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ELECTRIC RAILWAY JOURNAL

Volume 44, No. 1 New York, July 4, 1914 McGraw Publishing Co., Inc.

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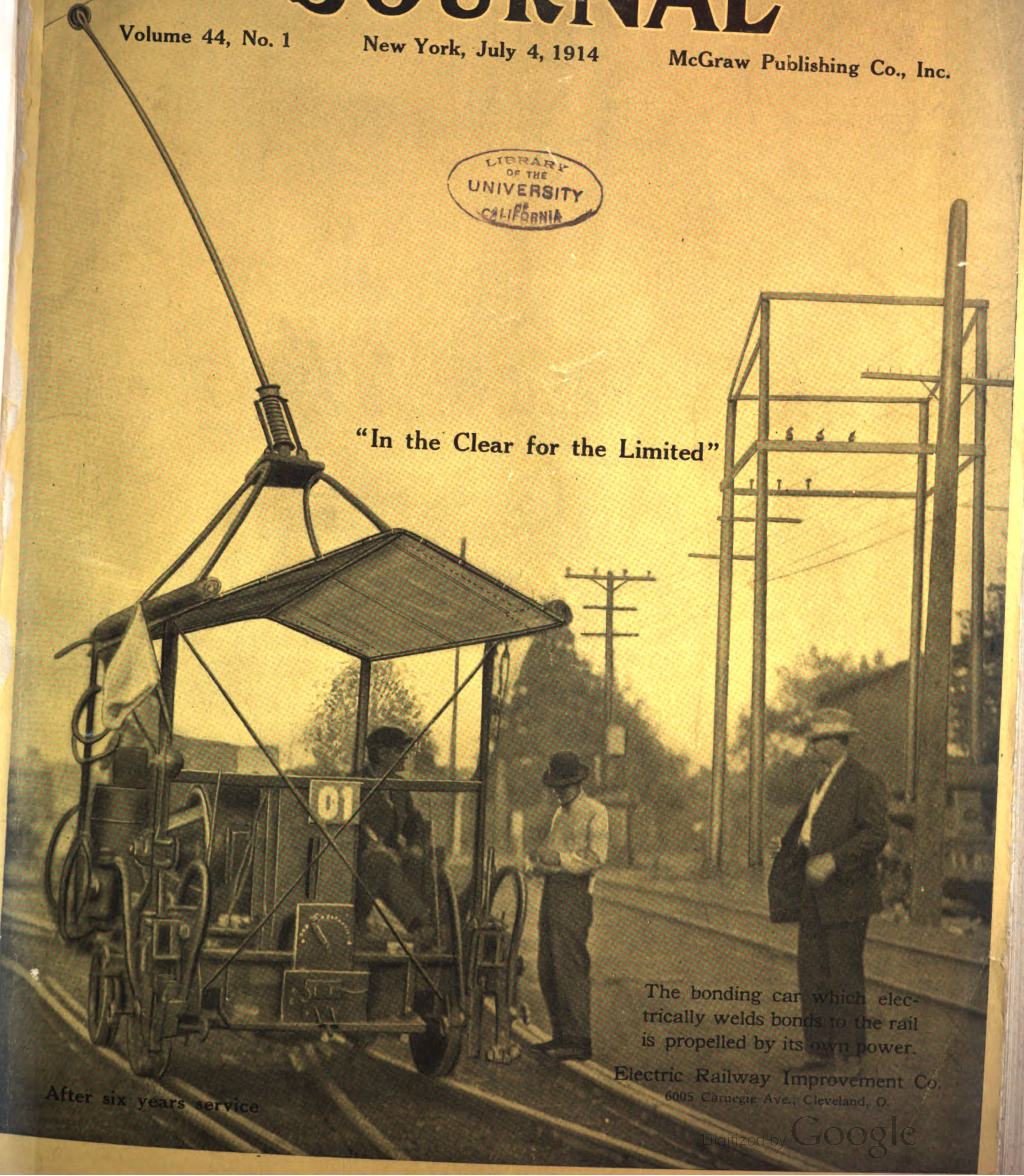

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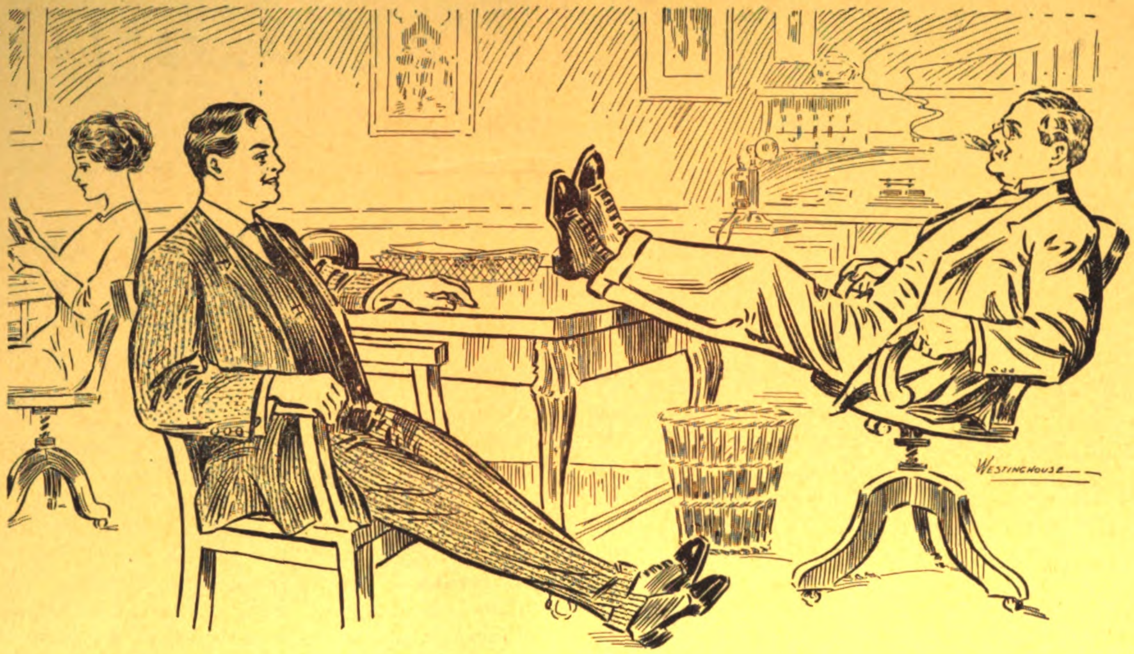

Times Have Changed

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Hohokus, N. J.

Washington & Old Dominion R. R. Co.
Washington, D. C.

Monongahela Traction Valley Co.
Fairmount, W. Va.

W WESTINGHOUSE ELECTRIC

Westinghouse Electric and Manufacturing Company
Sales Offices in 45 American Cities East Pittsburgh, Pennsylvania

Electric Railway Journal

Volume XLIV

July to December, 1914

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Instructions for Use of Index

This index is essentially a subject index, not an index of titles, and articles treating a number of different subjects are indexed under each subject. In addition, a geographical reference is published wherever the article relates to any particular railway company. The geographical method of grouping serves to locate in the index any article descriptive of practices, conditions, events, etc., when the searcher knows the name of the electric railway to which the article refers. Groupings are made under the names of the city in which the main office of the company is located, and cross references are given for the names of the railways, which appear in alphabetical order. An exception is made in the case of electrified sections of steam railroads, such entries being made direct under the name of the railroad.

In the subject index, the alphabetical method is followed, and if there is a choice of two or three keywords the one most generally used has been selected, cross references being supplied. Below will be found a list of the more common keywords used in the index. This list has been subdivided for convenience into sixteen general subjects, but the general subject headings, shown in capital letters, do not appear in the body of the index. As an example, if a reader wished to locate an article on power-driven motor trucks he would obviously look in the list under the general subject "vehicles," and of the four keywords that appear under this only "Commercial Vehicles" could apply to the article in question. The reader would therefore refer to this keyword under "C" in the body of the index.

CLASSIFIED LIST OF KEYWORDS

ACCIDENTS AND LEGAL

Accidents (including wrecks)
Accident claim department
Legislation
Legal
Public service commissions
Public service corporations

CARS

Car design
Cars (descriptive)
Cleaning of cars
Gasoline cars
Lubrication
Heating of cars
Lighting of cars
Storage battery cars
Tower cars
Ventilation of cars
Work cars
Wrecking cars

CAR EQUIPMENT

Axles
Bearings
Brakes, air
Controllers and wiring
Couplers
Current-collection
Fenders and wheel guards
Gears
Headlights
Journals
Motors
Trucks, car
Wheels

EMPLOYEES

Employees
Strikes

FARES

Fare collection (including apparatus)
Fares
Freight rates
Through routes and joint rates
Tickets
Transfers

FINANCIAL AND STATISTICS

Accounting
Appraisal of railway property
Financial
Franchises
Maps
Operating records and costs
Statistics
Traffic investigations, cities

HEAVY ELECTRIC TRACTION

Heavy electric traction
High tension d.c. railways
Interurban railways
Locomotives
Single-phase railways

MAINTENANCE OF EQUIPMENT

Cleaning of cars
Inspection of cars
Maintenance records and costs
Paints and painting
Repair shop equipment
Repair shop practice
Repair shops
Tests of equipment
Washing of cars
Welding, special methods

OPERATION

Dispatching trains
Multiple-unit trains
Operating records and costs
Passenger handling records
Rules
Schedules and time tables
Signals
Stopping of cars
Telephones
Trailer operation
Yards

POWER

Boilers and equipment
Cables
Catenary construction
Converters
Overhead construction
Poles
Power distribution
Power generation
Power stations
Purchased power
Storage batteries
Substations
Transmission lines
Trolley wire
Turbo-generators and equipment

RECORDS

Maintenance records and costs
Operating records and costs
Passenger handling records
Record forms

STRUCTURES

Bridges
Carhouses
Freight stations
Power stations
Repair shops
Terminal stations and terminals
Waiting stations

TRACK

Pavement
Rail joints and bonds
Rails
Ties
Track construction
Track maintenance

TRAFFIC

Advertising
Freight and express
Parks and pleasure resorts
Public, relations with
Publicity
Routing of cars
Signs on cars
Traffic investigations, cities

VEHICLES (not on tracks)

Commercial vehicles
Motor buses
Service and tower wagons
Trackless trolleys

MISCELLANEOUS

Fire protection and insurance
Lightning
Municipal ownership
Organization charts
Public, relations with
Standardization
Storerooms
Timber preservation

In addition to the groups of articles covered by these headings the papers and reports from railway associations and technical societies are grouped under the names of the various organizations. Proceedings of other associations are indexed only in accordance with the subject discussed. The heading "Cars" includes all extended descriptions of individual types of cars, but short accounts of cars displaying no important innovations appear only under the name of the railway to which they apply. Under the headings "Financial" and "Statistics" appear all articles relating generally to capitalization, earnings and operating costs, as distinguished from the detailed and highly subdivided figures that are entered under "Operating Records and Costs." Short descriptions of machine tools appear only under the heading "Repair Shop Equipment" and are not indexed alphabetically, because of the wide choice in most cases of the proper key word.

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*Denotes **Portrait.**

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MR. WESTON AND POLITICS The forcible removal of George Weston as a member of the Board of Supervising Engineers, Chicago Traction, is, of course, due wholly to politics. The Board of Supervising Engineers is peculiarly a creation of the city of Chicago. It was formed under the ordinances of 1907 to give the city a regulative hand in the rehabilitation of the surface railway properties and over subsequent capital expenditures. The city wanted the board to do exactly what was done and had its way. That, so far as the board had authority, it has failed to do its work well in these respects is not, we believe, seriously claimed by anyone. The city undoubtedly made a mistake from its standpoint when it failed to write into the ordinances authority for the board to regulate service and other features of the operations and affairs of the companies. However, the fact that it did not do so when it had an opportunity cannot be laid to the door of the members of the board nor to Mr. Weston. The cause for the removal of Mr. Weston is to be found in that kind of politics which threatens disaster to all forms of regulation and supervision in this country. Such a happening naturally provokes a query concerning public ownership. If politics can determine so absolutely the disposition of a satisfactory member of a regulative body, would any less drastic step be taken where a property was not simply regulated by the public but actually operated by the public? The event is an illustration of the extreme difficulty of combining politics and the direction of public utilities. Fortunately, Mr. Weston is still chief engineer of the board.

EFFICIENCY OF CO-OPERATION In a paper which was read at this week's convention of the New York Electric Railway Association and is published in abstract elsewhere, W. H. Sawyer has emphasized the practical, common-sense side of efficiency. This treatment of the subject is timely. So much has been heard of late about the wondrous possibilities of "efficiency engineering," and so little has actually been accomplished in the way of final results, that even the sound of the name has, to many employers, acquired in mild degree the qualities of an emetic. In calling attention to the fact that efficiency may be reached through co-operation Mr. Sawyer makes an exceptionally important point. Through reasonable co-operation the operators in any industry may obtain the benefit of the costly experience that only the strongest companies can afford to purchase at first hand, yet but few of the smaller concerns take advantage of it. Each year the committees of the various technical associations present reports fairly teeming with valuable information on actual practical problems, but it is safe to say that they are not read understandingly from cover to cover by more than 10 per cent of the individual members. Certainly many of the suggestions contained in such reports are seldom put into practice, and whether this condition arises through lack of appreciation of the efficiency of co-operation or whether it is due to simple inertia the fact is obvious that so long as it continues the field of endeavor of even the most impractical reformers will be a wide one.

PRACTICE OF PUBLIC RELATIONS "I propose hereafter to stand up and be counted and let the people of any community in which I am interested know just what they are doing not only to me but to themselves." These were the words recently spoken by Thomas N. McCarter in an open meeting before the citizens of Toledo, and we wish that there were more men in the electric railway field who would feel such a steadfast resolution. There is something stirring in the thought that the president of one of the largest public utility corporations in the country can lay aside his own pressing affairs and journey westward to point with the finger of experience and wisdom to the dangers in the present Toledo situation. We do not know that the facts presented by Mr. McCarter are entirely new to the citizens of Toledo. Probably the same information has been reiterated again and again in the recent publicity campaign, but this very repetition by local officials has rendered it less forcible than the words of the visiting authority. Mr. McCarter's review of the three points of fare, franchise and municipal ownership is clear-cut and persuasive, but it carries more weight because it is placed side by side with the recital of the Toledo dispute and because it gives a running story of the more sane treatment accorded his own company in New Jersey. Mr. McCarter is optimistic and says that he believes the day is coming when electric railway properties will be recognized on a higher plane than they have been in the immediate past. It is quite certain that this optimism would not be unwarranted if all electric railway officials would personally put into practice all that has been said on the subject of public relations with as much zeal and as great a spirit of personal sacrifice as Mr. McCarter has done.

THE ALL-AROUND SIDE-ENTRANCE TYPE OF CAR A feature in the growing popularity of the side-entrance type steel girder car is its equal availability for the opposing conditions of city and interurban service. In city operation it is often necessary to have the greatest possible capacity for a given length, and this feature the side-entrance car gives in the elimination of wasteful platforms and in the greater car length which is made possible by the use of rounded ends. The low step and the desirable isolation of the motorman also commend themselves as valuable features. For interurban operation the factors of greatest capacity, maximum possible length and low step are not of commanding importance, although the tapering ends may be considered as of some benefit in reducing energy consumption. The big problem in the case of the interurban car is the location of the smoking compartment, for it is most objectionable to women and children to pass through this compartment even when it is unoccupied. The side-door car offers a happy solution, whether single or double-end operation is in vogue, because the smoking section can be provided with a separate passageway and partition doors. This consideration may seem a small one to some operators, but it was the prime reason for adopting a side-entrance car on an interurban railway which feels sure that this change will cause a large increase in mid-day traffic because "A ride will then become a part of the day's entertainment," as the manager expressed himself in regard to the change.

DOUBLE-PINION DRIVES FOR RAILWAY MOTORS

Elsewhere in this issue is an article by A. A. Blackburn, chief engineer Belfast (Ireland) City Tramways, outlining the experience of that street railway with the double-pinion drive, in which a pinion is pressed on to each of the extended ends of the armature shaft to mesh with two gears that are mounted on the axle just inside of either wheel. The direct mechanical advantages of such an arrangement are so obvious that they have often attracted consideration to the scheme, although no practical use of it seems ever to have been made in this country for street railway service. That it should first appear in extensive use in Ireland, whence came the once-famous Irish "bulls," does not by any means require that it should not be taken seriously, even though a well-known Irish engineer has said, regarding the use of two pinions, that he would rather have one boil than two boils under any circumstances which occur to him.

Indeed, it should be noted that, in addition to its obvious "squaring" effect, the scheme provides a means for eliminating several of the worst difficulties encountered with the present standard single-pinion drive. First of these in importance is the fact that the slightest wear on armature shaft or axle bearings allows the pinion and gear to separate slightly, throwing the armature shaft out of line with the axle and placing the entire strain of driving upon the inside corners of the pinion teeth. This, as is well known, results in the almost invariable breakage of teeth at the corners nearest to the motor, and, notwithstanding the extraordinarily high grades of material used for gear teeth and the conservative standard diametral pitch of three teeth per inch, difficulty is often experienced in reducing the number of pinion teeth below fifteen, although the theoretical lower limit is twelve.

As the gear diameter is naturally limited by the diameter of the car wheel, the paradoxical condition has been reached wherein the smaller sizes of railway motors actually have a slower armature speed than the larger ones. Obviously a high armature speed will reduce the weight of a motor of given horse-power in almost inverse proportion, and to a marked extent it will reduce the cost as well, so that any arrangement whereby the pinion can be reduced in size and the armature speed increased seems to be well worth a thorough tryout.

The plan of using double pinions does just this. By maintaining the teeth in line it eliminates the improper strains on the corners of the teeth, and by dividing the work it cuts in half the power transmitted by each pinion. With its use, therefore, a great increase in gear ratio becomes possible, not only by reducing the pitch and adding teeth to the gear without increasing its diameter, but possibly also by reducing the number of teeth on the pinion, and, as a consequence, the armatures of motors for city service could be speeded up materially. The equivalent of the present 30-hp motor, for example, could easily be made to give an output of 45 hp. Certainly the consequent reduction of weight and first cost would at least go a long way toward offsetting the disadvantages of the necessary extra parts, and in view of the fact that the double-pinion drive has had its practicability demonstrated not only by the Belfast installation but also by a number of American electric locomotives so equipped it looks like a means for economy that is too important to be passed by without trial.

The questions of adjustment of teeth and of providing sufficient clearance between the wheels have no doubt contributed to the general timidity with which the use of the double-pinion drive has been regarded. However, the first of these seems to have been satisfactorily met by the experience in Belfast and the second may be answered by the fact that, even when new, two pinions with 2½-in. faces would provide the equivalent of a single one with the present standard 5-in. face. When wear has taken place in the bearings and the load on the single pinion has been concentrated on the inner corners of the teeth, the two narrow pinions would provide a vastly greater effective face.

Of course, the arguments that apply in favor of the double-pinion drive in city service do not have equal weight in the case of interurban cars, which have a high free-running speed and a gear ratio well inside of the maximum set by space limitation. However, the squaring effect of the double pinions still remains and reduction in pinion trouble is inevitable, even with this class of service.

A BROAD VIEW OF COMMISSION RESPONSIBILITIES

In the early days of commission rule there was a general sentiment on the part of public utility companies that the powers conferred upon state regulating commissions would be used primarily for the imposition on the companies of greater burdens than they had hitherto been required to carry. Nor was this opinion confined in its entirety to the companies. In fact, we suspect that one of the principal reasons why many citizens advocated commission regulation was that they believed it would have the effect of reducing fares and increasing the service of the public utilities.

With the extension of the plan of commission government and its more nearly perfected operation, however, a better conception of the functions and opportunities of public service commissions has been developed. In many respects a commission is a judicial tribunal. It considers evidence and renders decisions upon its best analysis of the facts presented. But a board of commissioners has other and broader duties than those simply of a judicial character. It has executive powers, as well as judicial functions, and for this reason possesses a wider latitude in its decisions than a court, because the attitude of the latter must be one of strict interpretation of existing statutes and of the constitution, whereas by the statutes the commission is able to interpret its powers in the way it deems best for the community.

An example of this enlightened view of the purposes of a commission is shown in the decision of the Public Service Commission for the Second District of New York in a recent case of the County Council of the city of Schenectady against the Schenectady Railway. The aspect to which we refer is exhibited not so much in the conclusion announced by the commission as in the reasoning by which it reached this decision as expressed in the opinion of Commissioner Emmet.

The case came before the commission because the Schenectady Railway some time ago discontinued its practice of selling six tickets for 25 cents and established a standard 5-cent rate of fare. The usual steps were then followed of a complaint by the authorities of Schenectady and a valuation of the property to determine whether the company was earning a reasonable return at its old rate of fare. The valuation of the railway property as claimed by the company was $4,562,032 and the value as determined by the city was $3,157,809. The net profits after the annual deductions for betterments, additions, etc., amounted to about 3 per cent on the investment as determined by the company's valuation. Without these deductions, it amounted to between 8 and 9 per cent on the valuation made by the city, or with these deductions, a return considerably lower.

With these facts before it the commission justifies the higher rate and it does so not because it would not be possible for the company to keep out of a receivership at the lower rate but on the broad ground of public policy. "Our present public service commissions law was intended," the commission says, "not merely to permit corporations of this character to accumulate such scant earnings as would keep them out of the bankruptcy courts, but actually to allow them under good management to attain positions of reasonably assured prosperity. The fact, therefore, that the Schenectady Railway seems to have attained that kind of a position does not alter our opinion that such a decision as is asked for by the complainants here would be regarded throughout the State of New York, and perhaps over a larger area, as the equivalent of a warning to private enterprise and capital that these are not particularly wanted any longer in the street railway field. We do not think it well to issue such a warning, or what might with some degree of justice be construed as such, at the present time. The result of driving private capital from the work of extending and improving the transit facilities our people now enjoy would, in our opinion, be quite as deplorable from the standpoint of the general public as from that of the financially courageous individuals whose money is now invested in good faith in public service enterprises throughout the United States."

These words are refreshing. There was no need for the company to cite as a defense that a lower fare would result in the confiscation of its properties. Under the federal constitution the company is protected against the actual taking away of its property, but public policy demands more than this. As Commissioner Emmett says later in his decision: "The truth is, it is not a particularly happy time, in our judgment, for government to intervene with a heavy hand in cases like this, where the rate that is complained of is after all merely the well-known and widely prevalent charge of 5 cents for each passenger. If industrial conditions in Schenectady and elsewhere were different, if the business outlook were rosier and the difficulties in the way of an orderly adjustment of our commercial problems less complex, we might (although of this we are by no means sure) be willing to apply in this particular case a somewhat more rigorous test as to the justice of the rates involved than we are now applying. But the conditions to which we refer seem to justify us in construing an admittedly doubtful point with some degree of liberality toward the respondents in this case, leaving the way open at some future time, after a change in conditions has occurred, to consider afresh the fundamental question involved in this controversy, if by that time voluntary action has not been taken by the railway company to adjust its differences with the citizens of Schenectady on some basis that will be satisfactory to both parties."

We have had occasion in the past to comment favorably upon the decisions of the Public Service Commission of New York, Second District. Although with a changed personnel, the commission is maintaining its reputation for forceful and sound thinking for the benefit of the community, while holding level the scales of justice.

THE PSYCHOLOGY OF BUSINESS

A great deal has been said in high political circles recently about the trouble with business at present being largely psychological. Psychology has been defined as the study of the condition and phenomena of the mind, and if business and public utility companies are suffering from psychological conditions it is because the men interested in those activities have become discouraged in their outlook for relief from the conditions under which they have been and are suffering. Instead, they see evidences everywhere of a tendency in legislation to put in force untried theories of government and to disregard the experience of the past in political matters, as well as the fundamental laws of finance and business. The result is a general feeling of uncertainty and dread, which is not confined to those who are so bound to old forms and methods that they cannot see anything good in anything new but is shared by a very large part of the business world. As an example of the loose political thinking and the disregard of the warnings of the past which seem to characterize some of the political policies at the present time, we need only cite the movement in some parts of the country in favor of municipal ownership of public utilities, and even the venture of some cities in enterprises of this kind.

In a recent talk, in which he discussed this situation, F. A. Vanderlip, president of the National City Bank of New York, referred to this restlessness and desire to try all kinds of freak experiments in governmental matters and said that they result in as startling productions, viewed in the light of anything known before, as had been reached in art by the schools of cubism and futurism. He also said that he had evidence to indicate that the majority of the people of the country were not behind Congress in demanding the enactment of the further business legislation now proposed, and even that a majority of Congress itself is unfavorable to the passage of many of the present measures which have aroused the opposition of business men. His recommendation was a Congressional recess of three months to give the country a rest and to permit the members of Congress to familiarize themselves with the views of their constituents and the state of public opinion. He also recommended greater interest on the part of the business men of the country in political matters and insisted that it was their duty to assist the public to obtain clearer ideas of correct business principles.

This latter suggestion is one which ought to be followed both during a Congressional recess and at other times in the public utility field as well as in that of general business. Electric railway managers ought to know the facts about their own industry and should be equally ready to give expression to them. We are firmly convinced of the possibility of better public relations as a result of better knowledge of railway problems by the public and through this means of a better treatment of the capital invested in public utility enterprises, but we are also equally convinced that such a result will not be brought about unless electric railway officials and others whose interests are concerned with these companies assume the major part of the burden of education. Both as individuals and collectively they should improve every opportunity to give the facts and to correct every misrepresentation so effectively and speedily that the truth will surely overtake the lie. This policy, if followed consistently, will win.

FUNDAMENTALS OF "SAFETY FIRST"

The excellent and successful efforts to reduce street accidents under the "safety first" propaganda, made largely at the instigation of electric railway managements, depend for their effectiveness upon the recognition and application of certain fundamental principles. The most vital of these is that ultimately the safety of the individual depends upon the degree to which he concentrates his attention upon his own safety. When a foot passenger is on his way through the streets, his primary business is that of transportation. His duty is to get somewhere in reasonable time and with minimum danger to life and limb. His mind should be intent on this purpose only. Hence those methods of educational work which are designed to impress upon young and old the importance of mental concentration in dangerous locations are striking at the root of the matter. Detailed suggestions, which drive home the lessons of previous accidents, will serve to make the teaching permanent. Heedlessness, absentmindedness, lack of concentration, these are the causes of most accidents. We believe that only a comparatively few result from bewilderment in the face of danger, or, in other words, that the number which could not have been prevented by care on the part of pedestrian or passenger is very small.

An electric railway company naturally has every incentive to keep down the number of street accidents, and it is eminently proper that its officers should be active in any safety propaganda which is begun in the city in which it is located. But, after all, "safety first" has a far broader significance than merely that of reducing the accident account of the local electric railway company. The community as a whole has a far greater interest at stake and should, in proportion, show a far greater concern in the plan. An important matter of this kind should not be left to depend upon the enterprise and humanity of a single interest only. "Safety first" should be taught continuously, and it is a fit subject for instruction in the home, the school, the church. Herbert Spencer gives as the first aim of education training for self-support. A still more fundamental purpose in the busy community of the present day is that of self-preservation as exemplified in the care and ability of the individual to avoid unnecessary danger. When this duty is realized the question will no longer be asked as to who will continue the "safety first" campaigns which have been inaugurated so successfully and largely through the efforts of electric railway companies in different cities during the past two years. They will be conducted by the public as a part of its most essential work.

WORKMEN'S COMPENSATION LEGISLATION

The addresses that were delivered this week at Bluff Point before the New York Electric Railway Association on the subject of employees' accident insurance, while dealing more particularly with the New York State workmen's compensation law, which went into effect on July 1, should be of interest to all electric railways wherever situated, for they lay stress upon the tendency for the betterment of working and social conditions that have not yet reached their fruition among our American states. During the last few years industrial insurance and workmen's compensation laws creating new and fundamental principles of compensating workmen for injuries received in the course of their daily employment have been enacted by the United States and by twenty-two individual states.

When the American colonies separated from Great Britain, they inherited the common law under which the master was liable to his servant for damages in case of accident only when the accident was caused by the fault of the master or by a vice-principal, or agent acting for the master. Under the common law the master was entitled to three defenses: The fellow-servant doctrine, assumption of risk and contributory negligence. Such a plan was well adapted to a state of society in which the establishments of employers were comparatively small and where both the employer and employee could oversee and to a considerable extent could control the conditions of work. In other words, it was suited for a social system under which, as a rule, each employee could know his employer and most of his fellow employees, because, then, if he did not like either, he could change his job. But these defenses, especially that of the fellow servant, lost their significance when large industrial plants came into being, because then a workman might have many thousands of fellow servants whose actions he could not control and of whose existence he was in most part ignorant.

Estimates of the cost to the employer of the workingmen's compensation plan vary enormously, and it has been put as less than the present plan and also as much more. Two estimated figures quoted at the Bluff Point meeting were one half of 1 per cent of the gross receipts in the case of a manufacturer and 20 per cent of the net receipts in the case of a steam railroad. Mr. Sims, who mentioned the latter figure, also called attention to the fact that if the expense was greater than that under the present system the railroad companies could not pass this charge on to be paid by the consumer, the plan usually suggested with laws of this kind. Definite figures of the expense will not be forthcoming, of course, until the present law has been in general use for a considerable time. We believe that most railways will admit the desirability of the principle of workmen's compensation laws and will agree that their advantages are not confined entirely to the workman. Such laws are certainly in line with the spirit of the times, but if they cast an additional financial burden on the railways some means must be devised to allow these companies to shift this burden upon the riding public. Moreover, if the incidence of the compensation expenses as between the several classes of employers proves unfair to the common carriers, adjustments will have to be made to bring about a distribution which is more equitable to the carriers.

THE USES OF A TECHNICAL JOURNAL

The careful reader of a technical magazine is usually conscious of two mental experiences. He will usually notice, first, that he is acquiring information of direct use to him in his vocation and, second, that his mind has been opened to larger questions of economics and public policy, to events and experiences which affect him only indirectly. For example, here is a man who inspects car equipments for a livelihood. He is really two beings in one. As an inspector he is interested in wiring, motors, controllers and other elements of his trade. As a man he wants to know what is going on in the world around him. If he does not have this desire for a wider experience he is only an inspector, and a poor one at that.

The attention of the average reader is naturally directed first to that part of the paper which contains matter affecting him most directly, but it does not stop there. Such topics as the clamor for the electrification of steam railroads, the experiments in municipal ownership of public utilities and the tendency to more and more elaborate regulation of public utilities are of interest to the man in the pit as well as to those who occupy directors' chairs. They may not intimately concern his daily life, but neither does the war in Mexico, yet he undoubtedly follows the accounts of that in his daily paper so that he will keep informed of current events and be able to talk intelligently about them with those with whom he comes in contact. The old saying that "reading maketh a full man" was formulated long before the days of technical journalism, but it is vitally true in the industrial world of to-day. The keen, up-to-date, rising man is almost invariably a discriminating reader, broad in his selection of topics. For this reason each number of a modern journal is planned so that, as far as possible, all sections will have some value to every reader.

The editor of the technical paper wants to print facts which will help each of his readers to earn a better living and to earn it more easily. But he considers that this is far from their sole desire. He feels that while each reader is particularly interested in certain parts of the paper and in certain departments of the industry, all of his readers are broadly interested in all parts of the paper and that by keeping in touch through it with the advancement in the field they are better fitting themselves for their present work as well as for any which the future may bring to them in the form of greater responsibilities. Finally the editor also feels that it is his duty to endeavor to discern the signs of the times in the different branches of the industry, to interpret them accurately and to express them in terms of his reader's interests. These, in the main, are the functions of a technical journal.

A 151-Mile, 1200-Volt Line in Texas

This Catenary Line Gives High-Speed Service Between Dallas, Waco, Corsicana and Other Important Cities in a Rich Cotton Country—Three of the Seven Substations Have Three-Piece Motor-Generator Sets for Delivery of 600-Volt and 1200-Volt Current

Another long link in the chain of electric interurban railways radiating from Dallas, Tex., has been completed. This new line was built by the Southern Traction Company and forms a 151-mile extension to the Texas Traction Company's lines, making in all an electric railway system of approximately 250 miles. This is by far the longest electric line in Texas and it is also the longest one in the South.

Interurban railway construction in Texas began in 1900 with a 10½-mile line between Denison and Sherman. This was followed two years later by a 35-mile line between Dallas and Fort Worth, built by the Stone & Webster Management Association. The first interurban construction on a large scale, however, was started by the Texas Traction Company in 1906 when it began the laying of a 76-mile line between Dallas and Sherman.

During 1911 and 1912 the success of the first installations led to the construction of more than 230 miles of electric lines in the State, which included the Galveston-Houston Electric Railway, 50 miles long, and the Fort Worth Southern Traction Company, 32 miles long, both of which were started in 1911. In the following year the Southern Traction Company financed and commenced building its 151-mile extension, which was completed and put in operation in January, 1914.

THE ROUTE

This new 1200-volt line of the Southern Traction Company is made up of two sections, one extending from Dallas to Waco, 97.1 miles in length, and another from Dallas to Corsicana, a distance of 54 miles. Both of these divisions, along with the original line between Dallas and Sherman, Tex., traverse the heart of the great Black Land belt. This is the most densely populated and highly productive section of Texas. Within recent years Dallas has become the metropolis of the Southwest, being a railroad and business center as well as a distributing point for manufacturers' equipment and supplies for Texas and the extreme Southwest of the United States. Moreover, added impetus has been given to business prosperity in Texas by the approaching completion of the Panama Canal. With this in sight, many railroads have improved their terminals and bettered their roadbeds in order to facilitate the movement of freight to the Galveston seaboard.

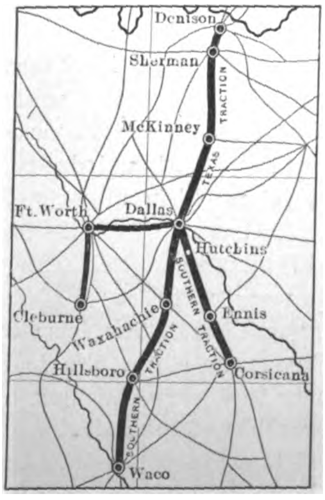
A natural channel of travel exists between Dallas, Waxahachie, Hillsboro and Waco, as well as between Dallas and Corsicana, each being the county seat of a rich cotton-producing territory. In fact, Waxahachie is said to be the largest inland cotton market in the world. Taking advantage of this condition, as well as the infrequent service furnished by steam roads between the points named, the Southern Traction Company was financed locally and undertook the construction of the new electric lines.

Another feature which helps to make electric interurban railway construction and operation profitable in Texas is the fact that the legal fare is 3 cents per mile. In addition, interurban lines do not carry bulk freight, but engage in an extensive first and second-class express business with rates fixed a little less than those charged by old-line express companies. Earnings which would be considered phenomenal in other parts of the United States are obtained by Texas electric railways. Few of them earn less than 40 cents per car-mile, with an hourly passenger service and at least two or three express trains each way daily.

Summer in Texas lasts approximately ten months of the year, during which period people travel by the electric line almost exclusively in order to be free from the dirt and dust incident to steam railroad travel. This tendency has been clearly demonstrated on the line between Dallas and Fort Worth, where a steam railroad between the same points proceeded to give very frequent service at rates far below the least the electric lines could afford to charge. Despite this the travel between these two cities went the electric way almost exclusively, and in time the steam railroad had to abandon its local competitive service.

CONSTRUCTION FEATURES

Topographical conditions in the territory traversed were not ideal for the construction of a first-class interurban railway at least cost for grading, while the undulating black earth and clay hills made the grading quantities per mile quite heavy. However, these cuts and fills through the gently rolling, highly productive


Denison
Sherman
McKinney
Ft. Worth
Dallas
Hutchins
Cleburne
Waxahachie
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Corsicana
Waco
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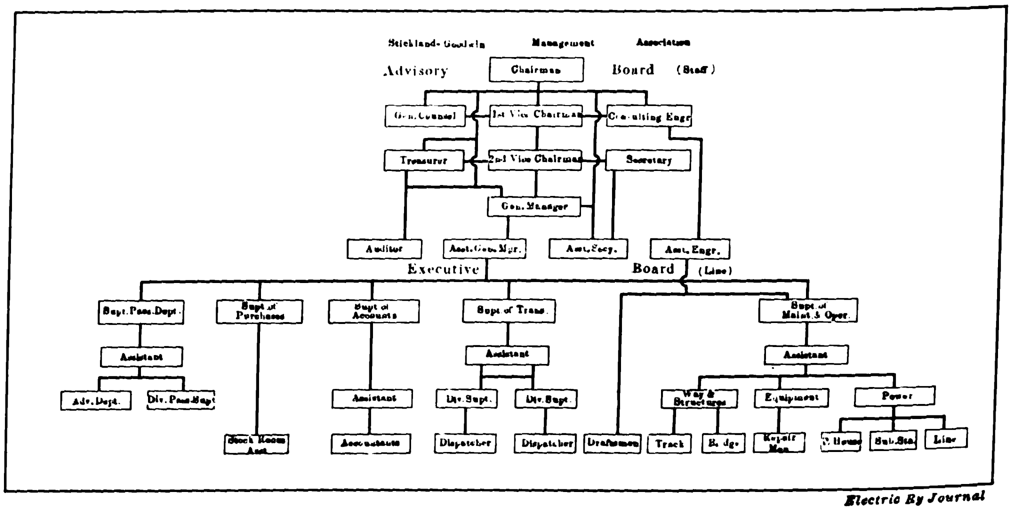
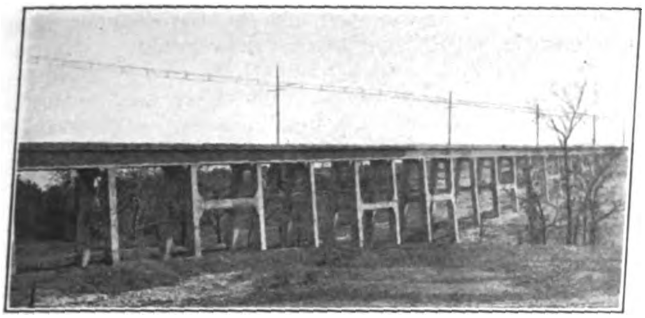

Stickland-Goodwin Management Association
Advisory Board (Staff)
Chairman
Gen. Counsel
1st Vice Chairman
Consulting Engr.
Treasurer
2nd Vice Chairman
Secretary
Gen. Manager
Auditor
Asst. Gen. Mgr.
Asst. Secy.
Asst. Engr.
Executive Board (Line)
Supt. Pass. Dept.
Supt. of Purchases
Supt. of Accounts
Supt. of Trans.
Supt. of Maint. & Oper.
Assistant
Assistant
Assistant
Assistant
Adv. Dept.
Div. Pass. Supt.
Div. Supt.
Div. Supt.
Way & Structures
Equipment
Power
Stock Room Asst.
Accountants
Dispatcher
Dispatcher
Draftsmen
Track
Bridge
Repair Men
P. House
Sub. Sta.
Line
Electric Ry Journal

SOUTHERN TRACTION—CHART OF CONSOLIDATED MANAGEMENT SOUTHERN & TEXAS TRACTION COMPANIES

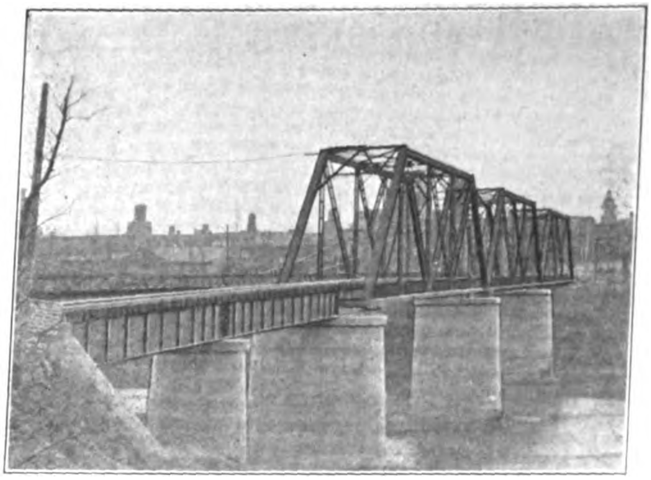


SOUTHERN TRACTION—CEDAR CREEK BALLAST DECK VIADUCT NEAR DALLAS

agricultural country made the new interurban line an interesting and picturesque one to the traveler. On the other hand, profiting by experience in electric railway construction since 1900, the Southern Traction Company provided a high-speed roadbed with a maximum grade of 2 per cent outside of the city streets and a maximum curvature of 6 deg. except where governed by streets. Of the total mileage built 91½ per cent is tangent track.

A private right-of-way varying in width from 80 ft. to 100 ft., depending upon the amount necessary to complete the grading economically, was purchased outside the cities. Additional widths were acquired at points where station sites were desired, or to provide sidings. This right-of-way is inclosed with a five-wire Osage-orange post fence with wing fences and cattle guards at all highway crossings. The standard roadway section is 16-ft. wide on embankments and 24 ft. in cuts, with a liberal allowance for shrinkage so that the seasoned embankment will remain full width. On embankments the slope is 1½ to 1, and in excavation it varies from ¼ to 1 to 1 to 1, depending upon soil conditions. The highest fill is at a point near Dallas over a 15-ft. concrete arch culvert, where the top embankment is 65 ft. above the floor of the culvert.

As mentioned heretofore, this extension comprises 151 miles of main line track, 20 miles of which, namely, between Dallas and Waxahachie, was acquired from the Stone & Webster Management Association. In addition, the completed line includes about 2 miles of second track and approximately 5 miles of sidings. The standard type of construction of all these tracks includes 6-in. x 8-in. x 8-ft. seasoned white oak ties, spaced seventeen ties to a 33-ft. rail. The ties were laid on 6 in. of gravel ballast except in paved streets, where 6 in. of concrete was placed under the ties. All gravel was taken from the railway's pits at Waco and Hutchins. Approximately 80 miles of the main-line track was built with 80-lb. A. S. C. E. rail and the remainder, except 5 miles in city streets, was built of 70-lb. A. S. C. E. rail. All turnouts from the main track are No. 9, with a 77.5-ft. lead laid on white oak switch ties cut to length, and equipped with medium height Buda switch stands. Practically all sidings were constructed with stub-ends; when the subgrade has thoroughly seasoned they will be double-ended.

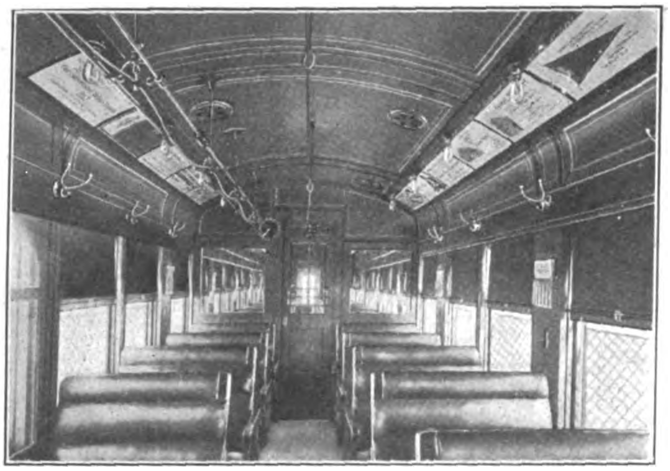


SOUTHERN TRACTION—BRAZOS RIVER BRIDGE

BRIDGES AND STRUCTURES

In all, the construction of this new line comprises eighteen steel bridges or steel viaducts having a total length of 3513 ft. The longest single span was placed over the Brazos River at Waco, being 450 ft. in length and forming three 150-ft. spans. The longest viaduct, 1454 ft., was built at a grade separation which carries the interurban line over the main line and side tracks of two steam railroads at Waxahachie. All steel bridges and viaducts were designed to carry Cooper's E-30 loading. Probably the most interesting piece of bridge construction was encountered in building the

SOUTHERN TRACTION—VIADUCT AT WAXAHACHIE



SOUTHERN TRACTION—INTERIOR OF PASSENGER MOTOR CAR

piers for the Brazos River bridge. At this point caissons were necessary to carry on the pier excavation. These were constructed of reinforced concrete with 12-in. walls, beveled at the bottom to form a cutting edge so that they would settle readily as the excavation progressed. The complete reinforced-concrete caissons were about 16 ft. in height, extending from bedrock to the bed of the river. In order to conduct the excavating to advantage, however, the caissons were built in several sections. When bedrock was reached the bottom was sealed, after which the open caisson was used as a form for the concrete piers.

Concrete structures included two reinforced-concrete ballast-rock trestles, one 660 ft. long and another 340 ft. long. Both of these structures were required just south of Dallas, and are combination reinforced-concrete, deck-girder, ballast-deck structures, the former structure, however, supported on concrete piers and the latter structure supported on two-column bents and four-column towers alternately spaced along the length of the structure. A number of other waterways were provided with concrete arches, two of which are noteworthy, one being a 50-ft. reinforced-concrete arch and the other a 40-ft. arch. All reinforced-concrete structures were designed for Cooper's E-40 loading.

In several instances the size of the opening was questionable, and rather than run any risk of future renewals by building permanent structures, wooden-pile trestles were provided. These, it was believed, would give sufficient life to enable the engineers to study conditions accurately and replace them with permanent structures when renewals were necessary. In fact, the size of these trestle openings were severely tested during the record floods in December, 1913. All trestles withstood these floods without damage, and in each instance it was demonstrated that the large temporary openings provided were necessary. In all, 11,147 ft., or 2.1 miles, of wooden-pile trestle were constructed on this new line. Small openings, namely, those between 12 in. and 48 in. in size, were supplied by non-corrosive corrugated culverts.

At three points where steam railroads were crossed, topographical conditions were such as to make grade separation exceedingly expensive. At these points the crossings were installed at grade and were protected by derails on each side of the steam railroad. The derails are operated by an interlocking device designed so that the conductor may readily close them. The locking-bed elements, however, are so arranged that the derail cannot be closed until after the danger signals have been set on the steam line, and these signals cannot be dropped to the danger position if a train is within 2000 ft. of the crossing. This locking feature is controlled by a clock set for a thirty second release.

ENERGY GENERATION AND DISTRIBUTION

Energy for this new line is supplied at 2300 volts, sixty cycles by the Texas Power & Light Company, an organization controlled by the same holding company as the one which operates the interurban line. At present this energy is transmitted from the power and light company's Fort Worth station, but the larger portion of this load will ultimately be transferred to a new generating station now under construction at Waco. Energy is transmitted to six substations, including three terminal and three intermediate stations, located in the principal cities on the two divisions of the road. Each substation feeds a trolley section slightly in excess of 25 miles in length.

The three terminal substations are situated at Mon-

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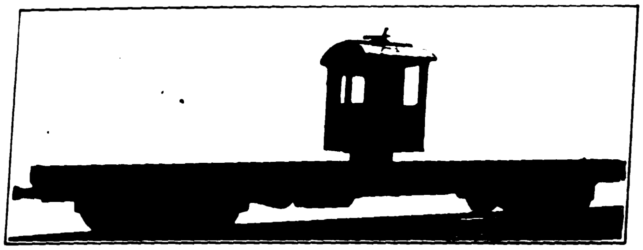
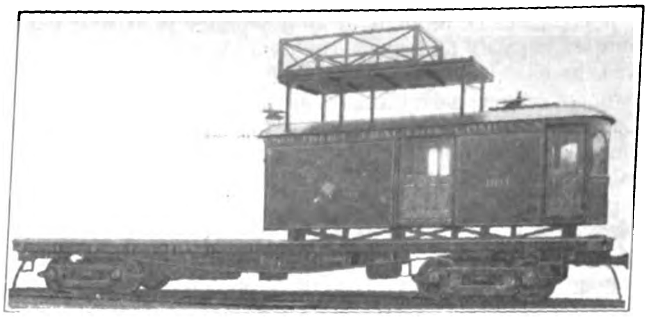
DALLAS
EXPRESS

SOUTHERN TRACTION—PASSENGER MOTOR CAR WITH TRAILER



SOUTHERN TRACTION—WORK CAR



SOUTHERN TRACTION—COMBINATION LINE AND WORK CAR

roe, a suburb of Dallas, Corsicana and Waco. Each is equipped with two 400-kw motor-generator three-piece sets, designed to deliver both 600 volts and 1200 volts d.c. to the trolley line, the lower voltage being necessary to comply with the ordinances of Dallas, Corsicana and Waco.

The three intermediate substations are located at Waxahachie, Hillsboro and Ennis. Each has one 400-kw motor-generator two-piece set, designed to deliver only 1200 volts d.c. In addition to the three intermediate substations, a portable substation has been purchased for use in cases of emergency.

As shown in one of the accompanying illustrations, the substations are housed in fireproof brick and concrete buildings, 40 ft. x 50 ft. in plan, with a clear inside height of 15 ft. The transmission lines enter the substation by way of a structural-steel terminal tower formed of four built-up tower posts which support the terminal insulator racks. From this point the transmission lines connect into transformers located in the space defined by the four tower posts, and lead from there to the substation by way of a small transmission bracket located on the roof, and roof insulators. The out-door substation equipment is enclosed with a high-woven wire fence as a safety measure.

OVERHEAD CONSTRUCTION

All trolley construction, except that on city streets, is of the catenary type, nine-point suspension carried on mast-arms. It is supported on 9-in. top, 35-ft. Idaho cedar poles spaced at 150-ft. intervals on tangent track, and at closer intervals on curves. The mast-arms are of the usual structural T-beam section, 9 ft. in length, provided with special end-castings at feeder taps and a long bracket steady brace at frequent intervals. Clearance between the top of rail and trolley are fixed at 19 ft. Feeder taps are supplied five to each mile, and lightning arresters at the same interval.

The high-tension transmission line is carried on steel towers along the company's right-of-way, except through the cities, where it was necessary to purchase a private right-of-way around them. This tower line follows the right-of-way from Waco to Waxahachie and from Ferris to Trinity Heights. It was built primarily to serve a number of lighting and power properties in the cities and villages in this territory. From Ferris to Corsicana the transmission line is carried on wooden poles along with the trolley wire.

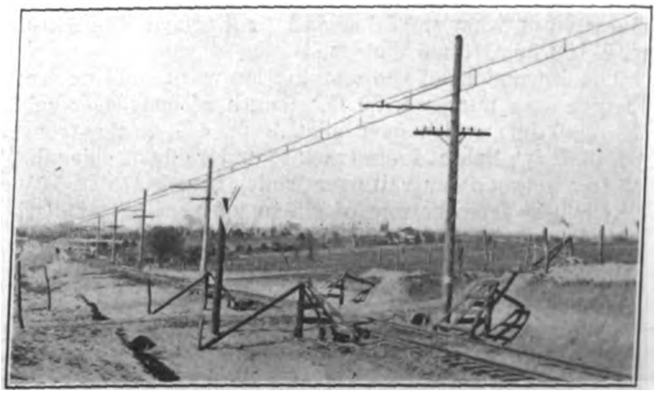
On city streets the overhead construction is changed to a simple trolley on span wires. Here also compressed, concealed rail bonds are provided in place of the brazed bond used in open-track construction. In addition to these five crossbonds are installed in each mile and special No. 0000 long bonds provided around switches and railroad crossings. Overhead construction on the bridges and viaducts, where the spans were too long and too high to permit poles to be set in the ground, was provided by setting the poles on structural-steel brackets projecting from the piers and towers. The butt of the pole was set on the bracket and it was tied in just below the bridge deck level by a structural-steel bracket designed to hold the pole rigidly in position. Several typical overhead construction installations are shown in the accompanying illustrations.

Two complete metallic telephone circuits are also carried on cross-arms set immediately below the mast-arms. These were provided for a telephone-selector system furnished by the Western Electric Company. The telephone circuits are No. 10 copper wire mounted on porcelain insulators and each telephone is protected from the high-trolley voltage by a small transformer. Both of these telephone lines are used for train dispatching; a third circuit is to be added and used as a commercial line when required.

REPAIR SHOPS AND ROLLING STOCK

General repair shops are now being constructed at Monroe, a suburb just south of Dallas, and at the junction point of the lines to Waco and Corsicana. All heavy general repair work for the new line as well as the lines of the Texas Traction Company north of Dallas will be concentrated at this point. Ordinary running repairs necessary to maintain schedules on the Dallas-Sherman line will be done at the repair shop at McKinney, where all repair work is being handled until the new general repair shops are completed.

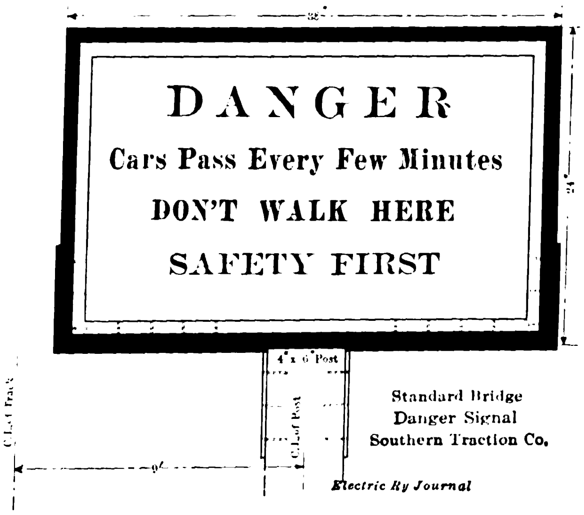
SOUTHERN TRACTION—STANDARD SUBSTATION



SOUTHERN TRACTION—OVERHEAD ON TANGENT

A complete equipment of rolling stock including passenger, express and work cars was purchased for this line, and is now in service. This list included twenty-two passenger motor cars built by the St. Louis Car Company, six express motor cars, ten passenger trail cars, two express trail cars and two motor work cars furnished by the American Car Company. All of these cars were built with underframes of composite construction, except the motor passenger cars, which are of semi-steel. The cars are finished in golden oak with tan grain leather upholstered seats. All cars were designed for high-speed. The principal general dimensions of the motor passenger cars are as follows: Over-all length, 53 ft. 6 in.; over-all width, 9 ft.; seating capacity, fifty-six passengers. The electrical equipment in these cars includes four GE-225 motors arranged for single-end control. Each car has a switch to permit full speed operation on either 600 volts or 1200 volts.

The ten passenger trail cars were also designed for high-speed interurban service, and to be coupled in trains of two or more cars each. Each side of the car is framed for seven pairs of double windows with oval-top sashes. The bulkheads at each end are fitted with single sliding doors, which, together with the end windows, are removable in hot weather. The express motor and trail cars are practically identical in construction with the passenger trail cars, except that they are designed for a carrying capacity of 40,000 lb.



SOUTHERN TRACTION—WARNING SIGNS ON BRIDGES

The combination work and line cars also have composite underframes similar to the express motor and trail cars, except for minor changes in size of the steel members. These cars were designed to carry a distributed load of 40 tons at high speed, and the principal dimensions are as follows: Work car: Length over bumpers, 50 ft.; width over sills, 8 ft. 4½ in.; width of cab, 5 ft.; length of cab, 7 ft.; wheelbase, 6 ft. 6 in.; diameter of wheels, 37 in., and Brill trucks 27-MCB-3 with 100 hp GE-225 motors.

The dimensions of the combination work and line car: Length over bumpers, 50 ft.; length of body over cab, 24 ft. 6 in.; width over sills, 8 ft. 4¼ in.; extreme width, 9 ft.; height from track to underside of side sills, 43 in.; height from rail over trolley boards, 14 ft. 10½ in.; height from bottom of sill to top roof of car, 8 ft. 6½ in.; Brill trucks 27-MCB-3 and GE-225 motors. Views of these cars are shown in the illustrations.

GENERAL

The Southern Traction Company was promoted and financed by J. F. Strickland, its president. Its opening was made an auspicious occasion with celebrations in all the important cities along the line. Much stock was sold locally, consequently there was a personal interest in the success of its operation. The road is known as the "Home Interurban." The actual construction was done by the Southern Engineering & Construction Company, of Dallas, of which Burr Martin is president and Luther Dean is vice-president and chief engineer. The operation of this new line, as well as that of the Texas Traction Company, is under the direction of R. B. Stichter, general manager.

The Canadian Radial Electric Railway Act

In a long report which he has made to the Bureau of Foreign and Domestic Commerce of the Department of Commerce of the United States on commercial and economic conditions in Ontario, Consul Julius D. Dreher at Toronto, Canada, says in referring to electric railway progress and to the extension of the radial electric railway:

"The street and rural electric railways in the Dominion have a total first main track mileage of 1357, or, including second main track mileage, a total of 1727 miles. Of the former total, Ontario lines have 543 miles, or 40 per cent, and of the latter 659 miles, or 38 per cent. Of the total capitalization of $141,235,631 the lines in Ontario have $44,591,296, or 31.6 per cent, and of the total net income for the year ended June 30, 1913, amounting to $6,612,575, Ontario lines made $2,710,375, or 41 per cent, which was a net profit of 6.1 per cent on the total capital invested in Ontario lines. Only three of these lines showed a deficit last year, the aggregate loss being $34,197. It is expected that the mileage of rural car lines will be considerably increased in the near future.

"In April last the Dominion Parliament passed an act conferring further powers on the Hydroelectric Commission in order to promote the building of radial, or interurban electric railways. Under the provisions of this act the commission will construct, equip and operate these lines for the benefit and at the expense of the municipalities. The railways will be built with money secured by issues of bonds by the Hydroelectric Commission, guaranteed by the Province. The government will in turn be protected by requiring the municipalities to deposit with the commission debentures covering the expenditure made. The interest, sinking fund, or possible deficits will be met by the municipalities interested. The bonds covering construction will be extended over a period of fifty years, a provision calculated to lighten the burden upon the enterprise, and in order to tide over the first ten years, when the roads are getting under way, the municipalities will not be required to pay sinking fund charges at all.

"As an added protection for the commission, it is provided that where a municipality defaults on its interest or sinking-fund payments the commission shall have the right to go on the market and sell the debentures of that municipality to make up the deficiency. Where the debentures fail to produce the necessary amount the municipalities can still be made liable for any amount still due the commission, as its bonds will be a first mortgage upon the railway property.

"The responsibility for entering upon a radial railway project lies entirely with the municipalities. The commission is empowered to enter into a contract with one or more municipalities, with the approval of the Lieutenant-Governor in council. The agreement or contract must then be submitted to the electors qualified to vote upon money by-laws."

For electrification of railways in Japan the sum of $1,250,000 has been included in the budget for the current year of the Japanese Imperial Railway Board.

The Question of Public Relations

Full Text of Speech Delivered at Public Meeting at Toledo June 25 by Thomas N. McCarter, President Public Service Corporation, Newark, N. J.—The Speaker Discussed the Toledo Situation, the Hazards of the Industry, Rate of Return and Other Allied Subjects

The trouble with this street railway proposition is that most people do not know anything about it. If we who are versed in this business should undertake to tell them as much about their business as they with great nonchalance tell us about ours, they would quickly inform us that we were talking about things we knew nothing of. With what I say on this subject, I have no false modesty. I speak whereof I know, taught in the school of hard experience.

A 3-CENT FARE INADEQUATE

I start with the direct proposition that it is impossible, under present-day conditions, to operate an up-to-date street railway in this country, pay operating expenses and earn interest on the actual cost of the investment on a 3-cent fare. Why this demand for a 3-cent fare? Have the gentlemen who so clamor for such a fare worked it out scientifically? If I understand the principle of rate regulation at all, it is that electric railways, being quasi-public bodies, must be allowed to earn, in exchange for the franchise grants, only a fair return upon the value of the property devoted to the public use. Who has told these gentlemen that a 3-cent fare will do that? Why is it that they clamor so loudly for a 3-cent fare? Why do they not make it 2 cents or 1 cent? It is simply a will-o'-the-wisp, a happy catch word of the politicians.

While I accede entirely to the proposition that in the long run one catches more flies with molasses than with vinegar, and I am willing to go the limit in endeavoring to placate even those whose intelligence I may not respect, I do not propose that the interests I have in hand shall be ridden over rough shod by the demagogues and the cheap politicians without a fight. I venture to say that of those in authority clamoring after this fare at the present moment, there is not a single man, in this city or elsewhere, who can tell you the basis of his belief, other than that the companies under discussion are public service corporations, that fortunes have been made out of those properties, perhaps improperly, in the past, and that, all things considered, 3 cents is enough for them. The whole 3-cent fare agitation is uneconomical and unsound, and as soon as the people of this country get that in their minds the better for everybody, including themselves.

The railway property of the Public Service Corporation of New Jersey has gross receipts of approximately $16,000,000 a year. We furnish with transportation all of the larger cities of the State of New Jersey, with the exception of Trenton, and many of the smaller ones. We operate large city, suburban and interurban properties. We have a straight 5-cent fare with a very liberal transfer privilege, so that the county rather than the city is largely our 5-cent fare limit. To that extent we are liberal. Sixty per cent of a 5-cent fare is 3 cents. In 1908 our vast system was operated for 61.7 per cent of its gross receipts. In 1909 it was operated for 59.1 per cent of its gross receipts, in 1910 for 60 per cent, in 1911 for 63 per cent, in 1912 for 63.6 per cent and in 1913 for 63 per cent. Where would we have been with a 3-cent fare? We would not have paid operating expenses, except in one year, when we would have had 0.9 per cent over.

Some one will say that the 3-cent fare will very largely increase the receipts because of the large increase in the riding habit over what it would be with a 5-cent fare. It is not so. We have just been through an experience of this character in our gas business. For many years our average increase in the output of gas has been 7 per cent. A year ago the Public Utilities Commission of New Jersey reduced the price of gas from $1 to 90 cents per 1000 ft. and they and the people of New Jersey said that we would more than make up the decrease in price through the increase in consumption. The first year, under the 90-cent gas rate, we increased a little over 6 per cent, or less than the 7 per cent average of the preceding ten years. The same result was demonstrated in the New York Consolidated Gas Company matter, where the price of gas was reduced from $1 to 80 cents with absolutely no abnormal increase in consumption.

HAZARDS OF THE INDUSTRY

We are at the parting of the ways with these industries in this country. I am not an apologist for the past. I know money was made out of public utility properties in the early days, and that some things were done which would not be countenanced now. I am not so sure that they were wrong. You must remember the electric railway industry is only twenty-six or twenty-seven years old. I still adhere to the principle that a man who has the hardihood to venture his money in a new and untried art that develops and changes over night, is entitled to make a good profit, something more than interest on his money. If he were not entitled to such a profit, he would be a fool to go into the enterprise. It is easy when success is assured to begin to talk about cutting down the rate of return to something more nearly normal, but when you are talking about the industry that in only twenty-seven years has almost revolutionized transportation in the world, it is too soon to begin to cry "Wolf" and to attack the early investors because they have made money out of it.

When this country wanted a transcontinental railroad built, it held out very great inducements to the promoters who would build it. Among other things, the government gave thousands of acres of land along the line of the Union Pacific Railroad. After the Union Pacific became a success, it undertook to take the land back. Was that fair? Did not the men who had the hardihood to go into that enterprise have the right to keep this land? They did, and the United States Supreme Court said so. It is the same thing in this matter of ours. A few years ago some gentlemen had the hardihood to build tunnels under the Hudson River, connecting the States of New York and New Jersey. Nothing has ever been done that has been as great a boon to New Jersey as the making of these tunnels, but the venture has not been a success. The property has had to be readjusted, and the bonds which were issued only for investment have had to be scaled down, half being mortgage bonds and half being income bonds. The company is now earning interest on the mortgage bonds and hopes some day to earn interest on the others. Will anyone say that those gentlemen who had the temerity to put their money in the bowels of the Hudson River and connect the great States of New York and New Jersey by rapid transit, should, if their enterprise ever does prove successful, be limited to a 6 per cent return on their investment? If this is adopted as the policy of this country it certainly means to say that no such enterprise will be established, for no man will be fool enough to undertake the risk and hazard of such an extraordinary enterprise under such conditions.

Would any of you take a franchise to-day for airship work and put your money into it? Would any of you back an enterprise that had transportation between here and Detroit by air for its object? It is not any more unlikely, thirty or forty years hence, that there will be such a means of locomotion between here and Detroit than it was thirty years ago that street railways would be what they are to-day. If you and I had the hardihood to back an enterprise of this kind and we waited until the people began to use it, would we not be entitled to more than 6 per cent on our investment?

FAIR RETURN FOR ESTABLISHED PROPERTY

After a property has become established, as ours is at present, though not firmly, a different problem presents itself. There should be no extraordinary or improper return, but the return should always be substantial and above the legal rate of interest. Otherwise I, for one, who have some idea of the annoyance and responsibility of this work, would leave my money in a savings bank or take a mortgage on real estate, and leave the troubles of this business for someone else. What is a fair return on the hazards of the business? I cannot say, but I know it must be sufficient to attract capital. It must be sufficient to keep the property developed up to the needs of the city, and, by and large, it should never be less than 8 per cent on the value of the property devoted to the public use. Otherwise capital will flow elsewhere into different channels with less hazard. Any community that seeks to pare down the return below this point hurts not only the traction company but more especially itself.

When I was president of the American Electric Railway Association, I went from one end of the country to the other making speeches. The great value of this was that I saw how the different properties were operated and how they were developing the cities of the country, and I say, without fear of contradiction, no one other single element that has arisen in the last twenty-five years has so developed the American city as have the electric railways of this country. And they will go on developing this country if they are allowed to. Just think how they have revolutionized the lives of the people of the cities. Just think how they have made it possible for men of moderate means to live in the suburbs and to own their own homes instead of living in the congested centers in tenements. All has been done with a maximum of a nickel fare, throughout the length and breadth of this land, and yet the cry goes up that we are robbing the poor people and robbing the country, when as a matter of fact we have not only done this development work but have also created untold amounts of wealth for the individual property owners, and also for the cities themselves through the medium of the increase in tax values. It is such a mistaken point of view for municipalities to try to draw the last drop of blood and insist upon the last pound of flesh. How much better it would be, instead of the turmoil that is in Toledo at the present time, to have a company allowed to go on in its own way, regulated, with rates so that the return would be commensurate with the service rendered, but so that the company could get the necessary capital to develop the city. How much better would every individual be if that were the case, instead of having the present condition prolonged to an indefinite future, with a saving once or twice a day of some portion of a cent.

RESULTS OF 5-CENT FARE IN NEW JERSEY

I said we had in New Jersey 5-cent fares. So we have, but by the operation of the transfer system it is reduced, as far as the fare per ride goes, to 3.8 or 3.75 cents. That is the fare that every passenger who boards a car, whether for a cash ride or a transfer ride, pays us. A 5-cent fare, or this 3.8-cent fare, enables us to pay our operating expenses, pay a reasonable return upon the investment of capital, and, what is more important, obtain the necessary new capital for further development. In the eleven or twelve years of my administration, there has been invested between $30,000,000 and $40,000,000 in the development of the railway property alone. Under present conditions in Toledo, how long will it be before that sum of money is invested here?

Only yesterday I had the great privilege in the city of Newark of turning the first operation of a steam shovel on a new electric railway terminal which we are about to construct for the purpose of taking our cars off the congested centers of the streets. We approach this terminal along the one side by a subway a quarter of a mile long, and on the other side by an elevated line a quarter of a mile long. On the ground floor of this building will be a great concourse, like that of the Hudson Terminal, one flight down to the subway and one flight up to the elevated. When the terminal is done, we shall be able to double the cars now in use, and we hope to increase our business very materially. It will cost more than $5,000,000. We had no trouble to get the money because of the conditions I have spoken of, but if you needed such a terminal in Toledo at this time, you would have a nice time getting any $5,000,000.

The answer to the whole proposition is that while there are peculiarities about this business, it is like every other business; it is governed by inexorable economic laws, which no amount of skullduggery or tomfoolery or political nonsense can overcome. Some people say I am blunt and tactless at times and undiplomatic. I am all through with trying to soft soap these things to a successful issue. I propose, for one, hereafter to stand up and be counted and let the people of any community in which I am interested know just what they are doing, not only to me, but to themselves.

THE FRANCHISE QUESTION

I know it is hopeless for me to attempt to change the attitude of the Middle West, or perhaps the rest of the country, on the question of short term franchises, but I also know that the principle of a short term franchise is all wrong. It is uneconomical and unsound. I do not argue for the old fashioned, unregulated, perpetual franchise, which allows properties to be exploited by a few men for the benefit of themselves. Now that regulation has come to stay, as it has in this country, these things are a thing of the past. The question of the length of the franchise, from the standpoint of the municipality, is relatively unimportant, whereas to the company itself it is of vital importance. Some say a twenty year franchise is long enough, and they ask you to make a large capital investment or to retain your present capital investment, with a twenty year franchise, and let the future take care of itself. Suppose any of you leased a piece of property on any of these main streets, where the property values are high, for ten years, and only for that period, and you went ahead and put a large mercantile building upon it, costing $100,000. Would not any reasonably prudent man, if he had only a ten or twenty year lease on that property, charge off one-tenth or one-twentieth of the value of his property as he went along? If these short term franchises are to be granted without any hope in them beyond the limit of the day to which they are granted, then I say it is the duty of the company to amortize its investment. In such a case, who must pay for the amortization? The people who ride on the car. It becomes an operating expense, or a fixed charge, an expense akin to an operating expense. In other words, it is a short-sighted policy on the part of the municipalities to insist on short term franchises unless they want to put an undue burden on the present generation. The length of a franchise period becomes immaterial when it is assumed that there is a commission that will enforce good service and reasonable rates. These constantly recurring periods, such as occurred a few years ago in Chicago and Cleveland, and such as is now going on in Toledo and is about to burst wide open in Detroit, hurt the community. If this franchise question did not come to a head with such periodic frequency, but went on either indeterminately, or so that the amortization would be spread over a long period of years and not fall so heavily upon the present generation, it would be better for all concerned.

MUNICIPAL OWNERSHIP OF RAILWAYS

I recently appeared before a committee of the House of Representatives in Washington, which had before it a proposition to condemn the street railways of the city of Washington for governmental use. The committee of the District of Columbia, before which I appeared, consisted, I think, of a total membership of twenty-one men. They were called together to hear what was to be said upon this very important question, and at one time while I was talking there were actually five of the twenty-one present. That committee has since voted nine to eight to report the bill. I have not much fear that the bill will pass, but I do say that for a Congressional committee composed of twenty-one members to give such a scant hearing and attention to this vital matter is a travesty upon our system of politics, and something will have to be done by the legislature if it is going to carry on its work in committees, to overcome this evil. Mr. Brady confirms this, because he recently appeared before a Senate committee in an equally important matter and had practically the same experience. We were representing vast amounts of capital and should have been granted a full hearing, so that the committee members might at least know upon what they were voting, which was not the case with the recent vote in favor of condemning the Washington railways.

In regard to the wisdom or foolishness of municipal ownership, my own judgment is that it is a very foolish thing for this government or for our municipalities to undertake. I am willing to admit, with some reservations like the one just spoken of in Washington, that our scheme of national government has been a great success. Our fathers built better than they knew, and we have had a hundred and thirty-five years of marvelous success. With the state governments the plan has also worked well, and in the main they have been honest and economically managed. Who can say the same thing about our municipal governments? Municipal government, as it has been worked out in the United States up to the present time, is a failure. The municipal governments in this country have not been as practical, so far as the personnel of the men, the results obtained, and the efficiency of the government concerned go, as have the national and state governments. Upon this premise, of which I defy contradiction, does it seem wise to turn over to these gentlemen, who have already made a failure of almost everything they have undertaken, the burden of the operating of public utilities?

Some utilities are easier to operate than others. The gas business, for example, is all underground and not in the public eye very much. The street railway business, however, is before you every day and many times a day. The men operating the cars are coming in constant contact with the public. Some times they lose their tempers, as much as we try to keep them from it, and, stranger still, sometimes a passenger loses his temper. Imagine what kind of operation you would have, after a short time, with these street railways in operation under the guidance of the municipal governments of this country. But, even if they were equipped to do their present work well, have they not about enough to do—parks, play grounds, sewers, schools, libraries, streets, paving, water supply, and all the rest of it? Is it not too much to turn over to these already overburdened cities the operation of all these utilities? Moreover, think of the money involved. We showed the committee in Washington that to take over the Washington railways would require not less than $50,000,000. If they would come knocking at the door of my company in New Jersey, I can promise them that the price would be not less than $300,000,000 on a careful valuation. Think of the straining of municipal credit, already overstrained in this country, if the cities attempted to buy such properties. If they began borrowing these enormous sums of money, how long would they remain on a 4 per cent basis, if they are on that basis at the present time? Before they knew it, the municipal rate would be up to 6 per cent. But the municipal ownership advocate says that even if it is 6 per cent, the company wants 8 per cent, so that the rate will be 2 per cent cheaper anyway. How long would that 2 per cent last as between efficient private operation and municipal ownership? In my judgment, it will be a sorry day for this great republic when, in addition to all the present troubles these municipalities have, they take upon themselves the operation of public utilities, paying for them sums running into the thousands of millions of dollars.

All I ask on this subject of municipal ownership is that self-respecting citizens should come and reason together, and try to decide whether, after all, the better way is not to let these companies continue to develop the communities in which they operate and make a fair return upon their money invested, thus enticing more money for further developments, rather than embarking upon the seas of municipal ownership, with its dire and dread consequences. Let those of us who are operating these properties realize our responsibilities and hold ourselves to the full measure of our duty toward the public, devoting our surplus energy to improving conditions wherever we can. I know the men who are engaged in the electric railway business in this country, and I say that nowhere is there a more honest, loyal, devoted, patriotic set of men in any business in this country. Our business did not exist at the time of the Civil War, but the railroads existed at that time, and the history of that war is replete with the patriotism and the valor of the men who were then operating the great steam roads. Many of them laid down their work and went to the war, and those who stayed operated the railroads through that crisis, first for their country and then for the owners of the properties. And so it would be the same to-day. There has grown up a feeling in this country that a man connected with a large public utility corporation is hardly fit to associate with. I resent this feeling, for myself and all those who are interested in this business, because I know that each and every electric railway man is just as solid and sober a citizen as one from any other class of men in this country.

Many of us are trying to do what we can to improve conditions among those that work. The companies have welfare funds and minimum wages for female employees, and in many other ways they are vieing with each other to better the tone of all those laboring for them. Let us devote ourselves, after we have done our duty to our communities and to our stockholders, to this ennobling work, first, because it is right; second; because it will make the world a better place to live in, and, third and selfishly, because it should help to stem this tide of thoughtlessness that seems to be so prevalent about us.

I have been discouraged at times, just as have many of you who are operating these properties, but I am not finally and eternally discouraged. I believe the dawn is coming when our properties are to be recognized on a higher plane than they have been in the immediate past, and that the good judgment of this country, perhaps differing in the non-essentials, will say that the philosophy that I have tried to give thus far, is, after all, not only for the welfare of the public, but for the country at large.

Interstate System of Accounts

The complete system of accounts prescribed by the Interstate Commerce Commission for electric railways subject to its jurisdiction has been issued. The accounts are effective on July 1, 1914.

The order of the commission prescribing the adoption of the accounts is in part as follows:

"Any such carrier or any receiver or operating trustee of any such carrier may subdivide any primary account established in the said issue (as permitted in the general instructions contained in the said issue); or may make assignment of the amount charged to any such primary account to operating divisions, to its individual lines, or to States. Provided, however, that such subprimary accounts set up or such assignments made by any such carrier or by any receiver or operating trustee of any such carrier do not impair the integrity of the accounts hereby prescribed.

"In order that the basis of comparison with previous years be not destroyed, any such carrier or any receiver or operating trustee of any such carrier may, during the twelve months from the time that the said issue becomes effective, keep and maintain, in addition to the accounts hereby prescribed, such portion or portions of its present accounts as may be deemed desirable by any such carrier, or by any receiver or operating trustee thereof, for the purpose of such comparison; or, during the same period, may maintain such groupings of the primary accounts hereby prescribed as may be desired for that purpose.

"Any such carrier or any receiver or operating trustee of any such carrier, in addition to the accounts hereby prescribed, may, unless otherwise ordered, keep any temporary or experimental accounts the purpose of which is to develop the efficiency of operation: Provided, however, that such temporary or experimental accounts shall not impair the integrity of any primary account hereby prescribed."

The introductory letter of Fred W. Sweney, chief examiner of accounts, says:

"This uniform system of accounts for electric railways supersedes the classifications of expenditures for road and equipment, operating expenses and operating revenues which became effective Jan. 1, 1909, and all conflicting instructions contained in Accounting Bulletin No. 7.

"In formulating this uniform system of accounts for electric railways, containing the first revised issues of the classifications of operating expense, operating revenue, and road and equipment accounts, and also the first issues of the classifications of income, profit and loss, and general balance-sheet accounts, it has been the purpose to enlist the co-operation of representatives of electric railways and of the various State commissions. Accounting series circular No. 41, containing a tentative system of accounts, was submitted to the representatives of all such carriers of record in this office and to each of the State commissions for criticisms and suggestions, and careful consideration has been given to all replies received.

"In the preparation of the revision of the accounting rules contained in this system of accounts for electric railways the commission has had the co-operation of the committee on a standard classification of accounts of the American Electric Railway Accountants' Association.

"Special attention is directed to the provisions for depreciation. The use of account No. 40, 'depreciation of equipment,' is mandatory. Until further notice the use of account No. 25, 'depreciation of way and structures,' and No. 50, 'depreciation of power plant buildings and equipment,' is optional with the carrier.

"In order that uniformity in the application of the provisions of these classifications may be secured, accounting officers are requested to submit all questions of doubtful interpretation to this office for consideration and decision."

The general instructions on operating expenses say regarding depreciation:

"Depreciation accounts in which to include monthly charges to cover depreciation of way and structures, equipment, power plant buildings, and power plant equipment are provided in order that carriers may create reserves which will meet or reduce the amounts otherwise chargeable to operating expenses or to profit and loss account to cover the cost of the renewal or retirement of property. Such depreciation charges should be upon a basis determined to be equitable according to the carrier's experience and best sources of information as to the actual accruals of current loss from depreciation. Depreciation charges with respect to property or equipment shall cease when the difference between the ledger value (estimated if not known)and the estimated scrap value shall have been credited to the depreciation reserve account. A statement of the bases used by the carrier for computing these charges shall be included in its annual report to the commission.

"Commencing July 1, 1914, carriers shall accrue depreciation on equipment (included in accounts Nos. 530 to 535), but the accrual of depreciation on way and structures, power plant buildings, and power plant and substation equipment is left optional with the carrier until the commission shall direct otherwise.

"When equipment (included in accounts Nos. 530 to 535) is retired from service and proper charges for depreciation have not been made during its life, the ledger value of such equipment, less salvage and depreciation accrued to the date of retirement, shall be charged as follows: That proportion of the actual loss from depreciation equitably assignable to the period prior to July 1, 1914, shall be charged to profit and loss and the remainder shall be charged to operating expense account No. 41, 'equipment retired.'"

The outing of the Jovian League of Louisville, Ky., will be held at Sennings Park on July 14, and will consist of a dinner dance on the cabaret order. A special orchestra will furnish the music.

Meeting of New York Association

The Main Topics at the Thirty-second Annual Meeting of the New York Electric Railway Association Were Employees' Accident Insurance, Accident Prevention and Efficiency in Operation

The thirty-second annual meeting of the New York Electric Railway Association was held at the Hotel Champlain, Bluff Point, N. Y., Tuesday and Wednesday, June 30 and July 1, 1914. The program was of the most timely character, the chief subject being that of employees' accident insurance in view of recent New York legislation on this matter. About 200 delegates and other visitors attended the sessions and annual banquet.

TUESDAY MORNING SESSION

The session on Tuesday morning opened with the usual routine business. President Hedley welcomed the convention in a most striking address on the big problems now before the railway operator.

PRESIDENT'S ADDRESS

Mr. Hedley said that in these days there was a greater field for the association than ever before because the electric railway business of late had gotten into a situation where it must be carried on with an absolutely new set of rules. Most operators in the past had been compelled to run their business in a way that would not be tolerated to-day. Many of the railways in the State, he could safely say, had been founded and capitalized under conditions that would not now be permitted—conditions that made it extremely hard for a manager to make a good showing. So the new rules were not altogether against the managers. Some of the new rules under which the railways were now being financed were very good for the operators. There had been a time when a manager who had come to the point of meeting the existing fixed charges was confronted by the financier's demand to meet the interest on a new issue of unloaded securities. Such things could not be done nowadays, and that was of great advantage to the manager.

Two things, however, of the greatest importance were left to the manager, and to these the association was giving ample attention. One was the safe operation of their properties—that meant a great deal. He did not believe that the best way of handling this problem was to send a laborer over the system to stencil "Safety First" on every shanty, plank and box. This was to make a jest out of a great movement and to harm instead of benefiting it. "Safety first" must start with the manager and must go down through his various subordinates to the commonest laborer. The matter of safety was one that was up to the managers more than to the public authorities.

The second thing now before the managers, and one in which the public authorities could interfere, was that of efficiency. This problem, like the price of liberty, demanded eternal vigilance. He did not see how it was possible for any legislation or legislators to do anything to take these two things—safety and efficiency—away from the railway manager.

Following President Hedley's remarks, the Hon. James J. Hoey, second deputy superintendent of insurance of the State of New York, delivered an address on "Employees' Accident Insurance," which will be found in abstract elsewhere in this issue.

DISCUSSION ON MR. HOEY'S PAPER

J. S. Kennedy, secretary benefit fund committee New York Telephone Company, spoke of the welfare work of that company and other Bell organizations. Eighteen months ago the New York Telephone Company and all other Bell companies in the United States had set aside the sum of $2,000,000 as a permanently unimpaired fund for general welfare purposes. Pensions are granted to all male and female employees after twenty, twenty-five or thirty years of service, according to certain conditions, and after only fifteen years in case of total disablement. For accidents an employee, regardless of term of service, receives full wages for the first thirteen weeks and half wages for an indefinite period thereafter during the continuance of disability. For death by accident, regardless of term of service, three times the annual salary, with a limit of $5,000, is paid. For death by accident to an employee of five years' service, his heirs received six months average wages; for a like cause, the heirs of a ten-year employee received one year's average wages. For sickness, after two years or more of service, sick benefits of the same nature as the accident benefits are paid. The Bell companies were self-insured, and permission to continue such self-insurance had been granted by the Workmen's Compensation Commission of the State of New York.

Mr. Kennedy pointed out that the compensation provisions of his company were more liberal than demanded by the State of New York. For instance, the law grants no weekly accident compensation for the first two weeks, while his company had it begin immediately. His company was now co-operating with the commission to harmonize a number of differences on this general subject. In concluding, he said that 97 to 98 per cent of the telephone company's accidents caused disability lasting for less than thirteen weeks, while 76 per cent were for less than two weeks.

Capt. W. B. Rockwell, Eastern Pennsylvania Railways, Pottsville, Pa., thought it was the height of folly to expect women to get off cars the right way from instructions merely by use of posters. Where passengers were under the control of the conductors, the latter alone must be held responsible for safety. Mechanical appliances were not the most important means for preventing accidents. Far more could be accomplished by square treatment of the men, for this in turn would lead them to reciprocate by using greater care in operation.

Mr. Hoey observed, however, that the mechanical arrangements of the New York stepless car were such as to make boarding and alighting accidents impossible.

Mr. Rockwell said that he also believed in the stepless car, but since such a car required maximum traction trucks it could not be used where grades were heavy.

President Hedley complimented Mr. Hoey on the sincerity of his paper. However, he did want to take exception to his statement that operators wanted their crews to make time regardless of safety. He knew that no good operating man would ever countenance such a practice. As to accidents, President Hedley said that his company's records showed that women took better care of themselves than men, so why direct so much attention to the ladies? Mechanical safety appliances were a necessary curb on stupidity.

The session was adjourned after a rising vote of thanks to Mr. Hoey.

TUESDAY AFTERNOON SESSION

President Hedley opened the afternoon session by introducing Martin E. Burke of the Interborough Rapid Transit and New York Railways legal department. Mr. Burke said that the companies named, as well as the Third Avenue and New York & Queens County Railways, had decided to insure themselves because it was cheaper. Further, as a part of their welfare work, these companies for years had been paying their men where no liability existed. He believed that nothing would make railways more careful than if they had to pay out large sums of money directly instead of indirectly through premiums to insurance companies. The existing organization was such that this self-insurance could be carried at say $100 extra a year in clerical expense. He believed that it was perfectly feasible for the State to quote lower insurance rates than stock companies, as the latter must pay for solicitors and give dividends to stockholders. The State fund has no such expenses, and for the first two and one-half years the cost of operation will be absorbed by the State at large. An important reason for favoring the State fund was that if a stock company failed the policyholder therein would not be absolved from liability, whereas the State fund insured this absolute release from liability. He was still more in favor of self-insurance because it would be cheaper in the end. The only difference was in the State fund's provision for medical and hospital attendance, but his companies had taken care of their men in this respect anyway. These companies were also more liberal in paying the wages of injured men from the start instead of waiting two weeks. Payment in such cases was made upon recommendation of the injured man's foreman and superintendent. The new law required medical attention to be given for eight and a half weeks. The practice on his companies' properties was as follows: "First-aid" men who had been trained by the chief surgeon were stationed at the shops and other places where groups of men were working. The chief value of the "first-aid" man was to prevent little hurts from becoming big. An improperly treated scratch or cut, for instance, might easily lead to blood poisoning. If the injury required further attention, the employee was sent to a local doctor. Following this, he could be sent to any of four hospitals, where he would be placed in semi-private quarters under the care of high-class physicians and surgeons. Even after leaving the hospital he is free to return to the care of these men instead of going to a dispensary. Arrangements are also in force for treating men at their homes.

MR. PHILLIPS ON ACCIDENT INSURANCE

The next speaker was Cyrus W. Phillips, deputy commissioner Workmen's Compensation Commission of the State of New York. Mr. Phillips prefaced his remarks by saying that it would be better for our system of legislation if business men gave their attention to laws while they were in the making rather than to criticise these laws after they had been passed. Mr. Phillips then referred to the old law of negligence. This was a fiction set up by the courts under which an employee had been prevented from getting damages if he or his fellow servants were negligent or if the injury was due to the risks of the occupation. All this had been eliminated by the compensation law, the fundamental idea of which was that an industry should bear the cost of scrapping a workman as it had borne the cost of scrapping a machine.

For many years legislation had been advocated and passed to do away with the negligence and occupational barriers set up by the courts. In the federal law the fellow-servant, assumed risk, and contributory negligence rules had been swept away, and, in addition, a safety appliances law had been passed. Thus the compensation law would put a stop to measures which would have proved more costly in the end. Some twenty-six States now had compensation laws, but the New York law differed from most of the others in being compulsory instead of elective. Where selective insurance was in vogue, support of the law seemed to meet with a heartier response. However, he had found that where the agreements between employer and employee were not controlled by the State, as in New Jersey, many of the agreements filed with the Department of Labor showed that the employers had failed to pay the proper compensation. In other States, as Massachusetts and Michigan, the agreements were subject to correction. In general, the New York law was more liberal to the worker than any other either in the United States or Europe. He appreciated the fact that while other employers could add the cost of insurance to that of their product, the electric railway with a straight 5-cent fare could not.

C. S. Sims, vice-president and general manager Delaware & Hudson Company, said that the premiums under the new law would amount to 20 per cent of one steam railroad's net earnings. He also believed that smaller manufacturers might be tempted to leave the State because of the burden imposed by the law.

Mr. Phillips replied that the steam railroad would have had to pay in any event because of the federal laws. As to manufacturers, the premium amounted to no more than 0.5 per cent of their business, and this difference was too small to cause removal to the States that had no compensation law. In conclusion, Mr. Phillips pointed out that the reason for not paying benefits during the first two weeks was to prevent beneficiaries from staying home unnecessarily.

Mr. Gonzenbach's address on "Accident Insurance" was then presented. It will be found on another page.

MR. BALDWIN ON ADVANTAGE OF INSURING IN STATE FUND

The next speaker was F. Spencer Baldwin, manager State Insurance Fund, Workmen's Compensation Commission, State of New York, who spoke on the advantages of insuring in the State fund. Compared with stock companies, the State fund offered the only real insurance obtainable if insurance meant protection, release from liability and immunity. Under Section 53 of the law, the employer is granted a full release from liability if he insures in the State fund. On the other hand, the employer must assume the liability himself if the stock company fails. As a matter of fact, such companies differed widely in stability, as was proved by the fact that thirty British insurance companies had become insolvent since 1897. The State fund gave complete protection at the lowest cost. The rates were 8 1/3 per cent below those of the stock companies and were subject to further reduction for meritorious records and equipment. A reduction of 20 per cent in the premium rate was made if the employer had his own system of medical treatment. The rates were subject to still further reduction through dividends for given groups. The State fund eliminated the great economic waste of solicitation for insurance business for, he said, paraphrasing Shakespeare's statement: "None are born insured, some achieve insurance, but most have insurance thrust upon them!" Whether a man insured through a stock company or with the State fund direct, the money for benefits came to the latter anyway. The compensation law was a tax, and why pay an additional tax to a tax-gatherer? Nor was there anything in the argument about the superior service of stock companies because the law would be administered only by the commission. The inspection service upon which reductions for merit will be made would also be administered by the commission through a central bureau.

Mr. Baldwin also believed that the State fund would prove superior to mutual insurance owing to the superior reliability of the fund, no expense for management and no liability of assessment up to 100 per cent. He doubted also whether mutual insurance was desirable for conditions where payments had to extend for more than a generation. The State fund offered to employers in the same business unusual advantages if they would make up a group of say 3000 employees so that they could obtain all the advantages of mutual insurance without its drawbacks. The same prospect of dividends would exist, while in case of trouble the special mutual fund would be backed up by the State fund as a whole. He hoped that the association would see fit to appoint a committee on this subject. Should the mutual group have its own hospital treatment, a reduction of 20 per cent would be made; and for meritorious safety methods and equipment, a reduction of 40 per cent was possible. He did not believe that the State fund would get the bulk of the business at first because of misapprehensions and the misstatements made regarding its purposes, but in time the State fund would come into its own.

Mr. Gonzenbach said that his paper might have given the impression that he was absolutely for insurance in a mutual fund; but the mutual feature in connection with the State fund appealed to him greatly and was worthy of study by the association. He realized that the liability of a catastrophe was decreased by cooperating with the larger fund.

In reply to a question, Mr. Baldwin said that employers whose equipment was below standard would have to pay a differential or penalty rate. In answer to another question, he said that an employer could withdraw from the State fund at the end of a year to insure otherwise if he wanted to. The reference in the law to "liability to assessments" had been left in inadvertently, for the law contained no statement as to its collection, etc.

President Hedley said he had learned a great deal about the law from Mr. Baldwin's remarks. He asked Mr. Baldwin to prepare a statement showing how the mutual plan for 3000 men or more could be applied to the State fund, and promised that this statement would be sent for consideration to all the members of the association. On the motion of J. S. Doyle, he also announced that a committee would be appointed to confer with the commission's men on this subject with a view to deciding upon insurance plans for next year.

APPOINTMENT OF NOMINATING COMMITTEE

After a vote of thanks had been tendered to the speakers of the afternoon, President Hedley announced the nominating committee as follows: E. S. Fassett, J. K. Choate and W. H. Collins.

The meeting was then adjourned.

WEDNESDAY MORNING SESSION

On Wednesday morning J. P. Barnes, general manager Syracuse & Suburban Railroad Company, Syracuse, N. Y., read his paper on "Accident Prevention" scheduled for Tuesday. This was followed by a symposium on "Efficiency," comprising three papers by C. J. Witherwax, general passenger agent Schenectady Railway Company, Schenectady, N. Y.; F. A. Bagg, chief engineer Fonda, Johnstown & Gloversville Railroad Company, Gloversville, N. Y., and W. H. Sawyer, E. W. Clark & Company, New York, N. Y., respectively. These papers were not discussed and on account of lack of time, the questions propounded in the "question box" were not brought up for discussion.

The following were then elected to the offices named for the ensuing year: President, James F. Hamilton, general manager United Traction Company, Albany, N. Y.; first vice-president, John J. Dempsey, superintendent of transportation New York Consolidated Railroad, New York, N. Y.; second vice-president, James F. Barnes, general manager Syracuse & Suburban Railroad Company, Syracuse, N. Y.; secretary and treasurer, Chas. C. Dietz, New York, N. Y.; members executive committee, S. W. Mower, general manager Otsego & Herkimer Railroad Company, Cooperstown, N. Y.; Wilbur C. Fisk, president Hudson & Manhattan Railroad, New York, N. Y.; Ernest Gonzenbach, general manager Empire United Railways, Inc., Syracuse, N. Y., and W. O. Wood, general manager New York & Long Island Traction Company, Hempstead, L. I.

After resolutions of appreciation of the successful efforts of the outgoing officers and of all others who had contributed to the success of the meeting had been passed, Mr. Hamilton took the chair. He expressed his appreciation of the honor and responsibility conferred upon him and adjourned the convention. The total registration exceeded 150.

DIVERSIONS OF THE CONVENTION

Superimposed upon the more serious features already described there was an unusually attractive program of entertainment. The baseball game between the "pedlers" and the railroad men, played off on Tuesday was a star feature. Captains Frank Hedley and C. C. Castle starred as pitchers while W. B. Rockwell was a remarkable first baseman and J. K. Choate shone as a base runner. The score was somewhat in doubt, as Umpire Harry Evans was roughly handled at times. It was finally adjusted at 22 to 21 in favor of the supply men. The high score gives a false impression of the fine quality of the playing. A handsome engraved brass vase has been donated as a permanent trophy. Golf was, of course, the absorbing pastime of the convention. Under the direction of N. M. Garland there were three competitions. The first was for the state association championship, a 19-hole medal play handicap with about twenty-five entries, won by C. R. Ellicott. There were also a blind handicap and a ladies' clock golf competition. There were also informal dancing at various times in the ballroom of the Hotel Champlain, a ladies' bridge whist contest and an excursion to Ausable Chasm. Altogether the splendid weather, the large attendance of ladies and the excellent hotel accommodations combined to make the convention a social success.

THE BANQUET

The banquet on Tuesday night was accompanied by the usual good oratory on the smiling and serious aspects of the electric railway business. W. L. Conwell, vice-president and treasurer Transportation Utilities Company, New York, was the first speaker. He noted the many rapid changes in standards and methods that had been made during a period of rising prices for manufactures but of a fixed price for fares. The public was justified in demanding good service, but the railways must be granted conditions which would give them a just return on their investment after due expenditures for operation, depreciation and obsolescence. He deplored the fact that politics should have injuriously entered into the conduct of a great industry. Speaking in a lighter vein, and as a manufac-

OF THE UNIVERSITY

turer, Mr. Conwell said that the convention afforded the supply men a chance to mingle with the railroaders on other matters than delayed shipments, defective apparatus and unsatisfactory prices. He hoped that no condition that would prevent their attendance would ever be brought about.

E. A. Maher, Jr., assistant general manager, Third Avenue Railway, New York, said that these were parlous days for electric railways. Some railway men thought that public service commissions and workmen's compensation commissions were as useful as a corn plaster to a mermaid; but he felt that such commissions had the possibilities to do great work. The situation as to railroads had changed very much in the past few years. The time was not long distant when those in charge of public utilities had tried to play a confidence game with the public and public officials. Now conditions had changed, for the railways were taking the public and officials into their confidence. Every railway man now wanted to play the game with the cards on the table. He took the position that the public from which every penny of income came was entitled to know what the railways were doing and how that income was spent. The railways must give the widest publicity to their acts to convince the world that there is a community of interest between the railways and the people so that the interest of the people demands that they back up the railways. The period of explaining before government commissions the deeds of bygone days was over. Now the period had come when the railways could explain their acts beforehand and thus prove that they are conducting their business honestly and fearlessly.

President Hedley in commenting upon Mr. Maher's remarks, said that a few years ago the railway owner had not permitted the operator to play the game with the cards on the table, but now it was the kind of a game that they had to play. This change was one of the greatest helps that the railway manager had ever been given. The financiers could no longer flood the operators with securities that did not represent the investment of real money, and it was right that they were no longer permitted to do so.

The last speaker was Howard MacSherry, attorney Public Service Corporation of New Jersey. He opened jocularly by saying that he also was fond of playing with the cards on the table, but he wanted to select the cards. He did not see why electric railway men should be apologizing for their business all the time. They should fight back. Electric railway men should take a more active part in politics instead of permitting irresponsible men who had never shown constructive ability to run the railway business from some government office. If he had a mission to preach it was that business men should take a hand in the business affairs of the nation to protect what they had themselves created.

Power Station Improvements at Danville, Ill.

The Danville (Ill.) Street Railway & Light Company now has improvements under way in its power station which, when completed, will make that station one of the most modern on the Illinois Traction System, of which it is a part. Two 4000-kva, 2300-volt, three-phase, sixty-cycle General Electric turbo-generators will be installed in an addition to the present building. These machines will be among the first 4000-kva units ever manufactured to operate at 3600 r.p.m. The old reciprocating engines which have been acting as reducing valves on the heating system and also supplying electrical energy, will be retained in their present position and operated during the steam-heat season. The new condensing turbines will carry the load during the summer months.

One of the chief engineering problems confronting J. E. Johnson, manager of the Danville company, in connection with these new units was that of condenser arrangement. Two surface condensers with approximately 8000 sq. ft. of surface will be purchased and installed beneath the turbines, the bottom of the hotwell being about 24 ft. beneath the engine-room floor. This floor is about 78 ft. above the Vermillion River so that the circulating water will act against a 47-ft. head. At first, the advisability of digging a 60-ft. pit beneath the engine-room floor for these condensers was considered. This would have reduced the necessary lift of condensing water from the river, disregarding syphon effect, to about 18 ft. However, after some consideration it was decided that the saving would not capitalize a sufficient amount to build the pits and tunnels. It was also thought that the maintenance of condensers in such an inaccessible position would be unduly difficult and would probably be less satisfactory because workmen would prefer not to work in the hot subterranean pit. It was also thought that with the condensers at this low level sufficient circulating water might not be available in periods of drouth. To meet this latter contingency, however, the company intends to build a concrete dam across the river, and with the condensers at their present level the circulating water can be returned to the upstream side of this structure, cooled and used again.

Boston Service Complaint Dismissed

The Massachusetts Public Service Commission has dismissed the complaints of the boards of aldermen of Medford and Somerville, of the city council of Woburn and of the Everett board of trade upon service conditions at the Sullivan Square terminal of the Boston Elevated Railway. The petitioners claimed that the system of elevated train operation at Sullivan Square gave passengers from Malden and Everett an unjust preference over passengers from Medford, Somerville and Woburn. By an order of the Railroad Commission in 1912, the company arranged the operation of its trains at this station so as to permit passengers arriving at the upper or elevated train level from the Malden and Everett districts to board, from the platform previously used for unloading only, such trains as are to be operated around the loop and back into the city of Boston. A three-month trial of this plan convinced the board that the rearrangement of service did not constitute an unjust discrimination, but was necessary in order to give the Malden and Everett passengers facilities at the terminal more nearly equal to those enjoyed by the Somerville, Medford and Woburn passengers. The arrangement has since been in force, and by its means passengers from all points served by upper level cars have been placed on a substantially even footing with respect to the distance necessary to cover in transferring between cars and trains.

Complaint was also made by the petitioners in regard to the crowded condition of cars operating to and from the terminal during the rush hours. In order to relieve these conditions, the company is, in compliance with a suggestion of the board, operating a large number of cars upon its trains over the elevated structure and through the Washington Street tunnel, and is running these trains during certain morning and evening hours as frequently as conditions of safe operation will permit. The board, in dismissing the petition, calls attention to this increased service and points out that the completion of the extension of the Boston Elevated Railway to Everett and Malden will further relieve the congestion of traffic during rush hours.

Papers at the New York State Convention

Abstracts Are Published of the Papers Presented at the Bluff Point Convention by Messrs. Hoey, Gonzenbach, Barnes, Witherwax, Bagg and Sawyer.

EMPLOYEES' ACCIDENT INSURANCE

BY JAMES J. HOEY, SECOND DEPUTY SUPERINTENDENT OF INSURANCE OF THE STATE OF NEW YORK

Employer and employee in this State will assume a new relationship towards each other after July 1. It will be a relationship unclouded by the fear that has always hung over both when there existed the likelihood of injury to the workman and doubt as to the extent and character of the compensation he was to receive.

DEFECTS UNDER FORMER SYSTEM

The old employers' liability law served as an instrument for the creation of mutual distrust between employer and employee. The charge of negligence always brings with it reflections on the person guilty which he is likely to resent. In as much as the employee was obliged to prove not only negligence on the part of the employer but also the absence of negligence on his own part, the question of negligence became a double instrument for the creation of distrust and irritation between the parties.

This distrust and irritation was accentuated by the insurance companies. The employer did not insure his workmen under the old law. He simply insured himself against damage on account of negligence. The insurance companies which undertook the defense of suits had no interest in the future of the injured workmen. They were concerned only in protecting themselves against verdicts, and they employed high-priced lawyers specially versed in negligence law for the purpose of defeating any and every claim presented. These lawyers had but one point of view, the protection of their clients by the extreme exercise of their technical legal skill. To offset the conduct of insurance companies, buttressed by such expert legal skill, the injured workman was obliged to put himself in the hands of other lawyers of equal skill and competence. Consequently, the system of contingent fees sprang up, and in as much as the workman's lawyers could not be paid unless he won his case, the misfortune of the injured man became a pawn in the legal game between two expert attorneys, each concerned only with the question of whether he would win or lose.

Under such a system the old relationship of confidence and friendship between employer and employee was bound to disappear. The employer, instead of looking upon his workmen as wards who needed his protection and assistance, came to regard them in many cases as vultures awaiting the opportunity to pounce upon him as prey, while the employees, on the other hand, grew to look upon the employer as a heartless personage without any regard whatsoever for their welfare or protection.

With the constant creation of legal entities known as corporations to take the place of real personalities as employers, this condition was bound to increase. It was aggravated further by the constant disposition of all classes in this country to do things under high pressure and without regard to the best care and circumspection—a disposition which in recent years has been so much identified with what is known in the United States as progress.

It did not improve the temper of the workman to learn that his claim for damages might be defeated by any one of three defenses, viz., the assumption of risk, negligence of a fellow servant or contributory negligence on his own part. Nor was it consoling to him to know that, even if he had surmounted all difficulties and obtained a verdict, half of his award or more was to go in payment for the skill which his lawyer exercised in winning the case. Economists are puzzled when they attempt to explain why the workmen have been compelled to assume all the risk of their employment and why, because of that hazard, workmen's children are exposed to the danger of becoming public charges. It seems certainly more rational, more economical, to have the cost passed on to the public in the first instance. There is no more reason why the risk assumed by the mechanic while working on a building should not be paid for by the owner of that building than that the time consumed in the making of the bricks for the building should not be paid for by the same owner.

FOREIGN PROGRESS

It is hardly creditable to the United States that Europe is so far ahead in the practical work of providing compensation for workmen's injuries. Germany passed a workmen's compensation act in 1884, and twenty-six countries of Europe have since done the same. The schemes adopted were as varied as the countries adopting them, but the underlying principle was the same throughout. Whether compensation was provided through mutual associations, as in Germany, and Austria, through direct obligations, as in England, through private insurance companies guaranteed by a state fund, as in France, through a combination of both kinds, as in Sweden, or through a state monopoly, as in Norway, the European workman has for years been enjoying the sense of security which the workman of New York will have after July 1.

WORKMEN'S COMPENSATION IN NEW YORK

The fact that New York has not had a compensation law in operation until now, however, has not been the fault of modern enlightened public opinion in this State, because it was the first to adopt a scheme of compensation insurance. This, because of the disposition of the Court of Appeals to interpret super-strictly constitutional provisions that were never intended to apply, was declared to be incompatible with New York's constitution. It has taken five years to correct the defect, and meantime New York has been distanced by Massachusetts, New Jersey, Illinois, Michigan, Washington, West Virginia, Oregon, Nevada and a number of other States, which have adopted as many schemes of protection as there exist in European countries.

It is unnecessary to repeat the history of the efforts to procure a workable workmen's compensation law for this State, of the contest between the labor unions committed to the creation of a State monopoly on the one hand, and those agencies which did not believe the State could successfully undertake such a scheme on the other. The contest, however, resulted in a compromise measure, largely through the influence of Governor Glynn, embracing the best features of both systems but paying to the workmen greater compensation than is paid by the system in force in any other State.

Inasmuch as Governor Glynn was largely responsible for the passage of the law, he deemed it wise to follow its operation closely. Perhaps no five men better qualified to administer such a law could be picked in the State than those selected by Governor Glynn to compose his compensation commission. Robert E. Dowling, whose name stands for business and constructive progress; John Mitchel, whose name is synonymous with the requirements and the progress of enlightened labor; Mr. Darlington, New York's greatest health commissioner; Professor Mosher, educator and lawyer, and J. Mayhew Wainwright, legislator, whose name is identified with the first commission that evolved a compensation scheme for New York. The task which each has to accomplish is difficult. To comprehend, digest and assimilate the variety of actuarial, engineering, manufacturing and administrative questions which will come before them, and to pick out the defects and ambziguities of the law as it stands, whip the corrections into shape and give them concrete expression by the beginning of the next legislative session, is a task calling not only for application and energy but also for constructive ability of the highest order.

MEDICAL SERVICE

The workmen's compensation law provides not only for damages on account of injuries but also for medical service for injured employees during the time of disability. It is refreshing to see that the great organization with which your president, Mr. Hedley, is identified has taken the initiative by providing in advance for this important service. The Interborough Rapid Transit Company has arranged with doctors and hospitals for the care of its injured employees. It has also worked out a scheme which bears the ear-marks of care and study. When a man is injured he reports at once to the first-aid man, a fellow employee, at a terminal shop or power house. It is this man's duty to give the proper first-aid treatment, and then send the injured man either to a local doctor or, if the injury is trivial, back to his work. If further treatment is needed, the employee continues to visit the doctor as often as necessary, and if necessity arises he is sent to a hospital. In the hospital he does not become an ordinary ward patient but is sent to the semi-private ward where he can see friends and relatives at reasonable times and where he does not have to incur the stigma that attaches to a charity patient. If his injury requires special treatment, he will obtain the services of a specialist. At the central hospital massage, baths, electricity and the like will be provided to treat those who have become victims of rheumatism or other ills common to the workman who is exposed to the weather. All these go to make a strong link in the magnificent scheme for the conservation of human life.

RAILROAD ACCIDENTS

The country is now entering on an era of economic conservation of life and property. With the confidence of a young giant, we have been prodigal of our strength, unmindful of the fact that some day that strength might be dissipated. We are waking up. We are realizing that this waste of life and property cannot go on indefinitely, if our future prosperity is to keep pace with our prosperity of the past.

Yet while science has been searching out and destroying the older enemies of man, invention has not provided safety appliances to keep pace with its own creations. The number of accidents on American railroads is a by-word of Europe. Every man injured by a railroad and improperly compensated becomes an agent of discontent among his fellow men, with whom the railroads in the last analysis will have to reckon. Every inadequate piece of rolling stock becomes a piece of evidence in the indictment against efficiency. Every unprotected mile of roadbed makes for the propagation of the spirit of ill-will towards the company that maintains it.

To accomplish safety, to bring it to its highest state of perfection, organization is needed. The schools also must be utilized, and the young people taught what to do and how to do it in order to protect themselves. Yet a higher duty devolves upon the railroads, a duty which must find its practical expression in the adoption of the most up-to-date methods of safeguarding life and limb.

The disposition of woman, for example, to use her right hand in alighting from a street car, acquired congenitally through a long line of female ancestors who did sewing and household duties with their right hands while their lefts were practically neglected, cannot be corrected in a day. You cannot correct this disposition by any number of educational pictures. The trouble is too deep for such a superficial remedy. The evil can only be obviated by providing a means which makes the use of the right hand under the circumstances unnecessary or impossible, and by instituting a radical and thorough system of education. You can begin with the young girl in school. You can train her to acquire proper habits; you can teach her how to use her hands in order to protect herself. But the process of education has to be undertaken before the habit predicated on a natural tendency is acquired.

EDUCATION OF EMPLOYEES

The most necessary of all educational work, however, is the education of your own employees. Every motorman, every conductor, every trainman is familiar with the causes of accidents. Many of them have worked out in their own minds methods by which these accidents should be avoided. Experts tell us that only 15 or 20 per cent of the accidents caused by machinery can be prevented by the adoption of mechanical appliances. It follows, therefore, that if we are to cut the number of accidents in half, the remaining 30 or 35 per cent must be prevented by means of education.

In the old days conductors and other employees of railways received bonuses based on the amount of their collections and the time made on each trip, and more recently they were rewarded for their economic use of electricity. In the future they will get rewards for minimizing the number of accidents. Such a system has been established by the United States Steel Corporation and remarkable results have flowed from it. Each mechanic is given to understand that every scheme of safety he invents to make the operation of his own machine safer is going to be recognized by the payment of periodic bonuses for the prevention of accidents. By this means each mechanic's talent for invention or adaptation is stimulated and the company has the advantage of all this otherwise undiscovered talent, perhaps genius, which it pays for only after results have been accomplished. The stimulation of this talent improves the mind of the workman, creates a stronger binding tie between him and the company; saves him from dangers to which he would otherwise be exposed, and protects his family and the company, which would suffer an economic loss were he to be replaced by an inexperienced and untrained man.

This is a plan which steam railroads and electric railways can copy with advantage. New trainmen should be trained in a well-equipped school maintained by the company. Their latent talents should be developed, their suggestions heeded, their schemes put into practical effect, and, if the scheme prove useful, the members should be remunerated.

It is the general impression that the companies have heretofore acted on a wrong theory in their dealings with the public. Stockholders have been greedy for dividends, officials hungry for large salaries. For that reason the trainman was paid a minimum wage and was instructed to bring his car in on time irrespective of public safety, injuries meant only lawsuits to be defended to the last ditch, old equipment was maintained long after safer and better kinds had been evolved and long after it had been demonstrated that the adoption of the safer and better kinds would mean an ultimate saving to the company. Safety, however, is going to be the watchword of the next decade. Safety is economy. The railway which does not adapt itself to the new idea will run the risk of having its property condemned and turned over to public ownership and operation. The country is not ripe for this step, but the public is sometimes impatient. Such impatience can be controlled by good service by the companies and in no other way. Good service means safety to the public and to employees.

A PLEA FOR MUTUAL EMPLOYERS' LIABILITY INSURANCE

BY ERNEST GONZENBACH, GENERAL MANAGER EMPIRE UNITED RAILWAYS

Knowing that I have been living in the State of New York less than three months and am not yet really established solidly in my new work, it seems to me that I was somewhat presumptuous in accepting this invitation to discuss the subject of employers' accident insurance. Nor have I become as yet familiar with the details of the New York compensation law which became effective on July 1. Therefore I will not pretend to discuss the merits or demerits of the law as it stands on the statute books. My object is to make a plea for mutual insurance, and the subject has been assigned to me presumably because I have just recently passed through the experience and ordeal of operating a public utility, with all its advantages and disadvantages, under a workmen's compensation law.

For a number of years past I have been located in the State of Wisconsin and that State passed a workmen's compensation law which went into effect on Sept. 1, 1911. In order to understand clearly my viewpoint as to mutualization of risk, it will be necessary for me to give you a short summary of our experiences in the State of Wisconsin. At the time the law was before the Legislature all the manufacturers and employers generally very bitterly fought it but did not succeed in materially changing its provisions, and when it became effective it was by many considered a detriment and a burden on the industries of the State. This view was still further intensified when we received the stock liability insurance companies' new schedule of rates covering risks under the workmen's compensation law. The rates for all classes of employees were increased in prodigious amounts, but particularly was that the case in the public utility business. A few months of actual experience under the compensation law soothed our ruffled feelings, and I think I am safe in saying that a large percentage of employers found that settlements under the new law were more satisfactory to both employer and employee. On the whole the law has won much favor. The New York law is more drastic, I am told, than the Wisconsin law and its administration, it is feared in some quarters, will give cause for some dissatisfaction. However that may be, I can only wish for the New York law the level-headed and fair administration which has made the Wisconsin law a success and a source of great satisfaction to both sides. May the New York law be equally detrimental to the shyster and the ambulance chaser.

The manufacturers of Wisconsin found their way out of the dilemma by organizing the Employers' Mutual Association, which has been working successfully and to their great advantage. It is one of the best-administered concerns of its kinds. The public utility operators, and particularly the electric light and electric railway people, were not in as fortunate a position. For one thing, their rates had been increased in proportion greater than that of any other class of employers. Electric lighting employees were increased 124 per cent, city street railway employees were increased 650 per cent, and interurban employees 1100 per cent. This increase was partly due to the fact that up to 1910 the liability insurance companies had been actively soliciting business and competing in rates, whereas shortly after that a uniform scale was established and the percentage of increase as compared with this uniform scale would not appear quite as large. Stimulated by the comparatively low rates and good service which competition had forced onto the stock companies, few companies had attempted to carry their own insurance, and the sudden rise in rates therefore seemed all the more a burden and threatened to wipe out the all too slender balances of many a company. The consequence of the prohibitive rates naturally was that most companies cancelled their liability insurance as fast as policies expired, preferring to carry their own risk. But the stock companies had another trump card in their hand. While it has never been possible for electric railway companies to get public liability insurance, such insurance has been issued regularly to electric light companies, and almost every electric light company carries such a policy and considers it essential; in fact, such public liability insurance in electric lighting companies is much more important than employers' liability insurance. When the electric light companies of Wisconsin began cancelling their policies the stock companies refused to issue public liability policies unless the companies also carried employers' liability. This was a club held over the head of the smaller companies which forced many of them to accept the very high rates of employers' liability insurance, which they paid in preference to losing liability insurance altogether.

Confronted by this situation the Wisconsin Electrical Association appointed a committee, of which I had the honor of being chairman, to find a way out of the difficulty. After a year's deliberation and a great deal of discussion it was decided that the electrical companies in the State form a mutual insurance company, the administration of which was to be in the hands of the Employers' Mutual Company, formed by the manufacturers of the State, and which would be administered by that company and the cost of administration pro-rated on the basis of cases handled and compensation paid. The electric companies, however, were to form a separate and distinct class with their own reserve fund, and we were in no way to participate in either the risks or profits of the general funds belonging to the manufacturers. The administration of the fund was to be in the hands of the electric companies entirely. The point of advantage of this arrangement is in the fact that while manufacturers and electric companies each carried their own risk, the cost of administration and all overhead charges were shared by a larger number of risks, with consequent reduction of the unit costs. So far as I know this plan is being put into effect now. In view of the situation now confronting the electric railway industry of New York State I believe that I have been justified in mentioning the experience of the Wisconsin association here.

The general tendency among the larger companies in the State of New York seems to have been to declare their intention of carrying their own liability insurance, under the State law which went into effect on July 1. In view of the large size of the companies which make up the majority of operating properties in this State this may be the best policy. There seems to be no doubt whatever that the employers' risks involved in the street railway business are very much less than they are in most manufacturing interests, or than they are in contracting and construction work. Furthermore, the element of general risk in the street railway business is naturally very great and is infinitely greater in the case of the public than it is in the matter of injury to employees. Employers' liability is a small fraction indeed of the risk which every company in the railway business incurs and carries continuously. Many companies ignore employers' liability entirely, and this justly so when one considers the enormous risk in public liability which the business involves. This, however, it would seem to me is only a further argument in favor of mutualization. Under the new law we must, if we carry our own insurance, provide a reserve in funds for carrying this insurance, or we must pay rates to stock liability companies or to the State which, in the opinion of most of us, seem exorbitant and higher than the risk warrants. Is there not reason why we should share this fractional risk involved in the carrying of our employers' liability?

THE OPPORTUNITY FOR CO-OPERATIVE INSURANCE

We have for many years been talking of co-operation in the electrical fraternity. We have an Electrical Development Association which is continually preaching to us "co-operation." We have committees of various national associations which have presented the subject of co-operation before their respective bodies, where the slogan has aroused much enthusiasm. We have an electrical secret society and it is no breach of obligations to disclose the fact that their principal object is co-operation.

We are now confronted by an opportunity which enables us to put into practice the many nice things we have said about each other and the many good deeds we have promised ourselves to do. This opportunity comes to us through the possible mutualization of employers' liability risks. By sharing our risks it is, of course, within the range of possibilities that we may assume some risk slightly greater than ours, judged on the basis of past records. However, very likely the other fellow thinks that he is assuming a greater risk by going in with us. I do not believe that a past record is altogether a criterion on which to base liability risks, for it is a well-known fact that many a road having an absolutely clear record covering a period of years has suddenly met with a series of accidents which proved exceedingly burdensome and costly. It is an axiom in the insurance business that the larger the distribution of the risk the greater safety to the insurer.

There is not one company in a hundred which feels strong enough and able enough to carry its own fire risk. Any company which does so, carries its risk at an expense in capital investment and reserve fund which is jealously guarded and of a sum ample to cover possibilities. We have splendid examples of mutualization in risks in the fire insurance business. There is not a better class of insurers than the Senior Massachusetts Mutuals. One of the stock arguments urged against mutual fire insurance companies and mutual companies of all kinds is the fact that the risk is distributed over too small a number of individuals. Such an argument would have no bearing whatever in the case of employers' liability insurance which we are now discussing because we are insuring a small part only of the risk which each company carries individually and must continue to carry. If fire insurance in stock companies is a good thing, then employers' liability insurance in stock companies is a good thing; if fire insurance in mutual companies is an accomplished and successful procedure, then employers' liability insurance in mutual companies can be made so, and it would seem to me that there is ample talent and financial power among the railway operating companies of New York State to organize and administer a mutual employers' liability insurance fund in such a way that ample justice will be done and that fair rates will be charged. Mutualization in New York is further facilitated by the fact that the State assumes the cost of administration of mutual funds for a period of two or more years. The companies I represent have had an exceptionally clear record in carrying their own employees' risks. We do not hesitate to continue to carry our risk under the new law, but we stand ready to help along the cause of mutualization and would be glad to see a mutual organization established to carry the workmen's compensation liabilities of the electric railways of New York State.

ACCIDENT PREVENTION

BY JAMES P. BARNES, GENERAL MANAGER SYRACUSE & SUBURBAN RAILROAD

The subject of accident prevention is too vast for any one paper, or any one discussion, or even, it would seem, for any one volume or library of volumes. It is, therefore, to one phase only, and only one side of that phase, that we must address ourselves. The recently enacted workmen's compensation law of New York State is, in essence, the culmination of a series of attempts to reconcile cause and effect in this matter of accidents and their resultant effects and to transfer from the individual to the industry itself the burden of accidents incident to the conduct of that industry.

Fundamentally our question of accident prevention reduces itself to terms of industrial improvement, more particularly safeguarding. As the public mind to-day is so engrossed by the matter of accidents to employees, it would seem pertinent to direct our discussion to the prevention of this particular kind of accidents, in other words, to the safeguarding of an industry with respect to its employees rather than to the public which it serves.

Usually criticism is ill-advised and unwelcome unless it is constructive in character. The various laws under which the remedy of hazardous conditions has been attempted have been critical and have, in the main, aimed at constructive measures in such matters as safeguarding of machinery and the like. It has been and still is all too true that the employer, generally speaking, has resisted the enforced installation of various safety devices, calling for an outlay of capital and in some cases a slowing down in the rate or reduction in the amount of output. Many an employer is not big enough to see over the top of his payroll, or broad enough to see around it. Upon him the broad humanitarian aspect of the situation is lost or distorted.

But it is the fact and not the theory with which we have to deal; it is the operation and not the inception of the various so-called "labor laws" which concern us in this discussion. Looking back over the years to the time before the injection into the laws of the words "compensation" and "liability" we see a definitely marked tendency toward the standardization of conditions in the shop and factory through the activities of the State labor department and particularly the bureau of factory inspection. This standardization took the form of compulsory guarding of woodworking machinery, punch presses, belts, gears and similar equipment, together with the installation of signs of various sorts designed to promote safety of operation and prevent panic from various causes. Much of this work was good and of a real constructive character, but to one tendency of it in particular I desire to direct attention. As the various safety devices multiplied and increased and were installed under compulsion, often in direct opposition to the will and desire of the workman himself, the individual most affected, the tendency grew to disregard the human factor still further—to say under any set of conditions "do thus and so," regardless of surrounding conditions which were often fundamentally different. Yet these conditions were frequently the determining factor in the success or failure of the particular device or method.

It is an axiom that an unguarded machine, with a careful operator, is much safer than a guarded machine with a careless or incompetent operator. It is equally true that many careful and reliable operators find the liability to accident actually increased by the addition of guards, which are often cumbersome and inconvenient and which sometimes in themselves constitute a very real hazard.

Of these things our laws have taken no cognizance, saying in effect, "A workman is a workman and must be protected always and in the same manner, regardless of what his qualities are as an individual." I wish to call attention to this tendency of the operation of our laws without over-emphasizing it and, at the same time, without minimizing its importance. Standardization of conditions is on the march and the vanguard has already arrived. Therefore let us waste no time in idle discussion of its merits, or demerits, but study rather how best to meet those conditions that are with us as well as those that are surely approaching.

Accidents are accidents only in name. An accident is a perfectly logical and proper result of some particular cause or set of causes. Every accident is a logical succession of cause and effect, and in this sense no accident happens accidentally. Now, any effect which is the result of a definite cause or causes can be controlled if the causes can be controlled. Our remedy, then, is to seek the causes of our industrial accidents and to remove or modify the causes, so that they will result not in that undesirable effect that we call an accident, but in that desirable effect which we call safety.

Remembering that we are dealing here with the industrial accident, or more specifically with the accident in which the employee rather than the public is the victim, we can definitely fix the cause of a large percentage of such accidents under the general heading of "carelessness." The cause may be the carelessness of the injured workman himself, or of his fellow workman, of a bystander (especially is this true in out-of-door work), or of the supervising officer or employee, but, broadly, if everyone concerned were thoroughly careful, most of the accidents of to-day would be avoided.

In this one matter of carelessness lies the most prolific cause of accidents, and the trait of carelessness is fundamentally a part of the human character. Everybody is careless to some extent about some things. Eliminate carelessness and you have eliminated the larger proportion of all accidents by the one means.

Our analysis then brings us to the conclusion that by far the most prolific cause of accident lies in the action of that group of forces which we describe as "human nature." Does the problem then become one of altering human nature? No; rather of redirecting the forces and bringing their action to bear along different lines and to different results than the present methods evoke. Philosophers have remarked, and no contradiction has yet been very successfully offered, that human nature is pretty much the same whenever and wherever you find it. Since we have then an old and well-established force to deal with, one which tends to proceed pretty much along the same lines on successive occasions, it is obvious that we must change the surrounding conditions in order to change the result in as much as we cannot change the actuating force.

Consider for a moment the action of the body that has been most conspicuous, perhaps, in the reduction of industrial accidents in recent years, the United States Steel Corporation. Conspicuously located at the Gary plant of the Illinois Steel Company is a stereopticon flashing such warnings as "Remember it is better to cause a delay than an accident." Exhibits of unsafe tools taken from the hands of workmen form a conspicuous part in this company's plan of campaign. Safety devices and guards on and about machinery have also formed an important part of this campaign, but personal attention to the little matters of safety, as well as the large ones, has played a most important part in attaining success.

Our most important and essential problem in dealing with these matters is that of reaching, and reaching in the right way, the personality of each man on the working force. Primarily men must be careful, careful for themselves and careful for others if real results in accident elimination are to be obtained. Different men are of different minds and open to different manners of approach, and the successful preventer of the industrial accident will be he who studies, knows and wins the confidence and loyalty of his men.

Incidentally many other good things will accrue to the credit of the man who scores in the prevention of accidents because the loyalty, good-will and co-operation which form the basis of successful accident prevention form also the basis of economy and efficiency in the every-day routine of operation.

Good will feeds upon good will and grows larger and stronger thereby. When the millennium arrives that plant or business which shall bear the designation "successful" will also bear as conditions precedent to that success the designations, "square, upright, careful and humanitarian."

EFFICIENCY

BY CHARLES J. WITHERWAX, GENERAL PASSENGER AGENT
SCHENECTADY RAILWAY

Efficiency that has assumed sufficient proportions to make it perceptible in service rendered to a critical public is undoubtedly the result of that kind of influence that makes for co-operation and a desire to serve. This cannot be contained in one man but must be persistently permeating the various departments of an organization from top to bottom. A combination of men, imbued with a spirit of responsibility to their employers and the public they serve, will quite readily develop sufficient energy and leadership to overtake at least the reasonable demand now being made for greater efficiency.

The successful railway managers and operators are those equipped with powers of discernment, not only in stock, bond and dividend values, but in the signs of the times. The growing man cultivates his job, has constructive curiosity. He reaches out in all directions for information and capitalizes it for practical purposes. He realizes that these are days of investigation and explanation. With his broadened view he has almost obliterated departmental independence, for he feels that true efficiency demands that the component parts of an organization have the same common tendency. If he is observant, he soon discovers that a rule is not a rule but a reason. He often substitutes application for vacation, or uses the vacation as a means and not an end. Men as well as nations show better results from continual application, efficiency being lost in too much relaxation.

Efficiency is not a career. It is a cheerful, mental and moral feeling of obligation towards a given end. In the passenger department of an electric railway it is that kind of attitude that begets business and favorable comment, which means more business, turning verbal brickbats into nickels. This applies to every department of railway business, but especially to the transportation department, because that department furnishes by far the greatest number of points of contact with the people served. It must be remembered, however, that one can sometimes stand too near the woods to see the trees. He must go to the hilltop to get a good perspective. I have sometimes wondered whether men in the train service might not be standing too near themselves, thereby missing the real view and the many opportunities which they have to distinguish themselves for personal efficiency and regard for the company's interests.

Building and operating a railroad involves great risk. Rails once laid cannot be taken up except for betterment, and no railroad that is not making money can be sold except at a sacrifice. Men capable of inaugurating such enterprises and carrying them to successful conclusion must have knowledge of the past, discernment of the present and imagination of the future. Their executive ability depends upon their power to have their work well done by others. The greatest difficulty is in the prevention of economic waste, one of the largest items of which is the supervision made necessary by carless employees.

EFFICIENCY

BY W. H. SAWYER, VICE-PRESIDENT E. W. CLARK & COMPANY MANAGEMENT CORPORATION

The term efficiency, as it is generally used to-day, means, as I understand it, a maximum of result for a minimum of effort. The scientific theory of practical efficiency is as sound as science itself, but as in all such movements one particular industry, such as the electric railways, must take only that which is practical for its own conditions. Efficiency as it has been applied and is being applied to electric railway management and operation, and as I shall speak of it to-day, is efficiency born of stern necessity—efficiency which has been compulsory in order that our electric railway systems might survive and exist—efficiency which is still compulsory, still a necessity. As applied to electric railways, efficiency is, to my mind, what you and I know as good management—nothing more, nothing less.

During the period from 1902 to 1912, the efficiency of electric railway operation increased to an extent that would not have seemed possible, let alone probable, ten years ago. The cost of living during this period has increased, say, 40 per cent, coal has increased in cost, say, 20 per cent, and taxes several hundred per cent. The revenue passengers carried by street railways have increased approximately 100 per cent, while the transfer passengers have increased approximately 143 per cent. During the last five years, with large and efficiently operated companies, the costs of operation of the power plant and the costs of injuries and damages show the greatest decreases. Maintenance and platform wages show the largest increases.

Possibly some of us have this efficiency idea too strongly in our minds. Efforts toward efficiency must and should be based on cold-blooded business. True efficiency means net saving, taking into account all things of to-day, to-morrow and hereafter, and the efficient manager proceeds slowly and cautiously. He knows that the expenditure of good money should not be made until he is reasonably certain that the new expenditure is warranted, after taking into account the financial resources of the company as well as the fact that many claims which look well on paper do not help to pay interest on investment, let alone dividends. Let me state that old truism to the effect that even a poor manager may show a good operating statement if furnished with sufficient new money, but that the best managers are those who, with a minimum of new money, produce satisfactory results, and this is especially true to-day, when the primary thought should be to conserve present investments.

Our efforts must be to make the best possible use of existing equipment before we figure the saving on new equipment. Efficiency methods as generally understood should be conservatively and cautiously dealt with, for the margin for error in electric railway problems is so slight, if it is not actually a minus quantity, that before proceeding along radical lines we must make more than reasonably sure that the net effect of the change is for the better.

The efficient manager spends, but he spends wisely. Economy is not necessarily efficiency, and buying second-hand or lower-quality material or laying off men is often not even economy. It is poor economy to rewind an armature and then put it out in service without a high-potential test. It is efficiency to attend to maintenance and repairs when needed—not before and not after.

The question as to what percentage for fixed charges and profit justifies expenditure of money depends first of all on the certainty or uncertainty that the estimated percentage will be really saved. The manufacturer generally sees to it that the savings are all included in the estimate. We must all experiment to a certain extent, but not without first thoroughly appreciating the possibilities of the results of the expenditure. A new device that looks and reads well may, if bought to-day, have to be superseded by a different one five years from now. This, if true, means 20 per cent for supersession alone. The electric railway owner is not looking to-day for ways to spend more money, except as such expenditure is necessary to protect or better present investment. Generally speaking, any new device must show at a minimum at least 20 per cent for fixed charges and profit, and unless one can see estimated profits at least twice as much to justify the expenditure, the safer rule is to do without the expenditure.

Efficiency is, of course, relative. When we fall below the average of comparative companies, we cease to be efficient in the true sense of the word. The pace set in the electric railway industry is a fast one, necessity is ever present, and he who is truly efficient must lead and not follow. It is not true efficiency to have any one department far below par, even if the property as a whole is up to the average. Moreover, the man and the company are often judged and criticised for its weakness, and true credit is generally not given to those departments that are above par.

Definite, correct, detailed, analytical, comparative records are not useless red tape, although even these may, of course, be overdone by needless detail and complications, but without such records no official can hope to be efficient. It is by means of these comparative records that the weak spots can be found and given thought to, until the once weak spot is eradicated, with always, of course, others needing attention. The records must be so carried out and analyzed in detail that the weak spots in the operation are clearly apparent when fair comparisons with previous years or with other companies are made. It is not enough to know that maintenance is higher than it should be; we must know just what details are high before we can correct the cause.

It would not be fair to stop on this question of efficiency after simply reviewing the past and the present and pointing out the necessity for further efficiency. The real question is, in what way can we, from now on, do the most that can be done to make our electric railways more efficient? I can but bring home to you the old answer, though it was never more appropriate than now. Individuals can do their best, can give their very heart's blood, as it were, to the detailed problem, but the greatest good to the greatest number is brought by efficient co-operation—co-operation of local employees by company sections, formal or informal—co-operation between groups of companies, as illustrated by this association—co-operation between all of us, company employees, company officials, manufacturers, engineers, technical press, and the multitude of others all interested in electric railway prosperity.

The electric railway associations are working along proper lines in their endeavor to co-operate with the public for the benefit of the public and of an industry whose continued prosperity and advancement is necessary for the public good, and with the vast amount of efficiency work that is done to-day by the larger companies—with the many reports and papers on the subject—I believe that the greatest cause of inefficiency to-day is that we do not take full advantage of the efficiency of the other man or the other company. If there is one thought more than another that I want to strike home this morning, it is that of the efficiency of co-operation, and, in order to get this, we must keep in detail comparative records and use them to continually check ourselves against the other man. The electric railway industry needs our best endeavors, and these cannot be given efficiently unless all of us, individually and collectively, co-operate through our electric railway associations.

EFFICIENCY

BY F. A. BAGG, CHIEF ENGINEER FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD COMPANY

Efficiency as applied to railroads means in our minds the managing of the properties and the carrying on of all of the work of the different departments in as economical a manner as possible, and by this means showing a favorable operating ratio and producing as large dividends as the property is capable of. This we have always supposed meant efficiency, and it has not occurred to most of us that there could be any other kind of management. Within a few years, however, the normal progress of civilization, together with the economic needs of the times, has brought into prominence a new idea, a new interest called scientific management.

[Mr. Bagg then outlined the fundamental principles of the Taylor system and referred to the writings of C. B. Going, Harrington Emerson, Frank B. Gilbreth and F. W. Taylor. He also described briefly the "unit system" of management, devised by Major Hines and used during the past few years on a portion of the Harriman lines. He also mentioned the criticism of the steam railroads for their waste of labor and materials, resulting in low efficiency.]

If it is true that there is such waste on steam railroads our electric railways may well be suspicious that there may be waste not now apparent that might be saved by the adoption of some new ideas of management. According to Mr. Emerson we should search for such waste in the labor and material accounts.

I have no complete and ready-made plan to offer that can be "clapped on" to any electric railway and which will show a marked decrease in the operating ratio in the next annual report. During some years of employment on public works and steam and electric railways I have, however, observed some conditions that appeared capable of improvement.

In the first place, any new plan must come from the top. Subordinates are apt to believe that suggestions and much initiative are not usually encouraged, hence the whole organization should be given to understand that the higher officials are ready to encourage anything that will stop waste and increase efficiency. The ignoring of such suggestions as those relating, for example, to the location of a power house with respect to high water, to the proper width of a roadbed, to the proper angle of slope in cuttings, to the best location of a portion of track, etc., is always costly to a company.

The management organization should be so complete, or should be made so by the addition of the necessary staff officers, that the work in all departments can be thoroughly covered and ample time afforded for studies and investigations designed to increase efficiency. Every year the railway and allied associations gather a great deal of valuable material, make recommendations and prepare standards, of value if followed. The regular line officers whose time is taken up with routine work may or may not be aware of these recommendations and when they do it may require special effort to convince the management that the recommendations should be adopted. The proper way is to make it the business of some one or some staff to investigate and determine from time to time those improved methods or plans which are worth taking up.

Why is it that private individuals and contractors can do work or conduct business cheaper than can a railroad or other large corporation? My observation shows that successful contractors have the best equipment and well-paid assistants who work under the concentrated attention of the contractor himself. Often the railroads cannot have as strong construction or maintenance organizations because they must get along with inferior or insufficient equipment. Fewer superintendents and foremen are sometimes provided and they are paid less for their work. This is not true with the labor item when the restrictions are removed. The saving in poor supervision is more than lost in the larger payrolls. A contractor told me that he wants his foremen to spend a dollar whenever they can save two, but this is not usually the case with railroads.

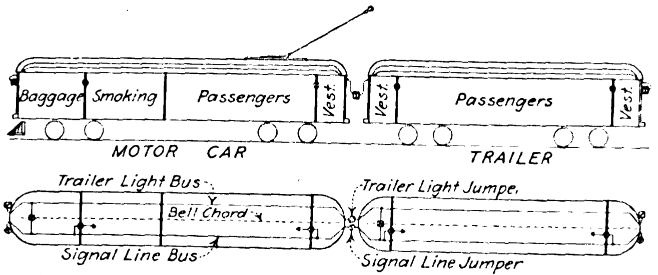
Two illustrations of the application of the last-named principles may be of interest. In one case a railroad secured very great improvement in track maintenance at low cost by a 25 per cent increase in the track force. In another case an expenditure of $2,700 in eliminating defective bonds saved $3,700 in the power bill in two years.

Consider the application of the principles of better management to the case of the maintenance of way department of an interurban line. This work is often done after a fashion followed for years. A good practice would be this: As spring arrives shims are removed, the track is fixed up where necessary and new ties are put in here and there. This work should be finished early in the summer. Then come mowing, weeding, ballasting, lining and surfacing, and later ditching and preparation for winter. On how many lines is such work done in accordance with a well-planned schedule and under the complete and constant control of the track supervisor? Too often the decision as to the number of ties is left to the guess of the section foreman and cut arbitrarily. During the period of tie replacing the track supervisor can save his wages by preventing the removal of ties still good for a year or two. All ties should be in by a certain date, say July 1, and the track ready for summer traffic. A schedule should be prepared in advance for the season's operations and it should be rigidly adhered to. The track supervisor should be on the line constantly, keeping the track gangs up to schedule and following up and remedying the causes of delay. In the fall the tie requirements for the following year should be accurately determined to insure prompt delivery. This procedure would result in better control of maintenance work at less cost.

Proposed Standards of the Central Electric Railway Association

At the convention of the Central Electric Railway Association held in Toledo last week the report of the standardization committee presented a number of important recommendations. These were given in abstract in the ELECTRIC RAILWAY JOURNAL for June 27, page 1454. Details of the recommended changes are now available. As reported in the account of the meeting, the report of the committee on standards was accepted as presented by the committee and the secretary was ordered to send copies of the report to the individual members of the association for final action at the next meeting. This will be held in Indianapolis some time in November, so that ample time is afforded for consideration of the recommendations.

In its report the standardization committee recommended the adoption as "recommended practice" of the standard 6-in. trolley wheel which was tentatively submitted before the association a year ago. This wheel is 6 in. in diameter over all, has a hub 1¾ in. long and has a groove with a maximum width of 1⅛ in. and a minimum width of ½ in., the depth of metal at the bottom of the groove being ½ in. A drawing of this standard trolley wheel was published in the ELECTRIC RAILWAY JOURNAL for July 26, 1913, page 140.



⊗ Signals, with necessary resistance, to be located so as to be audible on both sides of bulkheads.

⊕ Signal line connectors, as per print No. B-11-A.

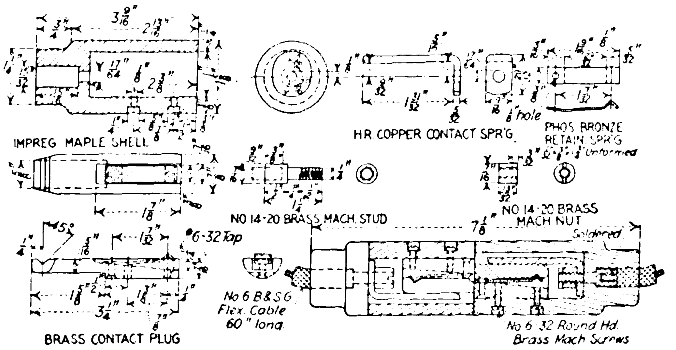
⊠ Trailer light connectors, as per print No. C-5-A, used for light heater and other auxiliary circuits.

■ Signal sws. operated by bell cord and connecting trailer light with signal line bus.

C. E. R. A. STANDARDS—PROPOSED LOCATION OF ELECTRO-PNEUMATIC SIGNAL WHISTLES AND WIRING

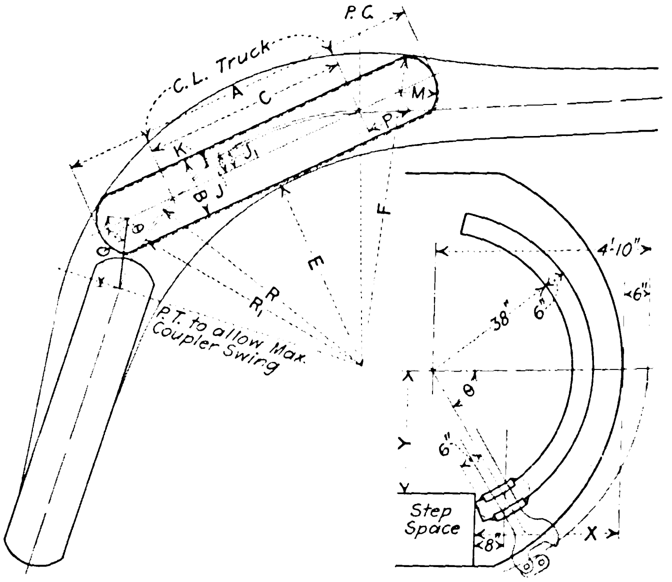
In connection with the standard train signal system the committee proposed a standard arrangement of electromagnetic signals for car interiors. The report did not go into details regarding the location of the accessory apparatus which would necessarily have to be determined by local conditions, but defined the location of the signal whistles so that they could be readily heard by trainmen from any part of the car. This proposed arrangement is shown in the accompanying cut.

The committee considered that it was advisable to use a connector for the signal line between cars which would not intercouple with the trailer-light connector, and in view of the fact that the present standard trailer-light connector had been found to be of insufficient current-carrying capacity, especially when electric heaters were employed, it was recommended that the present standard trailer-light connector, as reproduced in the ELECTRIC RAILWAY JOURNAL for July 1, 1911, page 32, should be adopted as a standard signal-line connector. The committee then recommended that a new standard trailer-light connector be adopted in place of the old one. The details of this are shown in one of the accompanying line cuts.



C. E. R. A. STANDARDS—PROPOSED NEW STANDARD TRAILER-LIGHT CONNECTOR

With regard to the standard end connections for interurban cars, the committee recommended the revision of the present arrangement to provide for the additional line as mentioned above. This arrangement was shown in an illustration in the ELECTRIC RAILWAY JOURNAL for July 5, 1913, page 30.



C. E. R. A. STANDARDS—DIAGRAM SHOWING CLEARANCES OF CAR BODIES AND ANGULAR SWING OF COUPLERS

In connection with the discussion on the subject "Mounting of Radial Couplers," the committee submitted for inclusion in the proceedings of the association a table prepared by the Ohio Brass Company which showed the clearances of car bodies and the angular swing of couplers when two-car trains were passing around curves of short radius. This table is published below in condensed form, the most important features in it being given. It applies only to curves with a radius of 35 ft. and to cars that have a bumper beam radius of 5 ft., an overhang between the bolster and the bumper beam of 11 ft., and a projection of the coupler pulling face 6 in. beyond the bumper beam at the center line of the car.

CLEARANCE OF CAR BODY AND ANGULAR SWING OF COUPLER FOR 35 FT. CURVE AND 11 FT. OVERHANG

GENERAL CAR DIMENSIONS			Radii of Car Clearance Lines for Car Positions Entirely on the Curve		4 FT. 10 IN. M.C.B. COUPLER DATA 6 IN. PROJECTION OVER BUFFER CENTER LINE		
Length Over Buffers	Width	Truck Centers			Angular Swing of Coupler from Car Center Line	Clearance in Inches from Step to End of Car	Clearance in Inches from Step to Car Center Line
A	B	C	Inside E	Outside F	Θ	X	Y
70 ft.	10 ft.	48 ft.	20.14 ft.	44.36 ft.	86 deg. 42 min.	57.64 in.	36.40 in.
65 ft.	10 ft.	43 ft.	22.31 ft.	43.96 ft.	79 deg. 22 min.	52.43 in.	30.27 in.
60 ft.	10 ft.	38 ft.	24.11 ft.	43.59 ft.	72 deg. 15 min.	47.51 in.	33.70 in.
55 ft.	10 ft.	33 ft.	25.59 ft.	43.19 ft.	65 deg. 22 min.	42.92 in.	34.19 in.
50 ft.	10 ft.	28 ft.	26.81 ft.	42.79 ft.	58 deg. 56 min.	38.85 in.	33.43 in.
45 ft.	10 ft.	23 ft.	27.80 ft.	42.40 ft.	52 deg. 18 min.	34.92 in.	31.92 in.
40 ft.	10 ft.	18 ft.	28.53 ft.	41.99 ft.	45 deg. 48 min.	31.42 in.	39.74 in.

NOTE: A decrease in width of car to 8 ft. increases value of E by 1 ft. but does not affect value of F.

The formulas from which this table was made up are given below, the terms used in these being shown in the accompanying diagram.

R = Radius of center line of track curve

Wb = Distance between wheel centers on truck

K = Distance between center line of track and center of truck, when truck is on the curve.

$$K = R - \sqrt{R^2 - \left(\frac{wb}{2}\right)^2}$$

$K = 0.23$ ft. when $R = 35$ ft. and $wb = 8$ ft.

$$R_1 = R - K$$

$$J = R - \sqrt{R^2 - (C/2)^2}$$

$$J_1 = R_1 - \sqrt{R_1^2 - (c/2)^2}$$

$$E = R_1 - J_1 - \frac{B}{2}$$

$$F = \sqrt{\left(\frac{A}{2} - M\right)^2 + (R - J)^2} + M$$

Angle of coupler swing, $\Theta = 180$ deg. — (angle L + angle N)

$$L = \text{angle whose tangent} = \sqrt{\frac{R^2 - (c/2)^2}{\frac{c}{2} + P}}$$

$$N = \text{angle whose cosine} = \frac{c \times p + Q^2 + P^2}{2Q\sqrt{R^2 + (C \times P) + P^2}}$$

$$X = 5Z - 41 \cos \Theta + 8 = 60 - 41 \cos \Theta$$

$$Y = (52 - X) \tan \Theta + \frac{6}{\cos \Theta}$$

$$= 41 \sin \Theta - 8 \tan \Theta + \frac{6}{\cos \Theta}$$

The results given by these formulas are expressed in feet. The values of E and F give the radius of the clearance lines for the car under consideration when the car is wholly on the curve. The clearance lines draw in toward the track at the ends of the curve, changing from the circular arcs with radii E and F to practically straight, converging lines. No provision has been made in the formulas for super-elevation of the outer rail of the curve. In case this condition exists, allowance at the inside of the curve must be made not only for the tilting of the car but also for the compression of the springs on the side toward which the center of gravity of the car body has been moved, this being equivalent to an increase in width of body.

Municipal Ownership for Capital

For the District of Columbia Committee of the House of Representatives Representative Robert Crosser, of Cleveland, has filed the majority report approving the Crosser bill for the government ownership of the street railways in the District of Columbia. The report is a voluminous one, filled with tabulations of statistics and citations from the testimony taken by the committee, as well as from the books of writers on political economy. The minority report, which is being prepared by Representative S. E. Winslow, of Worcester, Mass., has not been finished and an extension of time is to be granted by the House for its filing. Until that report has been made, no action will be taken on the bill. There is little likelihood that the bill will be called up at the present session of Congress.

Representative Crosser's report asserts that government ownership of the street railways would result in better service and better wages and that it would take the companies out of politics. Much of the report is devoted to an attempt to prove that regulation of street railways is not effective, particularly where efforts have been made to divorce regulation from local influence. The report declares that there should be no competition in street car service, and devotes considerable attention to charges of overcapitalization and false accounting. It is asserted the employees of private companies do not receive as fair treatment as municipalities accord them, not because of any ill-feeling on the part of the private employer, but because of the desire to keep down expenses and increase profits, and that one of the most serious evils resulting from the private ownership and operation of public utilities is the corrupting and weakening of municipal governments.

Mr. Crosser devotes several pages of his report to a criticism of the idea of "regulation." Concerning this he says in part:

"Regulation is now constantly urged by the defenders of private ownership as the proper remedy for the evils which have invariably accompanied private ownership of public utilities, and it is somewhat amusing to know that the private owners of public utilities are the most eager and vociferous in the demands for regulation. The terms of the franchise, the traffic regulation, etc., are all efforts at regulation, but practically every objection and defect that has been shown to apply to private ownership and operation of street railways under these old regulative plans applies to the later methods of regulation. The fact is that the change has been largely a change of name. The regulating body is now generally called a public utility commission, whereas it was formerly called a council or board of aldermen. In this connection, however, it is interesting to note one essential change upon which the public utilities are insisting, and that is the transfer of the regulating authority from local to state officials. The state board is much less responsive to the will of the people of the municipality, who are the only ones directly affected."

As a resident of Cleveland, and a follower of the late Mayor Johnson, Representative Crosser complains particularly about the troubles in his own city. He discusses the controversy in Cleveland and states that he cites the case simply to serve as one example of the very natural tendency of a privately owned public utility to resist in every way possible every effort to regulate it in any way which will seriously interfere with its profits, and also to show the tendency of commissions who are not solely responsible to the persons directly affected by their decisions. According to Mr. Crosser, the fundamental cause for the failure of commission regulation is the natural and unavoidable antagonism between the interest of the private owner of public utilities on the one hand and the general public on the other. The private owner's natural tendency is to procure the largest amount of revenue possible for the least service necessary. "On the other hand," says Mr. Crosser, "the municipality is not concerned in earning a profit on its street railway system, but is concerned only in operating the system, so as to furnish the best service possible at the lowest price which will enable it to pay expenses. So far as the public official in charge of a municipally owned public utility succeeds in providing the best service at the lowest price, just so far is he a successful man in the eyes of his employer. According to his success will be his reputation, the certainty of employment, and the increase of his compensation toward the maximum for the kind of work in which he is engaged.

"There would be," the report continues, "no corruption and scandal in connection with efforts to procure special privileges or to resist governmental restrictions, because the municipality requires no special privilege and has no other restrictions than those self-imposed. Experience shows that the rates of fare of a municipally owned street railway are materially less than those of the privately owned systems. There are no big dividends to pay but instead usually a very low rate of interest. There is no over-capitalization, and there are no large promoters' and attorneys' fees to be paid for lobbying.

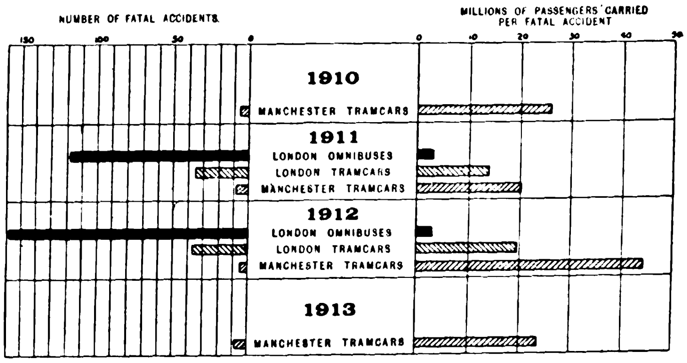
"The chief and really the only argument of any consequence urged against municipal ownership is that machine politicians would control the employees of a municipally operated street railway to perpetuate themselves in power. It must be remembered, however, that the city administration would be held responsible for the conduct of the street railway system. If the service should be inferior as a result of employing incompetent men, the city administration would suffer at the next election. With newspapers free from such influences as private street railways can and do bring to bear upon them they could and would without restraint criticise any attempt by public officials to place political supporters in the street railway service, regardless of competency. The fact is that private ownership fosters the political machine to a far greater degree than public ownership."

Mr. Crosser says that there are two municipally owned street railways in the United States, at Monroe, La., and San Francisco, Cal., and he insists that both have proved successful. The report presents a tabulation of British statistics to show that municipally owned railway lines are more liberal in extensions in non-profitable territory than are privately owned systems and that municipal ownership also results in reduced fares. Figures from the report of the National Civic Federation are used by Mr. Crosser in trying to prove that municipal operation results in a reduction of working hours, increased wages and welfare activities for aged employees. The report concludes with a statement of the financial and physical details of the street railway systems in the District of Columbia.

Forty-five employees of the Pennsylvania Railroad have recently been retired under the pension rules of the company. Two of the men have been in the company's service more than fifty-two years, while twenty have worked for the railroad forty years or longer. One motorman served fifty-three years and three months.

Traffic Study in Manchester, England

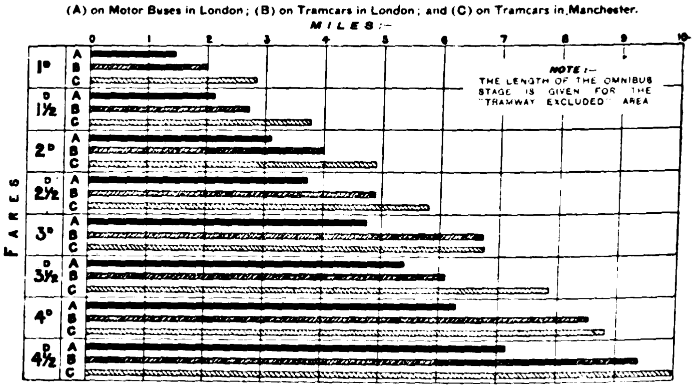
J. M. McElroy, general manager Manchester Corporation Tramways, has recently submitted to the city an extensive report on the congestion problem in that city. This report is based on the study of the local situation as well as of the traffic problems in other cities with data obtained by personal visits by the manager during the past year to New York, Boston, Philadelphia, Chicago, Pittsburgh, Newark, Toronto, Montreal, Paris, Berlin, Vienna and Hamburg. The report is accompanied by maps, diagrams and other particulars of the cities visited. An interesting discussion is given on the practice in each city. Below will be found an abstract of the London bus situation and some of the conclusions reached.



MANCHESTER REPORT—DIAGRAM SHOWING COMPARISON OF FATAL ACCIDENTS TO PASSENGERS CARRIED

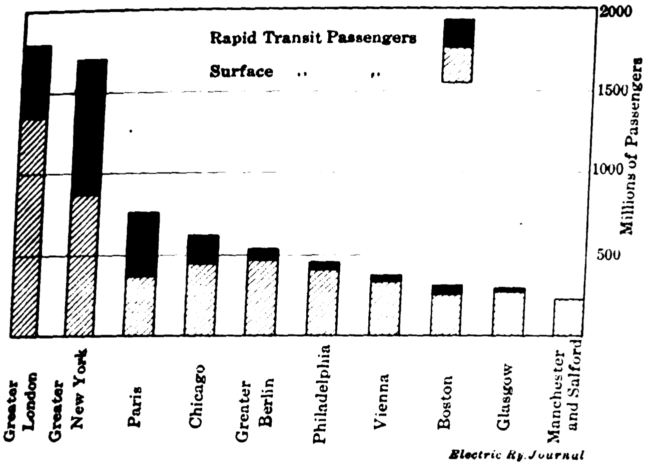
THE LONDON SITUATION

A defect of the London rapid transit system, according to Mr. McElroy, is that it has not been laid out in accordance with a comprehensive plan to meet the requirements of the city as a whole. There have been several recommendations in favor of a permanent authority for controlling all the means of transit in London, but this has never been carried into effect. Recently there has been an amalgamation of tube companies and bus companies so that, with the exception of the tramways operated by the London County Council, the passenger transportation business in London is almost entirely in the hands of one traffic combine. This combination has brought many advantages to the traveling public, but Mr. McElroy suggests that there is danger that the public interests may not be properly safeguarded if there is no control or regulation by some permanent traffic authority.

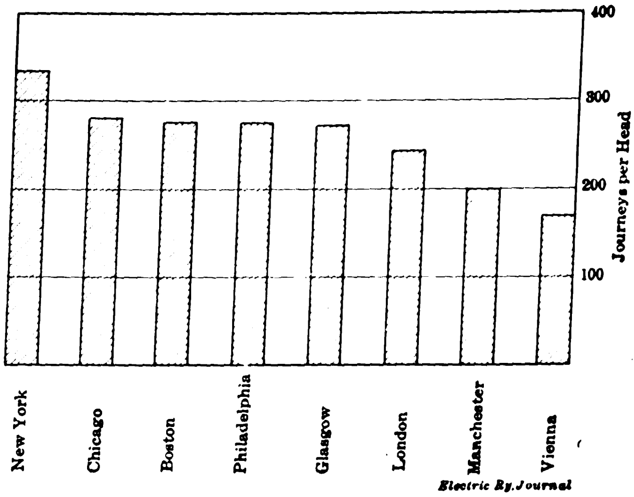


MANCHESTER REPORT—DIAGRAM SHOWING COMPARATIVE DISTANCES WHICH CAN BE TRAVELLED FOR DIFFERENT RATES OF FARES

There is no city in any part of the world so favorably circumstanced for the working of motor buses as London. It has the best paved streets in the world, and



MANCHESTER REPORT—PASSENGERS CARRIED IN DIFFERENT CITIES



MANCHESTER REPORT—RIDES PER HEAD OF POPULATION

the riding habits of the people are increasing rapidly. Moreover, the construction of tramways has not been permitted in the heart of London, therefore the motor buses supply what the tramways cannot, namely, through service. In this part of the city the bus fares are higher, due to lack of competition, and in many cases are about 1 penny per mile.

The running time of the motor buses compare favorably with rapid transit in the tubes. It has been found, however, that the buses are more dangerous on streets than the tram cars. The number of passengers carried per fatal accident by the motor buses of the London General Omnibus Company in 1911 was 2,900,000, and in 1912 the number was 3,100,000, whereas for the tram cars of the London City Tramways the figures were 14,400,000 and 19,800,000. This condition is due largely to the fact that as yet no satisfactory lifeguard has been devised for use on the buses.

CONCLUSIONS

The conclusions in general are that a comprehensive plan for transportation should be made in the case of every large city and should be followed, that where there are rapid transit lines they should be under the same management as the surface lines so as to supplement the service of the surface lines, but that generally the subways should not be used by the surface cars. The reason for this statement is that on account of their great expense of construction, the underground lines must be worked by high-speed trains operating under very close headway. In discussing rolling stock improvements the report says that the points to seek in car design are to improve rapid loading and unloading, to prevent boarding and alighting accidents, to decrease the number of stopping places and to simplify fare collection. Mr. McElroy speaks favorably of the operation of the pay-as-you-enter system in America and thinks that while the obstacles in the way of applying it to a zone system are serious they are not insurmountable.

The bridge department of New York City is arranging to divert to the Manhattan Bridge many of the surface railway cars now operated over the Brooklyn Bridge on account of the necessity for reconstructing the Brooklyn Bridge to fit it to care for the operation of rapid transit lines under the dual subway contracts.

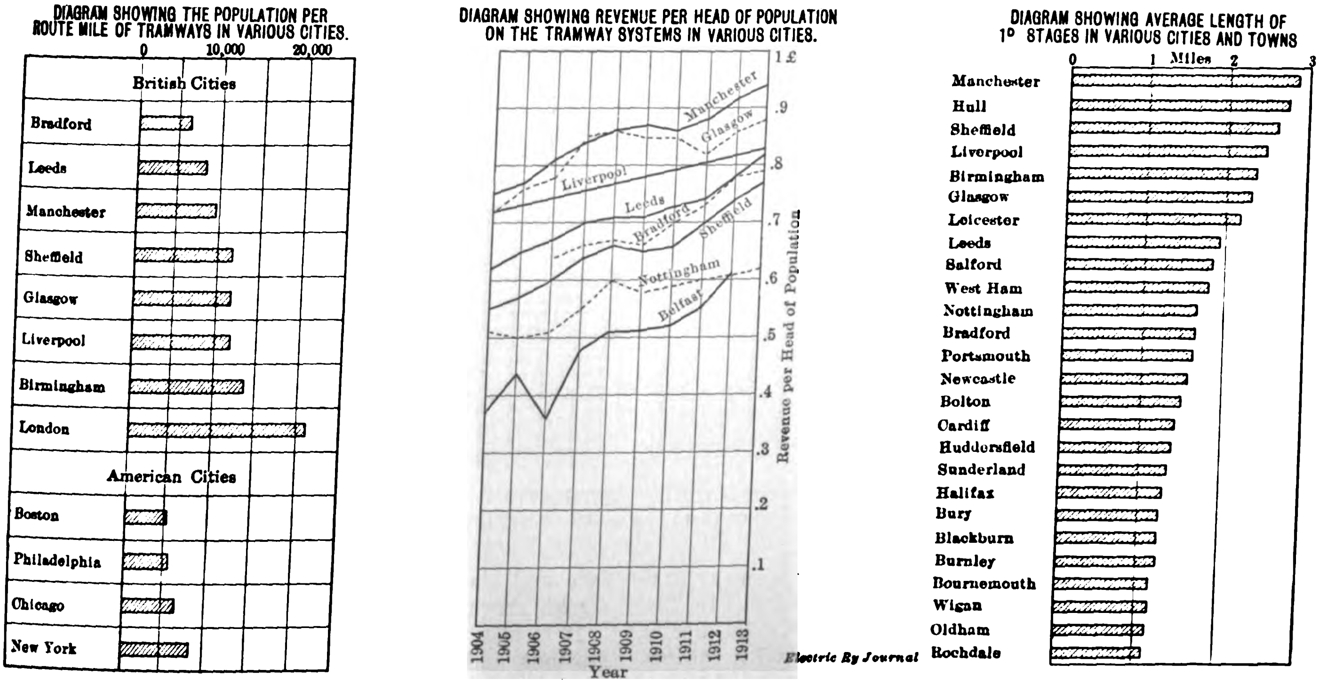


DIAGRAM SHOWING THE POPULATION PER ROUTE MILE OF TRAMWAYS IN VARIOUS CITIES.

DIAGRAM SHOWING REVENUE PER HEAD OF POPULATION ON THE TRAMWAY SYSTEMS IN VARIOUS CITIES.

DIAGRAM SHOWING AVERAGE LENGTH OF 1D STAGES IN VARIOUS CITIES AND TOWNS

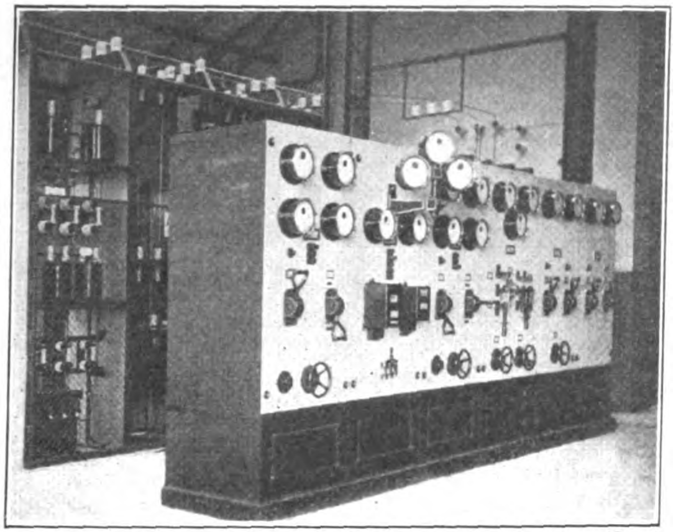
MANCHESTER REPORT—DIAGRAMS SHOWING POPULATION PER MILE OF ROUTE, REVENUE PER HEAD AND AVERAGE LENGTH OF 1-PENNY STAGES IN DIFFERENT CITIES

Some "Safety First" Practices in German Substations

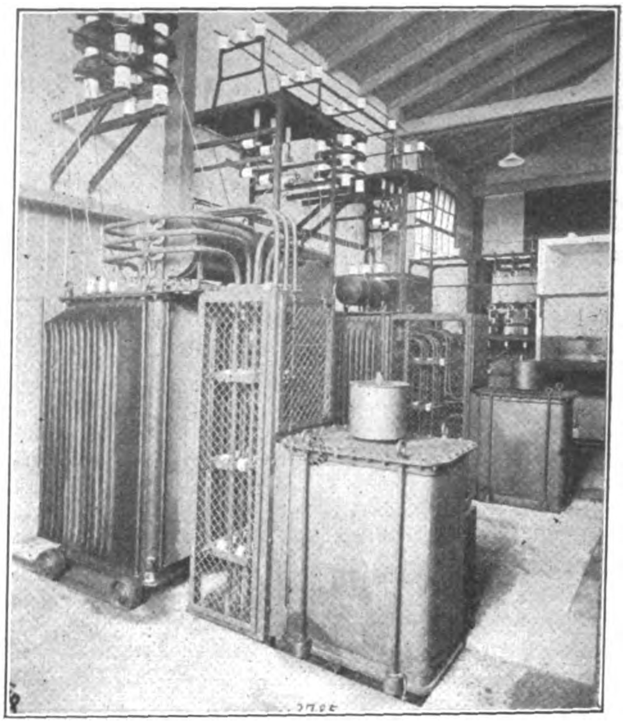
The "safety first" movement in the United States is comparatively new, but in Germany and other European countries many schemes for the protection of electrical and other workers have been used for years. The different industries have co-operative accident insurance organizations, and committees from these bodies decide upon and enforce the protective measures to be used.

The accompanying illustrations of some substations equipped by the Siemens-Schuckert Company are typical of the care given to this subject. Thus at the Heilwig Street substation of the Hamburg Rapid Transit System all of the switching equipment for each machine unit is mounted on a carriage in a properly-labeled cabinet. When any repairs or adjustments are required the carriage is drawn out along a set of rails to a place where the work can be performed in perfect safety and under the best space and lighting conditions. In the view showing transformers and reactance coils, heavy screening is employed to prevent contact with the reactances. In a second view it will be observed that the high-tension switching sections behind the switchboard are screened to a height of about 6 ft. These screens are divided into doors which may be opened for the inspection of individual sections. Where separate control apparatus is installed for single operating units, like motor-generator sets, it is common to inclose such equipment in a wire cage to which access is obtainable only by authorized employees. A third view shows that protection against transformer leads is obtainable by the addition of a tray-like side-screened structure at the top. In addition to these forms of protection, enameled warning signs lettered in red on a white surface and also marked with the symbol for a lightning stroke are installed wherever necessary.

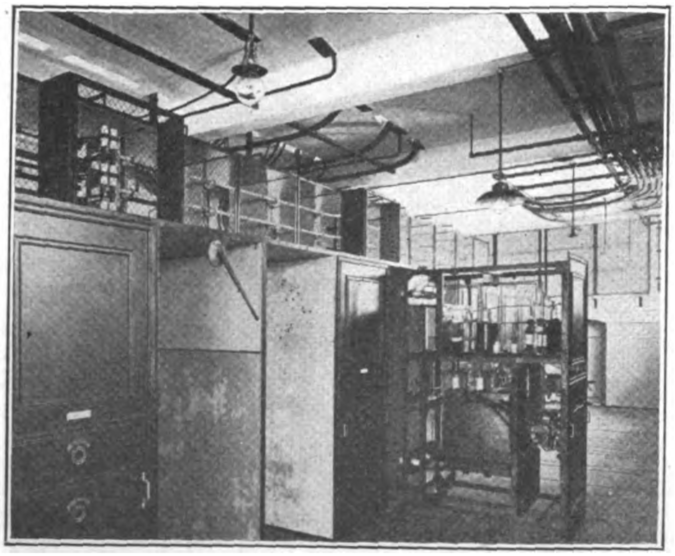
It is also common practice in the power plants, substations and machine shops of Germany to inclose all belting to a reasonable height, and to paint the dangerous parts of machinery a vivid red.



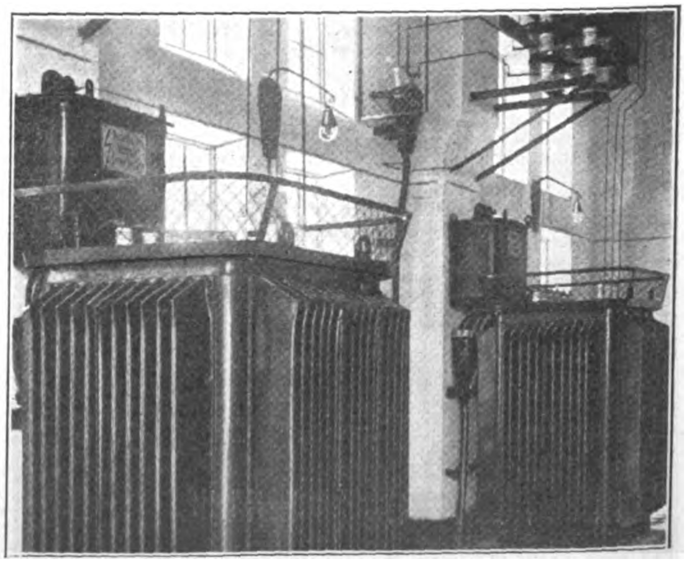
SUBSTATION AT TROMPET, SHOWING PROTECTION OF HIGH-TENSION GEAR BEHIND SWITCHBOARD



SUBSTATION AT CRONENBERG, SHOWING THE TRANSFORMERS WITH PROTECTED REACTANCE COILS



SUBSTATION, HEILWIG STREET, HAMBURG, SHOWING HIGH-TENSION ROOM WITH MOVABLE SWITCHING SECTIONS



SUBSTATION AT FLÖRCHINGEN, GERMANY, SHOWING TERMINAL PROTECTION OF TRANSFORMERS

COMMUNICATIONS

Correspondence Courses for Accountants

PUBLIC SERVICE RAILWAY COMPANY
NEWARK, N. J., June 23, 1914.

To the Editors:

The course in accounting prepared by the committee on education of the American Electric Railway Accountants' Association and described in the issue of the ELECTRIC RAILWAY JOURNAL for May 30, page 1214, is the latest effort in correspondence courses by a national association.

The fee of $10 for each year's lectures in the new course is an exceedingly low one.

The usefulness of these correspondence courses, conducted by trained teachers and under the technical advice of those best qualified to give it, has been amply demonstrated. The work is done without any idea of profit and the charge to the student is a nominal one. The information given cannot be obtained elsewhere except at a very much greater cost. The course can only be a success with the co-operation of accounting officers of member companies. The enrollment of employees in such a course is bound to have a stimulating effect upon them and add to their efficiency. The effect upon the student will be to give him something more than an enforced interest in his daily work and should make him a much more valuable employee.

It may be of interest to accounting officers who have had no experience with educational courses of this character to know that courses along similar lines have been given by the National Commercial Gas Association for the past three years. The first course consisted of ten lectures on salesmanship, each with a series of ten questions. A lesson was issued each month. Seven hundred and twenty-five students enrolled and a large percentage completed the course. A similar course on business organization was given the second year. Six hundred and sixty-eight students enrolled and a large percentage completed this course also. The third course is now being given. It consists of ten lectures on the utilization of gas appliances. This course is a most complete one, and 3850 students have enrolled. Each lecture gives the history of a class of appliances, the details of their manufacture, their efficiencies, their application, installation and operation.

The success of these three courses has led the Gas Association to plan for a three-year course. This course is now in preparation and will comprise the following subjects:

First year, business English; penmanship; arithmetic; mensuration; elementary algebra; elementary geometry; elementary physics (mechanics, heat, electricity, light); elementary chemistry.

Second year, manufacture and distribution of gas; generation and distribution of electricity; utilization of gas and electricity (lighting appliances, heating and cooking appliances, power and industrial appliances).

Third year, corporation organization and control; finance, accounting and office management; salesmanship and sales development; inter-department relations; public relations.

The fee for the three-year course will be $60, if payments are spread over the three-year period, or $50 if the fee is paid in advance. It will be necessary to have 1000 men enroll in order to conduct it.

The plan under which the third-year course on utilization of gas appliances has been conducted has provided for a class leader wherever there have been sufficient men in a company taking the course to warrant it. The class leader, through correspondence with the director of the course, prepares himself in advance of the date on which the answers have to be sent in and calls the members of the class together to discuss the lessons and the questions. It has been found that these meetings and the discussions have increased the usefulness of the course tremendously and have caused the men to retain interest in the work. The class leaders are also of very great assistance to the director, and the American Electric Railway Accountants' Association will do well to adopt a similar practice as soon as the enrollments justify them in going ahead with their educational program.

Accounting knowledge is useful to every employee of an electric railway and no doubt the Committee on Education of the American Electric Railway Accountants' Association will find a large proportion of men outside of those in the accounting department enrolled in the course in the same manner as the educational committee of the National Commercial Gas Association found that many men outside of the departments interested were taking the course provided by them.

Both self-interest and the desire to become efficient should bring about a large enrollment in this very practical course on accounting prepared by the committee on education of the American Electric Railway Accountants' Association. P. S. YOUNG, Treasurer.

The Springfield Report on Electrolysis

NEW YORK, June 30, 1914.

To the Editors:

The Springfield electrolysis tests, which were reported in abstract in the ELECTRIC RAILWAY JOURNAL for March 21, page 646, were evidently in mind when you wrote the editorial printed in the issue of June 27, page 1428. I wish to call attention to the fact that the conditions in Springfield were very favorable on account of the co-operation of all of the public utility companies involved. Owing to the expiration of certain franchises the city was able to use pressure in bringing about such co-operation, which could not have been obtained before. This co-operation was absolutely necessary to secure the interlacing of the negative return systems of the local utilities. It would have been impracticable for either company having a power plant inside the city limits to develop a reasonably safe system alone.

The method adopted in Springfield for preventing electrolytic troubles was the negative return system of the type called "the insulated negative feeder system." In this the feeders radiating from the power station to the rails are distributed in accordance with the current congestion and the potential gradients. The accepted practice is to use the same insulating methods as are employed on the positive side of the distribution system. In a few isolated cases scrap rails, bonded together and buried, have been used for the return feeders from rails to negative busbars, but on account of the corrosion of the bonds between the rails this practice has not proved reliable. While insulated return feeders were found practicable and presumably economical in Springfield, it does not follow that this system should be used everywhere, for the Springfield case must be considered a special one.

In order that the best return system may be provided for any particular case, the engineers involved should be familiar with all methods of protection and should investigate them with regard to the peculiarities of the special system under study. I have not found two systems which present identical conditions in regard to the electrolytic relation of sub-surface conductors and the negative return. In more than one hundred systems personally examined since 1896, no one method of relief has proved to be a panacea. In all cases it is not only the prevention of electrolysis which must be considered but also the cost of the recommended plan which must not be overlooked.

Returning to the subject of the insulated return system it should be noted that there are conditions under which the extension of the negative return will not accomplish desirable results. In the first place, when the auxiliary negative feeders are carried far from the power plant, the area of contact between rail and soil is increased and the resistance of contact is decreased. The same current can then be dissipated from pipe surfaces with less difference of potential between pipe and soil. When there is no accidental metallic connection between the rail return and the underground conductor system the return current divides between the rail return and the earth pipe return in inverse proportion to their resistances. Anything which tends to reduce the resistance of the earth path, therefore, deflects more current from the rail return and increases the electrolytic corrosion in the area where the pipe is positive to the soil. It is important to note that the vital difference of potential involved in this matter is that which exists between the pipes and the adjacent electrolyte. The difference of potential between pipe and rail is the sum of the pipe surface drop, the counter emf and the contact resistance drop between rail and earth. In addition there is a further resistance drop due to paving conditions. Now if the resistance between rail and soil is lowered, the difference of potential between the electrolyte and sub-surface conductors is increased, with consequent greater danger of corrosion. Another condition which is produced by the expansion of the negative feeder system is the increase in the difference of potential between rails and adjacent roadbeds in negative territory. This increases the corrosion at the foot of the rail, such corrosion being known as "foot-wear." If this foot-wear is more rapid than the head-wear on the rail the normal useful length of life of the rail is not obtained. Where rails have concrete footings or bases, chemical reactions are set up decrystallizing the bond between the rails and the concrete, producing the condition known as "rotting of the concrete." This is due to the acid condition produced in the concrete at its junction with the rail when current leaks from the rail surface.

In a number of respects the Springfield report seems to me to be incomplete, and possibly misleading. The report does not contain data regarding the increased difference of potential between pipe and surrounding electrolyte due to the increase in leakage areas, as outlined above. Further, the tests were made in winter, during which season the frost in the ground increases the total resistance of the earth circuit. At the same time the resistance of the rail return is much less than in summer on account of the comparatively high temperature co-efficient of steel. The over-all voltages given in the report are not the maximum voltages, as higher voltages are often found than those existing between the end of the road and the power station. This is especially true where there are metallic connections between rails and pipe. In Springfield these metallic connections seem not to have been tested for, although they were found to exist during a previous survey. The report does not state whether or not the resistances of the pressure wires were compensated for in determining the over-all voltages. As these were telephone wires measuring, say, 8 ohms per thousand feet their resistances would exert considerable influence on the results if not corrected. The cost of the losses in the Springfield case are incorrectly estimated, for central stations of the size of those in Springfield would produce additional energy to make up the losses at ½ cent per kw-hr. This overstatement of the cost of energy leads to incorrect conclusions. Operating engineers know that all the cost which can be charged in this case is that of additional coal. The increased efficiency in the outlying feeders is apparent but not real. The reduction of potential gradient caused by these feeders is due to the local increases of potential between the rail and the negative bus at the power station. The increased local losses should be deducted from the apparent economy affected by the outlying negative feeders. I cannot see, by any argument of logic or mathematics, how the aggregate drop between rail and negative bus can be increased and yet at the same time the losses in the negative transmission system be decreased. Furthermore, I do not believe negative boosters to be an economical proposition as compared with proper feeders, from the standpoint of operation, depreciation and attendance. Boosters have been installed in several cases in this country but they have been abandoned. The system installed in Springfield may be perfect, but the data in the report do not warrant us in judging it to be so.

Let us consider briefly the objections which are alleged against the pipe drainage system. In these objections the usual statement of the proportion of current returning over the drainage feeders indicates metallic connections between rails and pipe. In any case where 10 per cent or more of the total station current returns over the pipe feeders there is undoubtedly metallic connection between the rails and underground conduction structures which have been temporarily connected to the negative bus. The amount of this current flow in the pipe system, not metallically connected to the rails, can always be brought down to from 5 to 7 per cent of the station output by properly adjusting the pipe drainage feeders with due regard to the potential gradient in the rail and the congestion of current around the power station.

It is often argued from theoretical considerations that insulating joints in pipe lines, whether they be ordinary joints insulated by caulking or special joints of the insulated type, will cause corrosion on the positive side of the joint. As a practical matter I have never found a case of corrosion on the positive side of a pipe adjacent to an insulating joint. This matter is continually raised in electrolysis suits, and railway companies have continually asked for samples of corroded pipe adjacent to insulated joints. Such exhibits have never been made for the reason that the theoretical corrosion is that due to the assumed electrical conditions surrounding the joint, but, as a fact, the current flow there is actually negligible in amount. In a test made on an 8-in. cast-iron main buried in earth saturated with moisture, measurements made 4 ft. on either side of an insulating joint showed a resistance of 30 ohms when a 5-volt pressure was first applied. This rose to 180 ohms in sixty hours. The effect of introducing an insulating joint in the line of pipe paralleling an electric railway line is to force the current into a path in shunt with the joint. This is not true in a pipe-drainage system composed of a quadrilateral system of conductors covering an area over which the lines of rail radiate. In this case the current has presented to it many paths of metallic return, and main arteries of circulation of current are often found in pipes not adjacent to the railway line.

I would not advocate a pipe-drainage system as the only means for pipe protection, but the objections raised against its adoption in the Springfield report are more academic and theoretical than practical. No conscientious engineer would attempt to utilize the pipe-drainage system without first connecting the pipes and cable sheaths to the negative busbars, and then testing the system to determine the exact conditions of the piping as a conductor. He would then relieve those sections where the potential gradient is too high or differs too much from that of paralleling rails or where shunting from one system to another occurs. In a pipe-drainage system of negative underground conductors, all pipes and cable sheaths must be treated as one negative system of return, and so connected that the potential relations of sub-surface conductors in any one locality will be practically the same. The pipe-drainage plan must not be applied to any system which has metallic connections between pipes and the rails at any point, and it is, furthermore, illegal to apply such a system where such metallic connections exist under the general law that one cannot use another's property for his own purposes. Metallic contacts must first be located by well-known means. They are often found in iron bridges, gate boxes, surface connections and forgotten connections which existed originally between rail and pipe. These must all be removed and the resistance of the earth interposed between the pipe system and the rail.

In regard to the expense of the pipe-drainage system, it should be noted that the return current to be dealt with is from 5 to 7 per cent of the total current output of the station only. Hence the cost of conductor through the territory over which pipe and cable sheaths are drained is greatly less than that of any insulated negative return system which increases the negative return drop and has to handle the total output of the station. Furthermore, by the proper location of the drainage feeders a compounding effect can be produced by the natural shifting of the load over the system by which portions of the pipe are made negative for a short period, and an advantageous hydrating effect be produced which tends to neutralize the positive ionic condition existing between pipe surface and electrolyte.

In conclusion, I wish to call attention to the fact that engineering for betterment is the useful spending of a dollar to earn its value by producing greater economy. Academic methods which do not comprehend this phase of engineering are costly and experimental. The electric railways in Ohio have been restricted in their earning powers by legislation under threats regarding franchises. Pressure is now brought to bear on them to safeguard the property of other utility companies which claim damage from electrolysis. The railway companies are further burdened by methods which have for their purpose the development of a system to conform to those arbitrary rules known as the British Board of Trade provisions. These provisions may or may not prove effective, serious electrolytic damage having arisen when property has been maintained under them. What ought to be accomplished is the protection of the pipe surfaces against accentuated corrosion due to current flow from them; to keep these surfaces at potentials below those at which ionization is set up in the electrolyte which surrounds them. The eliminating voltage in any natural ground-water electrolyte is readily determined and the reduction of the potential difference between pipe and electrolyte is a matter of feeder resistance.

On the above two fundamental principles rest the solution of the problem of providing effective preventive measures. Without the application of these principles in every given locality under treatment the results that are attained are only visionary.

ALBERT B. HERRICK, Consulting Engineer.

Accounting Terms

MOBILE, ALA., June 23, 1914.

To the Editors:

Your editorial of June 20, 1914, "What is Treasury Stock?" is very timely.

It has been realized for a long time by electric railway accountants and others interested that terms are used in accounting, whose meaning is not clear, and in some cases names are used interchangeably, while their meaning is different.

A celebrated authority on accounting makes this statement:—"Unfortunately, despite the advancement made in accounting, there is a most embarrassing confusion in terminology, so that one can never be sure of just what is meant by a given account."

Realizing this trouble, the executive committee of the American Electric Railway Accountants' Association appointed a committee on accounting definitions, and it is hoped that through a report of this committee a number of conflicting terms may be clearly defined, and the adoption by the association of the defintions will do much towards clearing up confusion of terms now existing.

A recent newspaper article discussing a reorganization plan stated that provision may also be made for an issue of "adjustment income bonds." This term is capable of several interpretations, the correct meaning not being clear without additional explanation.

This is a subject of vital importance to the owners of bonds and stocks, as well as to operating officials of corporations, and it is hoped that the Accountants' Association will be able to do its part in defining terms in accounting which are not clearly understood by all who use them.

M. W. GLOVER.

Princeton Meeting of the Society for the Promotion of Engineering Education

The twenty-second annual meeting of the Society for the Promotion of Engineering Education was held at Princeton, N. J., from June 23 to 26. The proceedings cover a wide range of subjects but the central idea brought out was that emphasis should be laid upon fundamental principles, and that education is not so much a matter of administration as of purpose and spirit. The meeting was notable from the attendance of official representatives of a large number of educational institutions.

The following elections were made at the last session: President, Anson Marston, dean of the division of engineering, Iowa State College, Ames, Iowa; vice-presidents, Henry H. Norris, ELECTRIC RAILWAY JOURNAL, New York, and C. Russ Richards, acting dean of the College of Engineering, University of Illinois, Urbana, Ill.; secretary, F. L. Bishop, dean of the School of Engineering, University of Pittsburgh, Pittsburgh, Pa.; treasurer, William O. Wiley, secretary John Wiley & Sons, New York; members of the council, R. H. Fernald, professor of dynamical engineering, University of Pennsylvania, Philadelphia, Pa.; A. H. Fuller, dean of the College of Engineering, University of Washington, Seattle, Wash.; A. M. Greene, Jr., professor of mechanical engineering, Renssalær Polytechnic Institute, Troy, N. Y.; E. V. Huntington, assistant professor of mathematics, Harvard University, Cambridge, Mass.; Vladimir Karapetoff, professor of electrical engineering, Cornell University, Ithaca, N. Y.; D. C. Miller, professor of physics, Case School of Applied Science, Cleveland, Ohio, and W. M. Riggs, president of the Clemson Agriculture and Mechanical College of South Carolina, Clemson College, S. C.

Equipment and Its Maintenance

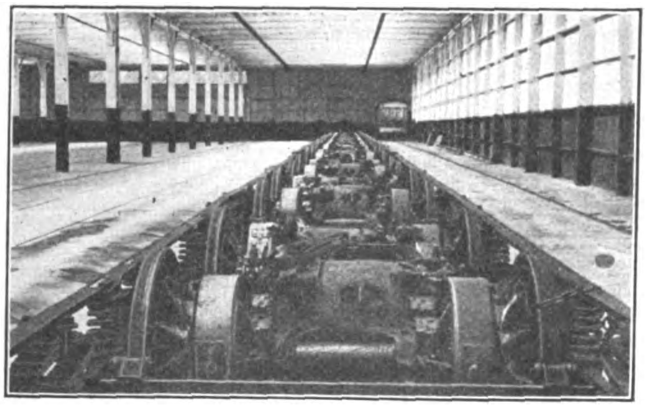
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field are Solicited and Will be Paid for at Special Rates.)

Double-Pinion Drives for Railway Motors

BY A. A. BLACKBURN, CHIEF ENGINEER, BELFAST (IRELAND) CITY TRAMWAYS

In the *Tramway & Railway World* for April 7, 1910, I contributed an article regarding the use of double-geared drives on the Belfast City Tramways. Since that time we have equipped approximately 150 car trucks with this drive, and they have proved to be uniformly successful.



IRISH GEARS—TRUCKS EQUIPPED WITH DOUBLE GEARS AND PINIONS READY FOR INSTALLATION UNDER CARS

Our experience with this double drive during the past four years has enabled us to make a fair comparison between the single and the double geared method of driving, and the results obtained have been so satisfactory that we are now equipping all of our 300 trucks with the double drive as rapidly as possible. We have had no reason to alter our views in regard to the claims set forth in the above mentioned article, but as a matter of fact we are finding even greater improvements in the wearing parts on all the trucks fitted with this drive, as against those of the single gear.

Cars have been sent in to the works, on an average, about every nine months for wheel flange wear, but we find that the cars fitted with the double gears stay in service for an average period of eleven months before being sent into the works. We attribute this to the fact that the four gears drive the truck parallel on the track. These cars also climb hills better, as the wheels have not the same tendency to slip. The trucks do not have the same corner-thrust action, consequently they keep more square and the wheels wear more evenly.

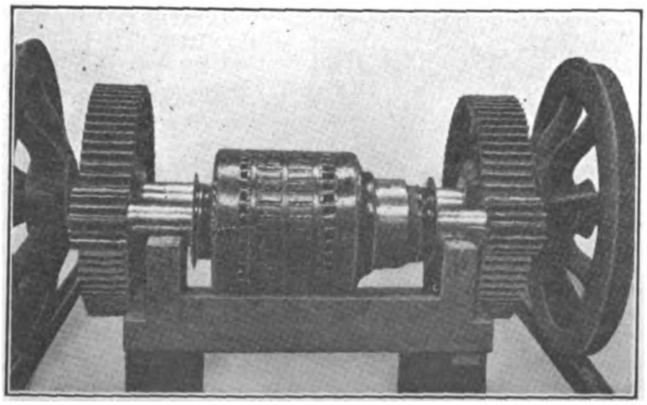
Motormen report that the double-geared cars run much steadier and start easier. In starting the car there is not the same jerk as with single geared trucks, therefore there is not the same wear on gears and pinions. These cars have run on every service and over every route on the system, and careful meter tests show that the current consumption per car mile is slightly less. Armatures and motor-suspension bearings wear more evenly and last longer. Commutators do not flash across and they wear better.

In fitting the double gear-wheels to an axle, a certain amount of care is necessary to see that the gear-wheel teeth are parallel and are perfectly in line, one with the other. To obtain these results everything depends upon the accuracy with which the gear-wheel keyseats are cut as the least alteration in the keyseat or key throws the gears out of mesh. The armature shaft is lengthened out at the commutator end to suit the extra pinion, and the same care must be observed here as with the gears, that is to say, the keyways in the pinions must be cut exactly parallel one with the other.

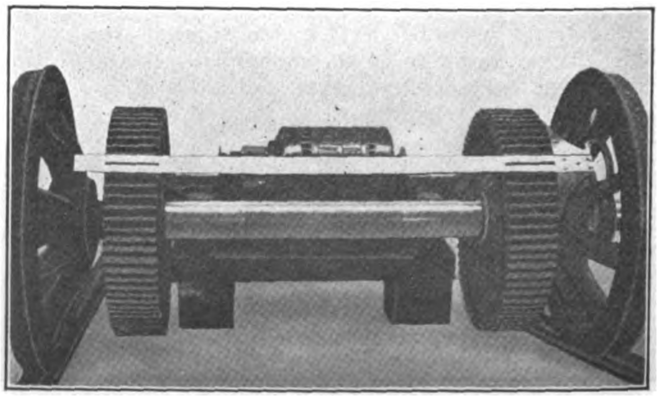
We use the British Westinghouse Company's 68-tooth gears and 14-tooth pinions. They are supplied to us with keyseats accurately machined out for this purpose, but slight errors will sometimes arise. Therefore all our gear wheels are tested before fitting, by placing two gear wheels together on an axle fitted with a long key. By this means we are able to see if the gear-wheel teeth and keyseats correspond.

Pinions are tested by a similar means. A short piece of axle is turned with a taper at each end, and fitted with two keys. Two pinions are then pushed together until they meet. We are then able to see at a glance whether the teeth are in line.

Occasionally a gear key will have to be side-stepped to permit moving the gear wheel around until the gear teeth are in line, and when this has to be done we proceed as follows: First of all one gear is fitted firmly



IRISH GEARS—ARMATURE WITH ITS DOUBLE PINIONS IN MESH WITH GEARS



IRISH GEARS—T-SQUARE USED TO ALIGN TEETH OF DOUBLE GEARS into position, then the second gear is placed over its keyseat, from which the key has been removed, and then the gear is carefully adjusted by means of a steel T-square, into the blade of which are cut slots which fit over one tooth in each of the two gears. The amount of side-step or off-set required by the key can be seen at once from the relative position of the keyways in the shaft and in the gear.

Overhead Problems—Poles and Adjuncts

BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER CONNECTICUT COMPANY

The fact that much overhead construction might well be common for trolley, telephone, telegraph and lighting has led to a movement for a joint committee representative of all interests to deal with such questions, and although apparently no definite steps as yet have been taken to that end, it is undoubtedly a move of the near future.

As regards wooden poles, however, no action is needed; although differing somewhat in wording the important requirements of all concerned are identical. The following table shows standard dimensions of the principal woods used.

MINIMUM POLE DIMENSIONS

Natural Poles

Length of Pole, Feet	CHESTNUT Circumferences in Inches at Top and "Ground" Class A		Class B		Crook, Inches	WHITE CEDAR Eastern Circumferences in Inches at Top and "Ground" Class A		Class B		Crook, Ins.	WHITE CEDAR Western Circumferences in Inches at Top and "Ground" Class A		Class B		Crook, Inches	JUNIPER Circumferences in Inches at Top and "Ground" Class A		Class B	
30	24	40	22	36	..	24	40	22	36	..	28	37	25	34	5	24	40	22	37
35	24	43	22	40	10	24	43	22	38	10½	28	40	25	36	6	24	43	22	40
40	24	45	22	43	11	24	47	22	43	12	28	43	25	38	7	24	47	22	44
45	24	48	22	47	11	24	50	22	47	9	28	45	25	40	8	24	50	22	48
50	24	51	22	50	11	24	53	22	50	10	28	47	25	42	8	24	53	22	52
55	22	54	22	53	12	24	56	22	53	11	28	49	25	44	9	24	56	..	..
60	22	57	22	56	13	24	59	22	56	12	28	52	25	46	10	24	59	..	..
65	22	60	22	59	14	..	..	..	..	..	28	54	25	48	11	..	..	..	..
70	22	63	22	62	15														
75	22	66	22	65	..														
80	22	70	22	69	..														
85	22	73	22	72	..														
90	22	76	22	75	..														

"Ground" circumference shall be taken 6 ft. from butt. Crook is maximum distance from pole to string stretched from point 6 ft. from butt to point at top.

Special Poles

Length of Pole, Feet	SAWED REDWOOD Dimensions in Inches at Class A Top	Class A Ground	Class B Top	Class B Ground	CREOSOTED YELLOW PINE Circumference in Inches at Class A Top	Class A Ground	Class B Top	Class B Ground
30	7x7	11 x11	6x6	10x10	22	35	20	32
35	7x7	12 x12	6x6	11x11	22	38	20	34
40	7x7	13 x13	6x6	12x12	22	40	20	36
45	7x7	14 x14	6x6	13x13	22	42½	20	38
50	7x7	15½x15½	6x6	14x14	22	44½	20	40
55	.....	.....	.....	.....	22	47	20	42½
60	.....	.....	.....	.....	22	49	20	44½
65	.....	.....	.....	.....	22	51	20	47
70	.....	.....	.....	.....	22	53	20	49
75	.....	.....	.....	.....	22	55	20	51
80	.....	.....	.....	.....	22	57	20	53

"Ground" circumference to be taken 6 ft. from butt.

In tubular steel poles there is no such uniformity; the makers list a large series of "standard" types and a still larger series of "specials." The table in the 1913 report of the power distribution committee of the American Electric Railway Engineering Association gives ninety-six combinations between the lengths of 28 ft. and 35 ft. There is little reason, however, for any such conditions. As listed the poles have lengths varying by single feet, and pull resistances varying by but a few pounds. Lengths varying by 2½ ft. and three values of pull resistance in each size would be more than ample to meet all conditions economically, and would require just twelve combinations as against the present ninety-six.

For transmission work and the like there have been developed some excellent structural forms of pole, but for ordinary trolley work their use has not proved economical. The concrete pole is still in the developmental stage. There are many installations of excellent appearance and behavior, but the fact that they are not being reproduced in most cases raises some question as to their real economy. The suggested A. E. R. E. A. design promises much and it is to be hoped it will receive a thorough test in the near future; there is a large field for a reasonably low cost concrete pole that can be handled by the average pole gang and be depended upon.

SETTING POLES

Pole setting follows the practice of the earlier users, the depths under normal conditions being as follows:

Length of Pole:	DEPTH OF HOLE In Rock or Concrete	In Earth
30 ft.	5 ft. 0 in.	6 ft. 0 in.
35 ft.	5 ft. 6 in.	6 ft. 0 in.
40 ft.	5 ft. 6 in.	6 ft. 6 in.
45 ft.	6 ft. 0 in.	6 ft. 6 in.
50 ft.	6 ft. 6 in.	7 ft. 0 in.
55 ft.	6 ft. 6 in.	7 ft. 6 in.
60 ft.	7 ft. 0 in.	8 ft. 0 in.
65 ft.	7 ft. 0 in.	8 ft. 6 in.
70 ft.	7 ft. 0 in.	9 ft. 0 in.

On side slopes the measurements should be made from the low side, and in soft or treacherous ground greater depths may be necessary. Ordinarily the roadbed furnishes good setting, but occasionally it is necessary to bolt carrier frames to the pole at the ground line. In dry sand or running wet soil the excavation is often best made inside a barrel or casing which is driven down as the hole deepens, and in which the pole is eventually set. Such casing, and for that matter all holes, should be large enough to permit thorough tamping without the necessity of cutting the butt.

The butt always should be cut square, and in poor soil those poles should be used which have the greatest butt area. Some years ago a line foreman on work under the writer's charge made the brilliant discovery that by pointing the butts he could stand poles on end in a swamp section and work them down to position without digging any holes at all. His remarkable record in pole setting across the meadow was not understood until later, when the crossarms had stopped further settlement and the poles were extracted. In this particular instance squaring the butts and filling in the new holes with a bed of gravel about 2 ft. deep was sufficient to prevent further trouble.

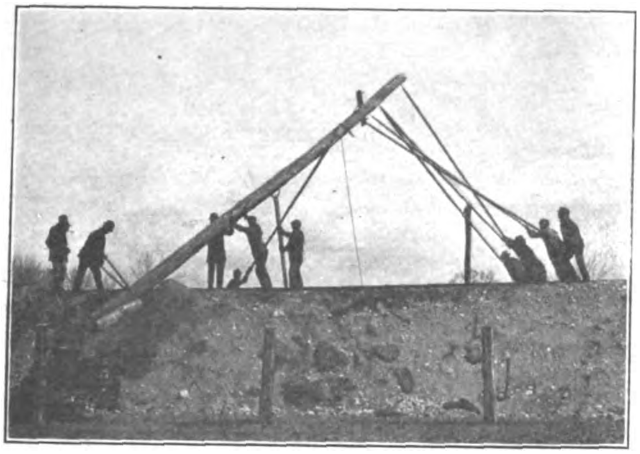
Barrel holes, holes in soil not requiring barrelling but of poor holding capacity, or where the pole is subject to heavy stresses, and holes for steel poles, are often filled with 1:3:5 concrete. If practicable, this concrete should extend 6 in. above the ground with a diameter 8 in. greater than that of the pole at that point, and should then pitch up to the pole at an angle of 45 deg., this to prevent the otherwise probable decay or corrosion just above the concrete. In city work, however, it is rarely possible to bring the concrete above the surface.

Most wood poles are still hand set, being laid on the ground with the butt at the hole and then up-ended, first by hand, a jenny or pole prop "following up," then as soon as the end is high enough, the pole pike-poled till upright. A plank is usually set up in the hole for the butt to thrust against, to prevent caving in the side. A skilful crew will keep the pole steadily moving from the start, making the shifts from hands to pikes and through the several lengths of pikes without a hitch. The advantage of mechanical help is fast being recognized, however, and there is now on the market, besides many home-made ones, at least one patented derrick. These derricks expedite greatly the direct handling of the poles, obviating the aggravating delays which often result from caving in the side of the hole during erection and simplifying the manipulation of the pole where it has to go up through a network of existing wires.

Particularly where there are bending strains it is well to wedge the pole with large pieces of rock, and if these strains are heavy key blocks should also be used. One block should be applied at the bottom of the hole opposite the pull and the other at the surface on the same side as the pull. "Four by eight" scantling serves well for this purpose, the bottom key being made 2 ft. long and the surface key 4 ft. long.

RAKING AND ANCHORAGE

Poles should be given a rake away from the track of 6 in. in 24 ft. for bracket poles and 12 in. in 24 ft. for span poles if of wood, and half of these values if of steel. This rake chiefly is for appearance; a pole originally set plumb and having very little deflection looks as if it was tumbling on to the tracks, while with a rake at the bottom, even though the top be deflected in much more than the rake, the pole has an appearance of vigorous resistance and strength that is reassuring to "Pro Bono Publico," "Safety" and other well-known guardians of the general public.



SETTING POLES BY HAND WITH TEN MEN

In city work anchors are usually out of the question, and stability must be secured either through heavy poles with special foundations or by high guys attached to one or more poles at sufficient height above the ground to ensure clearance. In the open, a most substantial anchorage can be had in the direction of the line, if clearance is not essential, by guying to the bases of the adjacent poles. It is preferable, however, to make the attachment at least 7 ft. above the ground, and usually this can safely be done. Where pole attachments are not practicable some form of anchor must be used. The old standby "deadman" consists of a galvanized rod 6 ft. long and 1 in. diameter, with 4-in. x 4-in. x ¼-in. square plate washer and nut at one end, and eye at other. Run through a half-tie buried 4 ft. under ground, the rod having the same inclination as the anchor guy it is to hold (this should be 45 deg. if practicable); this makes about the best all-around anchor to be had. In good soil the patent anchors which require little or no digging are excellent, but in rocky soils the interferences usually more than offset the advantages.

In rock that can stand the action a wedge bolt is good; for softer rock an eyebolt 2 ft. long should be leaded, sulphured or cemented in a hole as deep as the bolt shank length. Whichever kind of rock anchor is used, it should be set at right angles to the pull of the guy, which latter should make an angle of 45 deg. with the horizontal if practicable. Up to an angle of 75 deg. the customary two-turn wrap will usually hold on the pole without slipping. Where local conditions force a more nearly vertical guy, however, guy hooks should be used on either side, although a guy requiring hooks, as a matter of fact, is of very little service.

Where there is any likelihood that persons will pass at points where guys are low, the latter should be made conspicuous by a marker about 3 in. diameter, painted white. Plank 1-in. thick is sometimes used, but it tends to get edgeways to the traffic, and the line of contact with the guy is a fruitful source of corrosion. The best device is a piece of pipe or tube slipped over the guy and resting on the head of the anchor rod or on a clamp, keeping it about 1 ft. from the ground. Where it is undesirable to undo an existing guy two pieces of half-round molding can well be used, in which case the faces in contact and the groove in which the strand lies should be white leaded. In this, as in all other work, care should be taken that adjacent guards are of the same length and in line. Nothing looks more slovenly than a line of guys, spans, or any other construction which should be parallel but are not, and in which the various fittings are out of line.

INSULATION

Recognition of the danger of unexpected slight shocks which may cause a lineman to fall from sheer surprise is developing a general tendency to double insulate all steel pole work from the trolley, the hanger forming the first break, and on span work a strain insulator 5 ft. from the pole making the second. With brackets the limited space introduces complications not yet worked out with entire satisfaction. About the best treatment so far is by the use of a strain insulator in the oversupport rod and a fiber bushing in the pole seat casting. The use of insulators in the strand requires an extra long bracket arm, as there should be at least 8 in. of free strand between the hanger and the insulator, or between the insulator and the end casting if the former is attached directly to the hanger.

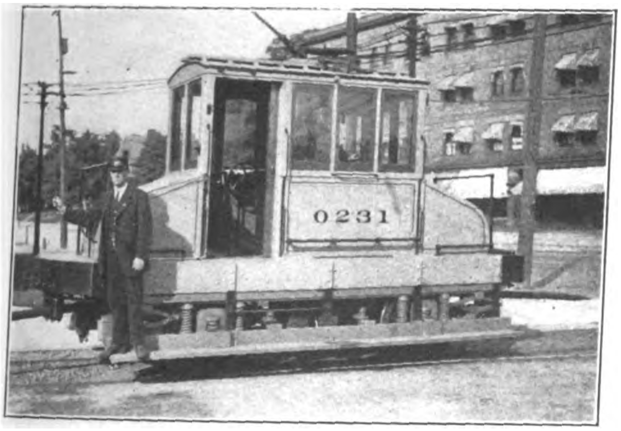
SETTING POLES WITH TRACK DERRICK—FIVE MEN AND TWO ONLOOKERS

Where globe or similar composition strains are used the arm length can be reduced, but the growing use of the wood strain makes the latter the important factor. Recently there have been loud cries for interlocked strain insulators, but it is to the writer's mind an open question to what extent this is warranted. The use of poor stock and poorer treatment by irresponsible makers gave the early wood strains a bad reputation, but as at present supplied by the better class of manufacturers they are entirely reliable. Composition strains hold if the composition squeezes out, but many of their failures are in the malleable castings themselves, dropping the lines, while a slight injury to the composition destroys the insulation. "Goose eggs" of porcelain and tough glass, not to mention the Hewlett and "saddle" types of disk insulators, give an absolute interlock, but many engineers consider it unwise to use such materials where they will be subject to sudden shock.

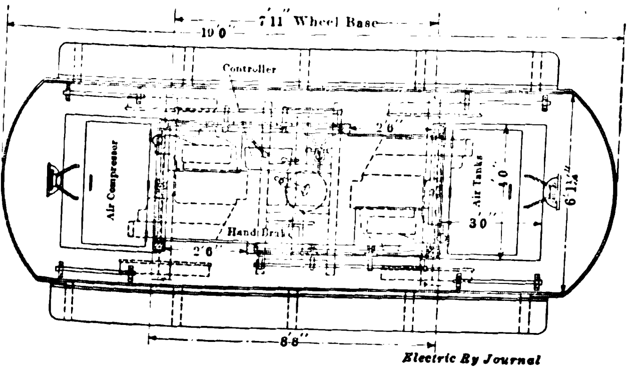
Cleveland Railway's Switching Locomotive

BY TERRANCE SCULLIN, MASTER MECHANIC THE CLEVELAND RAILWAY COMPANY

The operation of trail cars in trains during the rush hours in Cleveland, Ohio, has grown to a point where the Cleveland Railway has found it necessary to provide special switching locomotives at three principal carhouses. These are used to make up trains in the yard as well as to relieve the motors of the trail cars at the close of the rush hours. In general these locomotives are built with a cab, 4 ft. x 8 ft. 8 in. in plan, mounted on an old-style single truck with a 7-ft. 11-in. wheelbase and equipped with two Westinghouse 49 motors. The cab is arranged for double-end operation, being provided with a controller set in the middle of one side to permit the motorman to face either end without difficulty. The air compressor and reservoirs are housed under sheet metal hoods at each end of the cab on the car floor which is 19 ft. long x 6 ft. wide. The floor is of wooden construction mounted on five sections of 5-in. 80-lb. rail, which serve both as longitudinal sills and ballast. Completely equipped this locomotive weighs approximately 20,500 lb., and the two 35-hp motors are so geared that the locomotive will handle two standard Cleveland trailers up a 4 per cent grade, or push seven standard trailers on a level track.



THE CLEVELAND RAILWAY'S SWITCHING LOCOMOTIVE



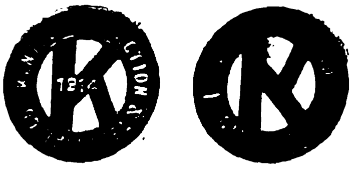
Electric Ry Journal

PLAN SHOWING EQUIPMENT ON CLEVELAND LOCOMOTIVE

The floor plan and arrangement of the control equipment are shown in one of the accompanying illustrations along with a side view of the locomotive. It will also be noted that the locomotive is equipped with side running boards and a continuous arrangement of grab handles which completely surround the cab so that a switchman may board from any position. Instead of standard drawbars these locomotives are equipped with the Cleveland Railway's standard couplers, described in connection with its new center-entrance motor cars in the issue of ELECTRIC RAILWAY JOURNAL for Feb. 28, on page 458. As this coupler is approximately 6 ft. in length it allows for considerable variation in coupler heights and permits the locomotive to push or pull the trailers around the sharpest yard curves.

Metal Tokens for Tickets at Lexington, Ky.

Late in March of the current year the Kentucky Traction & Terminal Company, Lexington, Ky., began the sale of six metal disks for 25 cents in place of paper tickets. The disks are wrapped at the office of the company in envelopes bearing the name of the company and the fac-simile signature of F. W. Bacon, vice-president. The object of selling the disks in this way is twofold: First, to take the sale of tickets out of the hands of the conductors, and, second, to prevent the disks from being rewrapped by the conductors or the public.



OBVERSE AND REVERSE OF METAL TOKENS

The form of accounting on the cars is as follows: Fares are collected according to the prepayment system with the aid of Johnson fare boxes with locked drawers, which are removed at night by the carhouse clerk. The total traffic is registered on the inside register. Change is made by the conductors in wrapped envelopes, which are furnished to the conductors in the same way as the disks. Thus the conductors are not allowed to make change for anything under 50 cents or to sell the disks loose. The disks when dropped in the fare box make the same registration as a 5-cent piece and are thus accounted for on the fare-box dial as full fare. An allocation of straight 5-cent fares and disk fares is made by the auditing department. The tokens, as reproduced, consist of a disk of the exact size and thickness of a nickel, the disk being perforated, however, to form the letter "K" (Kentucky). The head of the disk is marked "Good for 5-Cent Ride—City Car." The tail is marked "Kentucky Traction & Terminal Company" along the periphery, and "1914" on the middle of the "K." The envelopes are of a special red paper. To date, this method of fare collection has proved very satisfactory both to the public and to the company.

At a recent election in Bristol, England, the question of municipal ownership of tramways was submitted to the voters. There were 18,057 votes in favor of municipal ownership and 14,894 against.

Switchgear Ordered for the London & North-Western Railway's Electrification

The British Westinghouse Electric & Manufacturing Company, Ltd., has secured the contract for the high-tension and low-tension switchgear and details for eleven substations, in connection with the London & North-Western Railway's North London electrification. The switchboard panels on order at the present time total 258, comprising 129 high-tension panels and cubicles, 107 d.c. substation panels and twenty-two low-tension a.c. and d.c. boards in the main station. The substations are situated at Camden, Queen's Park, Stonebridge Park, Kenton, Pinney, Bushey, Dalston, Broad Street, Willesden, West End Lane and Acton. There are three rotary converters in each substation, excepting at Broad Street and Acton, in which there are two; of these rotaries six, situated in Camden and Bushey substations, are of 1000-kw capacity, and the rest of the rotaries have each a capacity of 750 kw. The number of high-tension feeders coming into the substations total thirty, and there are also eighteen high-tension outgoing feeders.

The oil-break circuit-breakers are of remote mechanically operated type, except at Stonebridge Park substation where the switches will be of the solenoid electrically operated type. The switches are so arranged that phase separation can be carried out throughout the whole of the switchboard structure, each separate phase of the switch being contained in a separate tank, and in a molded stone cubicle entirely separated from the other phases.

The busbars are sectionalized in each substation, and each machine can be connected through isolating switches to either of two main busbar sections. Isolating switches are being provided on each side of the main oil switches. All incoming feeders will be fitted with reverse-current relays for tripping the oil circuit-breakers, and all outgoing feeders and transformer circuits will have overload relays with time-limit attachments. The rotary converter high-tension circuits will also have overload time-limit relays.

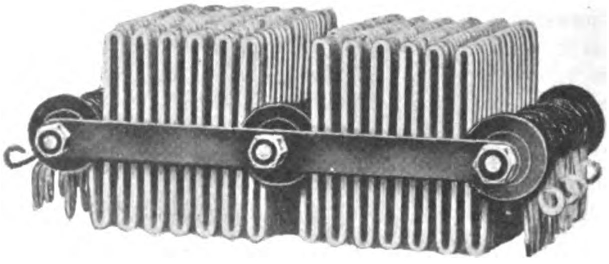
Each section of busbar will be fitted with horn-type static dischargers combined with the usual resistances and isolating switches. The panels on which are mounted the instruments and handles for operating the oil circuit-breaker are situated on the floor level, and behind them are the cubicles containing the oil switches. These are linked to the operating handles, which are mounted on the switchboard by means of levers and rods. In the case of the Stonebridge Park substation, the operating panels will also be on the floor level and the switches will be electrically operated.

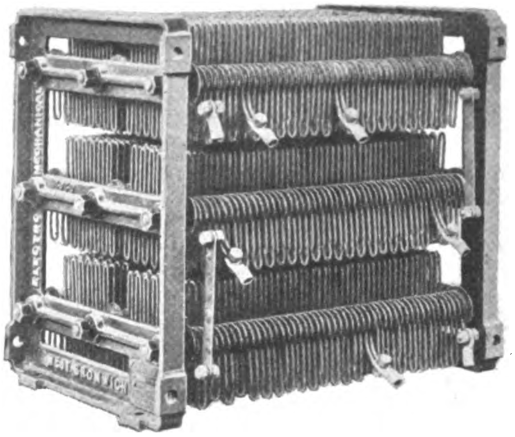
The cellwork consists of molded stone. The slate panels of which the high-tension control board and also the low-tension switchboards are made will have a black marine finish. The low-tension panels, exclusive of battery and booster panels, which form the subject of another contract, deal with 100 outgoing feeders and thirty-one rotary converters on the d.c. side. The rotary converter circuits have reverse-current, single-pole circuit-breakers, fitted with a tripping arrangement for operation by speed limiting devices on the rotaries. The track-feeder panels which control both poles of one feeder have single-pole overload circuit-breakers for 2000 amp and two single-pole knife switches for the same current. Sector pattern moving coil ammeters with illuminated dials are used. The circuit-breakers are of type "C" traction pattern.

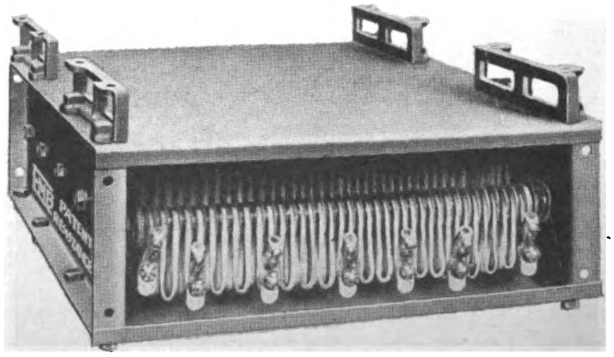
In addition to the above panels there are lighting and auxiliary panels in all the substations, and in the power station a low-tension a.c. and low-tension d.c. board are also to be supplied under this contract to deal with the circuits feeding the auxiliary machinery, lighting, etc. The contract is estimated to be worth between $250,000 and $300,000.

Unbreakable and Jointless Grid Resistors

A new jointless and unbreakable grid resistor, known as the "E M B," is meeting with favor on the electric railways of England and other countries. These resistors are supplied by the Electro-Mechanical Brake Company, Ltd., West Bromwich, England, which has already made about 3000 installations. One object of the new grids is to eliminate fragility. A second object is to avoid the troubles due to failure to maintain good contact at the ends of the grids because of corrosion and loss of pressure on the contact surfaces. The latter trouble is frequent with the ordinary grid owing to vibration and to the inevitable expansion and contraction in service. As a large number of the grids are made from one length of material, the circuit does not depend on a contact joint from grid to grid and consequently there is no risk from open circuits or intermittent contacts. The manufacturers point out that although grids of an unbreakable type can be produced


SECTION OF SINGLE GRID


RESISTANCE FOR ATTACHING INSIDE WOOD LOCKER ON CAR PLATFORM


UNDER PLATFORM TYPE RESISTANCE

by stamping, individual grids necessarily must have end contacts so that in this respect stampings have the same defect as castings. Apart from the advantage of no end contacts the new grid is much more rigid than stampings. The temperature coefficient of this rustless material is similar to that of cast iron. It is said to retain its shape even at bright red heat, to have excellent radiating properties and to be free from scale. Its uniform cross section avoids local fusing, and for a given current capacity it occupies practically the same space as cast grids. These resistors can be supplied in any number of units per equipment in a wide range of sizes, either for under-car or platform accommodation, as may be preferred. They are also made for use with other electrical apparatus, notably with crane motors where perfect circuits are so important.

European Chain Insulators

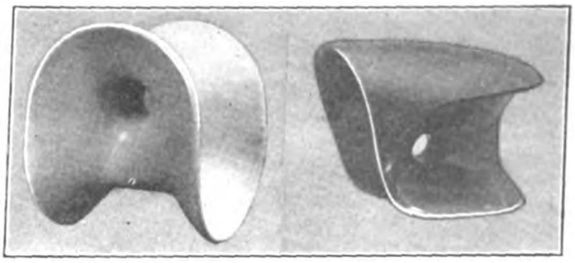
The chain insulators of Vedovelli, Priestley & Company, Paris, France, have found such wide use abroad in both low and high-tension railway work that American engineers may be interested in a brief description of their properties and uses. These insulators are made up in six sizes, *A*, *B*, *C*, *D*, *E* and *F*. Their chief characteristics are shown in the accompanying table:

	Approximate Breakdown Voltage Dry—Volts	Breaking Strain—Pounds
A	15,000	2,204
B	22,000	3,306
C	30,000	4,408
D	40,000	6,612
E	55,000	11,020
F	70,000	15,428

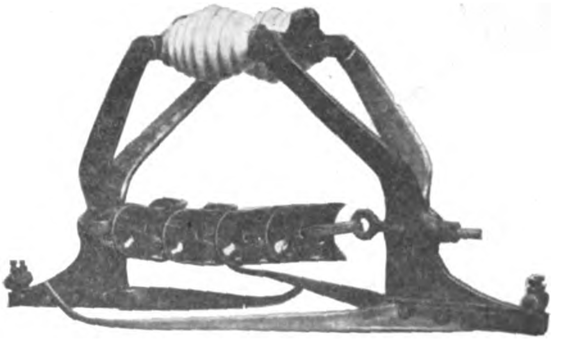
The insulators are made in porcelain or glass, and can be glazed in various colors such as green, brown and white. Type *C* is that most commonly used in high-tension railway work.

The great advantage of this type of insulator is that the thickness throughout is the same at all points of the elements, and thus no internal stresses are produced during baking. The insulators are linked together by galvanized steel wires forming a chain, and the porcelain is always in compression. A chain can be made up for any pressures and loads, and it is necessary only to increase the number of links in series to insure that the chain will withstand a higher pressure. These chains can be placed in parallel for very great mechanical loads, although the largest size will withstand about 15,400 lb., which is sufficient for loads as met with in practice.

A number of views are presented of the insulator alone and of several of its applications to railway work. The first view shows the company's ordinary design at the left and the new hooded type at the right. The latter is superior to the older design in so far as the metal ligaments are protected from rain when the insulator is placed in a horizontal position, thus maintaining a high insulating value even in stormy weather.

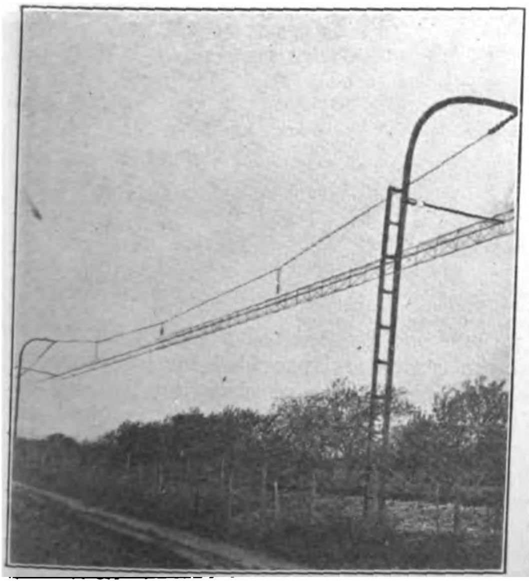


ORDINARY LINK INSULATOR AND HOODED LINK INSULATOR FOR HORIZONTAL INSTALLATION

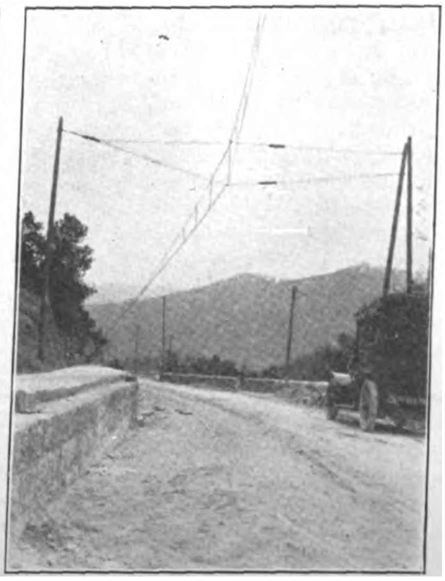


SECTION INSULATOR WITH LINK INSULATOR

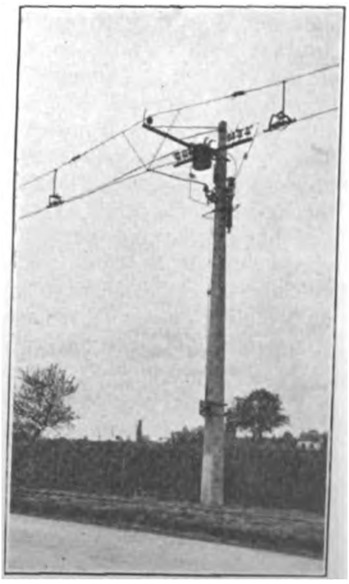
For insulators installed vertically, a metal hood is provided to keep off the rain. The adaptability of this insulator to railway work is clearly indicated by the diverse applications shown. The simplest, perhaps, is that for span construction on the 10,000-volt, single-



SEMI-RIGID TYPE 12,500-VOLT SINGLE-PHASE SUSPENSION ON THE MIDI RAILWAY IN SOUTHERN FRANCE

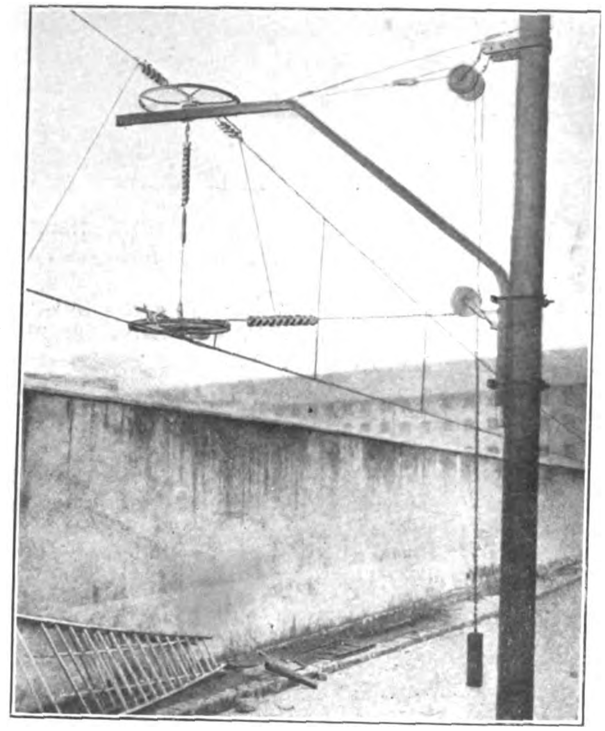


10,000-VOLT SINGLE-PHASE CATENARY SPAN CONSTRUCTION OVER A PUBLIC HIGHWAY



SECTIONALIZING POLE WITH LIGHTNING ARRESTERS AND OUTDOOR TYPE OIL SWITCH phase Oriental Pyrenees Railway. In this instance, where a plain catenary is suspended over the public highway from wooden poles, ample insulation is offered by placing six insulators in series in each of the span wires and at the junction of these wires at one side.

On the 12,500-volt, single-phase line of the Midi Railway, the semi-rigid type of suspension, devised by M. Paul, chief engineer of this railway, is used. In this system the contact wire is part of a rigid girder suspended from cables which are anchored to the inwardly curved arms of successive steel poles of ladder design. A bracket to keep the contact girder in line extends outward from a point near the top "rung" of each pole. The insulation between the catenary cable and the contact wire system, and at the anchorages of the catenary is effected by means of link insulators. Drawings of this construction were presented in the ELECTRIC RAILWAY JOURNAL for July 6, 1912, page 26. Another Midi view shows the use of link insulators at an automatic tension installation on a bracket section. It will be observed that insulation was provided not only in the catenary and hanger wires themselves but also in the chain to which the tension take-up weight is hung. Still another example is afforded by the illustration of a sectionalizing pole with outdoor oil switch and horn lightning arresters on the 6600-volt single-phase line of the Libourne Tramways at Saint-André-de-Cubzac. Link insulators are inserted in the catenary and also in the section insulator as presented in the separate view.

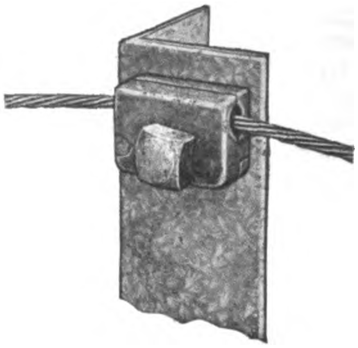


AUTOMATIC TENSION DEVICE WITH SUSPENDED WEIGHT ON MIDI RAILWAY

At a recent meeting of the Jovian League, of Lexington, heard the report of the delegates from that city who attended the Philadelphia convention. The delegates were most enthusiastic as to the future developments of electrical enterprises and advocated progress in Lexington. J. B. Fitzgerald, who was secretary of the local league, has resigned his position with the Lexington Utilities Company and goes with the Westinghouse Electric & Manufacturing Company. He has been succeeded temporarily as secretary by W. N. Hanna.

Easily-Adjustable Ground Wire Clamps

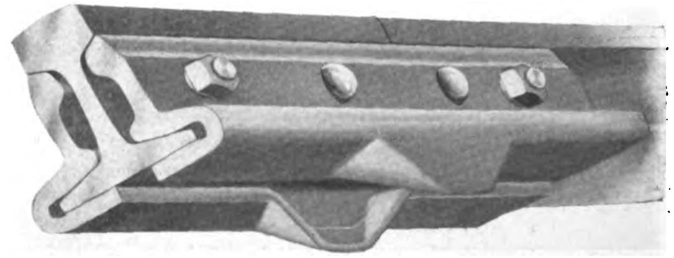
The accompanying illustration shows the improved Keystone ground wire clamp of the Electric Service Supplies Company, Philadelphia, Pa. It consists of two identical malleable iron castings, which when fitted together form a clamping jaw to receive either a ¼-in. or 5/16-in. strand. A ⅝-in. bolt of any practicable length is placed through these castings, thus allowing this clamp to be rigidly secured to either bayonet or other ground wire supports used in high-tension transmission line construction. These clamps may also be secured directly to wooden or iron poles by means of a through bolt when angle-iron supports are not used. A noteworthy feature which renders this clamp easy to install is that it requires but one bolt and it is so designed that it may first be secured to the bayonet or pole while the ground wire to be supported is placed therein afterwards. Greater wear is insured for that part of the ground wire inside the clamp on account of the corrugated surface and the flares at either end of the hole. Greater protection is given the strand owing to the small width of 2¼ in., therefore allowing a flare of ¾ in. at each end. The Type B clamps differ from the earlier standard type of this company in that the clamping surface is not corrugated but smooth, with flaring ends. All parts are heavily galvanized to withstand rust.



ADJUSTABLE GROUND WIRE CLAMP

Joint Combining Base-Supported and Suspended Features

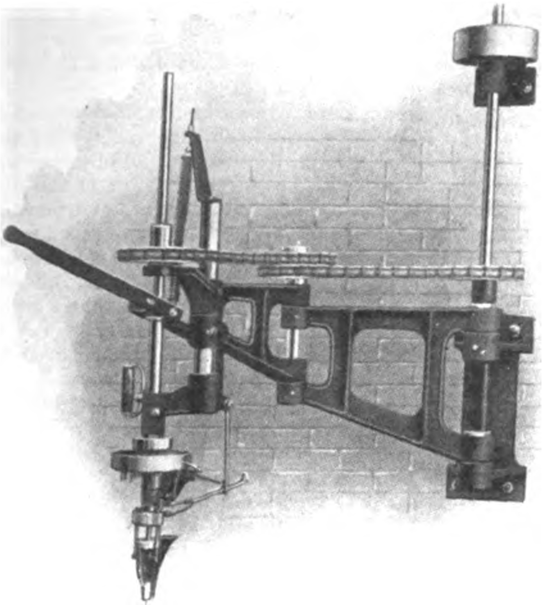
A novel rail splice has been developed by the Track Specialties Company, New York, by combining the salient features of the base supported and suspended joint. Since the weakest part of the track is where the two rails meet, the wave motion can be transmitted properly only with splice bars that have at least the same cross-sectional area as the rails connected. It is asserted that before the "Superior" joint illustrated was invented, no one had constructed a joint with a truss member at the center and provided for base supports immediately before it, without changing the sectional areas. With this joint, tie plates are not required, and the girder depth at the center of the joint is greater than the rail height. The structure at the junction of the two rails is theoretically stronger than the unbroken rail. The method of manufacture consists merely of rolling a bar as shown on the center portion of the splice. Then by means of a bulldozer the two ends are pressed up so that they support the rail base and rest on the ties. Spiking this joint is not recommended, although it is notched to suit if so desired.



JOINT WITH BASE-SUPPORTED AND SUSPENDED FEATURES

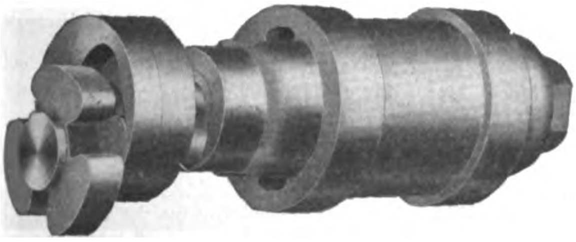
Automatic Screw-Driving Machine

The accompanying illustration shows an automatic screw-driving machine, designed for operation within a 3-ft. radial area, which has been put on the market by the Stresau Engineering Company, Brooklyn, N. Y. This machine may be bolted to a wheel or post and is so constructed that the operation can easily and accurately bring the spindle into position on work which cannot be manipulated under an ordinary fixed drilling machine. The working stroke of the main spindle is 6 in., and the head of the machine has 9-in. vertical adjustment. The automatic screwdriver is attached to the machine spindle by means of its standard Morse taper shank. It may be detached in a moment and replaced by a different sized screwdriver or some other tool.

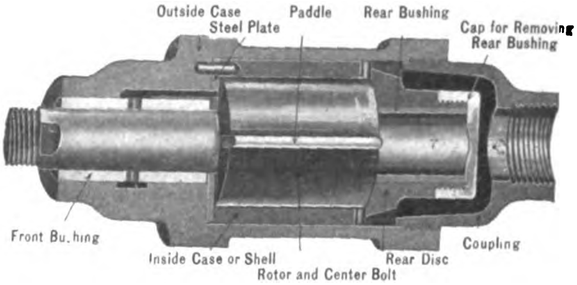

RADIAL MACHINE WITH AUTOMATIC SCREW-DRIVING ATTACHMENT

Turbine Cleaner With Vibrating Knocker for Fire-Tube Boilers

A new type of air or steam turbine-driven vibrator knocker head for dislodging scale from the outer surfaces of tubes in return tubular boilers has been recently put on the market by the Lagonda Manufacturing Company, and is shown in the accompanying illustrations. This cleaner also removes the soot from the inner surfaces of the tubes. The soot is loosened by the vibrating knocker and is blown out of the tube ahead of the cleaner by the steam or air exhausting from the front of the turbine.


VIBRATOR HEAD ATTACHED TO AIR OR STEAM DRIVEN TURBINE

The knocker head is made of three parts; a cylindrical body somewhat smaller in diameter than the boiler tube, and an eccentrically pivoted lever carrying a clover-shaped knocker on a stud at its free end. The lever fits flush into a triangular recess in the forward face of the main body, the free end swinging in an arc through the center of the head. The three hammer faces of the knocker are shaped to fit the inner circumference of the boiler tube, thus giving a large area of contact with the tube. This arrangement permits the hammer to be made heavy and a firm blow to be struck without injury to the tubes. The extra weight and force of blow facilitates the loosening of stubborn scale. The head is driven at high rotative speeds, the eccentrically pivoted lever carrying the knocker is thrown from side to side and the knocker caused to revolve on its axis at each contact with the tube, giving a resultant gyratory motion to the knocker and causing it to hit all points of the interior circumference of the tube.



SECTIONAL VIEW OF TURBINE CLEANER

The cleaner is fed into the tube by a flexible rubber hose which furnishes the air or steam pressure. The revolving motion of the head eliminates the necessity of turning the cleaner by twisting the hose. The motor for driving the head is intended for either steam or compressed air and is of the rotary engine type. The air or steam strikes upon radial paddles, thus giving a high rotative speed to the shaft. The paddles themselves are continually held out by the air or steam which is admitted to a chamber behind the paddles so that they always form a tight fit with the case. The motor has four paddles, two of which are always under pressure, so that it is impossible for the motor to stall. An oiling device for these motors mixes the oil with the air or steam supply, thoroughly blowing it into all the bearings and rubbing parts.

Railless Traction in Brighton, England

In his annual report W. Marsh, engineer and general manager of the Brighton Corporation Tramways, Brighton, England, refers to the recent demonstrations with railless cars, which were manufactured by the R. E. T. Construction Company, Limited, London, England. Mr. Marsh said in part: "These trials showed, without question, that, notwithstanding the fact that railless traction cars are dependent upon overhead wires for their power supply, this does not detract from their mobility in traffic, and augurs well for their future success in Brighton. The trials in question were very valuable in showing certain points where improvement could be effected. The Board of Trade was subsequently asked to sanction these, and did so, the result being that you will be able to make a start with vehicles which are an improvement on any in operation in this country at the present time."

The Società Brioschi, of Milan, has made public its plan for the construction of an electric railway from Borgo San Donnino to Salsomaggiore. It forms the first section of a main line from Borgo San Donnino to Borgo Taro, for which plans are now being matured.

LONDON LETTER

(From Our Regular Correspondent)

The nineteenth annual convention of the Incorporated Municipal Electrical Association was held recently at Birmingham. After the usual official welcome by the Lord Mayor, the address of R. A. Chattock, president of the association and chief electrical engineer of the Corporation of Birmingham, was presented. This was followed by a paper, "The Commercial Development of Electricity Supply in Moderate-Sized Towns," by W. A. Vignoles, chief electrical engineer of the Corporation of Grimsby. In the afternoon a visit was paid to the works of the General Electric Company, Ltd., at Witton, where there was a demonstration of electrical vehicles organized by the electrical vehicle committee of the association. The annual dinner of the association was held in the evening. The second day of the convention was held at Coventry. In the morning a paper, "The Design and Operation of Modern Boiler-House Plant," was read by S. E. Fedden, chief electrical engineer of the Corporation of Sheffield. In the afternoon visits were paid to various electricity works and electrical manufacturing plants in the vicinity. The third day of the convention was held at Stratford-on-Avon. Here a paper, "The Standardization of Tariffs," was read by J. Horace Bowden, chief electrical engineer of the Corporation of Poplar. In the afternoon, vehicles conveyed the visitors to Warwick Castle and grounds, returning via Kenilworth. The last day of the convention was devoted to the council meeting and the annual general meeting. On the afternoon of the last day a visit was paid to the Corporation electric generating station, and in the evening a Cinderella dance was given by invitation of the Birmingham entertainments committee.

The project of linking up the new colliery districts at Woodlands and Warmsworth with the Doncaster tramway service is to be proceeded with at once. The rails to the Woodlands will be laid on the grass margins at the side of the road.

The first-class tramcars in Birmingham have been abandoned. In response to a public request specially furnished cars were provided on the Hagley Road route, and the inside fares were doubled, while outside the fares were as usual. Only a small percentage of the passengers have paid the first-class fares.

The electrification of the section of the North-Eastern Railway, between Shildon and Newport, is nearing completion. The line, 18 miles long, is an important one, as it connects the Durham coal fields with the coast and with the great iron manufacturing district. Part of the line has been completed just outside Darlington, and upon this stretch the first of the ten electric locomotives, which are being built at Darlington, is undergoing preliminary tests. The overhead direct-current system is in use on the line. Power is to be generated at 20,000 volts and will be transformed in substations to 3000 volts direct-current for use on the trolley wire.

So as to prevent any misapprehension as to the cause of the discontinuance of the railless trolley service at Dundee, the general manager of the Dundee Corporation Tramways has recently reported that the system has been in operation for one year and eight months and so far as working is concerned has been an unqualified success. The real cause of the trouble has been the roadway. The service, therefore. has been discontinued until the road is put in a reasonably suitable condition.

The Leeds Corporation is seeking by means of a bill to extend the system of railless trolley cars into Wharfedale. Recently a select committee of the House of Lords sanctioned the extension, but laid down general conditions under which the vehicles should be run. The promoters have now introduced new clauses to carry out the decision, and the bill has been ordered to proceed. Those clauses provide that the Corporation shall pay 0.375 of a penny per car mile to the West Riding County Council, as the road authority, for the first three years after the service is started, and that at the end of that period the Corporation shall pay a sum equal to the extra expense incurred in repairing the roads as a result of the railway traffic.

The citizens of Bristol have decided to purchase the tramways from the Bristol Tramways & Carriage Company. The Bristol Corporation has a bill before the House of Lords which has been delayed awaiting the result of the recent poll in favor of the purchase. After passing the House of Lords the bill will have to go to the House of Commons, where further opposition is expected on technical points.

The results of the financial year of the Glasgow Corporation tramways department, which has just closed, constitute another record in respect of the mileage run by the cars, the number of passengers carried, and the revenue from fares. In round figures the number of miles run by the cars since June 1 of last year was 24,400,000; the number of passengers carried was 337,000,000, and the revenue £1,078,000. About 25,500,000 more passengers were carried during the year than in the preceding year, and the increase in revenue amounts to more than £70,000.

With the commencement of the new financial year of the Glasgow tramways, the Corporation has taken over third party risks incurred by the department. Following upon this step, James Dalrymple, general manager of the tramways, has issued a memorandum addressed to motormen and conductors. The aim of the department at present is stated to be a "safety campaign" of the same kind as have been introduced in the cities of the United States. Mr. Dalrymple indicates that he is prepared to recommend that a proportion of any saving in the cost of meeting claims which may accrue through the efforts of motormen and conductors be distributed among them.

The statement has lately been made that most of the street accidents in London happen on tramway routes. The London County Council is issuing a repudiation of the assertion. That the tramway is the safest vehicle, it states, is proved by statistics which indicate that more mishaps occur where there are no trams at all. In 117 miles of streets which are both tramway and motor-bus routes the fatalities caused by power-driven vehicles were, in 1910, 67; in 1911, 107, and in 1912, 126. The tram and bus shares of the accidents were in 1910, nineteen by trams and twenty-six by motor-buses; in 1911, eighteen by trams and forty-six by motor-buses; in 1912, twenty-one by trams and sixty-seven by motor-buses. In 119 miles of routes without trams the fatalities from motor-buses were in the same three years, twenty-three, thirty-nine and seventy. The two divisions of the Metropolitan police which have the largest average number of fatalities per square mile for 1910, 1911 and 1912 are St. James's, with 11.40, and Marylebone, with 8.98. Neither of these has tram lines. The Council, too, quotes the views of other than London experts on the question. Thus, the chief constable of Manchester says that where there is great traffic there must necessarily be a greater risk of accidents, but that the risk is not caused by the tramcars, adding that the motor-bus is a greater danger than the tramcar. The traffic manager of the Glasgow Tramways is even more emphatic, asserting that the tramcar running on a fixed rail is the safest vehicle of the streets. The head constable of Liverpool also regards tramways as less dangerous than motor-bus services, and the chief constable of Birmingham, too, refuses to admit that traffic dangers are due to tramcars exclusively, saying that accidents in busy streets would be as numerous if there were no tramways.

The revenue account of the Manchester Corporation Tramways shows an income of £925,309 as compared with £887,646 in the previous year. The working expenses were £585,223. The financial results per car mile show the revenue to be 11.410d., as against 11.351d. in 1912 and 1913. The working expenses were 7.216d., as against 7.132d. The increase in the traffic expenses is accounted for by the increased scale of wages adopted for nearly all grades of labor chargeable to this account. The consumption of electrical energy per car mile shows a further decrease, notwithstanding the increased number of cars fitted with top covers. Commenting upon the reduction of fares, the report states that the effect of the change was found in the increase of 17,933,558 in the number of passengers carried—205,608,741 against 187,675,183. The number of parcels carried on tramway-cars last year was 1,303,353, as compared with 1,189,143 the previous year. The total profits in this department were £3,641. The first year's profits in 1907 were £265. There are now 662 cars ready for service. A. C. S.

News of Electric Railways

Deficit Predicted for Washington Roads Under Municipal Ownership

Clarence P. King, president of the Washington Railway & Electric Company, has made public figures which indicate that the passage of the Crosser bill for the government ownership of the electric railways of Washington, D. C., would cause an annual deficit of at least $1,000,000. The computation upon which Mr. King's figures are based is as follows:

Market value on June 15, of securities of Capital Traction Company and Washington Railway & Electric Company	$48,483,617
Minimum estimated District of Columbia bond issue	50,000,000
Interest on district bonds at 3.65 per cent	1,825,000
Necessary for sinking fund per annum	1,000,000
Total fixed charge	$2,825,000
Net revenue of two roads after operating expenses, taxes, but not interest, 1913	2,263,374
Minimum estimated deficit	$561,626

Mr. King has based his figures upon the expectation that the condemnation would approximate the present market value of the securities of the lines. As the district bonds are to be a lien only upon the actual income of the railroad properties, it has been assumed that the bonds will have to be sold below par. The $2,263,374 net revenue for 1913 represents the net earnings of the lines after paying operating expenses and taxes, but not the interest on the bonds. The $1,000,000 sinking fund item is worked out on a basis provided in the bill that the commissioners of the District shall set aside each year for twenty-seven years a sum sufficient when invested to redeem the bonds at maturity.

A favorable report on the Crosser bill has been ordered by the District committee of the House of Representatives, and it was promised that an attempt would be made in the House on June 22 to call the bill up for action. The district day on the House calendar, however, was displaced to make way for the sundry civil appropriation bill. The next District day will be July 5, and that probably will be displaced by the July 4 holiday.

New York Subway Construction Contracts

The Public Service Commission for the First District of New York will soon advertise for bids for the construction of Section No. 5 of Routes Nos. 4 and 36, the crosstown portion of the Broadway-Seventh Avenue and Fifty-ninth Street subway. Bids will be opened on July 24. The Broadway subway, which is to be operated by the New York Municipal Railway Corporation, runs up Broadway to Forty-second Street, where it crosses underneath the existing subway and continues up Seventh Avenue to Fifty-ninth Street. Here the four-track construction ends, but two tracks curve to the eastward and run to and over the Queensboro Bridge to a connection with the new rapid transit lines in Queens.

A public hearing will be held July 23 before the commission upon the terms and conditions of the proposed contract for the construction of Section No. 3 of Route No. 33, the Whitehall-Montague Street subway and tunnel line, for operation by the New York Municipal Railway Corporation. The contract for the Manhattan end of this line, as well as for the tunnel under the East River, has already been let. After the public hearing is held the commission will put the contract in permanent form and advertise for bids for construction.

The commission in a few days will advertise for bids for the finish work in six stations on the extension of the Fourth Avenue subway in Brooklyn between Fortieth and Ninetieth Streets. Bids will be opened on July 23. The work to be done includes everything necessary to complete the stations and station approaches.

Bids for making borings along the lines of proposed rapid transit railroads in Manhattan, Brooklyn, Queens and The Bronx will be opened by the commission on July 10. This contract will include both land and river borings.

Coalition of American Cities to Combat Corporations

A coalition of five representative American cities has already been effected, which, in the words of the promoters, will "fight the combination of municipal utility corporations, big and little, that has for a generation operated to thwart municipal progress and growth." Mayor Blankenburg of Philadelphia conceived the plan of campaign. Those who have approved the movement include Mayor Mitchel, of New York; Mayor Harrison, of Chicago; Mayor Baker, of Cleveland, and Mayor Shroyer, of Dayton, Ohio. A conference is to be held this fall in Philadelphia, when a permanent organization will be established. A letter has been sent from Philadelphia to mayors of cities throughout America, setting forth the need of such an organization and inviting them to participate in the conference. This letter, signed by Mayor Blankenburg, follows:

"The city of Philadelphia is preparing to bring, in the early autumn, a case before our new Public Service Commission, in which that body will be asked to pass upon a proper schedule of rates for electric light and power. In the course of our investigations and reviews of hearings on this subject, we have come to realize that the side of the people has seldom, if ever, been adequately presented before other public service commissions, while the interests of the public utility companies are presented and argued by the best informed and most able men in the country. If the cities do not join for the presentation of their cases as the public utility companies have, the laws and precedents established by the commissions stand in danger of being biased by the able arguments of the representatives of these corporations.

"The equipment required for an adequate presentation of the rights and interests of the people involves a degree and extent of technical knowledge and information which it is not practicable for any one city to obtain. This knowledge and information is much the same for each city, and its cumulative use would greatly add to its value. It must be borne in mind that the utility companies constitute themselves an offensive and defensive alliance, probably stronger than any other interest in this country. Its weakest member is never without information and assistance of every kind.

"To meet this situation it has been suggested that there should be formed a bureau of public utilities research which shall equip itself to give to the cities the same able assistance which the public utility companies' associations give to the public utility companies, thus in effect constituting an offensive and defensive alliance among the cities similar to that existing among public utility corporations.

"To this end we are preparing to form a permanent organization of this character. I am writing to you to ascertain your interest in this matter and to ask whether you would be represented at a nation-wide conference of city officials to be held in this city in the autumn to discuss the various phases of public utility problems as affecting the people, and how they may best be dealt with.

"Mayor Mitchel, of New York; Mayor Harrison, of Chicago; Mayor Baker, of Cleveland, and Mayor Shroyer, of Dayton, join me in making this inquiry. Mayor Mitchel and Mayor Harrison will personally represent New York and Chicago at this conference. We are confident that the result will be a great step forward in the matter of securing a proper presentation of the people's side in utility cases."

In discussing his plans, Mayor Blankenburg said:

"We believe most heartily in the principle of regulation through public service commissions, and we want to coöperate with the commissions by presenting the citizens' side at their hearings as effectively as the corporation side has been presented in the past, so that these commissions will not be placed in the rather unfair position of having to judge a situation where only one side is adequately presented. We hope and expect that through public service commissions the problems now rising in regard to public utilities are going to be adjusted to the satisfaction of all concerned. The sooner the people's side of the question is adequately and fairly presented before these commissions, the sooner they will come to some final and permanent standard of decisions. We believe that the proposed bureau of public utilities research should be purely a people's institution, with no leading strings of any kind attached to it. It will be at the service of all citizens and mayors and city officials everywhere. Even the tax rate is of interest only to those who have property to be taxed. But the service rendered and the rate charged for gas, electricity, water and street cars reaches and affects every single individual in the entire city, and it affects with special force those of moderate incomes. I feel that we have been slow in recognizing this responsibility and responding to it. No officers have yet been elected for the proposed bureau of public utilities research nor have the details of the organization been worked out. It is expected that every city of any considerable size in the country will be represented at the convention this fall. The bureau is for the present being financed by some private individuals."

Preparing for the Kansas City Franchise Vote

The extension of the franchise of the Metropolitan Street Railway, Kansas City, Mo., to be voted on July 7, was recently endorsed by the Kansas City Commercial Club, the leading commercial body, by a vote of 330 to 36. The Real Estate Board, the German-American Alliance and other organizations already had come out in favor of the grant.

In anticipation of the election, 208 canvassers were recently appointed to cover the city and ascertain how many voters have been disqualified by moving and in other ways. The company waived the right to appoint the canvassers, each of whom will be paid $4 a day. This expense, however, will be borne by the company.

The attitude of labor on the franchise is indefinite. Newspapers adverse to the measure have attempted to create unfavorable sentiment among the laboring classes by alleged misquotations. Those favoring the grant, on the other hand, have given publicity to the receivers' statements as to their position and assurances that labor will receive a fair hearing.

Paid advertisements were run recently by a group of leading business men calling attention to a meeting held at the Baltimore Hotel. At that gathering sentiment was distinctly favorable to the extension, most of the speakers asserting that business in general is being retarded by the unsettled conditions regarding the street railway. Anti-franchise meetings on the streets have been held by labor agitators, aroused over the failure of employees of the company to organize before the holding of the election.

Judge W. C. Hook of the United States District Court has advised the company's creditors to accept the proposed franchise. Philip J. Kealy, and others interested, have spoken before the City Club and other organizations, answering objections to the franchise and otherwise outlining the company's position.

The Metropolitan Street Railway has been active in other respects. The Kansas City *Star*, a bitter opponent of the franchise, recently hit upon the idea of creating interest in the election on July 7 by running numerous placards through the paper: "Kansas City's Day, Tuesday, July 7." The company was so favorably impressed by this line of action that it has equipped all of its cars with the same slogans, similar to the productions of the *Star*. Script was used in the signs instead of ordinary lettering. The street railway secured the reproduction by photographing and enlarging the newspaper's signs.

In addition, the company has placed boxes in all cars containing copies of three bulletins which have been issued. The brochures discuss the franchise, answering all questions asked the company and analyzing the salient points of the contract.

The Kansas City Railways, which will take over the system in Kansas City if the franchise is passed, has filed an application with the Missouri Public Utilities Commission for authority to issue $5,000 additional common stock. The application was filed by Frank Hagerman, attorney for the receivers.

Every precaution is being taken to insure a fair election on July 7.

Wage Agreement Modification in Cleveland

J. J. Stanley, president of the Cleveland (Ohio) Railway, announced to a committee representing the local branch of the Amalgamated Association of Street & Electric Railway Employees on June 24, that he could not consent to their demand for an eight-hour minimum day. He told the men, however, that he was willing to increase the wages of the men who have been with the company more than a year from 30 to 31 cents an hour and fix a minimum day of five hours. Estimates made by the company show that the change in the schedules, with a minimum day of eight hours, would increase the operating expenses $321,000 a year. According to the estimates of the union the increase would be $527,000 a year. Mr. Stanley said that an increase of from $125,000 to $140,000 per year is all that he was willing to grant and that the figures he mentioned would just about cover this.

The following day the committee called upon Peter Witt, street railway commissioner. He told them that he had had in mind an increase of $150,000 a year as a maximum and that he would not be willing to recommend a greater amount.

The committee did not accept Mr. Stanley's proposition, but stated that the schedules would be gone over to see if any change can be made in them that will bring the total figures to approximate those mentioned by Mr. Stanley.

It is said that if the demands are granted the fare would have to be advanced to 4 and possibly to 5 cents. Mr. Witt feels that he cannot recommend anything that will result in an advance in the fare.

The conductors and motormen have arranged to vote upon the proposition made by Mr. Stanley relative to new schedules and wages for the men. The conditions imposed are that the revised schedules, as prepared by the subcommittee, be made the forms of schedules after which all future schedules shall be made; that all present schedules be revised to comply with these forms on the conclusion of this agreement; that all the runs in future schedules which do not furnish trainmen five hours or more time on any calendar day pay five hours' time; that trainmen who are called upon to work a run of less than five hours will, whenever called upon by the dispatchers, do other work to the extent of five hours without extra compensation, but should the work require more than five hours, pay be made for the actual time employed; that the rate of pay for conductors and motormen who have been in the employ of the company less than one year be 27 cents per hour and for those who have been in its employ one year or more be 31 cents an hour. The proposal depends upon the city's action in granting an increase in the operating expenses sufficient to meet the cost imposed by the new agreement.

The Salem Fire

A conflagration resulting in an estimated loss of $10,000,000 occurred at Salem, Mass., on the afternoon and evening of June 25. The fire rendered about 20,000 persons homeless and consumed approximately 1000 buildings, sweeping the shoe and leather district and many residential streets. Early in the evening the city was placed under martial law, and although dynamite was freely used to check the flames, strong and shifting winds carried the fire over an area about 1.5 miles long and 0.5 mile wide. The loss of life was small.

The damage to the property of the Bay State Street Railway was confined to the overhead system and the wharf of the maintenance of way department. The company carried thousands of refugees and sightseers. Several hours after the fire started it became necessary to cut the cables serving the main lines of track entering the city from the south and west, and cars were then run only to the Salem High School. The next afternoon cars were again operated to the center of the city, temporary feeders having been erected. On Sunday the company handled the largest local traffic in its history. The Boston Elevated Railway, the Bay State Street Railway and the Boston & Worcester Street Railway carried several companies of militia to the scene of the fire early on June 25, and all these transportation organizations have since handled supplies for the sufferers free of charge.

Action Unlikely in Connecticut Mail Case

The post-office department will continue its experiment with automobiles in transporting mail in Connecticut for an indefinite period, according to information given out at the office of the Second Assistant Postmaster-General at Washington, in relation to the refusal of the Connecticut Company to continue the service. The post-office authorities will make no effort to have the company re-establish its mail service, even though the government claims that the contract with the company had not expired. As previously stated in the ELECTRIC RAILWAY JOURNAL the company asked to be relieved of side and terminal service at fifty-four stations, and also wanted the number of mail pouches to be carried on any one trip limited to six. The post-office department offered an increase in pay and to relieve the company of side and terminal service at thirty points, but was unwilling to yield on the number of pouches to be carried, in as much as such a course would probably mean a delay in delivery. The company therefore discontinued the service.

New Power Station for New Jersey System

Public Service Corporation of New Jersey, Newark, has preliminary work under way for the construction of a large power station at Point-no-Point on the Passaic River. The site, which is located about 2000 ft. north of the Plank Road, has an area of 16 acres and the plant will be known as the Essex Station as it is intended to take care of the business in the county whose name it will bear. The ultimate capacity of the plant will, according to the present plans, be 150,000 kw. It is not intended, however, to build the plant to capacity at once but something like $2,000,000 will be spent within a year and the station will be so designed that it can be enlarged to meet the demands of future growth.

Much has already been done in the way of preparing the ground and securing data to pave the way for the awarding of contracts. As the land was practically inaccessible for business purposes the company built a road, about 2000 ft. long, from Blanchard Street to the property. This was constructed of broken stone and cinders, on a foundation of old poles and railway ties laid crosswise on the meadows mud, and the whole forming a highway capable of supporting heavy trucking. A spur of the Manufacturers Branch Railroad has also been laid across the site to what will be the turbine room. Twenty-seven test piles, ranging in length from thirty-five to fifty-five feet have been driven to determine the resistance of the soil and water borings were made to provide data upon which to base specifications for foundation and dock contracts. The tests have shown a depth of 9 ft. of marsh mud, underneath which were 2 ft. of mud, 12 ft. of sand, 2 ft. of gravel, 14 ft. of red sand, 4 ft. of clay and 2 ft. of rock for a total depth of 45 ft.

Proposals have been invited for the building of a dock which will have a total length of 682 ft. and extend from the pier head line back to the present high water mark, a distance of about 65 ft. Contractors have been asked to submit alternate figures for three different types of docks, concrete, timber crib and a combination of concrete and timber crib. The top of the dock is to be 30 ft. above the bottom of the government channel and the solid portion of the structure will be 16 ft. wide. Behind that the space will be filled with material dredged from the river as the company will provide itself with a depth of 10 ft. at its proposed dock with the depth sloping to the present 20-ft. channel in the river. The top of the dock will be 18 in above the highest flood tide mark of which there is any record and the foundation of the station will be as high to preclude probability of trouble from high water.

Intakes for condensing water will be built through the dock and the latter will be arranged to accommodate the coal handling machinery. Incidentally the company will have the water route and two railroads to carry its coal supplies and there will be coal storage facilities sufficient to take care of all the company's power stations in the northern part of the State, if necessary or desirable.

It is proposed to build the station on a line with the outermost point of the present land, that is to construct it on foundations laid between the existing high and low water marks. In its finished state the building will be 366 x 285 ft. but the intention is to get along with a structure 366 x 154 ft. until such time as an addition will be necessary. There will be a turbine room, a boiler house and a switch house. Two turbines of 25,000 kw capacity each will be installed leaving room for a third and at the outset space will be provided for eight boilers although only four will be set up. It is expected that bids will be asked for the foundations early in August and that the plant will be in operation in the late summer or early fall of next year.

Mr. Mellen's Hopeless Tangle

Everybody's Magazine for July contains an illustrated interview by Garet Garrett with Charles S. Mellen, former president of the New York, New Haven & Hartford Railroad. Mr. Mellen states that the acquisition of the electric railways estranged public sentiment more than anything else the New Haven did. In this connection Mr. Mellen is quoted as follows:

"I was trying to secure control of the trolleys contiguous to the lines of the New Haven because I had the theory and belief that, first, all railroads were going sooner or later, especially in congested communities, to be operated by electricity. Then there was a great economy in the erection of large units in the way of power houses to furnish the electricity for both systems of transportation. It is my conviction that the beginning of government ownership of railways is almost imminent in this country. But I said to myself: 'Though that is so near at hand, it will be many years before public sentiment will submit to government ownership of street railways.' Therefore I proceeded to tie the New Haven Railroad and its electric railways so tight that it would be very hard ever to untie them. I made street railway mortgages that were also a lien on a part of the New Haven Railroad, and then railroad mortgages that were also a lien on parts of street railway systems, saying to myself as I did it: 'Now when they come to New England with their schemes for government ownership of railroads they will look it over and lift up their hands in despair. They can't take the railroads without the trolleys, and the public will not stand for their taking both.' The result is that now the department of justice is in despair. It is a hopeless tangle, as I intended it should be."

St. Paul Electrification Progress

C. A. Goodnow, assistant to the president of the Chicago, Milwaukee & St. Paul Railway, made the following statement about electrification at Great Falls, Mont., recently:

"My first purpose on this visit to Great Falls is to get things started toward the electrification of our terminals in Great Falls in order that we may keep our word with the city that the work would be completed by Jan. 1, 1915. Electrification of the terminals will be under Mr. Beeuwkes, our electrical engineer in charge of electrifying our main line between Avery, Idaho, and Harlowton. The exact time of starting actual construction could hardly be fixed now because there are a mass of details that must be worked out.

"There has been some disappointment on our part in the fact that the construction of our passenger station at Great Falls has not gone forward as rapidly as we had hoped. The delay has been due to hindrances in getting the brick needed, but we hope now the work will be pushed with all possible speed until the station has been completed. Ballasting the line is going forward quite satisfactorily just now. New grades do not stand spring freshets well and there has been some trouble between Great Falls and Lewistown. However, we shall have no difficulty, we now believe, in getting the road ballasted and opened to scheduled service by Aug. 1.

"Concerning the electrification of the main line which is in charge of Mr. Beeuwkes, there is only the best report. The trolley poles and the transmission poles are arriving in plentiful quantity and are being set promptly, so we are certain not to be delayed from that source. As has been announced, the plans and specifications for the locomotives, and the equipment which will be needed in the substations and in other ways in making the change to electric power are now in the hands of the manufacturers. Naturally, with assurance of being ready so far as the installation of the trolley and transmission lines by the time we have set, Jan. 1, we shall hope to get the equipment as nearly on time as the makers can deliver it, but until the bids have been opened it would hardly be wise to predict what the bidders will offer on the time for delivery. It is a safe prediction, it seems to me, to say the date of actual operation by electricity will not be delayed long, if at all, beyond Jan. 1, 1915."

Chicago Engineer Removed by Mayor Harrison

By a vote of forty-one to eighteen, with six Aldermen excused from voting, the Chicago City Council on June 29 concurred in Mayor Harrison's removal of George Weston as the city's representative on the board of supervising engineers. Mr. Weston still holds the position of chief engineer of the board.

The transportation committee of the City Council inquired on June 30 into the methods of procedure followed by the board of supervising engineers. Walter L. Fisher appeared as counsel for the board. Corporation Counsel Sexton conducted the inquiry for the committee. Both B. J. Arnold and Mr. Weston were examined. During the inquiry Mr. Sexton asked the board to produce the complete record of opinions furnished to the board by the Corporation Counsel. Both Mr. Fisher and Alderman Capitain were in favor of having the investigation disposed of as soon as possible. The members of the committee, however, determined to defer until fall all further consideration of the accounting charges against the board. Mr. Arnold and some of the other Aldermen also protested against the postponement of the launching of a new investigation before the pending charges had been disposed of. In this connection, Alderman Capitain said that he wanted to criticise the parties that submitted the order—the same parties that appealed to the Council for $50,000 for a new audit.

At the suggestion of the Mayor the City Council has referred to the finance committee the Mayor's request for an appropriation of $50,000 for a new audit of the street railway companies' books.

Chicago advices state that Mayor Harrison has decided to appoint Edward W. Bemis, public utility expert, as the city's representative on the board of supervising engineers to succeed Mr. Weston.

Toledo Citizens' Franchise Considered Informally

A meeting of the special franchise committee of the City Council of Toledo, Ohio, was held on the evening of June 30. The franchise submitted by the Toledo Citizens' Franchise Association was discussed. Mayor Carl H. Keller was in Columbus, City Solicitor Thurstin remained only a few minutes when he found that no official discussion was to take place.

J. R. Cowell, representing the Non-Partisan League, has announced that his organization will have a franchise proposal ready for submission soon. This proposal, it is understood, will be similar to the franchise of the Cleveland Railway. The Non-Partisan League is operating on the idea that municipal ownership will be the ultimate end, but that the city is not yet ready to take over the properties of the Toledo Railways & Light Company. The franchise committee has informed Mr. Cowell that it will be glad to consider any proposition that is likely to hasten a settlement of the franchise question.

Frank L. Mulholland, of the Citizens' Franchise Association, requested the committee to fix upon an early date for a meeting to take up the negotiations on the proposed franchise. It was decided to hold a joint conference of the franchise committee of the City Council and the Citizens' Franchise Association on July 2.

The impression prevails that if the franchise committee does not recommend some action to Council within a short time steps will be taken to initiate the proposal of the Citizens' Franchise Association and get it before the voters. Councilman F. M. Dotson is quoted as saying that negotiations with the company will be continued no matter what other movements are inaugurated.

The Municipal Ownership League filed petitions containing 8000 names with the City Auditor on June 30, asking that its proposal be submitted to the voters. This organization proposes to issue $8,000,000 of bonds with the proceeds of which the city is to purchase the railway, lighting, power, gas and heating properties of the Toledo Railways & Light Company. The Municipal Ownership League favors the immediate acquisition of the railway properties by the city and is pledged strictly to support that plan.

It seems likely that there will soon be a three-cornered effort to settle the question under way, but it is believed the business men's proposition is so strongly supported that it will of necessity take preference over all others in the order in which they are taken up for consideration.

The company has done little the last two weeks toward a settlement. Mr. Doherty and the officials are waiting for developments from the efforts made by the Toledo Citizens' Franchise Association before taking further steps. It is the intention to afford every opportunity to the city to work out a satisfactory proposition, since the plan presented in behalf of the company did not meet the approval of the administration. The company, however, looks to the city to follow out the mutual understanding arrived at when the company suspended its order to collect the old rate of fare and proceed in earnest to reach a settlement.

Henry L. Doherty has been in New York for a week. This is the first time he has been absent from Toledo in more than three months. He was expected to return on July 1.

Even if the city should vote in favor of municipal ownership, following the petition filed with the auditor, Councilman Dotson explained that it will be necessary to extend the present franchise. Several years would be required, he said, to take over the properties.

Westinghouse Strike Situation

A company of the State Constabulary of Pennsylvania went to East Pittsburgh on June 29 for the purpose of assisting in the maintenance of order in the district affected by the strike of employees of the Westinghouse Electric & Manufacturing Company. The State Constabulary were sent at the request of Sheriff Richards, of Allegheny County, made after a demonstration by strikers which threatened disorder.

Employees of the Union Switch & Signal Company who walked out on June 12 have returned to work. Col. H. G. Prout, president of this company, in announcing that all the men had returned to work, said:

"This walkout was an Industrial Workers of the World effort thinly disguised, and the men went out without presenting any grievances, demands or requests. No concessions whatever have been made by the company."

I. C. C. Report Concerning New Haven Railroad.—It is reported that the findings of the Interstate Commerce Commission in response to the resolution of the Senate authorizing its recent investigation of the New York, New Haven & Hartford Railroad will be submitted to the Senate within the next two weeks.

Striking Employees of Kansas Road Return to Work.—Five former employees of the Union Traction Company, Coffeyville, Kan., who went out on a strike on March 31, have applied for reinstatement. The company accepted their applications as individuals, declining to recognize the union. Other men are expected to return shortly.

Extension of Time Granted.—The Public Service Commission of the First District of New York has granted the Hudson & Manhattan Railroad an extension of time from June 28 to Oct. 1, 1914, within which to begin the construction of the extension of its system from Thirty-third Street and Sixth Avenue, New York, to the Grand Central Station at Vanderbilt Avenue and Forty-second Street.

Proposed Radical Action in Pittsburgh Not Approved.—Councilman G. A. Dillinger, of Pittsburgh, on June 16 presented a resolution in the City Council, instructing the city law department to take steps to force the Pittsburgh Railways into the hands of a receiver. Several days previously the Mayor and the Council had agreed to let the law department compile all the complaints against the company and then take them up with the company. The Council, on June 24, postponed action on the Dillinger resolution for a week.

Ohio Tax Valuations.—The net increase in valuation on all street, suburban and interurban railways in Ohio, as reported by the tax commission, is $4,834,890 over last year. The total valuation of all properties is $145,476,000. The largest increase was imposed on the Cleveland Railway, which some time ago brought an injunction suit against the treasurer of Cuyahoga County to prevent the collection on all valuation over a certain amount. The increase for the Columbus Railway, Light & Power Company was about $553,000.

Small Line Abandoned.—It has been decided to abandon the line of the Orange Mountain Traction Company, West Orange, N. J., which operates from the foot to the top of Orange Mountain, a distance of 1½ miles. The system was installed about six years ago and has never been operated at a profit. The decision to abandon the property was reached on account of the inability of the company to secure an extension of its rights so as to permit it to discharge passengers near the station of the Delaware, Lackawanna & Western Railroad in West Orange. The town of West Orange has since bought in the property to satisfy $1,500 in taxes past due.

Indianapolis Business Men Visit Utilities.—Five hundred business men of Indianapolis took the fourth industrial excursion Saturday afternoon, June 20, and visited the property of five public utilities corporations. The excursion was under the auspices of the municipal development division of the Indianapolis Chamber of Commerce. The first visit was to the Tenth Street power station of the Terre Haute, Indianapolis & Eastern Traction Company. Robert I. Todd, president of the company, addressed the visitors at the plant. Other utilities visited were the works of the Indianapolis Water Company, the Langsdale Avenue plant of the Citizen's Gas Company, the Mill Street plant of the Indianapolis Light & Heat Company and the Washington Avenue plant of the Merchant's Light & Heat Company.

New York State Railways to Arbitrate Wage Question.—Employees and officials of the New York State Railways have agreed to arbitrate the question of whether wages shall be increased. This arrangement is in compliance with the agreement effective on May 1, 1914, and continuing until May 1, 1915, which covers all new working conditions, with the provision that if the two parties concerned cannot agree upon wages the matter shall be left to arbitration. Two of the three arbitrators have already been selected. Thomas Spratt, Ogdensburg, N. Y., will represent the company and James E. Roach, Schenectady, N. Y., the employees. Both sides have agreed to ask Charles P. Neil, New York, N. Y., formerly United States Commissioner of Labor, to accept the position of third arbitrator. It is not yet known whether Mr. Neil will accept this position as he is away in the West at present. He is, however, expected home shortly.

Bankers Inspect Chicago Elevated Railways.—The property of the Chicago (Ill.) Elevated Railways was inspected on June 22 by the representative of the banking firms which were members of the syndicate which underwrote the $12,500,000 of first mortgage 5 per cent bonds of the Northwestern Elevated Railroad. The members of the party, which also included a number of bankers who participated indirectly in the underwriting, made the trip from New York and Boston on a special section of the Twentieth Century Limited which left New York on Sunday forenoon, June 21, and returned to the East on the Twentieth Century Limited, leaving Chicago at noon on Tuesday, June 23. The inspection trip started from Fifth Avenue terminal of the Metropolitan West Side Elevated Railway at 11.10 a. m. The itinerary was west over the Garfield Park branch of the Metropolitan Elevated to Forest Park, thence downtown and to the Jackson Park terminal of the South Side Elevated Railway and thence north to the Wilmette terminal of the Northwestern Railway. On the return trip the Ravenswood branch was inspected. Luncheon was served en route. After the inspection of the elevated lines the guests were taken by automobile to the plant of the Commonwealth Edison Company, by which the elevated railway is supplied with power.

Financial and Corporate

Stock and Money Markets

June 30, 1914.

In the early trading on the New York Stock Exchange to-day a weak tone was shown. Good buying, however, followed the recessions at the opening of the market with the result that there was an abrupt change in the market tendency. In the last half of the day the range of prices was unusually high. Nearly all the important issues were up one point or more at the close. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2½ per cent; four months, 3 per cent; six months, 3½@3¾ per cent.

In Philadelphia to-day most of the local issues ruled fractionally weaker and were in very light demand.

The Chicago market was broader to-day and firm. The volume of sales was small, however. Bonds were steady and in fair demand.

The Boston market was dull to-day. Prices advanced all along the line, however, and were best at the close.

The Baltimore market was narrow and inactive to-day. Sales of stock totaled 2550 shares, mostly Elkhorn Fuel common. Bond transactions totaled $30,700, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	June 24	July 1
American Brake Shoe & Foundry (com.)....	88⅛	88⅛
American Brake Shoe & Foundry (pref.)....	134	134
American Cities Company (com.)...........	*29	*29
American Cities Company (pref.)...........	*65¼	60
American Light & Traction Company (com.).	341	339
American Light & Traction Company (pref.).	109	109
American Railways Company...............	37⅜	37
Aurora, Elgin & Chicago Railroad (com.)....	34	a35
Aurora, Elgin & Chicago Railroad (pref.)....	76	78½
Boston Elevated Railway	90¾	91½
Boston Suburban Electric Companies (com.).	7	7
Boston Suburban Electric Companies (pref.).	*65	65
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	35	35
Brooklyn Rapid Transit Company...........	90	91
Capital Traction Company, Washington.....	97	96
Chicago City Railway	135	135
Chicago Elevated Railways (com.)..........	25	20
Chicago Elevated Railways (pref.)..........	75	65
Chicago Railways, ptcptg., ctf. 1...........	99	97
Chicago Railways, ptcptg., ctf. 2...........	34	31¼
Chicago Railways, ptcptg., ctf. 3...........	6	5
Chicago Railways, ptcptg., ctf. 4...........	2½	2
Cincinnati Street Railway	105	101½
Cleveland Railway	103¾	103⅞
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company.........	13	13
Columbus Railway (com.).................	*53	*53
Columbus Railway (pref.).................	79½	79½
Denver & Northwestern Railway	*63	*63
Detroit United Railway	80	a80
General Electric Company	147½	147¼
Georgia Railway & Electric Company (com.)	120	120½
Georgia Railway & Electric Company (pref.)	86½	86⅞
Interborough-Metropolitan Company (com.)..	14	14½
Interborough-Metropolitan Company (pref.)..	61¼	61⅞
International Traction Company (com.)......	*30	*30
International Traction Company (pref.)......	*85	*85
Kansas City Railway & Light Company (com.)	22	*22
Kansas City Railway & Light Company (pref.)	39	*39
Lake Shore Electric Railway (com.).........	*6	*6
Lake Shore Electric Railway (1st pref.).....	*90	*90
Lake Shore Electric Railway (2d pref.).....	*22	*22
Manhattan Railway	130	130
Massachusetts Electric Companies (com.)....	11¼	11
Massachusetts Electric Companies (pref.)....	56	56
Milwaukee Electric Ry. & Light Co. (pref.)..	95	*95
Norfolk Railway & Light Company..........	*26	*26
North American Company	71	72¾
Northern Ohio Traction & Light Co. (com.)...	a60	70
Northern Ohio Traction & Light Co. (pref.)..	101	101
Philadelphia Company, Pittsburgh (com.)....	39½	38¾
Philadelphia Company, Pittsburgh (pref.)....	37	35
Philadelphia Rapid Transit Company.........	15¾	15
Portland Railway, Light & Power Company...	*47	*47
Public Service Corporation	112	112
Third Avenue Railway, New York...........	41	41¼
Toledo Traction, Light & Power Co. (com.)..	a13	20
Toledo Traction, Light & Power Co. (pref.)..	70	*70
Twin City Rapid Transit Co., Minn. (com.)..	103¼	103
Union Traction Company of Indiana (com.).	*11½	11½
Union Traction Company of Indiana (1st pref.)	*75	*75
Union Traction Company of Indiana (2d pref.)	*14	*14
United Rys. & Electric Company (Baltimore).	28	28¼
United Rys. Inv. Company (com.)...........	11	11½
United Rys. Inv. Company (pref.)...........	32½	32½
Virginia Railway & Power Company (pref.)..	87½	87½
Washington Ry. & Electric Company (com.).	86	85½
Washington Ry. & Electric Company (pref.).	82½	83
West End Street Railway, Boston (com.)....	66½	67
West End Street Railway, Boston (pref.)...	85	85
Westinghouse Elec. & Mfg. Company........	74⅜	73¾
Westinghouse Elec. & Mfg. Co. (1st pref.)....	124	122

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* Last sale. a Asked.

ANNUAL REPORT

Portland Railway, Light & Power Company

The comparative earnings statement of the Portland Railway, Light & Power Company, Portland, Ore., for the years ended Dec. 31, 1913 and 1912, follows:

	1913	1912
Gross earnings	$6,723,742	$6,642,308
Operating expenses (including taxes)	3,298,310	3,328,911
Net earnings	$3,425,432	$3,313,397
Interest	2,008,601	1,760,991
Surplus	$1,416,831	$1,552,406

The gross earnings of the company increased $81,434 during the year, or 1.2 per cent, while the operating expenses, including taxes, decreased $30,601, or 0.9 per cent, giving an increase in net earnings of $112,035, or 3.4 per cent. Interest charges increased 14.1 per cent, causing the surplus to decrease $135,575, or 8.7 per cent. There was available for depreciation renewals and dividends an amount equal to 5.7 per cent on the par value of the capital stock. The small increase in gross earnings was due principally to the business depression in the Pacific Northwest, although it was somewhat affected by the fact that comparison was made with a year during which revenues were received from the Salem Railway and the Williamette Falls Railway, both of which were sold in 1912. The operating ratio was reduced from 42.9 per cent to 42.5 per cent in 1913.

There was an increase in mileage per car per day on the city lines from 150 to 156, brought about through rerouting, alternate stops and the elimination of layovers. This caused a reduction in operating expenses per car mile sufficient practically to cover the increased wages of one cent an hour granted to the motorman and conductors. There was a heavy increase in fixed charges due to the completion of the Mt. Hood hydroelectric plant, and a transfer of the interest charge of this investment from the construction accounts to the operating accounts. Owing to the decrease of 8.7 per cent in the surplus, the dividend on the capital stock which had been paid at the rate of $5 per share per annum from December, 1912, was reduced to $4 per share per annum on Dec. 1, 1913.

Considerable construction work was done during the year, including the Mt. Hood plant at Bull Run, the Big Sandy diversion dam and the installation of a 7500-kw turbine. The electrification of the Mt. Hood Railway in July reduced the operating expenses and materially increased the business of the line. The electric business of the company was more widely developed during the year, as is shown by the fact that on Dec. 31, 1913, the company served 42,063 light and power customers, as compared with 38,415 in 1912. During the year $1,377,553 was charged to the construction account, of which $542,081 was for railway extensions and improvements, $68,401 for new cars, $60,736 for carhouses and $208,201 for power plant, substations and transmission lines. The above total is slightly less than for the average capital expenditures made during the years 1906 to 1912, inclusive. The item for new cars covered the purchase of four passenger cars and twenty freight cars.

The report states that during the year the application of scientific management was continued, covering the operation of the light and power department, the railway shops and the maintenance of way department. Furthermore, it has been asserted by competent judges that the company has gone further with the introduction of efficiency principles than any other public utility corporation in the country. The results have been so satisfactory that the work is being extended to include practically all departments.

Pensacola Electric Company

The annual report of the Pensacola Electric Company, Pensacola, Fla., for the twelve months ended Dec. 31, 1913, shows gross earnings of $285,757, an increase of $328 over 1912. These total earnings were divided $145,520 to the railway department, a decrease of $7,693, and $140,237 to the light and power department, an increase of $8,021. The operating expenses were $172,196, an increase of $5,754 over those of 1912, and taxes amounted to $10,542, an increase of $525. The net earnings of $103,020 were a decrease of $5,950 from those of the preceding year. Interest charges increased $4,718, which, with the dividends, prior surplus and replacement reserve, gave a current surplus of $43,174, a decrease of $3,806. The percentage of operating expenses, not including taxes, to the gross revenues was 60.3 in 1913, comparing with 58.3 in 1912, 59 in 1911, 58.4 in 1910, 57.3 in 1909 and 69.2 in 1908. The number of passengers carried during the year, including transfers, amounted to 3,116,615. The number of transfers taken up showed a total of 511,229.

American Cities Company

The income, profit and loss statement of the American Cities Company, New York, N. Y., for the twelve months ended Dec. 31, 1913, is as follows:

Dividends on stocks owned	$1,809,162
Interest on debentures owned	5,676
Interest on bank balances	10,447
Interest on notes and accounts receivable	23,442
Contract for services	1,583
Total receipts	$1,850,310
Operating expenses and taxes	57,624
Net earnings	$1,792,686
Interest on collateral trust gold bonds	500,000
Net income	$1,292,686
Dividends on preferred stock, 6 per cent	1,233,210
Surplus for period	$59,476
Surplus Jan. 1, 1913	135,518
Surplus Jan. 1, 1914	$194,994

The annual report states that the income of the company as set forth above is wholly from dividends declared and paid on stocks of the various constituent companies except the comparatively small amount received as interest upon loans and cash balances. If the proportionate interest of the American Cities Company in the undivided earnings of the constituent companies were added to the surplus earnings as shown above, the results for the year 1913 would be $255,194, an equivalent rate on the common stock of the American Cities Company of 1.5 per cent. The American Cities Company now owns in the aggregate 85.83 per cent of the preferred and 94.51 per cent of the common stock of the following companies: New Orleans Railway & Light Company, Birmingham Railway, Light & Power Company, Memphis Railway, Little Rock Railway & Electric Company, Knoxville Railway & Light Company and Houston Lighting & Power Company.

The combined comparative income statement for these constituent companies for the years ended Dec. 31, 1913 and 1912, follows:

	1913	1912
Gross earnings, all sources	$14,680,302	$13,878,961
Operating expenses and taxes	9,117,986	8,179,079
Net earnings	$5,562,316	$5,699,882
Interest, bond discount, amortization and miscellaneous	3,347,799	3,168,333
Amounts applicable to dividends on stocks	$2,214,517	$2,531,549

The gross earnings of the constituent companies increased at a rate of 5.8 per cent during 1913; the operating expenses and taxes, 11.4, and deductions, including interest charges, 5.6 per cent, leaving a decrease in net corporate income of 14.3 per cent. In commenting upon this showing, the report notes that during the year the Little Rock Railway & Electric Company reduced its electric light and power rates, the Birmingham Railway, Light & Power Company its gas and electric rates and the New Orleans Railway & Light Company its gas and electric rates. The increase in operating expenses and taxes was due largely to the increased percentage of operating revenue allowed for the maintenance of the constituent companies in addition to the sum which would have been derived from the increase in operating revenue. This aggregated $130,000, or approximately 1.6 per cent of the total operating expenses of the constituent companies. The taxes on the New Orleans Railway & Light Company, owing to a larger assessment, increased in an amount equal to 1.7 per cent of the total operating expenses and taxes. The operating expenses of the Houston Lighting & Power Company increased 0.75 per cent on account of greater cost of fuel oil. The operating ratios of the constituent companies for the last four years are as follows: 1910, 53.30; 1911, 52.23; 1912, 51.64, and 1913, 53.67.

Columbus Refunding Mortgage Approved

At a meeting of the stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, on June 29, the issue of $25,000,000 of 6 per cent first refunding mortgage bonds and $3,595,000 of prior preferred stock, bearing 4 per cent cumulative dividends, was authorized. The outstanding bonds of the constituent companies will be refunded as they mature with the new bonds, while the new stock is to be exchanged for the Columbus Railway 4 per cent bonds. The bonds to be refunded follow: $425,000 of Central Market Street Railway 5's, $3,000,000 of Columbus Railway first 5's, $572,000 of Crosstown Street Railway first 5's, $450,000 of Columbus Electric Company first 6's and $300,000 of Columbus Edison Company first 5's. After refunding these bonds there would remain unissued $20,253,000 of first refunding bonds. The capital liabilities outstanding would then consist of the $4,747,000 of bonds used for refunding, $3,595,000 of prior preferred stock, $1,143,500 of preferred series A, $4,066,500 of preferred series B and $6,340,000 of common stock.

E. W. Strong, Cincinnati, attorney representing a group of stockholders, objected to the amount of the bond issue and to the prior preferred stock. S. G. McMeen, president of the company, explained the purpose in refunding the present underlying bonds of the company and in providing for financing extensions and improvements. Mr. Strong made a motion to limit the authorized bond issue to $10,000,000 instead of $25,000,000, but this was defeated. He then moved to postpone action on the bond issue until July 20. In this he was also defeated.

Atlanta & Carolina Railway, Atlanta, Ga.—Roland Ransom has been appointed receiver of the Atlanta & Carolina Railway by Judge J. T. Pendleton in the Fulton Superior Court at Atlanta. The company was organized to build an electric railway between Atlanta and Augusta, but after constructing a short stretch of road it suspended operation in 1910 when a petition was made for a receiver. The demurrer against this petition was sustained by the Superior Court and later by the Supreme Court. The petition for a receiver on which action has now been taken by the court was filed only recently.

Fort Wayne & Springfield Railway, Decatur, Ind.—The property of the Fort Wayne & Springfield Railway was offered for sale a third time on June 22 at Decatur under foreclosure, but no bids were received. The upset price of the property was fixed by the court at $200,000.

Interborough-Metropolitan Company, New York, N. Y.—The $1,500,000 of 6 per cent notes of the Interborough-Metropolitan Company which matured on June 22 were paid off with money derived from the 5 per cent extra dividends recently declared by the Interborough Rapid Transit Company. The $1,936,942 of 6 per cent collateral trust notes which matured on July 1 were paid off with the proceeds from the sale of $1,500,000 of 5 per cent refunding mortgage bonds of the Twenty-third Street Railway, together with $500,000 of interest charges in arrears on the bonds. There are no further maturities until July 1, 1915, when the $4,000,000 of five-year 6 per cent notes fall due.

Interstate Railways, Camden, N. J.—John A. Rigg, president, and Thomas W. Grookett, Jr., treasurer of the Interstate Railways, have filed in the Court of Chancery of Trenton, N. J., an answer to the suit of Caleb F. Fox, a stockholder. Mr. Fox asked the court to restrain the defendants from paying to the company's bondholders such sums as the bondholders might have paid in release of certain bonds deposited with the Philadelphia Trust, Safe Deposit & Insurance Company. The answer of the defendants admits that the company was in a precarious financial condition in 1909. In June of that year $7,000,000 of bonds was deposited with the Philadelphia Trust, Safe Deposit & Insurance Company, as a depository for E. B. Smith & Company, Philadelphia, and a bondholders' committee, which was seeking to rehabilitate the company financially. It is further set out that the negotiations between Smith & Company and the bondholders' committee were abandoned on May 13, 1909. It is denied by the company that the Carson Estate controls the directorate of the defendant company. It is also denied that the rentals now received from the various properties of the company are insufficient to redeem and cancel certain preferred stock and to pay interest charges against the company, if the bondholders are compensated by the company for the payments which they made to secure the release of their securities. It is asserted that the Interstate Railways is now on a sound financial basis and that the efforts of the bondholders in 1909 have inured to the benefit of the complainant and the corporation.

Manchester Traction, Light & Power Company, Manchester, N. H.—The New Hampshire Public Service Commission has authorized the acquisition by the Manchester Traction, Light & Power Company of a controlling interest in the Nashua Light, Heat & Power Company. A transmission line will be built between the hydroelectric plants of the former and the steam plant of the latter, which are about 25 miles apart.

Marion, Bluffton & Eastern Traction Company, Bluffton, Ind.—The Marion & Bluffton Traction Company, the successor to the Marion, Bluffton & Eastern Traction Company, elected the following officers at a meeting of the directors on June 17, 1914: James W. Sale, president; Abram Simmons, vice-president; W. A. Patton, secretary and general manager; Dell Locke, treasurer. The following appointments have been made: James S. Clark, auditor, and George A. Redd, superintendent of transportation.

Minneapolis & Northern Railway, Minneapolis, Minn.—On petitions by George Heaton, president of the company, and of the Pittsburgh Coal Company, the Minneapolis & Northern Railway has been placed in the hands of the Minnesota Loan & Trust Company as receiver. On Jan. 26 five railroad contractors took over the line on liens amounting to $74,000, but the company was given a year in which to redeem the claims. The contractors, L. H. Boldue & Company, Leach & Mahoney, Belch & Company, Coolidge & Company and the Central Warehouse Lumber Company organized a separate company to extend the line to Mille Lacs, and this company, the Minneapolis, Mille Lacs & Northern Railway, will not be affected by the receivership.

Minster & Loramie Railway, Loramie, Ohio.—The Minster & Loramie Railway has been authorized to issue its common capital stock of the total par value of $42,700, and its new first mortgage 6 per cent bonds of the total sum of $20,000. The bonds are to be sold for the highest price obtainable, but for not less than 85. The common stock is to be issued in full exchange for the company's present outstanding issue of first mortgage bonds, of the total principal sum of $42,700. The proceeds arising from the sale of the new first mortgage bonds are to be devoted to pay and discharge present floating indebtedness.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The directors of the New York, New Haven & Hartford Railroad and subsidiaries held meetings on June 25. Dividends were passed by the Rhode Island Company, by the Ontario & Western, and by the Housatonic Power Company. The official statement regarding the Rhode Island Company says: "No meeting of the Rhode Island Company board was held because it was deemed unwise to declare a dividend for that property. This has been a poor year for this property, which earned about 3 per cent on its stock, compared with 6 per cent a year ago. The difference is made up almost entirely from increase in wages and heavy expenses due to rebuilding the power house at Providence. This company, like the Connecticut Company, has a separate board of directors and officers with headquarters at Providence and is perfecting its operation."

Ontario West Shore Railway, Goderich, Ont.—The municipalities interested in the construction of the Ontario West Shore Railway have decided to advertise the road for sale by tender, on the understanding that the successful bidder, if any, shall complete the road from Goderich to Kincardine. In the event of the road not being sold as a whole the ties, bridge timber and other material will be sold separately.

Phillipsburg (N. J.) Horse Car Company.—The Phillipsburg Horse Car Company has certified to an increase in its capital stock from $30,000 to $430,000.

Public Service Corporation, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has authorized the Public Service Railway to extend for thirty years at 5 per cent the $300,000 of 6 per cent second general mortgage bonds of the Paterson Railway, which mature on Oct. 1, 1914.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—M. A. Andersen has filed a protest with the Railroad Commission of California against granting the application of the San Francisco-Oakland Terminal Railways for an order authorizing the issuance of bonds. Mr. Andersen is the owner of $62,000 of 5 per cent fifty-year sinking fund gold bond certificates of the United Properties Company. He alleges that these bond certificates were acquired in lieu of 5 per cent fifty-year sinking fund gold bonds of the United Properties Company, which it was represented were in course of preparation and would be delivered to the owners and holders of the certificates as soon as the bonds could be made ready. The United Properties Company, the complaint states, owned, at the time of issuing these certificates, a majority of the capital stock of the San Francisco-Oakland Terminal Railways, and it was agreed between the United Properties Company and the holders of the certificates that no prior lien would be placed upon this property. Subsequently, Mr. Andersen states, the United Properties Company, without his consent, transferred to others the stock of the San Francisco-Oakland Terminal Railways. The present holders of this stock are now seeking to issue bonds and Mr. Andersen is trying to prevent this action on the ground that it will cloud his title to an equitable first lien upon the properties of the United Properties Company.

United Railroads, San Francisco, Cal.—The annual meeting of the stockholders of the United Railroads has been called for July 14. At this meeting, which will be held three days before the date set for the inquiry into the affairs of the company by the State Railroad Commission, directors and officers will be elected for the ensuing year. Proxies have been forwarded to Jesse W. Lilienthal, president of the company, by Mason B. Starring, president of the California Railway & Power Company, the holding company of the United Railroads. In his letter to Mr. Lilienthal, Mr. Starring refers to the proposed inquiry into the affairs of the company by the Railroad Commission. He concludes his letter to Mr. Lilienthal as follows: "At this time I know of nothing more such stockholders can do than to send you proxies to be voted by you and with which you can establish yourself and your board in office for the ensuing year and further establish such policies for the United Railroads as in your judgment and others are best calculated to serve all interests."

Washington (D. C.) Interurban Railway.—Guy T. Scott and T. Howard Duckett have been appointed temporary receivers for the Washington Interurban Railway. Suit for the appointment of receivers was brought by the Railway Storage Battery Car Company on a promissory note for $15,957, on which judgment for $18,350 was confessed.

Youngstown & Ohio River Railroad, Leetonia, Ohio.—A quarterly dividend of 1 per cent has been paid on the $1,000,000 of 5 per cent preferred stock of the Youngstown & Ohio River Railroad. The dividends on this stock have been cumulative from July 1, 1903. Three-fourths of 1 per cent was paid on March 25 last, 1 per cent on Dec. 31 last, 1¼ per cent on Sept. 30, three-quarters of 1 per cent in June and March, 1913, and 1⅛ per cent, quarterly, in 1912.

Dividends Declared

Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., quarterly, 1½ per cent, preferred.

Bay State Street Railway, Boston, Mass., 3 per cent, first preferred; 2¼ per cent, common.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, common and preferred.

Boston & Suburban Electric Companies, Newtonville, Mass., $1, preferred.

Chicago (Ill.) City Railway, quarterly, 2½ per cent.

Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., quarterly, 2 per cent, common.

The Citizens' Traction Company, Oil City, Pa., $1.25, preferred.

City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; quarterly, 2 per cent, common.

Columbus, Newark & Zanesville Electric Railway, Cincinnati, Ohio, quarterly, 1½ per cent, preferred.

Consolidated Cities Light, Power & Traction Company, New York, N. Y., quarterly, three-quarters of 1 per cent.

International Traction Company, Buffalo, N. Y., 2 per cent, preferred (No. 4).

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Monongahela Valley Traction Company, Fairmont, W. Va., 1½ per cent, common.

Montreal (Que.) Tramways, quarterly, 2½ per cent.

Nashville Railway & Light Company, Nashville, Tenn., quarterly, 1¼ per cent, preferred.

New England Investment & Security Company, Springfield, Mass., $2, preferred.

Porto Rico Railways, Ltd., quarterly, 1¾ per cent, preferred; quarterly, 1 per cent, common.

Public Service Investment Company, quarterly, $1.50, preferred; $2, common.

Springfield & Xenia Railway, Springfield, Ohio, quarterly, 1½ per cent, preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Western New York & Pennsylvania Traction Company, Olean, N. Y., 3 per cent, first preferred.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

Youngstown & Ohio River Railroad, Leetonia, Ohio, quarterly, 1 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
ATLANTIC SHORE ELECTRIC RAILWAY, SANFORD, ME.					
1m., May, '14	$27,199	$23,563	$3,636	$650	$2,986
1 " " '13	28,927	23,655	5,272	615	4,657
BATON ROUGE (LA.) ELECTRIC COMPANY					
1m., Apr., '14	$13,589	*$9,256	$4,334	$2,109	$2,225
1 " " '13	12,240	*7,416	4,824	2,083	2,741
12 " " '14	169,900	*110,503	59,397	25,259	34,138
12 " " '13	152,007	*92,477	59,530	21,817	37,713
BROCKTON & PLYMOUTH STREET RAILWAY, BROCKTON, MASS.					
1m., Apr., '14	$8,338	*$8,545	$207	$1,082	†$1,289
1 " " '13	8,354	*7,413	941	1,131	†190
12 " " '14	121,655	*100,919	20,736	12,923	7,813
12 " " '13	121,248	*93,334	27,914	12,755	15,159
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.					
1m., Apr., '14	$26,505	*$16,694	$9,811	$6,427	$3,384
1 " " '13	27,917	*15,858	12,059	6,082	5,977
12 " " '14	375,098	*210,677	164,421	74,560	89,861
12 " " '13	371,180	*196,699	174,482	69,553	104,929
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., May, '14	$94,761	*$59,111	$35,650	$28,840	$6,810
1 " " '13	123,316	*67,453	55,863	24,607	21,256
12 " " '14	1,172,194	*709,159	463,035	315,806	147,229
12 " " '13	1,148,956	*688,676	460,280	280,044	180,236
COLUMBUS (GA.) ELECTRIC RAILWAY					
1m., Apr., '14	$55,234	*$22,660	$32,575	$24,827	$7,748
1 " " '13	54,348	*26,678	27,670	20,314	7,356
12 " " '14	643,374	*281,014	361,360	292,289	70,071
12 " " '13	638,473	*287,867	350,606	232,413	118,293
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO					
1m., May, '14	$254,559	*$166,580	$87,979	$47,088	$40,891
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.					
1m., May, '14	$227,430	*$153,711	$73,719	$54,686	$19,033
1 " " '13	222,156	*124,338	97,818	50,051	47,767
12 " " '14	2,751,609	*1,731,975	1,019,634	611,725	407,909
12 " " '13	2,553,089	*1,411,159	1,141,930	584,674	557,256
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., May, '14	$538,473	*$287,288	$251,185	$183,643	$67,542
1 " " '13	549,852	*269,709	280,143	162,174	117,969
12 " " '14	6,739,779	*3,353,244	3,386,535	2,103,753	1,282,782
12 " " '13	6,697,304	*3,296,138	3,401,166	1,829,287	1,571,879
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.					
1m., May, '14	$257,020	*$150,032	$106,987	$44,446	$62,541
1 " " '13	245,342	*151,734	93,609	45,705	47,904
12 " " '14	3,078,559	*1,849,092	1,229,466	529,755	699,712
12 " " '13	2,808,243	*1,701,082	1,107,161	536,980	570,181

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*Includes taxes.
†Deficit.

Traffic and Transportation

Toronto Company Replies to Traffic Recommendations

H. S. Osler appeared before the Ontario Railway Board on June 26 for the Toronto (Ont.) Railway in connection with the recommendations of C. R. Barnes, the board's traffic expert. As noted in the ELECTRIC RAILWAY JOURNAL of June 20, page 1419, Mr. Barnes recommended that the company extend the Teraulay line north from Agnes to College Street, to be completed by Nov. 1, in order that the College cars may be taken off Yonge Street. He also suggested that the Bloor line be extended from Lansdowne Avenue to High Park. Mr. Osler contended in the latter instance that the work proposed was outside the limits covered in the franchise agreement of 1891. The company agreed to rearrange the layout at Broadview and Gerrard immediately. R. J. Fleming, general manager of the company, contended that it would be impossible to lengthen the platforms and lower the steps of the 202 old double-truck cars. Chairman McIntyre of the board held that at least 164 could be so reconstructed. Mr. Fleming finally agreed to rebuild thirty-four of the cars before Aug. 15, and to report on the others thereafter. The company consented to continue its custom of the last four or five years and equip new cars with push buttons at the time they are built. The company agreed to install an adequate private telephone system and to report before Oct. 1 on the recommendation for a change in the method of heating the cars. A number of regulations to promote safety and minimize blocking of the aisles were agreed upon. All the cars will be equipped with proper illuminated route signs, front and right side, during the next ten months.

Near-Side Stop Advocated in Cleveland.—Director of Public Safety Benesch of Cleveland is advocating a change to the near-side stop by the Cleveland Railway.

Fast Freight and Express Service.—H. W. Clapp, general superintendent of the Columbus Railway, Light & Power Company, has announced the establishment of a fast freight and package service between Columbus and Westerville by the company. Cars will make two round trips a day.

Accident on Lake Shore Electric Railway.—More than thirty persons were injured, some perhaps fatally, on June 22, when an eastbound limited car on the Lake Shore Electric Railway, Cleveland, Ohio, collided with a work train standing on a siding near Sandusky. Few of the passengers escaped superficial injuries.

Tacoma Company to Restore Transfer Privileges.—The Tacoma Railway & Power Company, Tacoma, Wash., has announced that it will restore transfer privileges which were recently withdrawn, on the understanding that an ordinance will be passed by the city protecting the company against the misuse of the slips.

Monthly Accident Reports Requested.—The Illinois Public Utilities Commission has requested all electric railways and other public utilities in the State to furnish sworn statements of all accidents the first of each month. Fifty per cent of all railroad accidents in Illinois are attributed to trespassing, and the commission is anxious to take action to eliminate such accidents.

Cincinnati Suburban Company Answers Complaint.—The Interurban Railway & Terminal Company, Cincinnati, Ohio, has filed with the Public Utilities Commission a denial of the complaints made against it by City Solicitor Walter Schoenle of Cincinnati. The company says that extra trains have always been used when they were needed and that this custom will be continued. It denies that it is the only line furnishing service to the district through which it passes.

Indianapolis-Louisville Service.—Frank Smith, the vice-president of the Interstate Public Service Company, which owns and operates the lines between Louisville and Indianapolis, has discussed with John Telford, of the transportation committee of the Board of Trade of Louisville, and other members of that organization the lack of depot facilities of which the Louisville shippers complain. It is understood that the order of the Interstate Commerce Commission in regard to through rates between the cities will be obeyed soon.

Crop Prospects Near Louisville.—By improved methods of packing freight in its cars the Louisville & Interurban Railway, Louisville, Ky., has been able to take care of a largely increased freight business on its country lines without the addition of equipment. Freight business of the lines out of Louisville has increased rapidly in the last year or so. This season the prospects for tremendous crops of raspberries and blackberries are the best ever and should yield much freight for the Louisville & Interurban Railway as well as for the Insull lines across the river.

Near-Side Ordinance in New York.—The Aldermen of New York on June 30 passed the ordinance requiring surface cars to stop on the near side of streets. At present cars stop on the near side where there are intersecting car lines and at "fire stop" and "school stop" streets. The ordinance says that cars must stop at the near side of all streets "except that in unusual cases, where considerations of safety or convenience so demand, the Police Commissioner may authorize variations from the rule." In such cases "trolley stop" signs will be displayed. If the Mayor signs the ordinance it will take effect on Sept. 1.

More Double-Deck Cars in Pittsburgh.—Pittsburgh now has six double-deck street cars. Two additional cars of this type were put into service on June 20 by the Pittsburgh Railways. They are equipped with the safety device invented and patented by P. N. Jones, general manager of the company, which short-circuits the motors through resistance and insures the immediate stoppage of the car. There is no failure of the safety device even if the trolley is off the wire and the hand brakes and air-brake apparatus are disabled. The seating capacity of each car is 110.

Through Rate Hearing in Peoria.—Acting upon a complaint of the Chicago, Ottawa & Peoria Railway, Ottawa, Ill., the Interstate Commerce Commission will hold a hearing in Peoria on July 14 to determine whether or not through freight rates between electric and steam railroads shall be adopted. F. E. Fisher, general superintendent of the company, argues that the lack of interchange rates has been productive of losses to the interurban lines. He cites instances where steam roads have declined to make a through rate for merchandise originating on the electric railway.

Canadian Post-office Act Amended.—By the terms of an amendment to the Canadian post-office act passed by the House of Commons at Ottawa on May 4 and by the Senate on June 4, the postmaster-general has been empowered to fix the rate at which an electric railway operating in Canada shall carry letter carriers on the cars. As the bill passed the House the postmaster-general was authorized to fix the rate without redress on the part of the company. The Senate, however, inserted a clause making it possible for a company to appeal to the Railway Commission for redress in the event of a dispute arising.

Another Toronto Civic Line Fare Proposal.—Works Commissioner Harris, of Toronto, Ont., reported to the Board of Control on June 25 that the interchange of traffic between the Toronto Railway and the Civic Car lines would probably increase the receipts of the latter $6002 a year and reduce the annual deficit from $205,842 to $199,839. This is on a basis of 5 cents for a fare with transfer privileges and 3⅛ cents for a local fare. The Comptrollers reserved consideration. Mayor Hocken remarked that the scheme did not look financially worth while, in comparison with Comptroller O'Neill's proposal to fix a flat local fare of 2½ cents a ride.

Increase in Pay on South Carolina Road.—The following announcement was made recently by the Greenville, Spartanburg & Anderson Railway, Greenville, S. C.: "Beginning July 1 the pay of the motormen and conductors will be increased from 12½ cents an hour for the first year to 15 cents an hour and the years of service will be rewarded by increase of pay to 1 cent an hour for each year of service until 20 cents an hour is reached. The minimum day rate will be increased from $1 to $1.20. It is with pleasure that we are giving this increase and take this opportunity of expressing our appreciation of the faithful service of the motormen and conductors."

Albany Traffic Recommendations Forwarded to Company.—The Public Service Commission of the Second District of New York has forwarded to the United Traction Company, Albany, the report of Charles R. Barnes, electric railway inspector of the commission, and has notified the company that it must file its answer to the recommendations made by Mr. Barnes on or before July 7. No action by the commission in regard to hearings on the report will be taken until after the reply of the company has been received. The recommendations contained in the report of Mr. Barnes were published in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, page 1478.

Mail and Express Franchise in Salt Lake City.—The amended ordinance granting the Utah Light & Railway Company, Salt Lake City, Utah, a franchise to haul mail and express matter over its interurban lines and into the city along West Temple Street has been passed by the City Commission. The provision to allow carload freight hauling was stricken out. Perhaps the principal provision inserted in the franchise before it passed was the one prohibiting the company from operating its mail and express cars in trains. The franchise runs until 1955, when all the other Utah Light & Railway Company franchises expire. The company agrees to pay the city $25 a year for each car used in transporting mail or express.

Through Express Service Between Worcester and Providence.—Arrangements have been made for the operation of through electric railway express service between Worcester, Mass., and Providence, R. I., over the Worcester Consolidated Street Railway, the Rhode Island Company and connecting lines. The plan is to have the through cars leave Providence on Monday, Wednesday and Friday afternoons at 3.30, arriving in Worcester at about midnight. The goods will be ready for delivery at 6 o'clock the next morning. The cars for Providence will leave Worcester Tuesday, Thursday and Saturday afternoons at 4.30, and the merchandise will be ready for delivery in Providence at 7.30 in the morning. Going each way the cars will take on merchandise only at Milford.

Suspension of Schedule Order in Washington.—The Public Utilities Commission of the District of Columbia and the Interstate Commerce Commission have granted the applications of the Capital Traction Company and the Washington Railway & Electric Company for the suspension of orders relating to schedules on their lines from July 1, 1914, to Sept. 15, 1914. A written statement from each company was filed with the district commission, agreeing that, if the service provided on any line between the dates mentioned during the periods of the day covered by the suspended orders was not sufficient in the opinion of the commission, the service on that line would be increased without the necessity of a formal hearing or the issuing of an order by the commission.

Protest Against Abandonment of Service.—Citizens of Jackson County have filed with the Public Utilities Commission a protest against the suspension of operation of electric cars on what is known as the Jackson and Hamden belt line, owned by the Hocking Valley Railroad, Columbus, Ohio. The cars were operated by electricity, and a number of towns and individuals were furnished current for lighting. The line is 17 miles long. According to the company the line is unprofitable and the track will soon have to be reconstructed. The company expects to operate steam trains over the road. The complaint states that several hundred miners use the electric cars daily and that it would be impossible for them to travel to and from their work conveniently on a steam road schedule.

Service Complaint Closed.—The Public Service Commission of the Second District of New York has closed upon its records the complaint of residents of Aqueduct against Schenectady Railway as to service rendered the public, the railway company having agreed that a shop car will be put on immediately, running from Aqueduct to the General Electric Company's works in the morning and returning in the evening; that the waiting room at Aqueduct will immediately be repaired and lighted and kept in a proper condition. Certain of the cars operated between Aqueduct and Schenectady have already been overhauled, and the company further agrees to make other improvements in the character of the cars and the time schedules before October next.

New York Subway Advertising Contract.—George F. Hurd, counsel for the Auto Sales Gum & Chocolate Company, has notified the Public Service Commission for the First District that his clients will not make any offer for the newsstand and advertising privileges on the new rapid transit lines on the conditions recommended to the Public Service Commission for the First District by the Interborough Rapid Transit Company. That company has made a new contract with Artemus Ward, formerly Ward & Gow, for these privileges, and this contract is now pending before the commission for approval. The Interborough Company has also submitted to the commission certain conditions which it would impose if the privileges are put up for public bidding. The commission as yet has not taken final action on the contract.

New Transfers in St. Louis.—The United Railways, St. Louis, Mo., arranged beginning July 1 to issue transfers in accordance with the conditions mentioned in the ELECTRIC RAILWAY JOURNAL of May 9, 1914, page 1061. The new transfers are double in form. The conductor to whom the first fare is paid issues the transfer, punching crosstown lines and the line to carry the passenger to his destination. The conductor of the intersecting line takes up the original or first transfer and the conductor of the last line to be used takes up the second half or duplicate transfer. On the duplicate transfer is printed: "This transfer, issued under rules of company and decree of Circuit Court, good only at intersections punched within time and direction punched; not accepted unless properly punched; not good for round trip; not transferable to another."

Smoking Question in Louisville.—The matter of smoking on the cars of the Louisville & Interurban Railroad is before the patrons of the line and the representatives of the company. In seasons past the conductors have permitted the no-smoking rule to become inoperative so far as it applied to the open trailers which are attached to several of the early morning cars to bring the business men into town. A car that reached the city at 8 o'clock carries a trailer. Both motor and trailer are occupied mostly by men. For the last season or so the men have been permitted to finish their after breakfast cigars on the cars. Lately the no-smoke order has been enforced by the conductors. Smokers protested in vain to the conductors and at length the men selected a committee which arranged to wait on Samuel Riddle, superintendent of the company. The patrons of the train in question are asking that a few seats at the rear of the trailer be set aside for smokers as is done in the open cars on the city system. Only the cars used on the Lagrange division of the company's lines are equipped with a smoking compartment. What in other localities is the smoking compartment of trolley lines constitutes the "Jim Crow" section of the cars of the Louisville & Interurban system.

Front-End Collection System Modified.—A successful variation of the front-end collecting system has been used by the Metropolitan Street Railway at Electric Park, Kansas City's chief summer resort in the southeast section of the city. Much difficulty formerly was encountered by the company in collecting from all passengers during the rush hours at the park, as well as in handling the crowds expeditiously. Automatic turnstiles have been installed at the park exits, two conductors being stationed there. All persons leaving the park desiring to ride into the city pass through the gates, the number being automatically recorded. The men at the gates must show 5 cents for each person using the stiles. One man collects fares, while the other distributes transfers, on which only the hour is punched. Passengers then board any car they wish, entering by either the front or rear doors. As soon as the car is filled it moves on, the conductor collecting or punching the transfers held by the passengers at his leisure, and not as the passengers enter. In the past many persons riding to the park have remained on the cars, the conductors being unable to collect the return fare by reason of inability to identify the passenger. Anyone not holding a transfer received at the park exit must now pay the conductor.

Personal Mention

Mr. A. K. Bodholdt, for years one of the trial attorneys of the Chicago (Ill.) City Railway, has been appointed assistant secretary of the Central Trust Company of Illinois, Chicago.

Mr. Frank J. Duffy, president and manager of the Southern Railway & Light Company, Natchez, Miss., has been elected president of the Natchez Chamber of Commerce, the leading commercial organization of the city.

Mr. B. W. Lynch, formerly general auditor of the Consumers Power Company of Minnesota, has been appointed assistant to the general auditor of H. M. Byllesby & Company to succeed Mr. N. P. Zech, resigned.

Mr. H. T. Willett has resigned as secretary of the Springfield (Ill.) Consolidated Railway and the Springfield Gas & Electric Company on account of ill health. Mr. Willett has been with the companies for seven years.

Mr. Charles Walsh, who has been assistant to the chief auditor of Hodenpyl, Hardy & Company, New York, N. Y., has been appointed secretary of the Springfield (Ill.) Consolidated Railway and of the Springfield Gas & Electric Company.

Mr. J. H. Hickey, formerly purchasing agent of the Buffalo, Lockport & Rochester Railway, with headquarters at Rochester, N. Y., has been appointed assistant purchasing agent of the Empire United Railways, Inc., with headquarters at Syracuse, N. Y.

Mr. J. C. Stone has been appointed assistant traffic manager of the Northern Electric Railway, Sacramento, Cal., to serve under Mr. J. R. Wilson, traffic manager of the company. Mr. Stone was formerly connected with the Southern Pacific Company as district freight and passenger agent at Sacramento, and afterward was chief clerk to the general freight agent of that company located at San Francisco.

Mr. George Kuhn, who has been appointed master mechanic of the International Railway, Buffalo, N. Y., entered business with the Buffalo Street Railroad in 1883. He was subsequently appointed to take charge of the wood-working department and later was placed in charge of the truck and motor department. Since then he has served in turn as carhouse foreman, general foreman in the shops and carhouses and assistant master mechanic.

Mr. W. H. Sawyer has resigned as engineer in charge of the New York office of Ford, Bacon & Davis, New York, N. Y., to become connected with the E. W. Clark & Company Management Corporation as vice-president, with headquarters at Columbus, Ohio. Mr. Sawyer was born forty years ago at Schoolcraft, Mich., and was graduated from the University of Nebraska in 1894 with the degree of B.S. For two years after graduation he was with several street railway companies. Subsequently he entered the employ of the railway and engineering departments of the General Electric Company, with which he continued for nine years. He next entered the employ of Ford, Bacon & Davis, with whom he has been connected for nine years. On June 26 Mr. Sawyer was tendered a farewell dinner at the Railroad Club of New York by the members of the Deportation Club. Mr. Sawyer was one of the charter members of this society and took an active part in its functions. Mr. Frank Hedley, vice-president of the Interborough Rapid Transit Company, acted as toastmaster at the affair on June 26 and in behalf of those in attendance presented Mr. Sawyer with a large silver loving cup.

W. H. Sawyer

Mr. W. L. Davis, formerly assistant secretary and assistant treasurer of the Texas Power & Light Company and affiliated companies, was recently appointed superintendent of accounts of the Strickland-Goodwin Management Association, of Dallas, Tex., succeeding Mr. J. R. Wolfe, assigned to other duties.

Mr. R. F. Kelker, Jr., has been appointed traction expert in charge of the traction bureau of Chicago's department of public service. Mr. Kelker resigned his position as assistant to the district engineer of the Central District, Division of Valuation, Interstate Commerce Commission, Chicago, to take up his new work. Prior to accepting the Government position he was principal assistant engineer to Mr. George Weston, engineer of the Board of Supervising Engineers, Chicago Traction.

Mr. J. R. Wilson, who has been appointed traffic manager of the Northern Electric Railway, Sacramento, Cal., began his railway career in the local freight office of the Southern Pacific Company at El Paso, Tex., twelve years ago. After serving for a year at El Paso he was transferred to the general freight office of the Southern Pacific Company at San Francisco where he was employed for two years. He resigned from the Southern Pacific Company to become connected with the San Francisco agency of the Illinois Central Railroad as traveling freight and passenger agent in the San Joaquin and the Sacramento Valleys. Three years ago he was appointed commercial agent of the Illinois Central Railroad at San Francisco, in which capacity he continued until his recent appointment as traffic manager of the Northern Electric Railway. Mr. Wilson succeeds Mr. S. W. Russell with the Northern Electric Railway.

OBITUARY

Herman Porter Kimball, who for nearly twelve years was associated with the New York office of the Standard Underground Cable Company, Pittsburgh, Pa., died on June 24 at New Rochelle, N. Y. He was forty-eight years old. Mr. Kimball was born in Fitchburg, Mass. For six years prior to his connection with the Standard Underground Cable Company he was engaged in electrical engineering.

Redick M. Ridgely, superintendent of the Springfield (Ill.) Consolidated Railway from 1876 to 1899, died at his home in that city June 23, at the age of eighty-four years. Mr. Ridgely had resided in Springfield since a boy and had been prominent in business and politics there for a half-century. He was postmaster at one time and a member of the State Legislature.

New Plan to Control Railroad Securities

On June 26 Louis D. Brandeis, Boston, and George Rublee, New York, laid before the Senate interstate commerce committee a new suggestion for the control of railroad security issues. The suggestion is proposed in place of portions of the House railroad capitalization bill now before the Senate committee and provides in brief that after Jan. 1 next no common carrier will be allowed to acquire any interest in any property or be permitted to issue any securities or assume any obligations except for purposes of construction, improvement or betterment of facilities of its railroad or "some railroad, boat line or car line" which it lawfully owns or operates; or for refunding lawfully issued securities, or for the reimbursement of the treasury of the company for any lawful expenditures, or for the acquisition of any transportation line authorized by the Interstate Commerce Commission or for some purpose approved by the commission where the expenditure involved "will not impair the capacity of the carrier to perform its public duty." Another feature provides that no carrier shall be allowed after the passage of the act to acquire, lease or purchase any interest in the railroad, boat line or electric railway unless authorized by the commission after a hearing.

On June 30, H. P. Thom, general counsel for the Southern Railway, offered an amendment to the House bill creating a bureau of credits and securities under the commission to be appointed for six years to examine and determine questions of security issues. A report of this bureau in such cases would become the order of the commission five days after made unless the commission ordered a hearing.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***North & South Railway, Wichita, Kan.**—Incorporated in Kansas to build an electric railway between Wichita, Concordia and Washington, Kan., a distance of about 200 miles.

***Ephrata & Lebanon Street Railway, Lebanon, Pa.**—Chartered in Pennsylvania to build an electric railway between Lebanon and Ephrata. This company is separate from the other companies chartered to build lines in this section. Capital stock, $34,000. Incorporators: C. O. Collett, C. D. Siegle, Charles D. Lawrence, Henry O. Evans and E. T. Noble.

***Philippi & Clarksburg Traction Company, Philippi, W. Va.**—Incorporated in West Virginia to build an electric railway from Philippi to Clarksburg. Capital stock, $25,000. Incorporators: Samuel V. Woods, J. H. Woods, R. E. Talbott, Henry H. Byrer, J. C. Watson and E. R. Dyer, all of Philippi, W. Va.

FRANCHISES

***Springfield, Ill.**—The Illinois Public Utilities Commission has issued a certificate of convenience and necessity to the Murphysboro & Southern Illinois Railway, which plans to build a 7-mile electric railway from Murphysboro to Carbondale. A. B. Minton, Murphysboro, is interested.

Cedar Rapids, Ia.—The Iowa Railway & Light Company has received a twenty-five-year franchise from the Council to extend some of its lines in Cedar Rapids.

Alexandria, La.—The Alexandria Electric Railways has asked the Council for a franchise to extend some of its lines in Alexandria to the city limits.

Kansas City, Mo.—An ordinance ordering the rerouting of the Minnesota-Indiana line of the Metropolitan Street Railway, Kansas City, has been passed by the City Council. The measure requires that the cars traverse Eighteenth Street as far west as Prospect Avenue north to Fifteenth and west to Main.

Portland, Ore.—Because it has been found that a portion of East Twenty-ninth Street on the course of the proposed crosstown street car line on the east side is not dedicated as a street, the Portland Railway, Light & Power Company has refused to accept the crosstown franchise granted two months ago by the City Council. The company through President Griffith will now ask for a new franchise for the crosstown line over East Thirtieth Street to Hawthorne Avenue, eliminating East Twenty-ninth Street from the route.

Providence, R. I.—The Rhode Island Company has received a franchise on Mount Pleasant Avenue, from Chalkstone Avenue to Atwell's Avenue in Providence.

Nashville, Tenn.—The Nashville Traction Company has asked the Council for a franchise in Nashville. W. O. Palmer, Nashville, president. [E. R. J., May 9, '14.]

East Dallas, Tex.—Daniel Sonnentheil and associates have asked the Council for a fifty-year franchise to build an electric line in East Dallas, to cross Lakewood addition. Several months ago another franchise was asked, but was withdrawn, the petitioners deciding that another route would be best. This proposed line will extend over Tremont, Ridgeway, Worth and Paulus streets to Junius and the Greenville road through the Belmont addition to the line of the Texas Traction Company.

Galveston, Tex.—The Galveston Electric Company has asked the Council for a franchise to extend the Avenue H line to the boulevard and to build several other short extensions in Galveston.

Port Arthur, Tex.—The Pier Railway has asked the Council for a franchise to build an electric line from the center of the city to the pleasure piers in Port Arthur. K. M. Smith, Port Arthur, is interested. [E. R. J., June 20, '14.]

TRACK AND ROADWAY

Lethbridge (Alta.) Municipal Tramway.—A by-law is being advertised at Lethbridge which includes a clause to provide $13,153 for municipal electric railway extensions in Lethbridge.

***Benicia, Cal.**—Surveys have been completed and construction will soon be begun on the proposed electric line between Vallejo and Benicia. This line will enter Vallejo near the North Vallejo depot and will have its terminus at the Monticello Steamship Company. This line will be extended north from Benicia and it is believed that it is to be a part of some other railway system, possibly the Oakland, Antioch & Eastern Railroad. J. R. Cunnyngham, Benicia, is interested.

Point Loma Railroad, San Diego, Cal.—Within the next few weeks this company plans to begin work on the extension of the Ocean Beach and Point Loma line to the wireless station and to the government line at La Playa.

San Francisco (Cal.) Municipal Railway.—Work has been begun by F. Rolandi on the construction of this municipal line on Stockton Street in San Francisco.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—Two loop extensions will be built at once by this company in St. Petersburg. Contracts have been awarded by this company to build extensions of its tracks to connect its North Ninth Street line and the Coffee Pot loop line in St. Petersburg.

Washington & Lincolnton Railroad, Lincolnton, Ga.—Surveys have been completed and arrangements are being made to begin grading at once on this 25-mile line to connect Washington and Lincolnton. The following officers have been elected: J. R. Dyson, president; H. W. Quin, secretary; E. A. Barnett, M. P. Pope and M. A. Pharr, directors. [E. R. J., June 6, '14.]

***Murphysboro & Southern Illinois Railway, Murphysboro, Ill.**—Right-of-way is being obtained by this company for its 7-mile electric line between Murphysboro and Carbondale. Among those interested are: A. B. Minton, Murphysboro; Charles H. Clay and Edward Flad.

La Salle County Electric Railroad, Ottawa, Ill.—Surveys have been completed between Ottawa and Mendota, 28 miles, grading has been completed between Ottawa and Prairie Center, 14 miles, and grading is now in progress from Prairie Center to Mendota, 14 miles. This 28-mile line will connect Ottawa, Prairie Center, Triumph and Mendota. [E. R. J., June 20, '14.]

Fort Wayne & Northwestern Railroad, Fort Wayne, Ind.—This company is asked to consider plans to build a 5-mile extension from Kendallville to Rome City.

Marion & Bluffton Traction Company, Indianapolis, Ind.—This company, formerly the Marion, Bluffton & Eastern Traction Company, has been recently organized and has elected the following officers: James W. Sale, president; Abram Simmons, vice-president; Dell Locke, treasurer, and W. A. Patton, secretary and general manager. [E. R. J., June 13, '14.]

Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia.—The extension south to Center Point has been placed in operation by this company. The extension from Center Point to Cedar Rapids will be completed before the end of the year.

Independence, Neodesha & Topeka Traction Company, Independence, Kan.—Petitions are being circulated at Neodesha, Kan., calling for an early election to vote bonds to the extent of $10,000 to this company, which proposes to build an electric line from Neodesha to Independence. T. J. Booth, president. [E. R. J., April 18, '14.]

Joplin & Pittsburg Railway, Pittsburg, Kan.—This company contemplates extending its tracks in Joplin, Mo. Business men of the city have offered a bonus for extensions to Parkview and to Fairview cemetery. Universal transfers also are proposed in order to give access to Schifferdecker Park. William A. Satterlee, Pittsburg, Kan., general manager.

Topeka (Kan.) Railway.—This company has placed in operation its line to Gage Park.

Fort Fairfield, Maine.—At a recent meeting of the Board of Trade of Fort Fairfield plans were considered to build an electric railway in Fort Fairfield and extend it to Limestone, Caribou, Caswell and other points. Eben S. Hopkins, Fort Fairfield, is interested. [E. R. J., June 13, '14.]

United Railways & Electric Company, Baltimore, Md.—This company has been ordered by the Public Service Commission of the State of Maryland to extend its Belair road line from Overlea, its present terminus, to Neckar, a distance of 3 miles.

Worcester (Mass.) Consolidated Street Railway.—This company is asked to consider plans to build a 1-mile extension from June Street and Chandler Street to Park Avenue and Chandler Street in Worcester.

Hattiesburg (Miss.) Traction Company.—This company is asked to extend its lines to the Woman's College in Hattiesburg.

***Brookfield, Mo.**—Plans are being considered to build an electric railway to connect Brookfield, Marceline, Wien, Bynumville, Prairie Hill, Clifton Hill, Randolph Springs, Huntsville and Moberly. No names are yet given of those interested in the project.

***Columbia, Mo.**—F. S. Mordaunt, Chicago, W. J. Delaney, Frank Kidd and J. N. Trescott, St. Louis, contemplate building an electric railway in Columbia and extend it to an amusement park which they propose to build.

Stone Harbor (N. J.) Terminal Railroad.—This company has completed the electrification of its line between Cape May Court House and Stone Harbor. The new central power plant of the Electric Light & Power Company at Cape May Court House furnishes power for the Stone Harbor Terminal Railroad. Plans are being discussed for an electric line to run the entire length of Seven-Mile Beach, crossing Hereford Inlet by bridge and connecting with the Wildwood electric line at Anglesea.

Schenectady (N. Y.) Railway.—Plans are being prepared by this company for extensions to the Grand Boulevard section, Carman and South Schenectady. Applications will soon be made to the Council for franchises.

Wilmington-Carolina Beach Railway, Wilmington, N. C.—Plans are being formulated by this company to build a 15-mile electric line to connect Wilmington, Carolina and Wilmington beaches. George F. Meares, Wilmington, is interested. [E. R. J., April 12, '13.]

Cleveland & Youngstown Railway, Columbus, Ohio.—Work has been begun on the line which is to extend from the downtown section of Cleveland through Kingsbury Run Valley to Shaker Lakes.

***Windsor, Ont.**—On June 9 the City Council of Windsor voted to ask the Ontario Hydro-Electric Commission to report on cost of construction, equipment and operation of electric railways to begin at a point in Sandwich West, and connect by one or more routes Sandwich. Windsor, Walkerville, Ford City, Sandwich East, and Maidstone, and villages of St. Claire and Belle River.

***Dallas, Tex.**—J. R. Babcock, secretary of the Chamber of Commerce, Dallas, A. M. Matson and J. A. Kemp, Wichita Falls, are considering plans to build an electric railway from Dallas to Wichita Falls, via Denton, about 125 miles.

Uniontown (Pa.) Radial Street Railway.—This company, which plans to build an electric line between Uniontown and Connellsville, via Oliver, has completed the section of the line between Connellsville and Oliver and will begin work on the line between Oliver and Uniontown at once. The contract for the construction of this section of the line was awarded to Reagan, Lynch & Company. Work will also be begun at once to build a new bridge over Redstone Creek in Uniontown.

Ogden, Logan & Idaho Railroad, Ogden, Utah.—This company, which is an amalgamation of the Ogden Rapid Transit Company and the Logan Rapid Transit Company. plans to begin work as soon as the right-of-way has been obtained by the Ogden Rapid Transit Company on the section of the line in Cache Valley. This will be the final link in the electric line to connect Ogden with Preston, Idaho, via Brigham, Wellsville, Logan and Lewiston.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex.—Improvements of this company's lines in Corpus Christi are being contemplated.

Portland Railway, Light & Power Company, Portland, Ore.—Material has been ordered and work will be begun at once by this company on the extension through Taylor's Astoria. As soon as this line is completed an extension to Alderbrook will be built.

Tarrant County Traction Company, Fort Worth, Tex.—The Hillsboro Chamber of Commerce has made a tentative proposition to this company to build an electric railway through Hillsboro, offering it a right-of-way and a bonus.

Houston (Tex.) Electric Company.—The bridge across White Oak Bayou has been completed and track laying has nearly been finished on this company's extension through Sunset Heights, northwest of Houston. It is planned to have this line in operation within the next few weeks.

Southwestern Traction Company, Temple, Tex.—Extensive improvements are under way to the tracks and crossings of this railway within the city limits of Temple.

SHOPS AND BUILDINGS

Union Traction Company of Indiana, Anderson, Ind.—Officials of this company spent several days in Marion recently and inspected the sites offered to them as locations for the new terminal station for this company. The city hall and several other sites were considered, the representatives of the company favoring the city hall site above all. This will be available only in case the city vacates this building for the City Market House. Definite action is expected soon.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—This company has opened its new offices at Sixth Street and Francis Street in St. Joseph.

Northern Ohio Traction & Light Company, Akron, Ohio.—A lease on a building about one block from the public square in Canton has been obtained by this company and this will be converted into a terminal station. Alterations will entail a cost of about $20,000 and a like amount will be required to lay tracks for the approach. It will be ready for use about Sept. 1. The Stark Electric Railway Company may use the same station. The change is being made to relieve congestion in the central part of Canton.

Pittsburgh (Pa.) Railways.—A new structure is to be added to the group of buildings known as the Craft Avenue carhouses of this company in Pittsburgh. The structure will be 32 ft. x 65 ft. and of brick, stone and steel construction. Its appearance will be similar to the present office and substation building on this property.

POWER HOUSES AND SUBSTATIONS

Pacific Gas & Electric Company, San Francisco, Cal.—An order has been placed by this company for one 1000-kw, 650-volt, six-phase, sixty-cycle, 600 r.p.m. rotary converter. The apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Centerville Light & Traction Company, Centerville, Ia.—This company has placed a contract for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter; one 200-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter. This apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Atlantic Shore Electric Railway, Sanford, Maine.—An order has been placed by this company with the Westinghouse Electric & Manufacturing Company for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter.

Benton Harbor & St. Joe Railway & Light Company, Benton Harbor, Mich.—A contract has been placed by this company for one 300-kw, 600-volt, d.c., three-phase, sixty-cycle, 1200 r.p.m. rotary converter. This apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Public Service Corporation, Newark, N. J.—Arrangements are under way by the Public Service Electric Company for the construction of a power house at Point-no-Point on the Passaic River to be used for the development of 200,000-hp to supply Essex County. The cost of the plant is to be about $2,000,000.

Hershey (Pa.) Traction Company.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter.

Manufactures and Supplies

ROLLING STOCK

Springfield (Mass.) Street Railway is contemplating the purchase of about ten city passenger cars.

Sao Paulo (Brazil) Tramways has ordered three closed cars from The J. G. Brill Company.

Worcester (Mass.) Consolidated Street Railway is contemplating the purchase of about ten city passenger cars.

Chicago (Ill.) Surface Lines announce that bids will be received until July 8 on 228 semi-steel, double-end motor cars.

Rockland, Thomaston & Camden Street Railway, Rockland, Me., expects to purchase one double-truck snow plow, with body for mail, baggage and freight.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., has ordered ten 51 ft. 2 in., all-steel, interurban, arched-roof passenger cars from the Cincinnati Car Company through W. R. Kerschner, its Eastern representative.

Steubenville & East Liverpool Railway & Light Company, East Liverpool, Ohio, has ordered four double-truck cars from the G. C. Kuhlman Car Company. The cars will be equipped with Baldwin trucks and General Electric motors and air equipment.

Southern Traction Company, Dallas, Tex., has ordered twelve city car bodies and truck equipment from the St. Louis Car Company. The order for the electrical equipment for these cars has been placed with the Southwest General Electric Company. This company has also ordered GE electrical equipment to convert four of its city trail cars to motor cars.

Albany Southern Railroad, Albany, N. Y., is giving several of its interurban cars a general overhauling. The company is removing the varnish and replacing the old with new woodwork and is placing sheet steel on the sides and new roof which makes the cars practically steel cars. It is proposed to continue this practice until all of the cars are changed in this way.

Sacramento Electric, Gas & Railway Company, Sacramento, Cal., has ordered six 41-ft. city passenger cars of the California type from the St. Louis Car Company, through its Pacific Coast agents, Pierson, Roeding & Company, San Francisco, Cal. The cars are to be delivered early in September. With the order is an option on four more cars of the same style which are very similar to the cars which are now in service in Stockton and Fresno. The new cars will have seating capacity for forty-four passengers. They will be mounted on Brill 75-E trucks with a GE-No. 203 motor on each truck. The car bodies will have semi-steel bottom frame, flush platforms, monitor deck roof and ash interior finish. Rattan cross-seats will be installed in the closed section and wood slat seats of the Brill "Winner" type in the open sections.

TRADE NOTES

Hart & Hegeman Manufacturing Company, Hartford, Conn., has been appointed exclusive selling agent for the H. T. Paiste Company, Philadelphia, Pa.

The J. G. Brill Company, Philadelphia, Pa., at a recent meeting of its board of directors, appointed W. H. Heulings, Jr., as vice-president, J. W. Rawle as second vice-president and E. P. Rawle as treasurer.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has organized a bronze department for the manufacturing of titanium bronze specialties under its various patents and has appointed Wm. M. Corse as manager of this department. Mr. Corse was formerly works manager of the Lumen Bearing Company, Buffalo, N. Y., and recently general manager of the Empire Smelting Company.

American Mason Safety Tread Company, New York, N. Y., has received an order from the Boston Transit Commission to equip with safety treads the new subway stations of the Boston Elevated Railway. An initial order for about 2000 sq. ft. of safety tread for equipping the Massachusetts and Copley stations has already been placed. Since Jan. 1 this company has furnished somewhat over 10,000 sq. ft. of safety tread to the Interborough Rapid Transit Company for the stairs and platforms of its subway and elevated stations.

I. Brooks Clarke, formerly superintendent of the New York & Long Island Traction Company, has opened an office at 431 Fifth Avenue, New York, as "safety engineer" for electric traction properties. Mr. Clarke has specialized in this and other closely allied lines of electric railway engineering since he was graduated from Cornell in 1900 and is prepared to advise electric railway companies in regard to the possibilities of reduction of accidents through the proper instruction of trainmen, in the reduction of power consumption in car operation, as well as in the reduction of troubles with train control and with straight and automatic braking for multiple unit operation. If desired, he is prepared to take charge of putting into operation plans of this kind as well as systems for the instruction of employees in efficiency in single car operation or train operation. His experience well fits him for work of this kind. For seven years he was engaged in this work for the Brooklyn Rapid Transit Company, and for the last three years of this time he had the title of assistant superintendent of the elevated lines. For a year he undertook the same work for the Public Service Railway of New Jersey. He was also for three years with the Westinghouse Air Brake Company and for six years in the shops of the Georgia Railway & Electric Company, Atlanta, Ga.

ADVERTISING LITERATURE

J. G. White Management Corporation, New York, N. Y., has issued an attractively printed booklet entitled "The Management of Public Service." The booklet presents a clear and concise discussion of the proper management of public service companies by showing how this ideal may be approached through observance of the following principles: (1) security of investment, due to harmonious working relations with the municipal officials in the community served and the support of public opinion; (2) wise development along systematic and conservative lines of the communities served and the properties serving them; (3) protection from competition by satisfactory quality of service; (4) economical and efficient operation by specialists who keep in touch with unit costs of operation and who are able to give clients the benefits of experience obtained on other properties; (5) proper maintenance and renewal of physical property; (6) establishment of a clear and comprehensive accounting system; (7) assisting clients in the general financing of their properties and marketing of their securities; (8) proper and thorough engineering and construction at reasonable cost; (9) a central and efficient purchasing department, which by large volume and wide range of purchases may be in a position to insure extremely low prices; (10) confidential and loyal relations with clients.

NEW PUBLICATION

Proceedings of National Association of Railway Commissioners. 612 pages. Law Reporting Company, New York, N. Y. Black Cloth, $1.

This volume is a complete report of the proceedings of the National Association of Railway Commissioners at the twenty-fifth annual convention held at Washington, D. C., Oct. 28-31, 1913. The chief value of the book to the electric railway industry lies in the fact that it contains the complete committee reports and papers before the convention on such subjects as the relation of service to rate making, accounting side of rate making, statistics and accounts of electric railways, depreciation and its relation to the fair value, elements of appreciation in valuation, railway capitalization laws, valuation decisions, relation between valuation and rate of return and the like. Abstracts of the most important of these reports and papers were published in the issues of the ELECTRIC RAILWAY JOURNAL of Nov. 1 and Nov. 8, 1913. Since the regulative powers of the commissioners who are members of this national association have been extended in many States to cover public utilities other than steam roads, the proceedings of the national body are becoming of increasing importance to the general public utility field.

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EFFICIENCY AND PERSONALITY

At the Bluff Point convention of the New York Electric Railway Association, reported in last week's issue of the ELECTRIC RAILWAY JOURNAL, three papers were presented under the vague but fashionable title of "Efficiency." In suggesting this title the program committee obviously intended to allow great latitude of treatment. There was, however, a thread of unity in the papers, in spite of the fact that they were written independently and from three points of view. As Mr. Sawyer pointed out, the term "Efficiency," as understood in its application to electric railways, is simply old-fashioned good management. To paraphrase a famous quotation, "that which we call efficiency by any other name would bring as good results." The thread of unity which appears in the papers of Messrs. Bagg and Witherwax and which binds them to Mr. Sawyer's "good management" paper, is the recognition of personality as the basis of efficiency. The officials must by personality inspire the men in the ranks; the latter must take personal pride in their work and the organization of which this work is a function, if not the function.

THE HUMAN ELEMENT IN WORK

In these days of scientific management there is a tendency to ignore the human element in humanity; to create industrial machines which shall turn out their products at maximum speed and at minimum cost. To be sure, the attempt is made to remunerate the workers handsomely for their labor with the purpose of furnishing them the wherewithal to live more comfortably. So far as such a process is mechanical, however, it cannot yield the best results. Man is not a machine and he "does not live by bread alone," no matter how much of it he gets. We therefore must heartily agree with the writers of the papers in question in such typical thoughts as "efficiency is the result of that kind of influence that makes for co-operation and a desire to serve," "the whole organization should understand that the higher officials are ready to encourage anything that will stop waste and increase efficiency" and "the greatest good to the greatest number is brought about by efficient co-operation." A prime requisite for promotion to positions of authority should be the possession of those distinctly human qualities which will inspire affection as well as respect. We are all attracted to the organization in which the manager is referred to as "the chief," "the boss," "the mogul," or some such human term.

DEFECTS OF THE CROSSER REPORT

It would be difficult to conceive a congressional report in favor of a measure of great and far-reaching consequence that entered less into the merits of the proceeding than that filed by Representative Robert Crosser of Ohio in support of his bill for the government ownership of the street railways of the District of Columbia. Mr. Crosser writes glibly enough about the "great advantages" of government ownership, of better service and lower fares and higher wages. But he gives no basis for his belief that any such thing would happen if the government of the United States were to undertake to run the street railway systems of the nation's capital. Nor is there a word as to the machinery by which such an enterprise would be operated. The members of the Public Utility Commission who testified before the House committee admitted freely their inability to cope with the problem of regulating the lines within the district. This certainly makes it reasonable to doubt their ability to operate. But Mr. Crosser offers no solution for this question. As to the great financial problem involved in this enterprise there is not a line in the report except charges that the existing companies are overcapitalized. How much it would cost to procure them under the condemnation proceedings outlined in the bill, Mr. Crosser does not say. He contents himself by making personal estimates that the physical valuation of the existing lines approximates $25,000,000. This, he points out, is half the capitalization. He does not suggest, however, that the government would confiscate the other half of the market value of the securities outstanding. His bill provides that the necessary funds are to be raised by the sale of a 3.65 per cent issue of bonds in the name of the District of Columbia, but that this issue is to be backed up only by a lien on the revenues of the companies. Mr. Crosser does not suggest any market where bonds on such a tenuous foundation could be sold at par. Nor does he intimate where the money is to come from that will pay the interest and the sinking fund charges provided for in the bill, if the revenues prove inadequate.

THE SITUATION AT WASHINGTON

Although a considerable portion of the hearings held were devoted to a futile attempt to discover any popular sentiment in the District of Columbia in favor of government ownership, Mr. Crosser carefully avoids mentioning this phase of the question. As a representative from Cleveland, he is eagerly willing to fasten upon the taxpayers of the District of Columbia an experiment for which they will have to pay the price—not he. According to every indication the people of Washington, so far as they have given any thought to the matter at all, are opposed to the plan of saddling the expense upon them. The fact is that the municipal ownership propaganda in Washington is an importation from Cleveland. And it is interesting to note that Mr. Crosser devotes a considerable part of his report to a description of the situation in that city and that his first act, after filing his report, was to hurry to Cleveland to handle his campaign for renomination and re-election. Evidently his fight for the "Tom Johnson idea" in the city of Washington was intended to play an important part in his own campaign at home. But the proposal to initiate municipal ownership there has focused national attention upon the question and was the means at the hearings of bringing out many expressions of opinion opposed to the plan, and of exposing many of the inherent weaknesses of municipal ownership of city railways which perhaps would not have been presented if the city under consideration had been less prominent than the national capital.

THE ADVANCE OF THE STEAM TURBINE In this issue of the ELECTRIC RAILWAY JOURNAL we print an extended abstract of the report of the committee on prime movers of the American Institute of Electrical Engineers. The remarkable feature of this report is the record which it contains of the triumph of the designers of the steam turbine in very greatly improving the thermal efficiency of this type of prime mover. In very large sizes the steam turbine now rivals the gas engine from the standpoint of efficiency. It is slightly superior to the gas engine when carrying a load of more than one-half its capacity. From a thermal standpoint the oil engine is the only one now possessing an important advantage over the well-loaded steam turbine of large size. The steam turbine won its way into favor primarily because it occupied small floor space and was light in weight per unit of output. These virtues it possessed because of the high speed of its rotating parts and its structural simplicity. In economy of steam consumption it had as a formidable and well entrenched rival the highly developed Corliss engine. At first the steam consumption of the turbine was excessive. The proper operating conditions had not been worked out, and many new and difficult design problems had to be solved. The steam turbine requires high-pressure, superheated steam, good vacuum and careful loading for best results. The report shows that, given proper conditions, turbines can now be expected to produce a thermal efficiency of 20 per cent or more in units of 2000-kw capacity and upwards. Of course, the greatest advantage possessed by the steam turbine is its low cost per unit of output capacity. This cost is so low and the fuel economy sufficiently high that it is difficult to generate energy more cheaply even by water power where a considerable steam reserve is necessary.

HIGHWAY CROSSING SIGNALS

Increased attention has lately been given the problem of choice and installation of highway crossing signals. This quite probably is due in a large measure to the automobile as well as to the more and more insistent demand on the part of the public for greater service refinements and protection. So many types of highway crossing signal apparatus are available for use that some views about the choice and installation of highway crossing protection systems may now be of particular interest.

Highway crossing signals perform two functions. First, they designate the location of crossings between railways and highways, and second, they announce the approach of trains to crossings.

Probably the simplest form of signal for performing the first function, that of informing the traveler on the highway that he is approaching a railroad intersection, is the old-fashioned "stop, look, listen" signboard. Somewhat similar boards are now being used as distance signals for crossing bells. They are placed near the highway and a short distance away from the railway track, and serve to notify the traveler that he must be on guard because he will shortly reach a more or less hazardous location.

One road in Iowa reports most satisfactory results from these highway distance signals. It has installed such signs close to the highway about 500 ft. in advance of the crossings. The signs read "Railroad Crossing 500 ft." They are illuminated at night, and their chief value is that of giving a warning to the tourist and thoughtless driver who may not know or realize the close proximity of the railroad crossing. Almost any driver, after passing such a sign, will take measures to assure that there is no danger in crossing the tracks and will obey the crossing signal at the tracks.

The second function of the highway crossing signal, that of announcing an oncoming train, is more difficult of performance. Various means have been employed successfully. Among the more common types now available for installation on electric railways are the simple illuminated crossing sign, the intermittently illuminated sign, which gives repeated flashes of light, the signal with moving parts imitating the waving or swinging of a red blade or flag, and various combinations of these aspects, all designed to be arrestive. Combined with these visible indications are audible indications such as bells, gongs and sirens. Another distinct type of mechanical crossing signal is the barrier or gate. This consists of one or more long poles from which are hung ticklers that make a screen across the roadway. In emergency an individual or vehicle may pass through this screen, and thus no one can be caught between the gates, but the effect is to block the crossing positively to the highway traveler.

The flashing lights have two aspects: first, the stationary lamp with its continuous or intermittent illumination, and second, the swinging lamp or row of lamps, the lighting of which is so timed as to stimulate the swinging lantern. In daylight none of these illuminative effects is of sufficient arrestiveness and so they are combined with various types of visible and audible signaling.

The prime requisite in a highway crossing signal is reliability. Unless a signal is very reliable it will not command the respect of the frequent traveler, and it may even introduce a hazard from this cause. A highway crossing signal should be so controlled that the train, by passing certain limits or being within a certain section, will cause itself to be announced at the crossing. There are two forms of control, intermittent and continuous.

With the intermittent control the electrical signal release is actuated either by the passage of the car wheels or the trolley wheel. The car-wheel type of intermittent control may be the old-style steam railroad track instrument, a short insulated track section, or a contact bar, placed adjacent to the rail and so located that the flange or tread of the wheel will touch it. Another type successfully used is that in which the intermittent control is obtained by the movement of the rail. This movement in one make of signals is mechanically multiplied and drives a small generator which supplies an electrical impulse to release the bell. In another kind the movement of the rails opens or closes balanced contacts attached to the base or side of the rail.

By each of the foregoing intermittent-control devices the highway crossing signal is started and stopped by the passage of any car, whether it is electrically equipped or not. The second, and very common form of intermittent control (trolley contactor type), is actuated by a trolley wheel passing along the wire, the wheel either mechanically throwing a switch or electrically making a desired contact. Contrasted with these intermittent forms of control is the continuous control obtained with track circuits to which are connected interlocking relays that in turn energize the crossing bells and lamps whenever a car is passing through or standing within the block.

A feature of importance which should be recognized in the design of highway crossing protective apparatus, in addition to that of reliability, is that of continuity of signaling, even though more than one train may enter the ringing limits at one time and, later, one train should pass out or both stop for some time and then proceed across the highway. Thus car-counting devices are an important feature in the trolley-contact control. It is desirable to arrange the control so that if several cars pass the contactor and one or more then recross it, the bell will keep ringing as long as there is one car inside of the protected zone. Of course the continuous track circuit performs this function in the ideal way. But on an electric railway means must be taken to carry the return propulsion current through the track-circuit protected territory. With trolley-contact control and with mechanical rail control the desirable feature just mentioned may be approached by placing extra contactors or restarters between the first starter and the crossing.

There is a wide variety of highway crossing signal apparatus available for installation on electric railways, but even with the good work which has been done in the past here is a field of wide scope that is growing wider and wider and one which can very profitably be studied by the manufacturer. And it should be remembered that no one can successfully develop and market a highway crossing signal without an intimate knowledge of the railway companies' requirements.

WHERE THE MEN HELP

A recent incident on an interurban electric railway seems worthy of mention in these days when silent sabotage has become an accepted doctrine among a certain class of labor leaders. This line does a large baggage business both on service and passenger cars. The rates for material carried on the baggage cars were on a weight and classification basis, but there was no limitation to the size or contents of the packages which could be carried on the passenger cars. The result was that shippers could often save money by sending bundles via the passenger cars at a loss to the railway and at great inconvenience to the crews and car riders. The management finally decided to curb this practice by issuing limiting regulations and specifying the use of certain labels. It was fondly believed that the evil had thus been cured until several trainmen voluntarily advised the general manager that the labels were being attached to material that should have gone at higher rates by way of the baggage cars. The best part of this story is that the men had not even been requested to see that the shippers obeyed the new regulations. As a result of this watchfulness by the trainmen, the company is likely to increase its baggage and package revenue by several thousands of dollars a year.

There is no doubt that by intelligent co-operation between the men and the company the net receipts of the company can often be greatly increased. A great many companies are recognizing this condition in their campaigns of "safety first" for reducing accidents and by the introduction of methods of rating motormen in their use of energy. These are steps in the right direction but by no means limit the opportunities for effective co-operation. A motorman can do more than save current and avoid accidents and report any defects he may see on the line. He can keep a sharp lookout for passengers who are waiting to board the car, and on a city line he can pick up a good many short-haul passengers who, if they are passed by the first car which they attempt to take, will often walk to their destination. This duty of watching for waiting passengers is also one in which the conductor can assist greatly, if he does not take the initiative. Indeed, some of the European lines have offered premiums to the different car crews for the number of passengers carried on their cars on the theory that it will encourage watchfulness in behalf of the company in this particular direction.

Montreal Tramways Shops at Youville

A Roofed Transfer Table, Clean Air Heating and Ventilation, Full Clearance Mill Room, Extensive Manufacturing Facilities and Simplified Storage and Supply Practices are Among the General Features in Addition to the Individual Shop Methods

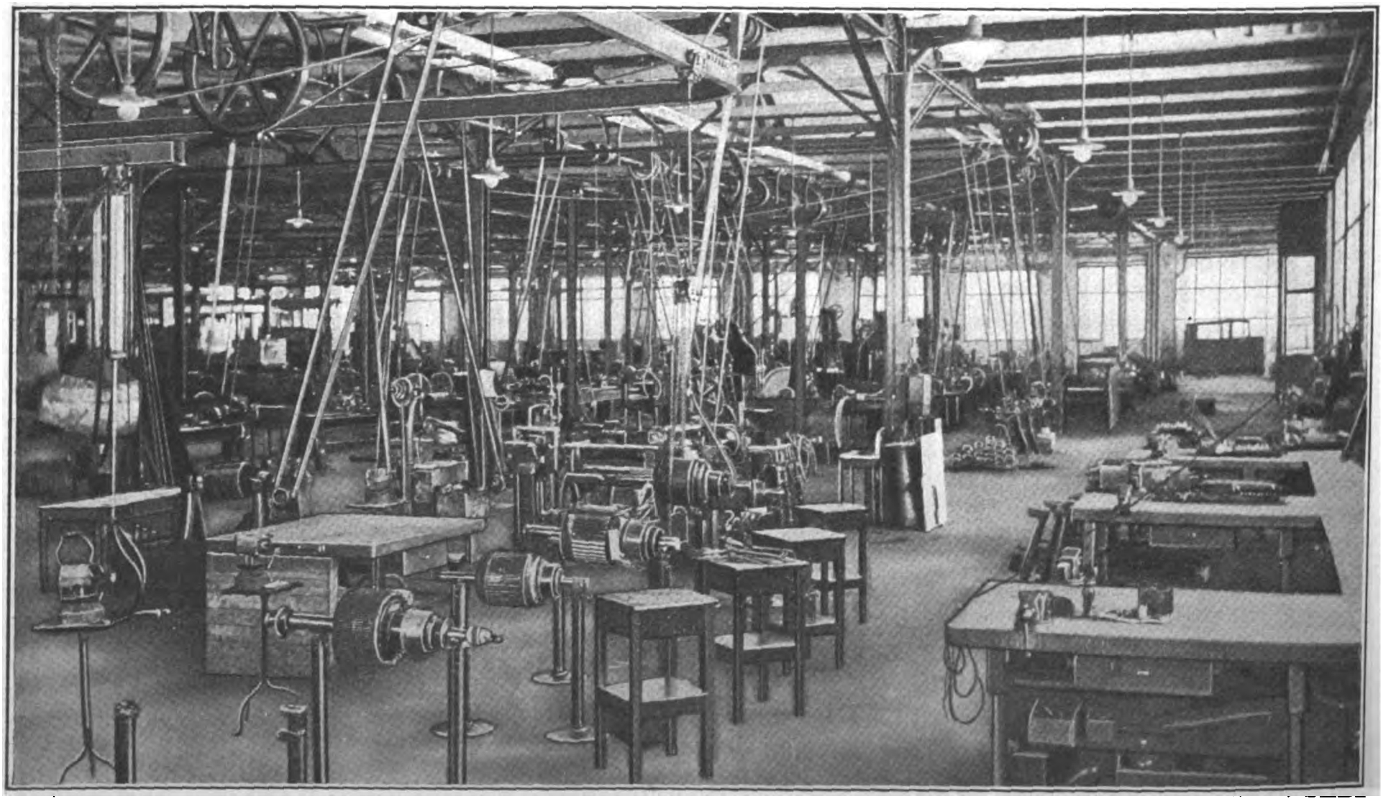
The Youville shops of the Montreal Tramways, which were completed about a year ago, afford a good example of an installation located far enough from the heart of the system to permit satisfactory areas for each department with ample extra ground for future expansion. Dead mileage is the only objection that can be urged against the location of shops as far as 5 miles from the center of the city, but in Montreal this factor is very small because all carhouses are equipped for replacement work. The Youville plant serves for the complete overhauling of cars, which is carried on at approximately annual intervals, for the large amount of home manufacturing required by Canadian conditions and for the installation of equipment on car bodies as received from the builders. At this time, the company is operating 850 cars, including 200 new ones which were equipped at Youville during the past twelve months. An additional order of seventy cars will be completed shortly.

The layout as hereinafter described was designed and fitted out under the general direction of D. E. Blair, superintendent of rolling stock, with Charles Remelius as consulting engineer during a part of the planning and construction period.

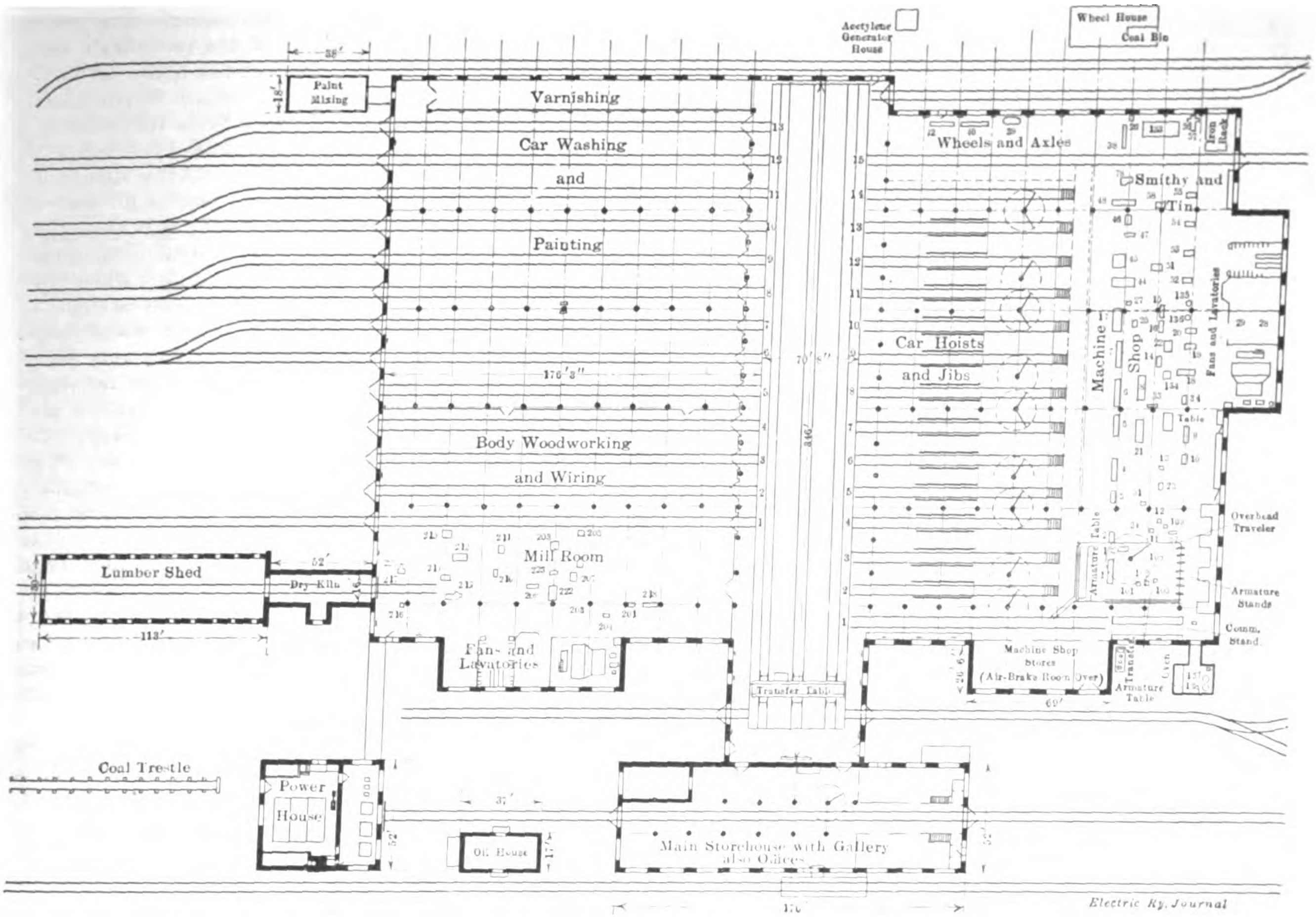
GENERAL LAYOUT

The shops cover an area 4800 ft. long x 570 ft. wide, the individual sections totaling 148,186 sq. ft. as shown in the detail tabulation under the accompanying plan. All of the important departments are housed in one fairly rectangular structure, but several small buildings are placed either adjacent to or at some distance from the property to isolate such fire risks as the oil house, paint-mixing room, power house, acetylene-generator house, lumber shed with dry kiln, etc. On account of this plan, the main building is practically open throughout except for the cheap corrugated iron partitions which separate the painting and woodworking sections from one another and from the transfer table. All buildings are constructed of brick on concrete foundations. The shop sections are furnished with saw-tooth roofs facing northeast, but the transfer table between them has a high monitor roof. Experience has indicated that a cheaper form of roof would have been satisfactory over the transfer table because the adjoining shops transmit ample light for such simple work as car movement. Cinder is used for the floor of the transfer table section, but in the shops the company uses a foot-easy and non-chipping mastic asphalt which is guaranteed for ten years. This floor is so elastic that wheel marks, furrows and the like disappear in time or can be rolled out.

The most striking point about the general design is the use of the covered transfer table which cuts the main structure in half and serves as the go-between of the truck and motor overhaul sections on one side and of the body overhaul sections on the other. Primarily, the transfer table was covered simply to insure freedom from snow, but the use of a covered table has several other advantages. Thus, the sheltered location and infrequent opening of this bay keep the shops free from exposure to the cold, enable the shifting crew to work in comfort, save time through the elimination of track doors, and by permitting uniform heating in winter



MONTREAL SHOPS—WINDING ROOM, LOOKING EAST, AND SHOWING THE INDEPENDENT OVERHEAD TRACK FOR THIS SECTION—AIR HOIST AND OTHER UTILITIES LIKE ARMATURE STANDS, WORK BENCHES OPPOSITE WINDOWS, ETC.


Acetylene Generator House
Wheel House
Coal Bin
Paint Mixing
Varnishing
Car Washing
and
Painting
176' 3"
Body Woodworking
and Wiring
Mill Room
Lumber Shed
Dry Kiln
52'
113'
Fans and Lavatories
Transfer Table
70' 6"
Wheels and Axles
Iron Rack
Smithy and Tin
Fans and Lavatories
Car Hoists
and Jibs
Machine Shop
Table
Armature Table
Overhead Traveler
Armature Stands
Comm. Stand
Machine Shop Stores (Air-Brake Room Over)
Armature Table
Oven
69'
Coal Trestle
Power House
37'
Oil House
Main Storehouse with Gallery also Offices
176'
Electric Ry. Journal

MONTREAL SHOPS—GENERAL ARRANGEMENT AND LAYOUT OF MACHINES AT YOUVILLE SHOPS

INDEX TO MACHINES

1 22" engine lathe.
2 18" engine lathe.
3 15" engine lathe.
4 20" engine lathe.
5 20" engine lathe.
6 20" engine lathe.
7 24" engine lathe.
8 24" engine lathe.
9 Turret lathe.
10 Speed lathe.
11 20" drill.
12 Two-spindle drill.
13 Three-spindle drill.
14 20" drill.
15 34" drill.
16 26" drill.
17 Three-spindle drill.
18 Planer.
19 24" shaper.
20 Shaper.
21 Horizontal boring and milling machine.
22 Double head bolt cutter.
23 Shear.
24 Wet tool grinder.
25 Wet tool grinder.
26 Wet tool grinder.
27 Dry grinder, double.
28 Tool room grinder.
29 Drill grinder.
30 Dry grinder, double.
31 Power hack saw.
32 Universal miller.
33 Grindstone.
34 Buffing machine.
35 Centering machine.
36 Air compressor, direct drive.
37 Air compressor, geared.
38 Axle straightener.
39 Wheel boring machine.
40 Wheel press.
42 Axle lathe.
43 Plate rolls.
44 Bulldozer.
45 Oil furnace, 6'x6'.
46 Oil furnace, 4'x2'.
47 Air hammer.
48 Punch and shear.
49 Platform scale.
50 Down-draft forge.
51 Down-draft forge.
52 Down-draft forge.
53 Down-draft forge.
54 Down-draft forge.
55 Down-draft forge.
56 Monogram exhauster.
57 Blast blower No. 2.
58 Blast blower No. 3.
59 Blast blower No. 8.
78 Cold saw.
87 Pipe threading machine.
101 Winding machine.
102 Winding machine.
103 Winding machine.
104 Exhauster.
108 Armature bonder.
109 Printers cutter.
110 Metal saw.
132 Commutator slotter.
133 Steel wheel lathe.
134 Single head bolt cutter.
135 Babbitt melting pot.
136 Babbitt melting pot.
137 Impregnating tank.
138 Impregnating tank.
201 Jig saw.
202 Saw gummer.
203 Tool grinder.
204 Iron drill.
205 Drum sander, single.
206 Drum sander, triple.
207 Dowel machine.
208 Horizontal boring machine.
209 Band saw.
210 Tenon machine.
211 Shaper.
212 Jointer.
213 Four-side molder.
214 Surfacer.
215 Rip saw.
216 Solid chisel mortise.
217 Cross-cut saw.
218 Pattern makers lathe.
222 Hollow chisel mortise.
223 Chain mortise.
225 Exhaust blower.

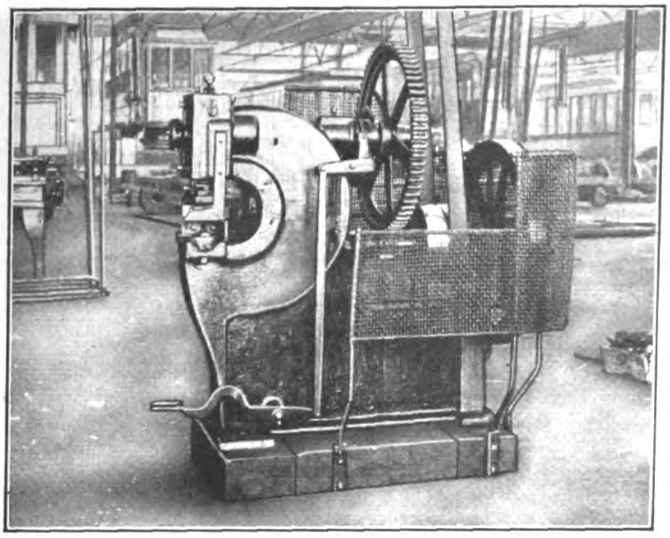
make it possible for newly painted and varnished cars to be shifted from track to track with perfect safety. The table was built up of I-beams and old motor and control with other odds and ends at a cost of $480 exclusive of motor, compared with a bid cost of $1,200 from an outside contractor. It is operated by means of a protected third-rail with side contact.

The simple, direct course of a car which enters the shop for overhauling is so clearly indicated on the plan that no comment is necessary. Of the fifteen tracks on the metal-working and electrical side, twelve are furnished with pits 104 ft. long and with motor-driven screw hoists of I-beam construction. A thirteenth track is also furnished with pits; it has no car hoists, but like the others is served by jib hoists. The first track on the entrance side is within range of a jib and is used for handling material to and from the armature room. The last track on the same side is used for the wheel and axle shop, but unlike the others it is continued to a yard loop as shown.

The shops behind tracks Nos. 1 to 14 are arranged in the following order: electrical, main machine and blacksmith. The wheel and axle shop is placed between the wall and its serving track. The extensions on this side of the building comprise a machine shop store with air-brake repair room on a mezzanine floor, a coil-baking oven and impregnating tanks and a fan room for Sturtevant heater and a toilet room.

On the opposite side of the shops the first building is the mill room. Of the thirteen tracks which lead from the transfer table and are 176 ft. 3 in. long, four are used for body woodwork; eight for car washing and painting and one for panel varnishing.

The key numbers and the list on the accompanying plan show the wide variety of tools in service in all shop divisions.



MONTREAL SHOPS—SMALL SHEAR SHOWING GEAR PROTECTION

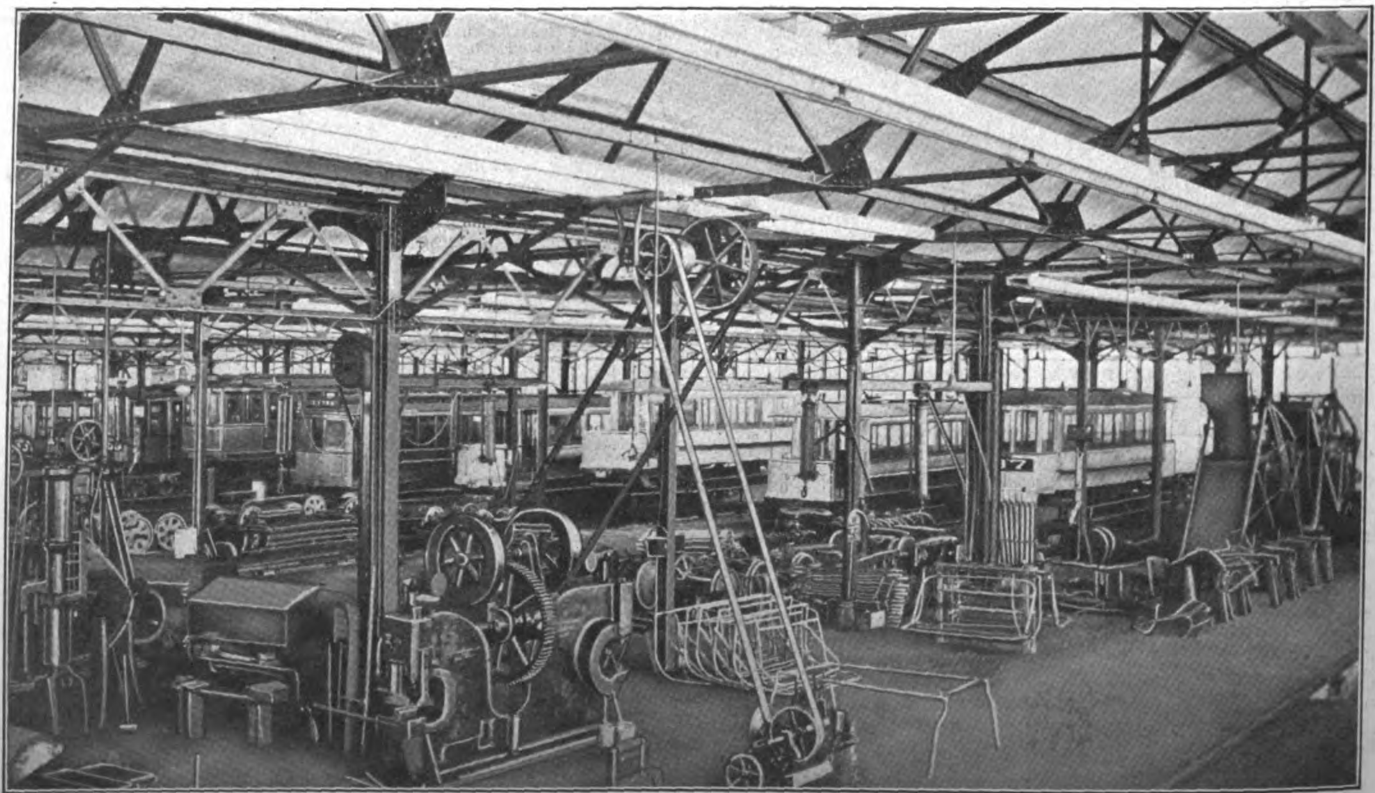
Heating, ventilation and lighting are supplied from an isolated power house. The latter is divided into a transformer room of 180-kw total capacity where purchased energy transmitted at 13,000 volts is stepped down to 110 volts and 220 volts for the lighting and the machine tool operations respectively, and a boiler room with three 125-hp boilers which supply steam at 100-lb. pressure for the indirect heating system. The electrical room also contains a 500-kw motor-generator set for the suburban railway service.

The steam is transmitted via a tunnel to two fan rooms, one alongside the mill room and the other alongside the machine shop. Most of the outlets of the hot-air duct from the heating apparatus are in the varnish and paint rooms where it is desirable to maintain a temperature of 68 deg. to 70 deg. Fahr. On its backward turn the warm air passes through the paint shop to the working sections and the mill room. The mill room is so located that the effect of the downdraft exhaust system is to confine the dust-laden air to that section. The result is that only clean air is reheated. The proportion of air which is drawn from the building by the mill room exhauster is replaced by fresh air which enters an 8-ft. x 2-ft. opening in the side wall close to the heating coils. When the heated air leaves the circulating fan it passes through a tunnel, the floor of which is covered with water about 3 in. deep. During the first few months of operation, when the mill room was operated without an exhaust system, a large quantity of dust was collected in this water trap. However, since the exhausters were started, very little dust gets into the tunnel. The water trap not only catches any dust particles but also humidifies the air, which is very desirable for paint and varnish work because of the dry winter climate of Montreal. The object of circulating the air from the mill-room plant as described is to give the paint shop the cleanest and warmest air; furthermore, the mill room, like the machine shop, creates quite an appreciable heat from the operation of its machine tools. Thermometers are installed throughout at convenient intervals to record the drop in temperature, and the outlets may be closed one by one as desired. In practice, the fireman reads only the end thermometers and regulates the steam supply and fan speed according to the readings.

The heating and ventilation of the metal-working shops presented an interesting problem on account of the down-draft forges and babbitt furnace therein. By careful tests with streamers the duct outlets and blower fan draft are so regulated that all air currents are directed toward the corner where the down-draft equipment is located. In this way all fumes, smoke, etc., are drawn in by the suction fans to make an odorless, smokeless and smudgeless shop.

Tungsten lamps ranging in capacity from 60 to 250 watts are used throughout for shop lighting. All wiring is in conduit of Crouse-Hinds manufacture.

Compressed air for shop purposes is furnished by two



MONTREAL SHOPS—THE TRUCK MOTOR SECTION, SHOWING A CORNER OF THE SMITHY, WITH FORGES, FENDERS IN COURSE OF MANUFACTURE, BELT DRIVE FOR TOOLS AND SERIES OF PNEUMATIC JIB CRANES

MONTREAL SHOPS—PART OF THE AIR-BRAKE ROOM, SHOWING THE CONVENIENT FORM OF WORK BENCH AND OIL BATH FOR COMPRESSORS

Reavell electrically operated automatic air compressors, each having a capacity of 100 cu. ft. of free air per minute. These compressors and their storage tank are placed in the machine shop fan room.

Attention has already been called to the practice of keeping all combustible departments outside of the main building. Care is also taken to keep only the smallest practicable amounts of inflammable liquids in the building. No oil is stored there over night, compressed air being used to bring it to the shops when it is wanted during the day.

Fire protection is afforded in part by the Reichel thermopile system, the indicator equipment of which is shown in an accompanying cut. The thermopiles are placed at different points in the roof. If the temperature in their vicinity suffers a comparatively sudden rise the thermopiles generate a sufficient voltage to operate a positive contact device with indicator, the mechanism being virtually an adaptation of the principle of the moving coil voltmeter. In operation it was found that the thermopiles were so sensitive that those in the blacksmith shop had to receive another coat of paint. In addition to these thermopiles copper-wire thermostats are installed in the impregnating room, paint storage, oil room, lumber kiln and boiler room. A fire in any of these rooms closes the circuit and causes the lighting of the corresponding lamp on the indicator board and the ringing of an alarm gong. The fire-fighting apparatus comprises wall extinguishers, ten hydrants with 125-lb. city water pressure, chemical and hose wagons and fire pails. A fire brigade is schooled in the handling of this equipment. In spite of these precautions, all the property of the company is fully insured with the underwriters.

SOME EQUIPMENT FEATURES OF THE METAL-WORKING AND ELECTRICAL SHOPS

Brief reference has already been made to the car hoists of the overhauling tracks. These were built at the shops and are operated with old motors. They embody pairs of 12-in. x 30-ft. I-beam carriers which are raised through worm and gear mechanism to a height of 6 ft. above the floor. One double-throw switch is used to enable one control to operate two hoists. The jib hoists so liberally supplied in addition to the car hoists make heavy manual work absolutely unnecessary. The pits themselves are of concrete and are 4 ft. 8 in. deep. Their rails are set on oak blocks embedded in concrete and are flush with the shop floor. In addition to a narrow-gage track on the pit floor for moving equipment, cross-pits are also provided for the convenience of the men. The pit lamps are in wall pockets and are all provided with a 12-ft. extension cord.

Of the manufacturing and repair sections the electrical shop is first in line. The layout of the principal parts is clear from the general plan, but this does not

MONTREAL SHOPS—VIEW OF THE MILL ROOM IN WHICH THE TOOLS HAVE BEEN SPACED FAR ENOUGH APART TO AVOID ALL INTERFERENCE BETWEEN ADJACENT WORKMEN—THE HEATING PLANT, FOREMAN'S OFFICE AND TOILET ARE AT THE RIGHT OF THE PARTITION, PAINT SHOPS ARE AT THE REAR

NO SMOKING
DO NOT REMOVE THIS BARRIER
PAINT
VARNISH
KEEP AWAY
E TOUCHEZ PAS

MONTREAL SHOPS—HOT-AIR OUTLET WITH DEFLECTOR—PAINT SHOPS

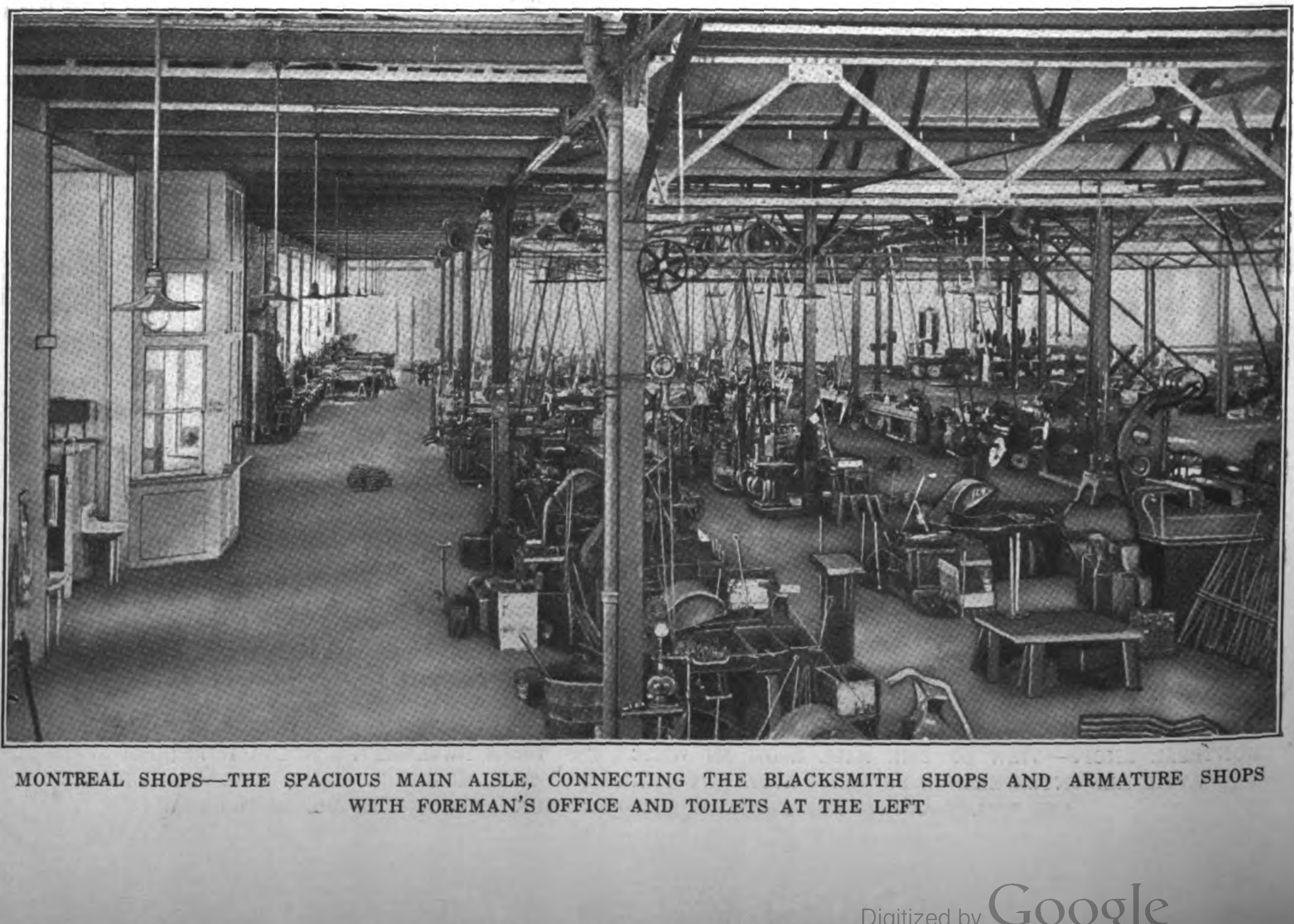
show the overhead track with air hoists which curves in and out from tool to tool in such order that an armature during its complete course from delivery to return never once touches the floor. All parts of armatures and fields are made here. Fields are impregnated by means of the Passburg vacuum system.

Of the tools in the main machine shop the N. S. K. 480-lb. air hammer made by Peter Pilkington, England, is of particular interest. This machine is much faster than a steam hammer, may be operated by manual or automatic control and is capable of very fine adjustment. With it a man ordinarily can make thirty heavy compromise joint plates in a day of ten hours, with thirty-two as a high-water mark. Another interesting tool here is a Butler three-spindle drill. In the central machine shop and electrical shop group drive is used from one 25-hp and two 15-hp motors, each carried from the roof trusses; but elsewhere in this division of the building individual drive is common.

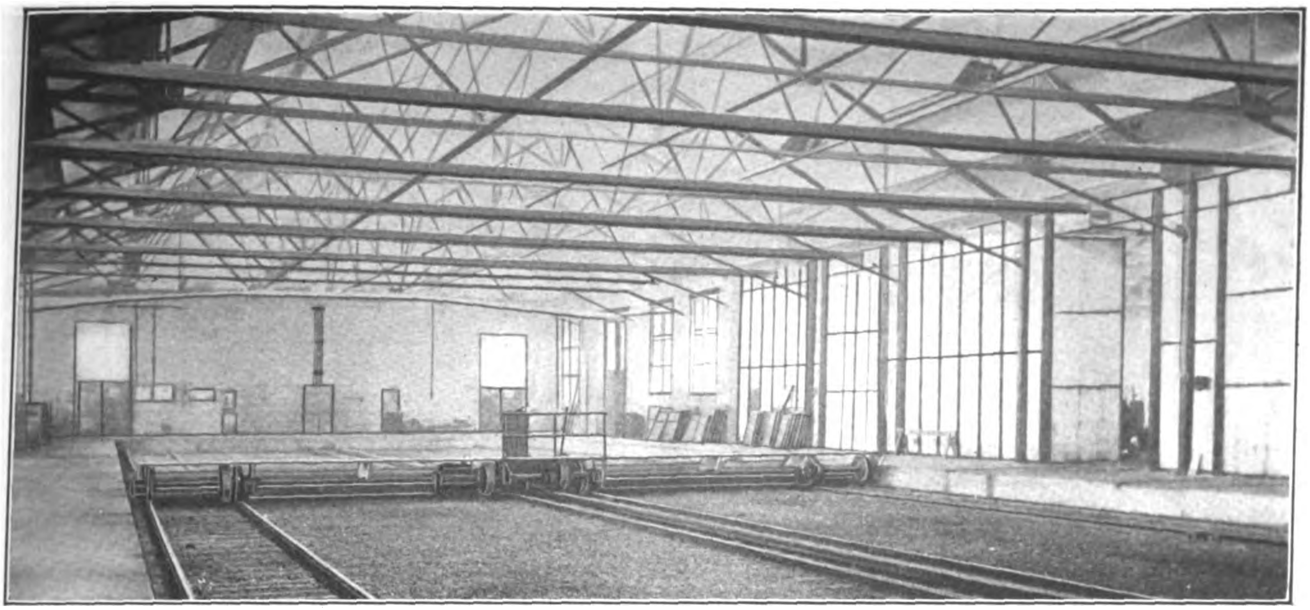
A large Jacobs oil furnace is installed in the blacksmith shop for handling long car members, but at present a small oil furnace and six down-draft forges are found ample for all regular work. The down-draft babbitt furnace previously noted is fitted with a direct-reading pyrometer. Babbitt is always poured at a temperature of 675 deg. to 700 deg. Fahr. within which range no segregation will occur when the mixture settles. This babbitt is composed of 83 1/3 per cent copper, 8 1/3 per cent antimony and 8 1/3 per cent tin. It may be added here that the company's axle bearings are of bronze only. They are serviceable for at least 50,000 miles, and on account of this long life, their freedom from accident and their high scrap value, they have proved the cheapest in the end. A tinsmith shop with punch and shear was added to the original equipment last summer to care for the large amount of sheet steel manufacture and repair.

The hydraulagraph record on the wheel press is credited with obviating the eighty to one hundred loose wheels a year which were common before this graphic telltale of the pressmen's work was installed. Since the hydraulagraph was installed in 1912, not one trouble has been traced to the application of the wrong pressure. One man, with one helper to assist him during the afternoon only, bores and mates all wheels and keeps all records. He has bored as many as eighty-four wheels in seven hours.

A safety feature of all machine tool work is the use of screens to protect the men against belting, wheels,



MONTREAL SHOPS—THE SPACIOUS MAIN AISLE, CONNECTING THE BLACKSMITH SHOPS AND ARMATURE SHOPS WITH FOREMAN'S OFFICE AND TOILETS AT THE LEFT



MONTREAL SHOPS—THE COVERED TRANSFER TABLE RUNWAY SHOWING ALSO THE CORRUGATED METAL TRACK DOORS AT THE PAINT AND VARNISH SECTION

etc. To achieve the best work and to secure the desirable standardization, such duties as sharpening tools, drills and bits are assigned to one man. The production of the men has been marvelously increased by the use of pneumatic tools for boring, riveting and the like. At first they were rather afraid of the air-operated tool, but on better acquaintance they were glad to use it because it does not tire them like hand labor.

AIR-BRAKE DEPARTMENT

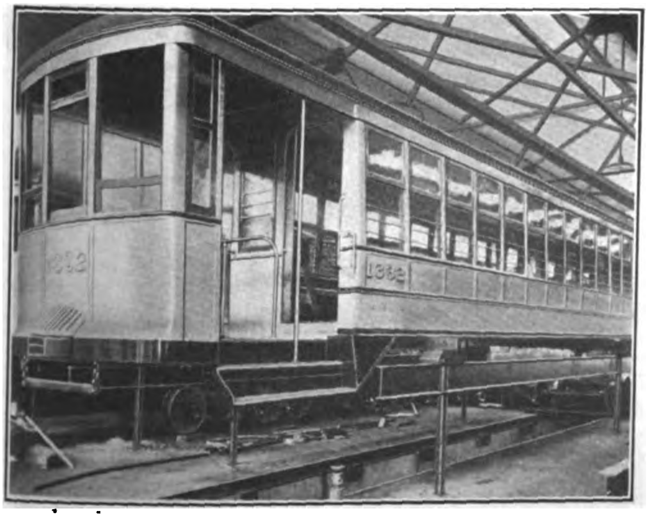
The air-brake department is located on the mezzanine floor, as shown on the plan. A half-tone view of the shop itself is also presented. Compressors are overhauled once a year, the stripping and assembling being done on a bench which is furnished with sliding pieces or movable deals so that a man can always work on the most convenient side. After the compressors have been stripped of all electrical parts they are lowered into a metal tank for cleansing, as illustrated. This tank contains kerosene which is forced up from outside storage tanks by means of compressed air. This scheme greatly reduces the fire hazard, especially at the close of the day's work, because the oil can be made to return by gravity to storage simply by cutting off the air pressure through a valve located on a near-by wall. The air-brake shop is also provided with apparatus for grinding valves and for testing out all air-brakes under service conditions, also with a Galena steam turbine filter for purifying the compressor oil.

OIL HANDLING

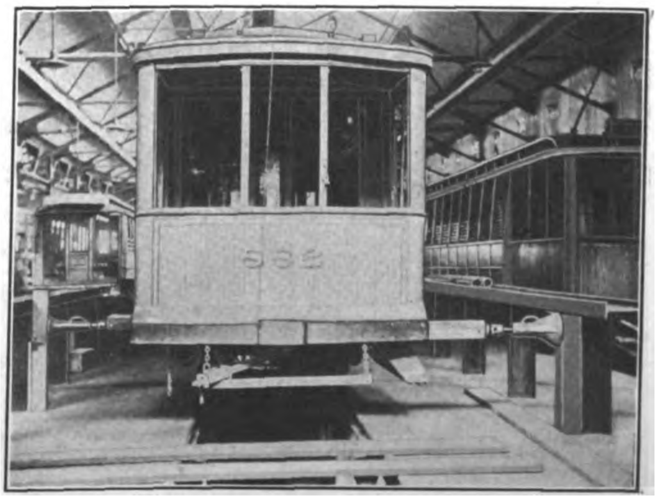
As indicated, the oil is stored in an isolated one-story and basement building. The building is provided with an overhead trolley for lifting the barrels on to a double set of racks. When oil is required for use it is taken from basement storage tanks by means of Bowser pumps. The basement also contains a waste and oil reclamation outfit.

WELDING PRACTICE

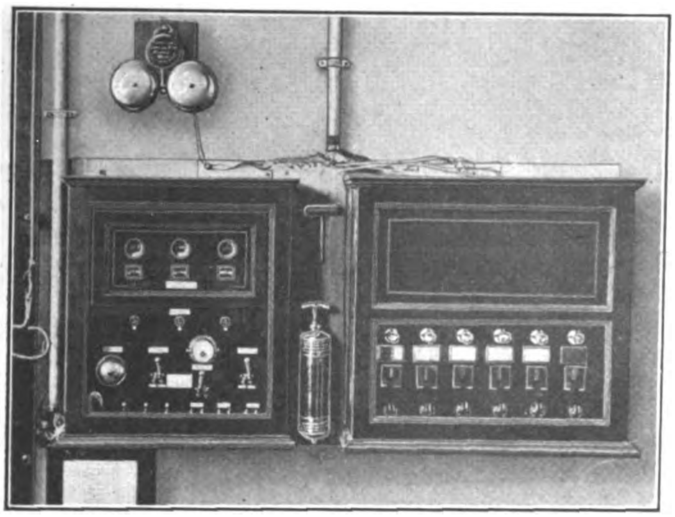
The general plan shows an acetylene generator house. The company prefers the oxy-acetylene process for light work and cutting. Electric arc welding has been found superior when large masses of metal must be heated. At this time the company is using trolley line energy at a cost of about ¾ cent per kw-hr., at which price electric welding is cheaper than oxy-acetylene, even with



MONTREAL SHOPS—VIEW SHOWING I-BEAM TYPE OF HOIST FOR RAISING CARS



MONTREAL SHOPS—APPARATUS FOR STRAIGHTENING CARS —JACK BETWEEN BRACING COLUMNS AND TIMBERS



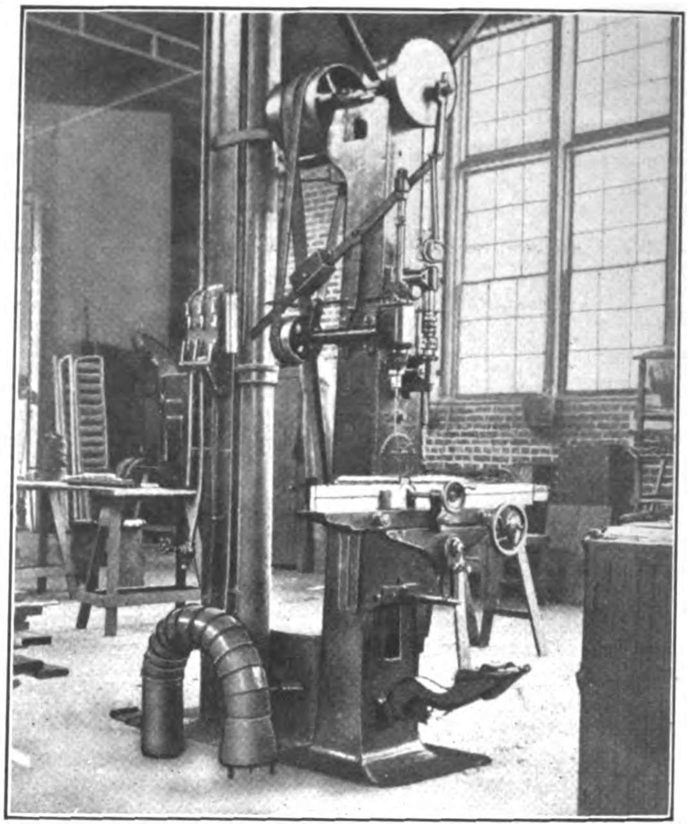
MONTREAL SHOPS—THERMOPILE FIRE ALARM SYSTEM—ECLIPSING DISKS IN THE LEFT-HAND BOX SHOW "SAFE" OR "FIRE"

the losses due to cutting down the potential from 500 volts to 70 volts at the arc. The welding flux used at Montreal consists of 28 per cent dry sodium carbonate, 70 per cent powdered crystalline borax and 2 per cent red iron ochre.

WOODWORKING AND PAINT SHOP

The mill room which is equipped to carry out any kind of car body work has several features worthy of imitation. Owing to the layout of the tools and the use of the less obstructive floor-drive belting, timbers up to 40 ft. length can be handled at each machine without interfering with the others. The inconspicuous belting and the elaborate shavings exhaust system make this shop as clean and safe as possible. All revolving parts of tools are fitted with wire screens or wooden guards to prevent injury to the workers.

The dry kiln and lumber shed are located in an adjacent lean-to, which has an individual through-supply track as shown. The body woodwork shop adjoins the mill room and is supplied with four tracks, all of which have pits. This shop is used not only for regular body work but also for wiring. An illustration taken in this division shows how bent car sides are straightened. No columns or walls were available for use as braces. Therefore it was necessary to set in the floor on each side of the track four I-beams on which a horizontal I-beam of nearly maximum car length is placed. The I-beam structure itself is braced by obliquely-set pipes of 4 in. diameter. The bent car side is straightened by operating jacks which are set horizontally between spacing and buffer blocks on both sides of the track.



MONTREAL SHOPS—OUTLET FOR FLOOR SWEEPINGS IN THE WOODWORKING SHOP

The main paint shop is separated from the other departments by a corrugated-iron partition. It has nine tracks, three of which have pits. The space between the last shop and the wall is also partitioned to form a panel and sash varnishing room. All paint mixing is done in a separate building near by, still further reducing the possibility of fire.

MANUFACTURING AND STORES PRACTICE AT THE YOUVILLE SHOPS

The company manufactures a large variety of railway supplies. Formerly this material was made on a hand-to-mouth basis. The cost, however, has been materially reduced by manufacturing in quantities which are turned over to the storekeeper at a fixed price. The practice of quantity work is also followed in handling parts returned for repair. The price of manufactured articles, as turned over to the storekeeper, covers material and labor only, but at the end of the year a general overhead charge which averages 14 to 15 per cent is added to the figures for this class of work.

MONTREAL SHOPS—WINTER VIEW OF THE YOUVILLE SHOP FROM SOUTHWEST, WITH THE POWER HOUSE SUBSTATION, OFFICE AND STORES AT THE LEFT

The storeroom is located in a separate building which also contains the offices of the superintendent of rolling stock, the drafting rooms, etc. The storeroom as built covered only the floor areas shown, but since then a gallery has been provided. This building is served by a special track for the convenient reception and dispatching of supplies. This storeroom handles all supplies used at the general shops as well as at the carhouses. Each carhouse has a sub-store with storekeeper, and all supplies are "in stock" until used.

In the blacksmith shop a sub-store under lock and key is provided for all standard sizes of iron. The pieces are placed on shelves which are readily visible through the screens. When a blacksmith runs out of stock he must notify his foreman, who is the only one authorized to secure material. This practice is substantially the same throughout all the shops. In general, about 90 per cent of the material which is used by the workmen is brought to them by errand boys. The workman simply rings a bell and secures the material after his order for the same has been properly authorized by his foreman.

GENERAL STORES SYSTEM

The car maintenance department is responsible for all supplies from the time that they leave the storekeeper on requisitions indorsed by the master mechanic until he returns them back to the storekeeper as scrap. The question as to what is scrap is not left to the carhouse foremen for determination, but to two specialists at Youville. These men divide all return material into three heaps, the first called "good for repair," the second "doubtful" and the third "rejected." The master mechanic has the last word as to what "doubtful" pieces shall be repaired. The scrap is carefully weighed and turned over for formal receipt by the storekeeper. Allowance is then made to each carhouse under the proper account number, and finally the auditing department assigns the credits on a money basis. The manifest which accompanies the material returned by any carhouse is regarded as an order for substitute material. It will be noted that under this system the storekeeper has nothing to do with any material from the time that it leaves him new until it is to be sold for scrap. The sub-stores at the carhouses can order as new only such material as brushes and dry batteries which are not subject to repair, but even these orders must be approved by the master mechanic before they go to the storekeeper. No carhouse receives substitute parts unless it returns an equivalent number of old parts. The necessary adjustments for lost material are made monthly. This system of concentrating at the main shops all responsibility for life of material was inaugurated Nov. 1, 1912. It has worked out very well, especially in avoiding the unnecessary scrapping which arises when carhouse men are too eager to get rid of material which, while old, is still capable of repair and perfectly safe for re-use.

EMPLOYEES

While the shops are notable for many labor-saving features, very little has yet been done in the inauguration of piece work, owing partly to the peculiarity of local labor conditions and partly to the desire to obtain more experience in determining real costs on the day labor basis before attempting to inaugurate a system based upon individual productivity. However, complete piecework schedules have already been worked out for the electrical shop, and this will probably be the first department to change from the day basis. The time of the men is now kept on clock cards which print normal time in blue and late time in red, so that the timekeeper in checking up need look only for red figures.

Ten Rules for Service

In the May issue of *The Annals* of the American Society of Political and Social Science, P. A. Sinsheimer, stock and bond expert of the California Railroad Commission, contributes an article entitled "Ten Rues for Service." This paper is not an enumeration of regulations that have been adopted by this commission, but rather an outline of the broader principles that have guided it as its decisions are interpreted by the author. The ten rules which compose the author's code are discussed in regard to their legal and economic aspects, and in connection with each a complete explanation is presented as to the reason for the wording. The rules determined upon are as follows.

1. Service must be measured primarily by the needs of the public and only secondarily by the ability of a given utility.
2. Adequate service is the price a utility must pay to hold a field free from competition.
3. The highest type of service may best be obtained through a single agency.
4. Utility rates should be adjusted to fit the quality of the service rendered.
5. Security issues should be so regulated as to render the utility financially able to meet all reasonable demands for service improvements.
6. Every utility must make such extensions or provide such additions as may be reasonably required so far as its rates will enable it to earn a fair return upon its property.
7. A utility with limited product must be restricted in its operation to the area in which it can render adequate service.
8. Every utility must extend the use of its facilities to any other utility to perform a service which the first utility is, itself, not able to perform.
9. Utility service regulations must combine a maximum of convenience to the public with a maximum degree of protection to the utility.
10. The first consideration in utility service must be safety.

Steam Railroad Investments for Six Years

From 1908 to 1913, inclusive, the steam railroads in the United States with annual operating revenues of more than $1,000,000 invested in their road and equipment cash to the amount of $4,010,385,303. These railroads include about 90 per cent of the mileage, receive more than 96 per cent of the revenues and handle more than 98 per cent of the traffic. The cash investment of the operating railroads of the Eastern district was greater than the amount of capital securities issued by them during this period, and was 19.9 per cent of the aggregate of their capital securities outstanding June 30, 1913; of the railways of the Southern district it was 21.1 per cent, and of the railways of the Western district it was 23.2 per cent of the aggregate of their capital securities outstanding June 30, 1913. That is, the cash actually expended by these railways during the last six years upon their properties used in transportation amounts to more than one-fifth of their total capitalization at the close of the last fiscal year. These figures are obtained through an original compilation made by the Bureau of Railway Economics from the reports made to the Interstate Commerce Commission.

The Saxony State Railway has decided to begin work on the electrification of its system. The first section to be converted will be that between Klingenthal and Untersachsenberg, after which the Pirna-Dresden-Meissen line may be taken in hand.

Estimating the Cost

The Writer Describes the Steps to Be Pursued in Making Different Kinds of Estimates with Special Reference to Correct Accounting for Replacements and Improvements

BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY PUBLIC SERVICE RAILWAY, NEWARK, N. J.

Broadly speaking, engineering estimates may be classed under four different headings as follows:

1. Preliminary estimates of work to be done, based upon general assumptions or upon a rough reconnaissance on the ground.
2. Detailed estimates of work to be done based upon quantities obtained from accurate plans, cross-sections, profiles, detailed surveys, etc.
3. Estimates of the original construction cost of work done at some more or less remote time, under conditions not definitely known to the estimator.
4. Monthly or other periodical estimates of work which has been completed on any contract, upon which the contractor is to be paid.

PRELIMINARY ESTIMATES

Referring to those coming under the first group, during the last three or four years that the writer has been making bridge and track estimates on the property with which he has been connected, he has frequently been called upon for an "approximate estimate" of what certain track or other work would cost. Very often but little or no time is available for even a preliminary investigation, and in such cases it becomes necessary to make many rough and hasty assumptions as to requirements upon which to base the estimate. Possibly a proposition involving a track extension may be brought up for the consideration of a railway company's officials, and their engineer is called on for a preliminary estimate of the cost. Of course, having a thorough knowledge of the physical conditions existing over the entire property is of very material assistance in cases of this kind, but there are so many factors which must be taken into consideration in the preparation of such a preliminary estimate that it is not reasonable to expect the engineer to do himself justice under such conditions.

Suppose, for example, we assume as typical the case mentioned above of a track extension. First comes the question of the length of line, which, when scaled from atlases, blueprints of maps, geological sheets, etc., is often unreliable. Then there is the question of headway which will probably be required to properly provide for the traffic, so that the need for double or single track may be determined. Then, where such extensions intersect other existing lines, you must consider what special connecting curves will be required to permit a possible flexible operation over the new track. Incidentally it might be noted that very often, especially where such new track is built in the heart of a city, the item for special work frequently forms a very large proportion of the total cost of the work and may greatly increase the "per foot" cost of the track.

Another important item which must be taken into account is that of probable municipal requirements as to paving, type of rail which will be required and whether the use of steel or wooden poles will be permitted. Where the extension is to be constructed on paved city streets, a knowledge should also be had of the character of the paving to be torn up. It is obvious that where granite block pavement laid on a concrete base has been grouted with a cement filler so strong that half the blocks break while trying to remove them, the cost of opening up a trench for the track will be much more than would have been the case if the granite block had been laid on a dirt foundation with sand joints. In the case of interurban construction on private right-of-way, we must take into consideration the probable amount of excavation and its nature. It must be admitted that an estimate based on the assumption that only ordinary earth or gravel will be met will not go very far if it is later discovered that underlying the top strata of gravel is rock to the extent of 25 per cent or more of the total excavation.

Another very important item which must be provided for is feeder. The size, of course, is largely fixed by the number and type of cars to be operated over the line, by the length of line, its distance from the power house and by the permissible drop in voltage. It may be that it will not be necessary to run additional feeder all the way from the power house, but experience has shown that this is not a safe assumption to make.

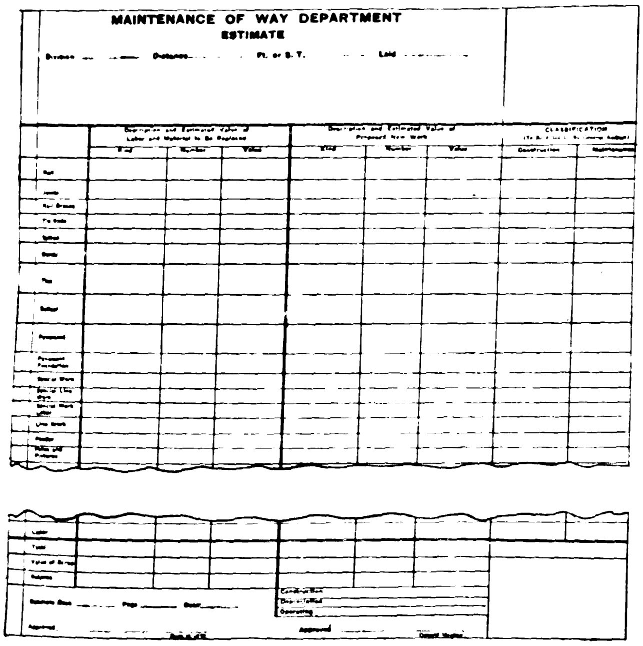
One other factor of no less importance which, especially in the case of interurban construction, very often runs into a considerably large amount, is that of bridges, culverts, viaducts, etc. This must also be considered in the case of track to be built over existing structures in order to determine to what extent such structures must be strengthened or whether they must be entirely rebuilt.

Many more specific items might be mentioned, all of which may have a more or less important bearing on the estimate, but occasionally less time is given the engineer to prepare his preliminary estimate than it has taken to state the considerations just noted. The fairness of the statement that under such conditions it is not practicable for an estimator to do himself justice must therefore be acknowledged, and it is certainly not fair to any company to be obliged to use such figures as a basis for the approval or rejection of any proposition and certainly not for the purpose of making an appropriation actually to do the work.

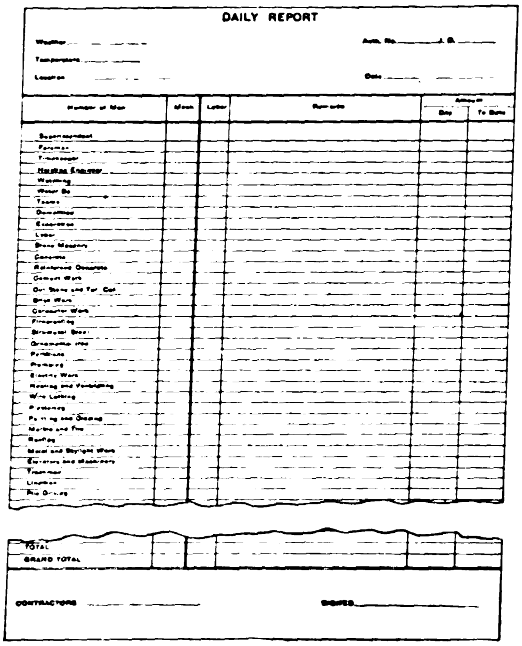
The first two or three times an engineer is called on for such an "approximate estimate" he is very liable to figure low. He may even fail to consider one or more of the items mentioned, as he is apt to learn when called upon to explain the reasons for large excesses when the work has been completed. He is soon forced to realize that but little or no credit is given him. although he may deserve it, when his authorizations show a favorable balance upon their completion. On the other hand, he comes in for some sharp criticism or even censure if the sheets show an excess. Either way he is apt to be labeled as a poor estimator. As a result of such experience he is apt either to figure his unit costs high, figure higher on estimated quantities or include an unnecessarily large contingency item in order to protect himself against those items which he cannot determine in his preliminary investigation but which must be taken care of when the work is done. Naturally, of the two evils, he would prefer to be able to show a cost of construction less than his estimate rather than in excess of it.

What is the result of this necessity for accuracy on the part of the engineer? Looking at the question from the company's standpoint it very frequently proves true that when the work is approved, much more money is appropriated than is necessary. This is undesirable because interest must be paid on all money borrowed for such improvements or extensions. Further, such inaccurate estimates add an extra burden on the company, which in many cases could have been eliminated had ample time been allowed for the preparation of a more accurate estimate. Or, looking at the question from another angle, such excess appropriation might have been devoted to other badly needed improvements which were cut out of the annual budget because sufficient funds were not available. From the standpoint of the engineer, he is discredited when he is obliged to come back with a request for more money to finish a job, no matter how small the amount may be or what the reason.

The above should not be construed as a plea for obviously incompetent estimators or engineers, but is rather a statement of facts regarding conditions which actually exist on almost every railway property, and against which, I believe, almost every engineer has to contend more or less frequently. Some one has defined the word "Estimate" as "a scientific guess." It is certainly true that in the case of estimates prepared under such conditions, other qualifications remaining the same, a good guesser will often make the best estimator, and it is a wonder that estimates agree as closely with the actual cost and as many times as they do. During the writer's connection with the estimating branch of the work, estimates have been prepared on a great many bridge and track propositions, both on new and reconstruction work, covering both very large and very small amounts. Opportunity has also been available for comparing the actual costs with the estimated costs on every piece of work done. In some exceptional cases the difference has been as much as 15 per cent but in many others less than 1 per cent, on the average the variation being considerably less than 10 per cent, and it is generally conceded that it is not practical for an engineer to consistently estimate closer than this latter figure on work of this character.


MAINTENANCE OF WAY DEPARTMENT
ESTIMATE

ESTIMATING THE COST—FIG. 1—FORM FOR DETAILED ESTIMATE AND AUDITOR'S STICKER


DAILY REPORT

ESTIMATING THE COST—FIG. 2—RECORD KEPT BY BUILDING INSPECTORS

In Group 2, detailed estimates, there are, of course, fewer chances for the engineer to go so far astray. However, weather conditions, strikes, etc., will naturally play an important part in affecting costs. Another factor is that much time may elapse between the preparation of the estimate and the actual performance of the work, during which time the prices of both labor and material may fluctuate greatly. But even in estimates based upon accurate detailed plans and surveys and known material costs, we are still obliged to tack on an arbitrary percentage to cover engineering, legal expenses, contingencies and such items as may cover a "multitude of sins." For this reason it is neither necessary nor advisable to try to split hairs too finely in the preparation of estimates of any character.

ESTIMATES OF ORIGINAL COST

The most trouble is given by Group 3, estimates of original construction cost. On reconstruction work it is not only necessary to figure on the cost of doing the required amount of work but also to prepare an estimate of the original construction cost of the work proposed for reconstruction. This detailed information is required by the auditor for properly classifying the proposed expenditure into the various construction, depreciation and operating accounts. Where such reconstruction is complete, this figure represents the amount at which such track or other structure was originally capitalized and which must be written off the books when it is replaced. In the case of only a partial replacement, or where such reconstruction is done with part of the materials from the old structure, the same data are necessary for the determination of operating expenses. Since work is seldom done exactly as originally estimated on, any preliminary estimate of the original construction value could not properly be used for the purpose of a final classification of the amount actually spent. Hence it is necessary to keep an accurate record during the progress of such reconstruction work of all old materials reused as well as of all new materials used. On the Public Service Railway this record is made in each division during the working season by an inspector of track construction whose duties include a daily visit to every job in his territory. In order to make his records as accurate as possible each inspector receives explicit instructions as to what records he must keep. Before work is started the street is stationed off, and it is to these stations that the inspector refers for his distances and other identifying data.

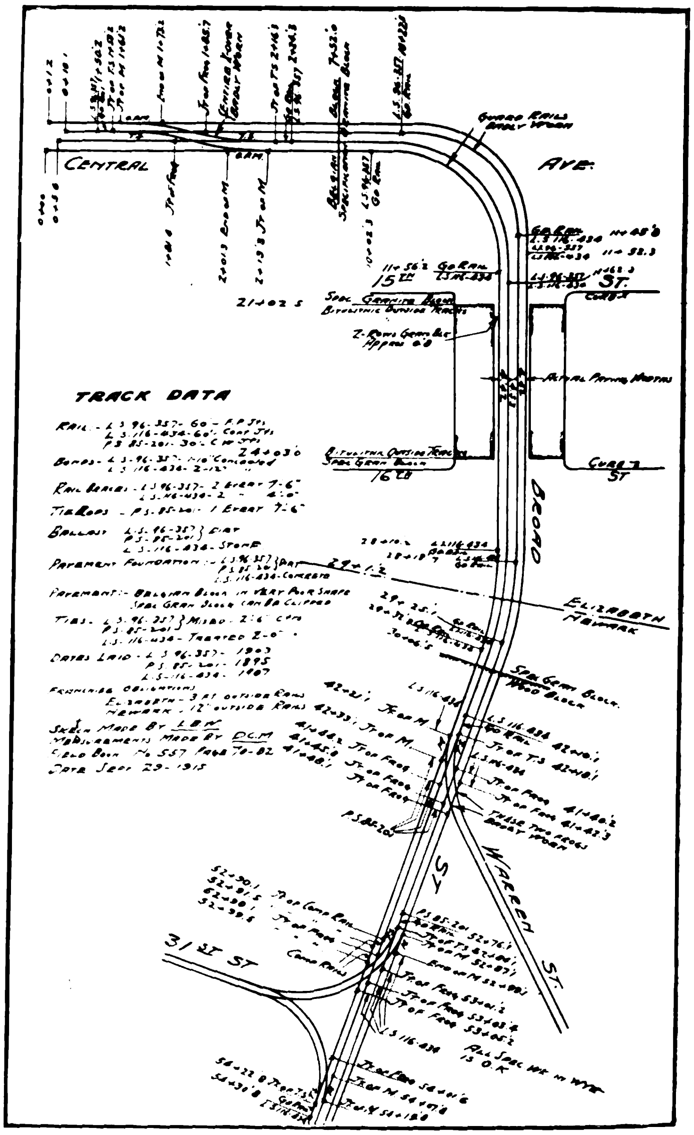
The general auditor supplies the engineering department with a detailed statement upon the completion of a job, showing every charge that has been made against the authorization, as well as all credits which may have been applied to it. A complete report is also made out by the division engineer from the data collected by his inspector, which, together with a sketch, is submitted to the engineer of maintenance of way. From this information a final revised estimate is then prepared to show not only a detailed classification of the actual cost but also a revised estimate of the original construction cost of the work which was actually replaced. It may seem to some that such care is not necessary, but in these days of frequent audits of a railway company's books by outside expert accountants and the more exacting requirements of the various governing commissions, it is not only very desirable, but also essential that great care be taken to secure the most accurate figures practicable and to avoid discrepancies. This shows the need for an accurate adjustment of all figures affected by even a slight departure from the type or extent of the reconstruction originally estimated on. Even in the installation of an entirely new cross-over at a location where none previously existed, which was formerly considered as a purely construction charge, the value of the rail and other material which the special work replaces must now be written off, and a scrap credit for the same be applied to the authorization.

If, in preparing the final revised estimate, the engineer finds any marked discrepancies between the division engineer's reports and the detailed statement of the actual charges submitted by the general auditor, such, for example, as more ties or rail being charged against the work than the measurements show could possibly have been used, he then has both records checked and an investigation made to determine whether or not some material might have been taken away for use on some other job and no credit applied. If no agreement can be reached in this way, he personally has a check measurement made of the entire completed job, upon which the revised estimate is then based. There is, however, little occasion to resort to this extreme.

It frequently happens that the old track or other structure has been built so long that no records are available as to its actual cost, in which case other methods must be resorted to. Much valuable information may often be obtained through consultation with old track foremen, roadmasters or other officials of the maintenance of way department who have been in charge of track construction work, and advantage taken of their personal knowledge of labor and material prices which were obtainable when a large part of the older track was originally constructed, as well as details of construction and methods of doing the work. By following out such a method, the estimates of the original cost of track to be reconstructed will be much more accurate than would otherwise be possible. This has been the practice of our estimating department in the preparation of estimates coming under this group, with very good results.

For a final record, both the original estimate and the final revised estimate, the division engineer's report with sketch, and the general auditor's detailed statement of the charges comprising the total cost of the work are then filed with the auditing department. The inauguration of this system will in later years prove of inestimable value to the engineers who will then be called on to give the original construction cost of any of the track or other structures which we are now building or reconstructing, as they will thus have the actual value at which such structure was capitalized together with a complete detail as to its type of construction.

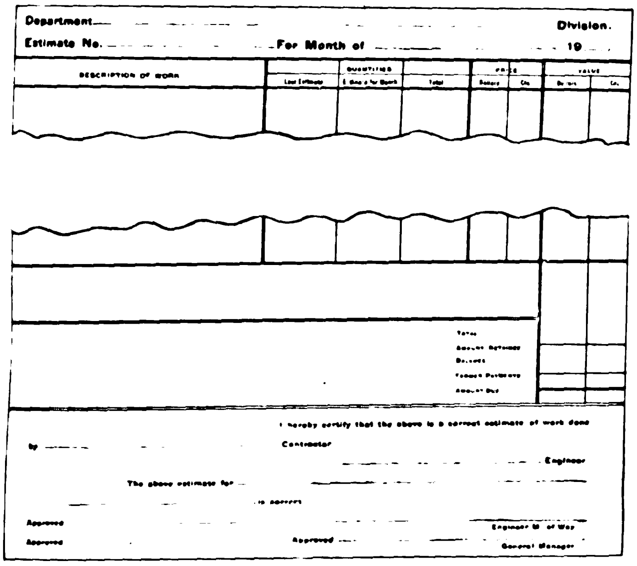
It has been the practice of our Estimating Department to keep in close touch with the Storekeeper and the Auditing Department, so as to be thoroughly familiar with the current prices of all materials which we carry in our stores. In this respect it has also been our practice to carefully read that section of the *Engineering News* devoted to the current market prices of the principal structural materials. All such cost data, together with their dates, are carefully filed alphabetically in a loose-leaf note book, the size of which will permit of its being carried around in one's pocket. The alphabetical arrangement greatly facilitates the work of finding the material in question. As this "dope" becomes obsolete, it is brought up to date with other more recent figures as soon as the same can be obtained. The allowance for labor is generally based upon actual observations of labor costs on work recently performed under as nearly as possible similar conditions. For the purpose of quick estimating on special work lay-outs, where time is not available for the preparation of a large-scale drawing, we keep a loose-leaf book with small scale drawings of every piece of special work which we purchase. On each sheet is typewritten, along with other data, the kind of rail, type of construction, date purchased and cost of the



ESTIMATING THE COST—FIG. 3—DIVISION ENGINEER'S REPORT USED AS BASIS OF FINAL REVISED ESTIMATE lay-out. Thus an estimate becomes simply a matter of picking out a lay-out conforming as nearly as possible to the one under consideration. At first thought, it might seem that this search would take much time, but the estimator soon learns such a book practically by heart and selects the required lay-out with little or no difficulty.

PERIODICAL ESTIMATES

Little need be said regarding the monthly or periodical estimates coming under the last group, 4. These estimates are based upon actual measurements (generally made at the end of each month) of the work as completed at that time. Since such measurements are generally made in the presence of a representative of the contractor, but little opportunity should arise for any dispute because the unit prices are fixed by contract. The only chance for any difference of opinion is in settling claims as to allowance to be made for extras or force account work. Where the practice is strictly adhered to of allowing no extras or force accounts except where the engineer's written orders have been obtained to cover same, and the price agreed upon at the time, this part of the work is very much simplified.


Department Division.
Estimate No. For Month of 19

DESCRIPTION OF WORK	QUANTITIES			PRICE		VALUE	
	Last Estimate	[illegible]	Total	Dollars	Cts.	Dollars	Cts.

Total
Amount Retained
Balance
Former Payments
Amount Due

I hereby certify that the above is a correct estimate of work done
By Contractor
Engineer
The above estimate for is correct
Approved Engineer M. of Way
Approved Approved General Manager

ESTIMATING THE COST—FIG. 4—MONTHLY ESTIMATES OF AMOUNTS DUE TO CONTRACTORS FOR WORK PERFORMED

Fig. 1 shows the blank form used by our engineering department for the preparation of detailed track estimates. The last two columns of Fig. 1 show another blank form, one edge of which is gummed so that it can be attached to the right hand edge of the form shown. These last two columns are filled out by the general auditor's department and show the classification of the cost of each item entering into the work. Fig. 2 shows another blank form used by the building inspectors for the purpose of keeping a daily record of the men employed on various classes of work, etc. The sketch shown in Fig. 3 is one submitted by the division engineer with his report and it is principally upon this information that our final revised estimates are based. mates due to contractors for work performed.

The United Railroads of San Francisco are making a test of a rebuilt low-entrance car. The car has been in service about two months, and after the test is completed the company will probably place an order for new equipment and controllers for low-entrance cars.

Recent Tendencies in Valuation

The recent tendencies in valuations for rate-making purposes is the subject of an article by Edwin Gruhl, assistant to the president, The North American Company, published in the issue for May of *The Annals* of the American Academy of Political and Social Science. From numerous cases decided by courts and commissions during the latter part of 1912 and 1913, Mr. Gruhl summarizes the significant changes thus:

1. When appraisals of the cost of reproduction new are considered in determining the present value for rate-making purposes, experience has proven the necessity of making more liberal additions for overhead percentages, not to cover mere conjectural values, but to include costs which do not appear in the appraiser's inventory.

2. When the present value for rate-making purposes is based upon the cost of reproduction new, deduction may properly be made for the depreciation in value. The amount of such deduction, however, may vary with the care with which the owners of the property or corporation have provided against such depreciation. There is a tendency to measure the deduction by inspection rather than by theoretical estimates of expired life. Where the owners of the property or corporation have given evidence of their responsibility to replace depreciated property, such fact may be taken into consideration in determining value for rate-making purposes. Likewise the reserve accrued by the owners of the property or corporation to offset depreciation is properly considered an asset of the utility for rate-making purposes.

3. Where the cost of reproduction new is determined, inclusion is properly made for the cost of repaving over mains, even though it has not been necessary for the utility to disturb such paving during the course of construction.

4. Where the present value for rate-making purposes is determined, inclusion must be made for appreciation as well as depreciation of real estate. It does not seem proper that any portion of such appreciation should be construed as income upon which dividends or taxes may be paid. With few exceptions the recent proposal to deduct the so-called "unearned increment" from the value for rate-making purposes upon the theory of a relation of "principal and agent" is dissented from upon the ground that such a policy would carry with it the necessity of underwriting past losses. As yet no attempt has evidently been made to apply this principle in practice.

5. There has been a reiteration and elaboration of the necessity of including going concern value in the present value for rate-making purposes.

Judgment in Canadian Case

The Privy Council in London, England, delivered judgment on June 26 in the case of the British Columbia Electric Railway versus the Vancouver Railway & Navigation Company. The issue was whether the Dominion Railway Board had jurisdiction to direct the appellants to pay part of the cost of bridges over certain streets in Vancouver. The Privy Council, allowing the appeal, said that if the board possessed any such jurisdiction it must be derived from the statutes which created it. A fundamental error underlying the decision of the Railway Board was that it had considered that the fact that the tramway company would be benefited by the works gave it jurisdiction to make the company pay part of the cost. There is nothing in the railway act which gives the board any such jurisdiction.

The Present Status of Prime Movers

The Report of the A. I. E. E. Committee on Prime Movers Showed Remarkable Progress in the Thermal Efficiency of the Steam Turbines—The Reasons for This Are Brought Out in the Following Abstract

At the annual convention of the American Institute of Electrical Engineers held in Detroit, June 22 to 26, H. G. Stott, R. J. S. Pigott, and W. S. Gorsuch presented a paper on the present status of prime movers as the report of the committee of which Mr. Stott is chairman. The committee had selected the following subdivisions of the subject in order to cover the most important recent developments in the field of prime movers: reciprocating steam engines; steam turbines; gas engines; oil engines; hydraulic turbines, and finance and economics. The purpose of the paper was to bring out in a concise form the present status of heat engines and hydraulic turbines, and the various types were compared as to relative importance, capacity, efficiency, weight, cost and economy. The paper is the result of a very extensive research, and the results were presented in tabular and graphical form and they were thoroughly discussed.

It appears from the report that the reciprocating steam engine has become practically obsolete for use in modern power stations. In the large new central stations this engine is not even considered, but in small isolated stations it is still in use, especially where heating service is also handled. In small sizes the engine still has some advantage in economy over the small turbine, but the margin is becoming continually smaller, some of the latest geared units being almost on equal terms. The superior reliability, low maintenance cost, sustained original economy, and low attendance cost of the turbine generally overbalance the rather doubtful advantage in original economy of the small reciprocating engine.

STEAM TURBINES

In comparing the steam turbine with other prime movers the following points were considered: capacity, efficiency, weight and price. The authors state that the use of steam consumption or water rate per kilowatt hour is very unsatisfactory in connection with the efficiency of a steam turbine. Unless the steam and vacuum conditions are stated, the water rate means nothing. They recommend the "efficiency ratio," which is the ratio of the water rate of a perfect engine, that is, one working on a perfect Rankine cycle, to the water rate of the actual turbine working under the same thermal conditions. This ratio increases with size, superheat, reduction of vacuum down to about 26 in., and reduction of pressure. Speed also affects it, either to increase or decrease it, depending upon the design and conditions. Thermal efficiency increases with pressure, superheat and vacuum. It is possible that the turbine having the best water rates may not have the highest efficiency ratio. A chart given with the report shows that the efficiency ratio of a very large turbine may be over 70 per cent, the corresponding thermal efficiency being about 23 per cent.

The report showed that the weight of the steam turbine increases with increase of vacuum, decrease of speed, decrease of initial pressure and increase of efficiency ratio. The reasons for these increases are as follows: Increase of vacuum increases the size of the exhaust end and of the blading; decrease of speed results in the enlargement of dimension in every direction and sometimes increases the number of stages for a given efficiency; increase in efficiency ratio usually implies sharper blade angles, more stages and larger blading.

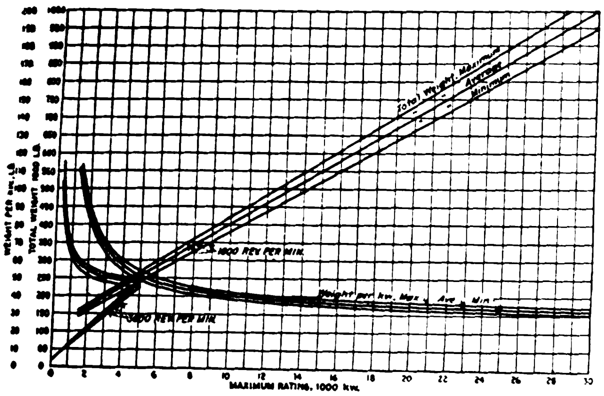
Turbine design is usually a compromise between cost of manufacture and efficiency. The cost is influenced by steam conditions and speed as well as to some extent by type. Increased thermal efficiency means increased cost. The curves given in the reports showed that average cost per kilowatt for the 3600 r.p.m. turbine varies from about $10.25 for a 2000-kw machine to somewhat less than $9 for a 5000-kw machine, the largest size now built. The average cost for the 1800-r.p.m. turbine varies from $14 for the 4000-kw machine to about $7 for the 30,000-kw machine. These figures are for sixty-cycle, maximum twenty-four-hour rating at 50 deg. Cent. rise, power factor 80 per cent, pressure 175 lb., superheat 100 deg. Fahr., vacuum 28½ in. Twenty-five-cycle machines cost from 15 per cent more in smaller sizes to 10 per cent more in larger sizes. Cost per pound remains about constant for a given capacity.

The three items which influence the purchasing of a turbine are price, water rate and time of delivery.

GAS ENGINES

The committee outlined the fundamental situation in regard to the gas engine following the same general subdivisions as in the preceding case. In comparing steam turbines and engine ratings with those of the gas engine attention is called to the fact that the former are such that the machines are worked under the most economical load at the rating of the electric generators. With gas engines, on the other hand, the efficiency increases with the load beyond the capacity of the engine, and for this reason the rating of the engine is generally made as nearly as possible its maximum capacity, allowing from 10 to 20 per cent for overload. The gas engine does not possess inherent capacity for overload in the same sense that the steam turbine and engine do, hence whatever overload it has is allowed by the manufacturer. The maximum capacity of a gas engine is reached when the cylinder has taken a full charge of mixture of the highest heat value and density. The engine must therefore accommodate itself to variations in the quality of gas. As the gas engine is somewhat limited as to the power which can be produced in a single unit, there has developed on the part of some manufacturers a disposition to increase speed. While high speeds have been used in steam turbine and engine practice this should not be taken as a criterion in gas engine work, for the action of the heavy masses involved in the reciprocating parts of the gas engine may become destructive and the result may be higher maintenance cost.

A characteristic of the gas engine, which other heat engines do not possess, is that the thermal efficiency remains fairly uniform over all ranges of sizes. The committee believes that under conditions generally met with in large gas engines a thermal efficiency of 25.2 per cent on the basis of brake horse-power, or 23.8 per cent on the basis of kilowatt-hours generated at full load rating are about what is to be expected. The range of fuel consumption, as guaranteed by American manufacturers with different fuels, varies from 9500 to 13,500 B.t.u. per brake hp for producer gas and 8500 to 15,000 B.t.u. per brake hp for natural gas. The



PRIME MOVERS—TOTAL WEIGHT AND WEIGHT PER KW OF STEAM TURBINES (60 CYCLES, MAX. 24-HR. RATING, 50 DEG. CENT. RISE, 80 PER CENT POWER FACTOR, PRESS. 175 LB. PER SQ. IN., SUPERHEAT 100 DEG. F., VACUUM, 28.5 IN.)

corresponding kw-hr. figures are 13,500 to 19,200 B.t.u. per kw-hr. and 12,200 to 21,400 respectively. Blast furnace gas runs in the neighborhood of 10,500 B.t.u. per brake hp-hr. or 15,000 B.t.u. per kw-hr. generated.

The operation of a gas engine involves high temperatures and pressures suddenly applied to the working parts, consequently this class of prime mover is inherently massive. The average weight per kw-hr. capacity was shown in the report to vary from 500 lb. for a 200-kw engine to slightly more than 740 lb. for a 1500-kw engine. The large unit weighs more than the smaller one for the reason that as size increases the stroke is lengthened and the weight is correspondingly greater per unit of capacity. This weight is governed by many considerations, such as rotative speed, mean effective pressure and other considerations.

On account of the heavy parts made necessary by high temperatures and pressures the gas engine is considerably more expensive to build than steam turbines or steam engines. The report showed that the average cost per pound for tandem and twin tandem engines of the horizontal type, using producer gas and natural gas, directly connected to sixty-cycle generators of from 200 to 1500-kw capacity at 80 per cent power factor, varies from about 16 cents to less than 10 cents. The corresponding average cost per kilowatt of capacity varies from $79 to less than $72. Many attempts have been made to lower the cost of the gas engine by decreasing its weight without impairing its reliability, and to increase its capacity by increasing the pressure of the charge and simultaneously scavenging of the exhaust gases, but all without definite results.

OIL ENGINES

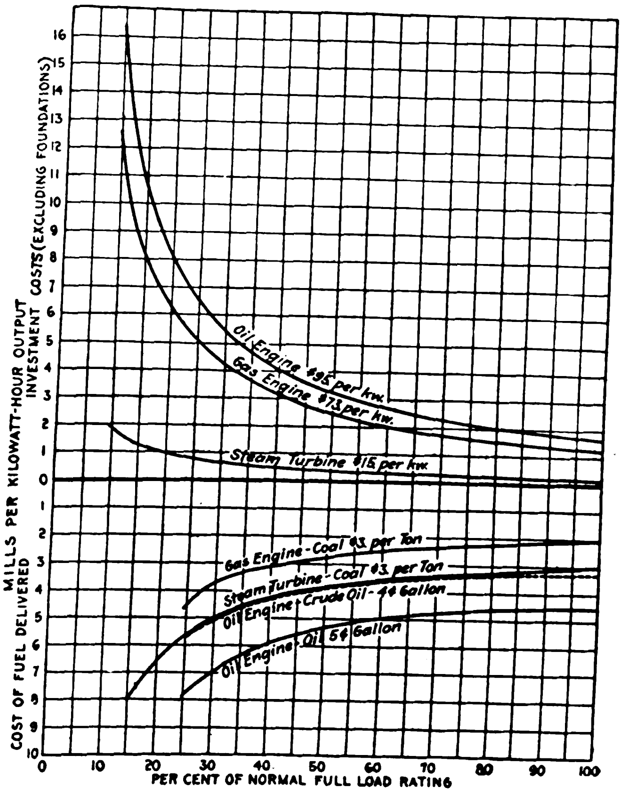
While oil engines have progressed rather slowly in this country the development has been more marked in Europe, especially since the expiration of the basic Diesel patent in 1912. The Diesel engine is essentially a vertical type, but while tests show that fuel consumption in the horizontal type is slightly higher than in the vertical type, many manufacturers have begun to build the horizontal type on account of its greater simplicity and accessibility and lower cost. There are approximately 300 installations of medium and heavy-duty oil engines, aggregating in capacity over 75,000 hp in operation in the United States.

Like the gas engine the oil engine does not possess an inherent overload capacity in the same sense that the steam turbine does, hence whatever overload is required must be provided by the manufacturer. The oil engine is restricted in size for the same reason as is the gas engine. The largest Diesel engine operating in this country is a 450 brake hp, double unit of the vertical, four-cycle, three-cylinder type, although in Europe they have been built as large as 2500 brake hp. There has been recently built in Germany a 2000 brake hp horizontal double-acting, four-cycle, twin standard Diesel engine operating with tar oil which promises interesting results.

The thermal efficiency of the oil engine varies slightly with capacity but, unlike the gas engine, the thermal efficiency does not increase with the load beyond the capacity of the engine. Figures of efficiency have been given that cannot be substantiated. With oil having 19,000 B.t.u. per lb. the thermal efficiency and fuel consumption that may be expected at different percentages of load are about as follows, no allowance being made for auxiliaries: thermal efficiency at quarter load, 16 per cent; at half load, 24 per cent; at 0.9 load, 28 per cent; at full load, 28¼ per cent: fuel consumption at quarter load, 1.1 lb.; at half load, 0.76 lb.; at 0.9 load, 0.65 lb., and at full load, 0.64 lb. These figures are for the vertical Diesel engine, four-cycle, three and six cylinders, directly connected to sixty-cycle generators, with oil having 19,000 B.t.u. per lb. The fuel consumption of the best oil engines to-day, made in large sizes, varies from 0.4 to 0.5 lb. per brake hp, the highest fuel economy being attained with the four-cycle type.

The Diesel engine is inherently massive for the same reason as the gas engine and the weight per unit of capacity increases with the size. The report showed that engines of the type mentioned above vary in weight per kw from 500 lb. at 40 kw to 750 lb. at 350 kw, the corresponding total weights being 20,000 and 260,000 lb.

There have been so few oil engines, driving generators of any appreciable size, installed in this country that it is difficult to tabulate cost. The most reliable figures available average approximately $95 per kw installed, including engine and generator complete, but not the foundation, within 600 miles of the factory. This corresponds to a cost per pound of about 19 cents for the 40-kw engine to 12.6 cents for the 400-kw.

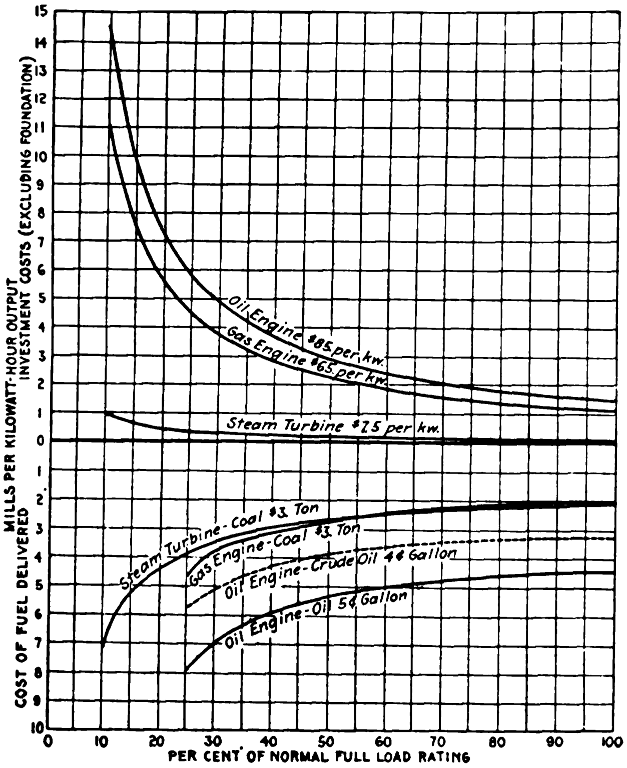


PRIME MOVERS—RELATIVE INVESTMENT AND FUEL COSTS OF 750-KW STEAM TURBINE, GAS ENGINE AND OIL ENGINE (INCLUDING D.C. GENERATOR)

High-compression, Diesel-cycle, crude-oil engines of the two and four-cycle, single and twin cylinder, horizontal type, using a heavy grade of crude oil, are now being manufactured in America as large as 500-hp capacity. They are somewhat heavier per kw capacity than the Diesel engine.

HYDRAULIC TURBINES

The demand on turbine designers and manufacturers for increased efficiency has been met by the production of turbines which, under test conditions, have given efficiencies of 90 per cent or over. These high efficiencies can now be maintained through considerable variations of head and power. Since 1911 the trend has been toward the adoption of single-runner, vertical-shaft turbines for low and medium heads. This change in type of unit is due to the recent progress in the design and development of high capacity runners and the improvement in thrust bearings.



PRIME MOVERS—RELATIVE INVESTMENT AND FUEL COSTS OF 20,000-KW CAPACITY OF PRIME MOVERS WITH GENERATORS

The weights and cost of hydraulic prime movers are not strictly comparable with those of the steam turbine, gas and oil engine because the conditions are quite variable, involving head; kind of flume, open or closed; setting, vertical or horizontal, single or multiple; material in runner, etc. With a given head the greater the power of the turbine the less the unit cost. With a given head and power, the higher the speed the less the unit cost. On the other hand with a given power, the lower the head the greater the unit cost. In general the cost of hydraulic turbines and generators, larger than 200-kw capacity, varies from $30 to $10 per kw installed, exclusive of foundation.

FINANCE AND ECONOMICS

Under this head the report took up the various types of prime movers from the standpoint of investment and fuel cost stating that, in comparing the various types of prime movers, conclusions are often reached largely from a study of the cost of fuel, without any reference to the total cost of power and the relative investment cost. The impression that gas and oil power invariably imply a lower cost of generation is constantly losing ground through the critical analysis of the elements of power cost.

The committee worked out the investment and fuel costs for a 20,000-kw plant equipped with one 20,000-kw steam turbine, ten 2000-kw gas engines, or forty 500-kw oil engines. Basing the estimate on the cost given earlier in the report and on the cost of coal as $3 per ton, crude oil as 4 cents per gallon, and oil for the Diesel engine as 5 cents per gallon, the steam engine was shown to be not only cheaper, as far as investment is concerned, but also superior in fuel cost to the crude oil engine. Above half load the gas engine is more economical in fuel, while the oil engine is less economical than the steam turbine. Below half load the steam turbine is best of all. The committee states that from a study of the curves it will be seen that the ratio of cost of steam to gas and oil units is decidedly in favor of the former so that gas and oil power comes to be really handicapped in large work owing to the proportionately greater investment burden. Unless the price of coal rises materially above the present value the gas and oil engine will find limited applications in any appreciable size, except under very favorable circumstances, where natural gas, by-product gas or some artificial fuel oil can be secured at low prices. If the maintenance cost and the additional investment cost required to show reliability or continuity of service are excluded, the steam turbine will stand out more prominently.

The redeeming feature of the water turbine is shown to be the absence of fuel. As a result the operating expenses are practically the same whether the plant is working 10 or 24 hours per day. On the other hand, the investment cost is influenced by the load factor, but it is doubtful in any case whether the water turbine and generator will exceed twice that of the steam turbine and generator on the basis of 11 per cent allowance for interest, taxes, insurance and amortization. When the investment cost can include an adequate supply of auxiliary capacity to supplement the deficiency in stream flow, the difference between the investment cost of prime movers plus the fuel cost, at any percentage of normal full load rating, will not be so marked. In fact, with the same class of service and the reliability charge in the form of duplication of units or steam reserve, the straight steam turbine units will in many cases be more economical. In low-price fuel districts the hydraulic turbine is only a competitor of the steam turbine where the development costs are moderate and the load factor reasonably high. The following table is given in the report summarizing the information as to total cost of investment and relative cost of prime movers and generators.

Prime Mover	Total Investment Cost Per Kw.	Cost of Prime Mover and Generator Per Kw.	Percentage of Total Investment
Steam turbine..............	$65.00	$7.50	15
Gas engine (producer gas)..	140.00	65.00	46.5
Oil engine	120.00	85.00	71
Hydraulic turbine	125.00	12.00	9.6

Summarizing the data contained in the report the committee points out the remarkable fact that the large steam turbine has now passed the gas engine in thermal efficiency, and the only prime mover surpassing it is the Diesel type of oil engine. Owing to the present limit in size of the Diesel type of engine, which seems to be about 1800 kw, the space occupied by engines in plants of capacity larger than 15,000 kw is excessive. The committee had not sufficient data to warrant a report on the subject of maintenance of these engines. The general conclusion is that the steam turbine is far more economical for power generation than any other type of heat engine.

Atlantic City Meeting of the American Society for Testing Materials

The seventeenth annual meeting of the American Society for Testing Materials was held at Atlantic City, N. J., June 30 to July 3. From the standpoint of the electric railway engineer the chief actions of interest were those relating to the recommendations of committee A-1 on standard specifications for steel. Certain changes in details of the specifications for steel rails, splice bars, structural steel, built-steel concrete reinforcing bars, steel forgings, heat-treated carbon steel axles, and a few others were referred to letter ballot.

Under the head of "Standard Specifications for Steel Forgings for Heat-Treated Carbon-Axles, Shafts and Similar Objects," the committee recommended that the present specifications be cancelled and a new set substituted under the title "Quenched-and-Tempered Carbon-Steel Axles, Shafts and Other Forgings for Locomotives and Cars." In addition to the change in title, the following other changes were recommended: The description of the heat treatment has been changed, as well as the sections on prolongations for tests; the section on warping has been omitted; requirements as to boring have been added; the manganese requirements have been changed; the maximum and minimum limits for carbon have been given; classification by sizes has been added; the ductility requirements are now based on the inverse ratio of the tensile strength, that is, factor ÷ tensile strength; the method of determining the "elastic limit" has been changed; section providing for proof tests of finished forgings has been added; the requirements as to number of tests have been changed; and requirements as to character of fracture and permissible requenching have been added to the section on retests. Attention was directed to the following: (1) That many sections in these specifications are the same as the corresponding ones in the specifications for carbon-steel and alloy-steel forgings; (2) that the tensile properties are the same as those of the corresponding class in the last-named specifications, and (3) that certain requirements have been included that are not covered in the last-named specifications.

As representatives of the American Electric Railway Engineering Association on committee A-1, Norman Litchfield, J. P. Barnes and W. E. Johnson filed a minority report on the subject of steel-axle specifications which did not affect the committee's recommendation. (See letter on page 78 from George L. Fowler.)

The committee's reason for its attitude toward the request of the representatives of the A. E. R. E. A. was that the proposed specifications were not considered practicable from a manufacturing standpoint. The minority report follows:

"As representatives of the American Electric Railway Engineering Association on committee A-1 on standard specifications for steel, and its sub-committee VI on steel forgings, we wish to protest against the action which the committee has taken in submitting to the society a proposed revision of the present standard specifications for heat-treated axles, shafts, and similar objects, without due consideration being given to the wishes of the American Electric Railway Engineering Association and before it could have the attention of that association at its annual meeting. The first specification covering this class of material was originated by one of the member companies of the American Electric Railway Engineering Association, and then adopted by that association, which later, at the solicitation of some of the members of the American Society for Testing Materials entered into joint consideration with that society in the production of the present standard specifications of the society entitled 'Specifications for Heat-Treated Axles, Shafts, and Similar Objects.' The specifications which committee A-1 now proposes are general, covering axles, shafts, and other forgings for locomotives and cars, and would consequently supersede the present specifications for heat-treated axles. To this the representatives of our association strongly objected in the meetings of sub-committee VI and committee A-1, as the requirement of the new specifications, while in some respects an improvement over those of the existing specifications, do not, in the main essentials, retain the high standard set by the original specifications, and particularly with reference to the elongation and reduction of area, required to be not less than 22 and 45 per cent respectively for all tensile strength above a minimum of 85,000 lb. per sq. in. It is proposed to place the elongation and reduction of area on a sliding scale basis, such that with a tensile strength of 85,000 lb., an elongation of 23.5 per cent is permitted as a minimum, with 91,000 lb., 22 per cent as a minimum, and with 97,000 lb., a minimum of 20.6 per cent as the ultimate limit is reached; and with the tensile strength of 85,000 lb. a minimum reduction of area of 44.7 per cent is permitted, with a tensile strength of 90,000 lb., a reduction of area of 42.2 per cent is permitted, scaling down to a minimum of 39.2 per cent for a tensile strength of 97,000 lb.; covering forgings of various sizes within the range of standard driving axles for electric railway work.

"While it is frankly admitted that in no instance will the minimum reduction requirements of the proposed specifications be as high as those of the present specifications, it is claimed by certain members of committee A-1 that the above arrangement should actually result in a higher minimum requirement for the elongation than that called for in the present specifications for this class of material. We do not agree with this contention, and base our opinion in this respect on experience which has shown us that even with the incentive to keep the tensile strength low in order to meet the elongation and reduction requirements of the present specifications, in the majority of cases the tensile strength exceeds 91,000 lb. per sq. in. Moreover, in the specifications as proposed, the tendency will be greatly in favor of a high tensile strength, as this will not only permit of a reduced elongation and reduction requirement, but will also result in a lower elastic ratio.

"After having submitted argument in favor of retaining practically the present physical properties and made motion to this effect, which was lost by negative vote of all members present at the meeting of committee A-1 held in Philadelphia on April 3 and 4, but without any explanation in support of action taken, or submitting any evidence to indicate that there was any reason for not supporting this motion, the representative of our association endeavored to have the title changed to read 'Specifications for Quenched-and Tempered Carbon Steel Axles, Shafts, and other Forgings for Locomotives and Trailer Axles for Cars,' in this way excluding electric motor driving axles and armature shafts. A motion to this effect was lost, notwithstanding the fact that the argument has been made that if it were defeated you were overruling the wishes of the originators of the specifications.

"The executive members of our association exceedingly deplore this action, feeling that as the specifications in question had been adopted by this society after being suggested by our association, and after co-operative consideration with this society, it should not be modified by you without direct consultation with the American Electric Railway Engineering Association, which is the engineering representation of the electric railway companies —extensive users of this material, for which these specifications are intended. Our executive members feel that such action cannot help but jeopardize the value of the co-operative work of the two societies."

Semi-Annual Meeting American Society of Heating and Ventilating Engineers

The summer meeting of the American Society of Heating and Ventilating Engineers was held at Hotel Hollenden, Cleveland, Ohio, July 9-11. Two papers of particular interest to electric railway men were "Car Ventilation," by D. I. Cooke, Chicago, and "Car Heating by Electricity and Temperature Regulation in Connection Therewith," by W. S. Hammond, Jr., Chicago.

CAR VENTILATION

Mr. Cooke's paper was largely taken up with a description of the tests on ventilation of street cars in Chicago, and the outcome of these tests in the equipment of a large number of cars with an exhaust system of ventilation. He first reviewed briefly the history of car ventilation, pointing out the defects of several of the methods used and outlined the tests made under the supervision of the health department of the city of Chicago, officials of the street railway company and the Board of Supervising Engineers, in 1908 and 1909. [These tests were described by Dr. W. A. Evans, Commissioner of Health, Chicago, in the issue of the ELECTRIC RAILWAY JOURNAL for May 8, 1909, page 876.] In Chicago the exhaust system of mechanical ventilation was adopted because it could be most readily applied to standard car construction.

Mr. Cooke stated that in Chicago the heating season is considered as 155 days per year. During this period the cars are operated with the doors and windows closed, and in winter with extra sash fitted in the windows. Mechanical ventilation has been recently applied to 125 of the single-end operated cars of the near-side type, operating on the lines of the Chicago City Railway. These cars were already in service and it was, therefore, deemed impracticable to install the standard system in which the air is drawn over the heating units from outside through inlets in the side of the car. The near-side cars were originally equipped with natural ventilators of the "aspirator" type located on the roof, with a series of openings through the car floor, to provide fresh air. In converting this system into a mechanical one six of the aspirators were changed into injectors, and the openings beneath the car heaters in the floor were closed. A motor-driven exhaust fan was placed beneath the end seat in the rear of the car, discharging downward through an opening in the floor. This fan had a capacity of 1000 cu. ft. per minute, and was driven at 2000 r.p.m. by a ½-hp motor.

In this installation at least one-half of the air comes through the roof injectors, the balance entering through leakage points, around doors, windows, etc. When the car stops, and the forward door is opened, the roof injectors cease to operate, but an ample supply of air is provided through the doors themselves. As a result of experience with this installation, Mr. Cooke believes that direct contact of air with the units of the heating system for the fresh air supply is not necessary, and he believes that the amount of heating surface for this kind of installation may be somewhat less than would be required in a direct-indirect system.

A mechanical exhaust system of car ventilation has been applied during the last two years in the double-deck cars which are being operated experimentally in New York, Rochester and Columbus. In these cars an exhaust chamber space is provided in the car roof in the upper deck with a cross section of 5 in. x 40 in. In the lower space of this exhaust chamber a series of 6 in. registers is provided to serve as air outlets from the upper deck section. The space between the seat backs in the upper deck forms the sides of a triangular duct of which the arch across the lower deck forms the bottom. This duct serves as an outlet from the lower deck section, and is connected with the main exhaust chamber in the upper deck roof by means of a riser at the mid-section. A series of outlet registers is also located in the lower deck roof, opening into the triangular duct. The main exhaust chamber in the upper deck roof terminates in the header at one end of the car body, to which in turn are connected four risers extending vertically downward along the window posts and having a cross section of 6 in. x 6 in. each. These vertical risers connect to a header in the roof in the lower deck and an exhaust fan motor is connected into it at the same point. Fresh air inlet connection is made to the car heaters in the lower deck section, and with the exhaust fan in service a circulation of air is established through the upper and lower deck compartments.

Mr. Cooke states that on account of investigations made by the Chicago commission on ventilation and others, the ventilation requirement in Chicago has been increased from 500 cu. ft. per minute to 1000 cu. ft. per minute. The average load is taken as eighty passengers, and to keep the carbon dioxide content of the air down to a maximum of twelve parts in 10,000 requires an equivalent of 750 cu. ft. per hour per passenger, or a total of 60,000 cu. ft. per hour per car.

ELECTRIC HEATING AND ELECTRIC HEATER CONTROL

In his paper on the above topic, W. S. Hammond, Jr., who is vice-president of the Consolidated Car Heating Company, first called attention to some of the fundamental facts regarding the transformation of electrical energy into heat. He stated that it requires about 20,000 B.t.u. per hour to properly heat a 20-ft. car body in the latitude of New York State in the coldest weather. Thirty per cent more heat is required for a steel car than for a wooden car of the same capacity.

In estimating the amount of heat required to maintain the desired temperature in a car, Mr. Hammond called attention to the fact that each passenger affects the temperature in a manner similar to a hot water radiator with a temperature, say, 38 deg. above the surrounding air, the temperature on the surface being the same as that on surface of the human body and the radiator surface being partly covered by cloth similar to clothing. Tests seem to show that the body of a man gives out twice as much heat as that of a woman. The amount of heat given off is proportional to the difference in temperature between the surrounding air and the body. Tests seem to show that the amount of heat given out on the average is from 198 to 400 B.t.u. per hour per person. A car which requires 10,000 B.t.u. per hour to maintain proper temperature can be heated by radiation from fifty passengers giving out 200 B.t.u. per hour each. This point has a practical bearing upon the heating of cars by means of electric heaters, for it shows that if heat is supplied to the car at a uniform rate the cars are overheated during those hours of the day when they are filled with passengers. Mr. Hammond's conclusion from these and other facts, on account of which it is difficult to heat cars uniformly, was that some kind of automatic control of the heating current should be provided.

Heat leaves a car by two routes, namely, one through the air which is replaced by fresh air for ventilating purposes, and the other through the windows and walls by conduction. Heat radiated in the latter way produces no ventilation, and tends to make the air in the car impure and cold. There should, therefore, be better heat insulation in the walls and ceilings of cars so as to stop as much as possible the loss of heat by conduction. Double windows are effective in providing dead air spaces through which heat will not be conducted readily. Double glazing of windows is known to save 33 per cent of the heat which would escape through single glazed windows. In the records of a test by a well-known authority the statement is made that in a building, 39 per cent of the heat escaped in the flues and 61 per cent in conduction through walls and windows. Because of that fact there would appear to be good reason for studying the problems of conduction through walls of cars to the end that this large loss of heat may be prevented. Mr. Hammond is of the opinion that, in heating cars, direct radiation should be provided to compensate for the heat losses through the walls and windows, amounting to about 60 per cent of the total heat, and that the remaining 40 per cent should be supplied by direct-indirect radiation, that is, by heaters exposed in the cars but receiving air from the outside. Air should be drawn into a car over the heating elements, preferably in small units. The source of power for causing the flow of air should be an exhaust fan operated by an electric motor.

In regard to the metals to be used in the construction of electric heaters, Mr. Hammond stated that as such wires as nichrome and the nickel-copper group have very low temperature coefficients their resistances are but slightly affected by changes of temperature. Therefore they give off heat at fixed rates, regardless of the temperature of the air surrounding the heaters. On the other hand, iron wire has a large temperature coefficient, and its resistance increases rapidly with rising temperature. As a result, an electric heater in which iron wire is used is in a certain sense automatic, the current increasing when the heater is supplied with cold air, and decreasing when the surrounding air is warmer, or when anything occurs which prevents the escape of heat.

In regard to the cost of heating cars, Mr. Hammond claims that the cost of energy to supply electric heat should be estimated on the basis of the additional cost of generating current to supply the heaters, but no charges should be made for such expenses as would continue the same if electric heaters were not used. With coal at $2 per ton he estimated this cost to be about 0.29 cent per kw-hr. At this rate, and basing the power consumption for heating on experience in Chicago, the maximum cost would be 2.12 cents per hour. The average is somewhat less than one-half this rate. Thermostatic control results in a considerable saving, which is specially marked when a railroad operates under peak-load-basis power contract. The period of peak load is that of crowded street cars, and on account of the extra heat from the bodies of passengers the thermostat tends to cut current off the heating system for the greater part of this time.

W. B. McKinley, president of the Illinois Traction System, has renewed this year his offer to the boys of the nineteenth Illinois Congressional district for prizes for the best corn raised in the district. Inasmuch as the United States department of agriculture is interesting boys in corn culture, Mr. McKinley has for several years supplemented the prizes of ribbons, which the government gives, with trips for the winners to various parts of the country. The first prize is a trip to the city of Washington, the second to St. Louis and the third to Springfield, Ill. The trip to Washington is valid while the conference of boy corn growers is in session. The expenses for all of these trips are borne by Mr. McKinley.

COMMUNICATIONS

The Question of Gear Ratios

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
EAST PITTSBURGH, PA., July 1, 1914.

To the Editors:

Referring to your editorial entitled "Again the Question of Gear Ratios" on page 1427 of the ELECTRIC RAILWAY JOURNAL for June 27, I beg to take exception to your inference that the comparison of equipments made in my paper before the Central Electric Railway Association is unfair and misleading.

It is generally impracticable for railway companies to adopt different sizes of motors, or even the same motors geared differently, for the two classes of service represented by purely city operation and combined city and suburban operation. The advantages of a single type of equipment and gear ratio for any one type of car are considered sufficient to outweigh the operating economies which may be secured by having the cars on each line provided with the equipment best suited to the service on that line and possibly to no other. Such conditions lead naturally to the selection of the equipment and gear ratio which constitute the best compromise.

Since such a situation demands a gear reduction of not more than 17:70 on the 310-C motors for the Toledo system, and since anything less than this reduction would increase the consumption of energy without producing any benefit, it is obvious that the field-control motor, to perform the same service most economically on the entire system, must meet two conditions as nearly as possible; first, it must propel the car at as high a free running speed as the ordinary motor and, second, it must not propel the car at a higher speed than the ordinary motor when developing heavy tractive efforts during acceleration.

It is impossible to make the speed-tractive effort curves identical on account of the different degrees of saturation in an ordinary motor and a field control motor. However, for a true comparison between the two types of equipment, the short field curve between car speed and tractive effort must be made as nearly coincident with that of the ordinary motor as possible. The field control motor on short field has a steeper curve. Therefore, the closest possible approximation to identical speed-tractive effort characteristics is secured when the field control equipment will propel the car faster than the ordinary equipment at low tractive efforts and somewhat slower at high tractive efforts.

There are three ways of obtaining this essential close similarity in characteristics: (1) By using motors with the same armature winding but geared differently; (2) by using motors with different armature windings but the same gearing; (3) by using motors with different armature windings and different gearing.

In my paper I stated clearly that the 310-C motors did not have the maximum possible gear reduction because of the fast schedules required on parts of certain lines with infrequent stops. I further stated that the 310-C-3 motor was geared so that the car speed on short field would be as nearly as possible the same as that of the car with 310-C motors. Fig. 3 in your abstract of the paper shows that on the level or grades of less than 0.75 per cent, the speed with field control is higher than without it. It is obvious, therefore, that the field control car is capable of maintaining the fast schedules necessary on those parts of lines with infrequent stops, which is one of the conditions to be met by any equipment applied to this system. Any economy resulting from the lower speed of the field control car at high tractive efforts is due to its steeper characteristic and is justly credited to the field control equipment in comparison with the ordinary equipment.

In the Toledo system, the two types of equipment were made equally suitable for maintaining all schedules by the first of the three methods cited above. For the sake of argument, let us suppose that it were feasible to equip the Long Belt cars with 310-C motors geared 15:72, and that such equipments would maintain the schedules on that line without reference to any other line. Such an equipment would undoubtedly reduce the energy consumption below that now required with 310-C motors geared 17:70. A comparable field control equipment would be obtained by either the second or third method cited above, and such an equipment would reduce the energy consumption below that of the 310-C motors geared 15:72 by the same percentage as shown by the tests.

I therefore maintain that the comparative economics shown by the tests are fair and truly indicate the value of field control equipments for the service condition of the Long Belt Line. F. E. WYNNE.

[The main points raised in the editorial in question were, first, that the ratio of 17:70 was not suitable for the particular run described, and, second, that, considered broadly, the result obtained with an improper ratio is not the best basis for comparison of the relative efficiencies of different equipments. Mr. Wynne admits the correctness of our first point. The second can hardly be disputed. As we said in the editorial in question, the tests described in Mr. Wynne's paper are interesting and the results are valuable. Our contention was simply that a too liberal application of the data might produce misleading conclusions.—EDS.]

The A. S. T. M. Specifications of Steel for Axles

NEW YORK, July 8, 1914.

To the Editors:

As a member of the American Electric Railway Engineering Association, it seems to me that the attention of the members of that association should be called to the action taken at the recent meeting of the American Society for Testing Materials in the matter of specifications for heat-treated carbon axles as applied to electric railway cars. The proposed specifications reduce the percentage of elongation and that of the reduction of area by a small amount from that now required by the standard specifications of the American Electric Railway Association.

A number of roads are working under these specifications (A. E. R. A.) and are satisfied with them. The committee of the American Electric Railway Engineering Association therefore sent a representative, W. E. Johnson, of the Brooklyn Rapid Transit Company, to the meeting to protest against the change. The reason for this was that if the elongation and reduction of area were kept as at present it would be necessary for the manufacturers to take more pains in the heat treatment of the axles than would be required were the percentages to be reduced in these particulars. Mr. Johnson, therefore, simply asked that the heading of the specifications be changed so as to except motor axles from the specifications and expressed entire willingness that they should be made to apply to trailing axles. The A. S. T. M. committee asserted that the old specifications were impossible commercially and that the proposed specifications would give the railroads a better axle. To this Mr. Johnson replied that axles were being bought under the old specifications without any trouble and that they were working satisfactorily. In spite of the protest, the Society for Testing Materials voted as a man, almost, to sustain the proposed specifications, and the suggestion from the A. E. R. A. was turned down with a thump.

Unable to understand this attitude, in view of the fact that at the same session the whole of the proposed specifications for automobile springs was cut out of the report because of the objections of the automobile manufacturers and that especial reference was made to the necessity of conforming to the views of the Master Car Builders' Association in the matter of things affecting the association, I took pains to discuss the matter with a number of members, and I found that the vote was cast, in most cases, without thinking, simply because it was the recommendation of the committee. There was no realization of the fact that the electric railway people were the users of the axles and that unless the specifications were satisfactory to them the axles would be of no value whatever. Even one of the officers of the association who is high in its councils made the same acknowledgment. He voted for the specification simply because he thought it a good one and because the committee recommended it.

I am not on the committee of the American Electric Railway Engineering Association which is concerned with axle specifications or even in its confidence and so do not know what action the members propose to take in the matter, but I feel that a direct affront has been offered to the representative of the association and take this means of bringing the matter to the attention of the members. GEORGE L. FOWLER.

Notes on Train Resistance Formulas

NEW YORK, July 7, 1914.

To the Editors:

I have read with interest in the ELECTRIC RAILWAY JOURNAL of June 20 the summary of the report on train resistance tests recently issued by the experiment station of the University of Illinois.

The new empirical formula derived from these tests presumably applies with satisfactory precision to cases and conditions similar to those of the tests. Usually, there is much variation in the values obtained in train resistance tests and it is difficult to obtain the same results twice. For this reason, it is usually considered useless to attempt to make the coefficients for the second and third terms very precise. It is only in the case of results which substantially repeat themselves and which are very closely concordant that one would usually venture to put more than one or two significant figures in the coefficients. It is hoped that the precision obtained in these tests justified the use of three significant figures; otherwise the formula is merely "putting on airs" and "traveling under false pretences," because it will not be as accurate as it looks.

It is known, of course, that a formula of this type does not tell the whole story, but ignores some of the incidents of train resistance. This is why it falls short of the requirements of a generalized rational formula. My views on this point are still substantially the same as they were ten years ago, when I discussed other formulas of this type, including one of my own, before the American Institute of Electrical Engineers. The following is a partial quotation from my discussion (*A. I. E. E. Transactions*, 1904, Vol. 23, page 734) . . . "the curve of train resistance, plotted as a function of the speed, is really a 'two-branch' curve; this fact is admitted and shown graphically by certain authors, including Wellington, Aspinall and Dennis; yet all 'our' formulas, as well as theirs, neglect entirely the first branch, showing the starting friction. That is why he could not help regarding them all, including

Mr. Smith's and his own, as mere make-shifts. He desired to point out that it would be necessary to do something more than merely to devise and introduce a new set of constants in a Maclaurin series of the form $Y = A + Bx + Cx^2 +$ etc., in order to accomplish something representing a material advance in our methods of dealing with train resistance in railroad engineering. We already have too many formulas of that kind. Moreover, it was not difficult to foresee that the physicist and the mathematician will contribute at least as much as, and perhaps much more than, the engineer, to the solution of the problem of finding a general formula for train resistance, if one be ever found. There is valuable work to be done by the engineer in obtaining data for theoretical analysis and in making tests for the purpose of proving or disproving the theory."

In 1907, in my discussion of the paper on the "Predetermination of Train Resistance," read before the Institute of Civil Engineers in London by Prof. C. A. Carus-Wilson, I again referred to this subject thus: "The Maclaurin power series $y = A + Bx + Cx^2$ had always been popular with designers of new train resistance formulas, and, to do it justice, it had done good service. It was undesirable, however, to dignify this equation with the term general equation until it could be completed by the introduction of a term which would provide for starting resistance. The complete general equation for train resistance would be one which gave, at zero velocity, not the value of zero, but a value equal to the starting (static) resistance. In order to do this there must be introduced a hyperbolic term, or a term in which the velocity appears with a negative exponent, thus $R = A + Bx + Cx^2 + Dx^{-n}$."

It is the general practice to assign a constant value to the first term of a formula of the Maclaurin-series type. This has the effect of limiting the scope and range of application of the formula. This first term, in reality, represents a sum of different effects. It varies with the weight per axle, the condition of the track, and, probably, with still other conditions. As I pointed out several years ago (*Harvard Engineering Journal*, 1905, Vol. III, page 269, and Vol. V, page 39) the power expended in causing a wheel to roll over any surface is expended in substantially the same manner as if the wheel were ascending a certain "equivalent gradient." It makes no difference whether the surfaces in rolling contact yield or not. When they yield there may be crushing and mangling effects; when they do not yield there may be shocks. These, as I pointed out, are mere details or incidents of the dissipation of the energy abstracted from the moving source to cause the rolling action. I adopted the term "track hysteresis," first suggested by Mr. A. Mallock, in England, and I used it, with slightly extended meaning, to designate generally all yielding effects due to continuous obstructions which were elastic in any degree and do not involve permanent deformation. (For a more complete analysis of the phenomena see the *Harvard Engineering Journal* articles or the discussion of Professor Carus-Wilson's paper already referred to.) Track hysteresis and all forms and phases of rolling resistance can be expressed in terms of the artificial gradient which they really produce. In this way it becomes possible to account for differences in the condition of the track, due to rails and ballast, to dirt, sand, snow, etc., because the artificial gradient causes a variation in the value of the first term. For this reason I have found it convenient to separate the first term into two parts $A = g' + a$, wherein g' is the resistance depending upon the equivalent grade due to the condition of track, including the presence of dust, dirt, snow, etc., and a is the resistance depending upon the weight per axle and other conditions. This segregation of the constant A into its two principal component parts has the effect of making a formula applicable to a much larger number of cases and conditions than it would be otherwise. The third term cannot be expressed as simply as it is in the formula under consideration in a formula intended to take into account variations in length of train. The formula therefore seems far from being entirely general in applicability. This consummation though "devoutly to be wished" is farther away and it doubtless involves many changes and additions in symbolical expression.

The tests were presumably made with great care and the records of the attendant circumstances and conditions are probably more complete than is usually the case in connection with such tests. It would be interesting and it might prove instructive to try to fit the data to train resistance formulas of other types, more comprehensive than the Maclaurin series type and including some of the features to which I have referred, such as starting resistance, journal friction, track hysteresis, etc.

C. O. MAILLOUX.

BOSTON, MASS., July 8, 1914.

To the Editors:

May I call your attention to some of the interesting features of the car resistance tests reported in your issue of June 20? From the standpoint of the traction engineer these tests are particularly valuable because they are conducted with a typical interurban car with a four-motor equipment, such as is very frequently installed, and at speeds which are thoroughly representative of interurban work. Very few resistance formulas have been based on runs with single cars. In fact, with the solitary exception of the Zossen trials of more than a decade ago, exact determinations of the resistance encountered by electric cars have been few and rather unsatisfactory. There are many train resistance formulas, old and new, yielding fairly satisfactory results, although the relative value of the several terms in the equation must necessarily be considerably altered when one considers a train rather than a single car, with its added possibility of lateral air and flange resistances and the general waste of energy that comes from persistent working of moving parts with respect to one another.

The general formula enunciated by the Illinois experimenters takes the ordinary parabolic form used by most previous investigators but differs in the relative value of the coefficients. Now a parabola is the most valuable carryall in graphics. With the coefficients properly chosen it can be made to hit to a very close approximation almost any set of observations which indicate a locus of single curvature, consequently the mere form of the equation has very little analytic importance and must be regarded as an empirical construction, valuable in proportion to the care with which it is made. The experimental work in the tests considered was apparently very carefully done and therefore the results within the limitations of the data must demand respect. The better to compare the results obtained with others, I write over against the Illinois equation that obtained from the Zossen tests.

$R = 4 + 0.222\,S + 0.00582\,S^2$ Illinois

$R = 4 + 0.02\,S + 0.0027\,S^2$ Zossen.

The car in these latter tests was very much heavier than the Illinois car but with about the same cross-section, and the drive was by four gearless motors. The range of speeds in the Zossen tests, however, ran from a little below 15 m.p.h. up to 130, as against the much lower range of the American test. Comparing these two resistance formulas the constant term is identical in each. The simple resistance term in S is about 10 per cent higher in the Illinois test than in the German one, a difference not big enough to be especially significant considering the nature of the data. When it comes, however, to the term in S^2, which is generally assumed to be chiefly concerned with air resistance, there is a very conspicuous difference in the coefficients, the Illinois result leading to a figure more than double that obtained in the Zossen tests, which were carried up to extreme speeds. The values of air resistance obtained from these latter were remarkably consistent and, moreover, are accurately checked by the air resistance values based upon Newton's formula and used by artillerists for dealing with the resistance of projectiles at velocities well below that of sound. There is, therefore, a large outstanding apparent discrepancy in the term involving S^2, too large to ascribe to experimental results. If one extrapolates to the Zossen speeds from the Illinois formula an absurd result is reached in view of the power consumption of the Zossen tests. And the discrepancy does not disappear, even when one applies the modified formula of the Illinois experimenters involving the cross-sectional area and weight of the car, but it changes sign and, curiously enough, drops to a considerably lower value than that indicated by the Zossen trials. These differences are instructive. They show first rather that the air resistance cannot properly enter as a mere coefficient to the term in S^2 but must be taken account of separately, as in the formula just referred to, and this even at speeds as low as 40 or 45 miles an hour when cars of only moderate weight are under consideration.

The difficulty in thus taking care of the air resistance lies in two matters which have never been really well investigated; first, the actual effect of the shape of the front of the car and, second, the effect of this shape on lateral drag at high speeds. In the Zossen tests the lateral resistances and those due to the bow collectors were quite perceptible and probably account for part of the differences observed. In fact, the Zossen air resistances, as determined up to the limit of speed used in the Illinois tests, would apparently be satisfied by a somewhat lower coefficient than that which would apply to the observations as a whole. One must therefore conclude that the results obtained in the Illinois tests and in the Zossen tests are really in a good deal better concordance than would appear at the first glance, and that with due corrections the apparently large discrepancy in the coefficient of S^2 is no more than might be expected from the widely different range of speeds. Setting this, therefore, aside, the very close agreement of the earlier terms in the equations indicates that the track and other normal resistances under modern conditions of construction can be very safely determined by either of the formulas and are considerably lower than the values given by earlier investigations. Finally, it is plain that the air resistance term, while approximately taken care of by a formula having a coefficient of S^2 in terms of the area and weight, still leaves material outstanding irregularities which need investigation.

LOUIS BELL.

The Sprague Double-Reduction Motor

SAN FRANCISCO, CAL., June 26, 1914.

To the Editors:

The writer recently made a visit to Sacramento and called at the car shops of the Pacific Gas & Electric Company, formerly the Sacramento Street Railway Company. On the floor of the machine shops was seen an old Sprague double-reduction motor, and while commenting on its appearance and doing some reminiscing about this old stanch and much-fun-poked-at motor an incident was told connected with its early history.

In about 1890 the carhouse foreman kept a blackboard on the wall of the building on which was a table giving dimensions of different parts of equipment, such as journal bearings, gears, axles, etc., and for the several equipments then in use. It seems there was a space left for miscellaneous figures. In this space was written and left for some time the following verse, said to be original with the foreman, the name of whom could not be learned:

"The little Sprague should fill this space,
But they're almost dead and out of the race;
Their days are numbered, their work is done,
Though the meaner you treat them the better they run."

We all know what abuse the old Sprague was put to in many shops and how it was relegated to some shelf or pit, there to furnish power for machinery. It was often buried deep in dust and dirt but was ever faithful to its duty.

The above verse shows where Frank's baby stood in the estimation of the "man behind the gun," and to one "who was there" it recalls many haps and mishaps of the early days of electric traction.

W. FRANK CARR.

ASSOCIATION NEWS

COMMITTEE ON FARES AND TRANSFERS

A meeting of the committee on fares and transfers of the American Electric Railway Transportation & Traffic Association was held July 8 in Chicago at the office of J. V. Sullivan, Chicago Surface Lines, and chairman of the committee. G. K. Jeffries, general superintendent Terre Haute, Indianapolis & Eastern Traction Company, was also in attendance. The report of the committee was completed for publication. It will be divided into recommendations for city lines and for interurban lines. For city lines the report will take up a number of practical subjects connected with the use of fare boxes, such as the maintenance of these boxes and the effect of these boxes on the gross receipts; it will also take up the present status of transfer issuing and collecting devices, will discuss the use of metal tickets versus paper tickets and the methods of accounting for free passengers. It will also make recommendations on the proper practice in the case of bodily transfers. Mr. Jeffries, as chairman of the sub-committee in charge of interurban practice, will discuss the collection, registration and accounting of interurban fares. The committee has been quite successful in securing a large number of data sheets to form the basis of its report.

COMMITTEE ON ENGINEERING ACCOUNTING

M. W. Glover, president of the American Electric Railway Accountants' Association, has appointed Charles H. Lahr, auditor of the Northern Ohio Traction & Light Company, Akron, Ohio, a member of the joint committee on engineering accounting, in place of F. B. Lasher, resigned.

Electrification of Berlin Railway

The preliminary work for the electrification of the Berlin Stadt & Ringbahn is reported to be making excellent progress. Inauguration of construction is planned for the early part of the year 1915, but it is expected that the electrical service will not be started before 1917 as this depends upon the reconstruction of the Friedrichstrasse station, one of the principal terminals in Berlin. The report of the State Railways Administration to the 1915 session of the Prussian Diet will not only call for additional funds but will also give a detailed report on the electrification plans. The first section to be electrified will be from Charlottenburg to Rummelsburg. Energy will be transmitted from a government station at Bitterfeld.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

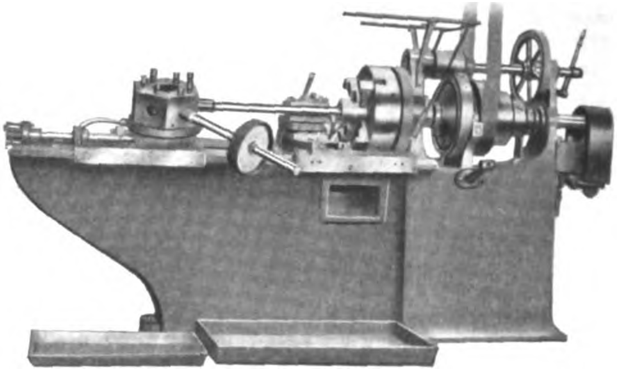
Boring Bearing Practice of the Bay State Street Railway

BY E. J. HAINES, ACTING ASSISTANT SUPERINTENDENT EQUIPMENT

Properly finished bearings play an important part in reducing motor maintenance costs, and upon the shop devolves the task of furnishing at the lowest cost a bearing from which the maximum efficiency will be obtained. At the Chelsea (Mass.) shops of the Bay State Street Railway bearings were formerly turned out in the ordinary lathe, but in the past year a large saving has been effected by securing for this work the second-hand 21-in. Gisholt turret lathe shown in the half-tone illustration. The bearing is held in place by means of a four-jaw universal chuck to insure quick and accurate work.

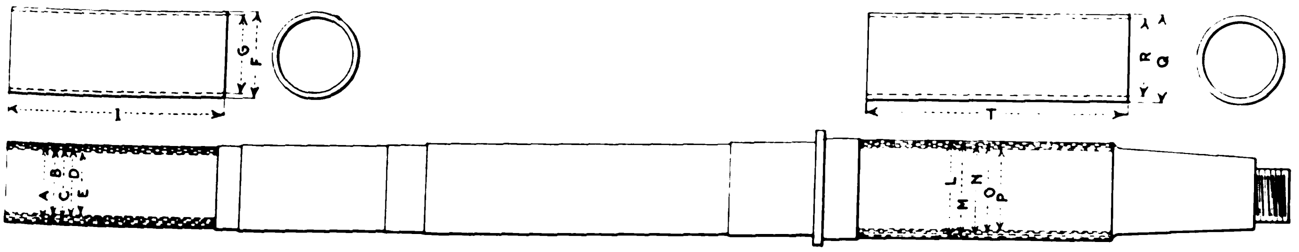
The present practice is to use a babbitted armature bearing with a semi-steel shell. These are furnished in two sizes for each type of motor. When the armature shaft becomes worn 1/16 in. it is turned so that the shaft diameter is ⅛ in. smaller than the original size, and the smaller bore bearing is used. When the shaft which has been turned becomes worn 1/16 in. it is turned again and a sleeve is then put on to make it the original size, so that the large bore bearings are used again. With this procedure few bearings are turned at the carhouses, and as a large number of bearings of each type are babbitted in one lot, it gives the opportunity to put these through the boring process. The job is also done in large lots, thereby reducing the tool adjustment to a minimum and securing the best results in the least time.

The tools for the boring process are secured on the boring bar, and separate boring bars are provided for each type of bearing to avoid frequent adjustments of the tool. After the tool is once accurately set with a depth gage, it need not be changed except by grinding.



TURRET LATHE WITH FOUR-JAW UNIVERSAL CHUCK FOR BORING BEARINGS

The first operation after the bearing has been placed in the chuck consists of a roughing cut varying from 1/16 in. to 3/16 in. The turret is then turned and the second boring bar is used for the finishing operation, less than 1/64 in. being taken off, thus giving a very smooth finish to the bearing surface. The turret is then withdrawn and the third operation is commenced. This consists in facing the babbitt on the collar, and rounding off the bearing surface at collar end of bearing. This is done with the tool on rest using cross feed.



COMMUTATOR END

A. Full size of standard armature shaft.
B. When shaft is worn down to this size, turn down to C.
C. Second standard size for armature shaft.
D. When shaft is worn down to this size, turn down to E and sleeve.
E. When shaft has been turned to this size, it must be sleeved to full size(A.)
F. Tubing outside diameter.
G. Tubing inside diameter.
H. Size of reamer.
I. Length of sleeve.

PINION END

L. Full size of standard armature shaft.
M. When shaft is worn down to this size, turn down to N
N. Second standard size for armature shaft.
O. When shaft is worn down to this size, turn down to P and sleeve.
P. When shaft has been turned to this size, it must be sleeved to full size(L)
Q. Tubing outside diameter.
R. Tubing inside diameter.
S. Size of reamer.
T. Length of sleeve.

	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q	R	S	T
GE52	2 3/8 in.	2 5/16 in.	2 1/4 in.	2 3/16 in.	2.131 in.	2 3/8 in.	2 in.	2 1/8 in.	6 1/16 in.	2 5/8 in.	2 9/16 in.	2 1/2 in.	2 7/16 in.	2.381 in.	2 5/8 in.	2 1/4 in.	2 3/8 in.	7 1/2 in.
GE57	2 3/4	2 11/16	2 5/8	2 9/16	2.506	3	2 3/8	2 1/2	6 1/16	3 1/4	3 3/16	3 3/16	3 1/8	3.006	3 3/8	2 7/8	3	8 11/16
GE58	2 1/2	2 7/16	2 3/8	2 5/16	2.256	2 1/2	2 1/8	2 1/4	6 5/16	3	2 15/16	2 15/16	2 7/8	2.756	3 1/4	2 5/8	2 3/4	7 13/16
GE67	2 1/2	2 7/16	2 3/8	2 5/16	2.256	2 1/2	2 1/8	2 1/4	6 5/16	3	2 15/16	2 15/16	2 7/8	2.756	3 1/4	2 5/8	2 3/4	8 1/4
GE80	2 5/8	2 9/16	2 1/2	2 7/16	2.381	2 5/8	2 1/4	2 3/8	7 5/16	3 1/4	3 3/16	3 1/8	3 1/16	2.881	3 3/8	2 3/4	2 7/8	8 5/16
GE90	2 5/8	2 9/16	2 1/2	2 7/16	2.381	2 5/8	2 1/4	.2 3/8	7 5/16	3 1/4	3 3/16	3 1/8	3 1/16	2.881	3 3/8	2 3/4	2 7/8	8 5/16
GE214	3 1/4	3 3/16	3 1/8	3 1/16	3.006													
GE800	2 3/8	2 5/16	2 1/4	2 3/16	2.131	2 3/8	2	2 1/8	4 5/16	2 1/2	0.	0.	2 7/16	2.318	2 1/2	2 1/8	2 5/16	6 5/16
GE1000	2 1/2	2 7/16	2 3/8	2 5/16	2.256	2 1/2	2 1/8	2 1/4	6 1/4	3	2 15/16	2 15/16	2 7/8	2.756	3 1/4	2 5/8	2 3/4	8 1/4
GE1200	2 5/8	2 9/16	2 1/2	2 7/16	2.381													
WP30	3 1/4			3 1/16	2.756	3 1/4	2 5/8	2 3/4	3	3 1/2			3 1/16	2.756	3 3/8	2 5/8	2 3/4	6
WP50	3 1/4			3 1/16	2.756	3 1/4	2 5/8	2 3/4	3	3 1/2			3 1/16	2.756	3 3/8	2 5/8	2 3/4	6

DATA FOR TURNING AND SLEEVING ARMATURE SHAFTS, BAY STATE STREET RAILWAY

As a check on the wearing of the tool all bearings are gaged after being bored. The diameter of the bore is checked by means of a snap gage, and the thickness of the collar is checked with a collar gage. The boring of all armature sleeves is also done on this lathe.

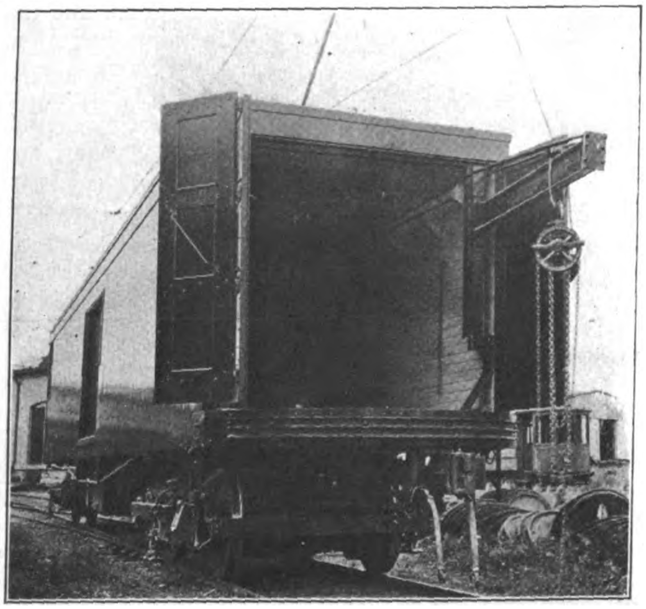
The average time consumed in boring and facing a commutator end bearing is five minutes. This is the average of a large number of bearings bored and includes changing bars, adjustments, etc. The actual time to place in the chuck, bore and face a GE-80 armature bearing, commutator end is four minutes. A pinion end bearing takes about a minute more on the average, in order to be sure that the two halves are properly aligned.

A metal shield, not shown in the illustration, is mounted on the lathe to prevent the babbitt borings from scattering over the floor, a pan being provided underneath the lathe to catch all that is deflected from the shield. This eliminates all possibility of steel chips getting in with the babbitt, which might happen if the babbitt borings were allowed to drop to the floor and if they were then swept up.

Michigan United Traction Company's Supply and Wrecking Tool Car

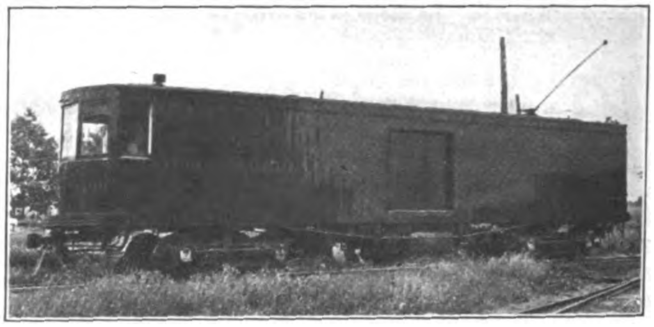
BY R. C. TAYLOR, SUPERINTENDENT OF EQUIPMENT

The Michigan United Traction Company has just put into service a combination car which is to be used for general utility purposes. It is located at the general storeroom and shops at Albion, Mich., and is regularly used to distribute supplies to the various shops of this company at Jackson, Lansing, Kalamazoo and Battle Creek. This car also has a complete equipment of material usually employed in attending to troubles that may develop in interurban car service, and is always ready to answer any call. Since all the city shops have wrecking cars, this one was designed primarily for attending to interurban troubles. The electrical equipment includes a quadruple set of Westinghouse 333 B-2 motors with type HL control, arranged to run on full speed of 600 volts or 1200 volts, either on trolley or third-rail. The motors are geared for high speed, having the same gear ratio as those on the limited passenger cars, and therefore can readily keep out of the way of the fastest cars on the line, and also reach the location of any trouble in the shortest possible time. As this car is equipped with multiple-unit control, it may also be coupled to any of the cars with similar equipment to bring them to the nearest station with the shortest possible delay to traffic.



MICHIGAN TRACTION WRECK CAR, REAR VIEW, SHOWING JIB CRANE

Closed compartments to house the wrecking tools occupy the front half of the car. These may be locked when the car is used as a supply car or while in switching service around the shops. Each of the two side doors at the center of the car is equipped with a 1-ton jib crane. The rear end of the car is fitted with a three-leaf door which may be opened the full width of the car, thus facilitating the loading of trucks, wheels and axles or other bulky material. At one side of this door is a 2-ton jib crane with a boom of the same length as width of the car. This crane is arranged to fold inside the closed end door. In addition to the three jib cranes this car has a small traveling crane which runs the full length of the car body, and with its aid bulky material may be deposited in any part of the interior. The car was designed and built by the Niles Car Company, Niles, Ohio. The jib cranes are home-made, with Yale & Towne differential hoists.



MICHIGAN TRACTION WRECK CAR, SIDE VIEW

Hints On and Costs Of Motor Maintenance—I

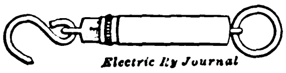
BY R. H. PARSONS, ELECTRICAL FOREMAN

Whether motors are cared for at the shop or carhouse, they must after a certain period be stripped, cleaned, tested, fitted with new bearings and reassembled. What this period should be must be determined by the type of motor, the service conditions and the care received in the carhouse.

The earlier motors require far more care and attention than the later designs, particularly on account of lubrication. At their best, these motors can be kept from giving trouble only by care and vigilance and at a cost which makes it of doubtful economy to run them when the maintenance cost of modern motors is so low, except possibly where the service is unusually light. Such antiquated motors must be inspected and checked for clearance each night, or every two nights at the outside, and must be oiled just as often. Yet regardless of careful checking for clearance and oiling, their bearings will sometimes run hot, or a worn bearing which has escaped the eye of the inspector will bring the armature down on the pole pieces, thus tearing out the armature coils, chewing up the laminations of the armature core and destroying the field coils.

The later motors are superior in other respects besides lubrication, notably in bearings, commutation and in better insulated brush-holders. Again, the last are designed to be placed only in the position located by the designer while the studs, etc., are so arranged that the brush-holder cannot be adjusted except as to distance from the commutator. The liability of flashovers from the commutator to the shell has also been reduced by increasing the air gaps between the shell and commutator from 1¼ in. and 1¾ in. to 2½ in or more.

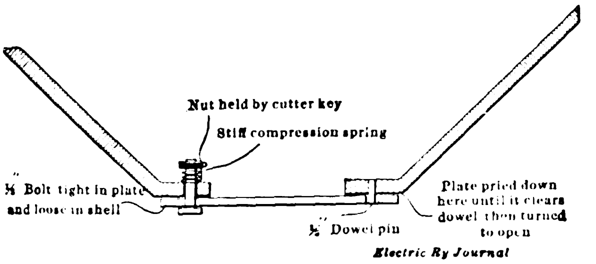
Not only must the oil and clearances of the old motors be watched closely, but the brush-holders should also be inspected more rigidly than those of the later type. A spring with too little tension leads to arcing between the brush and the commutator, thereby destroying the brush and brush-holder and leading to flat spots and flashovers which end in costly overhauling of the armature and the turning down of the commutator. A loose or improperly set brush-holder leads to the same results. In the newer brush-holders this trouble is practically eliminated.



BALANCE FOR BRUSH TENSION, ONE-FOURTH SIZE

The tension of the brush-holder springs of the older type motors must be set at 6 lb. to 6½ lb., whereas those of the later type motors, with interpole fields and other aids to good commutation, can be set as low as 4 lb. to 4½ lb., which decrease greatly reduces the wear of both the commutator and brush. It will be found to the advantage of the company to provide a small balance scale, similar to the one shown, for the men who overhaul brush-holders to check the tension of the springs, or to create enough interest in the subject to lead the men to buy it themselves. The scale is neat and accurate, not too bulky to be placed in the pocket, and a matter of pride to the users.

As dust and water are liable to get into the shell the inspection covers should be kept on at all times except during inspection. It is not necessary to dwell upon the bad effects of water, but too little attention is paid to dust. Even if dust does no immediate harm, it gathers on the commutator, brush-holders, inside of the shell and inside of the armature ventilating ducts. Dust on the commutator cuts the commutator and the brushes. On and around the brush-holders, its mineral particles make paths for current leakage, and consequently grounds are formed. The gathering of dust in the armature ducts chokes them up and destroys their ventilating qualities. The accumulation of dust in the motor, in my opinion, is one of the points against the use of ventilated motor, as the air which is drawn in adds more dust than it forces out. The dust mixes with the oil, which sometimes gets into the bottom of the shell, or with the aid of a little water it makes in the shell around the fields a damp mass which the heating of the motor will not dry out. Continued dampness around the fields makes them musty and destroys the insulation. On the other hand, a motor with sealed inspection covers excludes the dirt and water and keeps in better condition, providing, of course, that the capacity of the motor is great enough to fulfil its service without overheating.


Nut held by cutter key
Stiff compression spring
⅝" Bolt tight in plate and loose in shell
Plate pried down here until it clears dowel then turned to open
½" Dowel pin
Electric Ry Journal

CROSS-SECTION AT BOTTOM OF MOTOR SHELL, SHOWING HANDHOLE PLATE

The accompanying sketch illustrates a hand-hole cover designed and used on the GE-57 motor but which could be adapted to any. It consists of a plate fitting the surface of the shell and held on one side by a bolt extending inside of the shell with a spring held by a nut keyed to the bolt. The other side is simply kept from turning by a dowel pin, fitting tight in the shell and loose in the cover. The spring tension holds the plate in place, except when it is desired to open it, then by using a small bar to force the cover down until it clears the dowel pin the cover can be turned clear of the inspection hole. To replace, simply turn the cover until the dowel enters the hole in the plate, when it will snap itself securely into place.

Often too much oil is used in the bearings, particularly on the commutator end; or if the bearing is loose on the shaft, and the oil-draining ducts are stopped up by dirt, the oil from the bearing runs into the motor where it gets onto the string band and to the end of the commutator. This, added to the accumulation of dust, makes further trouble, chiefly in short-circuiting the commutator bars, which in turn short-circuit the coils, burning them out or making a path for the current to jump from the commutator to the shell. This defect could be minimized by using more care in oiling, but even if oil does get onto the commutator it will do no harm if wiped off soon enough. One good practice is frequently to wipe clean the commutator string band and the ends of the commutator bars and to paint them with a first-class oilproof insulating varnish. This action will save many armatures which would otherwise flashover or short-circuit, and it will also prevent grounded commutators.

MAINTENANCE COSTS OF NEW AND OLD MOTORS

As a comparison of the difference in maintenance cost for new and old type motors as used by a large railway system in Greater New York, the following figures on the total cost of labor and material expended in motor maintenance for the year 1913 are significant: Class A, one modern type, $29.04 per motor; Class B, a second modern type, $21.56 per motor, and Class C, older miscellaneous types, $35.27 per motor. The motors in Classes A and B ran for many hours practically every day in the year. Those in Class A were in a little harder service than those in Class B, but the older Class C motors ran in lighter service. In fact, at least one-half of the old motors were out of service during either the summer or winter, according to the type of car. Others were on snow sweepers and work cars, doing service only a small part of the time. Hence it is safe to say that the old motors were in use only one-third as much as the new ones. As the cost per motor is figured on the total number owned, the cost, if all had been in continuous service, would have been three times as great, or $105.81 per motor. This cost represents all the labor and material used in the carhouses and shops.

Another example of the cost of maintenance of the old types against the new types of motors is shown in the percentage of armatures rewound to the number in service during the year 1913: Class A, 7.0 per cent; Class B, 2.6 per cent, and Class D, 18.0 per cent.

The modern motors are in a harder service, and run 30 per cent more mileage a day than the older type. As they have been in use five or six years, their good record cannot be attributed to absolute newness. On the other hand, the older armatures were practically renewed the same number of years ago, and are kept up to the highest standard consistent with their design.

Use of Metallic Tapes on Third-Rail Lines

Surveyors on railroads operated by third-rail should use metallic tapes with discretion or avoid their use entirely. While danger of contact with the third-rail is imminent, the more frequent accidents seem to arise from leaving such tapes between the rails while trains pass over.

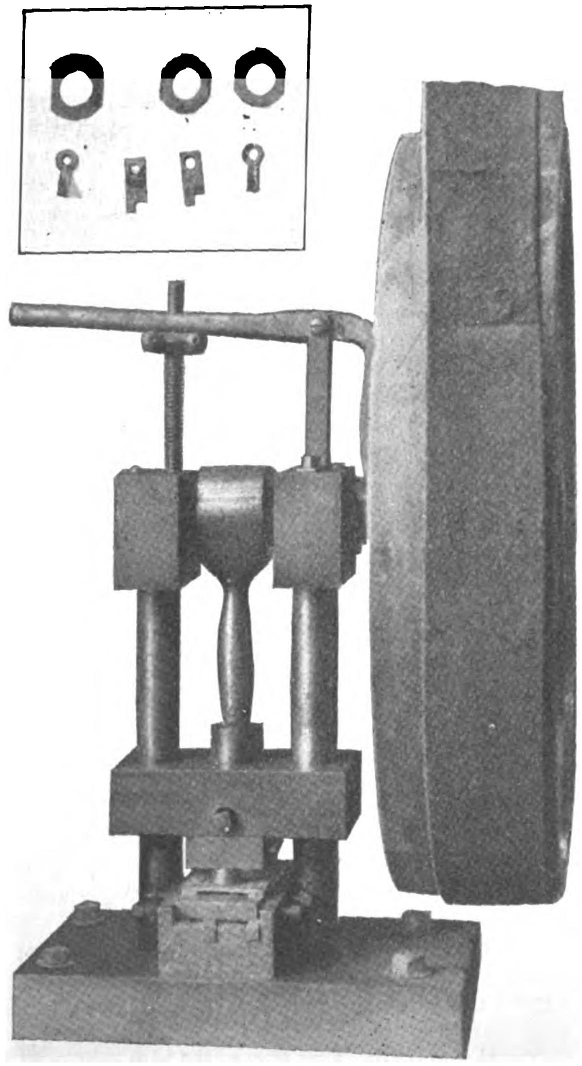
These tapes are often picked up by the armatures of the motors, particularly where gearless motors are used, with resulting damage to property. Small metal tools should never be left lying between the tracks for the same reason.

A Home-Made Punch and a Home-Made Shear

BY F. J. FOOTE, MASTER MECHANIC THE OHIO ELECTRIC RAILWAY

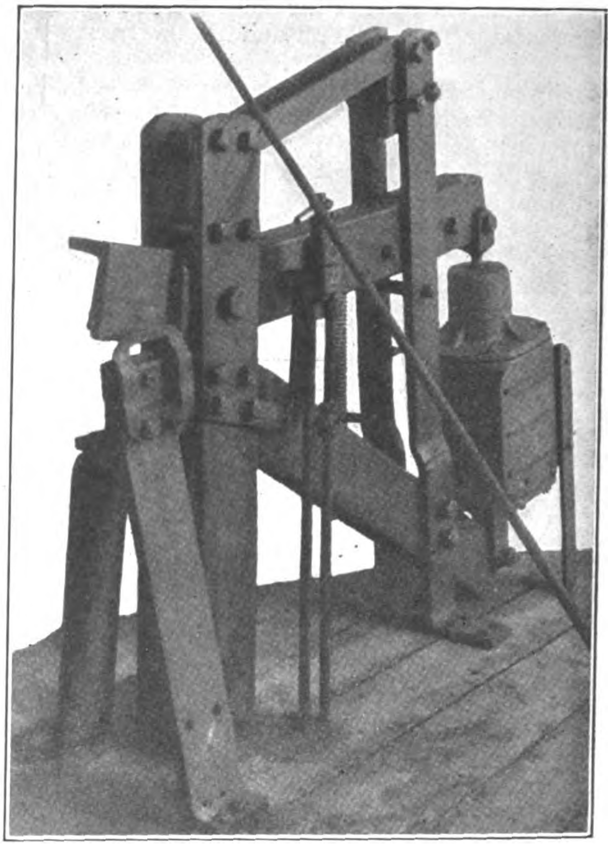
The first of the accompanying views shows our small home-made punch for punching trolley washers, rheostat washers, small copper terminals, etc. It is designed just to punch soft sheet metal of a thickness up to 1/16 in.

This is the only punch press in the shop, and we find it very handy for light work. It is shown arranged for hand trip operation. Samples of work done on this punch are shown in the upper left-hand corner of the above illustration.



HOME-MADE PUNCH OF THE OHIO ELECTRIC RAILWAY FOR PUNCHING TROLLEY WASHERS, SMALL COPPER TERMINALS, ETC.—NOTE SAMPLES OF WORK

The second view shows a shear for use in our blacksmith shop. It is hardly necessary to state that this machine is home-made, for the scrap pile was robbed of a number of parts for building it. The size of the device can be judged from the air cylinder, which is a standard 12 in. x 12 in. It is operated by an old straight-air motorman's valve. With this shear we can cut off iron up to 5/8 in. square.



A SCRAP-MADE SHEAR OF THE OHIO ELECTRIC RAILWAY

New Composition Glass of Great Strength

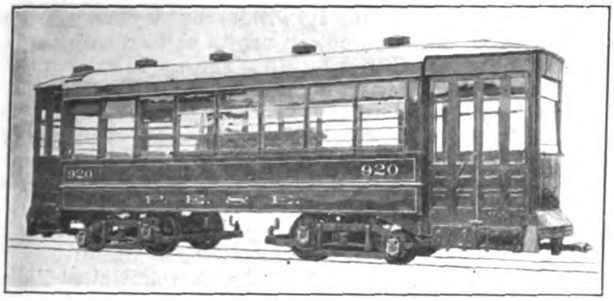
A new composition for glass known as "triplex," which embodies features of unusual strength and safety when breaking, has been recently developed in France. This product consists of two sheets of ordinary glass separated by a thin sheet of transparent celluloid—all caused to adhere closely by chemical agents and heavy pressure. In circumstances where ordinary glass would break and fall in all directions "triplex" glass simply shows a network of radiating cracks. In accidents such as trolley collisions where the shattered glass would probably wound many passengers, this new glass would simply crack and do no harm beyond covering the passengers with a fine powder. This was practically demonstrated in a recent accidental collision of an automobile with a car of the Chemin de Fer Nogentais, Paris, France, in which the "triplex" glass of the car was cracked but not broken. If three panes of glass and two of celluloid are used, plates called "bitriplex" are the result. These are so solid that they cannot be broken even with violent blows of a hammer. They may be cracked and the outer sheets may even be pulverized, but it is impossible to get through the combination.

The Glasgow Corporation Tramways have started a "safety first" campaign by placing on the fronts and rears of 150 cars boards on each of which is pasted a bill bearing the words "Safety First." The wording of these bills will be changed at intervals.

One-Man Near-Side Cars for Oregon

Four one-man, near-side, semi-convertible prepayment arch-roof cars, as shown in the accompanying illustration, were recently built by the American Car Company, St. Louis, Mo., for the Portland, Eugene & Eastern Railroad, Portland, Ore. These cars, mounted on No. 39-E maximum-traction trucks, have metal underframes and wooden body with an interior trim of bronze. The general dimensions of the car are as follows: length of body, 21 ft.; length over vestibule, 30 ft. 7½ in.; bolster centers, length, 13 ft.; width over sills, 7 ft. 9½ in.; width over posts at belt, 8 ft.; height, sills to trolley base, 8 ft. 6⅝ in.; height from top of rail to sills, 2 ft. 5¼ in.

The front platform of each car has a pair of hinged folding doors and folding steps for the regular entrance and exit. An additional emergency exit with folding door and folding step is located in the rear of the car. The seating arrangements, which allow for a total seating capacity of thirty-six persons, include a broad curved seat extending across the rear of the car, six rattan-covered cross-seats on each side of the aisle and longitudinal corner seats. Axles, truck bolsters, brake-shoes, car trimmings, center bars, hand brakes, journal boxes, sash fixtures, side bearings and springs are of Brill design. Two GE-216 motors per car are provided. Other specialties include Westinghouse air brakes, American Car Company body bolsters and bumpers, Hedley anti-climbers, Tomlinson automatic radial couplers, Curtain Supply Company's curtains and curtain fixtures; Hunter destination signs, gongs, Consolidated push button signals, American Mason safety treads, Knutson trolley catchers and 10-in. Globe ventilators.



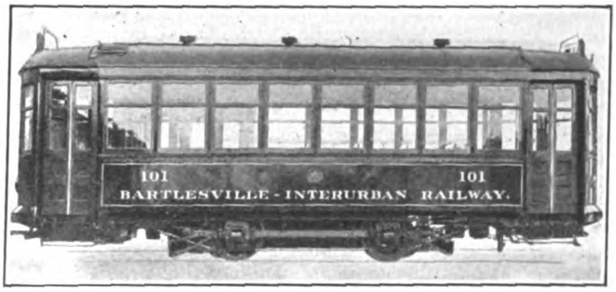
SIDE VIEW OF ONE-MAN NEAR-SIDE CAR WITH EMERGENCY EXIT AT REAR

A Lubricant with Graphite in Permanent Suspension

A semi-fluid concentrate containing graphite, known as "Lesoyl," specially prepared to insure the suspension of graphite when mixed with lubricating oil or grease, has been brought out recently by the Lumen Bearing Company, Buffalo, N. Y. It is asserted that this fluid permits the graphite to be carried to all parts of the bearing surface. The oil film is preserved unbroken, the graphite flakes taking part of the journal load. This mixture is intended for lubrication on a wide variety of bearing surfaces. In preparing the mixture the manufacturers first mix the graphite with a material that has a strong capillary affinity for the graphite. The latter substance is ground to the desired degree of fineness, and by this means larger particles of graphite that have heretofore been found practicable are carried in permanent suspension. It is stated that tests show that the introduction of the new preparation into the cheaper grades of mineral oil gives a lower coefficient of friction and produces a thicker oil film between the bearing surfaces, while better grades of oil are enabled by this addition to withstand much higher bearing pressures.

A Single-Truck, Fully-Inclosed Car

A single-truck car possessing many features unusual for equipment of such small size has recently been built by the St. Louis Car Company for the Bartlesville-Interurban Railway. It is only 30 ft. 8 in. long over the bumpers, but it is built without bulkheads and is equipped with folding doors and steps to make a fully-inclosed design such as is now growing in favor for use in large cities. The car is built with a steel underframe, and a 30-in. x ⅛-in. plate is installed for a side girder between the belt and the side sills. The roof is of plain arch type with Globe ventilators, and no headlining is installed on its underside, the carlins being exposed. The side posts and carlins and roof are of wood, but the interior finish beneath the windows is of No. 16 sheet steel. The car seats thirty-two passengers and it is 21 ft. long over corner posts, the width over side posts being 8 ft. 3 in. The rear doors are opened by means of a lever arrangement operated by the motorman. Among the other items of equipment are Pantasote curtains on spring rollers with Forsyth fixtures, Kirby Neal headlights and Consolidated heaters. The car will be equipped with the car builder's vertical geared wheel brake and radiating draw bars at each end.



SEMI-STEEL, SINGLE-TRUCK CAR FOR BARTLESVILLE-INTERURBAN RAILWAY

Flood in Simplon Tunnel

The famous Simplon tunnel, constructed between 1898 and 1905 and electrified with the three-phase system, was flooded on July 7 by a subterranean stream which burst through the retaining wall. The interruption to traffic was temporary. A train was derailed in the middle of the tunnel but no one was injured. During the interruption it was necessary for travelers to use the Simplon Pass or the St. Gothard Pass. The Simplon tunnel electrification is of interest not only on account of the fame of the tunnel itself, which is 12.3 miles long and bored at a great depth, but because the three-phase system used is radically different from the single-phase system of other Swiss railways. The tunnel installation is valuable for comparison with the standard single-phase system, and the occurrence of this flood will result in some interesting data. As the flood is reported to be only 2 ft. deep, however, it is unlikely that the electrical equipment was damaged.

The United Railroads of San Francisco have established their shop inspection system on the car-hour basis instead of on the car-mile basis. One advantage of this plan is that all of the data required for determining the car hours are at the carhouses, whereas the operating department supplies the mileage figures.

News of Electric Railways

Committee Meetings in Toledo

Two committee meetings were held at Toledo, Ohio, during the week, but the proceedings did not get beyond the point of discussion. Seemingly both sides are waiting until all the franchise suggestions in course of preparation have been submitted. If the City Council does not act the Toledo Citizens' Franchise Association will in all probability take steps to place its proposition before the voters. Should the Municipal Ownership League succeed in getting its draft submitted to a vote first, the Citizens' Franchise Association will urge its proposition with the hope of defeating the other proposal.

A meeting of the franchise committee of the City Council was held on the evening of July 2. The propositions so far submitted were discussed in an informal way. Representatives of the Toledo Citizens' Franchise Association were present, but otherwise the session was executive.

Attorney Frank L. Mulholland urged the committee to take action on the proposition presented by the Citizens' Franchise Association, in order that it may be used to offset the so-called Thurstin-Campbell municipal ownership plan. Judge John H. Doyle, of the association's franchise committee, said the property of the railway could not be acquired for many years under the plan proposed by the Municipal Ownership League. Mr. Doyle said the association had considered the sliding scale plan, as operated in Cleveland, but had understood from Mr. Doherty that the company would under no circumstances accept a franchise based upon such a scale. Both he and Mr. Mulholland stated that this plan would keep the matter in politics continually.

Judge Doyle discussed at length the provision in the business men's proposition which requires the written consent of the owners of 90 per cent of the company's bonds to the proposition, so that there will be no trouble should both the city and the company accept the plan. He also discussed the extent of the city's control over both the rates and operation of the road under this plan and said it is broader than that provided in either the Doherty or the committee drafts. Judge Doyle said that the Council had no right to pass the Schreiber 3-cent fare ordinance, fixing a certain rate of fare without the consent of the company.

It is understood that Councilman F. M. Dotson has been instructed to prepare a franchise based upon the Cleveland plan as an alternative in case the others fail of adoption. It would have the sliding scale of the Cleveland plan and the rate of income on the investment depending upon the decrease or increase of the fare rate, as in the London plan.

This plan, as well as the others, was discussed at a meeting of the Council committee on the evening of July 6. The only detail of this meeting made public was a brief statement by Mayor Keller that the committee is not impressed with the proposal made by the Toledo Citizens' Franchise Association and that the members still stand for a flat 3-cent fare.

The campaign for the initiation of the municipal ownership ordinance was opened on the evening of July 6 at Riverside Park with a speech by Irvin E. Austin, chief clerk in City Solicitor Thurstin's office. Mr. Austin attacked one of Henry E. Doherty's advertisements relating to the municipal ownership franchise. Mr. Doherty claims that the provision for municipal ownership did not go into effect until June 8, ninety days after it was placed on file with the Secretary of State, and that the preliminary proceedings relating to the extension of the ordinances of the company were begun before that time. Mr. Austin discussed the capitalization of the company. He said that it could not operate at a 3-cent fare and meet the interest and the dividend charges on the present amount of stock and bonds. Municipal ownership of the railway, lighting and heating properties would reduce taxes. The $8,000,000 bonds would be a lien on the plants themselves and have nothing to do with the taxes. John J. Quinlivan, business agent of the Central Labor Union, attacked the Toledo Citizens' Franchise Association because it held secret sessions while its franchise was in course of preparation. He also claimed that Mr. Doherty opposed the union leaders' efforts to organize the street railway employees.

Police Chief Murphy has ordered patrolmen to arrest members of the car crews whenever disturbances occur on the cars.

Frank L. Mulholland, in charge of the Toledo Citizens' Franchise Association, said on July 7 that the organization had not yet definitely decided upon the next step to be taken, but that nothing will be done until after the Council meeting on July 13. The franchise committee will meet again on July 10 and will probably prepare a report to the Council. The future action of the association will depend upon the nature of this report and the possibility of the Council taking steps to hasten the settlement.

Detroit Appraisal Details by November

By the terms of a contract entered into on July 6, between the Detroit Street Railway Commission and Prof. E. W. Bemis, Chicago, the commission is to be furnished a complete inventory and appraisal of all the property of the Detroit United Railway within the city not later than Oct. 10. The data and details are to be filed with the commission not later than Nov. 15. The appraisal is to start immediately and the cost is to be not more than $46,000. Of this amount Prof. Bemis is to receive $5,000, of which $2,000 was paid immediately as a retainer, and a commission of 10 per cent of the actual cost of the appraisal. Edward P. Burch and Charles L. Pillsbury, engineers, are to receive respectively $50 and $60 a day and actual expenses. Mr. Burch is to have direct charge of the work. A staff of twenty or more will be engaged for the appraisal.

J. C. Hutchins, president of the Detroit United Railway, has advised the commission that the company will cordially co-operate in every way possible to enable the commission to arrive at a correct judgment of the equities involved and of the value of the company's property, reserving the right, however, to assume a different attitude should those put forward by the commission show any disposition to deal unfairly with the company. In his letter Mr. Hutchins observes: "I do not make this reservation with the thought that anyone you (the commission) may name to gather data for you will deal unjustly with us, but in view of the fact that we have at times been unfairly dealt with by persons in public life with axes of their own to grind."

William Barclay Parsons, New York, who spent several days in Detroit recently studying the traffic problem, has notified the Street Railway Commission that he will be in Detroit on July 13, to report on the advisability of the city going ahead with plans for a subway. His letter advises the commission that he is ready to suggest means for solving congestion either by the construction of a subway or the re-routing of cars on the congested district.

Report of Industrial Commission of Wisconsin

According to the report of the Industrial Commission of Wisconsin concerning the operation of workmen's compensation in the State for the year ending July 30, 1913, a total of 2028 employers and 149,164 employees were under the act, as compared with 435 employers and 63,728 employees at the end of the preceding year. During the year ended June 30, 1913, 44.6 per cent of the accidents reported were under compensation; during the six months from Jan. 1 to June 30, 1913, the proportion was 52.8 per cent, and during June it rose to 61.1 per cent.

The Wisconsin law gives a free field to all forms of insurance. The old insurance companies at first opposed the act both by a campaign of misrepresentation and by prohibitive rates. They first doubled their former rates for liability insurance and then doubled the liability rates for compensation coverage. A mutual insurance company, which offered compensation for less than the old line companies charged for liability insurance was formed at Wausau and for the first eighteen months most employers under compensation either carried their own risk or were insured in the Wausau mutual. On Feb. 1, 1913, the old line companies reduced their compensation rates 25 per cent and increased their liability rates 50 per cent, so that on a "standard ($5,000-$10,000) limit" policy the rate is now the same for compensation as for liability insurance.

The report states that the remarkable and gratifying result of the administration of the law thus far is the ease with which employers have been able to fix compensation for injury and the very few cases which the commission has been called upon to adjust. A total of 5030 accidents was reported under the compensation law from Sept. 1, 1911, to July 1, 1913. Hearings were held and awards made in but eighty-one cases and only nine applications were made for court review. During the year ended June 30, 1913, a total of 3968 accidents under compensation was handled at a total expense of $8,326, giving an average of 2.10 cents per accident as compared with 3.19 for the preceding year.

The report states that the commission has not as yet sufficient data to determine the cost of compensation. Reports are, however, received from all employers carrying their own risks and from all liability insurance companies, and within a few years it will be possible to state the approximate costs of compensation for each industry. Data already in hand indicate that where the employer carries his own risk or is insured in a mutual company the cost is seldom greater than that under the old common law liability.

The Cleveland Wage Question

The members of the executive committee of the local branch of the Amalgamated Association of Street & Electric Railway Employees at Cleveland, Ohio, voted on July 1 not to accept the proposition made by J. J. Stanley, president of the Cleveland Railway. The stumbling block is the minimum workday of five hours which Mr. Stanley specified. The question will probably be submitted to a vote of the men before anything further is done.

George R. Davies, president of the local branch of the union, said that the plan offered by Mr. Stanley would cause a large number of men to be reduced from eight or nine hours a day to five hours. He also claimed that the extra men would be subject to the call of the dispatcher eighteen hours a day.

Mr. Stanley insists that he will not agree to any plan that will add more than $150,000 a year to the operating expenses. Furthermore, he says that he will not grant the newer men in the employ of the company an increase without making the same increase in the wages of the older men. The contract between the men and the company provides for arbitration on all disagreements.

On July 6 Mr. Davies stated that a second proposition on the question of wages and conditions will be made to Mr. Stanley. On the other hand, Mr. Stanley asserts that he will entertain no proposition that does not comply with the terms of his offer, as originally made. This is fair to all, he said, and is as far as the company can go. Mr. Davies intimates that the new proposition will deal with the distribution of the $150,000 additional the company is willing to pay the men. He says that under Mr. Stanley's plan about $90,000 will be taken away from a certain number of the men through loss of time and only about $30,000 returned by the increase in wages. He adds that the second proposition will be made, whether Mr. Stanley considers it or not.

New Rapid Transit Route in New York

The Public Service Commission for the First District of New York has laid out an entirely new rapid transit route in Brooklyn and adopted a plan for a radical modification of another. The new route is for the so-called crosstown subway line. It will run southerly from the Queensboro Bridge Plaza, where it will connect with the new rapid transit lines in Queens and the Steinway tunnel, to and under the Williamsburg Bridge Plaza to a connection with the Brighton Beach Railroad of the Brooklyn Rapid Transit System. The contracts as approved last year contain no provision for this line. It is now proposed to make it an extension of the dual system, and the difficulty as to Franklin Avenue has been met by providing for a subway through that thoroughfare and for an elevated railroad for other parts of the route. This route has been sent to the Board of Estimate and Apportionment and the Mayor for approval.

The route of the Fourteenth Street Eastern District line is the one which will be modified. This route, which is a part of the dual system, begins in Sixth Avenue, Manhattan, and runs under Fourteenth Street to the East River, under the East River to North Seventh Street, Brooklyn, and through North Seventh Street to Metropolitan Avenue and through Metropolitan to Bushwick Avenue, and thence through Johnson Avenue to Wyckoff Avenue, and from Wyckoff Avenue to a junction with the Broadway elevated line in East New York. The plan called for an elevated railroad through Wyckoff Avenue, and this the property owners opposed. The commission, on this account, sought to make an arrangement with the Long Island Railroad by which the Eastern District line could be continued from Johnson Avenue over the right-of-way of the Evergreen branch of the Long Island Railroad instead of Wyckoff Avenue. This branch, which is very little used by the railroad company, runs parallel to Wyckoff Avenue. After protracted negotiations the consent of the railroad company was obtained, and the commission has accordingly changed the route from Wyckoff Avenue to the Evergreen branch right-of-way. This route is known as No. 59, and has been sent to the Board of Estimate and Apportionment and the Mayor for their approval.

Some time ago Walter Wellman presented to the commission a plan to enlarge the station platforms in the subway so as to accommodate trains of twenty cars or more. The chief engineer of the commission held that the plan was impracticable. Mr. Wellman then proposed that the commission submit the matter to a board of engineers for an expert opinion. Alfred Craven, chief engineer of the commission, while still opposing the plan, consented to such an investigation. At the last meeting of the commission, Commissioner Robert C. Wood brought up the matter, and on his motion the commission decided to ask the Board of Estimate and Apportionment for an appropriation of $8,000 to retain expert engineers to make a report on the proposition.

Springfield (Mo.) Rate Case Decided

The Public Service Commission of Missouri made public its unanimous decision on June 24 in the Springfield Gas & Electric Company rate case. According to the abstract of the decision sent out by the commission, it is found that a net return of 7 per cent is adequate for the company, and a reduction in rates amounting to more than 30 per cent is ordered. According to the calculation of the commission, this will have the effect of reducing the revenues approximately 37 per cent. The company, it is announced, will file an application for a rehearing of the case. The brief that was presented to the commission by the company was abstracted in the ELECTRIC RAILWAY JOURNAL of May 2.

The Springfield Traction Company and the Springfield Gas & Electric Company were the defendants in the case. All the stock of these companies is owned by the Springfield Railway & Light Company, a holding company of Maine, and all of the latter company's stock is owned in turn by the Federal Light & Traction Company, a holding company of New York.

Evidence was introduced at the hearing to the effect that an up-to-date distributing system could be built at Springfield for $151,266. It was noted also that the assessed value of the entire property of the Gas & Electric Company for 1911 was $150,000. It was found, the decision says, that $500,000 stock and $277,000 bonds were issued on property for which the secretary of the company testified $300 000 was paid. The assets as shown by the books are $865.713 for the electric department. The commission observes that no deductions for superseded property had ever been made, and that. except for an item of $5,666, no depreciation had been deducted during twenty-nine years, and further that $60,000 is included as franchise values of the gas and electric property. The commission arrives at the conclusion that $270,000 is the corrected original cost of the electric department of the company, holding the amount for which the plant was transferred upon the books of the company, $414,526, to be entirely too large. The fair present value for determining reasonable rates of the property of the electrical department as of Sept. 30, 1913, is set at $300.000.

The companies asserted that the business had a distinct "going value" of between $60,000 and $137,900, based upon the earnings of the present plant. The commission holds that a distinction is to be made between a valuation of the properties of public utilities for the purpose of sale or condemnation and a valuation for rate-making purposes. The commission says that no proof was offered tending to show that the company suffered early losses, but that the record disclosed much evidence indicating that the early losses, if any, have long since been recouped through excessive rates, and that the alleged earnings have been from the electric department and the losses, if any, from the gas and street railway departments. No separate and distinct item for going value is allowed in this case but the commission takes "into account the fact that the plant was in successful operation" in fixing the fair value for rate-making purposes.

The commission in arriving at the rate of return to be allowed states that 6 per cent is the legal rate of interest in the State and by contract the rate may not exceed 8 per cent, and holds that 7 per cent is a just net return on property invested in public utilities. The rate of return must be determined from the facts of each case. For depreciation the commission makes an allowance of 5 per cent of the present fair value of the property.

In considering the salaries and commisions paid to the Federal company the opinion states: "We think, because of this situation [control by the Federal company through the railway company of Maine] and the very human tendency of corporate greed of some holding companies to 'milk' the earnings of subsidiary companies through 'dummy' directors, that it is the duty of this commission to limit strictly the amount of any such charges, which shall be only for the services rendered by such holding company, to the lowest reasonable charge for the services actually rendered. . . . The public at Springfield is paying the salaries of a competent manager and a competent secretary of defendant companies who reside at Springfield, and we do not think that the public should be called upon to pay for any other 'managerial services' or management by 'long distance,' from the New York office of the holding company in this case. No charge should be allowed for commissions, except for services actually rendered to the company, and that at no higher cost than the local company could employ the services of a competent independent engineer, provided that the manager in charge is not able and competent to render such service to the company himself. . . . We disallow any charge whatever for 'managerial services.'"

Fare Investigation on Manchester Street Railway

The Manchester (N. H.) Street Railway has filed a brief before the Public Service Commission in connection with the investigation that is being conducted by the commission to determine whether the railway can immediately be required to reduce its fares by the sale of school tickets and laborers' tickets during certain hours at 4 cents or 4 1/6 cents each. The brief states that the exhibits filed show such reduction would be in hours during which 37 per cent of the normal week-day riding is done and that it would mean a probable loss of one-fifth of the revenue from one-third of the ordinary week-day travel, being $25,000 to $30,000 annually.

The brief devotes considerable space to a discussion of the legal questions involved in the case, such as the value to be ascertained, appreciation, evidences as to value, reproduction cost, going value, overhead charges and depreciation. Looking at the evidence as to the value of the property of the Manchester Street Railway from these different viewpoints, the company states that the books as of June 30, 1913, show construction and equipment to have cost $1,431,633. On the same date the books showed the real capitalization and debt to be $1,402,750. The estimate of the cost to reproduce the entire plant compiled by the commission's engineer was $1,432,046 and as ascertained by the company's engineer $1,459,946. The commission's engineer made the depreciated present value $986,571, and the company's engineer made it $1,041,594. The brief states that the cost to reproduce would undoubtedly be greater than $1,500,000 and that the depreciated value cannot be less than $1,075,000. From the addition of $160,000 for appreciation and land values, the sum of $1,235,000 was obtained for the depreciated value of the property considered as a physical plant. To this sum $350,000 is added for working capital, giving $1,270,000 as a basis for rate making, without considering going concern values. The brief states that the railway paid no dividends on its capital stock for years, and averaged from the beginning 5.2 per cent, at least 0.8 per cent lower than the rate which the United States Supreme Court thought was the lowest that would not be confiscatory even for the peculiarly and favorably situated Consolidated Gas Company of New York. The Manchester Company, however, maintains that no public service corporation in New Hampshire ought to be limited to a lower return than 7 per cent upon the value of its property, which would give the basis for an allowance of $350,000 for going concern value. The total depreciated value of the property for rate-making purposes would therefore be $1,620,000. The company contends that on the evidence presented $1,500,000 is the minimum value of the property on which to figure a fair and reasonable return. At 7 per cent, which should be the lowest rate thought of as reasonable, the return would be $105,000, whereas the net profits for the year ending June 30, 1913, were only a trifle over $101,000. The company, however, asks that the commission declare that 3 per cent is as low a percentage for depreciation reserve as would be reasonable and that a proper allowance, not less than 3 per cent of the gross revenues, should be held out of the surplus to cover contingencies and unusual demands. On this basis the existing receipts of the company do not permit a reasonable return on the value of the plant after properly providing for its maintenance.

Social and Industrial Survey

The industrial economics department of the National Civic Federation has under way a comprehensive survey of the social and industrial conditions that have developed in the United States during the past generation. The object of the survey is to summarize the changes in the national life and to gather the essential material from which to judge where there have been advances or losses in the general well being, and how these have balanced or outweighed each other. The general conduct of the survey has been placed under the supervision of an executive council consisting of the officers of the National Civic Federation and the officers and chairmen of the committees of the industrial and economics department.

The main divisions of the inquiry cover the following subjects: Labor conditions, employers' welfare work, child labor, agricultural conditions, housing conditions, immigration, collective bargaining and methods of mediation and arbitration, educational opportunities, organized social service, distribution of ownership in investment, free speech and right of assembly, business ethics, political ethics, municipal government, judicial procedure, public health, enforcement of law and order, penal and correctional institutions, industrial profit sharing, social insurance, workmen's compensation, industrial loans and savings, foods and drugs, division of the people's income and the minimum wage. The following men known in the electric railway field are included among the committee members: Employers' welfare work—H. M. Byllesby, president of H. M. Byllesby & Company, Chicago, Ill.; Edwin M. Herr, president of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., and T. P. Shonts, president of the Interborough Rapid Transit Company, New York, N. Y.; social insurance—M. W. Alexander, of the General Electric Company, Lynn, Mass.; industrial loans and savings—T. P. Shonts.

In connection with the above survey a special committee is making a study of employers' welfare work. This committee desires to learn what is being done for the welfare of employees in the broadest sense and it is endeavoring to obtain reports on the subject from every establishment. In order to assist the companies in preparing replies that they may overlook no essential point the committee has prepared an outline of activities which are found in various industries and in public employment. It is divided into eight main headings, as follows: Type of work; place; sanitation; recreation; education; housing; additions to wages; provident funds, and supervision of welfare work. Each one of these headings is subdivided into many details, and the committee requests full information in each report in regard to any of the items mentioned. Unmounted photographs are also desired for incorporation in the proposed permanent exhibit of the welfare department, which has for its purpose the providing of standards applicable to different industries.

Final Wisconsin Valuations

Final valuations and assessment of the property of street railways, and light, heat and power companies in Wisconsin operated in connection with them have been made by the Wisconsin tax commission. The total assessment is to be divided so that 15 per cent will be retained by the State and 85 per cent distributed through municipalities in which the utilities assessed are located. This division gives the State $121,515 and turns over to the towns, cities and villages affected $688,589. The statement of final assessments and taxes levied follows:

	Final Assessment	Taxes Levied
Ashland Light, Power & Street Railway	$525,000	$7,283
Bay Shore Street Railway	20,000	277
Beloit Traction Company	265,000	3,676
Chicago & Milwaukee Electric Railway	225,000	3,121
Chicago & Wisconsin Valley Railway	25,000	346
Chippewa Valley Light & Power Company	2,600,000	36,072
Duluth Street Railway	1,150,000	15,955
East Wisconsin Railway & Light Company	1,300,000	18,036
Grand Rapids Street Railroad	110,000	1,526
Ironwood & Bessemer Railway & Light Company	240,000	3,329
Janesville Traction Company	70,000	971
La Crosse & Onalaska Street Railway	20,000	277
Manitowoc & Northern Traction Company	120,000	1,664
Menominee & Marinette Light & Traction Company	320,000	4,439
Merrill Railway & Lighting Company	165,000	2,289
Milwaukee Electric Railway & Light Company	29,500,000	409,284
Milwaukee Light, Heat & Traction Company	7,700,000	106,830
Milwaukee Northern Railway	1,950,000	27,054
Rockford & Interurban Railway	340,000	4,717
Sheboygan Railway & Electric Company	1,050,000	14,567
Southern Wisconsin Railway	1,000,000	13,874
Waupaca Electric Light & Railway	95,000	1,318
Wausau Street Railroad	800,000	11,099
Wisconsin Gas & Electric Company	2,600,000	36,072
Wisconsin Electric Railway	700,000	9,711
Wisconsin Public Service Company	2,100,000	29,135
Wisconsin Railway, Light & Power Company	1,300,000	18,036
Wisconsin Traction, Light, Heat & Power Company	2,100,000	29,135

Inquiry Concerning Income Tax Law

At the annual meeting of the Central Electric Railway Accountants' Association held at Cleveland, Ohio, on Dec. 13, 1913, it was voted that a committee should be appointed to draft a letter to the secretary of the United States Treasury on behalf of the association requesting an early construction of certain parts of the income tax law. A committee composed of H. J. Davies, H. B. Cavanaugh and A. L. Kasemeier was later appointed and a letter was drafted and forwarded to Mr. McAdoo, but no answer has as yet been received.

The letter requested the construction or interpretation of the words "received," "accrued" and "paid" in Section H-G of the federal income tax law. The secretary was asked to state whether the phrase "gross amount of its income received from all sources during the year" means the amount of cash collected by a corporation or the amount of its earnings, whether collected or not, and also whether the phrase "the tax herein imposed shall be computed upon its entire net income accrued within each year" means net income actually "received." This, it is stated, would seem to be a necessary conclusion from the requirement that corporations report the amount of "gross income received," for "net income accrued" is inconsistent with this other term. There are also queries as to whether the phrase "paid within the year" includes other obligations than those actually paid in cash, and whether the word "paid" means actually paid, due, owing or accrued.

The treasury department was also requested to state whether a new company reporting for the first year of its operation is not to be permitted to deduct from its gross earnings those obligations or liabilities for damages arising from personal injuries, although it may not have paid a dollar within the year on account of such liabilities. It is pointed out that the phrase "paid and accrued within the year" occurs in connection with interest, but that the amount of interest paid within the fiscal year may not be the same as the amount accrued within the year, especially in cases where a bonded debt is contracted immediately after the expiration of the first half of the fiscal year and the interest is payable semi-annually. The letter states that all instructions on the back of forms add to the general confusion in regard to the terminology used in the law, and quotations are presented showing that authorities who have analyzed the law have taken different points of view on some of these questions.

Voters Approve Kansas City Franchise

The ordinance extending the franchise of the Metropolitan Street Railway, Kansas City, Mo., carried on July 7 by a majority of 6798. According to the semi-official count the vote stood 22,408 for and 15,610 against. Thirteen out of sixteen wards voted overwhelmingly in favor of the franchise. The proposition lost in three wards. The total vote was heavy, being about three-fourths of the registration. The fourth ward, which has been for W. R. Nelson for years, went in favor of the franchise by twenty-one votes. His precinct gave the franchise a majority of fifty-three.

Thousands of people thronged the streets Tuesday night to learn the result. A crowd of 5000 watched the returns from various wards thrown on the screen at the office of the Kansas City *Post*. A staff of fifty handled the returns at the office of the Metropolitan Street Railway. The local papers issued extras at 9 o'clock, giving the approximate results.

When it was definitely known that the franchise had carried, several thousand residents formed in line at Fifteenth and Grand Streets and paraded the principal streets for two hours. A brass band, with a goat as the leader, headed the procession.

The new thirty-year contract between the city and the company went into operation at 11 a. m. Wednesday. P. J. Kealy, representing the company on the board of control, and Robert P. Wood, representing the city, were installed by the receivers. The name of the company became the Kansas City Railways Company. The city's five directors were qualified. Ford Harvey and R. J. Dunham are the only directors selected so far for the company.

John M. Egan, president and general manager of the company, will retire in the near future. His salary of $25,000 will go toward paying the salaries of the board of control and the general manager. The members of the board of control will receive between $6,600 and $10,000.

James E. Gibson, who has been general superintendent of the company, will be general manager of the company. Mr. Gibson is thirty-two years old. He was born in Kansas City and completed his education at the University of Missouri. Frank Hagerman has been named temporary president of the new company, with six straw men as officers. Permanent officers will be elected as soon as the city's directors are named.

The receivers for the company have six months in which to complete the reorganization and remove the receivership.

Prior to the franchise election in Kansas City on July 7, indications were that the measure extending the franchise of the Metropolitan Street Railway for nineteen years would pass by a majority of about 5000. Late developments were particularly favorable to the measure. The publication of old correspondence between W. R. Nelson and the receivers for the company caused many who were undecided to fall in line for the franchise. This correspondence indicated that Mr. Nelson, owner of the *Star* and the *Times*, was a short time ago in favor of a franchise which included many of the provisions of that which went to the people on July 7.

Slightly more than 10,000 voters moved following the municipal election in April and were disfranchised on this account.

The newspapers of Kansas City devoted their final efforts to summing up the arguments for and against the franchise.

A number of meetings were held, the measure being discussed by Major Jost and others in detail. The *Journal* and the *Post* of July 5 carried full-page advertisements urging the public to vote for the franchise. On the same morning the *Star* asserted that a poll showed that the measure would be defeated.

Berlin Rapid Transit System

The annual report of the Berlin Elevated & Underground Railway, Berlin, Germany, for the year 1913, states that the present length of the company's own lines is 17 miles, and including the leased Schöneberg, Wilmersdorf and Dahlen municipal lines, 23.3 miles. The company also has obtained permission to operate two auto-bus lines in connection with its rapid transit service. Sixty buses are now on order and should be ready for operation in the spring. The company has also joined the Great Berlin Street Railway in taking a large stock interest in the Berlin Omnibus Company. This movement is in line with the tendency to eliminate ruinous competition.

The company carried on its own rapid transit lines during 1913 a total of 71,525,370 passengers, compared with 62,731,827 passengers in 1912. The increase was not for the same mileage, however, as the company opened three extensions during the year. The gross earnings were $2,345,812, as compared with $2,042,369 in 1912. The average earnings per passenger on the zone system were 3.28 cents, compared with 3.25 cents in 1912, the increase being probably due to the longer average ride on account of extensions. The largest number of passengers carried on any one day was 424,025, on which day the gross earnings were $15,110. During the year the company operated 2,566,781 train miles in trains of two to six cars. The rolling stock at the end of the year consisted of 226 motor cars and 174 trailers. A total of 2700 persons were employed on these lines. The company declared a dividend of 6 per cent.

New Los Angeles-San Bernardino Line.—The first train over the new line of the Pacific Electric Railway between Los Angeles and San Bernardino, Cal., a distance of about 60 miles, was to be run on July 11. The company has announced that eight trains will be run daily, covering the distance in two hours and twenty minutes.

Iowa "Blue-Sky" Law Unconstitutional.—The Iowa "blue-sky" law, providing for the regulation of investment companies, was held unconstitutional on July 6 by Judge Walter I. Smith of the United States Circuit Court for Iowa and by Judge Smith McPherson of the District Court of the United States for the southern district of Iowa.

Change in Office Location.—On July 1 the office of F. A. Healy, secretary and treasurer of the Ohio Electric Railway, was moved from Cincinnati to Springfield, Ohio. Mr. Healy will occupy space in the Ohio electric terminal and office building in Springfield, which is the headquarters of the general accounting and operating department of the company.

Expense of Relocation Not Recoverable.—The Court of Appeals of Maryland has decided that the State Roads Commission cannot recover from electric railways for expenses incident to relocating tracks incurred in building the system of State highways when using rights-of-way of the railway companies. The suit was brought by the commission against the United Railways & Electric Company.

Cause of the Salem Conflagration.—The cause of the spread of the fire at Salem is attributed to the large number of houses with shingle roofs, a kind of roof more common on the older structures in New England than on the newer structures, but widely used in all parts of the country. Railway structures rarely use this kind of roofing, but the conflagration at Salem supplies a strong argument against it for any kind of building.

Complaint of Cincinnati Companies Sustained.—On the complaint of the Cincinnati (Ohio) Street Railway and the Cincinnati Traction Company the Public Utilities Commission of Ohio has relieved the companies from the obligations imposed by the city in an ordinance passed Dec. 16, 1913, to require the Cincinnati Street Railway Company and the Cincinnati Traction Company to extend the Warsaw Avenue route over and along Glenway Avenue from Wilder Avenue to Seton Avenue.

The Toronto Purchase Agreement.—Some days ago the Council of Toronto, Ont., directed the Board of Control to report progress on the negotiations with the Toronto Railway concerning the framing of the purchase document. The Comptrollers referred the resolution to Corporation Counsel Geary and his coadjutor in the affair, D. E. Thomson. Mr. Geary has now announced that he had "reported" to the Board of Control, though he would not say that his communication embodies the agreement itself.

Railway-Ferry Transfers in New York.—The Board of Estimate and Apportionment of New York has approved the arrangement made with the New York Railways for free transfers at the Battery to and from the ferry boats of the municipal ferry between lower New York and Staten Island to the cars running to the Battery. No retransfers are to be permitted. Of each nickel the city will get 2 cents and the railway 3 cents. It is estimated that the contract may result in a loss to the city of $200,000 a year. The ferry rate is now 5 cents.

Terminal Improvements in Louisville.—Extensive improvements in terminal facilities of the southern Indiana electric railways of the Insull systems at Louisville, Ky., are thought to be assured in Louisville, judging by the statements made by Frank Smith, vice-president of the Interstate Public Service Company, which owns and operates the lines. Mr. Smith spent several days in Louisville going over the ground and interviewing Louisville shippers as to their complaints about lack of facilities to handle package freight for Indiana points over the electric railways out of that city.

Rockford Franchise Application Considered.—The City Council of Rockford, Ill., has authorized the Mayor and city clerk to retain an expert in public utility franchise and traction property values to report upon the properties of the Rockford City Traction Company before any action is taken in connection with the proposal to extend the franchise of the company for twenty years. While no suggestion was made in the resolution, Alderman Smith thought that it would be advisable to communicate with Walter L. Fisher, Chicago, regarding his possible retention. The proposal of the company for the extension of its franchise was referred to briefly in the ELECTRIC RAILWAY JOURNAL of June 20, page 1414.

Stockholders at Corporation Meeting.—The proceedings of the annual meeting of the stockholders of the United States Steel Corporation for its last fiscal year are the source of some striking information in regard to the participation of employees in the meetings of corporation stockholders. At the meeting in question there were present a number of workmen who were also stockholders in the corporation. These workmen made very interesting statements as to the conditions now effective in the steel industry in so far as the working conditions are concerned. The general trend of the remarks was that no better conditions could be found in any other plant in the country than those of the Steel Corporation.

Strike Conditions in Pittsburgh.—On July 1 an unsuccessful attempt was made to dynamite the home of E. M. Herr, president of the Westinghouse Electric & Manufacturing Company. This was an outgrowth of the strike at the three Westinghouse plants in East Pittsburgh. The Westinghouse Electric & Manufacturing Company, the Pittsburgh Meter Company and the Westinghouse Machine Company are offering employment to all classes of skilled labor and many men are reported to have been engaged. The strikers have adopted a resolution calling on Governor Tener to withdraw the state constabulary from the strike zone. On July 2 Mr. Herr conferred in New York with Guy E. Tripp, chairman of the board of directors. The results of this conference have not been made public.

PROGRAMS OF ASSOCIATION MEETINGS

The Tramways & Light Railways Association

The annual congress of the Tramways & Light Railways Association is to be held July 16-17 at Newcastle-Upon-Tyne, England. According to the preliminary program contained in the association bulletin, the papers to be presented before the members of the association on July 16 are as follows:

"Some Features of Newcastle Corporation Tramways," by Councillor R. Mayne, J.P., vice-chairman of the Newcastle Corporation Tramways Committee.

"Tramway Experiences in Brazil," by H. M. Sayers, M.I.E.E.

"Standard Tram Rails: A Comparison of English and Foreign Sections," by Fred Bland, member of the council.

On July 17 there will be two papers, as follows:

"Rail Joints: Their Construction and Maintenance," by R. Humphries, tramways engineer of the Birmingham and the Midland Tramways Joint Committee.

"Town Planning," by J. A. Brodie, city engineer, Liverpool.

International Street & Interurban Railway Association

The date for the next convention of the International Street & Interurban Railway Association has been set for the week beginning Sept. 6. The technical sessions will be held in the National Museum at Budapest. The following is the programme in brief:

Sept. 6, registration. 8 p. m., reception to delegates by committee.

Sept. 7 at 10 a. m., first technical session. Registration office will be open at 9 a. m. for the benefit of those delegates who have not already registered. In the evening, a reception by the municipality at the zoological gardens.

Sept. 8 at 9.30 a. m., second technical session. In the afternoon and evening, trip by train and boat on the Danube to Visegrad on invitation extended by the two local tramway companies in Budapest.

Sept. 10 at 9.30 a. m., fourth and final technical session. At 4 p. m., excursion by automobiles to the mountains in the neighborhood of Budapest.

At the conclusion of the session the choice of two excursions is offered to the delegates, one to Tatra, the other to Mezöhegyes.

New England Street Railway Club

The annual men's outing of the New England Street Railway Club will be held on July 14 and 15. The start will be made from Boston for Bangor, Me., from the North Station at 10 p. m. on July 13. The boat is scheduled to arrive at Bangor at 5.30 a. m. on July 14. At 6.10 a. m. the party will leave the Union Station at Bangor in special cars for the Conduskeag Canoe Club, where breakfast will be served. Between 9 and 11 a. m. the carhouses, substations and city lines of the Bangor Railway & Electric Company will be inspected.

Luncheon will be served at 1 p. m. at the Graham Farm, owned and operated by John M. Graham, president and general manager of the Bangor Railway & Electric Company. Between 2 and 5 p. m. there will be baseball and other athletic sports. The return to Bangor will be made at 7 p. m. There, at the Colonial Hotel, of which Mr. Graham is the proprietor, a banquet will be served at 7.30 p. m. On July 15 there will be an excursion to Orono and Oldtown and an inspection of the Veazie and Milford stations. The return to Boston will be made that afternoon, the boat being due to reach Boston at 6 a. m. on July 16. Arrangements for transportation can be made through the secretary of the club.

The expense each way will be $4 for fare, with charges of $1.50 to $2 additional for a stateroom.

LEGISLATION AFFECTING ELECTRIC RAILWAYS

MASSACHUSETTS

Governor Walsh has signed the bill relative to the amount of bonds, coupon notes and other evidences of indebtedness which may be issued by street railways, providing in effect that bonds may be issued up to 120 per cent of the outstanding capital stock of such companies.

The House passed without debate the resolve referring to the Public Service Commission the question of authorizing the consolidation of the street railways at Boston. The Senate committee on ways and means has recommended that the Massachusetts "blue-sky" bill be referred to the next General Court.

Financial and Corporate

Stock and Money Markets

July 7, 1914.

To-day was a 200,000-share day on the New York Stock Exchange. Early in the day there were evidences of activity, but as it proved the bulk of the trading was crowded into the last hour. The railroad issues responded quickly to the rate decision rumors. During the upward turn several fairly large lots of Pennsylvania were sold at more than 112. Rates in the money market to-day were: Call, 2½ per cent; sixty days, 2½@2¾ per cent; four months, 3@3¼ per cent; six months, 3¾@4 per cent.

The Philadelphia market was strong to-day and advances were recorded. Union Traction sold at 42 and Baldwin common was bid up to 46¾.

Trading was dull in Chicago to-day, but the tone was firm. Bonds held steady.

In the Boston market to-day lower levels were general. The tone was firm. There was considerable buying of Boston Elevated.

In Baltimore the stock transactions to-day totaled 1694 shares, quite well distributed. The bond sales were $49,000, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 1	July 8
American Brake Shoe & Foundry (com.)	88⅛	88½
American Brake Shoe & Foundry (pref.)	134	137½
American Cities Company (com.)	•29	•29
American Cities Company (pref.)	60	62⅛
American Light & Traction Company (com.)	339	339
American Light & Traction Company (pref.)	109	109
American Railways Company	37	37
Aurora, Elgin & Chicago Railroad (com.)	a35	33
Aurora, Elgin & Chicago Railroad (pref.)	78½	76¼
Boston Elevated Railway	91½	95½
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	65	50
Boston & Worcester Electric Companies (com.)	•6¼	•6¼
Boston & Worcester Electric Companies (pref.)	35	37
Brooklyn Rapid Transit Company	91	91¾
Capital Traction Company, Washington	96	97
Chicago City Railway	135	135
Chicago Elevated Railways (com.)	20	20
Chicago Elevated Railways (pref.)	65	65
Chicago Railways, ptcptg., ctf. 1	97	97⅝
Chicago Railways, ptcptg., ctf. 2	34¼	35¼
Chicago Railways, ptcptg., ctf. 3	5	5
Chicago Railways, ptcptg., ctf. 4	2	2
Cincinnati Street Railway	101½	101
Cleveland Railway	103⅞	104
Cleveland, Southwestern & Columbus Ry. (com.)	•4	•4
Cleveland, Southwestern & Columbus Ry. (pref.)	•30	•30
Columbus Railway & Light Company	13	13
Columbus Railway (com.)	•53	•53
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	•63	55
Detroit United Railway	a80	80
General Electric Company	147¼	149½
Georgia Railway & Electric Company (com.)	120½	121½
Georgia Railway & Electric Company (pref.)	86⅞	86⅞
Interborough-Metropolitan Company (com.)	14½	14⅜
Interborough-Metropolitan Company (pref.)	61⅞	63⅛
International Traction Company (com.)	•30	30
International Traction Company (pref.)	•85	81
Kansas City Railway & Light Company (com.)	•22	a20½
Kansas City Railway & Light Company (pref.)	•39	39
Lake Shore Electric Railway (com.)	•6	6
Lake Shore Electric Railway (1st pref.)	•90	90
Lake Shore Electric Railway (2d pref)	•22	22
Manhattan Railway	130	130
Massachusetts Electric Companies (com.)	11	10¼
Massachusetts Electric Companies (pref.)	56	60
Milwaukee Electric Ry. & Light Co. (pref.)	•95	95
Norfolk Railway & Light Company	•26	24½
North American Company	72¾	75
Northern Ohio Traction & Light Co. (com.)	70	70
Northern Ohio Traction & Light Co. (pref.)	101	101
Philadelphia Company, Pittsburgh (com.)	38¾	39½
Philadelphia Company, Pittsburgh (pref.)	35	35
Philadelphia Rapid Transit Company	15	15⅛
Portland Railway, Light & Power Company	•47	44
Public Service Corporation	112	111
Third Avenue Railway, New York	41¼	40
Toledo Traction, Light & Power Co. (com.)	20	14
Toledo Traction, Light & Power Co. (pref.)	•70	a70
Twin City Rapid Transit Co., Minn. (com.)	103	102⅝
Union Traction Company of Indiana (com.)	11½	11½
Union Traction Company of Indiana (1st pref.)	•75	70
Union Traction Company of Indiana (2d pref.)	•14	a14
United Rys. & Electric Company (Baltimore)	28¼	27
United Rys. Inv. Company (com.)	11½	11½
United Rys. Inv. Company (pref.)	32½	32
Virginia Railway & Power Company (com.)	49	49
Virginia Railway & Power Company (pref.)	87½	95
Washington Ry. & Electric Company (com.)	85½	85½
Washington Ry. & Electric Company (pref.)	83	83
West End Street Railway, Boston (com.)	67	68¾
West End Street Railway, Boston (pref.)	85	85
Westinghouse Elec. & Mfg. Company	73¾	76
Westinghouse Elec. & Mfg. Co. (1st pref.)	122	122

• Last sale. a Asked.

ANNUAL REPORTS

Terre Haute, Indianapolis & Eastern Traction Company

The statement of income, profit and loss of the Terre Haute, Indianapolis & Eastern Traction Company for the year ended Dec. 31, 1913, follows:

Gross earnings from operation	$3,112,382
Operating expenses	1,719,908
Net earnings	$1,392,474
Taxes	128,049
Earnings from operation less operating expenses and taxes	$1,264,425
Income from other sources	289,029
Sale of power	95,368
Earnings from all sources less operating expenses and taxes	$1,648,822
Deductions and rentals:	
Bond interest:	
T. H. I. & E. Tr. Co.	$325,000
T. H. T. & L. Co	159,067
T. H. Elec. Co	75,000
I. & N. W. Tr. Co	123,500
I. & M. R. T. Co	37,500
I. & E. Ry. Co.	4,675
I. & G. R. T. Co	15,000
T. H. & W. Ry. Co	12,500
I. C. & D. Elec. Ry. Co	50,000
Total	$802,242
Dividends:	
T. H. T. & L. preferred	$54,496
T. H. & W. preferred	9,000
I. & N. W. preferred	22,500
I. C. & D. preferred	10,000
T. H. T. & L. common	100,000
T. H. & W. common	9,500
I. C. & D. common	4,000
Total	$209,496
Interest on notes	$23,932
Office maintenance—leased lines	3,000
	$1,038,670
Surplus	$610,152
Sinking fund	114,873
Balance	$495,279
T. H. I. & E. preferred dividend	455,000
Balance	$40,279

The operating expenses of the railway, light and power departments for the year 1913 were 55.26 per cent of the gross earnings. The taxes increased $25,003, making the total taxes 4.11 per cent of the gross earnings. The total operating expenses including taxes were 59.37 per cent of the gross earnings. An amount equal to 18 per cent of the gross earnings was applied to the maintenance of the owned and leased properties during the year 1913.

The expense on account of the floods during the last week of March, 1913, which partially destroyed a number of bridges and damaged the West Tenth Street power station, amounted to $102,566. In addition to this there was an estimated loss in revenue of $60,000. The loss in revenue to the Terre Haute, Indianapolis & Eastern Traction Company on account of the strike in the latter part of October was estimated at $25,000, in addition to $27,654 expense, or a total of $52,657.

During the year 1913 there was expended and charged to capital account for construction and added property the sum of $206,030. Of this sum $177,532 was expended on leased lines and $28,498 on owned lines. These expenditures cover construction work on the Terre Haute property, meters, transformers and lighting line extensions, additions to buildings and equipment, electric shovel, etc. Two new bridges were built on the Northwestern Division. A new 300-kw 600-volt d.c., General Electric Company unit was installed in the Maywood substation on the Martinsville division, and the high tension lines and substations on this division changed from 13,200 volts to 33,000 volts. The Y. M. C. A. building and ground at Crawfordsville were purchased at a cost of $18,000 and the building will be remodeled and used as a terminal station for the Crawfordsville division and the Lebanon-Crawfordsville branch of the Northwestern Division. During the year the work of installing block signals progressed, and 33 additional miles of road were equipped at a cost of approximately $1,500 per mile.

During 1913 the company invested in sinking funds of the various underlying companies the sum of $128,148. On Dec. 31, 1913, the par value of bonds held for sinking funds was shown to be $334,668. The full amount of dividend of 5 per cent was paid for 1913 on $9,100,000 of preferred stock of the Terre Haute, Indianapolis & Eastern Traction Company, making a total payment of $455,000. On April 1, 1914, it was decided that it would be inadvisable to pay the first 1914 quarterly dividend on account of the extraordinary losses and expenditures due to the flood and strike of 1913. The dividend was therefore deferred until these amounts should have been recovered from earnings.

Scranton & Wilkes-Barre Traction Corporation

The consolidated statement of income, profit and loss of the Scranton & Wilkes-Barre Traction Corporation, Scranton, Pa., and its subsidiary, the Lackawanna & Wyoming Valley Railroad, for the five months ended Dec. 31, 1913, follows:

Operating revenue	$279,671
Operating expenses	145,692
Net earnings	$133,979
Other income:	
Six months' interest on $888,000 Lackawanna & Wyoming Valley Rapid Transit Company bonds paid Aug. 1, 1913	$22,200
Interest on deposits	2,258
Total	$24,458
Total income	$158,437
Income charges:	
Taxes	$455
Hire of equipment	3,285
Miscellaneous rents	535
Interest on No. 6 Branch Erie & Wyoming Valley Railroad	1,000
Interest on $888,000 Lackawanna & Wyoming Valley Rapid Transit Company bonds (paid Aug. 1, 1913).	22,200
Five months' accrued interest on $2,112,000 first refunding 5 per cent gold bonds and $888,000 Lackawanna & Wyoming Valley Rapid Transit Company collateral trust bonds (payable Feb. 1, 1914)	62,500
Total	$89,975
Net income	$68,462
Other profit and loss credits:	
Profit and loss surplus, Lackawanna & Wyoming Valley Railroad for July, 1913	$9,207
Profit and loss surplus, Lackawanna & Wyoming Valley Railroad, as of June 30, 1913	15,392
Totals	$24,599
Total credits	$93,061
Profit and loss charges:	
Dividend No. 1 on Scranton & Wilkes-Barre Traction Corporation preferred stock	$14,167
Organization expenses (written off)	4,692
Total debits	$18,859
Profit and loss surplus, Dec. 31, 1913	$74,202

The gross earnings of the Lackawanna & Wyoming Valley Railroad for the calendar year 1913 showed an increase of $43,059, or 7.09 per cent, while the net earnings increased $35,522, or 12.84 per cent; the revenue from the transportation of passengers $32,731, or 6.32 per cent; freight revenue $7,090, or 10.04 per cent, and express revenue $1,416, or 19.89 per cent. The operating expenses showed an apparent increase of $7,537, but on account of the discontinuance on Sept. 30, 1912, of the practice of charging to maintenance of way and structures $1,000 monthly to cover expenditures for support of service, this increase was really $9,000 more, or $16,537. Maintenance of way and structures increased $21,160, the major portion of which was on account of replacement of ties and tracks. Maintenance of equipment decreased $2,784, which was generally distributed through the various items. Traffic expenses showed a small decrease, although a slightly larger amount was expended in advertising. Under transportation expenses the item of purchased power decreased $2,636. This was a reduction of 528,661 kw-hr. in the quantity purchased and a reduction in current consumption per car mile of 0.36 kw-hr. The expenses for operation of trains increased $2,600, there being an increase of nearly 45,000 car miles, more than half of which was made by passenger cars. Passenger train mileage increased only 20 miles for the year. The cost of operation per car mile showed a slight decrease. During the year 96,292 schedule trains were operated, of which 131, or 0.86 per cent, were delayed by trouble with their equipment. The general expenses decreased about $1,600, due partly to a lower rate for fire insurance and partly to changes in organization.

The report of the company contains a comparative tabulation of earnings and expenditures for the years from 1909 to 1913 inclusive, as well as a detailed schedule showing the analysis of operating expenses for 1912 and 1913. The percentage of operating expenses to gross earnings was 51.99 in 1913 as compared to 54.45 in 1912, and the percentage of operating expenses less depreciation to gross earnings was 47.97 in 1913 as compared to 50.13 in 1912. The number of revenue passengers carried in 1913 was 4,197,097; in 1912, 3,994,044; free passengers in 1913, 186,205; in 1912, 176,180; passenger earnings per mile of road in 1913, $24,349; in 1912, $22,903; passenger earnings per car mile in 1913, 35.69 cents; in 1912, 34.16 cents; total mileage of cars and locomotives in 1913, 1,836,224; in 1912, 1,791,599; operating expenses per car and locomotive mile, in 1913, 18.42 cents; in 1912, 18.46 cents.

Chicago Elevated Railway's Note Issue

The National City Bank of New York and the Illinois Trust & Savings Bank of Chicago are offering for sale at 98 and interest to yield 6.07 per cent $14,000,000 of Chicago Elevated Railway's two-year 5 per cent secured gold notes, dated July 1, 1914. These notes are issued by the Chicago Elevated Railways Collateral Trust, a voluntary association under Massachusetts laws controlling through stock ownership all of the elevated railways in Chicago. The notes will be redeemable as a whole on the option of the company on any interest date, Jan. 1 or July 1, on thirty days' notice at par and interest. The notes are specifically secured by a pledge under an indenture dated July 1, 1914, in favor of the Illinois Trust & Savings Bank as trustee of the following collateral: Northwestern Elevated Railroad, preferred stock, $4,943,300; Northwestern Elevated Railroad, common stock, $4,946,400; Metropolitan West Side Elevated Railway preferred stock, $8,706,300; Metropolitan West Side Elevated Railway common stock, $7,462,600, and South Side Elevated Railroad stock, $10,193,100, or a total of $36,251,700. These pledged securities, which represent an average of 99.88 per cent of the amounts outstanding, have been acquired by the Chicago Elevated Railway at an actual cash cost of $21,322,875.

Upon the basis of the valuation report on the elevated railways made by Prof. George F. Swain, Harvard University, in 1912, the management of the railways estimate the valuation of the properties represented by the above stock collateral as $84,386,294. On these properties there are outstanding $40,470,000 of underlying bonds, indicating that the equity pledged as collateral for these notes amounts to $43,916,294, or more than three times the total issue.

In connection with the present financing of these notes the Chicago Elevated Railways is to sell $7,000,000 of ten-year 6 per cent debentures at par. These debentures will be a general obligation of the company as junior, as to the pledged collateral, to the note issue. Inasmuch as an additional $16,000,000 was obtained from the sale of the shares of the Chicago Elevated Railways, its investment junior to these notes will amount to $23,000,000. The purchase of $12,500,000 of new first mortgage 5 per cent bonds of the Northwestern Elevated Railroad is to care for the balance of $30,000,000 of notes maturing July 1, 1914.

Brooklyn Rapid Transit Bond Conversion

The time for the conversion of the outstanding first refunding mortgage 4 per cent gold coupon bonds of the Brooklyn (N. Y.) Rapid Transit Company into stock expired on July 1. The company reports that on July 2 $5,220,000 par value of the bonds remained outstanding unconverted. The company had issued and outstanding in all $28,901,000 of the bonds. Up to Jan. 1, 1913, only one $1,000 bond had been converted. Thus in the period from Jan. 1, 1913, to June 1, 1914, $23,780,000 of the bonds were converted. As the stock is now on a 6 per cent basis the company will be called upon for the payment of the 2 per cent difference between the stock and the bonds on the amount of bonds converted, such payment totaling an additional $475,000, but reducing the fixed interest charge by $951,200. In short an annual fixed interest charge of $951,200 has been converted into a contingent dividend charge of $1,426,800. The conversion of the bonds brings the total amount of stock outstanding up to approximately $68,780,000.

On the whole it would seem that as many of the bonds were converted as could be expected. Undoubtedly a goodly number of the bonds was held by ultra-conservative investors to whom the present additional return to be secured and the prospects for a still greater return through conversion did not appeal. There must also be taken into consideration in this connection the bonds held by institutions which are precluded by law from holding stock, and then there are the bonds undoubtedly pledged as security for loans without the privilege of substitution of collateral. The bonds are now quoted at 83½ while the stock is at 91⅛. At these prices the bonds net 4.79 per cent and the stock 6.55 per cent.

Boston (Mass.) Elevated Railway.—Judge Dodge in the United States District Court at Boston has dismissed the bill brought by Amy Curtis, a stockholder of the West End Street Railway, to prevent the consolidation of that company with the Boston Elevated Railway under the act of 1911. Judge Dodge ruled that the act protects nonassenting stockholders by securing to them the right to a valuation of their shares by a jury if they desire and to payment of the ascertained value in money. He held the constitutional objections cited in the bill cannot be maintained.

Cleveland (Ohio) Railway.—The report of operation of the Cleveland Railway for May shows a surplus of $26,106, which, added to the interest fund of $369,835, increases the amount to $395,941. The allowance for operation through the summer months is 6 cents per car mile, however, and after June this is expected to reduce the interest fund materially.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex.—The negotiations for the consolidation of the Corpus Christi Ice & Electric Company, the People's Light Company and the Corpus Christi Street & Interurban Railway, begun more than a year ago, are reported to have been completed by Newburger, Henderson & Loeb, Philadelphia, Pa. These negotiations were referred to briefly in the ELECTRIC RAILWAY JOURNAL of Feb. 8, 1913.

Eastern Power & Light Corporation, New York, N. Y.—Lewis A. Riley, president of the Lehigh & Hudson River Railway, has been elected a director of the Eastern Power & Light Corporation.

Eastern Texas Electric Company, Beaumont, Tex.—Stone & Webster, Boston, Mass., are offering for sale at 95 and interest to yield 5.35 per cent, $200,000 of first mortgage collateral trust 5 per cent gold bonds of the Eastern Texas Electric Company, dated Nov. 1, 1912, and due Nov. 1, 1942. These bonds are of coupon issue in denominations of $1,000 and $500, with privilege of registration as to principal only, or fully registered without coupons in denominations of $5,000 or any multiple thereof. They are callable as a whole or in part for the sinking fund, at 105 and interest on any interest date. The sinking fund is made up of a payment of 1 per cent per annum of the bonds outstanding, the first payment being dated Nov. 1, 1917. The proceeds of the sale of these bonds will provide funds for the following purposes: Purchase of $100,000 of Beaumont Traction Company first mortgage 5's, which will give the Eastern Texas Electric Company $300,000 face value, or 50 per cent of the issue; the retirements of the present floating indebtedness of the Eastern Texas Electric Company amounting to $75,000, and certain additions and improvements to the properties of the subsidiary companies. In calling attention to this offer Stone & Webster emphasize the fact that the outstanding bonded debt, including the bonds now offered, amounts to less than 2½ times the gross earnings and that the net earnings at the present time amount to over 3½ times the bond interest charges. The bonds are followed by $500,000 of 6 per cent notes, $1,400,000 of preferred stock, paying dividends at the rate of 6 per cent, and $1,400,000 of common stock. The equity back of the bonds, as represented by present market prices of the junior securities, amounts to about $2,500,000. The Eastern Texas Electric Company controls besides the entire lighting and power business in Beaumont and Port Arthur, Tex., the Jefferson County Traction Company, operating an interurban railway 20 miles in length between Beaumont and Port Arthur.

Empire United Railways, Inc., Syracuse, N. Y.—An issue of $295,000 of 5 per cent first and refunding mortgage bonds of the Empire United Railways, Inc., under a $20,000,000 indenture to the Equitable Trust Company, New York, has been authorized by the Public Service Commission of the Second District of New York. The bonds are to be sold at not less than 85 to net $250,750.

Federal Light & Traction Company, New York, N. Y.—Of funds recently secured by the sale of 6 per cent notes, the Federal Light & Traction Company will devote $415,000 to extensions and betterments to plants of its various subsidiaries. At Trinidad, $110,000 will be used; around Tucson, $170,000 will be spent, of which $100,000 goes for powerhouse extensions, $40,000 for traction company improvements, $10,000 for gas extensions and $20,000 to extend the high-tension transmission service. A new street-lighting contract at Albuquerque calls for $15,000, while the $100,000 remaining of the amount appropriated for betterments will be spent upon track improvements for the Springfield Traction Company.

Interborough Rapid Transit Company, New York, N. Y.—Harris, Forbes & Company, Lee, Higginson & Company and Kissel, Kinnicut & Company, as syndicate managers, announced on July 7 that they had completed the sale of $20,000,000 of Interborough Rapid Transit Company bonds recently purchased from J. P. Morgan & Company. This lot makes a total of $50,000,000 of bonds sold by the syndicate in the past few months. The last $20,000,000 was placed at 99 and interest, an advance of one-half of 1 per cent over the offering price of the first $30,000,000.

Hudson & Manhattan Railroad, New York, N. Y.—The Hudson & Manhattan Railroad has applied to the Public Service Commission for the First District of New York for permission to issue $202,500 in bonds. The bonds are to be issued under the company's first lien and refunding mortgage for $65,000,000, to the Central Trust Company, approved by the commission in July, 1913, at which time an issue of $37,035,000 was authorized. The mortgage provided that the company, with the approval of the commission, might from time to time issue additional bonds to reimburse itself for expenditures made for additions and betterments. The present application states that the company, since the date of the mortgage, has expended for such purposes $202,579, and now desires to issue bonds for $202,500 for reimbursement.

Jacksonville Railway & Light Company, Jacksonville, Ill.—The Jacksonville Street Railway was incorporated recently to take over the present railway property in Jacksonville operated by the Jacksonville Railway & Light Company, provided that a new franchise is obtained in the city.

Lake Erie, Bowling Green & Napoleon Railway, Bowling Green, Ohio.—C. G. Taylor, receiver of the Lake Erie, Bowling Green & Napoleon Railway, has reported to Judge Killits. Mr. Taylor became receiver by appointment from Judge Killits ten months ago, in charge of the interurban lines east and west out of Bowling Green and the lighting and the heating plant of Bowling Green. Judge Killits is quoted as follows: "This company has been in the hands of receivers for more than three years and has been a losing proposition. Mr. Taylor's management of the road began in July, 1913. His first ten months of operation show a net surplus revenue above all expenses and deductions, except interest on bonds, of more than $6,000. In addition to this the physical condition of the company's plant, equipment and tracks has been greatly improved."

Mesaba Railway, Virginia, Minn.—The Mesaba Railway has been reincorporated under the laws of Massachusetts with $3,750,000 of authorized stock to succeed the Minnesota corporation of the same name. The stock will consist of 12,500 shares of 7 per cent preferred stock and 25,000 shares of common stock. Of the stock, 15,757 shares of preferred and 6850 shares of common are to be issued in exchange for the outstanding $1,100,000 of stock of the Minnesota corporation and $99,168 cash.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company has applied to the Railroad Commission of California for authority to issue $12,500,000 of first preferred stock and $5,000,000 of its general and refunding bonds. The company proposes to sell the stock at $82.50 per share. The company asks for authority to sell the bonds at a future date at a price to be determined later. The company has taken steps to amend its articles of incorporation so as to provide for the issue of first preferred stock. The company desires also to be granted authority by the commission to convert its present issue of $10,000,000 of preferred stock into first preferred stock after July 1, 1916, at the rate of 1.025 shares of first preferred stock for each share of the present preferred stock. The new first preferred stock which the company proposes to issue will be 6 per cent cumulative.

San Diego (Cal.) Electric Railway.—Authority to create a bonded indebtedness of $10,000,000 has been asked of the Railroad Commission of California by the San Diego Electric Railway. Of this amount the company desires permission to issue immediately and to sell, at a price not less than 90, bonds in the sum of $4,484,000. From the proceeds of this sale the company intends to use $1,805,555 to retire its outstanding indebtedness, which is $1,625,000. It also intends to sell, at not less than 90, $2,677,557 to pay indebtedness on a promissory note of $574,406; to return to income $302,438, which amount has been spent on betterments properly chargeable to capital, and to pay for contemplated construction the sum of $1,532,957. Out of the company's original bond issue of $5,000,000 of 1908 it states that $1,625,000 is its total outstanding indebtedness. The company also contemplates absorbing the Point Loma Railroad and the San Diego Coronado Ferry Company.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The Railroad Commission of California has rendered a preliminary order in the applications of the San Francisco-Oakland Terminal Railways for permission to issue additional bonds and notes. The applications now pending before the commission ask authority to issue $1,000,000 of general lien bonds to be pledged together with other collateral already pledged as security for an issue of outstanding notes, $500,000 of notes additional upon the collateral so pledged and $10,000,000 of first and refunding bonds. In rendering a preliminary order on these applications, the commission did so upon the representation that certain pressing obligations must be met by the company and because the physical valuation of properties now being made by the commission may not be completed before another sixty days. The obligations which the company desires to meet immediately include a preliminary payment of $60,000 on a new ferry boat to be used in carrying passengers from Oakland to the exposition grounds in San Francisco during 1915, and an initial payment of $100,000 on new cars for Oakland. The preliminary order of the commission permits the San Francisco-Oakland Terminal Railways, to issue its promissory notes for a period not to exceed one year in a sum not to exceed $650,000. The company is also authorized to issue $1,000,000 of its general lien bonds as collateral security for this issue of notes.

Shreveport (La.) Railways.—The Hibernia Bank & Trust Company, New Orleans, La., is offering at a price to yield 5.15 per cent, $800,000 of first mortgage 5 per cent serial gold bonds of the Shreveport Railways, dated July 1, 1914, and maturing $590,000 serially between 1918 to 1944. The bonds are all redeemable at 103 and interest on or after July 1, 1918. They are in the denominations of $100, $500 and $1,000. The Shreveport Railways is the successor to the Shreveport Traction Company, which in turn succeeded the Shreveport Belt Railway, and the Shreveport City Railway, chartered in 1870, and purchased the Highland Park Traction Company and the Shreveport Suburban Railway. The Shreveport Railways owns and operates the entire street railway system in Shreveport, consisting of 30 miles of track, over which nineteen single truck and nineteen double truck cars are operated. The deed of trust securing the present issue of bonds provides that no additional bonds can be issued unless the company earns at least three times its interest charges on all outstanding bonds, and then the additional bonds can be issued only for 80 per cent of the cash cost of extensions, etc.

Twin City Rapid Transit Company, Minneapolis, Minn.—The New York Stock Exchange has authorized to be listed the $1,900,000 of additional common stock of the Twin City Rapid Transit Company recently offered to stockholders at par on notice of payment in full, making the total amount authorized to be listed $22,000,000.

Wisconsin-Minnesota Light & Power Company, La Crosse, Wis.—The Wisconsin-Minnesota Light & Power Company, the successor to the La Crosse Gas & Electric Company, as referred to in the ELECTRIC RAILWAY JOURNAL of June 27, page 1475, is organized as follows: Joseph H. Brewer, president; W. B. Parsons and A. E. Peirce, vice-presidents; Blaine Gavett, secretary; C. A. Boalt, treasurer; W. J. Ripley, assistant secretary and treasurer; Messrs. Brewer, Parsons, Peirce, Gavett, Boalt, Charles B. Kelsey, A. W. Higgins, John H. Blodgett, Joseph S. Hart, George G. Whitworth and Charles McPherson, directors.

Dividends Declared

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Dayton & Troy Electric Company, Dayton, Ohio, quarterly, 1¼ per cent, preferred; 1¼ per cent, common.

Georgia Light, Power & Railways, Macon, Ga., quarterly, 1½ per cent, preferred.

Green & Coates Streets Passenger Railway, Philadelphia, Pa., quarterly, $1.50.

Jacksonville (Fla.) Traction Company, quarterly, 1½ per cent, preferred; quarterly, 1¾ per cent, common.

Metropolitan West Side Elevated Railway, Chicago, Ill., quarterly, 1¼ per cent, preferred.

Ottumwa Railway & Light Company, Ottumwa, Ia., quarterly, 1¾ per cent, preferred.

Scioto Valley Traction Company, Columbus, Ohio, quarterly, 1¼ per cent, first preferred and preferred.

South Side Elevated Railroad, Chicago, Ill., quarterly, 1½ per cent.

Thirteenth & Fifteenth Streets Passenger Railway, Philadelphia, Pa., $6.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILWAY, WHEATON, ILL.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$181,058	*$125,445	$56,614	$35,566	$21,048
1 "	"	'13	168,721	*105,380	63,341	23,227	30,114
11 "	"	'14	1,851,020	*1,195,452	655,568	378,609	276,959
11 "	"	'13	1,770,936	*1,061,547	709,390	355,288	354,102

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$112,894	$65,807	$47,088	$32,628	$14,460
1 "	"	'13	108,625	62,528	46,096	31,590	14,506
5 "	"	'14	486,820	305,299	181,521	160,771	20,750
5 "	"	'13	463,559	293,572	169,985	155,804	14,181

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	3,014,661	$1,117,955	$1,896,706	$1,086,410	$810,296
1 "	"	'13	2,914,336	1,161,674	1,752,662	1,105,358	647,304
11 "	"	'14	16,326,195	6,334,073	9,992,122	6,719,548	3,272,574
11 "	"	'13	15,943,213	6,499,085	9,444,128	6,617,155	2,826,973

JOPLIN & PITTSBURG RAILWAY COMPANY, KANSAS CITY, MO.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$48,829	*$31,565	$17,264	$12,542	$4,722
1 "	"	'13	49,466	*29,018	20,448	12,542	7,906
12 "	"	'14	583,833	*360,191	223,642	150,500	93,142
12 "	"	'13	557,467	*326,095	231,372	150,881	80,491

NEW YORK (N. Y.) RAILWAYS

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$1,233,505	$765,800	$467,705	$346,002	$121,703
1 "	"	'13	1,263,262	755,132	508,130	453,810	131,395
11 "	"	'14	13,039,690	8,052,875	4,986,815	4,054,667	932,149
11 "	"	'13	13,289,032	8,025,948	5,264,084	4,142,974	1,121,110

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$323,037	$191,808	$131,228	$65,494	$65,734
1 "	"	'13	279,993	167,697	112,295	58,131	54,164
5 "	"	'14	1,403,921	860,110	543,810	325,841	217,969
5 "	"	'13	1,205,720	750,103	455,617	284,501	171,116

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$806,614	$391,143	$415,471	$232,834	$182,637
1 "	"	'13	742,153	356,946	385,207	239,448	145,759
5 "	"	'14	3,727,219	1,994,125	1,733,044	1,133,253	599,761
5 "	"	'13	3,476,037	1,802,983	1,673,053	1,169,344	503,709

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*Includes taxes.

Traffic and Transportation

Chicago Electric Railways as Freight Carriers

The Chicago Municipal Markets Commission, appointed by the Mayor of Chicago, as noted in the ELECTRIC RAILWAY JOURNAL of April 4, page 797, to investigate market conditions in that city, has presented its preliminary report to the Aldermen and the Mayor. The document contains more than fifty pages and is of particular interest on account of the extended reference which it contains to electric railways as factors in controlling market conditions.

Under "Electric Street Railways as Freight Carriers" the commission says that trolley freight service with its cheap rates and practically house to house collection of farm products should be of enduring interest to the city consumer and to the producer. The urban and interurban railways should be operated for the benefit of the community in shortening the route between the producer of farm products and the consumer. Seven interurban electric railways enter Chicago or are connected with its surface or elevated lines, but only one, the Aurora, Elgin & Chicago Railway, has access to the loop district. The Aurora, Elgin & Chicago Railway handles considerable freight to and from the track connections with steam railroads, and brings into Chicago three carloads of milk daily to its freight terminus at Laramie Avenue, on the Metropolitan Elevated Railway. During 1913, 615 cans of milk and cream were brought into Chicago daily. The charge for this service is 15 cents per can between any two points on the company's line. The Chicago & Milwaukee Electric Railroad runs four express trains each day for the United States Express Company. A large portion of this company's express business consists of milk deliveries to Evanston and Milwaukee. These deliveries average about 300 cans each day. The bulk freight and merchandise traffic includes crushed stone, gravel and coal and averages approximately 150,000 tons annually, not including the freight hauled for company use. Freight traffic, however, is limited, owing to the restrictions in the company's franchises.

Speaking of the service on the other electric railways which enter Chicago and of the possibility of extending the service the report says:

"The Chicago & Interurban Traction Company, formerly known as the Chicago & Southern Traction Company, has its Chicago terminal at Sixty-third and Halsted Streets. The station is a joint one with the Englewood branch of the South Side Elevated Railroad. Direct connections are made at this point with the South Side Elevated Railroad and the Chicago City Railway for all parts of the city. This company operates its cars over the lines of the Chicago City Railway from the city limits of Chicago to Sixty-third Street. At the present time freight traffic is comparatively light owing to the fact that the company has not put its downtown freight terminal in service. As soon as this can be done, it is expected that the freight traffic will become very heavy owing to the quick delivery which can be made to the territory served by the Chicago & Interurban Traction Company's lines.

"By means of a traffic agreement with the Chicago & Eastern Illinois Railroad and the Chicago, Rock Island & Pacific Railroad, the Illinois Traction System makes shipments and deliveries from its lines to Chicago. A general agent's office is maintained in Chicago, and considerable freight for this 625-mile electric railroad system originates in this city. At the present time less than carload shipments average 20,000 lb. daily with the addition of isolated carload shipments, which include live stock, grain and fruit. The two steam roads connect with the Illinois Traction System at Glover and Peoria, Ill. At the former point cars may be interchanged, but at Peoria interchanged freight is handled to the electric line by teams. The important feature of this service to Chicago is the large number of flourishing Illinois cities touched and the fact that one-day delivery is made to all points on the electric line except St. Louis, and the completion of the Chicago, Ottawa & Peoria division of the Illinois Traction System in Joliet has given it an electric connection with Chicago.

"Among the electric roads in Michigan whose traffic is increased by boat line service to Chicago is the Grand Rapids, Grand Haven & Muskegon Railway. By advertising the fact that Chicago can be reached by way of the Goodrich boat line from Grand Haven a large amount of freight business has been developed. Freight traffic to Chicago includes all classes and averages approximately 100 tons daily in each direction.

"The Benton Harbor-St. Joe Railway & Light Company taps the rich Michigan fruit belt, and during the height of the fruit season thousands of bushels of fruit are delivered to the Graham & Morton boat line at Benton Harbor, from where it is shipped to Chicago and the territory lying to the west.

"The Chicago & Joliet Electric Railway operates through a territory having a population of more than 675,000 people outside of Chicago. No freight is carried in and out of Chicago on account of the distance of the company's terminal from the city's business district. Small quantities of bulk freight and express are handled from Joliet to points along the company's line.

"Although the Chicago, South Bend & Northern Indiana Railway has no lines into Chicago, its passenger and freight traffic is largely affected by its proximity to the city. The existing congested conditions at all steam road terminals seriously delay freight transfers from points east to points west of Chicago, necessitating at least two days to make the interchange of freight and get trains en route for the Northwest territory. The South Bend line has been able to take advantage of this delay by making a traffic arrangement with the various boat lines operating out of Michigan City, Ind., and Benton Harbor, Mich., to Chicago. Two loads of less than carload merchandise are delivered and received daily from boat lines at Benton Harbor. This boat line service makes it possible to save one day over steam road service to points west of Chicago. The boats deliver to trucks at Chicago. During the summer season from one to three cars of freight are delivered to boats at Benton Harbor daily.

"It is estimated that if the electric interurban lines are allowed direct access to the Chicago market, the cost for rapid, efficient service will be less than the cost of the present inferior service, due to the great cost of teaming and the delays at the railroad freight stations. The electric interurban railroad is better adapted for handling this class of foodstuffs because it operates more trains and makes stops convenient to the producer, as well as intensively developing this feature of its service. The steam roads have now more business in Chicago than they can handle with dispatch. The interurban electric railroad, with an eye to greater financial returns, will foster and promote its freight handling privilege to the utmost.

"All the interurban lines having termini in and near Chicago have facilities for bringing produce and garden truck to the people of Chicago more conveniently and rapidly than the steam roads. The city, therefore, should make arrangements under which interurban electric railways coming into the city limits will be permitted to carry express packages and farm products into and from Chicago over the lines of the existing street railway companies.

"A careful study of future relations of the steam railroad and the interurban electric railway indicates very strongly that the latter will largely handle a purely local freight and express business. It is urged that if the hauling of freight is limited to the night time, when the passenger trains are nearly all off the line, that this night operation of the freight traffic would not only assist in raising the sag in the powerhouse load curve, but would increase the gross business without adding materially to the fixed charges."

The report also refers to the handling of baggage and freight by electric railways in Massachusetts and to the service by the electric railways at Los Angeles, Cleveland and Philadelphia. A summary of recommendations of the committee contains the following paragraph in regard to the electric railways:

"In order to give the producer direct access to the markets of the city and to furnish the Chicago consumer with fresher and a more varied allotment of farm products, electric railway freight service should be placed in operation over the present existing street railway lines, and the interurban street railways should be given direct access to the city markets and to such other points in the city convenient to the consuming public for the delivery of fruits, vegetables and dairy products. The rapid and easy access to the new markets achieved by the establishment of street railway freight service to and from the city will encourage production, and the vast amount of land near the city of Chicago at present undeveloped will be divided into small truck, poultry, dairy and fruit farms. The time has arrived when our urban and interurban street railways should be operated for the benefit of the community in shortening the route between the producer of farm products and the consumer. The carrying of freight by street railway lines inside of the city limits, however, should not be permitted to interfere with the proper handling of the passenger traffic. Such freight cars should be operated during the hours when the passenger service is at a minimum and practically at a standstill, and they should be kept out of the congested district of the city. Freight handled by the interurban street railways could be carried over the Chicago street railways between the hours of 11 p. m. and 5 a. m. without inconvenience to the public. By permitting our street cars to carry freight during the night, street congestion in the day time will be lessened to a large extent by the elimination of a large amount of hauling by teams."

Trespasser Defined in New Jersey

In the case of Calvin Burns against the Atlantic City & Shore Railroad, Atlantic City, N. J., the Supreme Court of that State held recently that in proceedings under the act of 1911 for the prevention of trespassing upon railroad trains, and railroad property, it is necessary to prove a trespass contrary to the rules of the railroad corporation and an intention to ride without paying fare or to do the other acts mentioned in the statute.

Burns was convicted of a violation of the act of 1911 for the prevention of trespass upon railroad trains and railroad property. He had boarded a car at Pleasantville. The car was crowded. He had no seat and when the conductor demanded fare the prosecutor refused to pay until provided with a seat. None could be provided, so he remained on the car without paying fare although he might have alighted at two regular stops. The railroad company is incorporated under the general railroad law, but the custom was to collect fares on the car as in the case of street railways.

Many of the reports of this case which were published in the daily newspapers appeared under the caption "No Seat, No Fare Wins."

Don'ts for July 4.—The Pittsburgh (Pa.) Railways carried a full page advertisement in the Pittsburgh papers just previous to July 4 headed "Don'ts for July 4." The company referred to the unusually large crowds on the streets on July 4 and published a series of fifteen don'ts designed to protect its patrons and pedestrians.

State Board to Investigate Northampton Arbitration.—The Massachusetts Board of Arbitration and Conciliation has agreed to visit Northampton on July 7 to investigate its dispute between the Northampton Street Railway and members of the employees' union in connection with the interpretation of the recent finding of the local arbitration board. Commissioners C. G. Wood and F. M. Bump will sit in the case. Retroactive wages is the chief subject of discussion.

Adams Express on Detroit United Lines.—An arrangement has been made by which the Adams Express Company will handle the express business on the Detroit United Lines, succeeding the United States Express Company, which discontinued business on June 13. The Adams Express Company will establish agencies at all principal points along the electric railways included in the Detroit United Lines. Fast electric freight service will be maintained as at present on all the Detroit United Lines, the arrangement in regard to express business in no wise supplanting the regular freight service.

Traffic Regulation in Detroit.—Police Commissioner Gillespie of Detroit, Mich., is using his department to aid street car riders in the congested downtown district. He has marked off a number of "safety zones" at various heavy loading points on the lines of the Detroit United Railway, and these zones are protected with iron stands against vehicular traffic. The purpose is to keep a portion of the pavement clear for those boarding and alighting from cars and thus facilitate the handling of street car riders. In addition, the police commissioner has marked all the principal crossings in the congested district with heavy chalk lines.

Trial Belt Line Service Ordered at Boston.—Upon a petition of the Charlestown Improvement Association for improved service on the surface lines of the Boston Elevated Railway, the Massachusetts Public Service Commission has ordered that a three months' trial schedule be adopted which will include a loop line operated on a ten-minute headway in each direction from Sullivan Square to City Square, via Bunker Hill and Main Streets, and thence to Sullivan Square, with transfer privileges at City Square to and from Boston cars. The board also has ordered the trial installation for the above period of a ten-minute line between the top of Winter Hill and Summer Street, Boston, and a ten-minute line from Sullivan Square via Bunker Hill Street and the Tremont Street subway and Shawmut Avenue to Dudley Street.

Brooklyn Mail Contract Terminated.—Because the Brooklyn (N. Y.) Rapid Transit Company was unable to arrange satisfactory terms for renewing its contract with the Brooklyn post-office, for the transportation of letter carriers, the latter have been paying full fare since July 1. Postmaster William E. Kelly of Brooklyn has announced that the new plan of 5-cent fares for each ride will be tried for a period of three months. Tickets will be issued to the carriers for the payment of their fares to and from the stations while delivering and making collections. It is stated unofficially that the department hopes by the time the three-month experimental period is up to be ready to install automobile mail delivery service in Brooklyn. Under the arrangement which existed in Brooklyn the company received $25,000 a year for transporting the carriers.

Bay State Street Railway Fare Orders.—The Massachusetts Public Service Commission has ordered the Bay State Street Railway to rearrange its present fare limits so as to permit passengers to ride between the Braintree station of the New York, New Haven & Hartford Railroad and White's turnout in Holbrook for a 5-cent fare. The extension involved from the previous limit is about 0.5 mile. The commission has also ordered the company to provide 7-cent tickets good for passage between Middleton Square and Cabot and Dow Streets, Beverly, between 5.30 and 7.30 a. m., and 4.30 and 6.30 p. m., for the use of regular patrons traveling from any part of Middleton to any part of Beverly. The commission points out that similar tickets are in use between Middleton and Salem and that the company's revenue will not be materially reduced by the application of such a rate to the Beverly traffic.

New Fare System on New Jersey Line.—The Burlington County Transit Company, Mount Holly, N. J., has installed the fare registering system of the Rooke Automatic Register Company, Providence, R. I. The railway apprised the public of the change in display advertising which it carried in the daily papers. It said that the new system commended itself to any one willing to be shown. In explaining the advantages of the system to the passenger and to the conductor the company said: "The passenger pays his cash fare by easily paying his nickel into the hand-held register instead of placing same in the conductor's hand. The accustomed physical act of payment is not so much changed as merely utilized. The conductor is relieved of registering fares. Collection means registration and the instant possession of all cash, as usual. The entire transaction involving payment, registration and delivery is accomplished automatically and instantly at passenger's finger tips. All this saves time, and eliminates the old unavoidable annoyance of jostling passengers during the old 'ring up' process. The correct audit of all cash collected is no longer a matter of memory or optional intent. The conductor is relieved of mental accounting. Passengers cannot now 'ring up' fares by mistake, as formerly, or dispute regarding denomination of coin paid. The chance for honest financial error is eliminated along with any plausible basis for excusing intentional irregularities. This means a 'square deal' without casting reflections or imposing hardships."

Personal Mention

Mr. S. G. Cunningham has been appointed purchasing agent of the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., to succeed Mr. George W. Milliken.

Mr. J. Dunhill has been elected secretary of the Tucson (Ariz.) Rapid Transit Company to succeed Mr. L. C. Gerry, who continues with the company as vice-president and treasurer.

Mr. W. J. Tharp, who has been auditor of the Little Rock Railway & Electric Company, Little Rock, Ark., has also been elected secretary of the company, to succeed Mr. George B. Rose.

Mr. L. C. Gerry, who has been secretary and treasurer of the Tucson (Ariz.) Rapid Transit Company, has been elected vice-president of the company and continues as treasurer but not as secretary.

Mr. W. W. Freeman has been elected vice-president of the Cincinnati, Newport & Covington Railway and the South Covington & Cincinnati Street Railway, Covington, Ky., to succeed Mr. P. G. Gossler.

Mr. C. S. Gannon, who has been secretary of the Birmingham-Tuscaloosa Railway & Utilities Company, Tuscaloosa, Ala., has also been elected treasurer of the company, to succeed Mr. W. S. Adams.

Mr. F. J. Beyer has been elected vice-president of the Winona Interurban Railway, Warsaw, Ind., to succeed Mr. William D. Frazer, who has been elected president and general manager of the company.

Mr. Claus Spreckels, who has been treasurer of the San Diego (Cal.) Electric Railway, has also been elected secretary of the company, to succeed Mr. H. L. Titus, who continues with the company as general counsel.

Mr. William D. Frazer, who has been vice-president and general manager of the Winona Interurban Railway, Warsaw, Ind., has been elected president of the company, to succeed Mr. H. J. Heinz. Mr. Frazer also continues as general manager.

Mr. S. C. Steinhardt has been elected president of the Wilmington, New Castle & Delaware City Railway, New Castle, Del., to succeed Mr. W. R. Brown. Mr. Steinhardt has also been elected president of the Wilmington Southern Traction Company, New Castle.

Mr. C. A. Pearson, Jr., who has been assistant treasurer of the Union Railway, Gas & Electric Company, Rockford, Ill., has also been appointed assistant secretary of the company, succeeding Mr. Jacob Hekma, who continues as an officer of the company with the title of treasurer and secretary.

Mr. J. W. Coleman has been elected president of the Coast Countries Gas & Electric Company, Santa Cruz, Cal., to succeed Mr. John Martin. Mr. Coleman, who has been general manager of the Union Traction Company, Santa Cruz, has also been elected president of that company, to succeed Mr. Martin.

Mr. George L. Mayer has been appointed purchasing agent of the Ohio Electric Railway, with headquarters at Springfield. The purchasing for the Ohio Electric Railway has heretofore been done by Mr. Claude Burckmyer, who also acted as purchasing agent for the Cincinnati Traction Company, the Ohio Traction Company and the Cincinnati Car Company.

Mr. T. B. Massey has been elected vice-president of the Wilmington, New Castle & Delaware City Railway, New Castle, Del., to succeed Mr. T. D. Rhoades. Mr. Massey has also been appointed general manager of the company. Mr. Massey has also been elected to the position of vice-president and general manager of the Wilmington Southern Traction Company.

Mr. Henry C. Hazzard has resigned as secretary of the Pacific Coast Electric Railway Association and will engage in the practice of law with offices in the Alaska Commercial Building, San Francisco. In this work he will be associated with Mr. T. T. C. Gregory, general counsel for the interests of Louis Sloss & Company, who are largely interested in the Northern Electric Railway, Chico, Cal., and other enterprises. Mr. Hazzard is a graduate of Leland Stamford, Jr., University and was admitted to the New York State Bar in 1899. Later for five years he was executive head of the division of light, heat and power of the New York Public Service Commission, First District, but resigned this office to become assistant attorney to the State Railroad Commission of California.

Prof. E. W. Bemis has been appointed as the city's representative on the Chicago Board of Supervising Engineers to succeed Mr. George Weston. The appointment has been approved by the Council. Professor Bemis is well known as a public utility expert and as an economist. He is at present engaged in supervising the valuation of the property of the public service corporations operating in the District of Columbia for the Public Utilities Commission of the District, and has been retained by the Detroit Street Railway Commission to appraise the property of the Detroit United Railway within the city of Detroit. Professor Bemis was born in Springfield, Mass., on April 7, 1860. He received the degree of A.B. from Amherst in 1880 and A.M. in 1884. In 1885 he received the degree of Ph.D. from Johns Hopkins University. He was professor of history and political economy at Vanderbilt University from 1889 to 1892 and was assistant professor of political economy at the University of Chicago from 1892 to 1895. In 1896 he served as assistant statistician of the Illinois Bureau of Labor Statistics, and from 1897 to 1899 was professor of economics, science and history at the Kansas State Agricultural College. Later he was director of the department of municipal monopolies of the Bureau of Economic Research in New York. From 1901 to 1909 he was superintendent of the water department of the city of Cleveland, Ohio. From January to October, 1910, he was deputy commissioner of water supply, gas and electricity in New York. Since 1910 Prof. Bemis has been engaged as a consulting expert in connection with problems affecting public utility properties.

J. F. Hamilton

Mr. James F. Hamilton, general manager of the United Traction Company, Albany, N. Y., and the Schenectady (N. Y.) Railway, was elected president of the New York Electric Railway Association at the annual meeting held at Hotel Champlain, Bluff Point, N. Y., on June 30 and July 1. Mr. Hamilton entered the transportation department of the International Railway, Buffalo, N. Y., in 1896, and after serving in various positions was placed in charge of one of the largest stations. He resigned his position with that company in 1902 to become assistant superintendent of the Schenectady Railway and was appointed superintendent of the company in 1909. In 1911 Mr. Hamilton was engaged as general superintendent of the United Traction Company, and was retained by the Schenectady Railway in an advisory capacity, and in 1912 he was appointed general manager of both companies. Mr. Hamilton has been active in the work of the New York Electric Railway Association for a number of years, and has served on the executive committee and as vice-president.

OBITUARY

Guy Phillips, assistant secretary and assistant treasurer of the Virginia Railway & Power Company, Richmond, Va.; secretary and treasurer of the Richmond & Chesapeake Bay Railway, and assistant secretary of the Missouri Pacific Railroad, killed himself by shooting at the office of Mr. Frank J. Gould, with whom he was associated in New York. Mr. Phillips had been identified with the Gould interests for many years. He suffered a nervous breakdown about ten years ago, but after a long rest in Germany he returned to the United States and resumed business apparently greatly improved in health.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Niobrara Electric Light, Power & Railway Company, Lincoln, Neb.**—Incorporated in Nebraska to build electric railways and other public utilities. Capital stock, $300,000. Officers: Hugh O'Neill, president; C. L. Keeler, vice-president; Carl E. Grant, secretary; John Korab, treasurer, and W. C. Grant, director.

FRANCHISES

Tuscaloosa, Ala.—The Birmingham-Tuscaloosa Railway & Utilities Company will ask the Council for an extension of time on its franchise in which to complete its electric line in Tuscaloosa.

Oakland, Cal.—The San Francisco-Oakland Terminal Railways have received a franchise from the Council for a double track on Telegraph Road in San Lorenzo, from the north line of Sycamore Street to Main Street.

Savannah, Ga.—The Savannah Electric Company has received a franchise from the Council to extend its line on Habersham Street from the present terminus southward to Forty-fourth Street to connect with the line at Chatham Crescent in Savannah.

Springfield, Ill.—The Southern Illinois & St. Louis Railway has asked the Illinois Public Utilities Commission for a certificate of convenience and necessity to build an electric railway between Marion, Harrisburg and Johnson City. [E. R. J., March 28, '14.]

Salina, Kan.—The Salina Street & Interurban Railway has received a franchise from the Council for an extension of its lines in Salina. The company also plans to build a new steel bridge. H. C. Smither, president.

Portland, Ore.—The application of the Portland Railway, Light & Power Company for approval of a line on East Eighth Street from Hawthorne Avenue to East Yamhill Street in Portland on which the company has a franchise, has not been approved by the Department of Public Works. Some suggestions have been made, however, which if followed will result in the immediate construction of the line.

Rock Hill, S. C.—The Carolina Traction Company has received a franchise from the Council for an extension of its tracks along Elm, Park and Crawford Streets in Rock Hill.

Nashville, Tenn.—The Nashville Traction Company will ask the County Court for a franchise for a right-of-way on the Murfreesboro turnpike from the city limits on LaFayette Street in Nashville to the town of Una.

Nashville, Tenn.—The Nashville-Gallatin Interurban Railway will ask the County Commissioners for an extension of time on its franchise in which to complete its line from the present terminus to the boundary of the county, passing through Goodlettsville. The purpose is to build a line to Ridge Top and Springfield, in Robertson County.

East Dallas, Tex.—Daniel Sonnentheil and associates have received a twenty-five-year franchise from the Council to build an electric line in East Dallas through the Lakewood addition, a distance of about 2 miles. [E. R. J., July 4, '14.]

Orange, Tex.—The franchise granted by the City Council of Orange to A. H. Hodges, C. F. Smythe and their associates giving them authority to build an electric railway and an electric light plant in Orange was formally accepted recently. It is intended to extend this line eastward to the town of Vinton and to the Vinton oil fields. [E. R. J., June 20, '14.]

Texas City, Tex.—The Texas City Street Railway has received a franchise from the County Commissioners in Texas City.

Salt Lake City, Utah.—The Utah Light & Railway Company has received a forty-one-year mail and express franchise from the Council in Salt Lake City.

TRACK AND ROADWAY

Northwest Arkansas Railway, Bentonville, Ark.—This company has placed in operation the 8-mile section of this line between Bentonville and Rogers. The line will be extended to Springdale, Pea Ridge and Cave Springs. H. L. Cross, Bentonville, secretary. [E. R. J., May 16, '14.]

Benicia, Cal.—Definite announcement that the construction of the Vallejo and Benicia electric railroad will be begun in a few weeks was made recently by officials of the Benicia Land & Terminal Company, recently incorporated. J. R. Cunningham, who is on the field in charge of operations, announces that the company had secured options on 1000 acres of land near the outskirts of the city for a terminal and repair shop. His statement that the line would ultimately be extended through the Vaca and Suisun Valleys into the Sacramento Valley is believed to mean that the line will connect with some other system, probably the Oakland, Antioch & Eastern Railway. The survey between Benicia and Vallejo has been completed. The line will have a terminal in Vallejo at the Monticello Steamship Company's wharf. [E. R. J., July 4, '14.]

San Francisco (Cal.) Municipal Railway.—The Bay View Improvement Club has asked the Board of Supervisors to extend the municipal line from Petrero Avenue to the Hunter's Point dry dock, the route to be along San Bruno, Oakdale, Railroad and Revere Avenues in San Francisco.

Peninsula Railway, San José, Cal.—Work will be begun at once by this company on the extension of its line from the corner of Franklin and Jefferson Streets to the town limits on the Saratoga road in Santa Clara.

Sacramento Valley West Side Electric Railway, Willows, Cal.—The third trestle on the 11-mile unit of this railway between Dixon and the station of Rio, on the Oakland, Antioch & Eastern Railroad has been completed and one-third of the track has been laid. The line is about 8 miles from Dixon. [E. R. J., June 20, '14.]

Norwich & Westerly Traction Company, Norwich, Conn.—During the next few weeks this company plans to build a new siding in front of the New York, New Haven & Hartford Railroad station at Westerly, R. I.

Albany (Ga.) Transit Company.—During the next few weeks this company plans to build about 1 mile of new track in Albany. All material has been purchased.

Chicago & Northern Interurban Railroad, Chicago, Ill.—This company, which plans to connect Chicago with the Fox Lake district, will shortly seek a franchise from the City Council of Chicago and a certificate of convenience and necessity from the State Public Utilities Commission of Illinois. The railway offers to exchange transfers with the city and elevated lines of Chicago if the franchise is granted. Both freight and passengers will be carried and the line will tap the dairy and truck garden districts between Chicago and Fox Lake. The business men of the general vicinity of Elston, Belmont and California Avenues in Chicago, working under the auspices of the Northwest Side Market Association, are back of the plan. [E. R. J., July 26, '13.]

Western Illinois Railway, Carthage, Ill.—Surveys are being made by this company for its line from Beardstown, Ill., to Burlington, Ia., via Fort Madison, Ia. G. T. Cappel, Augusta, Ill., is interested. [E. R. J., May 30, '14.]

Kewanee, Bradford & Henry Interurban Railway, Kewanee, Ill.—Plans are being made to finance this 35-mile railway to connect Kewanee, Osceola, Bradford and Henry. C. G. Lampman, Cedar Rapids, is interested. [E. R. J., June 27, '14.]

Mount Vernon Traction & Power Company, Mount Vernon, Ill.—About 2½ miles of track have been laid by this company in Mount Vernon. Charles C. Baldwin, Mount Vernon, chief engineer. [E. R. J., Dec. 6, '14.]

Waterloo, Cedar Falls & Northern Railway Company, Waterloo, Ia.—This company has just contracted with the Ohio Brass Company for 25 miles of catenary overhead work and hangers, and for 45,000-volt insulators for a transmission line of the same length. This overhead material is for use on the last link of this company's extension between Waterloo and Cedar Rapids, Ia.

Oklahoma-Kansas Railway, Baxter Springs, Kan.—Interest has been revived in the construction of the electric railway to connect Newkirk, Ponca City, Arkansas City, Blackwell, Enid, Perry, Kildare, Guthrie, Hunnewell, Guedo Springs and Tonkawa. The intention of the company has been to build first from Arkansas City, south to Ponca City, passing through the Chilocco School, Indian reservation, Newkirk and Kildare. C. F. Lambert, Kansas City, chief engineer. [E. R. J., Jan. 14, '11.]

Arkansas Valley Interurban Railway, Wichita, Kan.—Several extensions are being planned by this company. A line will be built north, either from Newton to Salina or from Halstead via McPherson to Wichita. An extension to Hutchinson will also be built. Work on these branch lines will not be begun until the fall.

Middlesboro, Ky.—It is reported that W. Godfrey Hunter, Middlesboro, has succeeded in interesting enough capitalists in the proposed 5½-mile electric railway to connect Middlesboro and adjoining towns to insure the construction of the line. [E. R. J., Oct. 18, '13.]

Blue Hill Street Railway, Canton, Mass.—During the next few weeks this company will award contracts to build a three-car siding in Canton.

Detroit (Mich.) United Railway.—The extension to Almont and Romeo has been placed in operation by this company.

Detroit, Lansing & Grand Rapids Railway, Detroit, Mich.—As soon as financial backing can be secured this company will begin work on its proposed 135-mile line between Grand Rapids and Detroit. Henry M. Wallace, 704 Union Trust Building, Detroit, vice-president. [E. R. J., Dec. 13, '14.]

Columbia, Mo.—David R. Francis, St. Louis, has consented to take securities of the proposed electric railway between Columbia, Mo., and other cities, if a franchise is secured. F. S. Mordaunt, Chicago, is promoting the railway, which includes a city system at Columbia. [E. R. J., July 4, '14.]

***Elizabeth, N. J.**—Active steps are being taken toward the establishment of an electric railway between Elizabeth, Rahway and Linden. At a recent meeting of the Elizabeth Board of Trade it was decided to take steps toward organizing a joint committee of citizens of Elizabeth, Rahway and Linden to form plans to build an electric line between these points. The Public Service Railway has refused to build a line between these towns.

Jersey Central Traction Company, Keyport, N. J.—Work will be begun at once by this company on an extension in Keansburg from its substation near Palmer Avenue, through Salina Place, down Carr Avenue, along the beachway and out to the end of the steamboat pier in New Point Comfort.

***Oklahoma City, Okla.**—Complete plans for a network of electric interurban railway lines in Oklahoma have been announced by C. B. Hale and J. W. Tippon. The lines are planned to be connected with the Union Traction Company lines at Independence and with the Dallas-Denton Interurban Railway. Present plans are to start with a capital of $15,000,000. The proposed railway would connect Oklahoma City, Sapulpa, Bartlesville, Tulsa, Muskogee, McAlester and various other Oklahoma cities. Two main lines are proposed, one to run from Independence, Kan., south through Muskogee to Denison and the other from Oklahoma City through Chickasha and Lawton to Wichita Falls, Tex. The first construction intended is from Tulsa east through Coweta, Broken Arrow and Wagoner to Muskogee, a distance of 52 miles.

Berlin & Northern Railway, Berlin, Ont.—Grading has been begun by this company for a ½-mile extension of its line in Berlin.

Blenheim, Ont.—At a representative meeting in Blenheim on June 30 steps were taken to have the Hydro-Electric Power Commission of Ontario report upon a hydro-radial railway from St. Thomas to Amherstburg, to serve the district lying along the north shore of Lake Erie. A permanent organization was formed, with Mayor Little, Blenheim, as president.

Bridgeburg, Ont.—Engineers have been asked to survey the route for the proposed Bridgeburg-Port Colborne electric line, decided upon by the Ontarion Hydro-Radial Commission.

Morrisburg & Ottawa Electric Railway, Ottawa, Ont.—This company is advertising for bids for the complete construction, equipment, right-of-way of its line of railway, which will begin at or near Ottawa, and extend to Chesterville, a distance of about 35 miles, such bids to be based on the company's plans and specifications. L. Von Sydow, engineer in charge.

Sudbury-Copper Cliff Suburban Electric Railway, Sudbury, Ont.—About 2 miles of grading has been begun by this company on the route which extends parallel with the Copper Cliff Road, 5 miles. Further proposed extensions include the Ramsay Larke road, 1.2 miles, and the Frood Mine road, 2 miles. C. D. Norton, Sudbury, engineer.

Lehigh Valley Transit Company, Allentown, Pa.—This company is rebuilding about 7 miles of track in Phillipsburg, N. J., with 105-lb. Dudley Section Tee Rails, in 60 ft. lengths, laid on creosoted ties, Abbott joints, and stone ballast.

Hanover & McSherrystown Street Railway, Hanover, Pa.—Arrangements are being made by this company to award contracts for building its proposed line from Conewago Chapel to New Oxford, a distance of about 4 miles.

***Kane, Pa.**—Plans are under way to build an electric railway to connect Kane, St. Mary's, Johnsonburg and Ridgway, a distance of 33 miles. A large power plant is to be built near Ridgway to supply power for this proposed line.

Schuylkill (Pa.) Railway, Girardville, Pa.—Plans are being considered by this company to extend its lines into Delano and Lakeside, via Park Place.

Cumberland Valley & Interurban Electric Railway, Nashville, Tenn.—Preliminary arrangements are being made by this company to build its 80-mile line between Nashville and Sparta via Smithville, with branches to Lebanon, Woodbury and McMinnville. W. G. Baird, Lebanon, president. [E. R. J., March 14, '14.]

Nashville (Tenn.) Traction Company.—An amendment to this company's charter has been authorized to increase its capital stock from $500,000 to $1,000,000, and to construct, acquire and operate electric railways and extensions of its present lines upon a number of highways of the city and county and through private property. The Detroit-Nashville Construction Company, which was organized for the purpose of building the lines of the Nashville Traction Company, has also been authorized to increase its capital stock from $100,000 to $300,000. W. O. Palmer, Nashville, president. [E. R. J., July 4, '14.]

El Paso (Tex.) Electric Railway.—This company is reported to contemplate extending its lines in El Paso.

***Fort Worth, Tex.**—F. W. Ferguson, New York, E. E. Fosdick, Fort Worth, and associates, are considering plans to build an electric railway from Fort Worth to Mineral Wells, 60 miles.

Gainesville, Whitesboro & Sherman Railway, Gainesville, Tex.—This company is desirous of interesting outside parties in the railway with a view to its construction and operation. The line was promoted originally in 1906. Franchises and rights-of-way have been obtained and surveys made. Twelve miles of the line have been graded. William L. Blanton, Gainesville, Tex., is attorney for the company. [E. R. J., April 18, '14.]

Southwestern Traction Company, Temple, Tex.—Extensive improvements are under way on all the lines within the city limits of Temple.

Victoria, Tex.—The project to build an electric line between Victoria and Houston, Tex., has been revived. The railway, if built, will touch Sugarland, Richmond, Rosenberg, Wharton and other cities. John T. Land, secretary of the Victoria Chamber of Commerce, is among those interested.

***Wichita Falls, Tex.**—Plans are being considered to build a 170-mile electric railway to connect Dallas, Denton, Bowie, St. Jo, Grapevine, Decatur, Henrietta and Gainesville. The Southern Traction Company and the Texas Traction Company will offer to the proposed Wichita Falls-Dallas interurban line interchange of service and inter-line tickets, according to J. F. Strickland, president of the two companies. Among those interested in the project are J. A. Kemp and C. H. Boedeker.

Janesville & Madison Traction Company, Madison, Wis.—Right-of-way has been secured by this company between Edgerton and Stoughton and plans are being made to begin the construction of this section of the line in the near future. G. Pickhardt, 409 Washington Building, Madison, president. [E. R. J., June 13, '14.]

Southern Wisconsin Railway, Madison, Wis.—The Railroad Commission has ordered this company to construct within the next ninety days double tracks on Williamson Street, Park Street and on University Avenue, from Park Street to the crossings of the tracks of the Milwaukee road on Mills Street, and from University Avenue to a point near West Johnson Street in Madison.

SHOPS AND BUILDINGS

San Francisco (Cal.) Municipal Railway.—Construction of this company's new carhouses, to be located on the block bounded by Seventeenth, Mariposa, York and Hampshire Streets in San Francisco, will soon be begun. The Board of Public Works has called for bids for excavating the site.

Norwich & Westerly Traction Company, Norwich, Conn.—During the next few weeks this company plans to build an addition to its passenger station at Stonington, to be used as a freight house with siding.

Utah Light & Railway Company, Salt Lake City, Utah.—Plans and specifications are being prepared by this company for an addition to its carhouses in Salt Lake City. The addition will cost about $50,000.

POWER HOUSES AND SUBSTATIONS

Pacific Gas & Electric Company, San Francisco, Cal.—New equipment to be installed in this company's power plant in Oakland in the near future will consist of one 1000-kw, 600-volt generator on common base shaft with one 1440-hp, 11,000-volt, three-phase, sixty-cycle, 514 r.p.m. synchronous motor generator set. This apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Peoples Traction Company, Galesburg, Ill.—A new substation is being built by this company in Abingdon and a 300-kw rotary converter is being installed. It is expected to have this station in operation by Aug. 1.

Winona Interurban Railway, Warsaw, Ind.—This company is considering plans to buy stokers for four 300-hp Babcock & Wilcox boilers for its power plant in Winona Lake.

St. Paul Southern Electric Railway, St. Paul, Minn.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter; three 100-kva, single phase, sixty-cycle, 13,000-volt to rotary voltage OISC transformer and one switchboard to control same.

Water, Light & Transit Company, Carrollton, Mo.—During the next two months this company plans to purchase one 250-hp Heine type boiler and a new boiler feed pump for its power plant in Carrollton.

Jamestown, Westfield & Northwestern Railway, Jamestown, N. Y.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for the following apparatus: one complete, portable substation consisting of one 500-kw, 600-volt, six-phase, twenty-five-cycle, 750 r.p.m. rotary converter; one 550-kva, three-phase, twenty-five-cycle, 16,500-volt to rotary voltage OISC outdoor type transformer; one two-panel switchboard to control the above, and one substation car complete.

Philadelphia (Pa.) Rapid Transit Company.—This following new equipment will be installed by this company at its power plant in Philadelphia: two 3000-kw, 600-volt, six-phase, twenty-five-cycle, 250 r.p.m. rotary converter; six 1100-kva, single-phase, twenty-five cycle, 13,200-volt, rotary voltage air blast transformer. This order was placed with the Westinghouse Electric & Manufacturing Company.

Northern Texas Traction Company, Fort Worth, Tex.—One 1000-kw, 600-volt, six-phase, twenty-five cycle, 750 r.p.m. commutating pole rotary converter will be installed by this company at its power plant in Fort Worth. The apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Manufactures and Supplies

ROLLING STOCK

Sioux City Service Company, Sioux City, Ia., is building eight new cars in its own shops.

Fargo & Moorehead Street Railway, Fargo, N. D., expects to purchase one single-end equipment car.

Canadian Northern Railroad, Toronto, Ont., noted in the ELECTRIC RAILWAY JOURNAL of April 4, 1914, as being in the market for eight all-steel suburban passenger cars for its Montreal tunnel electrification, has ordered these cars from the Pressed Steel Car Company.

Sacramento Electric, Gas & Railway Company, Sacramento, Cal., has ordered six city passenger cars from the American Car Company. This item is a correction of a previous report on this order in the ELECTRIC RAILWAY JOURNAL of July 4, in which an error was made in the name of the car builder. The trucks will be mounted on Brill No. 76 E trucks instead of No. 75 E, as formerly specified.

Charlotte (N. C.) Electric Railway, noted in the ELECTRIC RAILWAY JOURNAL of May 9 as having ordered six closed city cars from the Southern Car Company, has specified the following details for this equipment:

Seating capacity	40	Bumpers	Hedley
Weight of car body	12,000 lb.	Car trimmings	bronze
Bolster centers, length,	17 ft. 9½ in.	Curtain fixtures	Natl. L.W.
		Curtain material	Pantasote
Length of body	27 ft.	Destination signs	Hunter
Length over vestibule	37 ft.	Gongs	12 in.
Width over sills	8 ft. 4 in.	Hand brakes	vertical wheel
Width over all	8 ft. 7 in.	Motors	outside hung
Height, rail to sills	32 in.	Sash fixtures	Natl. L.W.
Body	metal	Seats	willow
Interior trim	mahogany	Seating material	rattan
Headlining	Agasote	Step treads	anti-slip
Roof	arched	Trucks	maximum traction
Underframe	metal	Ventilators	Ry. Utility
Air brakes	West.		

TRADE NOTES

Taylor-Wharton Iron & Steel Company, Seattle, Wash., has moved its offices from 319 Pacific Building to 1604 L. C. Smith Building.

Carbo Steel Post Company, Chicago, Ill., has moved its offices from Chicago Heights, Ill., to 879-881 Rand-McNally Building, Chicago, Ill.

Union Switch & Signal Company, Swissvale, Pa., has appointed T. W. Siemon as secretary and treasurer, to succeed J. H. Johnson, recently resigned.

Joseph Dixon Crucible Company, Jersey City, N. J., has appointed Dudley O. Johnson as branch manager of its Chicago office, succeeding the late Sam Mayer.

Lawrence Steel Casting Company, Pittsburgh, Pa., has appointed H. W. Green as vice-president. Mr. Green has been for the past ten years district sales agent for the American Steel Foundries, Pittsburgh, Pa.

St. Louis Car Company, St. Louis, Mo, has received an order for seats for the fifteen cars which were recently ordered by the Jacksonville (Fla.) Traction Company from the American Car Company.

N. W. Halsey & Company, New York, have published a small pamphlet entitled "How to Select a Good Bond." It discusses briefly the question of the accuracy of a bond circular, the work of a corporation lawyer, the report of the engineering firm, franchises, territory served, population and certification by public accountants.

Harry C. Holloway, who has represented The Rail Joint Company, both in Cincinnati and Chicago, for several years, resigned on July 1. Mr. Holloway has opened an office at Room 647, Railway Exchange Building, where he will handle railway supply accounts representing among others, the Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.

Glass Founders Corporation, Inc., New York, N. Y., has opened an office at 20 Exchange Place and has secured patents for the manufacture of a new composition of glass for use in vestibules and windows of street and interurban cars and for other purposes. This glass combines the features of unusual strength and safety. When broken it merely pulverizes and will not cut any one.

William H. Heulings, Jr., who was elected last week vice-president of The J. G. Brill Company, has been identified with that company for his entire business life, and the election will give pleasure to the hosts of friends which he has acquired during his long association with the electric railway industry. As a representative of his company, he has attended nearly every national convention in the steam and electric railway field during the last twenty-five years at which his company has had an exhibit. His technical knowledge of the car building and truck industry and his wide acquaintance and popularity in the transportation field well fit him for his present position. Mr. Heulings became connected with The J. G. Brill Company on Feb. 7, 1885, when slightly more than fifteen years old, and he was first engaged to fill a temporary position as a stenographer. At that time he was preparing for a course at the University of Pennsylvania, but after he had been with The Brill Company a short time, at the suggestion of James Rawle, then treasurer of the company, he decided to give up his university career and put forth all of his energies in developing the business of the company. After working for five years directly under Mr. Rawle, Mr. Heulings went to the sales branch of the business, where he came under the direct supervision of John A. Brill, through association with whom his natural qualities of salesmanship were broadened. He was made assistant secretary of the company in 1901, and in 1903 he assumed, in addition, the duties of general manager of sales. Aside from his office of vice-president of The J. G. Brill Company, he is president and director of the John Stephenson Company and vice-president and director of the G. C. Kuhlman Car Company. Besides his active business connections, Mr. Heulings is a member of a great many clubs, including the Racket and Art Clubs of Philadelphia, the Franklin Institute of that city and the Railroad Club of New York. He has also always taken a great interest in the affairs of the American Electric Railway Manufacturers Association and is a past president of that organization and has served for a number of years as an active and efficient member of the executive committee.

W. H. Heulings, Jr.

ADVERTISING LITERATURE

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued a catalog describing its lumber crayons.

S. K. F. Ball Bearing Company, New York, N. Y., has issued a catalog describing the principles of its ball bearings.

Railway Improvement Company, New York, N. Y., has issued a folder entitled "The Microbe that Clings Joyously to the Ordinary Leather Strap."

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a folder which contains a list of its distributers who handle a complete line of its ball bearings.

Welding Materials Company, Inc., New York, N. Y., has issued folders describing its welding materials and apparatus for electric arc, butt, spot and oxy-acetylene welding.

Electrose Manufacturing Company, Brooklyn, N. Y., is distributing copies of the *Scientific American*, issue of May 16, 1914, which contains an article on the evolution of the high-tension insulator in which diagrams are shown of insulators of the type manufactured by this company.

Esterline Company, Indianapolis, Ind, has issued catalog No. 321 describing in detail its graphic efficiency meters for making continuous records on charts of any varying quantities, such as speed, temperature, pressure, speed per minute, miles per hour, volts, amperes, kilowatts or horsepower.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a catalog describing Baldwin-Westinghouse industrial locomotives. The catalog shows a number of installation views of this class of apparatus and also contains a description of the characteristics of the locomotives.

Duff Manufacturing Company, Pittsburgh, Pa., has issued a general catalog of its line of jacks and other apparatus. This catalog, which contains 144 pages, describes its various types of standard trip jacks, car jacks, geared emergency car jacks designed especially for the equipment of electric railways, high-speed, ball bearing screw jacks, forged steel hydraulic jacks, trench braces and armature lifts.

Brown Hoisting Machinery Company, Cleveland, Ohio, has issued a catalog describing and illustrating its suspended concrete bins for handling coal and ashes in power plants. Numerous illustrations of installations of bins are shown in the catalog, among them being the Winnipeg (Man.) Electric Railway, Memphis (Tenn.) Street Railway and the Cleveland, Painesville & Eastern Railroad.

Ohmer Fare Register Company, Dayton, Ohio, has issued a booklet entitled "The Proof of the Pudding Is in the Eating," which directs attention to a number of repeat orders for registers which have recently been received from the following electric railways: Pacific Electric Railway; Portland (Ore.) Railway, Light & Power Company, San Francisco-Oakland Terminal Railways and the Southern Pacific Railroad.

Bowman, Cost & Company, St. Louis, Mo., recently issued a special investment bulletin in sheet form containing carefully selected lists of railroad bonds, public service bonds, municipal bonds and miscellaneous corporation bonds that are good offerings at the present time. Some of the larger issues are the following: Chicago (Ill.) City Railway first mortgage 5's, Interborough Rapid Transit first and refunding 5's, Los Angeles (Cal.) Railway first and refunding 5's, United Railways of St. Louis general first mortgage bonds and Springfield (Mo.) Railway & Light first refunding 5's.

Stone & Webster, Boston, Mass., have issued a detailed circular describing bonds, coupon notes, preferred stocks and common stocks of companies managed by the Stone & Webster Management Association which are recommended for purchase at this time. Among the securities mentioned are the following: Six per cent cumulative first preferred stock of the Dallas (Tex.) Electric Company; 6 per cent cumulative preferred stock of the Dallas & Houston Electric Company; first consolidated mortgage 5 per cent gold bonds of the Jacksonville (Fla.) Traction Company; 6 per cent cumulative preferred stock of the Puget Sound Traction, Light & Power Company; 6 per cent cumulative preferred stock of the Public Service Investment Company; collateral trust sinking fund 5 per cent gold bonds of the Railway & Light Securities Company, and capital stock of the Capital Electric Company.

NEW PUBLICATIONS

Five Lectures Concerning Transportation.—Written and published by Logan G. McPherson, Baltimore, Md., 1914. 110 pages, paper bound.

Mr. McPherson is chief of the Bureau of Railway Economics at Washington, D. C., which is supported by the steam railroads of the United States, and the five lectures in this book were delivered at The Johns Hopkins University in 1914. They include the following subjects: The economic transition; railway competition and combination; government ownership of railways; the valuation of railways and the service of accounts and statistics. Mr. McPherson's conclusion in regard to railway competition and combination is that practical as well as ethical considerations would seem to be all in favor of such combinations of railways as will enable them best to serve the needs of industry and commerce, most efficiently and economically perform the function of transportation and most satisfactorily adjust the questions that arise with shippers, with railway brotherhoods and with governmental legislative and regulatory bodies. The most interesting lecture is undoubtedly that dealing with government ownership of railways. In regard to a choice between regulation and public ownership Mr. McPherson makes the following pertinent remarks: "There is an old saying that if you want a thing done right you must do it yourself. That dictum has a limited application to the things done wholly by oneself in one's own interest, and frequently does not hold good even within this limit. When it comes to administration, and especially to the direction on a large scale of the processes of a large organization, it is much easier to pick flaws than to perform, to criticise than to do, and this is the principal reason why it is better that the large business of this country be regulated by the people than administered by the people." Two additional points which the author specifically mentions are that it is almost inevitable that the tremendous voting power of the rank and file of employees under government ownership would cause their vote to be sought by politicians with various promises of increases in pay and easier working conditions, and that if the government were to take over and operate the railroads with the same degree of business inefficiency and business laxity that has characterized other phases of the administration it would not be many years before taxation would bear heavily upon every taxpayer. The lecture devoted to the subject of the valuation of railways is a general discussion of the economic aspects of railroad valuation, the relation that railroads bear to the public and the present uncertainty as to what constitutes the fair value of a railroad.

State Regulation of Public Utilities; published by the American Academy of Political and Social Science, Philadelphia. 357 pages.

The May number of *The Annals* of the American Academy of Political and Social Science contains a collection of articles, largely from commission sources, dealing with the State regulation of public utilities. The papers are grouped under seven headings, as follows: (1) legislation as to State public utility commissions; (2) State regulation and municipal activities; (3) uniform accounting and franchises; (4) public control over securities; (5) valuation of public utilities; (6) electric and water rates, and (7) standards for service. The authors include William D. Kerr, director Bureau of Public Service Economics, New York City; Frank W. Stevens, chairman of valuation committees, New York Central Lines, New York; John M. Eshleman, president Railroad Commission of the State of California; Edwin Grühl, assistant to the president the North American Company; and Halford Erickson, member Wisconsin Railroad Commission.

New Transfers in St. Louis

Reference has been made previously in the ELECTRIC RAILWAY JOURNAL to the new transfer system put into effect by the United Railways, St. Louis, Mo., on July 1. The company conducted a campaign of education in the newspapers before the system was installed. One of the paid advertisements inserted in the St. Louis papers by the company over the signature of Robert McCulloch, president and general manager, follows in part:

"On July 1, 1914, the old form of transfer will be abandoned and a new transfer substituted. The new transfer is intended to be used so as to 'transport passengers by a continuous trip from any point on the system to any other point on the system.'

"Please do not fold or roll the transfer. The conductor's work will be greatly expedited and the passenger's comfort thereby subserved if the transfer is allowed to remain as issued by the conductor.

"Only one form of transfer will be used, which will contain a list of all the lines in the city, the issuing line being conspicuously printed on each transfer. Two colors will be used, green and lavender. The green transfer will be used when only one transfer is needed or when a third transfer is necessary; the lavender transfer will be used when two or more transfers are required to transport a passenger to his destination; the green transfer is always used singly, the lavender always double.

"We repeat the request that both passengers and conductors exercise patience until all become familiar with the issue and use of the transfer by which the company means in good faith to 'transport passengers by a continuous trip from any point on the system to any other point on the system.'"

Electric Railway Journal

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AXLE STEEL SPECIFICATIONS

In last week's issue we printed an abstract of the new specifications for forgings for heat-treated axles which were presented by a committee of the American Society for Testing Materials at the Atlantic City meeting and were referred to letter ballot of the society. The society did not adopt a request, presented by a minority of the committee members which includes all of those representing the electric railway interests, that the specifications should be made to exclude steel for electric motor car axles. The purpose of this simple request was to enable the American Electric Railway Engineering Association to consider the new specifications at the coming convention. The present specifications of the latter association are working out very well and there is no serious objection to them. They are designed to secure for the severe service required of axles on heavy electric motor cars a suitable quality of steel and the result has been satisfactory. When the axles were first manufactured they were quite expensive, but in two years the price has come down to a reasonable figure.

THE A. S. T. M. AND THE A. E. R. E. A.

We regret that more consideration was not shown to the protest of the representatives of the engineering association. The action of the A. S. T. M. in voting to support its committee on technical details is, of course, a natural one. Only a part of the membership is interested at all in a special subject of this kind and must depend upon the experts to determine technical matters. But for the same reason the association, as a whole, might well have heeded a request of duly accredited representatives of another association that it should not attempt to prescribe for the needs of the membership of the latter without its consent. The attitude of the American Electric Railway Engineering Association on this point is clearly set forth in the letter from President J. H. Hanna, published elsewhere in this issue. This association is in the habit of giving careful study before adopting standard specifications. The membership comprises the master mechanics and other engineers of practically every electric railway in the country. Thus, while the association is young its standing is very high. We do not mean to say that there are no merits in the A. S. T. M. specifications. The American Electric Railway Engineering Association might have been willing to adopt them for certain classes of service if there had been a full opportunity to consider them. The real question is a larger one than this, however. It involves the attitude which must be taken by one association toward another if the co-operative spirit is to be fostered. Such actions as the one in question will, we fear, be productive of two results. In the first place, the electric railways will continue to use their own specifications exclusively, and, second, they will be discouraged in their attempt to co-operate with other associations in the preparation of specifications.

THE NEW HAVEN REPORT

The findings of the Interstate Commerce Commission in the case of the New Haven Railroad will surprise no one who read the testimony presented before that body, especially the testimony of Mr. Mellen. The resulting opinion, in its general form, was a foregone conclusion, and few persons will be inclined to disagree with the commission in its condemnation of the mismanagement of the road and of its directors who did not direct. The commission is evidently strongly convinced that anyone who accepts the responsibility of director on a railroad corporation should at least know in a general way what is going on and be convinced of its honesty of purpose, even if he is not sure of its wisdom. With this all will agree. It is another matter, however, to consider that the directors of a company are sureties of its financial success. Poor business judgment is as apt to be exercised by a board of directors as by an individual, and errors of judgment by corporations will be more common if successful men of affairs are discouraged from occupying the office of directors through fear of excessive criticism or suits in case the enterprise is a failure. The most unfortunate phase of the New Haven catastrophe is that the greater part of the punishment for the errors of the past are being visited on the stockholders, who have seen their securities shrink enormously in value. No benefit will be gained by further prosecution of the road or of its present management, which is striving to do its duty to the public. The difficulty with the public is that in a case of this kind it considers the road as an entity. In the case of a bank it is different. If there was a bank defalcation the guilty bank officer would be prosecuted, not the bank which suffered from the loss. It should be so in this case. If there were any lawbreakers they were the former officers, not the present officers nor the stockholders. The latter are the chief sufferers from the evils which have been brought to light, and they should be treated by the authorities with consideration rather than with rigor.

WATER RATE VERSUS EFFICIENCY RATIO

The usual manner of rating a steam prime mover has been to state the steam consumption per hour per kilowatt or horse-power of output. The statement is necessarily always accompanied by specifications of steam pressure, superheat and vacuum. If all machines were rated under the same steam conditions the water rates would be comparable, but even then the comparison would not be fair because all do not produce the best results under the same steam conditions. Even if we grant for the sake of argument that it would be fair to compare water rates at the same pressure, superheat, vacuum and load conditions, it would still require a great deal of mental effort and auxiliary data to estimate the water rate under conditions other than standard ones. It is also very inconvenient to have to append a whole train of specifications to a statement of water rates. To overcome this difficulty the report of the committee on prime movers of the American Institute of Electrical Engineers, abstracted in last week's issue, urges again the use of a simpler and more logical procedure.

If a given quantity of steam is expanded in an engine from the volume which it has at one pressure and temperature to the volume which it will have at another pressure and temperature, it should do a certain amount of work, the theoretical amount depending upon the initial and final states of the steam and upon the amounts of heat taken from or added to the steam during the process of expansion. Assuming the same conditions other than those of initial and final states of the steam, all steam prime movers have the same theoretical water rate. The ratio of the theoretical to the actual water rate under any given set of conditions is then an accurate measure of the efficiency of the machine. The committee very properly urges this "efficiency ratio" as a substitute for the present "water rate."

We believe this to be wise for several reasons. In the first place, the efficiency ratio stands by itself for all practical purposes, being only to a slight extent dependent upon operating conditions; second, its use keeps clearly before the mind the fundamental facts regarding the production of energy in the engine; again, it gives a definite notion of the theoretically avoidable losses in transformation. Elaborating this last point, it should be noted that when the water rate of a turbine, for example, is stated to be 12 lb. per kw-hr. under certain conditions there is nothing here to indicate what it would be were there no friction, no radiation losses and no cylinder condensation. In other words, it does not suggest the water rate of the "perfect" engine under these conditions; "perfect" in this case meaning the engine having none of the above losses. This definition is justified by the classic expresssion "He who does the best his circumstances will allow, does well, acts nobly; angels could do no more." In other words, an engine is perfect if it produces all of the energy represented by the energy difference between the incoming and outgoing steam. The efficiency ratio, or Rankine efficiency as it sometimes is termed, overcomes this difficulty. The fact that water rate alone means little is further illustrated by the famous little engine built and tested many years ago by Messrs. Hall and Treat. This was a quadruple-expansion engine of but a few horse-power but it eclipsed all records for water rate up to that time and its record is creditable even to-day. Obviously there must have been unusual operating conditions to compensate for the proportionately large friction and thermal losses in such a small machine. Examination of the report of tests made upon it shows that there were employed a very high pressure, up to 500 lb. per sq. in., a high degree of superheat, and a very high vacuum.

The efficiency ratio does not render the thermal or thermodynamic efficiency useless. In comparing prime movers of radically different type this ratio of actual rate of energy input to that of energy will always be interesting. It is valuable also in studying, in the case of one prime mover, the effects particularly of changes in pressure and temperature.

KANSAS CITY FRANCHISE SETTLEMENT

The Kansas City ordinance settles one more franchise controversy. The term of the franchise is thirty years. The position of the company is far stronger when it can go to bankers with rights of this duration than when it had to admit that under the old franchise its contract to operate would have expired in 1925. The dangers of expiring franchises almost kill the possibility of borrowing capital at reasonable rates. For several years the company has said that its franchise position prevented it from borrowing money satisfactorily. The removal of this incubus is an incalculable advantage to both company and city. Hampering the company now, it would have hampered it still more as the termination of the franchise grew nearer.

In the recognition of an agreed capital value there is the same principle which is recognized in the equally notable settlements in Chicago and Cleveland, and in a measure in New York. Of the total recognized capital value, one-fourth represents intangible elements. Of the $30,000,000 total value $7,500,000 represents other than physical values. The part of the total in Missouri is roughly $25,600,000, of which $6,300,000 is for intangible items. The latter amount is to be amortized from the income divisible between company and city with the intent that ultimately capital value and value shall be the same. It is distinctly stated in the ordinance that the capital value represents a compromise. It is neither as much as the company wanted to have nor as little as the city wanted to allow. Both parties abandoned a position in the interest of settlement. If the company had held to its position stubbornly it would have obtained in the end less—or more—than this amount. If the city had refused to budge from its position, no matter what eventual price it forced, it would have had to put up in the meantime with a service under the deadly blight of expiring franchises. Both sides are better off with a compromise settlement. The city is not wholly free of all responsibility for present capital value. Evidently, it was not a question with the voters of whether they could legally escape this responsibility, but of whether there was an obligation to give some protection to the reasonable development costs whose advantages they had enjoyed.

Three main purposes of the grant are set forth. That the first of these is "first-class modern service" is wholly in accord with modern theories of regulation. "Subordinate thereto," adds the franchise, the purpose is "to secure for the company its capital value and a 6 per cent. return thereon." After all, these clauses are not remote from the purposes of any company engaged in like business, whether under restrictive or loose ordinances. Service must be given to secure earnings and thereby the integrity of the capital investment. If it is not first-class modern service the company digs its own grave, slowly, it may be, but surely. The third purpose of the grant is the participation of both parties in the income after provision for various deductions which are stated in detail. Subject to its right to secure service of the kind described, the city will not require anything that will impair capital value or the return or materially impair the enjoyment of the rights of participation.

The rights of participation accrue after deductions which, in brief, are as follows: Expenses of management and operation (including maintenance), taxes of all kinds, 6 per cent cumulative for the company on capital value, and liabilities for injuries and damages. The surplus then remaining is to be credited to the city but used by the company for extensions and additions to property until $6,300,000 shall have been so applied, the purpose of this being, as stated, to make capital value and value the same. Thereafter, this surplus shall be divided in the proportion of two-thirds to the city and one-third to the company. The disposition of earnings thus prescribed is noteworthy in several particulars. The allowance in operating expenses for maintenance, repairs, renewals and depreciation is to be at least 16 per cent of the gross of the previous year, which, of course, would make the actual amount realized somewhat under this percentage if the normal increase in business takes place. The rate named, 16 per cent, is specified in Chicago now and it is clearly based on the experience of the lines in that city. Naturally, much comment will be aroused by the fact that the rate of return is fixed at 6 per cent. Whether or not it was intended to give a higher rate of return because of a low allowance for capital value, 6 per cent is surely not more than a reasonable figure for Kansas City. The respect that we have for Kansas City does not go so far as to lead us to say that it can get along as easily without outside capital as with it. Wanting capital, it is better to offer 6 per cent and get it than to hold for a lower rate and fail to get it. The segregation of expenses for injuries and damages from other operating costs and their subordination to the return on capital is past understanding. This is a proper element of operating expense and is commonly so regarded.

The city participation in control is effected through two means, representation on the board of directors and on a board of control. The latter board will have an appointee from the company as well as from the city, and, in the event of differences, a third member. It is evidently an enlargement of the plan underlying the Board of Supervising Engineers, Chicago Traction, but goes farther than the Chicago arrangement in providing not only for supervision of rehabilitation, but also for such control of service as the final interpretation of the ordinance permits. If the ordinance does not assure good service, undoubtedly the appeal to the Public Service Commission of Missouri, which the contract indicates is possible, will take place.

The rate of fare for adult passengers is to be 5 cents, but the city may use its proportion of the distributable profits to reduce fares, although it "shall not so exercise such right as to materially impair or reduce the amount of the company's share below the amount the company would have received if the rate of fare had not been reduced." The construction of this provision appears to involve a determination of the extent, if any, to which a decrease in the rate of fare would stimulate short-haul riding so as to yield enough additional profit to overcome the effect of the reduction. To the extent that the city part of the divisible profits is used for additions or extensions the city acquires an interest in the property. When that interest reaches one-half of the total capital value the city becomes the owner of the property subject to the lien securing the remaining one-half of the capital value. The city also has the right to acquire the property by payment of the entire capital value at any time, but special provisions are inserted to govern the transaction in the event of early purchase. The point is that the city has various rights to purchase under conditions which protect capital value. Another important section gives the city the right to exact forfeiture of the franchise. If the end of the franchise period is reached with the property still in its ownership the company is assured of the integrity of capital value.

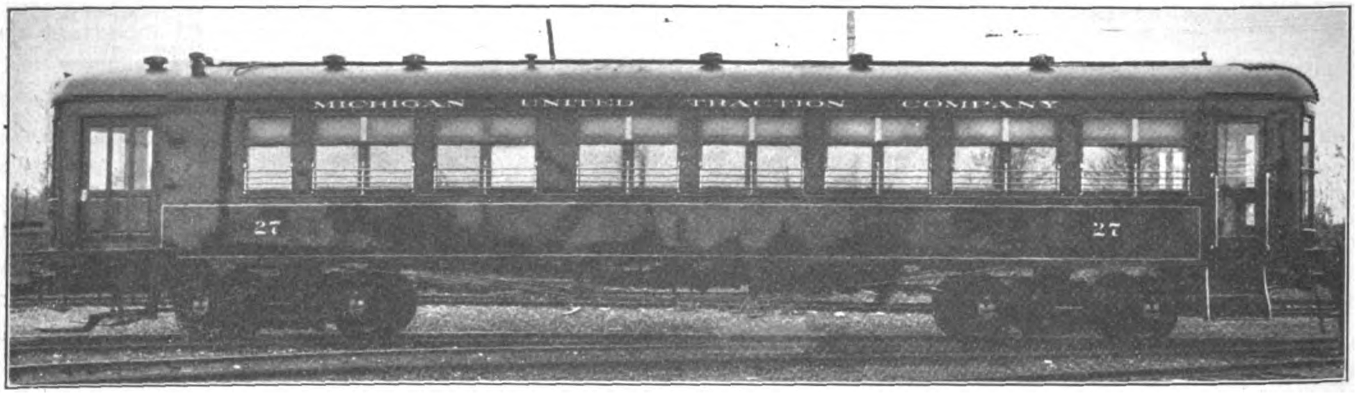
Criticisms of the ordinance will arise from various sources. One such, from Dr. Wilcox, who took part in the fight against adoption of the contract by voters, is published as a communication in this issue. Since nothing done by man is perfect, it may be taken for granted that the ordinance is deficient in some respects from the standpoint of either interest. The real question, however, is, whether or not it was to the interest of both company and public to make a reasonable settlement rather than to continue hostility and retard development of the city. The ordinance gives the city many rights and steps the period of rehabilitation forward from 1925 to 1914, eleven years. Those years will be lived better with the modern service that the city can compel than if they were frittered away in fruitless franchise controversy. The ordinance represents many of the best ideas in settlements, and is a workable contract, promoting, not retarding, progress.

New Steel Cars for the Michigan United Traction

These Cars Are of Especial Interest Because They Are Constructed of Steel and Embody New Features in Structural Design and Arrangement and in Lighting and Ventilating System

Some time ago the executive officials of the Michigan United Traction Company, Jackson, Mich., decided to start a policy of buying all-steel rolling stock for extensions to the existing system as well as for the replacement of worn-out cars. Articles have previously appeared in the ELECTRIC RAILWAY JOURNAL describing the company's city and steel freight cars. The first consignment of steel interurban motor and trailer coaches has just been placed in service on this company's lines between the cities of Jackson, Kalamazoo and Owosso.

One of the considerations leading up to the selection of this type of car was that the company's lines paralleled the Michigan Central, the Grand Trunk and Grand Rapids & Indiana steam railroads. In order to secure its share of passenger business in competition with these steam lines, it was necessary to design a type of car which would be as safe, comfortable and convenient as the best cars used on the lines of the company's steam railroad competitors. It also was necessary to inaugurate an interurban service that was a distinct step in advance of anything heretofore attempted on any electric interurban line.



MICHIGAN ALL-STEEL CAR—SIDE VIEW OF CAR

Another consideration entering into the selection of this type of equipment was the decision to raise the operating voltage from 600 to 1200 d.c. on some of the Michigan United lines. Since interchange agreements were in effect with other interurban roads which required these cars to be operated over 600-volt lines, the electrical equipment had to be such as to provide full speed on either 600 or 1200 volts, and on either trolley or third-rail. To comply with these conditions with multiple-unit operation on both of these voltages required an electric equipment and system of control entirely new in most of its essential details.

When the company had decided on these new all-steel cars and had submitted the designs to the manufacturers for bids, it was found that only a few manufacturers could handle the work, but as the total order was for only ten cars several of these builders refused to bid. The original design included a number of pressings and special shapes which would have materially reduced the total weight of the car body. After the company had had this experience on the first design, another was prepared that could be built by builders of ordinary wooden cars and a wider competition was obtained in this way. In other words, the new design was a concession to prevailing facilities and available steel-working tools in a great many of the shops in the country and contained only the standard structural shapes which could be purchased in the open market.

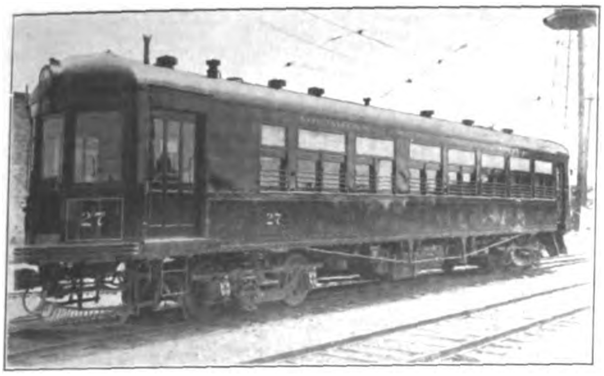
ESSENTIAL CONSTRUCTION DETAILS

The principal dimensions of these new all-steel cars are as follows:

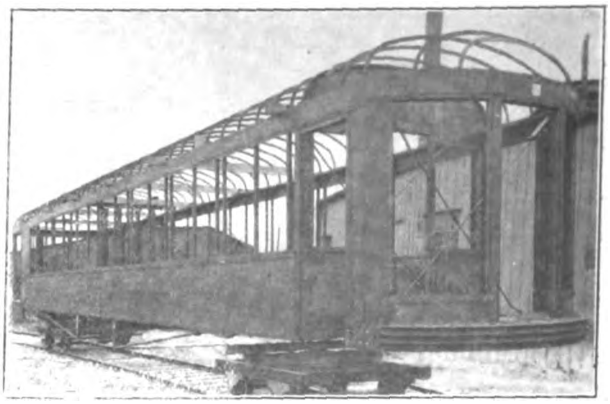
Length over bumpers	61 ft.
Length over vestibules	59 ft.
Length of passenger compartment	29 ft.
Length of smoking compartment	11 ft. 6 in.
Length of baggage compartment	9 ft. 4 in.
Length of rear vestibule	4 ft. 6 in.
Width over sheathing	8 ft. 9 in.
Width over belt rail	8 ft. 11 in.
Width inside at seat line	8 ft. 2 in.
Height from rail to top of roof	12 ft. 1⅝ in.
Height from lower sill to roof	9 ft. 4⅝ in.
Center to center of body bolsters	36 ft.
Length of seats	3 ft. 2 in.
Center to center of seats	2 ft. 10 in.
Width of aisle	1 ft. 10 in.
Seating capacity	56

As mentioned heretofore, the underframe is made up of structural shapes, the center sills being 8-in. 18-lb. I-beams extending from buffer to buffer. The two side sills are formed of 8-in. 13¾-lb. channels extending from the rear bulkhead to the front buffer, and the two intermediate sills are 6-in. 10½-lb. channels. The body bolsters are formed of two 6-in. 10½-lb. steel channels with top and bottom cover plates ¾ in. x 12 in. These are securely riveted together and to the longitudinal side sills. Cross-braces supporting the floor are formed of 5-in. 6½-lb. channels. The bumper irons are 8-in. 13¾-lb. channels riveted to the side members, center and intermediate sills, to which Hedley heavy-section anti-climbers are fastened. Each side sill has an under truss rod extending from bolster to bolster which supports 16-in. queen posts fitted over 8-in. needle beams 8 ft. center to center.

The car-body framing is of the side-girder type with ⅛-in. x 36-in. side sheathing securely riveted to the side sills and reinforced at the belt rail with a ⅜-in. x 2½-in. plate, which is continuous from end post to end post. The sides are framed for seven double windows and one single window on each side, with a baggage door opening 42 in. in width situated at the front vestibule, a location which reduced the structural problem at this point to insignificance. All single posts and composite posts are built on 2-in. x 2-in. x ¼-in. tee-section main members, arranged with a steel covering, as shown in the accompanying illustrations. These posts are designed for double sashes, the lower ones raising inside the Gothic upper sashes and behind the pressed-steel curtain boxes. The posts are securely



MICHIGAN ALL-STEEL CAR—VIEW FROM FRONT END

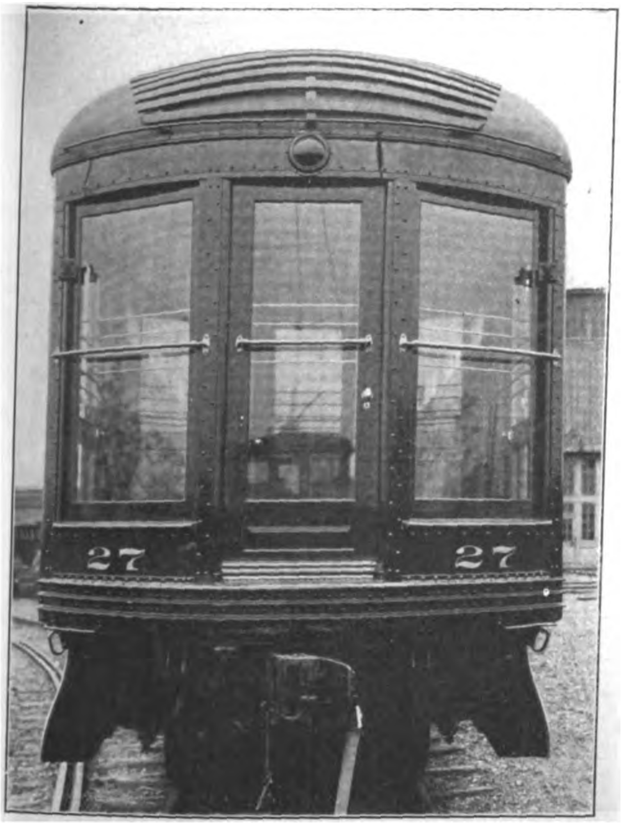


MICHIGAN ALL-STEEL CAR—VIEW FROM FRONT END AND STEEL BODY BEFORE RIVETING WAS COMPLETED

riveted to the side sills, side plates and top plates. The corner and door posts were designed specially for their respective locations, and they are strongly braced to the underframe to resist unusual impact.

In order to provide maximum value in girder strength the side plates are made continuous from end post to end post, with a single splice at the center. The letter plate is continuous around the entire car, and the inside facia board is continuous the full length of each side. The inside lining below the window sill is 3/16 in. agasote, and the space between it and the outside sheathing is thoroughly packed with Flaxlinum, a fire-resisting, insulating compound.

The partitions between the baggage room and the smoking compartment are provided with double walls of 3/32-in. sheet steel, with reinforcing members at the doors. These partitions are anchored to the floor by a 3-in. channel. The space between the two partition walls is packed with the insulating material. The partitions between the toilet compartment and the smoking and passenger compartments are of single thickness, being 3/32-in. sheet steel. These partitions are lined on the passenger side with sheet brass to a distance of 30 in. above the floor line. A double wall rear bulkhead is also used, with a window on each side of the sliding door opening between the passenger compartment and the vestibule.

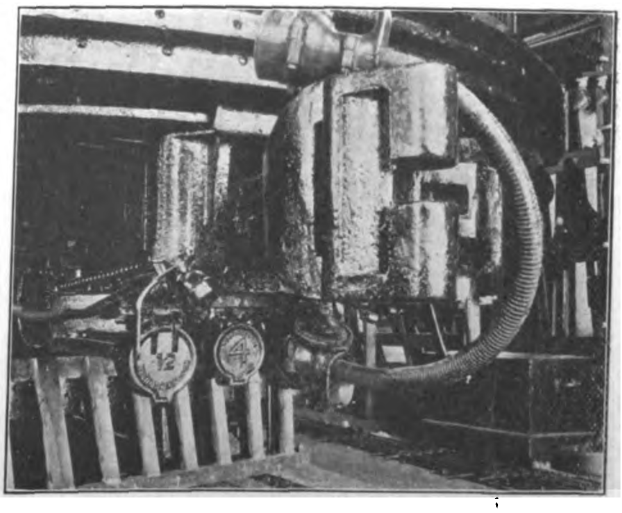


MICHIGAN ALL-STEEL CAR—END VIEW OF CAR

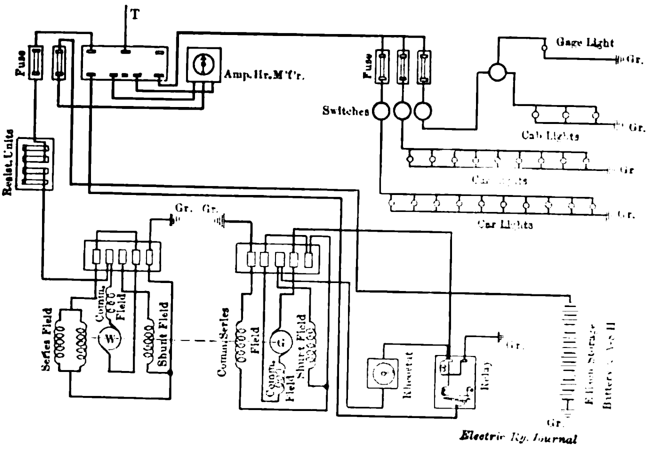
The roof is of plain arched type formed with the 2-in. x 2-in. x ¼-in. tee carlins and posts, which are continuous from side sill to side sill. Additional roof support between the continuous posts and carlins is supplied by intermediate ½-in. steel carlins securely riveted to the top plates. Ash nailing strips are bolted to these intermediate carlins, and two longitudinal rafters of ash serve as spacers. Both the ¼-in. roof sheathing and the 3/16-in. headlining are formed of agasote sheets securely screwed to the roof carlins. The roof sheathing is covered with a No. 8 duck in one piece and thoroughly saturated with white lead before being laid. Surmounting this covering is a roof board extending the full length of the car and stringers properly insulated to receive the trolley base.

GENERAL ARRANGEMENT

As is shown in the tabulation of over-all dimensions of these new all-steel cars, the body is divided into three compartments, namely, a combination motorman's cab and baggage compartment, a smoker, and a passenger compartment. The total seating capacity is for fifty-six passengers, there being eighteen cross-seats and two longitudinal seats in the passenger compartment, and eight cross-seats in the smoking compartment. These two compartments are separated by a corridor, 3 ft. 5 in. in length, with swinging doors fitted with door checks at each end. This arrangement serves to



MICHIGAN ALL-STEEL CAR—SCHEME OF END CONNECTION.


T
Fuse
Amp. Hr. M't'r.
Fuse
Switches
Gage Light
Gr.
Cab Lights
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Car Lights
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Car Lights
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Resist. Units
Gr.
Gr.
Series Field
Comm. Field
W
Shunt Field
Comm. Series Field
G
Comm. Field
Shunt Field
Rheostat
Relay
Gr.
Edison Storage Battery
Gr.
Electric Ry. Journal

MICHIGAN ALL-STEEL CAR—WIRING DIAGRAM FOR STORAGE BATTERY LIGHTED CARS

prevent smoke from passing back into the passenger compartment and also as an entry way to the two toilets. On each side of this corridor are two sanitary drinking fountains arranged to fold into pockets in the wall. The water is automatically turned on when a fountain is pulled from its pocket.

The rear platform is unique in that it is arranged as a fully-inclosed, unobstructed observation compartment. As shown in the rear view of this car, the glazed areas in the two vestibule windows and end center door extend from the letter board to within 14 in. of the vestibule door level. The trap doors over the rear vestibule steps are of the O. M. Edwards balanced type, locked in both the vertical and the horizontal positions. On the under side of these doors there are riveted diagonal grab handles to aid passengers in boarding the car. The steps have steel risers and treads, the latter being entirely covered by Mason safety treads, and the sides of the well are covered with polished brass edging. The first step is 14 in. above the rail, and all other steps have 12-in. risers, with 8-in. treads, thus giving easy access to the car.

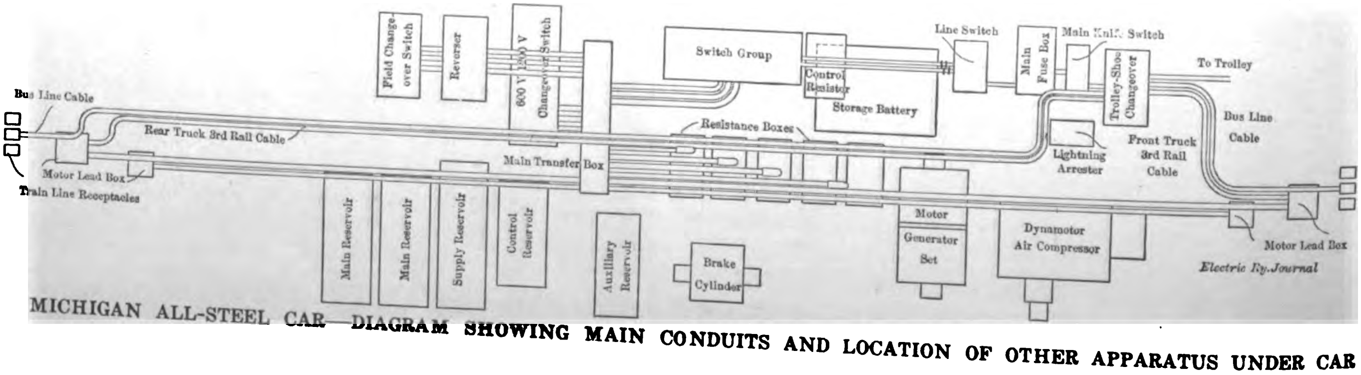
A feature in connection with the seats used and their arrangement is that all are stationary, this being possible because the car is operated single-end. The seats are not like the usual stationary seat with the straight back, but have high backs with head rolls and spring edged cushions like the Hale & Kilburn Walkover type, and consequently they are just as comfortable. Generally, when stationary seats are used, those facing the bulkheads between compartments are undesirable because of the limited space for the passengers' feet. To meet this objection foot pockets were placed in each partition immediately in front of each stationary end seat. This makes these seats as comfortable and desirable as those in any other part of the car. These pockets are formed of sheet metal and extend into the baggage compartment and toilet compartment and are in spaces which would not otherwise be utilized. Another feature in the construction of this car is the over-all thickness of the car sides, which is only 2 9/16 in. This made the available width at the seated passengers' waist line 8 ft. 4⅛ in., and by utilizing the 2½-in. recess outside the window stool line extra seat width was provided.

All interior finish in the smoking and passenger compartments is mahogany or imitation mahogany, except the ceiling, which is a light color to give reflective effect to the lighting scheme. The doors, sashes and window stools are finished in the natural mahogany, and the exposed steel and inside lining below the window stools are finished in imitation mahogany. The baggage compartment is finished in imitation oak, the toilet rooms in white enamel and the rear platform in the same color as the car body, which is a dark olive green. A composition flooring known as Flexolith, 1 in. in thickness, is laid with a smooth polished finish over Chanarch floor plates with corrugations ½ in. deep. This composition floor is used in the smoking and passenger sections and it has ogee curves in all corners to facilitate cleaning. The baggage room floor is formed of 1¾-in. matched hard maple with 1-in. half-oval iron strips opposite the doors, so as to withstand the rough usage incident to a baggage compartment. Beneath all these floors is a false floor also of corrugated sheets riveted to the lower side of the underframe, and the space between these two floors is thoroughly packed with mineral wool.

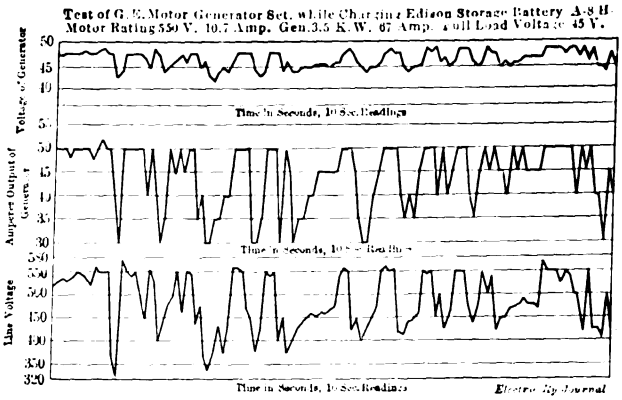
HEATING AND VENTILATING SYSTEM

As mentioned heretofore the baggage compartment is 9 ft. 4 in. over all in length and is arranged to serve also as a motorman's cab and for the hot-water heater installation. The latter was especially designed by the Peter Smith Heater Company and is one of the features of the design of the car. The heater system has a double circulating system from a central tank located in the baggage room at the transverse center of the car body. With this arrangement hot water to each side of the car circulates through separate coil systems of four rows of 1½-in. pipes installed on each side of the car. In this system the hot water must travel but half as far as in former designs. It therefore returns to the coils in the heater twice as often. It is believed that this change will increase both the efficiency and the economy of the heating system. As these cars are for use in a cold climate, they were built with double windows, walls, ceiling and floors.

Owing to the use of the plain arch roof, it was believed that the cars would be difficult to ventilate in winter without artificial ventilation, and a system using air under pressure was installed. This consists of a direct connected electric motor with a Sirrocco blower in a housing swung from the baggage-room roof carlins. This blower takes fresh air from the roof and forces it into a duct which branches just back of the fan. From this point two ducts pass along the partition between the baggage compartment and smoker to


Bus Line Cable
Rear Truck 3rd Rail Cable
Motor Lead Box
Train Line Receptacles
Field Change-over Switch
Reverser
600 V 1200 V Changeover Switch
Main Transfer Box
Switch Group
Control Resistor
Storage Battery
Resistance Boxes
Line Switch
Main Fuse Box
Main Knife Switch
Trolley-Shoe Changeover
To Trolley
Bus Line Cable
Lightning Arrester
Front Truck 3rd Rail Cable
Main Reservoir
Main Reservoir
Supply Reservoir
Control Reservoir
Auxiliary Reservoir
Brake Cylinder
Motor Generator Set
Dynamotor Air Compressor
Motor Lead Box
Electric Ry. Journal

MICHIGAN ALL-STEEL CAR—DIAGRAM SHOWING MAIN CONDUITS AND LOCATION OF OTHER APPARATUS UNDER CAR



MICHIGAN ALL-STEEL CAR—CHART OF LINE AND M.-G. SET VOLTAGE

the floor line, where they connect with ducts installed behind the heater pipes extending the full length of the car. Outlets under each seat permit the fresh air to be forced over the heater pipes into the car, from which it is removed by twelve 8-in. Globe ventilators. The capacity of the motor-driven fan is 500 cu. ft. per minute, which is sufficient to deliver fresh, warm air below the breathing zone at an outlet pressure of 2 ounces. By this system of heating and ventilating, it is believed that all compartments will have a sufficient supply of pure air to make riding in winter as pleasant as in summer. In addition to the ventilating system described, the smoking and passenger compartments are fitted with 12-in. circulating wall fans for summer use.

LIGHTING SYSTEM

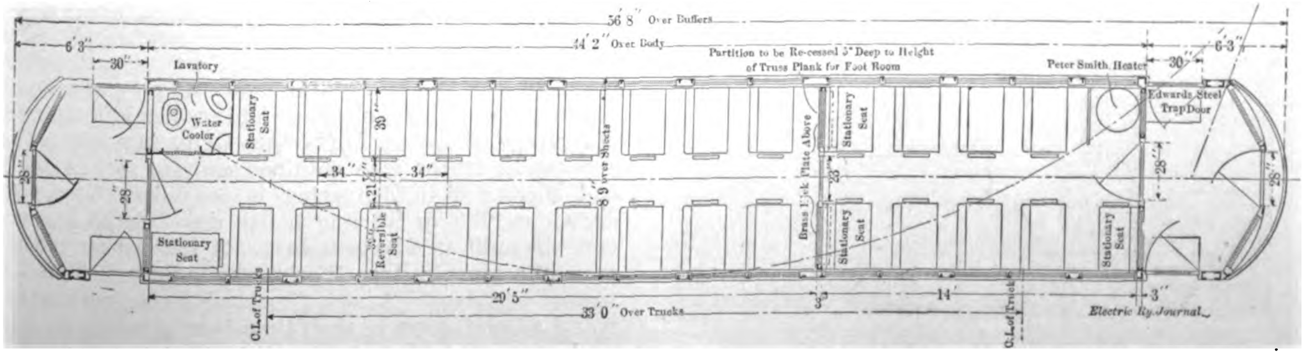
It has been recognized by progressive railway managers, as well as by the riding public, that the lighting of interurban coaches in the past has been far from satisfactory on account of the fluctuations of the line voltage. In the case of third-rail systems another cause of trouble occurs because of the breaks in the third-rail at road crossings. In this particular case these two factors were complicated by the fact that the cars were to be operated at two different potentials, namely, 600 and 1200 volts. Nevertheless, the lighting of these cars has been quite successfully accomplished by the use of twenty-five cells of Edison A-8-H storage batteries and without the use of any complicated regulating devices. The batteries are mounted under the car, and during the lighting period discharge direct into the lighting circuits at 30 volts. The batteries are charged by a 3-kw GE motor-generator set, also mounted underneath the car. This motor generator operates direct on 600 volts and when the car is on 1200 volts derives its current from a dynamotor. According to the present plan the batteries will be charged during the day, at normal rate, which requires seven hours. If the battery should fail, energy may be derived direct from the motor-generator set.

This system of lighting was selected because of its reliability, simplicity and flexibility. As the cars may be laid up over night at any siding on the system, it was deemed advisable to install independent units, in preference to using a central charging station which would require the handling of the batteries daily. In a test run made with this lighting unit, the improved voltage regulation was clearly demonstrated. As shown on the accompanying chart in one of the illustrations, an average drop of but 5 volts at the motor-generator set was recorded when the average line drop was more than 150 volts. This indicates a sufficient voltage regulation to insure uniform illumination at all times. Another reason for this rather complicated arrangement was not only to obtain a lighting system sufficiently perfect for all practical purposes and to bridge over the third-rail gaps which heretofore have interrupted the energy supply to the lighting circuit, but to provide light when current is off the line.

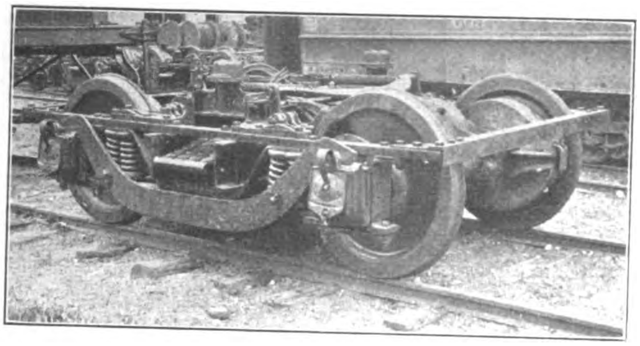
As to the lighting system proper, all circuits are installed in pipe conduit, and the fixtures include deep opalescent shades set in special lock sockets and shade fastenings. The lamps are 25-watt, 30-volt Mazda, and are arranged one over each of the twenty-eight seats. An actual test of this entire lighting system indicates that each car will be perfectly lighted with a total current consumption of 644 watts. Another feature in connection with the lighting system is that the tail light is connected in the battery circuit. This light is installed in conjunction with the usual oil tail lamps. Both this tail light and the headlight are set in recesses under the front and rear hoods of the car body, so that the lenses are flush with the car front and rear. The headlight is made adjustable, so that its rays may be readily thrown at any angle along the track.

TRUCK DETAILS

Other features worthy of mention include the manner of installing the end connections. These include two control circuits and a bus circuit, all of which are brought down to the pivotal points on the drawbars. From this point they are carried forward in steel pipe conduit to the drawbar carrier castings, and, of course, follow the drawbar in rounding curves. This type of connection is shown in one of the illustrations. It not only permits the use of a short jumper connection, but the drawbar curve limits, only, are the end connection limits. Other electrical equipment includes Westinghouse 333-B-2, 115-hp, interpole motors with H.L. control. These are so arranged that the motors will operate at full speed on either 600 or 1200 volts and also provide for multiple-unit operation of all switches for both trolley and third-rail. All wiring and connections throughout the entire car for every purpose are laid in conduit with special fittings, and junction boxes



MICHIGAN ALL-STEEL CAR—FLOOR PLAN OF 56-FT. 8-IN. STEEL TRAILER



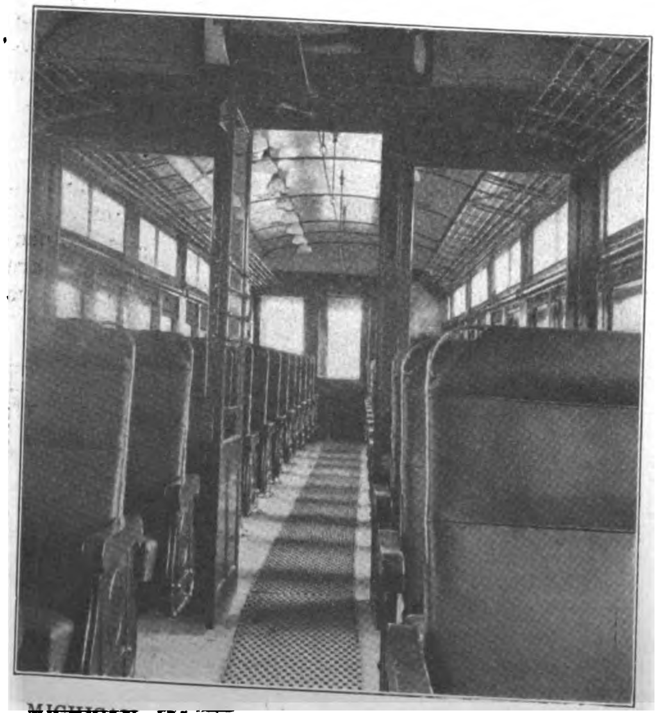
MICHIGAN ALL-STEEL CAR—SPECIAL TRUCKS

are used whenever it would add to the safety of the installation.

Especially designed trucks with an 87-in. wheelbase which permits the use of quadruple elliptic springs were purchased for these cars from the Baldwin Locomotive Works. The long wheelbase and the spring arrangement were employed to obtain an easy riding truck. A double set of machine coil springs is mounted in the truck to prevent its nosing longitudinally. The trucks are also equipped with Symington ball-bearing center bearings and double Perry roller, roller side bearings.

TRAIL CAR FEATURES

Of this order for ten all-steel cars, four were trail cars. These are of the same general appearance and design as the motor cars but were arranged for double-end operation, consequently they have vestibules at both ends. Each has two compartments, a smoker and a passenger. There are nineteen reversible cross-seats upholstered in green plush in the passenger compartment, and eight cross-seats and one longitudinal seat upholstered in black leather in the smoker. The partition between the two is provided with wide glass areas, the lower edge of the frames being well below the tops of the seat backs, to give the effect of a single compartment body. Heating and ventilation are the same as in the motor cars, but the lighting system is supplied from the trolley direct on 600-volt or from the dynamotor on 1200-volt lines. Exterior and interior views of this car are shown in the accompanying illustrations.



MICHIGAN ALL-STEEL CAR—INTERIOR OF TRAIL CAR

GENERAL DATA

The following are the principal dimensions of these new all-steel trail cars:

Length over bumpers	56 ft. 8 in.
Length over vestibules	44 ft. 2 in.
Length of passenger compartment	29 ft. 5 in.
Length of smoking compartment	14 ft.
Length of vestibules	6 ft. 3 in.
Width over posts	8 ft. 8¾ in.
Width over sheathing	8 ft. 9 in.
Length of seats	39 in.
Width of aisle	21⅞ in.
Seating capacity	56

These new cars were designed by R. C. Taylor, superintendent of equipment of the Michigan United Traction Company, under the direction of J. F. Collins, vice-president and general manager, and were built by the St. Louis Car Company, St. Louis, Mo. To give an idea of how the total weight of this car, namely, 52.8 tons, is distributed, the following table is presented:

Weight of body	51,200 lb.
Weight of motors	17,320 lb.
Weight of air brakes	2,500 lb.
Weight of trucks	26,500 lb.
Weight of electrical equipment	5,525 lb.
Weight of lighting set	2,600 lb.
Total weight	105,645 lb.

Restoring Service Quickly After Boiler Explosion in Meridian, Miss.

A remarkable example of what can be accomplished by the good public relations of an electric railway is furnished by the recent emergency repair work performed following a boiler house explosion by the co-operation of citizens, city authorities and outside engineers with the officials of the Meridian Light & Railway Company, Meridian, Miss., a subsidiary of H. L. Doherty & Company. This accident was briefly described in the news department of the ELECTRIC RAILWAY JOURNAL of June 27. A defective boiler head caused the boiler to be blown through the brick wall of the power house and to land some distance outside after having turned a complete somersault.

The first emergency work consisted in clearing away the wreckage caused by the destruction of the side wall and roof of the power house. The demand for extra men for this repair work met with quick and generous response. The New Orleans & Northeastern Railroad at once turned over its extra gang of about forty men to General Manager A. B. Paterson and the city authorities set the city prisoners to work on the task of removing the debris.

So fast was the work of repairing the power house apparatus expedited, despite a period of record breaking hot weather, that within two and one-half days after the explosion occurred it was possible with the aid of the sole surviving boiler to generate a power output of 1400 kw, sufficient to resume the city lighting service and to operate the usual number of street cars at half schedule. Full street car service was dependent on installing new boiler equipment. The Babcock & Wilcox Company made an unusually quick shipment of a 500-hp Stirling boiler which was on order at the time of the explosion. This boiler left the manufacturers' shops at Barberton, Ohio, accompanied by a personal tracer who obtained express service for it and succeeded in delivering it four days later. An additional 750-hp Stirling boiler was ordered and was entirely built in fourteen days. A new stoker ordered from the Murphy Iron Works was built and shipped in twenty-one days. A new Crocker-Wheeler commutator was also sent down in rush time from Ampere, N. J., to replace one which had been injured by bricks.

Kansas City Railways Franchise Ordinance

Abstract of Ordinance Recently Approved by Voters of Kansas City, Mo.—Among the Features Shown Are a Partnership Method of Control, a Valuation of the Physical and Intangible Property of the Company, a 6 Per Cent Rate of Return, a Plan for Division of Excess Earnings with the City, and a Recapture Clause

The new franchise ordinance approved by the voters of Kansas City, Mo., on July 7 grants rights to the Kansas City Railways, a new company organized for the purpose of acquiring the property of the Metropolitan Street Railway, the Central Electric Railway and the Kansas City & Westport Belt Railway. The preamble says in part that the city desires to fix and define the terms and conditions upon which the company shall operate its lines and the method by which the city shall have the right to participate in the management, operation and control and in the earnings of the property in Missouri and, if it shall so elect, to take over and operate the property.

INTENT OF ORDINANCE

The intent of the ordinance is to grant the right to own and operate lines upon the surface of streets specified. Where any parts of the existing lines are now operated upon a street or upon an elevated structure over a street they shall continue to be so operated unless changed with the consent of the city. The ordinance shall not be so construed as to grant the right to own, maintain or operate a subway or elevated line. No right granted by the ordinance shall vest unless within fifteen days after its passage and approval the company shall accept all of the provisions, and the United States District Court which has been administering the receivership shall recommend that the ordinance be fully carried out, and there shall be deposited with the comptroller a sum sufficient in his judgment to defray expenses of the election.

The obligation of the company to the city created by this ordinance shall be the first and paramount obligation of the company prior and superior to any other obligation, lien or right upon or against any of its property or earnings. At the time of acceptance of the contract there shall be filed with and approved by the city comptroller the bond of the Kansas City Railway & Light Company that the grantee will acquire the title to the properties, and if it defaults in the obligation the city shall receive $100,000. All rights, franchises and authority granted to the company shall cease thirty years from the date the ordinance is adopted by the people unless terminated sooner in accordance with its provisions. Both parties agree that the first and primary purpose of the contract is to secure for the public first-class modern service, and after that purpose is accomplished and subordinate thereto, second, to secure for the company its capital value and a 6 per cent return thereon, and, third, to enjoy the participation outlined for both parties to the contract. The city agrees that, subject to its right to secure such service, it will not require the company to do anything that will impair the capital value or return thereon or materially impair the enjoyment of the rights of participation in accordance with the contract.

BOARD OF DIRECTORS

In no event shall the aggregate amount of outstanding mortgage indebtedness and capital stock be in excess at any time of the value of the property of the company wherever situated, exclusive of franchise value under this ordinance. The company shall deliver to the city such shares of stock as are necessary to qualify the persons designated by the city as its representatives on the board of directors. Of the eleven directors Kansas City, Mo., shall select five. No person so designated shall be eligible to serve if he owns or controls any stock (except qualifying shares) or bonds or has any contract directly or indirectly with the company for materials or supplies or for labor or has any financial motive in relation to the business of the company. If any such person shall be disqualified for any such cause, his right to the office shall cease. In the selection of such directors political affiliation shall be disregarded. The directors shall not delegate power to any executive or managing committee without the unanimous consent of the city's directors. The five directors for the city are designated in the ordinance. They are: William T. Kemper, John H. Wiles, Davis M. Pinkerton, Frank C. Niles and John W. Wagner. They serve respectively for different periods from five years to one year in length. It shall be the duty of the company to cause such persons and their successors to be elected promptly as directors of the company. The future directors are to be selected as follows: The Mayor shall submit to the Kansas City Court of Appeals a list of three names for every city director to be chosen and the court shall select the names to be certified to the company. The judges shall have the right to reject all names. The Mayor shall then continue to submit lists until a selection is made. The city shall have the right by agreement with Kansas City, Kan., to give to that city the right to name as its representatives on the board of directors not more than two of the five city directors. The city is to have the right to examine the books.

BOARD OF CONTROL

The company shall appoint a board of control consisting of P. J. Kealy, designated by the company, and Robert P. Woods, designated by the city. Any difference between the two shall be summarily determined by a third person as arbiter to be selected by a majority of the judges of the Kansas City Court of Appeals. The third person shall be disinterested and qualified by study and experience to pass upon the questions. The company may remove its representative and appoint a successor. The city's directors or a majority of them with concurrence of the Mayor may remove the city's representative on the board of control and designate a successor. Either the city or the company shall have the right to apply to any court of competent jurisdiction for the removal of either member of the board of control for fraud, corruption or failure to perform his duties in good faith.

The board of control shall have the right to employ such assistants as are necessary for the performance of its duties. The salaries and compensation of members and of assistants and necessary expenses and outlays shall be paid by the company. The board is charged with the following duties: to supervise and direct the routing, stopping and schedules of cars in accordance with ordinances of the city and orders of the Public Service Commission of Missouri; to require to be maintained upon the lines at all times sufficient, good and convenient cars and equipment to accommodate public travel and provide first-class service; to designate and approve the kind, character and amount of construction, reconstruction, equipment, re-equipment and additions; to approve the kind of rails, poles, wires and materials to be used and to supervise and approve all work in relation thereto and ascertain and certify the cost thereof; to determine and certify to the city and the company what expenditures shall be charged to capital account and to classify properly and charge all other expenditures of the company; to determine the system of accounts and supervise the keeping thereof; to inspect and audit all receipts, disbursements, vouchers, prices, payrolls, time cards, papers, books, documents and property, and to prepare and file semi-annually with the president of the company and the city comptroller a statement of all receipts and disbursements and of the condition of the capital and other accounts and generally of all transactions and work done as well as work proposed to be done, together with such recommendations as they shall deem proper to make; and finally to do everything necessary for the efficient performance of their duties. Wherever in the ordinance any duty is imposed upon the board of control it is at the same time made the duty of the company, the board being for all these purposes the agent of the company.

FARES, TRANSFERS AND CARS

Unless fares are reduced as approved in the ordinance the company shall carry a passenger for a single fare of 5 cents over its entire system within the city. For passengers between eight and twelve years of age the fare shall be 2½ cents. The company shall furnish conductors with tickets to be sold for the use of passengers between eight and twelve years of age at the rate of two for 5 cents. No passes of any kind shall be issued to any person. Employees of the company, policemen and firemen shall be permitted to ride free, subject to rules and regulations of the board of control. Universal transfers shall be granted over all parts of the system in the city. Such transfers shall also be granted over all parts of the system in Kansas as the same now exists or may be extended within the limits of Rosedale and Kansas City, Kan., and intermediate points, as long as the company shall be interested in, operate or have traffic arrangements with the companies owning the lines in Kansas, and also as long as any of the cars of either the Missouri or the Kansas lines shall operate over any of the tracks of the other company.

The company shall make no traffic or transfer arrangements with any companies operating lines hereafter built in Rosedale or Kansas City, Kan., unless such company shall give like traffic or transfer privileges over their lines, although at no time shall the rights of the parties to the ordinance be substantially impaired by the granting of intercity transfers. The city shall have the right by ordinance to discontinue, regulate and control intercity transfers in any manner that will not reduce the return of the company on its capital value. The transfer provisions shall not be construed so as to enable passengers to return substantially to the initial point for a single fare.

All cars operated hereafter shall be of the best quality, style, finish and design and shall be approved by the board of control. The equipment as a whole shall at all times be equal to cars in ordinary use on the best managed and equipped lines of the street railways in the United States. The board of control or the city shall divide the city into speed zones. All cars shall be in charge of not less than two competent men, except where otherwise ordered by the board of control. The company shall furnish "owl-car" service.

REHABILITATION

As soon as the Twelfth Street viaduct, now under construction, is completed the company shall electrify all parts of the system not then electrified. It shall expend for this purpose $1,500,000, or so much thereof as may be necessary. In each year for three years following the adoption of the contract not less than twenty-five additional new cars shall be purchased and put in service. During each of these three years the company shall construct in specified locations not less than 5 miles of single track, or during the full period 7½ miles of double new track. The city shall retain the title to certain tracks to be constructed across the Union Station plaza. The city shall pay the cost to the company. In addition to expenditures for extensions as provided during the first three years of the contract, $250,000 shall be provided at once for such other and further extensions as may be determined upon by the board of control. The city, if and when it acquires the power so to do, or any number of inhabitants, under authority from the city, may build under the supervision of the city engineer extensions to the company's lines or entirely new lines within the city to be operated as part of the system upon such terms and conditions as the board of control shall prescribe.

FUTURE EXTENSIONS

After three years the city shall have the right by ordinance to require the company to construct and operate such extensions as a majority of the city directors may recommend and the city by ordinance require, unless manifestly unnecessary for the convenience of its inhabitants. The burden shall always rest upon the company to prove that the extension so required is manifestly unnecessary. The aggregate of such extension shall not exceed on the average 4 miles of single or 2 miles of double track in any one year. There shall also be such additional extensions of single or double track as shall be reasonably necessary for the convenience of the inhabitants, and, as the board of control shall declare, will if constructed produce an income on the investment of not less than 6 per cent over the expenses of operation and maintenance. Any single track extension shall be reconstructed and operated as a double track as soon as such double track is necessary and will produce the income specified.

The city shall have the right if it constructs or acquires any viaduct within its limits or in connection with cities in Kansas to compel the company to operate cars thereover and to pay therefor reasonable compensation whenever reasonably necessary to accommodate public travel. The board of control shall determine when such operation is necessary to the companies.

JOINT USE OF TRACKS

The city reserves the right to authorize one or more street railways to operate cars on the tracks and to use the poles, wires, appliances, power and electric currents for six consecutive blocks or less. The city also reserves the right to authorize any company to use certain loops. The using companies under these circumstances shall pay reasonable compensation, the amount of which shall be determined by the board of control with the right of judicial review.

INTERURBAN LINES

All connections with any existing interurban line shall be continued as they were on Jan. 1, 1914, unless the city by reasonable ordinance and after six months' notice shall require connection at another point. All connections made hereafter between any interurban line and tracks of the company shall be made at the expense of the former under the supervision of the board of control at the city limits or at such place within the city as the city may authorize by ordinance. All connections shall be maintained by the company at the expense of the interurban company. The city reserves the right at all times to revoke the right of any interurban company to operate its cars or have the company operate them within the corporate limits of the city in the event that such interurban company shall fail to pay promptly any final judgment rendered against it under the provisions of the ordinance, or shall fail to comply within a reasonable time with any reasonable order of the board of control or any lawful ordinance passed hereafter by the city. All interurban cars within the city may continue to be used until the board of control shall order the use thereof discontinued for the reason that the cars are not fit or suitable for such use. In such event the displaced cars shall be replaced with other cars. Interurban cars shall be operated within the city by crews of the city company. Interurban passengers on cars received by the company shall pay the company the same fare and shall be entitled to the same transfer privileges as if they had taken regular passage on city cars. The company shall pay to each existing interurban line for the use of interurban cars while on the tracks of the company 15 per cent of the amount received from each passenger who is on such interurban car when delivered to the company and from each passenger who is on the cars when redelivered to the interurban line at the point of connection unless the company and the interurban line with the approval of the board of control and consent of the city shall agree upon some other amount. The board of control may determine when and where interurban cars may be stopped for passengers and whether or not they shall stop for local passengers.

FREIGHT AND EXPRESS TRAFFIC

Interurban cars carrying market vegetables and the products of market gardens shall be conveyed by the company as near the public markets as the tracks of the company permit. Interurban cars carrying through express and freight shall be carried to and from stations. The hours during which such freight and express cars shall be operated shall be subject to regulation by the board of control and by the city. The compensation for the transportation of such cars shall be determined by the board of control with the approval of the city's directors. The city reserves the right to regulate and prohibit the carrying of freight and express and the operation of freight and express cars within the city limits. The city may construct or authorize others to construct a central passenger station for interurban passengers, baggage, express and United States mail. For the use of the central station each interurban line shall pay to the owner of the station the 15 per cent paid to it by the company for each passenger received or delivered at the point of connection. The company shall pay to the owner of the station an additional sum not exceeding 5 per cent of the fare paid by the interurban passengers. It is agreed that interurban traffic to and within the city shall be encouraged to the fullest practicable degree.

The company under the supervision of the board of control may carry United States mail and also light packages or parcels besides those in possession of passengers, but not in such manner as to interfere with the convenience and safety of passengers or with passenger traffic. The city reserves the right to regulate and prohibit the carrying of packages on cars within the city limits. All charges for such services shall be compensatory, uniform and reasonable.

MOTIVE POWER AND PAVING

The motive power shall be electricity applied by the overhead trolley system. The city shall have the right at any time after three years from the date of adoption of the ordinance to require any portion in congested business districts to be operated by the underground conduit system. It is provided that the city shall exercise its power in this regard in reasonable manner and shall not require at any one time an excessive investment of money for such purpose.

The company, under the supervision of the board of control, shall pave and keep in good condition and repair the streets between its tracks and between the rails thereof and for 18 in. beyond each outer rail, and shall repave the same when necessary. It shall perform a like obligation under direction of the board of park commissioners where its tracks are laid in any boulevard paved for its entire width. Obligations as to grading are also included in the ordinance. Other sections relate to the location of tracks in the center of the street, the abandonment of tracks in any street, and street cleaning and sprinkling.

CAPITAL VALUE OF PROPERTY

The capital value of all the property of the company in Missouri is fixed at $25,648,806. To this value shall be added the cost of all additional extensions and betterments, including bridges and rights over viaducts and through subways made after May 31, 1913, properly chargeable to capital account. The value of the property as specified is arrived at by taking into consideration the value of all existing property in Missouri on May 31, 1913, with the value of its earnings for the fixed period of the existing contracts with the city, as well as the total of moneys actually expended from time to time in the building up of the properties. The amount stipulated is a compromise between the company and the city of their respective calculations concerning property values. If the value of the properties as fixed be the subject of investigation or inquiry by any person or authorized tribunal, the company shall always have the right to assert and prove all matters and things in support of such values as fully as its predecessors might have done on May 31, 1913, provided that nothing shall be so construed that the value stipulated shall be increased. The company agrees to procure such new money as, together with such portions of the surplus as may be used by the ordinance to pay for extensions and additions to property in Missouri, will provide the following sums for additions and betterments: 1914 to 1918 inclusive, $650,000 per annum; 1919 to 1923, $725,000 per annum; 1924 to 1928, $775,000 per annum; 1929 to 1933, $825,000 per annum; 1934 to 1938, $875,000 per annum, and 1939 to 1943, $925,000 per annum. The new money shall become a part of the capital value. It is agreed that if the net earnings in the aggregate exceed or are less than 35 per cent of the gross receipts in any year the amount to be expended annually shall be increased or diminished correspondingly.

SUPERVISION OF EXTENSIONS

All extensions and additions shall be constructed or acquired by the company under the supervision of the board of control. In the replacement of any cars or any other property there shall be charged to capital account the excess amount that the new property costs over the original cost of the property displaced. There have been filed in the office of the city clerk the inventory of Bion J. Arnold and also the inventory by L. R. Ash, as of May 31, 1912, in which the engineers do not agree as to depreciated physical value, exclusive of other elements of value, of certain property. There has also been filed in the clerk's office a reconcilement of the values of P. J. Kealy and L. R. Ash, wherein it is agreed that such depreciated value of property in Missouri and Kansas was $22,500,000. The agreed apportionment thereof between Missouri and Kansas is in the ratio of 84 per cent and 16 per cent respectively, thereby fixing the depreciated value of the property in Missouri, exclusive of other elements of value, at $18,900,000. There has also been compiled a statement dated Sept. 6, 1913, by Mr. Kealy and Mr. Ash showing that between May 31, 1912, and May 31, 1913, the receivers added to property value in Missouri $600,000. It is the duty of the board of control to adjust these appraisal inventories before ninety days after the adoption of the ordinance so as not to increase or decrease the totals of the valuations as stated in the ordinance. It is agreed that when and as the physical property contained in the board of control's adjusted principal inventory is renewed or replaced the difference between the cost of renewal or replacement and the value of the property renewed or replaced shall be added to or deducted from capital value as such cost is greater or less than the value so fixed, unless paid for out of the surplus credited to the city or out of the city's share of the surplus.

DISPOSITION OF EARNINGS

Out of the gross earnings each year there shall be paid: (1) All expenses of management and operation, including all expenditures necessary to maintain the property in first-class condition and provide first-class modern street car service, and all taxes, license fees or public charges and special assessments, including all public charges upon earnings or income. (2) To the company, 6 per cent per annum cumulative, payable semi-annually, upon the capital value. (3) All liabilities for injuries and damages, including claims to the city up to the time of the adoption of the contract, whether these accrued before, during or after the receivership, shall be paid as a special operating expense, subordinate only to the payments stated in 1 and 2 and prior to participation by the city or company. (4) The remainder of the earnings shall be credited to the city from time to time and shall be used by the company to pay for extensions and additions to the property until $6,300,000 is so used. Such credits to the city shall be made upon the books of the company and evidenced by certificates delivered to the city comptroller to the effect that the city is the owner of an equitable interest in the property of the company to the extent of the amount of surplus so used (stating the total amount thereof to date) subject to the company's right to capital value, the return thereon and participation as defined in the ordinance. No part of the same and no part of the value of any extensions or additions acquired by the use thereof shall be added to or become a part of capital value or be considered in payment of reduction thereof. (5) When the $6,300,000 surplus income shall have been used, then and thereafter the surplus income shall be paid two-thirds to the city and one-third to the company. The two-thirds belonging to the city shall be credited to it upon the books of the company and until the city ordains that the total or any part shall be used for other purposes it shall be used either to reduce and pay for capital or to the payment so far as it may be needed of the cost of additions and extensions to the property.

The city reserves the right at any time after the $6,300,000 shall have been paid—first, by ordinance to reduce fares and thereby diminish the amount of its share of surplus income, but not to exercise this right so as to impair or reduce materially the amount of the company's share below the amount the company would have received if the rate of fare had not been reduced; and second, by ordinance approved by the vote of the people to direct that the whole or any part of the surplus income shall be used for any public purpose. When the city's surplus is used to reduce capital value the method by which the reduction is made must be satisfactory to the city comptroller. When the surplus is used either to reduce capital value or to pay for additions and extensions it shall be taken to be an investment by the city of so much money in the property toward the acquisition of title to the property, and to that extent the city shall be an owner of an equitable interest in the property subject to the company's right to capital value, the return thereon and participation as defined in the ordinance. The capital value shall not to any extent be increased by reason of the use of the city's surplus in additions or extensions. The amount of the city's share of the surplus used for this purpose shall be considered for the purpose of determining the time when the company's right to participate in the earnings shall cease and the city's right to possession of the property shall mature. As capital value is reduced, the 6 per cent return shall decrease in proportion. The rights of the company, its security holders and any others claiming any interest in the property shall be no greater than the right to be paid the capital value of the property from time to time, so that the city shall be equitably entitled to every part of the property subject only to the obligations against the same, including all extensions and additions, excepting those specifically named in the ordinance to satisfy the capital value, returns thereon and the company's right of participation.

MAINTENANCE, DEPRECIATION AND DAMAGES

At the beginning of each fiscal year the board of control shall determine what percentages of the gross earnings shall be used for (*a*) maintenance, repairs, renewals and depreciation, and (*b*) for personal injuries and property damage claims arising after the adoption of the contract. The amounts for maintenance, repairs, renewals and depreciation shall not be less than 16 per cent of the gross earnings of the previous year, and that for damage claims not less than 4 per cent. If the full percentages be not actually expended in any year the balance shall be deposited and credited on any amount in excess of these percentages determined to be necessary to be set aside for the same purposes during the next or any preceding year. In the event that the city should purchase the property the accumulation for maintenance, repairs and depreciation shall be paid to the city. The reserve for damages shall be applied to the payment of such claims and the balance if any shall be applied to the current liabilities of the company. The depositary may invest and loan the money so as to obtain a reasonable return of interest. The percentages fixed shall in no wise limit the obligation of the company to keep the property in first-class condition or pay just claims for damages.

ACQUISITION OF PROPERTY BY CITY

Whenever by the application of the city's share of surplus to the reduction of capital value the capital value shall become equal to an amount not in excess of 50 per cent of a sum made up of the capital value and the cost of extensions and additions, the city shall at once become the owner of all the property of the company in Jackson County, Mo., and entitled to possession thereof, subject only to a lien securing the payment of the balance unpaid of the capital value in Missouri. Whenever at any time by the application of the city's interest in the surplus income to the reduction of the capital value and to the payment for extensions and additions to property and by payment by the city to the company of cash, the capital value shall be so reduced, or the actual value so increased, as that unpaid portion of the capital value shall not exceed 50 per cent of the sum above mentioned, then if the city shall also pay to the company in cash the value of the remainder of its right to participation and the cost, if any, of redeeming before maturity such mortgage bonds of the company as it may be necessary to redeem in order to accomplish the purpose, not exceeding a premium of 3 per cent on the bonds to be so redeemed, the city shall thereupon become the owner of the property in Missouri and entitled to possession subject to a lien to secure the payment of the unpaid portion of the capital value and any mortgage securing the same or any part thereof. Whenever such capital value shall be reduced by any of the methods aforesaid to 50 per cent of the above sum, the company's right to participation in the surplus shall cease and the entire surplus shall belong to the city.

The city may at any time pay for the entire capital value. If the city exercises this right prior to the time such capital value shall have been reduced by the methods aforesaid to one-half of the sum, the city shall also pay to the company the value of the remainder of the company's right to participate in the surplus income and also the cost of redeeming before maturity mortgage bonds in order to accomplish the purpose, not exceeding a premium of 3 per cent on the bonds to be redeemed. In such event the company shall deliver to the city or its nominee such instructions as may vest the property to the city or its nominee, free of all liens except such as the city may by ordinance authorize. If, however, before the company's right to participation in the surplus income begins the city should pay in cash the entire capital value and also all sums due and a return thereon as well as the sums necessary to redeem bonds, then there shall be no payment on account of the value of the right of participation, but in such event the city shall take the property only for municipal operation and ownership and shall continue to own and operate the property for five years thereafter. In the event that the city shall desire to sell the property or to grant the right to operate to another within this period of five years, then the city shall pay to the company the full value of the company's right to participation in the surplus income.

SALARIES

The company shall pay to each of the members of the board of control the same salary for service not less than $6,000 or more than $10,000. Such salary shall be approved by the city directors. The company shall pay the arbiter such compensation as shall be fixed by the board of control and the arbiter in their award. The company shall pay its officers, agents, attorneys and directors such compensation as will be commensurate with the services required of them, taking into consideration compensation of other corporations of similar character for like services.

The company shall not discriminate either in favor of or against any person because of his or her affiliation with any labor organization. The city shall have the right, for municipal purposes only, without the payment of any compensation to use the poles and conduits of the company to carry signal, telephone, telegraph and electric light wires and lamps of the city. The city shall not have the right to use such poles or conduits for the purpose of supplying power or light to private consumers in the event that it hereafter establishes a municipal electric lighting plant.

In the event that the city shall not have purchased the property at the expiration of the franchise the city shall have the right either to take over the property on payment of the unpaid portion of the capital value or to transfer the right to any person or corporation. If the city at or after the expiration of the franchise shall grant a right to another company to operate a street railway along streets and public places constituting a whole or a substantial part of the system of the company, the city shall require such new company to purchase and take over the property and pay therefor in cash. The city may require such new company to pay to the city an additional price and to perform other obligations. The expiration of the franchise shall not have the effect of terminating the mortgage indebtedness existing against the property with the approval of the city. At the expiration of the franchise if the city has not purchased the property in its own right or by a licensee, the city may require the company to continue to operate according to this contract, pending purchase or other arrangement. If no purchase or other arrangement shall be made, the company's rights shall terminate and the city through its trustees shall take over the property subject to the unpaid portion of capital value and operate it, but shall apply all surplus income to the payment of capital value and return thereon until its entire payment shall have been made.

Meeting of Block Signal Committee of Illinois Electric Railways Association

A meeting of the block signal committee of the Illinois Electric Railways Association was held at Chicago July 9. Those present were John Leisenring, chairman; E. F. Gould, W. F. Carr, B. J. Fallon and L. E. Gould. Mr. Leisenring announced that President Budd had appointed L. E. Gould, western manager ELECTRIC RAILWAY JOURNAL, to membership on the committee.

Several topics for consideration in forthcoming reports were considered. These topics included: "What Other Associations Are Doing in Signaling," "Highway Crossing Protection," "Automatic Signal Maintenance and Operation."

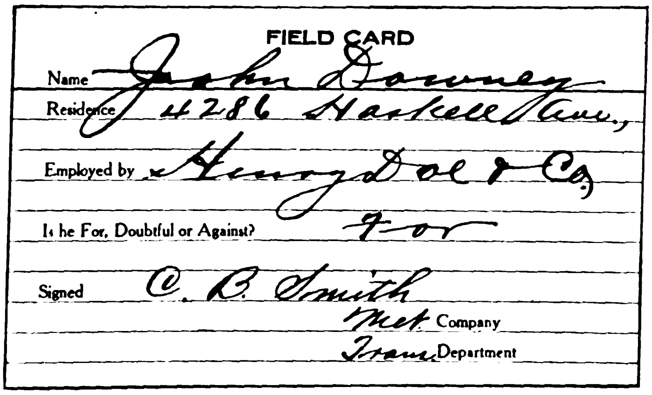
It was decided that the subject of highway crossing protection should be studied and a report should be made on this subject at the September meeting of the association. The consensus of opinion was that the problem of properly protecting highway crossings was of especial interest at this time and therefore would be valuable for early treatment. Individual members of the committee arranged to prepare data on different phases of the subject and will report to the chairman some time in August. The assignments made were: E. F. Gould, census of the bells in use by member companies; W. F. Carr, the history of the subject, the increased need and where and why; B. J. Fallon, types and costs of gate or watchman protection; L. E. Gould types and costs of crossing signals and pictures; John Leisenring, maintenance and operation.

The South Melbourne (Victoria) Council has decided to construct an electric tramway system from Princes Bridge through South Melbourne to Middle Park at a cost of $311,680.

Kansas City Metropolitan Franchise Campaign

Some particulars in regard to the systematic method of conducting the street railway franchise campaign in Kansas City which resulted in extension of the franchise may be of interest. The election occurred July 7. In the campaign of 1909 when the question was submitted to the electorate the company was defeated. This year it was decided desirable to learn if possible and tabulate in advance the opinions of the voters. In this work the registration lists of the city, the city directory, the telephone directories and the lists of employees were used.

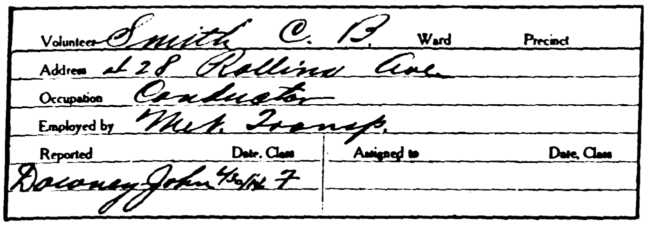
P. J. Kealy, in charge of the negotiations for the receivers of the road, and C. F. Cole, auditor for the Metropolitan Street Railway, held several conferences on this matter with the result that Mr. Cole devised a system for the listing of voters. It has been said since the election that this card system was responsible for the victory of the railway. Of course, the card system had the support of every employee of the company, in all nearly 4000, the assistance of every friend of the company and the approval of every high official who studied its working.


FIELD CARD
Name John Downey
Residence 4286 Haskell Ave.,
Employed by Henry Doe & Co.
Is he For, Doubtful or Against? For
Signed C. B. Smith
Met. Company
Trans. Department

FIELD CARDS FOR FIRST REPORT FURNISHED TO EACH OF 4000 WORKERS

The franchise measure, regardless of expressed opinions, could not be called a party issue, even though the draft was made under the Democratic administration. It was not safe to assume, therefore, that the measure would receive the Democratic majority in the previous mayoralty election. All parties had to be considered in taking the preliminary poll, hence the card system

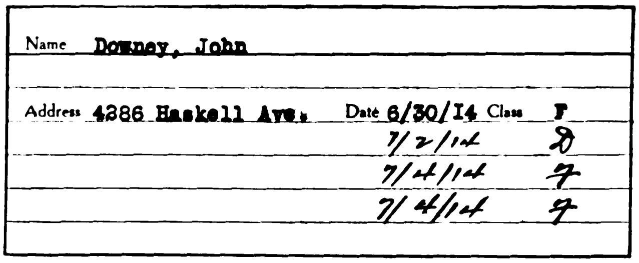
At the outset Mr. Cole issued field cards to all employees of the company with the request that they get a statement from friends and foes alike. No effort was to be made to convert a man but simply to secure a statement of the general sentiment existing among the voters. This field card had space for the name of the man interviewed, the interviewer, the place and class of employment of the man interviewed, a like space for the same information concerning the interviewer and space also for the expressed stand—"for," "doubtful" or "against" the extension of the franchise. This card was signed and turned in at the general office and went to the auditing department to be catalogued and filed.


Volunteer Smith C. B. Ward Precinct
Address 428 Rollins Ave
Occupation Conductor
Employed by Met. Transp.

Reported	Date, Class	Assigned to	Date, Class
Downey John	7/4/14 F		

SPECIAL CARDS FOR CREDITING VOLUNTEERS WITH REPORTS SUBMITTED

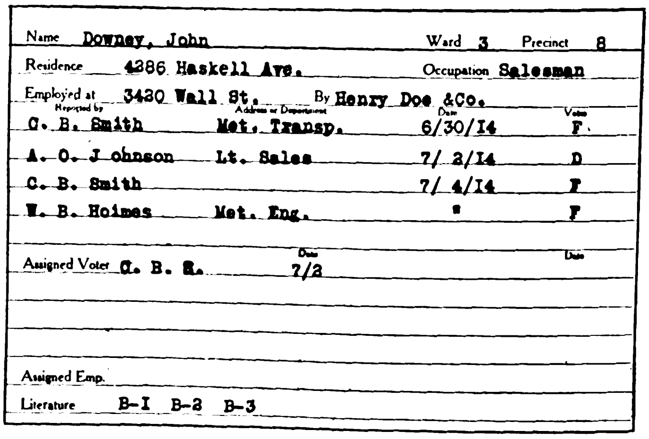
On reaching the office it was checked with the registration list in order to eliminate any but legalized voters from the files. The files were arranged in separate compartments for the three divisions of the classes. When a voter was found to have registered from the wrong address an effort was made to ascertain the reason. Where he was found to have moved within the legal limit a note was made, and he was classed as "not regularly registered." When all points were satisfactorily settled, the information on the field card was transferred to the office card which gave the name, residence, ward and precinct of the voter and his stand on the question.


Name Downey, John
Address 4386 Haskell Ave. Date 6/30/14 Class F
7/2/14 D
7/4/14 F
7/4/14 F

CARD FOR INDIVIDUAL VOTER WITH RECORD OF REPORTS RECEIVED

When a voter was found in the doubtful column an effort was made to learn the cause of his doubts. When this was learned, literature covering the points in doubt was mailed to him with a request that he make a call or write a letter on any point not entirely clear to him. This way of getting in personal touch with the voters had the effect of making them ask questions and become familiar with the measure themselves from new viewpoints.

After the entire city had been visited by the men of the company and the districts had been singled out, the auditor knew in which sections the sentiments were strongest "for" and "against" the measure so that he planned his campaign accordingly. Mr. Kealy announced to the opposition his willingness to answer questions or debate the measure at any time. The same men received booklets and leaflets covering the questions which had been raised in the opposing press, with the result that many votes were made even in the hotbeds of opposition.


Name Downey, John Ward 3 Precinct 8
Residence 4386 Haskell Ave. Occupation Salesman
Employed at 3430 Wall St. By Henry Doe &Co.

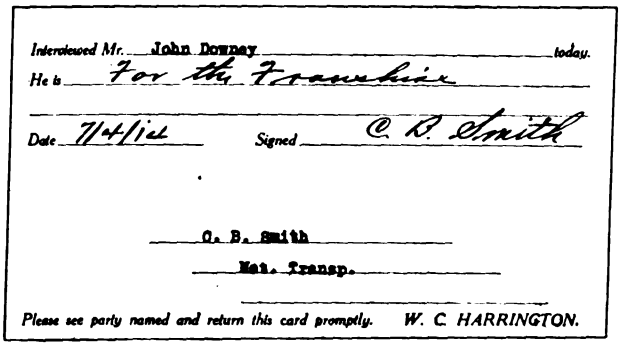
Reported by	Address or Department	Date	Vote
C. B. Smith	Met. Transp.	6/30/14	F.
A. O. Johnson	Lt. Sales	7/ 2/14	D
C. B. Smith		7/ 4/14	F
W. B. Holmes	Met. Eng.	"	F

Assigned Voter C. B. S. Date 7/2 Date
Assigned Emp.
Literature B-1 B-2 B-3

FILE CARD FOR TRANSFERRING AND CATALOGING OF INFORMATION CONCERNING REPORTS RECEIVED

No voter was classified until a reliable statement had been received. Where one interviewer reported a voter "for" the measure and another reported him "doubtful" or "against" it a tracer was always sent out to get the real stand of the voter. The cards were not only classified alphabetically and by ward and precinct, but they were further classified under the head of employment and employer. This was found to be a very successful plan, for in many cases where the voter had expressed no definite stand while the employer was friendly to the measure, co-operation was secured from the various commercial bodies which had endorsed the proposal.

The cards also furnished a reliable record for the workers on election day in getting the vote out. As each field man had a daily report on every voter in his district reported "against" the measure he was able to keep up the work until the time the polls closed on election day.



Interviewed Mr. John Downey today.

He is For the Franchise

Date 7/4/14 Signed C. B. Smith

C. B. Smith

Met. Transp.

Please see party named and return this card promptly. W. C. HARRINGTON.

TRACER SENT OUT IN CASE OF "FOR" AND "DOUBTFUL" REPORTS BEING RECEIVED FOR SAME VOTER

The election was carried by the work of the field men backed by the aggressive methods of Mr. Kealy and his assistants. The fact that the opposition started its campaign long before the franchise draft was completed left the railway and administration people with nothing to do but to refute the statements and get the information to the voters. This was brought about by having the questions most dwelt upon by the opposition printed in leaflets which explained the true meaning of each clause and showed the mistakes of the opposition. The employees of the Metropolitan Street Railway Company started out to gather in 4000 votes and succeeded, while the campaign managers through the information furnished by Mr. Cole and his department converted the rest of the doubtful ones.

We have information from another source that this party is not favorable to the franchise.

Please talk with him again and confirm or correct your original report on enclosed card.

LEAFLET SENT OUT WITH TRACER CARD

On the Saturday preceding the election Mr. Cole estimated that the franchise would carry by more than 5000 votes. More than 30,000 names were handled by Mr. Cole's staff prior to the election. That his records were thorough was demonstrated by the fact that from some wards more names were handled than there were voters in the municipal election in April. Shortly before the election Mr. Cole announced that of the voters canvassed, 15,480 were for the franchise and 5134 against. He assumed that 10,000 of the 15,000 voters not heard from were against the measure, and that it would therefore pass by a majority of 5346. The official count showed a majority of slightly more than 1000 above this figure.

Much has been said of the money spent in carrying the election, and some people in Kansas City are still crying that there was fraud on election day. Nevertheless, the card lists in the auditing department show that the election was fought out and won before the polls were open on election day. The expense of the campaign, it is safe to say, was not as great as the expense of the 1909 campaign, when the measure went down to defeat because an organized effort was not made to get the information to the voters. This time the spellbinder was lacking on the street railway side of the question, but in his stead an engineer or the Mayor of the city was sent out to debate the question with any and all parties. Every invitation was accepted by the campaign managers, and in no case was an opportunity lost to enlighten the voters.

Street Railways in Germany

The official statistics covering street railways of Germany for the year ending March 31, 1912, show a total of 283 systems, of which 194 are located in Prussia. This is an increase of fifteen in the number of railways. The total length of track was 4811.2 km (2983 miles), of which 3419.33 km (2120 miles) was in Prussia, an increase of 6.21 per cent. The largest railway is the Grosse Berliner Strassenbahn which, including suburban lines, operates a total of 353.6 km (219 miles). The 237 electrically operated roads had a total of 11,884 motor cars, 20,723 passenger trailers, 987 freight cars and forty-six electric locomotives. The Grosse Berliner Strassenbahn, the largest system, operates 2786 cars with a total of 97,931 passenger capacity.

The number of municipal lines has increased in Prussia from 120 to 132. The private systems now number 136, an increase of two. The largest syndicate is the Allgemeine Lokal & Strassenbahn Gesellschaft, Berlin, which operates seven systems with a total of 141.1 km (87.5 miles). The total motor car mileage of all German street railways was 504,875,589 km (313,022,865 miles) and train mileage 690,322,738 km (428,000,097 miles). The number of passengers carried was 2,567,155,295, an increase of 10.8 per cent. The freight handled amounted to 3,261,658 car km (2,022,228 car-miles) and 1,794,585 ton-km (1,112,642 metric-ton miles), an increase of 7.3 per cent. The earnings of the twenty-eight largest street railways varied from 4.6 pf. (1 1/2 cents) per passenger to 12.8 pf. (3.2 cents) per passenger. The last figure applies to both the Hamburg street railway system and the Berlin rapid transit system. The Berlin surface railways, however, earned only 9.5 pf. (2.4 cents) per passenger. The earnings per mile on the Berlin rapid transit system were 403,511 marks ($161,408) and on the Grosse Berliner Strassenbahn 169,642 marks ($67,856). In both cases these figures were the maximum for rapid transit and surface operation respectively. In general the average earnings per mile increased 5.1 per cent.

The operating expenses for all German street railways amounted to 86.4 per cent of the earnings. Of the 170 street railways in Prussia, sixteen paid no dividends, three paid up to 1 per cent, thirteen up to 2 per cent, seventeen up to 3 per cent, twenty-six up to 4 per cent, nineteen up to 5 per cent, sixty-eight from 5 to 10 per cent and eight more than 10 per cent.

Hanover with 2.66 miles per 10,000 inhabitants has more street railway trackage for its population than any other city in Germany, but this includes a large amount of suburban mileage. The city next in line is Dresden, with 1.54 miles per 10,000 inhabitants. Dresden has the highest number of trips per inhabitant with 237.5 a year. Berlin has only 186.2 and Hamburg 150.8 annual trips per inhabitant.

Pacific Claim Agents' Association

Abstracts of Papers Presented by Messrs. Bishop, Handlon, Boynton, Carson and Allen at the Pacific Claim Agents' Association Convention Held in Spokane, Wash., July 9-11

The sixth annual convention of the Pacific Claim Agents' Association was held at Spokane, Wash., on July 9, 10 and 11. Papers presented on topics dealing with the prevention of automobile accidents, the most effective methods for prosecuting fraudulent claims, co-operation between the operating and claim departments and the securing of statements from all injured parties are abstracted as follows.

PREVENTION OF AUTOMOBILE ACCIDENTS

BY S. A. BISHOP, GENERAL CLAIM AGENT PACIFIC ELECTRIC RAILWAY, LOS ANGELES, CAL.

The prevention of automobile accidents has come to be almost as important as the elimination of war. Statistically we find that fatalities and injuries directly attributable to the operation of automobiles compare in number with the dead and injured through conflicts between nations, and the dead and maimed in railway accidents. Many statisticians charge a railway with the death and injury of a number of persons riding in an automobile with which a railway train collides on a road crossing. I predict the time will come when the circumstances of such accidents will be examined to ascertain whether such casualities should be put in the railway or in the automobile column. It is my contention that when a driver of an automobile brings about a catastrophe by undertaking to pass over a railway crossing at high speed at such close quarters to an approaching train that collision is inevitable, such accident is an automobile accident, and should not, in any sense, be charged to the transportation company whose train unfortunately came in collision with the machine.

I cannot believe that any claim agent's observation of automobile accidents has brought him to any other conclusion than that, since the majority of such accidents are attributable not only to the negligence of the driver of the machine, but also to the concurrent failure on the part of each and every occupant of the machine to "look and listen," the only possible remedy is such as may be devised to induce the drivers and occupants of automobiles to exercise ordinary care. Municipalities should pass stringent regulations for the operation of automobiles, and the police department should, as in Los Angeles, stringently enforce the rules laid down. The county and state in turn have the same obligation to meet. Uniform laws should be promulgated and rigidly enforced to restrict speed within reasonable limits and to deter, if possible, the drivers of automobiles from following their impulse, which is to go ahead and leave the other fellow, who may be in charge of another automobile, trolley car or railroad train, to slow down or stop to prevent an accident.

There should be some test as to the fitness of the individual to operate an automobile as well as an examination to measure his efficiency as a driver. It is not unreasonable to require that all drivers of automobiles should have fair vision, be able to hear and be neither afflicted with the infirmities of age nor the reckless spirit of youth. There should be the further restriction that no person under the age of twenty-one years, or beyond the age of sixty years, be permitted to drive a machine. No transportation company could possibly contemplate putting in charge of the operation of any car or train a man who had no previous experience and no knowledge of the mechanism of the car or engine, who had never been required to pass an examination as to hearing or sight, and who perhaps was less than sixteen years of age or older than seventy years of age. There is no reason why similar rules should not be made applicable to the automobile driver.

Unless legislation can be had along the line indicated, automobile accidents will increase in proportion to the number of new cars manufactured and put into service. At least two new and inexperienced drivers are required for every car turned out, since the owners and the several members of the families are all ambitious to take a turn at the wheel. The prevention of automobile accidents depends upon the individual driver of the automobile, and unless he is fit to drive we shall probably fail to induce him to drive carefully. The only safe way is to make it more nearly possible by law to obtain an efficient driver, for an appeal to him to exercise ordinary care in operating his car ought to prevail.

I venture the opinion that conditions will grow much worse and accidents more numerous before we may expect to secure the much-needed legislation. This will come only after the legislators are induced to act through the influence and weight of the opinion of the public at large. A majority of all of the people must be won over to a proper appreciation of the necessity for such laws, and each and all of us can do much to influence the opinion and the attitude of those with whom we come in contact. We should, therefore, make a concerted effort along these lines.

THE MENACE OF THE AUTOMOBILE

BY J. H. HANDLON, CLAIM AGENT UNITED RAILROADS OF SAN FRANCISCO, CAL.

Automobile accidents are increasing in number so rapidly that to-day they are a source of much concern to the average claim agent. To illustrate: in 1909 the cars of the United Railroads of San Francisco were involved in only 388 collisions with automobiles. In 1910 there were 476 auto collisions; in 1911, 748; in 1912, 1076, and in 1913, 1404. Accidents of this nature are not only costly, for they often involve injury to the occupants of the automobile as well as damage to the vehicle, but they are also annoying to adjust, because a dispute almost invariably arises as to the extent of the damage. The reason for this is that it is the practice of many repairmen thoroughly to overhaul the damaged vehicle while it is in their possession. They do not attempt to confine their work to the repairs made necessary by the accident. Usually the owner does not hesitate to present the entire bill, and he resents the suggestion that many of the items were not due to the collision. In case the claim is without merit and is therefore rejected, a certain type of claimant, proud to advertise the fact that he is the possessor of an automobile, will go into the highways and byways, shouting bitter words of condemnation against all corporations except those in which he is a stockholder.

How can electric railways relieve themselves of this expense and annoyance? In my opinion state laws should be passed requiring automobile drivers to be not under twenty years of age and able to pass an examination of their eyesight and hearing as well as practical tests of their mental and physical fitness to operate an automobile. An instance is related where a chauffeur who was deaf thought that he was blowing a warning horn, when, as a matter of fact, the horn was out of order. He was not aware of that condition until his companion so informed him. Such a man should never have been granted permission to operate an automobile.

Street railways, in the interest of safety and economy, require platform men to be of a certain age, height and weight and able to pass a physical examination, particularly as to their eyesight and hearing. One of the cities of the Pacific Coast has an ordinance prohibiting motormen from operating cars until they have had seven days' training within the limits of the city, regardless of their previous experience. Yet street cars are operated on fixed tracks known to pedestrians and drivers of vehicles and are so geared that they cannot exceed a certain speed limit. On the other hand, automobiles, capable of traveling at a much higher speed than street cars, are permitted to roam the streets at the will of the driver. Surely, under these circumstances, rigid requirements should be exacted of the man who seeks a chauffeur's license.

Efforts should be made to co-operate with the local automobile association by having that body designate certain streets as main thoroughfares for automobiles, signs to be placed accordingly. The railway could then require its motormen to bring their cars to a full stop before crossing such streets.

Another means of securing the aid of the automobile association would be to prevail upon it to petition the city to appoint a hundred of its members as special officers. These special officers would be required to report to the secretary of the association all chauffeurs violating the speed ordinances. This officer could then notify the chief of police of all such offenses. In case the same person is reported for having exceeded the speed limit on three different occasions, the association could ask for a warrant for the arrest of the offender, and it would then become the duty of the attorney of the association to endeavor to secure a conviction.

The advantages of such a method are apparent. The statement of the motorcycle police officer who makes the arrest is usually questioned by the offender, and the committing magistrate is in doubt as to how to proceed. Influence is also brought to bear upon the judge and many speed maniacs are not punished. The moral influence of the association, however, would stiffen the backbone of the judge, and the member of the association at fault would feel the burden of fighting his fellow members on an issue of this kind.

Ordinarily, the chauffeur who is speeding his automobile is watching for the approach of the motorcycle policeman and he reduces his speed the moment the officer enters his range of vision. With fellow members of the association on the lookout for such offenders, the lawbreaker would not be able to ascertain so readily the official capacity of the occupants of the automobile approaching him and for that reason he would hesitate to take a chance. A further advantage of such a scheme as this: A person driving an automobile can gage the speed of another automobile by his speedometer and he is, therefore, qualified to testify as an expert witness.

In Portland, Ore., the 100 special officers of the local automobile association have been so successful in eliminating speeding that the city has abandoned the use of the motorcycle policemen, and arrests for speed violations rarely occur. In one instance, the automobile association of that city prevailed upon one of the judges not to fine the offender but to penalize him by depriving him of the use of his automobile for a period of six weeks. It is understood that there is a law in New Jersey authorizing the arrest of the automobile. The vehicle is then placed in a garage for such a period as may be determined by the judge. At the expiration of the specified time the owner pays the garage expense and court costs and obtains possession of the automobile. Such punishment is felt very keenly by the automobile owner and the results of temporarily depriving him of his automobile are very effective.

Experience in investigating automobile accidents reveals the fact that professional men who drive automobiles are more careless than professional chauffeurs. The average professional man does not confine his entire attention to his duties as chauffeur but is often thinking of other matters. The professional chauffeur, however, realizes that his livelihood depends upon the automobile being operated safely and governs himself accordingly. Physicians are the most careless drivers, and the situation is so acute in San Francisco that there is serious thought of designing for the desk of every physician in that city who drives an automobile some device which will be a gentle reminder to him that he must exercise ordinary prudence when acting as a chauffeur.

It would seem advisable to place placards containing safety rules in every garage in the city where they could be easily read by each chauffeur as he is about to take charge of his automobile. These placards would serve as a timely suggestion and a daily warning of the dangers of the street. Lectures on "safety first" could also be given at the local automobile clubs. In one city in Texas several hundred letters were sent to automobile owners by the claim agent of the local street railway. Instances were cited where automobiles had violated the traffic rules. Of the 200 replies received but two or three persons took exceptions to the criticism. The others received the letters in good spirit.

CO-OPERATION BETWEEN CLAIM AND OPERATING DEPARTMENTS IN SELECTING EMPLOYEES

BY B. F. BOYNTON, CLAIM AGENT PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

The claim department can assist the operating department in obtaining good and efficient employees by closely watching the accident reports, because a good, competent motorman or conductor always makes out an intelligent, comprehensive report when an accident occurs and furnishes the names of all available witnesses. Such men do not turn in reports like one recently received, in which the conductor wrote in the space provided for his statement, "I know nothing about the accident," and the motorman added, "The conductor's report is correct." The investigation of these reports shows not only the carefulness but also the average intelligence of the men who make out the reports. By carefully studying the good reports and the poor ones and furnishing the results of research to the superintendent, claim agents can greatly assist him in ascertaining what type of men he has under him.

Furthermore, by examining the reports of investigators who interview the witnesses to accidents, claim agents will find that the passengers are prone to state what they think of the trainmen who had the accident. For instance, a report was recently received to the effect that a motorman ran by a station so far that the rear end of the train passed an open cattleguard. The conductor gave the bells to back up to the platform, where the passengers were waiting. This the motorman refused to do, compelling the passengers to walk down to the train. In so doing a lady fell through the cattleguard and was slightly bruised. By informing the operating department of the attitude of this motorman, the claim department proved at once that the company had an employee who certainly did not belong on a street car at the present day.

Trainmen at different times have altercations, quarrels and fights with passengers. Reports of these are all made to the claim department on accident forms. This department should immediately notify the operating department as to what has happened, and, when the investigation is completed, take the matter up again and show the result of the investigation. In this manner the operating department is enabled to eliminate those employees who lack a certain "mental and moral fitness."

A man may be a good operating man, and yet, when he has an accident for which he may be blameless and is put on the stand to testify, he may not have sufficient intelligence to tell the facts truthfully. A man of this type is very undesirable, for his mental powers may be so deficient that when the opposing attorney gets hold of him he may tell any story the attorney desires. In some instances the evidence given on the witness stand by a motorman or a conductor has meant the direct loss of the case when it should have been won. When a man of this type is discovered, the operating department should be notified at once in order that he may be eliminated from the ranks, for a man who has not sufficient intelligence to get on the stand and tell the truth should seek some other vocation than operating a street car.

Trainmen should at all times be given the benefit of the doubt, but in all instances where the investigation shows, without any doubt, that a trainman is not proficient and careful in the performance of his duties, such as the handling of his car, being courteous to the public and at all times making out his reports promptly and intelligently, he should be removed. The claim department can assist the operating department in making motormen and conductors more efficient by having the trainmen sent to them for instruction regarding accidents before the men are given charge of a car. Some representative from the claim department is better fitted to talk to the trainmen concerning the elimination of accidents than anyone else. A great many men are delinquent in looking after accidents simply because they have not received instruction from those qualified to give it.

There are no two departments connected with a street railway that should be in closer touch than the claim department and the operating department, for without harmony and co-operation between these the key to success is lost. In a great many instances the claim department and the operating department do not realize the close relationship between the two. Good, honest, efficient work by an intelligent claim agent greatly helps the operating man, and good, careful, competent work by the operating man and his staff minimizes the number of accidents and helps to reduce the claim man's troubles.

The day has come when a claim agent's work does not stop at the mere settlement of claims. He must be a man of brains and possess sufficient tact to affiliate and work with the operating department in such a way as to eliminate accident hazards. This can be done in many ways through various educational systems, such as lectures and talks, safety organizations, safety meetings, inspection trips, and meetings of different kinds where he mixes with the trainmen. Through these things he is leading, not driving—teaching the men in such a manner that they are receptive to what he has to say and thereby become more efficient and of greater value to their companies.

MOST EFFECTIVE METHODS FOR PROSECUTING FRAUDULENT CLAIMANTS

BY HARRISON ALLEN, ATTORNEY, PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

All will agree that the prosecution of fraudulent claimants and professional witnesses presents a question of the greatest difficulty. The law provides ample remedy in statutes concerning perjury and subornation of perjury, but it is a well-known fact that few prosecutions have ever been instituted and fewer convictions had. This condition of affairs arises from two causes:

First: The tendency of courts, prosecutors and laymen to overlook the necessity of preserving the sanctity of the oath.

Second: The application of the law to the evidence.

The statutes generally provide that if any person takes an oath and then wilfully swears falsely in regard to any matter or thing concerning which the oath is required, such person shall be deemed guilty of perjury. If any person shall procure another to commit the crime of perjury he shall be deemed guilty of subornation of perjury.

In the treatment of damage claims many cases are encountered which are known to the public service claim agent and the attorney as "blind cases," concerning which no information has ever been received before the filing of the complaint in court. These cases, nine times out of ten, originate with the professional "ambulance chaser," who in turn takes them to some attorney known to be a "safe and sane" suborner of perjury. The machinery for manufacturing evidence is then started and a physician is called in who will, for the contingent fee named, supply the necessary medical testimony. The result is that when the case is finally laid upon the table in the court room it seems to be almost perfect.

To uncover this conspiracy is an extremely difficult feat. Conditions could be greatly improved, however, if the claim department of every public service corporation would spend more time and money in running down the professional crooks engaged in this nefarious business. The Claim Agents' Association and each public service corporation should announce it is proposed henceforth to spare no expense in bringing such parties to justice.

Whenever a blind case is filed, steps should be at once taken to investigate the past life and character of the plaintiff and his present environment. An effort should also be made to discover the witnesses for the plaintiff, and when this is accomplished the witnesses should be given the same searching investigation as the plaintiff. An examination of the plaintiff by disinterested physicians should be promptly demanded, and if it can be discovered who the plaintiff's physician is, he should be interviewed. If upon the trial of the action it reasonably appears to the claim agents and attorneys for defendant that false testimony has been given, the public service corporation should stand behind a vigorous prosecution of the offender, notwithstanding the fact that it will run the risk, in the event of acquittal, of being sued for damages for malicious prosecution.

The attorney who handled the case for the plaintiff should be given a rigid investigation by the Bar Association, whose rules and regulations in every state are ample to cope with the situation. The Bar should be given to understand that hereafter the attorney who devotes his time to chasing the ambulance and suborning perjury will be handled accordingly. The doctor should also receive attention at the hands of the Medical Association upon charges duly preferred.

Each of these steps, however, is fraught with difficulty. The claim agent and public service corporation are, for some reason or other, neglectful of this important matter. The attorneys who are members of the Bar Association and their grievance committees are too prone to give the brother attorney the best of it. The medical profession is one from which there can always be secured a doctor with a pliant conscience and an eye to the florescence of gold and silver. These knights of the itching palm are the cleverest of all, for they deal in a science most mysterious to the lawyer and layman.

At present around Portland every person who is injured, and every plaintiff in the blind case of perjury, turns out to be afflicted with "traumatic neurasthenia." This is the term applied to a nervous wreck. It is a safe estimate that within the past two years in nine-tenths of the complaints filed in the courts of Oregon by personal injury plaintiffs, it is claimed that the plaintiff is a nervous wreck. For this the doctors are at fault.

It is said that every man in the world possesses some symptom of insanity, but no man is really crazy unless he possesses at least two or more. One well-known authority has also remarked that every physician at the time he commences the treatment of these blind cases of neurasthenia possesses at least one symptom of the complaint. When he has followed the business and loaned himself to the persecution of the public service corporation for a sufficient period of time, he then possesses at least two symptoms, which make him a good witness. The only sure cure is to place him on the payroll of the public service corporation at a handsome yearly stipend.

Another great difficulty in these cases is the trend of court decisions in the application of the law to the evidence. For instance, it is generally held by the courts that while there are crimes of perjury and subornation of perjury, a conspiracy to commit either of the crimes is not a substantive offense, and therefore evidence of the conspiracy to commit the crime of perjury is not admissible. It is also held that proof that the defendant has made a statement outside of court contradicting the one given under oath, is not evidence of perjury. In an ordinary case, however, a witness may be impeached by testimony showing that he has made contradictory statements at other times and places. A search of the digests of Oregon, Washington and California shows that in the history of all three states the number of prosecutions for perjury has been very small and the acquittals 80 per cent.

SECURING STATEMENTS FROM EVERY INJURED PERSON

BY GEORGE CARSON, GENERAL CLAIM AGENT PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

As a general rule, signed statements should be taken from all persons who make claims or might reasonably be expected to make claims. There are exceptions, however, to this general rule. It is not at all advisable in cases where the injury is serious to rush immediately after the accident to the injured person with a view of getting him to sign a statement. The two reasons for this are as follows:

1. Should it be decided later that the case was one the company desired to settle, it would create a suspicion in the mind of the claimant that the representative of the claim department was making an effort to tie him up in some way for the purpose of defrauding him out of what might be justly due him. The result might be that the claimant would so mistrust the representative of the claim department that he would put his case into the hands of an attorney.

2. A statement obtained under those conditions would not be of any value in court in case of suit. It would be impossible to convince a jury that it was procured in good faith by the claim department representative. In fact, the use of such a statement obtained under such conditions would, in a trial be a positive detriment to the defense. In all probability the jury would punish the company for such a method of procedure by assessing large damages.

It is well, however, for the representative of the claim department to call on the injured man soon after the accident for the purpose of sympathizing with him and assuring him that the company will deal fairly with him. Of course, during the interview, the representative of the company should carefully note what the injured party says with reference to how the accident occurred, how long he has been a resident of the city, where he formerly resided and how long, whether he had received any other injury or made a claim against any other company, etc. This, however, should be done skilfully so as to avoid antagonizing the injured person. When the injury is not serious, and the claimant calls at the office or sends for someone from the claim department to visit him, a written signed statement should always be obtained. In all such cases, however, the claimant should be made to understand thoroughly the purport of what he has signed and, if convenient, a witness to the signature should be obtained.

The value of a statement from a claimant lies particularly in the lead it gives to the claim and legal departments in the event the claimant is disposed to be unfair and suit results. There is another phase of this matter, however, which is often discussed, namely, What effect will the calling on the injured party by a representative of the claim department have upon him with regard to leading him to present a claim which he would not have presented if the call had not been made? In other words, does such a call suggest the idea of damages to the mind of the claimant? There seems nothing in this. The fact that the representative of the claim department calls on a party injured in an accident does not call for the payment of money unless the company feels justified in so doing. Furthermore, it is quite certain that before the time expires in which the injured party can sue, he will learn that he has a proper claim against the company, if such should actually be the case.

Virginia Commission Report

The eleventh annual report of the State Corporation Commission of Virginia for the calendar year 1913 is devoted in the main to the following: Formal orders and opinions of the commission, charters, amendments, mergers and revivals of charters, assessments of property and franchises of public service corporations, and classifications and rates for steam railroads, express companies and telegraph companies. In an appendix separately bound there are given reports and statistics of canals, steam and electric railways and other corporate companies for the fiscal year ended June 30, 1913. The total value of the physical property, exclusive of franchise values, of electric railways as assessed by the commission in 1913 was $8,903,055. The total State tax assessed against electric railways was $81,002. The gross transportation receipts on the steam and electric railroads in the State for 1913 amounted to $68,121,265, as compared to $60,642,118 for 1912. The total mileage of electric railways for 1913 was 639.98, an increase of 135.95 miles over 1912. The commission states that it believes "that most of the public service corporations of the State are discharging their duties to the public with reasonable diligence, and that while complaints continue to be numerous not many of them are serious in character and general conditions are good."

Co-operative Plan in Philadelphia

Abstract of Statement Made by T. E. Mitten Before Commission on Industrial Relations—Origin of Plan—Successful Results of Co-operative Committee

An extended account of the history and results of the co-operative plan in Philadelphia was recently made by T. E. Mitten, chairman of the executive committee Philadelphia Rapid Transit Company, before the United States Commission on Industrial Relations. Mr. Mitten explained that this plan was born of necessity after the extensive strikes of 1909 and 1910 on the Philadelphia Rapid Transit System. These strikes resulted in great loss on both sides, bitterness of feeling and demoralization of the service. In this emergency, E. T. Stotesbury was prevailed upon to assume, as a civic duty, the responsibility for the policy and business management of the company. The financing necessary to the buying of new cars and the general rehabilitation of the property having been accomplished, the new management undertook to build up during the five years following June, 1911, an adequate system of surface transportation.

CO-OPERATIVE PLAN

At that time the motormen and conductors were receiving in wages, pensions and death benefits approximately 21.8 per cent of the gross receipts. The management was convinced that by the introduction of larger cars and improved operating methods this percentage of gross receipts could be made to produce much higher wages to the motormen and conductors, provided co-operation and team work could be established between the men and the management. Accordingly, the co-operative plan was devised, whereby 22 per cent of the gross passenger receipts were set aside in a separate fund for use in payment of wages, pensions and death benefits to the motormen and conductors engaged in the passenger service. Furthermore, a co-operative committee composed of representatives of the men and the management was established for the consideration of ways and means for satisfying the public and the employees.

ORGANIZED LABOR

At the incoming of the Stotesbury management about one-half of the motormen and conductors were affiliated with the Amalgamated Association of Street & Electric Railway Employees of America, the remainder being divided between the local Keystone union and those not affiliated with any organization. The company stated in the co-operatve plan booklet (issued in August, 1911) that the management could not take a position either for or against organized labor. Moreover, while it could not require any of its men to belong to a labor organization it could, if as large a majority as two-thirds of its men desired that a contract be made with a labor organization, pay from the 22 per cent fund the sum of the dues of every man. A vote on this plan was taken on Nov. 2, 1911, and of the 6944 men qualified to vote, 4276 voted in favor of making a contract with the Amalgamated Association and 2366 voted in the negative, the affirmative vote being 353 short of the required two-thirds. Immediately after this vote a rupture occurred in the Amalgamated Association, the result being that those who had voted in favor of a contract became more or less evenly divided, some remaining as members of the Amalgamated Association, while others followed the leadership of C. O. Pratt. No one faction had a sufficient number to represent 25 per cent of the whole, while those who wore no union buttons whatever approximated 40 per cent.

In July, 1913, the motormen and conductors again had opportunity to vote by secret ballot upon the question of continuing the co-operative plan with the men as individuals. The result was, that of the 6805 men qualified to vote 4320 were in favor of so continuing the plan, as compared to 2028 votes in the negative.

CO-OPERATIVE COMMITTEE

The co-operative plan of August, 1911, provided for a co-operative committee composed of a representative motorman or conductor from each division, the management being represented by the superintendent of each division, together with the superintendent of transportation or his representative. At first, the division superintendents were instructed to select a representative motorman and conductor from each depot without regard to their factional affiliations. In April, 1912, each motorman and conductor had an opportunity to suggest the name of a motorman or conductor to represent his depot as a member of the co-operative committee. More than 87 per cent of the men so expressed their preference. While the original plan was to have only one motorman or conductor representing each depot, it was decided, following this election, that the co-operative committee would include two representatives from each depot, the candidate receiving the highest vote to be known as committeeman No. 1, and the candidate receiving the second highest vote to be known as committeeman No. 2. This afforded direct representation not only to the majority at each depot but also to the largest minority. In June, 1913, the plan was adopted of voting for co-operative committeemen by means of a voting machine, thus insuring a secret ballot. There was also established a vote committee consisting of three motormen or conductors, members of the co-operative committee, no one of whom shall be a representative of the depot at which the vote is taken. The vote committee counts and certifies to the returns.

To be eligible as a co-operative committeeman, the candidate must have been in the service for two years or more and assigned to a regular run. The power of recall is in the hands of the motormen and conductors, in that every twelve to fourteen months the committeemen must stand for re-election. The committee now includes twenty-eight motormen and conductors representing the fourteen operating depots. At the election of these men, approximately 95 per cent of all the motormen and conductors voted, the present members having received nearly 80 per cent of the total votes cast.

RESULTS OF PLAN

The co-operative plan has now been in effect for three years and the results have been excellent. It is generally conceded that the public is receiving a much more adequate service than formerly and that there has been an equal improvement in the courteous treatment received by the public at the hands of the motormen and conductors. The number of complaints received at the office have shown an 80 per cent decrease during the last three years.

Although nearly 20 per cent more passengers are carried to-day than at the time immediately preceding the inauguration of the co-operative plan, the number of accidents has been decreased 25 per cent and the number of fatal accidents has been decreased more than 35 per cent. While a part of this improvement is due to better and safer cars, there has also been a great improvement in the human agency and care.

INCREASED WAGES

More than 47 per cent of the employees are now receiving the maximum wage of 30 cents per hour, as shown by Table I.

TABLE I—Showing Comparative Rates of Wages for Motormen and Conductors for 1911 and 1914 and Also Employees Divided as to Time of Service

	Per Cent of Total, 1914	Rate of Wages 1914	Rate of Wages 1911	Per Cent of Wage Increase
New Men	5.42	25 cents	22 cents	13.6
After one year's service	7.04	26 cents	23 cents	13.0
After two years' service	10.09	27 cents	23 cents	17.4
After three years' service	14.34	28 cents	23 cents	21.7
After four years' service	15.70	29 cents	23 cents	25.1
After five years' service	47.41	30 cents	23 cents	30.4
Total	100.00	28.83*	22.8*	26.4*

*Average

INSURANCE AND BENEFITS

A co-operative beneficial association was established in November, 1912. The company formerly provided meeting room, light, heat, janitor service, printing and stationery for all independent sick and death benefit associations having membership among its employees. These associations, however, were found to be too limited in their scope to cover the entire force of employees. Furthermore, a large portion of their membership was composed of ex-employees. The company therefore suggested the formation of this co-operative beneficial association to include the employees of all departments. In lieu of the assistance formerly extended to the independent associations the company now contributes to the new association an amount equal to the entrance fees and dues paid in each month by the men, and it bears the expense of the management of the association.

This association provides sick benefits of $1 per day for 100 days following the first week's illness and a death benefit of $150. The entrance fee is 50 cents, with monthly dues of 25 cents. In addition to sick and death benefits the association also offers a co-operative buying plan, whereby members are enabled to make a saving of 8 per cent in the purchase of the necessaries of life. Membership is open to all male and female employees between the ages of 18 and 45 years, after a service of three months. Of the 10,000 eligible employees in all departments 9013 are now members. Whether or not employees elect to become members of this organization and enjoy its advantages rests solely with themselves. All are given to understand that any decision they may make does not affect their rights or standing with the company.

The benefits paid by the association since its organization include 99 death benefits for $14,155.65 and 1859 sick benefits for $50,740, or a total to May 31, 1914, of $64,895.65. Such benefits are in addition to the general insurance and pension plan, established in January, 1910, under which $500 is paid at the death to the actual dependents of any employee who has been in the service for two years and earns less than $200 a month. This plan also provides to employees who at the age of sixty-five years have completed twenty-five years of continuous service, a pension of $20 per month for the remainder of their lives. The benefits and pensions paid since the establishment of this insurance and pension plan have been as follows: 383 death benefits for $189,771.75, and 96 pensions for $48,375.35, or a total to May 31, 1914, of $238,147.10.

UNIFORMS

By the efforts of the co-operative committee, the motormen and conductors are now securing a higher grade of uniform at a lower price. The uniforms are purchased direct from two wholesale houses under contracts approved by the co-operative committee at the following prices:

	Stock or Ready Made	Made to Measure
Without label (non-union)	$11.75	$12.75
With label (union-made)	12.25	13.25

DISCIPLINE AND DISCHARGES

The basic principle of discipline under the co-operative plan is that the penalty for the infraction of any rule shall be no more severe than is found by experience to be necessary to insure proper service to the public and the maintenance of proper discipline. The old practice of discharging men as a punishment and thereafter reinstating them through the influence of others irrespective of the merits of their cases is not now permitted. Under the co-operative plan, discharge is used only as a last resort, the co-operative committeemen being most effective in preventing the discharge of motormen and conductors by advising them to mend their ways and by assisting in presenting all the facts to the superintendent of transportation in order to insure a thorough understanding of the true merits of the case before final action is taken.

The best evidence that the co-operative method of discipline is most effective is found in the decreased number of men discharged. In 1911, 1635 men were dismissed, or one in every five; in 1912, 855 were dismissed, or one out of eight; in 1913, 536 were dismissed, or one out of every twelve; in 1914, 334 were dismissed, or one out of twenty. Furthermore, there is a smaller number of men now resigning from the service. In 1911, 1390 men resigned; in 1912, 913; in 1913, 956 and in 1914, 337.

HOURS OF SERVICE

The management first determines the number of cars required adequately to serve the public at different hours of the day. If the total car hours required upon the street are divided so that there is the least possible wastage then the highest possible wage per hour has been accomplished. As the men are, therefore, interested in avoiding any wasting of their 22 per cent fund and also in dividing the hours of service to suit their own desires, the actual make-up of the runs and hours of service performed can be and actually is left to the decision of the men.

Upon the recommendation of the co-operative committee, the basis for the car schedules is that regular runs shall constitute from nine to eleven hours of service, all to be completed within a maximum of fourteen consecutive hours. The former practice provided for spreading runs over fifteen or more consecutive hours. Deviation from the foregoing rule is permitted only when the men so request. If the actual time for the run is below nine hours (Sunday time-tables excepted) the man is paid for nine full hours.

During the past three years under the co-operative plan the total seating capacity provided during the rush hours on all surface lines has been increased 50 per cent.

The results of the co-operative plan may perhaps be summed up in the conclusion that the increased efficiency of management, methods and men, due to co-operative effort, works directly to the advantage of the public in improved service and to the men in increased wages and improved working conditions.

After the completion of Mr. Mitten's testimony, H. G. Tulley, superintendent of transportation, was called as a witness to explain the character of the runs. He said that 23 per cent of all the runs are early straights; 34 per cent, late straights; 39 per cent, early swings, and 4 per cent, late swings. The runs are chosen by the men in the order of their depot seniority. The proportion of extra men to regular men is about 25 per cent.

M. F. Hughes, member of the co-operative committee and motorman from the Jackson Depot; Robert M. Kernaghan, conductor from the Frankford Depot, and John H. Collins, a senior conductor, testified that the co-operative plan as a whole has worked greatly to the advantage of the men. Thomas Kirrane, ex-conductor, and C. O. Pratt and William B. Fitzgerald, non-employees, also testified before the commission and criticised the co-operative plan.

Ethics of a Franchise

An official of H. M. Byllesby & Co. recently listed what he deemed the principal obligations of both parties to a franchise. As printed in one of the Chicago daily papers under the heading given above, they were as follows:

OBLIGATIONS OF A UTILITY COMPANY

1. Rendering of good, adequate and continuous service.
2. Fair and reasonable rate schedules.
3. No discrimination among customers of the same class, nor between classes of customers for like service.
4. Extension of service into all populated sections of the municipality and suburbs.
5. Earnest endeavor to market the greatest possible volume of service.
6. Adoption of approved inventions and developments in machinery and apparatus.
7. Sound financial management.
8. A high standard of physical excellence.
9. Public spirited attitude in all matters concerning the general welfare and advancement of the community.
10. Broad and liberal business administration.
11. Keeping faith with the people in all agreements, promises and announcements.
12. Strict obedience to law and no participation in politics.

OBLIGATIONS OF THE PUBLIC

1. The same degree of confidence, encouragement and respect that one business man accords to another.
2. Willingness to permit a fair profit on the capital, energy, ability and risks embodied in the undertaking, to permit a profit greater than mere interest, which could be obtained without effort or hazard.
3. Disregard of attacks by popularity seeking agitators.
4. Willingness to recognize and reward improvements in service.
5. Recognition of the fact that the operation of utilities differs fundamentally from merchandising or manufacturing.
6. Reasonableness in demanding large capital outlays for improvements not strictly necessary to the rendering of adequate service, such as placing wires underground in cities of small size.
7. To make prompt payment of bills.
8. Protection against direct competition. All authorities agree that public utilities can be conducted with greatest benefit to the public as controlled monopolies.
9. Careful consideration of legislation which would hamper and curtail the development of utilities.
10. Recognition of the fact that, starting from a given base line, which varies in different localities, reduction in rates can be obtained without financial loss only by increasing the volume of service sold.
11. Recognition that no utility can well serve a municipality if not in prosperous condition and able to obtain the investment of new capital on favorable terms.
12. Treatment of all questions affecting public utilities in a fair-minded way, looking upon them as business questions without regard to politics.

New England Street Railway Club Entertained at Bangor

The most successful outing in the history of the New England Street Railway Club was held at Bangor, Me., on July 14 and 15, about 150 members being the guests of John R. Graham, president of the Bangor Railway & Electric Company. The main party left Boston on the 13th, and upon arrival at Bangor was conveyed by a reception committee to the Conduskeag Canoe Club, where a chicken breakfast was served. Following an inspection of the local offices and plants of the company special cars were taken to the Graham farm in East Corinth, an electrically operated gravel excavator being examined en route. A Dutch lunch was served at 1 o'clock, and informal addresses were made by Governor Haines of Maine, Col. Frederick H. Parkhurst and Mayor John Q. Utterback of Bangor. Governor Haines referred in glowing terms to the work of Mr. Graham in the Pine Tree State, saying that the host of the occasion is the greatest asset of eastern Maine. Colonel Parkhurst said that Mr. Graham is doing more to build up Bangor than any other man, and the chief executive of that city praised the ability with which the company's lines have been laid out to meet the public convenience, assuring his hearers of his co-operation in relation to further extensions. After the lunch the party enjoyed a baseball game which was won by the "Operators" from the "Supplies." Later in the afternoon races, shot putting, a tug-of-war and other sports were held.

At 5.30 p. m. the party took special cars for Riverside Park, and in addition to the regular performance scheduled at the local theater, a banquet was held, at which Harry B. Ivers, of Boston, Mass., was toastmaster, the speakers being J. E. Dozier, Lynn, Mass.; Mayor Utterback; Hon. J. A. Peters, M. C.; President C. F. Bragg, of the Bangor Chamber of Commerce; C. E. Elwell, consulting engineer of the Connecticut Public Utilities Commission; Gen. Joseph Smith, Bangor; C. M. Stewart, Bangor; C. C. Peirce, Boston, and John T. Conway, president of the New England Street Railway Club. Among the guests were also Governor Haines and Railroad Commissioners F. Kiezer and George F. Giddings of Maine. Great enthusiasm was aroused by the presentation to Mr. Graham by President Conway on behalf of the club of a handsome silver service. In his response, Mr. Graham expressed his appreciation of the gift, and after sketching the development of the electric railway system under his administration, concluded with brief comments upon the car earnings on some of the lines, which, he said, exceeded those on Washington Street, Boston, when figured on a car-hour basis. The speaker said he had had many opportunities to leave Bangor at a greatly increased financial return, but that he had cast in his lot with the city and proposed to remain as long as permitted. On Wednesday morning the party enjoyed a 90-mile automobile ride and boarded the steamer for Boston at Bucksport on the Penobscot River.

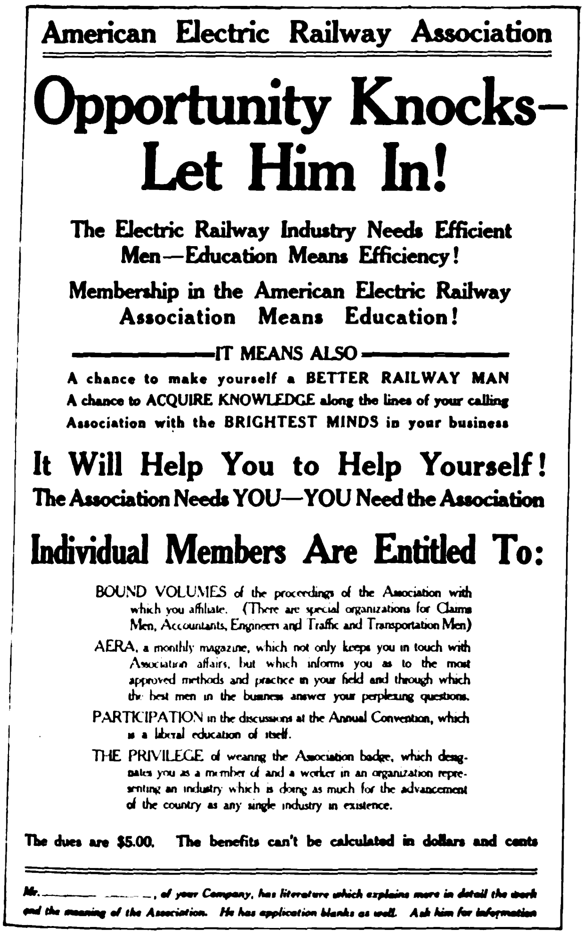
American Association News

Summer Has Not Diminished the Activities in the Several Divisions of Association Work, as is Evidenced by the Notes of Committee Meetings and Developing Plans Printed Below.

CAMPAIGN FOR MEMBERSHIP

Some of the details of the campaign for new members which the American Association has been conducting recently were made public this week through the New York headquarters of the association. The plan is explained in the following letter sent to member companies and signed by L. S. Storrs, chairman of the committee on company sections and individual membership:

"The officers of this association feel that its individual membership is one of its great sources of strength and influence. Every individual that can be impressed with the association's viewpoint in matters affecting the problems of the industry is a force acting towards the creation of better public relations.



American Electric Railway Association

Opportunity Knocks—Let Him In!

The Electric Railway Industry Needs Efficient Men—Education Means Efficiency!

Membership in the American Electric Railway Association Means Education!

—IT MEANS ALSO—

A chance to make yourself a BETTER RAILWAY MAN

A chance to ACQUIRE KNOWLEDGE along the lines of your calling

Association with the BRIGHTEST MINDS in your business

It Will Help You to Help Yourself!

The Association Needs YOU—YOU Need the Association

Individual Members Are Entitled To:

BOUND VOLUMES of the proceedings of the Association with which you affiliate. (There are special organizations for Claims Men, Accountants, Engineers and Traffic and Transportation Men)

AERA, a monthly magazine, which not only keeps you in touch with Association affairs, but which informs you as to the most approved methods and practice in your field and through which the best men in the business answer your perplexing questions.

PARTICIPATION in the discussions at the Annual Convention, which is a liberal education of itself.

THE PRIVILEGE of wearing the Association badge, which designates you as a member of and a worker in an organization representing an industry which is doing as much for the advancement of the country as any single industry in existence.

The dues are $5.00. The benefits can't be calculated in dollars and cents

Mr. ________ ______, of your Company, has literature which explains more in detail the work and the meaning of the Association. He has application blanks as well. Ask him for information

POSTER ISSUED FOR DISTRIBUTION AMONG MEMBER COMPANIES

"Every individual who can be brought under association influence receives an education that increases his value to his company and himself. An increase in individual members means for the association an increase in strength and influence. The association is far behind its sister organization, the National Electric Light Association, in the number of its individual members, and an earnest effort is being made to secure recruits.

"We solicit your assistance in this work, and with that end in view are sending you under separate cover several copies of a poster, which we would ask you to have displayed in conspicuous places so as to reach the men whom you think may be secured as individual members.

"In addition, we would ask you to designate some officer of your company to have charge of the pamphlets and application blanks which we are sending you, and who has sufficient interest in the association to answer such questions as may be asked. The name of such officer should be filled in on the blank space in the poster.

"I feel sure that your realization of the possibilities of association work and the good which is bound to come from an earnest, enthusiastic membership will lead you to assist us in the matter."

The poster to which Mr. Storrs refers is reproduced herewith. It is printed in two colors on a sheet 21 in. x 14 in.

TRANSPORTATION COMMITTEE

The following members of the transportation committee to have charge of special trains to the Atlantic City convention and of getting a good attendance there have been announced by J. K. Choate, master of transportation:

New England: H. E. Reynolds, Boston; H. C. Page, Worcester; M. S. W. Dingwall, Presque Isle; Charles C. Peirce, Boston; C. R. Edwards, Boston; W. A. Farnsworth, Boston; Charles N. Wood, Boston; Warren L. Boyer, Springfield; R. F. Gammons, West Newton.

New York State (exclusive of New York City): James F. Hamilton, Albany; E. J. Dickson, Buffalo; F. H. Hill, Elmira; James B. Strong, Rockland County; Charles R. Robinson, Buffalo; J. A. McIntyre, Albany; W. D. Brewster, Buffalo.

New York City: J. S. Doyle, New York; George Keegan, New York; William Siebert, Brooklyn; J. W. Brown, Newark, N. J.; H. W. Griffin, New York; Roy V. Collins, New York; C. G. Chamberlin, New York; Henry Lee, New York; C. B. Keyes, New York; A. G. Kingman, New York; E. R. Mason, New York; John Baird, New York; W. W. Storms, New York; Arthur Varian, New York.

Philadelphia and vicinity: H. J. Crowley, Philadelphia; J. L. Adams, Upper Darby; R. C. McCloy, Philadelphia; S. J. Cotsworth, Philadelphia; M. Alpern, Philadelphia; H. C. Bayard, Philadelphia; John Dickey, Philadelphia; William B. Goodall, Philadelphia.

Middle Atlantic States (Delaware, Maryland, Virginia and District of Columbia): T. W. Wilson, Wilmington; T. C. Cherry, Annapolis; D. S. Carll, Washington; J. N. Shannahan, Hampton; W. A. Woolford, Baltimore; Robert Burgess, Atlanta; H. H. Seabrook, Baltimore; S. K. Colby, Baltimore.

Central States (Indiana, Ohio, Michigan and western Pennsylvania): Dana Stevens, Cincinnati; G. K. Jeffries, Indianapolis; A. D. B. Van Zandt, Detroit; P. N. Jones, Pittsburgh; A. L. Johnson, Cincinnati; James H. Drew, Indianapolis; L. J. Drake, Indianapolis; D. H. Ackerson, Cincinnati; Ross Forward, Cleveland; W. McKay White, Indianapolis.

Chicago, northern Illinois and Wisconsin: G. T. Seely, Chicago; Leonard A. Busby, Chicago; H. E. Chubbuck, Peoria; R. B. Stearns, Milwaukee; C. N. Wilcoxon, Michigan City; H. J. Kenfield, Chicago; S. P. McGough, Chicago; John Benham, Chicago; L. E.

Gould, Chicago; L. E. Morier, Chicago; B. E. Bushnell, Chicago; Charles D. Jenks, Chicago.

North Central States (northwest Minnesota, North and South Dakota and Iowa): A. M. Robertson, Minneapolis; F. M. Mills, Sioux Falls; Thomas Roycraft, Grand Forks; E. L. Kirk, Sioux City; R. A. Swain, Minneapolis; W. D. McDonald, Minneapolis.

St. Louis and Kansas City and southern Illinois: Bruce Cameron, St. Louis; J. M. Egan, Kansas City; L. C. Haynes, East St. Louis; Scott H. Blewett, St. Louis; O. W. Uthoff, St. Louis; W. K. Norris, St. Louis; E. B. Meissner, St. Louis; E. J. Clark, St. Louis; H. C. Avis, St. Louis.

Southeastern States: Hardy Croom, Jacksonville; R. W. Spofford, Augusta; J. H. Sottile, Charleston; E. H. Ginn, Atlanta; G. H. Thomas, Chattahoochee; A. H. Sisson, High Point.

Southwestern States (Texas, Oklahoma, Arkansas and Louisiana): C. J. Griffith, Little Rock; David Daly, Houston; M. S. Sloan, New Orleans; R. D. Long, Muskogee; B. Willard, New Orleans; A. V. Handcock, Oklahoma City; C. W. Hobson, Dallas.

Western States (Utah, Colorado, Nebraska and Kansas): Simon Bamberger, Ogden; C. B. Wells, Denver; R. A. Leussler, Omaha; William A. Satterlee, Pittsburg; P. A. Hedendahl, Denver; H. C. Glaze, Denver; Wilson A. Austin, Omaha; Melvin D. Wells, Salt Lake City.

California: John A. Britton, San Francisco; A. W. McLimont, Oakland; J. McMillan, Los Angeles; Thomas Finigan, San Francisco; W. E. Amman, San Francisco; A. V. Thompson, San Francisco; H. S. Clark, San Francisco; Philip Dibert, San Francisco.

Northwestern States: F. W. Hild, Portland; George W. Rounds, Tacoma; A. M. Wilson, Portland.

Canada: R. J. Fleming, Toronto; A. Gaboury, Montreal; Acton Burroughs, Toronto; Richard Russell, Toronto.

COMMITTEE ON EDUCATION

The committee on education recently arranged with a well-known correspondence school to outline a set of courses for men in the several branches of electric railway work. Since that time the faculty of the school has been studying the requirements of men in this field and has completed a preliminary draft of the courses. This will be submitted to a sub-committee of the committee on education within a few days, to the entire committee soon thereafter and to the appropriate committees of the engineering association in due course.

The committee on education is also planning to secure a large attendance of representatives of technical schools at the convention with a view to interesting them and promoting a closer relation between them and the industry.

MEETING OF PASSENGER TRAFFIC COMMITTEE

The second and final meeting of the passenger traffic committee of the American Electric Railway Transportation & Traffic Association was held at the Hollenden Hotel, Cleveland, on July 10. Those in attendance were E. E. Soules, Illinois Traction System, Peoria, chairman; C. R. Gowen, New York State Railways; Richard Breckenridge, Aurora, Elgin & Chicago Railroad, and J. A. Greenland, Fort Wayne & Northern Indiana Traction Company.

A considerable part of the report, as already stated in these columns, will deal with the subject of motor buses and the trackless trolley system. The data compiled on this part of the report were gone over in detail by the committee. It will show, among other things, that there are forty-four motor bus companies in operation at the present time in the United States and that many others are contemplated. The committee has been successful in securing data on the cost of operation and the gross and net revenue of some of these lines, and every effort will be made to amplify this information so far as other motor bus companies are concerned before the report is filed for publication. The report will also contain a discussion of the duties and functions of the traffic manager under the following headings: Development of new business; distribution of traffic, especially at times of peak loads, and improvements in public relations.

MANUFACTURERS' ASSOCIATION ACTIVITIES

As a result of a meeting of the executive committee of the American Electric Railway Manufacturers' Association held on July 10, application blanks have been sent out to each manufacturer who has chosen exhibit space for the A. E. R. A. convention at Atlantic City next autumn, showing the official assignment of space for that particular manufacturer, as decided upon by the assignment committee. The committee has given considerable time to the individual applications and has tried to give each exhibitor as nearly what was asked for as conditions would permit. As the association is anxious to fulfil all of its contracts, it asks as a special favor that each exhibitor have the bill inclosed with his application blank passed for payment at once. The exhibit committee also makes a special request that nothing in connection with the exhibit shall be ordered from anyone except on the blanks which it will issue from time to time. H. G. McConnaughy, secretary of the Manufacturers' Association, will be glad to give personal advice to exhibitors who require such. The prospects are unusually good for a large attendance and exhibit, as shown by the fact that more space has been assigned this year than last year up to this time.

The membership committee has been doing good work in enlisting new members for the association. Companies which joined the association during the week ending July 14 are: the Brookfield Glass Company, New York; Independent Pneumatic Tool Company, Chicago; Federal Signal Company, New York; Universal Trolley Wheel Company, Northampton, Mass.; Sattley Manufacturing Company, Detroit, Mich.; Universal Car & Manufacturing Company, New York.

Plans have been considered for the appointment of a finance committee, and the members of this committee will probably be selected within two weeks.

The entertainment committee held its first meeting on July 10, at which tentative entertainment plans for the convention were discussed. The full list of this committee will be made public soon. An attractive program is promised.

An interesting incident of the development of the exhibit arrangement is a message received by Mr. McConnaughy by Marconi wireless from the Electro-Magnetic Brake Company, of London, England. The inquiry is for space and rates, and the method used in sending for information indicates progressiveness and urgent interest on the part of the prospective exhibitor.

The Manhattan City & Interurban Railway, Manhattan, Kan., is deviating from its policy to carry only passengers, and is now hauling wheat in that section. Arrangements have been made by the farmers with officers of the railway whereby the latter will place freight cars at switches along the road. The farmers will do the delivering and loading and the railway will run the loaded cars to Eureka Springs, where connection will be made with the Union Pacific.

COMMUNICATIONS

The Kansas City Franchise

NEW YORK, July 11, 1914.

To the Editors:

The Kansas City street railway settlement franchise, approved at the polls on July 7, easily takes a place with the Chicago settlement ordinances of 1907, the Cleveland settlement of 1910, and the New York subway contracts of 1913, in the novelty of its provisions and in the significance it may have in the development of public policy for the adjustment of the troubled relations between great cities and street railway corporations. Personally I was strongly opposed to the Kansas City franchise as I was to the New York subway contracts, for the reason that in my judgment both settlements carried the guaranty of the private investment to the point of practical certainty without securing to the cities the full measure of concessions which should be given as the price of such guaranties.

There is a general agreement, I believe, among the thoughtful students of public utility problems that the character of public utility investments in the United States should be changed and is being changed from speculative to non-speculative. I have gone so far as to say that it is almost as much of a disgrace to a city to have its public service corporations in receivers' hands as it would be for the city to default on its own bonds. For some years I have been advocating the theory that public utility investments should approximate municipal bonds in safety. I have done this as a conservative but firm believer in ultimate municipal ownership of street utilities, as well as from a recognition of the fundamental public importance of efficient and adequate service continuously rendered by modern and highly-maintained public utility plants. I even go so far as to say that cities ought to assume for the future the ultimate risk of public utility investments in so far as such risk is due to the possibility of existing structures becoming obsolete through the development of the arts and changes in the conditions of the service. Of course, I maintain that in return for making the investment safe and the annual interest payments and the ultimate return of the principal certain, the city ought to get very important advantages. From the standpoint of the cost of capital, these advantages ought to approximate the advantages of municipal ownership.

The street railway interests eagerly embrace the doctrine of a safe investment and of a guaranteed return upon it, but the safer the investment and the surer the annual return, the less they are inclined to favor the ultimate withdrawal of their capital through the process of amortization or otherwise. They are glad to accept the advantages of the proposed program but are loath to pay the price that may be reasonably expected of them. The companies balk at two points.

In the first place, the existing investment has to be measured and recognized as a sort of financial base or starting point for the readjusted financial relations of the future. The companies, even when operating under limited franchises, and even though their investments when made were highly speculative in character, seek to have included in the valuation of their existing property all of the money which may have been put in during the past, even though some of it was lost long ago. In other words, they take the position that in making a new deal the city should assume past risks as well as future risks, and include lost investments in one form or another in recognized capital value. On the other hand, if the enterprise has been profitable, that fact is not admitted to be a reason for assuming that the money invested in superseded property has been withdrawn from capital account, but rather is put forward as a reason for a further swelling of the recognized investment. Whether they have won or lost under the speculative conditions of the past, they ask the city to pay for it.

In the second place, the companies are generally unwilling to accept a rate of return hammered down to the point that the security of the investment will warrant. They cling to an element of speculation. They fail to distinguish between the return which capital as such demands on a safe investment from the speculative profits of promoters and reorganizers and from the profit-sharing regarded as necessary to induce men, not as investors, but as administrators, to do their best in the management of the property and the operation of the business.

It is at these two points that the greatest struggle inevitably comes in a readjustment of franchise relations like that which has been going on in Kansas City during the past two or three years. At these points there is a sheer conflict of interests, and how the respective parties fare will depend upon how well they are represented in the bargaining. It seems to me that in the final settlement of the Kansas City difficulties the company drove so hard a bargain and so successfully outmaneuvered the city as to make the contract distinctly disadvantageous from the public point of view.

The chief reasons why I believe that the Kansas City settlement is an improvident contract from the city's standpoint are the following:

1. The recognized capital value is too large, as it makes good the company's past losses. While the $30,000,000 valuation agreed upon does not cover nominally the entire amount of superseded and lost investments, or the entire amount of the speculative value of the unexpired portion of the life of the old franchise, the allowance of a 6 per cent preferential return instead of 5 per cent, as allowed in Chicago, makes the gross value of the securities to be issued substantially $36,000,000, as against a present physical value of about $23,000,000. What was left out in fixing the nominal valuation was put into the rate of return and the company's right of participation in the profits.

2. The forfeiture clause is a joke. It provides for pensioning the company at three-quarters salary as a result of wilful violation of contract proved in court and then persisted in, although the entire capital value, whether represented by stocks or bonds, and the 6 per cent preferential thereon, are left untouched by the forfeiture.

3. The extension clauses are totally inadequate. The minimum requirement, in regard to which the city is given authority to act, is less than the company would naturally build of its own volition if the city grows as is expected, and on other extensions by the company the impossible condition is imposed that they must be foreseen by the Board of Control to be fully self-supporting as extensions, paying full expenses of operation plus 6 per cent on cost. This is a wrong principle as to extensions, and if the city grows as rapidly as is anticipated, this franchise is bound to leave the city as powerless as it is now to secure adequate extensions from the company.

4. The system of dual control provided is without precedent and violates every principle of efficient business management. Either the city's share in the control will be a mere pretense or else the scheme will lead to perpetual wrangles and inefficiency. The provision for calling in an arbiter to settle disputes is not properly worked out, and is altogether too cumbersome as a means of settling an infinite succession of differences,

including both petty and important differences. This applies specifically to the Board of Control. The scheme for minority city directors on the company's board is crude and illogical. These directors are only remotely responsible to the city, as they are to be named by judges whose constituency extends to more than one-third of the State of Missouri with a population of which only one-fifth is in Kansas City. This joint directorate scheme overlooks almost entirely the permanent and inevitable antagonism of interest between the city and the company. The scheme destroys even the theory of public control and turns the whole business into a partnership for profit.

5. The franchise violates one of the most fundamental rules of law, accounting and public morality in making personal injury claims subordinate to the payment of a cumulative 6 per cent return on capital value. That the cost of accidents should be separated from operating expenses and put after capital charges in the disposition of the gross earnings is atrocious.

6. The franchise provides for the gradual inflation of capital value in connection with renewals to the extent of the present accrued depreciation of the property. As appraised by Mr. Arnold, the property was found to be about 79 per cent as good as new. Everybody knows that diligent maintenance and prompt renewals of worn-out or obsolete parts will never bring the property as a whole much, if any, above this average. And so, if 21 per cent of the replacement value of the renewed plant, substituted piecemeal for the depreciated plant with the result merely of maintaining present depreciated values, is added to capital account, it will represent the injection of just so much more water into capital value.

7. The franchise, while holding out the promise of municipal ownership, confuses the issue by dangling the bait of lower fares before the people's eyes. Upon analysis it is found that the utmost reduction of fares possible under the terms of the ordinance, assuming that the estimates agreed upon by the engineers prove to be correct, is a bare ½ cent off the 5-cent fare, and the effect of even that reduction would be to stop the process of amortization and thus prolong the company's right of participation, thereby adding millions of dollars to the purchase price of the property in case the city should desire to take it over the very next day after fares have been reduced.

8. The city was not in a position where it was necessary to settle on unfavorable terms. The old franchise still had eleven years to run and was in general satisfactory to the city. Though certain extensions were needed, the system as a whole was overbuilt, according to Mr. Arnold, and still a moderate amount of extensions could be demanded each year under the old contract. The street car controversy was nothing but an insistence on the company's part that the city should pull the company's financial chestnuts out of the fire. The company practically refused to live up to its franchise contracts, saying that it was financially unable to do so.

The new Kansas City franchise is complex, without being carefully worked out in detail. It is experimental to the point of being chimerical. It is full of lapses from sound reason and just bargaining, which, whether intentional or not, have the effect of "jokers" against the city's interest. It is vague and apparently inconsistent in some of its important provisions. It is a theoretical hodge-podge through which runs only a single thread of certainty, namely, the assumption by the city of the company's past losses and the guaranty by the city that the investors shall not lose in the future. Excellent things for the company—and how cheap they proved to be! DELOS F. WILCOX.

The A. S. T. M. Axle-Steel Specifications

AMERICAN ELECTRIC RAILWAY ENGINEERING ASSOCIATION

WASHINGTON, D. C., July 13, 1914.

To the Editors:

The minority report of the representatives of the American Electric Railway Engineering Association in committee A-1 of the American Society for Testing Materials, quoted on page 75 of your issue of July 11, states very completely the attitude of that association toward the proposed revision of the "standard specifications for steel forgings for heat-treated axles, shafts and similar objects." This report gives our association's objections to the proposed changes in physical requirements of heat-treated motor-car axles and needs no amplifications, particularly as the discussion has brought out no conclusive reply to their arguments. The statement that the existing standard specifications are not practicable from a manufacturing standpoint is not borne out by the fact that these specifications have been actually in use by a number of purchasers for several years.

The principal objection of the A. E. R. E. A. to the action of the A. S. T. M. is that the latter practically ignored our association's representatives in the consideration of this matter. The A. S. T. M. is an association composed of both manufacturers and consumers. In so far as the specifications in question refer to electric motor-car axles our representatives were the only consumers' representatives on the sub-committee, and any revision of a specification for motor-car axles made against their protest seems to us inconsistent. Our representative's motion to so amend the title of the proposed revised specification that motor-car axles and armature shafts would not be included, gave the committee an opportunity to have the proposed change apply to all parts in which other consumers were interested, but this motion was lost. Moreover, these particular specifications were drawn and proposed by the A. E. R. E. A. and adopted after two years' deliberation, which included consideration by a joint committee of our association and the A. S. T. M.

The A. E. R. E. A. has always recognized the great value of co-operative work with the manufacturers' and with other associations which might be interested in any particular work its committees had under way, and it has accomplished much useful work of this character. Our rules for the adoption of standards and recommendations provide, among other things, that the manufacturing and commercial interests involved must be taken into consideration and this principle has been followed invariably. The action of the A. S. T. M. in revising, against our protest, a specification covering material used almost exclusively by electric railways, which had been jointly considered and approved and which had been in satisfactory use for several years, must unquestionably retard any co-operative work between the two societies and probably makes necessary a change in our methods of procedure in connection with such work. J. H. HANNA, President.

Frank Hedley, vice-president of the Interborough Rapid Transit Company, New York, has written in response to a request from Charities Commissioner Kingsbury of New York to offer free transportation during the summer to and from Van Cortlandt Park to the women, and to children under fourteen years of age, of such charitable organizations as are recognized by the department of charities. This privilege will be granted on Tuesdays, Wednesdays, Thursdays and Fridays, but not on holidays.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Load Dispatching System of the Columbus Railway, Power & Light Company

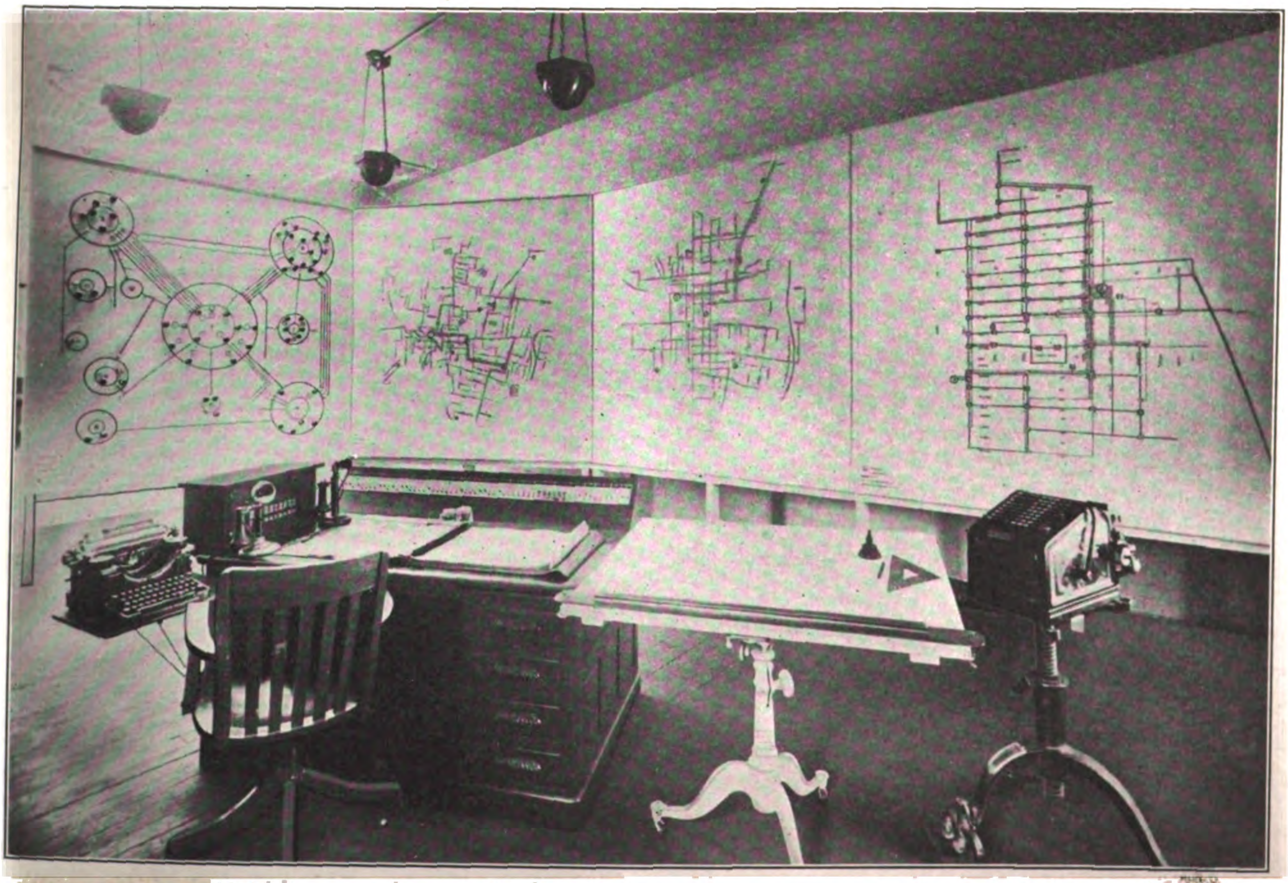
BY HAROLD W. CLAPP, GENERAL SUPERINTENDENT COLUMBUS RAILWAY, POWER & LIGHT COMPANY

The electric energy for operation of the railway system and for supplying the numerous power and light customers of the Columbus Railway, Power & Light Company, is furnished by a system of six power stations, ranging in size from 250 kw to 14,350 kw rated capacity. Current for the railway is generated at 575 volts, and for power and light at 4150 volts, while some direct current is furnished at 220 volts on the Edison three-wire system for lighting the central district of the city. The Spring Street station is the largest and contains four a.c. turbo-generators rated at 11,000 kw and four engine-driven d.c. units rated at 3350 kw. The second largest station has four 220-volt d.c. engine-driven units with a total rating of 2560 kw. The next station in size contains one turbine-driven and three engine-driven alternators, with a total rating of 2100 kw. Located at these stations are seven motor-generator sets varying in size from 300 kw to 750 kw capacity; while six other motor-generator sets and four rotary converters are located at points on the system convenient for proper distribution of energy. The other three stations are very small and are seldom used except in periods of very heavy loads in the winter season or in case of serious breakdown in the larger stations.

All the power stations and substations are tied together by transmission lines, both high and low tension, in such a manner as to make an outage on the lines for more than a very few minutes an unknown thing under all ordinary conditions.

The Spring Street station, containing the largest units, is the most economical to operate, and the rule is followed of carrying all the load possible on this one station. At times, on Sundays and during the latter part of the night, for instance, the load decreases to such a point that it is possible to cut out the prime movers in the second largest—the 220-volt—station and carry its load on its motor-generators from the alternators at the Spring Street station. The load formerly carried by the third largest station, which is also used in winter as a water-heating plant, is handled during the summer season by Spring Street.

Owing to the fact that the generating equipment was so widely scattered, and that the nature of the service required was so exacting, it was deemed advisable to place the responsibility for its proper handling in the hands of a load dispatcher. Consequently, a load dis-



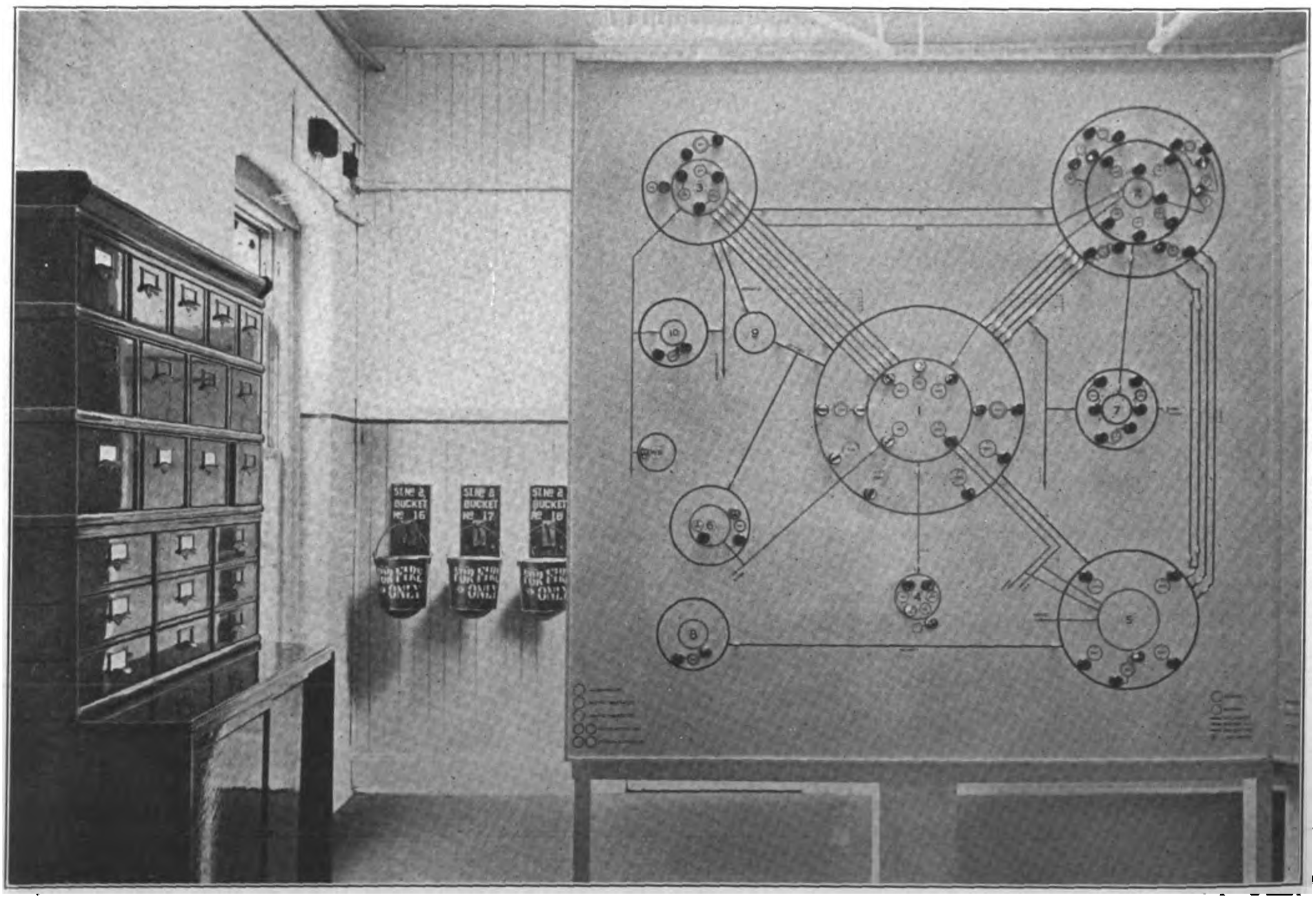
VIEW OF GRAPHIC POWER SYSTEM LAYOUT AND OTHER EQUIPMENT IN LOAD DISPATCHER'S OFFICE OF THE COLUMBUS RAILWAY, POWER & LIGHT COMPANY patching system was recently placed in operation which, it is firmly believed, will result in an increased reliability and the production of further economies in general power station load handling over the old methods. An office adjacent to the second largest station was fitted up with maps, telephones, recording barograph, recording electrical instruments and other necessary equipment for the dispatchers to supervise the load dispatching properly and from which to make out detailed daily reports covering their operations. They are kept advised from time to time through the day, by each station, of the amount of load carried and are given a daily report of the generators in service and their current output, from which the load curve for the day is made. Typewritten reports up to 6 a. m. must be in the hands of the superintendent of power by 9.30 a. m. The practice is followed of noting cases of trouble and fire alarms, received over private line, on these reports in red. This office is also supplied with daily and monthly forecasts of the weather conditions. Wireless antennæ are now being installed to give advice of approaching thunder storms.

A separate telephone system connects the dispatchers direct with all power stations and all substations except two, the latter being reached through the general office operator. The telephone system is so arranged that the load dispatcher may hold a telephone conference with the switchboard operators at all stations. This has already proved a very valuable adjunct as a time saver in connection with certain phases of daily procedure in the handling of the dispatching system.

The three load dispatchers, who work on eight-hour shifts, are switchboard operators of about ten years' experience. They have received several months of additional preparation for this work by being transferred from station to station in order to become familiar with the load conditions of each.

The view of the load dispatcher's office shows at the left a graphic outline of the power station and substation system, giving the manner in which stations are tied together. The next three boards give maps of the city, showing the distributing lines, both railway and power and light. With this information visibly at hand on the boards, the load dispatcher keeps directly in touch with the changes made at the different stations. In case of trouble on any of the lines, his maps indicate at once how he can get around such difficulties with the use of certain line switches and still make it possible to furnish current with the least possible interruption of service.

The No. 1 board shows the power generating system, each power station and substation being indicated by a large circle. The different tie lines between stations are indicated by lines drawn upon the board in the proper color, and line switches are shown by small spring buttons, which can be turned as occasion demands to indicate whether the line is in or out of service. There are sufficient tie lines between stations so that in case of trouble on any line service may still be furnished by using another line. Within the large circle and indicated by smaller circles, are shown each of the generators, motor-generators, rotaries, boosters or batteries in that station. Close to these smaller circles are placed lamps under different colored lenses, the colors indicating the class of current delivered. Railway current, for instance, is shown by a green lens, and alternating current for power and light by a red lens, other colors being used to show rotaries, boosters, etc. At the outer edge of the dispatcher's desk is placed a double row of push button switches which are connected to the lamps on the board; when he orders a certain generator placed on the line, he simply touches the proper button in the bottom row for that machine and its lamp is lighted. When this machine is cut out of service, he presses the top button and the light



GRAPHIC OUTLINE OF COLUMBUS POWER AND SUBSTATION SYSTEM is put out; the lighted lamps giving the number of machines in service and the kind of current each is delivering.

The second board shows the a.c. system, giving the station-to-station tie lines and all primary lines, whether one, two or three phase; no secondary lines are shown. The power stations, substations and the largest consumers are also located on this board. This board is used for following up troubles which may arise from time to time and gives the dispatcher a graphic outline of the means which have been provided to supply current at such cases.

The line department is required to co-operate fully with the dispatchers in handling cases of trouble arising from storms or otherwise, and must also work in conjunction with them in the proper handling of current while new installations are being made. The load dispatching system has proved its worth several times this summer during lightning and wind storms, for the reason that it has brought the dispatchers and line department closely in touch with each other.

The No. 3 board outlines the trolley and feeder system, showing in one color the railway feeders and in another color the double and single trolley lines. This board also locates section insulators, and is intended to be used in case of trouble on the lines, helping the dispatcher at such times to devise a method of supplying current sufficient to operate the cars.

The No. 4 board shows the underground system in the central district of the city. All manholes and junction boxes are located, while the underground and overhead feeders and distributing lines are shown by lines.

A great many calculations are made with the Burroughs adding machine shown in one of the views. Seven more of these machines are used in other departments, some of them being equipped with special features other than for straight addition.

Before the load dispatching system was placed in operation, the heavy peaks in the load were handled by the running engineers at the different stations as each saw fit, subject at times to the approval of the superintendent of power, advice of changes made being given from one to another by telephone. In emergencies, or in cases of breakdown especially, this system has often proved ineffective, occasionally resulting in confusion at a time when machines should have been replaced on the line promptly. This has now been avoided by making one man, the load dispatcher, responsible for getting the machines on or off the line. The load dispatcher knows the steam consumption of each of the steam units, and in most cases he can so order the plan of operation that certain units may be used in preference to those which otherwise might be operated at a greater expense. The great economy resulting from the use of the load dispatching system comes from this fact—the dispatcher can formulate in advance methods of handling the average daily load, using at all times possible those machines which are the most economical in steam consumption. In times of trouble the experience which he accumulates from day to day in handling the system makes his movements decisive and rapid, the whole tending toward a non-interruption of service plus economical generation of energy—"Never-Failing Service" being the final goal to be attained.

Plans have practically been completed for constructing an electric railway from Riga to Assern, a summer resort on the Gulf of Riga. The new line will be 19 miles in length. It will probably be built and operated under the same management as the Riga Street Railways (Aktien-Gesellschaft der Rigaer Strassenbahnen, Alexanderstrasse 171, Riga, Russia.)

Peculiar Derailments in Street Railway Special Work

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

The cause of every derailment should be traced and determined. Common safety demands this, but it is by no means easy always to determine the cause. Too often the record of a derailment reads: "Car No. —— derailed at —— (location). Trucks examined found O. K. Track examined: Gage and line O. K.," or, "Switches examined, found good to gage and line; cause of derailment unknown." This is the beginning of a dangerous element, and no one knows what bad results may follow.

Switch splitting, the most dangerous form of derailment, has been overcome in a large measure by the use of the "anti-straddler," but instances occur when switches equipped with the best of these devices are split. Suppose a mate is wide gage at the "toe." In this case the car wheel on straight run enters the mate groove, bearing heavily against the guard side of the same. Now as the tongue directly opposite this point is usually higher than the curve rail, the wheel will sometimes grip the tongue and pull it toward the mate, thus allowing the following truck or even the rear wheel of the same truck to enter the curve. A narrow gage wheel will often produce a split in the same manner. The cause here is easily determined by making a thorough examination of the truck and the gage of the switch.

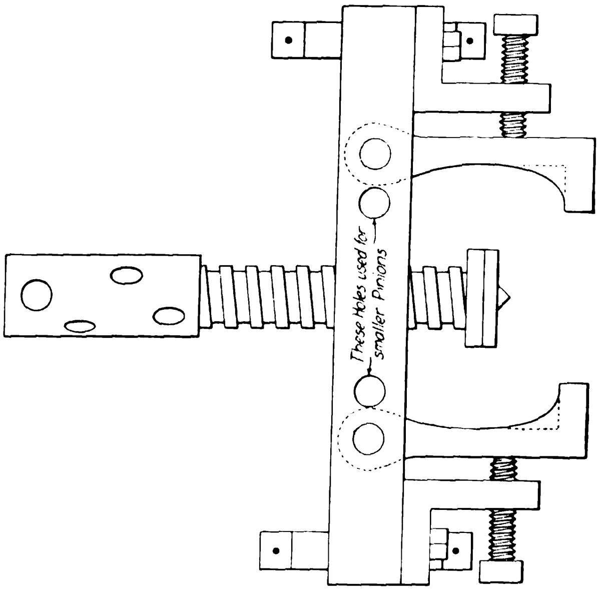
An interesting case occurred at one of our busiest points where traffic conditions are such that cars must keep moving regardless of the position of the other car, and where only extreme watchfulness prevents accident in case of derailment. Derailments (by splitting of the switch) were at first confined to one car. While this car was found in perfect condition, it was transferred to another line. The switch though quite worn was still capable of good service, and the gage at the heel and point was perfect. Trouble began again with another car of the same series. An examination showed the wheels to be new and in perfect gage. It was then thought that since the surface wear caused high guards on the switch, the filling of all the guard room in the switch and mate by the new wheels would cause enough side pull to open the tongue. Accordingly the guards were ground to normal height. As the derailments still continued, a fine line was drawn from the point to the heel of the mate. This showed that while the toe and heel of the mate were in perfect gage, the heel of the mate plate was almost ¼ in. wide gage. Although the groove at the mate point was full width according to standard, a measurement from the fine line to the guard side only showed 1 in., thus giving the same effect as though the mate was wide gage. The guard side of the mate groove was then ground and the derailments ceased.

Another case was that of a maximum traction truck with the pony wheels leading. All manner of investigation showed the existence of proper conditions. It was observed, however, that the derailments occurred about the same time every day. A watch was set, and we found that under a very heavy load the car body would sag sufficiently to allow a bolt projecting from a platform beam to strike the truck frame just as the wheel was taking the switch. When after a second derailment at a certain location an examination shows no cause for the trouble, the transfer of the car to another line makes it very hard to locate the cause of isolated cases. A good slogan for the careful operator of electric railways would be: Find the cause of the derailment at all costs.

Home-Made Pinion Pullers of Adjustable and Non-Adjustable Type

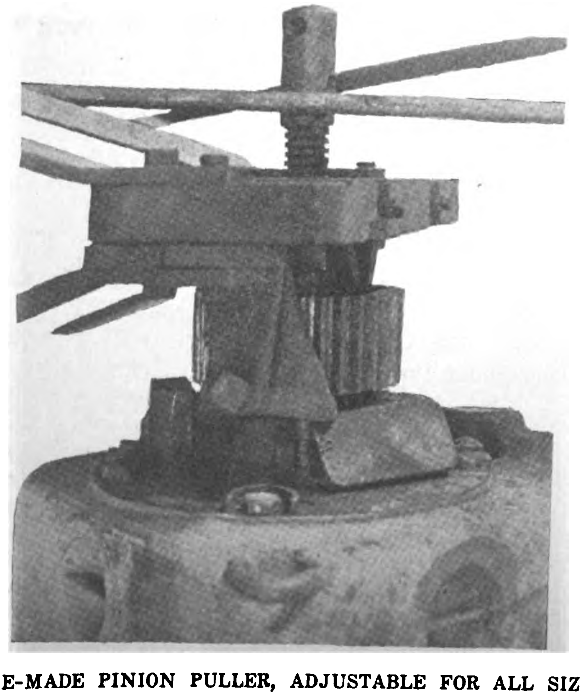
BY F. J. FOOTE, MASTER MECHANIC THE OHIO ELECTRIC RAILWAY

Among the home-made devices in our Columbus shops are two types of pinion pullers. One halftone shows our adjustable puller as used to pull a pinion off of a GE-73 motor shaft, while the drawing shows a rough outline of the device. The puller is fastened firmly to the floor at some point where it can be conveniently reached by a crane. The screw is heavy and is provided with a swivel point. The jaws of this puller are adjustable so that pinions of various sizes can be pulled off simply by pulling the pins that hold the jaws to the yoke. The jaws can be removed to place them in closer to the screw; the jaws are then in position to pull smaller pinions.

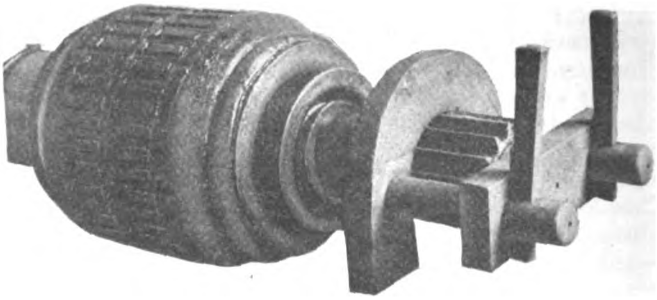


ADJUSTABLE PINION PULLER

A much simpler pinion puller also used by us is shown in the second half-tone. This consists of a heavy steel horseshoe with studs and a pulling yoke and keys. This puller has the advantage of simplicity, but the disadvantage that it can be used only for one size of pinions. However, on city lines where many cars have the same-sized motors and pinions, this style will pay for itself in a short time. Both of these pinion pullers are in successful use at our shops.



HOME-MADE PINION PULLER, ADJUSTABLE FOR ALL SIZES OF PINIONS



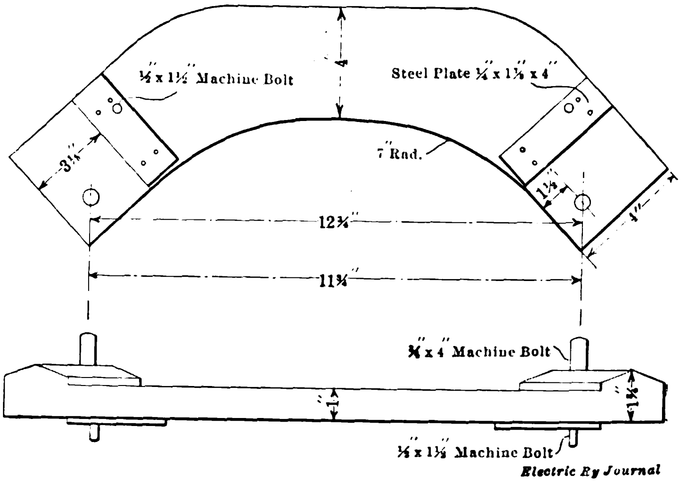
SIMPLIFIED PINION PULLER, BUT GOOD FOR ONLY ONE SIZE OF PINION

Brush-Holder Yoke for Westinghouse No. 49 Motor

BY J. N. GRAHAM, SHOP FOREMAN ROCKFORD & INTERURBAN RAILWAY

A home-made brush-holder yoke, which eliminates most of the brush-holder troubles on the Westinghouse No. 49 motor, has been in use on the Rockford & Interurban Railway's lines for several years with very good results.

The yoke is made of hard maple and is made to fit into the lead seats in the motor frame which are provided for the brush-holders. It is held in place by two ¾-in. x 4-in. machine bolts, the heads of which are cut to ¼ in. in thickness and sunk into the wood for ⅜ in. and covered with ⅛-in. x 2-in. fiber disks sunk level with the face of the yoke. Two plates of cold-rolled steel ¼ in. x 1⅞ in. x 4 in. are riveted to the face of the yoke in the position shown in the illustration. These plates have ½-in. x 1½-in. machine bolts through them to hold the brush-holders in position. The type of brush-holder is either the GE 52 or the GE 1000.



YOKE FOR BRUSH-HOLDER OF NO. 49 MOTOR

In making the yokes great care must be taken to get the plates at perfect right angles; also that they as well as the bolts, which hold the yoke in position, are at an equal distance from the center of the yoke. This will insure that the brushes assume the proper position on the commutator.

Types of Track at Richmond, Va.

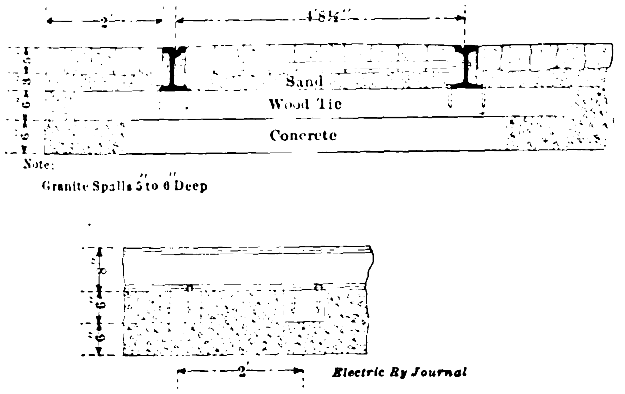
BY T. NORMAN JONES, CHIEF ENGINEER OF RAILWAYS VIRGINIA RAILWAY & POWER COMPANY

In the June 6 issue of the ELECTRIC RAILWAY JOURNAL there appeared an article by A. L. Johnston, Jr., relative to the life of concrete track on Broad Street, Richmond, Va. I should have written before for the benefit of your readers the result of our experience with this track, that those who read the article might be informed of all the facts, but pressure of work has prevented my doing so.

The track in question was constructed in 1896 with white oak ties on concrete foundation. The concrete extended up between and at the ends of ties to the top of same. The rail used weighed 95 lb. to the yard, and was 8 in. high.

We have about completed the reconstruction of approximately 5000 ft. of track constructed as above noted. Our experience with concrete track foundation has been most unsatisfactory, and the type of construction referred to above has been abandoned in Richmond.

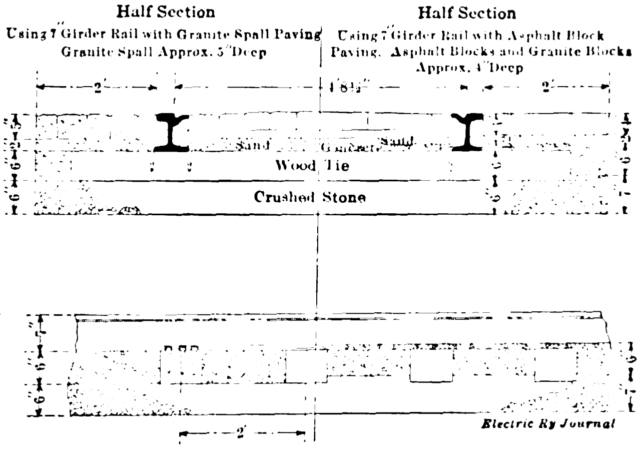
While our records are not complete as to the dates on which the early repairs to this track were made, my investigation made about two years ago satisfied me that the first serious trouble with this track developed in 1903, about seven years after the track was laid. At that time it was found necessary to make extensive repairs at the rail joints, including renewal of some of the bonds (from 1903 to 1908 it was frequently found necessary to renew rail bonds, and in 1909 a very large portion of the bonds had to be renewed) as well as to place shims of steel and wood between the base of the rail and tie, due to the failure of the concrete foundation, although it extended 6 in. below the base of the ties. The repairs to the track grew heavier from year to year, until in 1912 the cost of maintaining about 8000 ft. of this track was about three times that of maintaining a similar length of track laid the same year on a parallel street on earth foundation without any ballast worth naming, yet the earth-supported track was subjected to traffic of very nearly the same density as the track on Broad Street.



EARLY RICHMOND TRACK ON CONCRETE FOUNDATION

I have made a careful study of this track and many other sections of track in Richmond constructed during different years on concrete and other types of foundation. During the spring of 1912 I recommended that the concrete track construction be abandoned and that the tracks in future be constructed with white oak ties on crushed stone foundation, with a concrete slab between and at the ends of the ties to support the paving. The City Council granted us permission in 1912 to change our type of track construction from concrete to crushed stone foundation. This change in type of construction was confirmed by the Administrative Board last year shortly after its organization.

Throughout the entire 5000 ft. of single track, the reconstruction of which has been about completed, we have found the concrete foundation between and below the ties broken beneath both rails. The removal of the concrete base was tedious, as the concrete had to be broken to a convenient size for handling, but the work was not difficult as the foundation was badly cracked throughout. Very few of the old rails were not corrugated and many of them were corrugated very badly.


Half Section
Using 7" Girder Rail with Granite Spall Paving
Granite Spall Approx. 5" Deep
Half Section
Using 7" Girder Rail with Asphalt Block Paving. Asphalt Blocks and Granite Blocks Approx. 4" Deep
2'
4'8½"
2'
Sand
Concrete
Sand
Wood Tie
Crushed Stone
2'
Electric Ry Journal

PRESENT TRACK ON CRUSHED STONE FOUNDATION

For many years past much trouble has been experienced with this track following rainy spells and the melting of snow water would get down in the foundation through the cracked concrete under the rails, causing the concrete to work up and down under traffic. This trouble existed all along most of the rails and was not confined to joints only. Heaving, the result of freezing of the partly water-soaked foundation, was another source of trouble.

Our standard type of track construction, as illustrated, consists of crushed stone or washed gravel ballast on which rest white oak cross-ties, to which 7-in. rail is fastened. The rail section used is Lorain 116/434. Cut spikes are used in fastening the rails to the ties. A concrete paving slab (1:3:5 mixture) is placed between and at the ends of ties to support the paving.

Use of Battery Push-Button Circuit for Tail Lights

BY A MISSOURI CONTRIBUTOR

My attention has been called to a number of rear-end collisions on dark streets and alleys when the trolley wheel came off and left the car in darkness. One accident that I have in mind is where the conductor was on top of the car tying the trolley rope. There were two serious and several minor injuries because of the resulting rear-end crash. Some companies that run in the suburbs have dangerous curves with dead trolley wires therein as a warning to the motorman to slow up.

Suppose that for some unforeseen cause a car should stop in the darkness with no danger lights on the rear end. The chances are that somebody would be hurt and the car would be damaged.

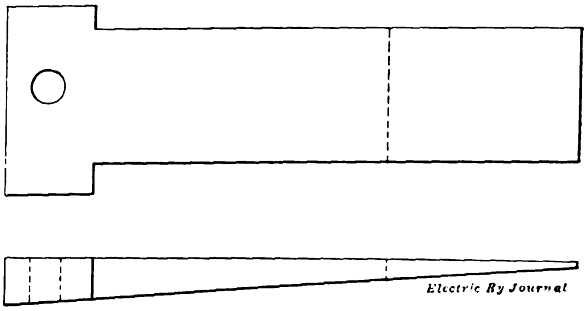
I wish to suggest a "danger signal" which would cost little, because the batteries of the passengers' push-button signal circuit would be utilized for the purpose. If four batteries are used for push buttons an 8-volt, 2-cp lamp can be used on the circuit, or some other lamp according to the number of batteries. The lamp should shine behind a pane of red glass or have a red bulb. The lamp switch should be in front of the motorman. As soon as the trolley pole comes off the motorman could cut in the switch, but as soon as the trolley pole was adjusted he could open it. A car could be equipped for less than $1. It is understood that this scheme is not intended for use when power is off on the whole division.

Hints On and Costs Of Motor Maintenance—II

BY R. H. PARSONS, ELECTRICAL FOREMAN

For a shop overhauling, the old motor should be removed from the trucks, opened and the armature removed. If the motor has once been put into good condition and has had proper carhouse care, it should not be necessary to remove the fields, providing they are tight in the shell and not baked or short-circuited. Fields in good condition, properly installed and not overloaded, should run four or five years before the insulation is baked enough to warrant their removal and reinsulation.

After the armature is removed the brush-holder should be removed for overhauling and the fields tested for short-circuits and grounds. The armature should be inspected and tested and refitted with bearings. In the meantime the shell should be scraped and blown out and treated with a good insulating paint. The dowel pins should also be tightened or renewed, the oil receptacles cleaned and the brush-holder supports inspected or renewed if necessary.



FIBER WEDGE FOR GAGING BRUSH-HOLDERS

While the shell is being overhauled, the armature should be tested for short or open circuits and grounds. This can be done best by passing a small current through the coils, and taking the drop between each bar with a millivoltmeter to detect any loose connections or short-circuits. The shaft should be examined to see if it is straight and smooth. The commutator bars should be tried to see if they are tight. Then the commutator should be turned and the mica undercut. Upon this the armature should be painted, a good oilproof varnish being used for the string band, and the shafts should be refitted with bearings.

While the undercutting of mica is a decided aid to good commutation, improper slotting is worse than none at all. Saws or slotting tools of the proper thickness to the thousandth of an inch should be used to make sure that every particle of mica is removed, for a little strip in the edge of the slot will cause jumping of the brushes and soon develop flat spots in the commutator.

Cut-out leads of armatures should not be allowed. It is the custom of many roads to cut out a grounded or open-circuited lead, using a jumper in its place and then turning the armature out for service. This practice simply adds trouble, for if it is done once it will be done again. Frequently armatures are found with a large number of the leads cut out. This is not economical practice because the added current due to lowering the resistance of the armature causes greater heating in the motor, for then the jumpered motor endeavors to do more work than its mate. Eventually the fields are roasted and the armature must be rewound. If the defective coil had been renewed or repaired when the armature first came in for trouble, the armature would have gone out practically as good as new and the motor would have taken only its proper share of the load. When a road has to go into receivership, the armatures are usually found full of jumpers. Jumpered armatures and receiverships are not necessarily Siamese twins, but the fact remains that they are often found together.

Before assembling the motor the surfaces of the shell should be thoroughly cleaned, and when the shell is tightened onto the bearings the armature should move easily enough to be turned by hand. At the same time the bearings must be tight enough in the housings to prevent the leakage of oil.

The setting of the brush-holders is as important a task as any. The man who does this must see that the brush-holders have the proper lateral position on the commutator to prevent the brushes from making a ridge; also, that they are so set that the brushes will rest squarely on the bars and that the spacing is correct for the motor in question. The tension should be adjusted, and the correct height from the bars be followed. For gaging the height of the brush-holders, a fiber wedge similar to that shown in an accompanying sketch will be found useful. This wedge can be made with a mark to show what point on it will give the clearance desired. This clearance usually is 3/16 in. Place the wedge on the commutator, set the brush-holder in position and drop it until it hits the wedge at the place marked. Then tighten the brush-holder and remove the wedge. Sometimes a man will use a screwdriver or a rule for this purpose but the wedge will be found correct and simple. Further, it will save a man from trying to hold the brush-holder to proper height with one hand and tightening it with the other. The wedge is also used to check the gage of the brush-holder when it is not necessary to remove it, and as it is of fiber it will not cut the commutator.

When brushes are placed in the holders, the advantages which are derived from fitting the brushes to the curve of the commutator by drawing a piece of sandpaper under the brush, with the brush in place and held down by the spring or hand, greatly offset the labor of doing so. While the commutator is running at a moderately high speed it should be smoothed by holding a piece of fine sandpaper on it. Then the brushes are fitted and also cleaned on the wearing surface after the sandpapering of the commutator is completed to prevent particles of copper from adhering to the brush and cutting the commutator. Finally, the motor is given a light running test to try out the bearings for heating and for commutation. It is not necessary to give each motor a load test, as one familiar with each type can quickly detect any defect by the light running test, especially since the fields and armature have been individually tested.

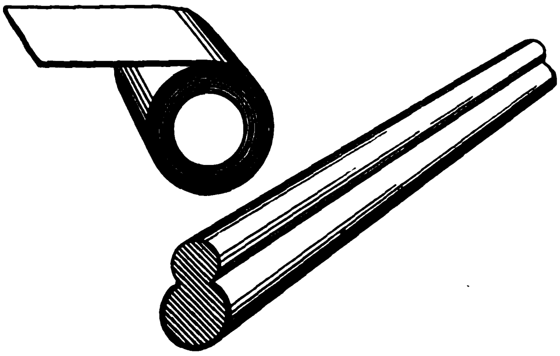
MODERN MOTORS

The maintenance and repairs of modern motors, while following the old procedure in many respects, is much easier and cheaper. It is not necessary to check the armature clearance except on a weekly inspection, nor is it necessary to oil the motors on short periods for many of them will go thirty days without replenishment. The repairs can be made more easily because the parts are more uniform and interchangeable. As the shafts are large in proportion to the armature, the bearings often will run five years, or 250,000 miles, before rebabbitting. Further, as the commutation is good the brushes will frequently last nearly as long. These improvements simplify the shop repairs to such an extent that a motor removed from the track and placed on the floor can often be passed without any repairs whatsoever after an inspection has shown its bearings to be safe for another overhauling period. In that event the brush-holders should be removed and cleaned, the fields tried for looseness and the armature and fields tested for grounds. From the appearance of the commutator it can be determined if the fields and armature are free from short-circuits, as this trouble is quickly reflected in the commutator. The slots should be cleaned by drawing a broken hack-saw blade, using the back side as the scraper, through the slot. Any little burrs should be removed from the commutator with a fine file, the hood and string band painted with an oilproof varnish, and the brush-holders and carbons replaced. The leads should then be inspected and painted. After the usual running test, the motor is again ready for service.

A Removable Conducting Jacket for Trolley Wire and Other Conductors

Louis Steinberger, president Electrose Manufacturing Company, Brooklyn, N. Y., who is well known for his inventions in the insulator field, has just secured a patent on what he terms a "flexible electric conductor," which is adapted more particularly to the trolley conductors of railways. In brief, the invention is intended to combine the high conductivity of, say, a copper jacket with the great strength of the steel around which it is wrapped. The conductor as a whole, therefore, comprises a longitudinal supporting member and a removable ribbon of metal with a low ohmic resistance and provided with a suitable contact surface.

The ribbon may be applied to the supporting wire when the latter is manufactured, or may be placed in position upon it at any time after the wire is suspended; moreover, the ribbon may be cut into any convenient lengths. A worn portion of the ribbon may be readily replaced at low cost. The ribbon carrying the contact face may be applied to compensate for the difference in the co-efficients of expansion or contraction between the body portion of the conductor and the ribbon.

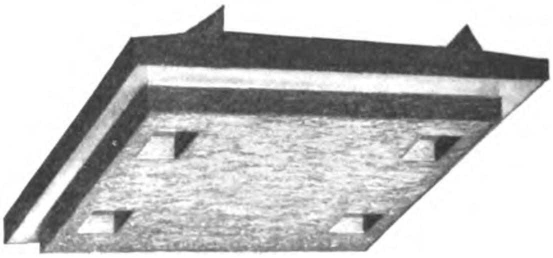

STRIP CONDUCTOR JACKET AND ITS APPLICATION TO FIG. 8 TROLLEY WIRE

One of the accompanying drawings shows the improved conductor applied to "figure eight" wire. A ribbon of copper is bent under and partially around the lower lobe to form a conducting envelope. A second view shows a roll of copper ribbon as used for splicing or patching.

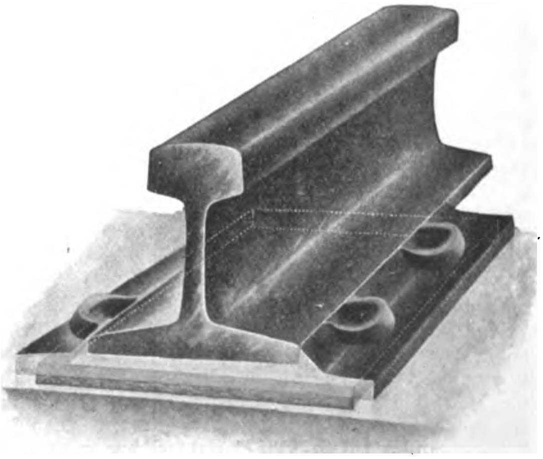
The conductor is suitable for either direct or alternating currents, but for the latter it has a peculiar advantage due to the fact that the copper ribbon involves the principles of the "skin effect." This principle follows from the known fact that alternating currents, and especially currents of high frequency, seek to follow the outside rather than the inside of a conducting body; consequently if the outside is of conducting material of very low ohmic resistance, the conductivity of the conductor as a whole is greatly increased.

A Padded Tie Plate

On foreign railway lines the use of felt pads under metal tie plates to produce a comparatively silent roadway and decrease maintenance has met with good results, although the question of design has not been exploited to the limit. A more effective application of this principle to American conditions has recently been invented by the Track Specialties Company, New York. The new shock absorbing plate is available anywhere, but, naturally, is most useful for subway and elevated construction.


VIEW OF NOISELESS TIE PLATE WITH BOTTOM UP, SHOWING APPLICATION OF COW-HAIR FELT PAD

The means used by this company to get a noiseless roadway is to cast the tie plates of malleable iron with a bottom panel into which a cow hair felt pad 5½ in. x 8½ in. x ½ in. deep is inserted. The pad is protected against the action of the weather, and, at the same time, is held securely so as to absorb all shocks. These pads are designed not only to protect the ties, rail and tie plate, but also to take up some of the shocks now transmitted to the cars. The construction of the metal plate in malleable iron assures additional life because of the slow corrosion of this metal. It is believed that the combined plate, which has been named the "Superior," will last as long as the tie or even for the life of the rail. It should not be disturbed, unless the ties are being replaced or the rails relaid.


VIEW OF NOISELESS TIE PLATE WITH FELT PAD AS APPLIED UNDER A RAIL

News of Electric Railways

The I. C. C. New Haven Report

The report of the Interstate Commerce Commission in regard to the investigation which it conducted into the affairs of the New York, New Haven & Hartford Railroad was transmitted to the Senate on July 12. The principal findings against the management follow:

That the conduct of the financial operations of the New York, New Haven & Hartford Railroad presents "one of the most glaring instances of maladministration in all the history of American railroading."

That this maladministration resulted in an absolute loss of $65,871,299.

That the road's directors were guilty of gross dereliction of duty and of a breach of trust that was "morally wrong and criminal in its fruits."

That the downward movement of Boston & Maine stock did not begin until the Mellen-Morgan-Rockefeller management was forced upon it.

That the alleged purchase by John L. Billard of 109,948 shares of Boston & Maine stock and its resale to the New Haven was a fraudulent transaction; that Billard never bought a share of Boston & Maine stock except with money furnished by the New Haven and never sold a share except as the New Haven dictated; that the Billard Company was used by the New Haven to take over some of its own questionable assets and assets which it was desirous of concealing, and that Billard burned the company's books for the purpose of getting them out of the way.

That the New England Investment & Security Company was a device conceived to carry out the policy of the New Haven to acquire the electric railways of Massachusetts, and that it operated in violation of the Massachusetts laws and in flagrant violation of an injunction issued by the highest court of that State.

That the New England Navigation Company, after sale of its steamship properties, was utilized as a holding company for the accomplishment of irregular transactions which were indefensible under any test of sound business management.

That the practice was general of transferring funds from the New Haven back and forth to its 336 subsidiaries for the purpose of declaring dividends.

That the acquisition of the New York, Westchester & Boston Railway and the New York & Port Chester Railway was a profligate waste of corporate funds.

That the frequency with which dummy corporations and dummy directors appear in the New Haven's records leads to the conclusion that some one high in the councils of the road "had an obsession upon the subject of the utility of such sham methods."

The commission says that the standard of business ethics and the absence of financial acumen displayed in directing the destinies of the railroad and in the attempt to establish a monopoly of transportation in New England is indefensible. In characterizing the purchase of the New York, Westchester & Boston Railway as a story of profligate waste of corporate funds, the commission says that the road was not necessary as a part of the New Haven system and that the first information the board of directors had concerning the "extravagant acquisition" was on Nov. 8, 1907, when the committee which negotiated the purchase made its only report. It was then learned, says the commission, that "$11,150,000 had been expended in obtaining control of two insolvent promotion schemes and that this expenditure carried with it an obligation to construct two railroads under franchises of doubtful validity, paralleling the existing lines of the New Haven." Mr. Mellen's testimony is quoted in connection with this deal.

The commission reviews in detail the plans which were adopted for exchanging the New Haven stock for New York & Portchester and New York, Westchester & Boston securities and refers to the due bills which were issued in connection with these deals. It expresses the opinion that "it would seem that the amount legally expended could be recovered from Mr. Mellen and the directors who authorized it." According to the commission the total construction cost of the road as reported on June 30, 1913, was $22,344,165. The principal figures in this report follow: Land, $5,090,641; tangible street railway capital, $229,744; right-of-way, $9,448,649; electric line, $625,978; buildings and structures, $1,569,575; rolling stock and miscellaneous equipment, $843,169; construction expenses, including interest, $4,536,444. The commission says to this figure of $22,344,165 must be added the $14,090,008 expended before the construction began, making a total of $36,434,173, or a cost per mile of $2,020,752. It says that in providing the money for this construction bonds to the extent of $17,000,000 guaranteed by the New Haven Railroad were sold at a discount of $1,200,000. The commission says that the one accomplished result of the Westchester transaction was the stifling of possible competition into New York City from New England. It lays the blame for the Westchester transaction upon the directors of the New Haven road, saying that some are guilty of acts committed and others—the greater number—for their failure to act. It holds that all are alike culpable and responsible to the stockholders.

In connection with the taking over of the electric railways in Rhode Island the commission says that the purchase of these properties "was another instance of millions wasted in acquiring properties that bring an annual deficit instead of a surplus and constitute a liability instead of an asset in the New Haven system." The expenditures by the New Haven in money and securities in this connection are placed at $24,352,336 in acquiring a cash investment of $9,685,500. It reviews briefly the multiplicity of corporations involved in these transactions, these companies including the Rhode Island Company, New England Navigation Company, New England Investment & Security Company, Providence Securities Company and Rhode Island Securities Company. It says that the properties in Rhode Island have stood the New Haven system an average annual loss of approximately $648,680. It characterizes the Rhode Island and the Connecticut electric railway ventures of the New Haven Railroad as "further evidences of the prodigality in the expenditure of the money of the New Haven stockholders in carrying out an unlawful policy of transportation monopoly."

The report contains the correspondence between the commission and J. P. Morgan & Company regarding the proposal to have the representatives of the commission go over the books of the concern. The final paragraphs of the report deal with the legal status of the New Haven directors and contain the following comment:

"This investigation has demonstrated that the monopoly theory of those controlling the New Haven was unsound and mischievous in its effects. To achieve such monopoly meant the reckless and scandalous expenditure of money; it meant the attempt to control public opinion; corruption of government; the attempt to prevent the political and economic instincts of the people in insolent defiance of law. Through exposure of the methods of this monopoly the invisible government which has gone far in its efforts to dominate New England has been made visible.

"It has been clearly proved how public opinion was distorted; how officials who were needed and who could be bought were bought; how newspapers that could be subsidized were subsidized; how a college professor and publicists secretly accepted money from the New Haven while masking as a representative of a great American university and as the guardians of the interests of the people; how agencies of information to the public were prostituted wherever they could be prostituted in order to carry out a scheme of private transportation monopoly imperial in its scope."

The commission recommends:

Civil and criminal prosecution of the responsible directors of the New Haven.

The prosecution of John L. Billard and of all persons who were concerned with him in the purchase of the Boston & Maine stock.

That suit be brought against Marsden J. Perry and Oakleigh Thorne to recover for improper or double commissions paid in connection with the Westchester deal; also for $1,524,072 expended by Charles S. Mellen in obtaining the Westchester franchises and for the $2,748,700 paid to John L. Billard in the Boston & Maine stock transaction.

On the question of immunity the commission defends its action in compelling Charles S. Mellen and other directors of the New Haven to testify on the ground that it was better to expose wrongdoing even at the expense of giving immunity to a few witnesses than to leave the facts under cover and thereby give immunity to all, not only as to prosecution, but as to the stigma of exposure as well.

The following interesting comment on the report was made by John W. H. Crim, personal counsel of Mr. Mellen:

"Much is said about the increase in capitalization from $93,000,000 in 1903 to $417,000,000 at present. It ought to be remembered that in 1903 the New Haven owned 400 miles of road and leased 400 miles. It owns 7000 miles to-day. Hundreds of miles were taken over from bankrupt companies, the Central New England Railroad having always been a bankrupt road.

"The commission talks about the purchase of the Connecticut trolleys. They were purchasing Connecticut trolleys ten years before Mr. Mellen went to the New Haven. Of course they had to pay well for them. People foresaw their prosperity and held them for high prices. But these very electric railways earned 4 per cent dividends in 1913, and 5 per cent in 1914. And they are steadily increasing in value. It is not too much to say that the time will come when the electric railways will be the money-makers of the whole system. I had rather have the electric railways than the New Haven road itself. It would have been in the hands of receivers this year had it not been for the earnings of the electric railways. The earnings of the New Haven are eaten up by terminal charges. It costs 23 cents for every passenger who passes through the Grand Central Station. The electric railways are free from such expenses. The New Haven built many of its electric railways for this reason, recognizing that the short haul is unprofitable on a railroad line, and feeling the need of the electric railways for local business.

"I know of a case in New England. A railroad connecting two towns charged a 30-cent fare, and made about $3,000 a year. Mr. Mellen went up there, looked it over, and scrapped the railroad. He put in an electric railway and charged 10-cent fares. The following year the line showed 1500 per cent more profit.

"If the New Haven can keep its electric railways for ten years more, they will prove a wonderful source of income for the road. Indeed, if the attack on the railroad had not come when it did, it would have been shown that the road was not overcapitalized. It would soon have been in a position to show its earning power."

It was stated unofficially in Washington on July 15 that Attorney-General McReynolds had decided to file a suit for the dissolution of the company under the anti-trust law. As to possible criminal prosecution, it was said that if such prosecutions should become necessary they would naturally follow the conclusion of the civil suit.

Plans for Completing Dallas-Greenville Line

It has been announced that arrangements have been completed by which the Stone & Webster Engineering Corporation, through its district headquarters at Dallas, will complete the line of the Eastern Texas Traction Company between Dallas and Greenville. The grading and the construction of bridges, culverts, cuts and fills, which have been in progress for more than a year under the direction of Karner Brothers, has been practically completed and the roadbed is in condition for the immediate laying of the rails. The stockholders voted on July 2 to increase the number of directors of the company from three to seven, and the following new directors were elected: E. T. Moore, Richard Meriweather, Rhodes S. Baker and R. E. L. Knight. The first two mentioned are connected with the Stone & Webster Engineering Corporation, and the latter are members of the law firm of Spence, Knight, Baker & Harris, attorneys for the Eastern Texas Traction Company. The three former directors who now make up the seven are F. E. White, J. W. Crotty and T. G. Nichols, Greenville.

Proposed Draft of Des Moines Ordinance

The proposed franchise for the Des Moines City Railway which was recently submitted by the company to the city commissioners for their approval, provides for a franchise period of twenty-five years after the date of the formal adoption of the ordinance by the voters of the city. The other main provisions of the ordinance are as follows:

The company is to permit the use of its track by interurban railways, subject to the rules provided for its own cars, for a compensation to be fixed by mutual agreement or by state law. The city company is required to construct connecting tracks, overhead trolleys and adequate terminal facilities for the interurban lines. Upon the failure of the interurban railway to pay its compensation promptly its rights are to be suspended until payment, unless it gives a sufficient bond to be fixed by the railroad commissioners. The city company is given permission to use its tracks for hauling freight, baggage, mail and express matter, subject to resolution of City Council, provided this service does not obstruct regular passenger traffic.

The company is required within three years to expend $1,500,000 for the following: (1) construction of 5 miles of new lines or extensions; (2) removal of present unused tracks; (3) reconstruction of at least 20 miles of existing tracks with new rails; (4) increase of present power plant; (5) purchase of twenty-five new double-truck cars; (6) the construction of a line from the intersection of Seventh and Mulberry Streets across the viaduct on Seventh Street and over a new bridge on Seventh Street to a connection with its existing line now running to Fort Des Moines; and (7) the purchase from the Interurban Railway of the "Valley Junction Line" and the "Army Post Line" and the sale to the above company of the "Urbandale Line."

Whenever a majority of the adult residents of any district not served by the company petition the City Council for an extension, the company may be required to make the extension, provided the territory contains a sufficient population to produce a revenue equal to the cost of operating cars (including ordinary maintenance of tracks, cars and overhead trolley), together with reasonable depreciation upon the cost of the extension and the equipment used. The company is required to pay for the paving or repaving between its tracks and 1 ft. on each side of each outer rail and it must also keep in repair a similar portion of the pavement and floor of each bridge and viaduct crossed by its tracks. Without compensation it must permit its poles to be used by the city for signal, telephone and telegraph and electric light service.

The company's value is made equal to $2,754,000 for bonds, $1,305,000 for stock and $1,356,000 for bills payable, or a total of $5,415,000, to which there is added the previously mentioned $1,500,000 required for reconstruction and rehabilitation purposes. The company is to be allowed to pay dividends at the rate of 6 per cent per annum, and higher dividends according to the following: 7 per cent during any calendar year in which the company shall sell six tickets for 25 cents; 8 per cent for five tickets for 20 cents; 9 per cent for four tickets for 15 cents; 10 per cent for ten tickets for 35 cents. Out of the gross earnings the company is to pay the actual operating expenses, including ordinary maintenance, insurance premiums, injuries and damage claims not compensated by insurance; taxes of every nature, interest on bonds and other securities, depreciation not to exceed 5 per cent of the gross earnings unless the total dividends exceed 6 per cent and the dividends on stock.

Immediately upon the passage of the ordinance the City Council is to elect a city supervisor who is to hold office at its pleasure but who may be removed by a two-thirds vote. The company is to elect a company supervisor. These two supervisors shall control service, schedules, routes and terminals, character and equipment of cars, cost of service, extensions, rate of fare, the distribution of expenditures and the manner of keeping accounts. The city and the company before Dec. 15 each year are to select an engineer not a resident of the city. If the two supervisors fail to agree in any matter pertaining to the reconstruction and re-equipment of existing lines or the construction and equipment of any new line or extension, the matter must be submitted to the consulting engineer for final decision. For any differences that may not be decided by the consulting engineer the ordinance provides an impartial board of arbitration jointly chosen.

The maximum rate of fare for a single continuous ride shall be 5 cents. It is provided, however, that if on Jan. 31 of any year from the net earnings for the twelve months ended on Dec. 31 preceding there shall remain above the fixed charges an amount sufficient to have permitted the payment of dividends of 7 per cent if the company had sold six tickets for 25 cents during these twelve months, the company must sell for the ensuing twelve months six tickets for 25 cents. Similar provisions are made in regard to the other rates of return. Transfers are provided at all intersecting points and on lines within 300 ft. of the transfer line, provided the passenger is not reversing his general direction of travel. No free passengers are to be allowed except firemen and policemen in full uniform and employees of the company. The salaries paid by the company are subject to regulation by the city and to arbitration in case of disagreement. The ordinance also provides that upon six months' previous notice in writing the city may purchase the entire railway system for one of three choices of consideration. The ordinance is to go into effect sixty days after being accepted by the voters of the city.

Mr. Whitridge on Current Events

Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., sailed on July 14 for Liverpool after spending five weeks in New York attending to business since he arrived on the *Aquitania* on June 5. He expects to be away about three months. Mr. Whitridge is reported to have said:

"I am coming back on the crest of the Wilson boom. I cannot give the exact day, but I have booked my return passage in October so as to give the boom sufficient time to come along.

"The Interstate Commerce Commission seems to be a clumsy, inarticulate lot, with a penchant for shady lawyers. I am not subject to their jurisdiction, and cannot speak of them from experience, but I have read their maunderings about their foolish and futile valuation notions, and I was told a few months ago of the illegal and impertinent questions they sent to the railroads. Some of the railroad presidents refused to answer, but I presume many of them did, for our public is being rapidly educated to believe that an official demand for the kotow may not be refused. If it is not, however, stoutly refused, some of our officials never will learn that humility which is the beginning of wisdom.

"Many railroad men also tell me that under the system of accounts prescribed by the commission, the object, or certainly the effect, is to make net earnings loom unnaturally large by charges to capital which should be made to operation. If this be so, the ultimate consequence cannot but be disastrous. Whether it is true or not, it is evident that the commission is slower than death to recognize the necessity for increasing rates, and, therefore, however conscientious the members may be, they are afraid, though they can be brave enough over a State scandal.

"It is also evident that the commission has not got a glimmer of the truth expressed a year or so ago in England by the Prime Minister, Mr. Asquith. On the occasion of settling a strike by the increase of wages which had been awarded by arbitrators, Mr. Asquith said to the railroads that in order to help them to grant the increase he would promise legislation which would 'pass the extra charge on to the public.' That is what we must learn here. Public authorities are continually imposing charges upon the railroads, increased taxes, full crew laws, arbitrations, increasing wages, compensation acts, etc., which all in effect constitute charges prior to our mortgage bonds.

"Now that rascality and bad management are supposed to have been eliminated by State regulation, and there can be no cooking of accounts, where is the money to come from to pay these charges, except from the pockets of the public? If the railroads are to remain solvent and efficient, all such charges as these must, as Mr. Asquith said, be 'passed on to the public.' The press is beginning to perceive this. Until the Interstate Commerce Commission learns it, the gigantic boom Mr. Wilson has promised us will, notwithstanding the crops, remain stalled."

Another Franchise Proposed in Toledo

The franchise proposal of the Non-Partisan League was submitted to the franchise committee of the City Council of Toledo, Ohio, on the evening of July 14. The committee will consider an July 20 all franchise proposals made up to the present time.

The Non-Partisan League draft is intended as an alternative to the Thurstin-Campbell, or municipal ownership, plan, which will be voted upon by the people in August. The franchise covers a period of twenty-five years from the day it becomes operative and includes all the railroad property now in existence within the city limits and all extensions built in the future. It is provided that other companies may use the tracks and overhead equipment of the Toledo Railways & Light Company upon such terms as the Council may deem proper. The city is to exercise the same regulatory care over such other company as over the original holder of the franchise. The company is obligated to pave or repave between its tracks and to a distance of 12 in. outside and keep this paving in repair. Ice and snow must be taken from the tracks and during the summer months the company must keep them sprinkled.

Within eighteen months after the ordinance goes into effect the company must have all its cars equipped with pay-as-you-enter or pay-as-you-leave appliances. If possible 150 of the cars are to be so equipped within five months. This is to be done either by the replacement of the present cars with new ones or by converting the old ones. The city reserves the right to control service, fix schedules and routes, designate the character of the cars and increase service. Should the Council insist upon service that, in the opinion of the company, would impair the interest fund the company may resort to arbitration.

The right is reserved to the city to allow interurban railways to use the tracks, poles, wires and power within the city limits upon such terms as the Council may deem equitable. Interurban railways seeking entrance must each have at least 10 miles of track outside the city before they can secure the rights mentioned, and such company's tracks are to be used only to reach an interurban terminal within the city and not for local business.

A street railway commissioner is to be appointed by the Mayor with the approval of Council. His salary is not to exceed $750 a month. The expense of his department is limited to 1 per cent of the amount set apart any month as an operating fund. The company is to furnish suitable offices for the commissioner.

All questions or possible disagreements not exempted by the franchise are to be subject to arbitration. The party bringing up the question first is to select a member of a board of arbitration and notify the other party, who will then select a member and these two are to choose the third. If they fail to agree the member of the Public Utilities Commission whose term expires first is to make the appointment. Should he fail to act, the member of the commission whose term expires next is to perform this duty, and finally the third, if found necessary. Specific directions are given for the submission of questions to arbitration and the manner in which they shall be taken up and treated.

Should the city and company not agree upon a valuation for the purpose of fixing the rate of fare and the return to the company, the question is to be submitted to arbitration. No values are to be allowed for anything except the physical and tangible property.

The company is authorized to sell its capital stock at not less than par and its bonds at a price that will yield not more than 6 per cent on par. All bonds are to contain a provision making them payable at 105 and accrued interest on ninety days' notice at any interest period. The company is to provide for refunding all indebtedness or liabilities constituting a lien on the street railway property. An interest fund of $250,000 is to be created by depositing that amount from funds on hand or from the sale of stock or bonds for that purpose. Each month the amount remaining after deducting from the gross receipts for the month 11½ cents per car mile for the regular motor cars, and 60 per cent of 11½ cents per car mile made by trail cars, and sums provided for maintenance, renewal and depreciation is to be deposited and constitute the interest fund, out of which all taxes, interest, dividends and other payments are to be made.

This allowance may be increased at times if found necessary to meet extraordinary expenses.

The maintenance fund is provided by an allowance of 4 cents per car mile during January, February, March, April, May and November and 5 cents per car mile for June, July, August, September, October and December for motor cars and 60 per cent of these rates for trail cars. If found necessary an increase may also be made in the allowance for maintenance and depreciation.

The maximum rate of fare for each passenger eight years of age or over is to be 5 cents cash or six tickets for 25 cents, with transfer to any other line necessary to reach a desired point. In addition to this the following scale of fares has been established:

a. Five cents cash with free transfer, eight tickets for 25 cents, 1 cent for transfer.

b. Five cents cash with free transfer, 3 cents when exact change is tendered, five tickets for 15 cents, 1 cent for transfer.

c. Five cents cash fare, with transfer free, 3 cents when exact change is tendered, four tickets for 10 cents, 1 cent cent for transfer.

d. Five cents cash fare, with free transfer, 3 cents when exact change is tendered, four tickets for 9 cents, 1 cent for transfer.

e. Five cents cash fare, with free transfer, 2 cents when exact change is tendered, five tickets for 10 cents, 1 cent for transfer.

f. Five cents cash fare, with transfer, 2 cents when exact change is tendered, eight tickets for 14 cents, 1 cent for transfer.

Children under eight years of age, 1 cent, and children in arms, free.

The rate of fare to be put into effect when the ordinance becomes effective is that noted in paragraph *a.* This is to continue eight months if 150 of the newly equipped cars are in operation within five months from the time the ordinance becomes operative. If not then this rate is to continue three months beyond the date they are put into operation. This will constitute the trial fare. If, at the end of the period named, the interest fund is below $250,000, the next higher fare is to be installed and continue six months. Thereafter that rate is to be changed to a lower rate whenever the interest fund of $250,000 is exceeded by $100,000, or has reached $350,000.

Provision is made for the acquisition of the property by the city. The return on the capital value is to be 6 per cent from the start, but provision has been made for higher returns in proportion to possible reductions in the rate of fare.

William Barclay Parsons to Report on Detroit Transportation

William Barclay Parsons, of Barclay Parsons & Knapp, New York engineers, has been retained by the Detroit Street Railway Commission to report on Detroit's transportation needs. The total cost will be $32,000. The commission will ask the Common Council to appropriate this amount out of the remaining $50,000 at the command of the commission. The work is to begin as soon as the contract is signed and the appropriation made.

Mr. Parsons will submit to the commission six sets of plans for the relief of present crowded traffic conditions. Whether these plans will include subways will depend upon his findings regarding the advisability of the project. With each plan will be an estimate of the approximate cost, the number of passengers the system will be able to care for, and the profits likely to be derived. The plans will be of such a nature that specifications for the construction of lines can be drawn directly from them. The terms of the contract provide that Mr. Parsons is to receive $5,000 a week for five weeks and the remainder of the $32,000 when his specifications have been completed and accepted by the commission.

Corporation Counsel Lawson of Detroit has rendered an opinion to the effect that the Detroit United Railway is not obliged to render any assistance to the Street Railway Commission in the appraisal which is now being made by Prof. E. W. Bemis, and that any assistance so given by the company is purely in the nature of courtesy. The company has arranged to give full access to representatives of the appraisers to all of the company's property within the city and to provide such other data as they may desire.

The Kansas City Aftermath

Shortly after the ordinance extending the franchise of the Metropolitan Street Railway, Kansas City, to thirty years, was passed, Philip J. Kealy, the company's representative on the board of control, left for Chicago, with Robert P. Woods, the city's representative. The two members plan to spend about ten days inspecting railway systems in the East and Middle West.

The company has ordered the half-fare tickets for children between the ages of eight and twelve. They will be distributed as soon as the printer delivers them. Half-fare tickets will be carried by conductors and will be sold at various stations.

Indications are that little other action will be taken until Judge Hook, of the federal court, outlines a plan for the reorganization of the company and the clearing of the receivership. Officers of the company stated that their efforts would be devoted to the reorganization for the present, and that other matters would be taken up later.

The company has not yet named its six directors, though the two receivers were selected as members. Frank Hagerman, temporary president of the Kansas City Railways Company, left on a short vacation following the election.

The salaries of the two members of the board of control were fixed at $7,500 a year. The board will care for all duties heretofore handled by the receivers.

The Nelson papers in Kansas City continued their attacks on the company following the election, alleging unfair tactics at the polls. Joseph Siegel was arrested on the day of the election and pleaded guilty to voting twice, once for and once against the franchise. He was sentenced to two years in the penitentiary.

Elsewhere in this issue extended reference is made to the means adopted by the company to ascertain the attitude of the voters in advance of the election, and an abstract is published of the new franchise grant.

Rapid Transit Construction Progress in New York

Alfred Craven, chief engineer of the Public Service Commission for the First District of New York, has notified the commission that the Terry & Tench Company, Inc., the contractor for the construction of additional tracks of the Fulton Street elevated line in Brooklyn, for operation under the dual system agreements by the New York Municipal Railway Corporation, had, on June 25 begun work on its contract by delivering its plant on the line at Fulton Street near Troy Avenue. The Fulton Street line is now a two-track railroad, but under the dual system plan a third track will be added to provide express service in the rush hours.

The commission adopted the form of contract for the construction of Section No. 2 of Route No. 48, which is a part of the William Street branch of the Seventh Avenue subway in Manhattan, for operation by the Interborough Rapid Transit Company, and has transmitted it to the Interborough Company for its criticisms and suggestions. As soon as the contract is returned by the company the commission will put it in permanent form and advertise for bids.

The Board of Estimate & Apportionment has approved of the award of the contract for the construction of Section No. 1-A of Routes Nos. 4 and 38, part of the Seventh Avenue subway in Manhattan, to the Rapid Transit Subway Construction Company, the lowest bidder, for $474,244.

The commission has received bids for the supply of special work for the Fourth Avenue subway in Brooklyn. The Indianapolis Switch & Frog Company, Springfield, Ohio, was the lowest bidder for this work.

During the week Chairman Edward E. McCall and Commissioner Milo R. Maltbie held an informal hearing in regard to the construction of a subway up Central Park West, Manhattan. Suggestions were made that this line could be connected either with the new Broadway subway, for operation by the New York Municipal Railway Corporation, or with the existing subway at Columbus Circle. Chairman McCall made the statement that the commission was in favor of the construction of such a line, but did not have sufficient funds to carry it out. He promised his audience that if they would wait on the Board of Estimate and Apportionment and secure its promise of an appropriation for the line, the commission would act on it favorably.

Centralized Control in Chicago

In a report made public by Montague Ferry, Chicago commissioner of public service, he suggests that the close relationship shown among public service corporations in that city may constitute a grave menace to the public, and urges a further investigation by the State Public Service Commission to determine whether the city suffers by reason of the centralized control. Named in particular in the report are Samuel Insull, John J. Mitchell, James A. Patten, Henry A. Blair and Ira M. Cobe, who, according to Mr. Ferry, exercise control over the Commonwealth Edison Company, the People's Gaslight & Coke Company, the Chicago Elevated Railways, the Chicago Surface Lines and numerous utility companies in surrounding towns. A chart, which accompanied the report, was said by Mr. Ferry to show that "three men constitute a majority of the executive committee of five which directs the business of the Commonwealth Edison Company; that the same three constitute a majority of the board of directors of the gas company; that Mr. Insull and Mr. Blair, who is also a director in the Commonwealth, are a majority of the executive committee of three which controls the elevated lines; that Mr. Blair, as chairman of the board, is the controlling factor in the Chicago Railways; that Samuel Insull, with men holding salaried positions in the Commonwealth Edison Company, controls the Public Service Company of Northern Illinois and the Middle West Utilities Company."

Mr. Ferry said:

"No facts are in the possession of the department of public service which would justify the statement that the prices paid for current by the several transportation companies is excessive. But the circumstances under which these contracts were made, with substantially the same men as buyers and sellers, suggest inquiry."

The report was asked for by the City Council and will be considered by the committee on gas, oil and electric light.

Samuel Insull has answered Mr. Ferry in part as follows:

"The stockholders of each of the companies are thousands in number. None of the directors could hold their positions unless they had the confidence of the security holders. So far as the public is interested, for years the prices paid for electricity, and for gas, too, were regulated by the City Council. Now such prices are regulated by the Public Service Commission. We cannot issue any securities, we cannot take any step without going to that body.

"All of these enterprises are monopolies in their separate fields, and rightly so. The city has been trying for years to get a unified transportation service, with universal transfers. I do not see how it is possible to get one system, a single fare and universal transfers except by having all the lines controlled by one set of men. The way to run the business of electrical production most economically is to run it as a monopoly. The same thing is true of gas. If the electrical company sells electrical energy to the transportation company the price the latter pays cannot be covered up. The Public Service Commission knows that price and passes on it.

"The best reply to Mr. Ferry is, that whenever Chicago has investigated prices in other cities for electricity furnished for transportation and other purposes, it has been proved that in Chicago electrical current is sold at a lower price than it is in any other large city in the world. Of course, we do not pretend to compete with hydraulically generated power.

"The only general reply I can make is that experience shows—and the statement is provable by figures—that electricity can be sold to the consumer at the lowest price when all the electrical energy of the community is produced under one system of generation and distribution. What is true of electricity is true of gas and of transportation."

Plans for a new audit of financial dealings of the surface railways with the city were outlined at the meeting of the Council committee on local transportation on July 7. It was decided that the new audit should take into consideration the 1907 and subsequent traction ordinances, including the 1913 unification measure, and should show what has been done under both the corporation counsel's interpretation of the ordinances and that of the board of supervising engineers. It was agreed that the audit should be done by Nov. 1.

The Hazleton Strike

The Lehigh Traction Company, Hazelton, Pa., is reported to have defaulted in the payment of the interest due on June 1 on its $500,000 of first mortgage 5 per cent gold bonds. A committee has been appointed to investigate the affairs of the company, and the Northern Trust Company, Philadelphia, Pa., has been designated as depositor for the bonds. The investigation into the affairs of the company will be conducted by W. F. Snyder, president of the Northern Trust Company, and W. H. Watts and G. P. Bursell of Robert Glendenning & Company, bankers, Philadelphia. George W. Pepper has been retained as attorney.

The Wilkes-Barre & Hazelton Railroad, which controls the Lehigh Traction Company, defaulted in the payment of the interest on its $1,900,000 of collateral trust 5 per cent bonds due on May 15. As stated previously in the ELECTRIC RAILWAY JOURNAL this company requested bondholders to accept in return for their May 15 certificates and all other certificates up to and including Nov. 15, 1916, non-interest-bearing certificates as the different coupons become due.

The financial difficulties of the Lehigh Traction Company are attributed in part to the strike of its employees which has been in progress for more than six months. Organized labor is particularly strong in the territory in which the company operates, and while full service has been in force for months the patronage of the company has suffered severely. Efforts made by the United States Government, the Pennsylvania State Department of Labor and Industry and the municipality to bring about a settlement of the differences between the company and the men have proved unavailing.

The strike resulted through the failure of the effort made to arrange a new agreement between the company and the men in December last. The company agreed to advance the wages of first-year men from 22 cents to 23 3/9 cents an hour; second-year men, from 23 cents to 24 4/9 cents; third-year men, from 24 cents to 25 5/9 cents. It insisted, however, that the clause be stricken from the proposed agreement which stated that all cases of discharged men should be submitted to arbitration. The men demanded $3.15 for a nine-hour day, with 52½ cents an hour for overtime. They promised not to go out on strike without giving the company notice in advance. On Jan. 1 the strike was declared without any notification to the company. Representatives of the company declare that they will not re-employ the five men who broke their word. The racial question has also injected itself into the siuation.

The present strike is believed to have an important bearing on the question of trade unionism in the coal fields. Several factories in Hazelton have recently declared for the open shop and organized labor is said to feel that the Markle interests, mine operators who are identified with the railway, hope through continuing the present strike, further to disrupt the unions.

Statements from the company giving the facts in connection with the strike were referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 24, page 201, and April 18, page 894.

Low Suburban Fares On Southern Pacific

The California Commission has recently been conducting another hearing on the passenger rates in effect on the ferry and electric lines of the Southern Pacific Railroad between San Francisco and Oakland. The hearing was begun because of a complaint by residents of the San Francisco peninsula on the ground of discrimination. Certain of the transbay fares were lowered in October, 1913, from 15 cents one-way fare to 10 cents, after a hearing by the commission as mentioned in the ELECTRIC RAILWAY JOURNAL, Dec. 13, 1913. In answer to the present complaint, the company has requested the commission to raise the transbay rates from 10 cents to 12½ cents for the one-way fare. After a hearing in San Francisco on June 16, 17 and 18, the case was adjourned for sixty days to allow attorneys for the transbay cities to digest the data submitted by the company.

The Southern Pacific Company submitted an expert valuation report on the property involved in the suburban service in question, showing that the revenue from the ferries and the electric system or from any one individual line of the system was not sufficient to meet the cost of operation, plus interest and taxes. It was asserted that only three of the best lines paid even the bare operating expenses. J. B. Pope, valuation engineer for the company, testified that the property used in the suburban service had a total value of $25,553,667. This sum included one-half of the value of the Oakland pier, which is used jointly by steam and electric trains, and also the values of other property used jointly, apportioned according to the comparative number of passengers handled by each kind of motive power.

According to the testimony of F. L. McCaffery, auditor of disbursements for the company, the total deficit on the suburban system for the first four months of 1914 with interest at 7 per cent on the investment was $686,515. If the ferry system were also considered, the total deficit for the four months would be $752,754. During this four-month period the company carried more than 6,400,000 passengers on the ferry system, so that the loss per passenger is claimed to be 11.81 cents, making an annual deficit of $2,258,263 against the suburban electric system. The following table is a brief summary of the figures presented by Mr. McCaffery:

JANUARY TO APRIL, 1914, INCLUSIVE

	Electric	Ferry
Gross operating revenue	$298,538	$228,383
Operating expenses	354,294	234,719
Deficit	$55,756	$6,336
Other expenses, taxes, etc	60,228	10,848
Deficit	$115,984	$17,184
Interest on investment for four months	570,531	49,054
Total deficit	$686,515	$66,238
Total ferry and electric		$752,754
Average annual deficit		$2,258,262
Capital investment—ferry		$2,102,324
Capital investment—electric		24,451,343
Total investment		$26,553,667

At the previous hearing on this subject the California Commission declared that the apportionment of expenses of maintaining and operating the ferry boats on the basis of the number of passengers carried by the steam lines and by the electric lines was erroneous and unfair to the suburban lines. Just what different allocations of expenses have been made between steam and electric traffic in the present case cannot be determined until the commission makes its final report on the hearing.

Progress in Extending the Municipal Railway in San Francisco

Rapid progress on all three of the new municipal railway lines now under construction in San Francisco is reported by the city engineer's office in that city. The work on the Van Ness Avenue line, which will be the main route for the entire city system to the exposition grounds, is 75 per cent completed and there is every indication that the work will be delivered to the city by Aug. 4, thereby earning for the contractor the maximum bonus of $15,000 at the rate of $30 per day. It is expected that this line will be operating by Aug. 15.

On the Stockton Street and the Potrero Avenue lines large forces are at work. It is expected that the full amount of bonus will be earned in each case. This means that the Stockton Street contract must be completed by Aug. 1 and the Potrero Avenue line, which is now 60 per cent finished, by Aug. 23.

Advices from the Jewett Car Company early in July stated that four of the new cars on order had already been shipped from the factory, and that others would follow in time to make a total delivery in San Francisco of twenty-five cars before July 14. Other deliveries are to be made before the fourteenth of each succeding month until all of the 125 cars contracted for are in the possession of the city. This will entitle the car company to the bonus of $5 on each car delivered thirty days ahead of the time specified in the contract. The new cars, while of the same length as those now in use on the Geary Street line, will be 8½ in. wider, will seat fifty persons as compared with forty-four on the old cars, and will weigh 4000 lb. less. The cost of the new cars is to be $7,038 each as compared with $7,700 for those now in use. It is estimated that the weight reduction will effect an annual saving of $200 per car in operating costs. The new trucks and motors are already in San Francisco, and as soon as the car bodies are received the cars will be assembled and put in commission on the Geary Street line replacing the old cars, which will not be again in use until the rush of exposition traffic begins.

Municipal Ownership Results in Edmonton

The financial difficulties which have been met in the operation of the municipal electric railway at Edmonton, Alberta, were reviewed in the ELECTRIC RAILWAY JOURNAL of June 13, page 1334, as they had been set down in the Edmonton *Official Gazette*. W. J. McNamara, who took office as Mayor of Edmonton in January, was in New York recently. He seemed to feel that the statements made in the official organ of the Municipal Council had been misinterpreted. In further explanation of them he said:

"Notwithstanding the reports to the effect that municipal ownership has fallen down in Edmonton, the premier city of Alberta, the plan has worked out successfully, and those reports are absolutely false, and our city affords a splendid vindication of the doctrine. When I went into office we found that the street railway was not paying. The reason was that we were selling transportation below cost, and I started a fight to raise the rates. I was not backed up by members of the Council, but the fight was won, and the fare was raised to a straight 5 cents. Immediately the street railways were put into good shape. Not only did we pay expenses and add to the sinking fund, but we were able to start wiping out the deficit. One reason for the loss had been the cost of materials, construction, and operation, which were far in excess of the figures for New York. For instance, we had to pay $60 a ton for steel rails—more than double what they would have cost in New York. We had the long haul and the tariff against us. As a matter of fact, the cost of materials was fully 100 per cent greater than what it would be here. Another thing, the maintenance and operation cost 35 per cent more than here. As for the price of transportation, tickets were sold at six for 25 cents, and at certain hours eight could be had for that sum, while children were carried at half fare. As a result of charging a fair price we have turned a utility running at a loss into a splendidly paying concern. There was another thing that added to our expenses. The railway had been extended out far into unoccupied territory, where land owners hoped some day the population would come."

Right of Ohio Commission to Order Valuation Questioned

The committee appointed by the Central Electric Railway Association some time ago to determine ways and means for valuing the electric railways in Ohio, as directed by the Public Utilities Commission of that State, now reports that it has grave doubts of the legality of the commission's order. In this connection the committee propounds for the consideration of the commission the following problem:

"Can this commission arbitrarily abrogate such contracts or set aside the statutes of the State when it is a fact that the present maximum rate of 2 cents a mile is, in many instances, inadequate to produce the income necessary to pay the everyday operating expenses, much less set aside a sum to take care of the deferred maintenance and afford any return on any kind of value?

"In complying with the order the public utilities and electric roads of Ohio will have to spend an enormous amount of money and a great deal of the time of their officers and other employees that can be ill afforded from their other duties. As it is likely that in the majority, if not in all, cases this order will be wholly unjust by reason of any results which may be produced as affecting the reasonableness of the present legal rates and charges, should not the legality of the order by the commission be ascertained before any such expense is incurred?"

The commission requested that the schedules of value asked by it be filed by the companies by Jan. 1, 1915.

Injunction in Ohio Fare Case

In the injunction case of the Ohio Traction Company and the Cincinnati & Hamilton Traction Company against the city of Cincinnati, Judge John E. Sater of the United States District Court on July 9 overruled the contention of attorneys for the city that the Federal Court has no jurisdiction in the case and granted the plaintiffs a perpetual injunction, preventing the city from putting in force an ordinance to reduce the fare on the Millcreek Valley line between the city and Carthage and Hartwell from 10 to 5 cents.

The court also held that all the franchises under which this line is being operated between Fifth and Walnut Streets and the present north corporation line of the city are valid and have not expired and that the enforcement of the ordinance would wrongfully impair the property rights of the companies and would operate to the detriment of the stockholders and creditors.

The court held that the failure of the city in former cases to attack the validity of the grant of the Zoological Land Syndicate covering the portion of the line over Erkenbrecher Avenue, between the southern boundary of the syndicate's land and the Carthage pike and 241 ft. between Vine Street and the southern boundary of the syndicate's land, to which the city claims the syndicate has no right of ownership, estopped the city from coming into court at this time with such contentions. Each of the other contentions of the city was decided adversely. City Solicitor Walter Schoenle announced that the case would be appealed to the United States Circuit Court of Appeals.

Kansas Strikers Return.—The strike of employees of the Union Traction Company, Coffeyville, Kan., which began on March 31, was called off on July 8 by the car men. Practically all of the employees have been taken back by the company.

Westinghouse Strike Called Off.—The strike of the workmen of the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., was called off by the men on July 9. While the day set for the men to return to work was July 13 many men reported on July 10 and 11. The works are now running on full time.

State's Attorney's Action Ruled Out.—State's Attorney Maclay Hoyne, of Illinois, has been prevented from proceeding against the Union Consolidated Elevated Railway for overcapitalization by Circuit Court Judge Windes. In rendering his decision Judge Windes said: "The state's attorney is acting too late. An action against the company for overcapitalization, if there is cause for it, should have been brought many years ago. By inaction the people have acquiesced in the actions of the company."

The Pittsburgh Wage Arbitration.—Judge Joseph Buffington, Attorney James H. Gray and Representative Stephen C. Porter have been chosen to arbitrate the differences regarding wages and working conditions between the Pittsburgh (Pa.) Railways and its employees. They have been holding sessions and hearing evidence from both sides since July 10. Many of the employees have been called to testify. Expert testimony as to the cost of living and the sufficiency of wages was given by J. Scott Nearing, professor of political economy at the University of Pittsburgh, and by others. Witnesses were still being heard on July 14.

Utility Legislation in Colorado.—Application for a writ of injunction was filed in the District Court at Denver, Col., on July 3 by Attorney General Fred Farrar to restrain the Secretary of State from referring to referendum the bill creating the public utilities commission passed at the last regular session of the Legislature, and upon which corporation interests filed a petition for referendum. If the contention of the attorney general is sustained and the bill is ordered off the official ballot for the November election, the law will become effective and the State Railroad Commission will be replaced by the Public Utilities Commission.

The Philadelphia Conference of Mayors.—It has been decided to hold the conference of Mayors, proposed by Mayor Blankenburg of Philadelphia, in that city on Nov. 12, 13 and 14. As announced in the ELECTRIC RAILWAY JOURNAL of July 4, page 43, the plan is to establish a bureau of public utility research in the interest of the cities. Invitations were sent to more than 100 mayors to participate in the conference and on July 13 it was reported that acceptances had been received from more than fifty. Mayor Blankenburg has asked that suggestions regarding the convention he addressed to M. L. Cooke, director of public works, Philadelphia.

The Cleveland Schedule Question.—George R. Davies, president of the local branch of the Amalgamated Association of Street & Electric Railway Employees at Cleveland, stated recently that an attempt would be made to have the old schedules restored by the Cleveland Railway. He alleged that Section 8 of the contract with the company fixed the order in which the runs shall be completed and sets the number of hours for the completion of the runs. He said the matter had been appealed to the international union. Many motormen and conductors are said to have expressed the opinion that the company's offer would have carried in a referendum vote if the men had understood it clearly.

Philadelphia Co-operative Plan to Continue.—The co-operative plan under which the Philadelphia (Pa.) Rapid Transit Company deals with its motormen and conductors as individuals rather than as an organization, will be continued in force for another year. The result of the vote on July 14 was 3406 in favor of continuing the arrangement and 2801 against it. As 6522 men qualified to vote the vote against the plan was 1547 short of the two-thirds negative vote required to interfere with the continuation of the plan as now in effect. This is the third time the men by secret ballot have endorsed the method of conducting the co-operative plan with the men as individuals instead of entering into a contract with organized labor.

The Strike on the Joplin & Pittsburg Railway.—No indications were in evidence on July 11 that the strike of the 149 employees of the Joplin & Pittsburg Railway, Pittsburg, Kan., which began on July 6, would be ended shortly. The strike took place when negotiations following the expiration of the old agreement on June 21 were unsuccessful. The agreement was continued temporarily by mutual consent until July 6, when the strike order was issued. The men demand an increase from 26 to 40 cents an hour, with stipulations regarding the company's right to discharge employees. The strike has seriously crippled business in the territory touched by the road, the coal and metal mining industry being particularly affected. Steam roads have put on special service.

The Detroit Running Inventory.—In commenting in the issue of July 10 on the proposed appraisal of the property of the Detroit (Mich.) United Railway within the city the *Electric Railway Service* said: "We name a few of the developments as indicating that the inventory of 1909 cannot under any possible viewpoint be taken as the inventory of 1914. During all this intervening time the inventory has been kept up to the minute. The cost of all this inventory from 1909 to June 1, 1914, has reached the total of $147,991. This represents the wages of the men working upon the inventory directly and does not include any portion of cost of the executive department of the company or the services of the large number of regular employees whose time was partly employed in this work."

Chicago Terminal Committee Off for Europe.—The members of the committee from the Chicago City Council and the engineers in charge of the terminal plans in that city arrived in New York on July 14 and sailed for Europe on July 15. At the head of the commission is John F. Wallace, formerly chief engineer of the Panama Canal. The other members of the commission are Walter L. Fisher, ex-secretary of the interior; Bion J. Arnold, chairman of the Board of Supervising Engineers, Chicago Traction; Edward H. Bennett, consulting architect of the Chicago plan commission; Lawrence E. McGann, commissioner of public works of Chicago; John W. Beckwith, first assistant corporation counsel of the city, and Ellis Geiger, chairman of the Aldermanic committee on railway terminals. To assist the seven members of the railway commission and to gather ideas about other things of importance in the Government of big cities, five Aldermen and the secretary of the City Council committees were appointed by Mayor Harrison to accompany the committee. The commission visited Toronto, Montreal and Boston on the way to New York, and spent July 14 examining New York terminals. The party is due in Liverpool on July 20. After an inspection of the docks there the members will go to London, thence to Paris, Frankfort, Vienna, Budapest, Dresden, Berlin, Leipsic, Hamburg, Kiel, Copenhagen and Stockholm. They will sail from Liverpool on Aug. 22.

Financial and Corporate

Stock and Money Markets

July 15, 1914.

In the trading on the New York Stock Exchange to-day the prices of many issues were carried to the lowest levels reached in years. New Haven made a new low record, 49¾. The railroad issues particularly were hard hit. Only brisk short covering toward the close prevented many sharp net declines. As a matter of fact there was a fair volume of business, with a distinct two sidedness to the course of quoted values. Rates in the money market to-day were: Call, 2 per cent; sixty days, 2½ @ 3 per cent; four months, 3¼ @ 3½ per cent; six months, 3¾ @ 4 per cent.

The trading in Philadelphia to-day was apparently not influenced much by the trend in New York. The tone was firm and the market ended strong.

The Chicago market was weak to-day. Bonds, however, held firm.

Under the lead of New Haven, sharp declines were recorded in Boston to-day. The selling was heavy and the lowest levels were established at the end.

In Baltimore business on the Stock Exchange was fairly active to-day. The sales of stock totaled 2,537 shares, while the bond transactions amounted to $34,400, par value.

Quotations of traction and manufacturing securities as compared with last week follows:

	July 8	July 15
American Brake Shoe & Foundry (com.)	88½	90½
American Brake Shoe & Foundry (pref.)	137½	138
American Cities Company (com.)	*29	*29
American Cities Company (pref.)	62⅛	60
American Light & Traction Company (com.)	339	328
American Light & Traction Company (pref.)	109	109
American Railways Company	37	37
Aurora, Elgin & Chicago Railroad (com.)	33	32½
Aurora, Elgin & Chicago Railroad (pref.)	76¼	76
Boston Elevated Railway	95½	99
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	50	50
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	37	37
Brooklyn Rapid Transit Company	91¾	90½
Capital Traction Company, Washington	97	98
Chicago City Railway	135	135
Chicago Elevated Railways (com.)	20	20
Chicago Elevated Railways (pref.)	65	65
Chicago Railways, ptcptg., ctf. 1	97⅝	98½
Chicago Railways, ptcptg., ctf. 2	35¼	34¾
Chicago Railways, ptcptg., ctf. 3	5	6
Chicago Railways, ptcptg., ctf. 4	2	2
Cincinnati Street Railway	101	103
Cleveland Railway	104	105
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company	13	*13
Columbus Railway (com.)	*53	*53
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	55	*55
Detroit United Railway	80	80
General Electric Company	149½	146½
Georgia Railway & Electric Company (com.)	121½	121
Georgia Railway & Electric Company (pref.)	86⅞	85¾
Interborough-Metropolitan Company (com.)	14⅜	13⅞
Interborough-Metropolitan Company (pref.)	63⅛	63⅛
International Traction Company (com.)	30	*30
International Traction Company (pref.)	81	*81
Kansas City Railway & Light Company (com.)	a20½	*20½
Kansas City Railway & Light Company (pref.)	39	*39
Lake Shore Electric Railway (com.)	6	6
Lake Shore Electric Railway (1st pref.)	90	90
Lake Shore Electric Railway (2d pref.)	22	22
Manhattan Railway	130	129½
Massachusetts Electric Companies (com.)	10¼	10¼
Massachusetts Electric Companies (pref.)	60	58
Milwaukee Electric Ry. & Light Co. (pref.)	95	*95
Norfolk Railway & Light Company	24½	*24¼
North American Company	75	71½
Northern Ohio Traction & Light Co. (com.)	70	63
Northern Ohio Traction & Light Co. (pref.)	101	97½
Philadelphia Company, Pittsburgh (com.)	39½	39½
Philadelphia Company, Pittsburgh (pref.)	35	35
Philadelphia Rapid Transit Company	15⅛	15¼
Portland Railway, Light & Power Company	44	44
Public Service Corporation	111	111
Third Avenue Railway, New York	40	40¾
Toledo Traction, Light & Power Co. (com.)	14	20
Toledo Traction, Light & Power Co. (pref.)	a70	a70
Twin City Rapid Transit Co., Minn. (com.)	102⅝	101¼
Union Traction Company of Indiana (com.)	11½	*11½
Union Traction Company of Indiana (1st pref.)	70	*70
Union Traction Company of Indiana (2d pref.)	a14	*14
United Rys. & Electric Company (Baltimore)	27	27¼
United Rys. Inv. Company (com.)	11½	11
United Rys. Inv. Company (pref.)	32	32
Virginia Railway & Power Company (com.)	49	48¾
Virginia Railway & Power Company (pref.)	95	95
Washington Ry. & Electric Company (com.)	85½	87
Washington Ry. & Electric Company (pref.)	83	83
West End Street Railway, Boston (com.)	68¾	69
West End Street Railway, Boston (pref.)	85	85
Westinghouse Elec. & Mfg. Company	76	78¼
Westinghouse Elec. & Mfg. Co. (1st pref.)	122	122

* Last sale. a Asked.

ANNUAL REPORTS

The Duluth-Superior Traction Company

The comparative statement of income, profit and loss of the Duluth-Superior Traction Company, Duluth, Minn., for the calendar years 1913 and 1912 follows:

	1913	1912
Revenue from transportation	$1,260,061	$1,060,937
Other revenue	23,853	22,322
Total revenue	$1,283,914	$1,083,259
Way and structures	$52,627	$38,205
Equipment	65,577	49,868
Traffic	655	618
Conducting transportation	463,266	414,886
General and miscellaneous	166,039	126,610
Total operating expenses	$748,164	$630,187
Net operating revenue	$535,750	$453,072
Taxes	$66,537	$61,001
Depreciation	74,100	70,114
Total taxes and depreciation	$140,637	$131,115
Surplus available for fixed charges and dividends	$395,113	$321,957
Fixed charges	$179,526	$158,294
Dividends, preferred stock	60,000	60,000
Dividend, common stock	148,750	175,000
Total fixed charges and dividends	$388,276	$393,294
Net income to surplus account	$6,837	*$71,337

*Deficit.

The above report shows a general increase in the revenues and expenses of the Duluth-Superior Traction Company during the calendar year 1913. The revenue from transportation increased 18.8 per cent; maintenance of way and structures, 37.7 per cent; maintenance of equipment, 31.5 per cent; total operating expenses, 18.7 per cent; net operating revenue, 18.2 per cent; taxes, 9.7 per cent; depreciation, 5.7 per cent, and surplus available for fixed charges and dividends, 22.9 per cent. The total charges and dividends decreased 1.3 per cent, giving a net income of $6,837, as compared to a deficit of $71,337 the year previous. The percentage of operating expenses (including taxes and depreciation) to gross revenues was 69.23 in 1913, as compared to 70.28 in 1912.

There was expended for renewals and charged against depreciation reserve during the year $33,076, and the appropriation to the depreciation reserve for the year was $74,100. In addition to this appropriation the sum of $18,900 was expended to meet the sinking fund requirements of the mortgage securing the general mortgage twenty-year 5 per cent gold bonds, $21,000 par value of these bonds being retired. Expenditures aggregating $63,067 were made during the year for new construction and extensions, including as the principal items $7,948 for new cars and equipment, $19,175 for new track, $10,305 for conduit and feed wires and $21,331 for substations. The total miles of single track operated by the company amounted to 82.47. The gross passenger earnings per mile of single track were $15,262 and the gross passenger earnings $1,258,638.

American Power & Light Company

According to the annual report of the American Power & Light Company, New York, N. Y., for the year ended Dec. 31, 1913, the combined earnings of its four controlled companies, the Kansas Gas & Electric Company, Portland Gas & Coke Company, Pacific Power & Light Company and the Southwestern Power & Light Company, were $5,864,165, an increase of 9.7 per cent over those of 1912. The total net earnings were $2,678,831, an increase of 12.6 per cent over those of 1912. The earnings for the year from electric light and power constituted 55 per cent of the gross earnings; artificial gas, 30 per cent; natural gas, 8 per cent; railway, 4 per cent, and water 3 per cent.

The Pacific Power & Light Company, Portland, Ore., which, with its street railway service in Astoria, Ore., Walla Walla, Wash., and Milton, Wash., covers all the electric railway service of the American Power & Light Company except that offered by the Paris Transit Company, Dallas, Tex., reports gross earnings for 1913 of $1,288,059, as compared to $1,257,364 in 1912. Other income items were as follows: Operating expenses and taxes in 1913, $663,674; in 1912, $648,037; net earnings in 1913, $624,385; in 1912, $609,327; interest charges in 1913, $341,656; in 1912, $288,070; net income in 1913, $282,729; in 1912, $321,257; balance after dividends in 1913, $40,229; in 1912, $106,257. The gross earnings for the twelve months were divided as follows for the various classes of business: electric light and power, 66 per cent; railway, 13 per cent; artificial gas, 13 per cent, and water, 8 per cent.

The gross earnings of all the properties controlled by the Southwestern Power & Light Company, Dallas, Tex., which include the Paris Transit Company, for the twelve months ended Dec. 31, 1913, were $2,267,091, as compared to $1,927,127 in 1912. Operating expenses and net earnings in 1913 were $1,240,326 and $1,026,765, as compared to $1,076,550 and $850,577 in 1912, respectively. The gross earnings for this company were divided 80 per cent to electric light and power, 14 per cent to artificial gas, 4 per cent to water and 2 per cent to railway business.

Seattle Municipal Railway

The operation of the Seattle (Wash.) Municipal Railway for the month of June showed a loss for Division "A" of $380.73, and for Division "C" of $25.65. The revenues from Division "A" were $1,362.68, and the expenses, operating and construction, $1,743.41. For Division "C" the revenues from passenger and freight business were $1,652.84, and expenses, operating and construction, $1,678.49. These figures do not include the rate for power purchased from the municipal plant, as this has not yet been determined by the council. Another item to be considered in this connection is the interest for one month on $300,000 of bonded indebtedness of the line, Division "A."

The complete report for June, 1914, submitted by Superintendent A. T. Valentine of the Public Utilities Department follows:

Division "A"	
Revenues	$1,346.02
Operating expenses:	
Maintenance, roadway and track	$123.82
Superintendence of equipment	62.50
Superintendence of transportation	62.50
Passenger conductors and motormen	985.59
Carhouse employees	425.25
Total	$1,659.66
Division "C"	
Revenues:	
Passenger revenue	$1,611.18
Freight revenue	25.00
	$1,636.18
Operating expenses:	
Superintendence of transportation	$30.88
Passenger conductors and motormen	873.17
Freight conductor and motormen	17.18
Miscellaneous car service employees	104.06
Carhouse employees	18.29
Total	$1,044.21
Construction expenses:	
Division "A":	
Distribution system	$18.06
Carhouse construction	35.68
Cars	30.00
Total	$83.75
Division "C":	
Track laying and surfacing	$578.03
Distribution system	22.50
Lighting department	33.75
Total	$634.28
Advertising revenue:	
Division "A"	$16.66
Division "C"	16.66

It is reported that regardless of the action of the Federal Court, it is the intention of the city of Seattle to make physical connections between the tracks of city line and those of the Seattle, Renton & Southern Railway on Stewart Street between Third and Fourth Avenues. Under the terms of the common user agreement between the Puget Sound Traction, Light & Power Company, and the Seattle, Renton & Southern Railway on Fourth Avenue South, which it is expected will fix the terms of payment to be made by the city in the event all of the litigation is decided in the city's favor, the cost of the privilege will amount to about $7,800. Whenever common user rights are granted the receivers of the Seattle, Renton & Southern Railway will insist that the city general fund guarantee the payment of this amount annually.

Philadelphia & Western Railway

The gross earnings of the Philadelphia & Western Railway, Upper Darby, Pa., for the eleven months ended May 31, 1914, were $338,281. The operating expenses were $191,089, leaving net earnings of $147,192. After deductions of $10,400 for taxes, $125,228 for interest and $956 for miscellaneous items, there remained a surplus for the period of $10,608. According to the balance sheet of the company the road and equipment value was $8,476,943 and its treasury stock value $970,000, against which stand $6,000,000 of capital stock and $3,000,000 of first mortgage 5 per cent bonds.

According to a recent summary of its history issued by the company, the Philadelphia & Western Railway operates by third-rail a high-speed double-track railway between Philadelphia and Stratford entirely on private right-of-way, connecting with the subway system of the Philadelphia Rapid Transit Company and with the Pennsylvania Railroad at Stratford. It also operates a double track extension from Villa Nova to Norristown on private right-of-way, and maintains through service between Allentown and Philadelphia by means of the Lehigh Valley Transit Company's lines at Norristown via the Norristown Transit Company. Express cars are operated from Philadelphia to Allentown under an arrangement with the Adams Express Company, and direct connections for interchange of carload freight with the Pennsylvania Railroad are made at Philadelphia and Stratford and near Norristown.

The authorized and outstanding capital stock of the company amounts to $4,000,000 of common and $2,000,000 of 5 per cent preferred, cumulative after Jan. 1, 1916, par $50. Of an authorized bonded debt of $4,000,000, there is issued $3,000,000 of first mortgage fifty-year gold 5's, dated July 1, 1910. Of this amount $2,030,000 is in the hands of the public. The old mortgage of the Trust Company of America, New York, covering an authorized issue of $20,000,000, is cancelled.

Alton, Jacksonville & Peoria Railway, Alton, Ill.—H. A. Strauss, consulting engineer, Chicago, has been retained by the bondholders' committee of the Alton, Jacksonville & Peoria Railway to prepare a complete valuation of the company's property. This valuation report is to be submitted to the Illinois State Public Utilities Commission in connection with the application for the authorization of the reorganization of the company and the issuance of stocks and bonds thereunder.

Buffalo & Williamsville Electric Railway, Williamsville, N. Y.—After hearings before Public Service Commissioner Hodson, the purchase of the property of the Buffalo & Williamsville Electric Railway in Batavia, N. Y., by the Batavia Traction Company has been authorized by the commission. This proposed purchase was referred to in the ELECTRIC RAILWAY JOURNAL of Jan. 31 and May 9.

Chicago (Ill.) Railways.—The directors of the Chicago Railways have declared a dividend of $8 on Series 1 participating certificates, payable on Aug. 1 to holders of record of July 20. No action has been taken as to the second dividend on Series 2 participating certificates, the initial distribution of $2 on which was made in February last.

Columbus Railway, Power & Light Company, Columbus, Ohio.—E. W. Clark & Company, Philadelphia, announce dividend declarations of 1¼ per cent on the preferred stock, series B, and on the common stock of the Columbus Railway, Power & Light Company, payable on Aug. 1 to shareholders of record of July 15. The stockholders of the Columbus Railway, Power & Light Company will hold an adjourned meeting at Columbus on July 29, at which action will be taken on matters of new financing in connection with the company. It is planned to issue $3,145,000 of prior preference stock to retire a similar amount of first consolidated mortgage forty-year 4 per cent gold bonds of the Columbus Railway, which mature on Oct. 1, 1939, this stock to be limited to 4 per cent dividends and to have preference over all other classes of stock; and to provide for an issue of $450,-

000 of 6 per cent Series A preferred stock, with which to retire a similar amount of outstanding first mortgage 6 per cent twenty-five-year gold bonds of the Columbus Electric Company, maturing in November, 1922. To provide for these issues the shareholders will take action on a proposition to increase the capital stock of the Columbus Railway, Power & Light Company from $11,550,000 to $15,145,000. They will also vote on a proposed issue of bonds of the Columbus Railway, Power & Light Company, to be known as first and refunding sinking fund mortgage 5 per cent gold bonds to an amount not exceeding $25,000,000 and to be secured by mortgage on the property of the company. The plan is to issue the bonds from time to time to pay for such additions, betterments and improvements as may be made by the company.

Detroit & Port Huron Short Line Railway, Detroit, Mich.—The Railroad Commission of Michigan has authorized the Detroit & Port Huron Short Line Railway to issue $603,000 of first mortgage 5 per cent bonds of 1900 for the retirement of $600,000 of bonds of the Rapid Railway due on May 1, 1915 and 1916, and $3,000 of bonds of the Port Huron, St. Clair & Marine City Railway due in 1920.

Hagerstown & Frederick Railway, Frederick, Md.—The Maryland Public Service Commission has approved the sale of the property of the Frostburg Illuminating & Manufacturing Company to the Hagerstown & Frederick Railway. The railway company has also been authorized to issue $50,000 of 6 per cent bonds with which to pay the purchase price of $35,000 for the property of the Frostburg Illuminating & Manufacturing Company and improve its plant. The bonds are to be sold to net the railway company not less than $45,000.

Joliet & Southern Railroad, Joliet, Ill.—The Continental & Commercial Trust & Savings Bank, Chicago, Ill., as trustee, has asked the Illinois Public Utilities Commission to sanction an issue of $1,500,000 of bonds by the Joliet & Southern Railroad.

Medway & Dedham Street Railway, Westwood, Mass.—The Medway & Dedham Street Railway, the successor to the Dedham & Franklin Street Railway, has petitioned the Public Service Commission for approval of an increase in its authorized capital from $35,000 to $58,000, the proceeds to be used for equipment and extension of lines.

Northern Illinois Electric Railway, Amboy, Ill.—The Northern Illinois Electric Railway has been sold under foreclosure to H. W. Hillison, S. L. Shaw and Reinhart Aschenbrenner, representing the bondholders. The sale was made under court orders in the office of Special Master in Chancery M. C. Keller of Dixon, Ill.

Ocean Shore Railroad, San Francisco, Cal.—The Railroad Commission of California has authorized the Ocean Shore Railroad to issue promissory notes as follows: Twelve notes totaling $6,365, thirty-two drafts amounting to $4,368 and eight notes totaling $21,552. They are to be used for the purchase of equipment. The railroad company does not expect to pay these obligations as they become due from earnings, but from the proceeds of an assessment recently levied on the stockholders. Of a total of $192,000 assessed the sum of $100,000 has already been collected.

Point Pleasant (N. J.) Traction Company.—New officers have been elected as follows for the Point Pleasant Traction Company: Carroll P. Bassett, president; H. M. Whitehead, vice-president; Frank C. Kimball, secretary and treasurer; Arthur Tepper, auditor, and H. E. Fenner, superintendent.

Port Jervis (N. Y.) Traction Company.—New officers have been elected as follows for the Port Jervis Traction Company: D. E. Mandeville, president; M. F. Maury, secretary and treasurer; W. E. Guthrie, general manager; William Rice, superintendent.

Springfield (Ohio) Railroad.—E. H. Rollins & Sons, Boston, Mass., are offering for sale at prices depending on maturities, to yield 5.4 per cent, $100.000 of Springfield Railway first mortgage 5 per cent serial bonds, dated May 1, 1914, and due Sept. 1, 1922 to 1935. Payment is optional on any interest date at 102 and interest. The bonds are in denominations of $100, $500 and $1,000 and are secured by first mortgage on the property of the Springfield Railway, the replacement value of which is appraised at $1,422,000.

Third Avenue Railway, New York, N. Y.—The Third Avenue Railway has made all preliminary arrangements for the purchase of the Pelham Park & City Island Railway from the Interborough Rapid Transit Company. It is understood that F. W. Whitridge, president of the Third Avenue Railway, will apply at once to the Public Service Commission of the First District for permission to reconstruct the line as far as the Bartow station. The line will also be extended to connect with the system of the Union Railway, which is one of the companies owned by the Third Avenue Railway.

United Railroads, San Francisco, Cal.—The date set for the first hearing in connection with the inquiry into the finances of the United Railroads by the Railroad Commission of California has been postponed from July 17 to July 20.

United Railways & Electric Company, Baltimore, Md.—The United Railways & Electric Company announced that the outstanding 5 per cent three-year collateral trust notes of the company, which matured on July 15, would be paid on maturity on presentation at the banking house of Alexander Brown & Sons, Baltimore.

Dividends Declared

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Chicago (Ill.) Railways, $8, participating certificates, Series 1.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Me., quarterly, 1½ per cent, preferred.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent, preferred.

Railway & Light Securities Company, Boston, Mass., 3 per cent, common and preferred.

Rio de Janeiro Tramway, Light & Power Company, Rio de Janeiro, Brazil, quarterly, 1¼ per cent.

Sao Paulo Tramway, Light & Power Company, Sao Paulo, Brazil, quarterly, 2½ per cent.

United Traction Company, Pittsburgh, Pa., 2½ per cent, preferred.

York (Pa.) Railways, $1.25, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE					
1m., May, '14	$56,965	$27,962	$29,003	$17,367	$11,636
1 " " '13	60,284	28,086	32,198	17,136	15,062
12 " " '14	772,137	352,698	419,439	208,423	211,016
12 " " '13	736,500	334,240	402,260	204,227	198,033
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., May, '14	$1,161,259	$640,793	$520,466	$343,602	$176,864
1 " " '13	1,140,746	646,331	494,415	321,662	172,753
12 " " '14	14,524,362	8,328,232	6,196,130	3,988,669	2,207,461
12 " " '13	13,547,078	7,784,259	5,762,819	3,719,172	2,043,647
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE					
1m., May, '14	$197,885	$114,135	$83,750	$63,504	$20,246
1 " " '13	175,866	100,501	75,365	57,293	18,072
12 " " '14	2,429,876	1,398,351	1,031,525	747,687	283,838
12 " " '13	2,199,570	1,223,574	975,996	670,215	305,781
GRAND RAPIDS (MICH.) RAILWAY					
1m., May, '14	$107,265	$70,215	$37,050	$13,344	$23,706
1 " " '13	108,168	63,625	44,543	14,963	29,580
12 " " '14	1,299,642	831,997	467,645	159,828	307,817
12 " " '13	1,265,999	734,044	531,955	176,689	355,266
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE					
1m., May, '14	$58,572	$37,390	$21,182	$15,660	$5,522
1 " " '13	54,123	33,408	20,715	14,659	6,056
12 " " '14	679,179	455,935	223,244	184,116	39,128
12 " " '13	645,783	395,298	250,485	173,721	76,764
DETROIT (MICH.) UNITED RAILWAY					
1m., May, '14	$1,112,275	$763,613	$348,662	$179,321	$169,341
1 " " '13	1,172,639	770,250	402,556	179,568	222,988
5 " " '14	4,976,304	3,424,228	1,552,076	900,376	651,700
5 " " '13	5,207,515	3,441,855	1,766,659	896,862	869,797
PORTLAND (MAINE) RAILROAD					
1m., May, '14	$86,427	$52,946	$33,481	$20,177	$13,304
1 " " '13	79,691	61,299	18,392	10,729	7,663
12 " " '14	1,046,716	650,100	396,616	238,632	157,984
12 " " '13	1,003,694	708,435	295,259	123,995	171,264

*Includes taxes.

Traffic and Transportation

United Traction Company Replies to Service Recommendations

The United Traction Company, Albany, N. Y., has filed its answer to the report and recommendations regarding service in Albany as made to the Public Service Commission of the Second District of New York by C. R. Barnes, electric railway inspector of the commission. The company denies that 13.26 miles of track mentioned in the report are in need of reconstruction or repair. With respect to points where cars will not pass at ordinary operating speed the company says that the installation of special work will do away with this difficulty.

In the matter of extensions the company says that the one on Arbor Hill to Watervliet Avenue and that through New Scotland Avenue are not justified. The Arbor Hill extension is regarded as impractical by the company until the ravine west of Quail Street is filled in. The New Scotland Avenue-Woodlawn extension is in controversy on account of the fact that a route has not been agreed upon. The company, however, says that both extensions will in all probability be made in time. The proposed extension to connect tracks in Trinity Place with those in Hamilton Street is one the company has had in mind itself for some time. The construction of curves in both directions on the east side of Pearl Street to connect with tracks in State Street is regarded as unnecessary because they could not be used to advantage.

The company denies that it has inadequate snow fighting equipment. It has a snow plow for each 5½ miles of track and a sweeper for each 9 miles of track, all in proper working order. The company also declares the motor equipment of the snow plows and sweepers to be adequate.

Criticisms of additional service are dealt with under the heads of West Albany, Delaware Avenue, A Belt line, North Albany, Arbor Hill-Kenwood, Rensselaer, Troy. The company claims that from inspectors' counts it is already providing many more seats than there are passengers during the rush hours and during the non-rush hours about three seats to every passenger. In the matter of its service for church and theater patrons the company says that inspectors count the number of persons who get off cars at such places and an adequate return service is arranged accordingly.

The recommendation of Mr. Barnes that a transfer be issued upon a transfer to persons going to and from West Albany from points in Pine Hills does not meet with the approval of the company on the ground that to issue a transfer upon a transfer would lead to abuses of the system. The recommendation that transfers to and from cars of the Schenectady Railway Company operating within the city limits be issued, is also objected to by the company, which says that such transfer would interfere with interurban traffic. Plans under way for an improved terminal at the foot of State Street, will do away with all need of suggestions for rerouting the Albany-Troy red line cars.

In regard to the rearrangement of passenger stops suggested by Mr. Barnes the company says that in 1911 it discontinued 187 stops with a view of quickening the service. The plan met with so much disapproval that most of the stops had to be restored.

The company says that the recommendations to replace the 18 ft. and 20 ft. cars with more modern equipment and to retire open cars are unreasonable. The criticism that the 800 type of car run on the A belt line is too heavy, the company thinks is trivial because the type of car is modern and well adapted to the service it renders. During the last three years the company has improved its equipment through the installation in the city of twelve cars that seat fifty-four passengers; twelve cars that seat forty-four; five cars that seat thirty; has rebuilt forty-one cars to seat twenty-eight; rebuilt six cars that now seat thirty. The company contends that its night service is more liberal than in most other cities.

The company has under way the construction of a new high tension transmission line between Watervliet and Mechanicville and is making arrangements to build a new transformer station on land recently purchased at Sheridan Avenue and Chapel Street.

The company denies the need of an additional braking system upon single truck cars which remain in operation after Nov. 15 next, says it will look into the need to install a telephone system along the various routes, and that the recommendation of illuminated signs for all cars is being complied with.

The recommendations of Mr. Barnes were published in the ELECTRIC RAILWAY JOURNAL of June 27, page 1478.

The hearing before the commission in regard to the report of Mr. Barnes was opened on the morning of July 15. After the preliminaries incident to the opening Mr. Barnes was cross-examined by Lewis E. Carr of counsel for the company. Mr. Carr characterized the report as a "grossly unfair one." In opening the hearing Chairman Van Santvoord of the commission said:

"We accept the inspector's report for what it is worth at this time. If his recommendations are not proper, if they are wrong in any instance we would like to have it pointed out to us. We stand by our inspector's report until it is pointed out that he is wrong. In regard to certain of these recommendations we infer from your answers to the commission that you propose to do some of the things that have been recommended."

Recommendations from Mayor Regarding Service in Pittsburgh

The resolution offered recently to the Pittsburgh Council by Councilman Dillinger to force the Pittsburgh (Pa.) Railways into receivership has been laid on the table indefinitely by a vote of six to three. Before leaving for a European trip on July 8, Mayor Joseph G. Armstrong sent the company a letter in which he set forth the policy of the city administration and its requirements for the betterment of passenger transportation. In the letter a number of suggestions are made to the company for improving service. An answer to this communication is expected from the company when the Mayor returns from his trip early in August.

J. R. Bibbins, engineer, Chicago, has been engaged by the law department of the city of Pittsburgh in an advisory capacity in connection with proceedings for the improvement of local transportation conditions in that city. This work has the support of the city administration, and through co-operative study of the various phases of the problem with the company an attempt will be made for an operative service standard for scientific rerouting in the terminal district and for the progressive rehabilitation of the property until an adequate physical condition is reached. Mr. Bibbins is associated with Bion J. Arnold, and participated in a previous Arnold investigation in Pittsburgh. He also was resident engineer for the Arnold investigation of transit problems in Providence and San Francisco and of steam railroad terminal development in Chicago.

Notice of Increase in Fare by Massachusetts Line

The Middlesex & Boston Street Railway, Newtonville, Mass., has given notice to the Public Service Commission of Massachusetts of a proposed increase in rate of fare, effective on Aug. 3, 1914, to 6 cents for every ride between any two fare limits, wherever situated, with an additional charge of 1 cent for every transfer issued. The commission has ordered the railway to give public notice of the increase ten days prior to July 20 by publication.

At present the company charges 5 cents for all rides between fare limits within Newton and Waltham, except that within limits of these two cities an additional charge of 1 cent is made for every transfer issued. The rate has been 6 cents upon the lines previously operated by the Newton & Boston Street Railway, without charge for transfers. The rate is 6 cents upon all other lines, except that the company issues for $2.50 each books containing fifty tickets, each ticket good in lieu of a cash fare of 6 cents between any two fare limits west of Newton Lower Falls.

The request by the company to be allowed to raise its tariff comes as a result of the recent dispute between the line and its employees, and the decision of a board of arbitration that the carmen are entitled to a 15 per cent raise and back pay from June 1, 1913. It is estimated that the award will cost the company about $25,000 for back pay and about the same amount each year in addition to the amount heretofore paid for wages.

The award of the wage arbitration board was referred to in the ELECTRIC RAILWAY JOURNAL of June 27, page 1472.

Newly Organized Employees' Mutual Benefit Association at Rockford

On May 8, 1914, the officers and employees of the Rockford & Interurban Railway and the Rockford City Traction Company, Rockford, Ill., met at the club rooms of the trainmen for the purpose of organizing the employees' mutual benefit association. A. G. Snell, superintendent of transportation of the companies, submitted data from other similar associations and outlined a plan of organization. The object of the association is to promote good fellowship among the employees and to aid its members while they are disabled by reason of sickness or injury, and at their death to contribute aid to their designated beneficiaries.

At the conclusion of these meetings a joint committee of twelve employees representing all departments, with Mr. Snell as chairman, was appointed to draft a set of by-laws and constitution and to arrange all details for a permanent organization. On June 22, at a meeting of all employees, this joint committee outlined the forms and blanks to be used, and submitted a set of by-laws and constitution, which was accepted. The committee was instructed to have these printed.

On July 6 a permanent organization was perfected. W. C. Sparks, general manager of the companies, will be permanent chairman of the board of trustees. The officers elected are as follows: President, A. G. Snell; vice-president, C. R. Simcox; treasurer, W. H. Lemons; secretary, H. D. Hollenbeck; trustees: transportation department, J. R. Wolf, A. G. Andrews and E. Furman; auditing department, H. D. Hollenbeck; electrical department, J. Kingsley; roadway department, B. T. Feeley and D. Lacey; electrical department, J. M. Quaintance and Ralph Short. All the officers are elected for a term of one year except the chairman of the board of trustees and the treasurer, who are to hold their respective offices as long as they continue with the railways.

Any regular employee of the Rockford & Interurban Railway or the Rockford City Traction Company more than twenty-one years of age and under fifty years of age (charter members excepted) who has been in the service for a period of at least thirty days is eligible to membership in the association, upon approval as to his physical condition by the authorized medical examiner of the association. There are to be two classes of members—A and B. Class A members will pay dues of $1 a month and Class B members 50 cents a month. Should the funds of the association ever be insufficient to meet its obligations the trustees are authorized to levy not more than three $1 assessments on Class A members in any one year and not more than three 50-cent assessments on Class B members. The sick benefits paid to the members of the two classes vary, as do also the death benefit. These payments are described in detail in the by-laws. The trustees are to invest the funds of the association in such securities as they may deem advisable.

The charter membership consisted of 145 out of a total of 250 employees. Applications are being made for membership daily. At the next meeting of the board of trustees plans for raising funds other than by dues will be considered.

Freight Franchise in West Chester.—The Philadelphia & West Chester Traction Company, Upper Darby, Pa., has received permission to haul freight in West Chester.

Accident on Minnesota Line.—Fifteen persons were injured on July 8 when a car of the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company collided with a steam freight train near the northern limits of Faribault.

Disagreement on Illinois Traction Mail Contract.—The negotiations have been abandoned in connection with the contract which it seemed likely would be arranged between the post-office department and the Illinois Traction System for handling mail.

Firemen Debarred from Inside Running Boards.—Chief McDonough of the Boston (Mass.) Fire Department has issued an order commanding fire department members to refrain from riding on the left-hand running boards of open cars in violation of an operating regulation of the Boston Elevated Railway.

Joint Steam and Illinois Traction Freight Tariff.—The Louisville & Nashville Railroad has issued a joint and proportional freight tariff on classes and commodities between Mt. Vernon, Ind., Evansville, Ind., Henderson, Ky., Owensboro, Ky., and Louisville, Ky., and all stations on the Illinois Traction System. This was effective on July 16.

Coney Island Traffic Interrupted.—An accident in the substation of the Brooklyn (N. Y.) Rapid Transit Company at Sheepshead Bay Road and Van Sicklen Avenue resulted in the suspension of traffic over the principal lines of the company to Coney Island on July 12 at 10 p. m., lasting two hours. It is estimated that more than 100,000 people were inconvenienced.

Special Evening Rates.—The Southwestern Traction Company, Temple, Tex., has put in effect a schedule of reduced rates applying between Temple and Belton and intermediate points for all travel occurring after 6 p. m. The through rate from Temple to Belton and vice versa has been reduced from 25 cents to 15 cents. Reductions between other points are made accordingly.

Ohio Electric Railway Submits New Milk Schedule.—For the second time within a short period the Ohio Electric Railway has submitted a milk schedule for the approval of the Public Utilities Commission. The classifications in the first one were objectionable. The second contains an increase of about 10 per cent over the rate for handling ten-gallon cans, when five-gallon cans are used.

The Connecticut Mail Controversy.—Second Assistant Postmaster-General Stewart was quoted as follows on July 15 in regard to the discontinuance of the mail service by the Connecticut Company. "When the railroad is ready to reopen negotiations on the department's plans the matter may be taken up again, but the next move must come from the railroad. The department here is doing nothing in the matter."

Stopping Places Designated in Pittsburgh.—On account of complaints from automobile drivers, who claim that street cars often block their paths at cross streets, the Pittsburgh (Pa.) Railways has ordered white signs to be painted at each corner one car length from the corner and another for the trailer. In this way the public will know the proper place to stand in order to board cars and the front of the cars will not block passage at a cross street.

Increase of Wages on Illinois Road.—An agreement has been reached by which a 15 per cent increase will be made in the wages of trainmen on the Chicago, Ottawa & Peoria Railway. The men asked for a 20 per cent increase. L. E. Fischer, representing the company, and A. D. Burbank, of the Brotherhood of Interurban Trainmen, met in Joliet and with a third party, chosen by them, arbitrated the wage question. The increase dates back to Jan. 1, 1914.

Forgetful Excursionists.—On July 4 ninety-six parcels were lost by absent-minded patrons of the Detroit (Mich.) United Lines upon the city and interurban cars. Fifteen people left their coats behind. There were ten who did not remember their umbrellas. One mother left her baby's carriage behind. A boy forgot his ball and bat. Some man remembered the saloons were closed on the holiday, but left his bottle behind him. Another excursionist left the family lunch basket on a car.

New Fort Wayne & Northern Indiana Traction Time-table.—A new time-table has been issued by the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind. It shows not only the complete passenger and freight train schedules, but also gives the steam and electric connections at all junction points and contains complete information regarding the through interline service between Ft. Wayne and Indianapolis. A notable feature of this time-table is an interurban map showing in detail nearly all of the lines in Indiana, Ohio and southern Michigan.

Electric Freight Service for Springfield Arsenal.—Electric freight service will soon be provided for the United States Arsenal at Springfield, Mass., over the tracks of the Springfield Street Railway, in place of present methods of shipping by teams and trucks. The connecting link between the armory and the Highland Division of the New York, New Haven & Hartford Railroad will be provided by the Springfield Street Railway, the service being made possible by recent track re-laying on State Street and the installation of special work with facilities for electric switch operation at various points. Coal, ordnance and other freight will be handled at a substantial saving in cost over present methods.

New Commutation at Ticket Rates at Rochester.—The New York State Railways filed with the Public Service Commission of the Second District of New York new rates effective on July 10. Ticket books each containing 600 coupons, each of a face value of 1 cent good for transportation (within one year from date of sale) between all points on Rochester lines, except between points within the city limits of Rochester, will be sold for $5 per book. This is a reduction. The time limit of fifty-four trip commutation tickets has been changed from the calendar month for which purchased to the date of the following month corresponding to that on which purchased. If there be no corresponding date in the month next following, the limit will be thirty days from and including date of sale.

Refrigerator Cars in Louisville.—The Louisville & Interurban Railroad, Louisville, Ky., gets its "refrigerator" cars iced for nothing, or, rather, gets paid for permitting them to be iced. Ice this summer is exceedingly cheap at Louisville in view of an ice war in that city and the people on the country lines are buying it in quantities. The company hauls great quantities of ice out early in the morning on what it calls its ice cars, which on the way back bring the milk from the surrounding country to the city. Going out, loaded with from seventy-five to 200 300-lb. blocks of ice, the cars are kept tightly closed and are therefore thoroughly chilled before they start on the return trip. Thus the produce and milk which are brought back to the city, a great deal of it iced at its point of origin, virtually has refrigerated cars.

New Uniforms on Illinois Interurban Line.—The Rockford & Interurban Railway and the Rockford (Ill.) City Traction Company have adopted a summer uniform for the trainmen, said to be unlike those used by other companies. The interurban motormen wore a striped blue and white over-all blouse and trousers similar to those used by other interurban lines, but the new uniform consists of a gray flannel shirt with soft collar and cuffs and the regular blue serge trousers. Trainmen are permitted to go without their coats provided they wear invisible suspenders. This uniform is neat, can be washed and kept clean, and is very cool during the daytime and warm at night, absorbing perspiration readily. The shirt is worn in blouse fashion. The trainmen wear a silk cap. Conductors have two bands of gold braid around the cap and motormen two bands of silver braid. The caps have a visor to shade the eyes.

"Safety First" Campaign Succeeding at Boston.—The first week of the "safety first" campaign at Boston, which is to extend throughout the present month, shows a marked diminution in the number and severity of accidents on the streets as compared with the first week of July in 1913. The Boston Elevated Railway reports that from the beginning of the month to midnight on July 8 the number of accidents of all kinds on the system was only 52 per cent of the number during the corresponding period of 1913. Most of the accidents resulted either in no injury or in minor physical damage, and only one fatality occurred. There has been only one collision of cars in which passengers were injured. Police department records show that this year there were only forty-three street accidents in the week compared with sixty-three a year ago, and of these two were fatal compared with nine in the 1913 period. The Boston City Hospital reports eighty-four accidents compared with 136 a year ago.

Transfer Inquiry in Brooklyn.—The Public Service Commission for the First District has ordered that a hearing be held to determine whether transfers shall be ordered between the Van Brunt Street & Erie Basin Railroad, 3 miles long, and the Coney Island & Brooklyn Railroad, the Coney Island & Gravesend Railway, the Brooklyn, Queens County & Suburban Railroad, the Nassau Electric Railroad and the Brooklyn Heights Railroad, or any two or more of them. According to the report of Joseph Johnson, chief of the transit bureau of the commission, transfers between the Van Brunt Street line and the Hamilton Ferry line of the Coney Island & Brooklyn Railroad were exchanged prior to June 10, 1914. The Brooklyn Rapid Transit interests, after acquiring the Coney Island & Brooklyn Railroad, suspended the exchange of transfers, on the ground that the territory was amply provided for by the Crosstown and Hicks Street lines. The company refused to restore the transfer privileges, and now the commission will inquire into the situation.

Personal Mention

Mr. W. W. Martin has been appointed secretary and treasurer of the Amarillo (Tex.) Street Railway to succeed Mr. Guy W. Fellar, who has been made second vice-president and purchasing agent.

Mr. L. R. Little, who has been master mechanic of the Dayton & Troy Electric Railway, Dayton, Ohio, has been appointed chief engineer of the power station of the company, to succeed Mr. Waldo Weaver.

Mr. H. F. Ferguson has been appointed master mechanic of the Dayton & Troy Electric Railway, Dayton, Ohio, to succeed Mr. L. R. Little, who has been placed in charge of the power station of the company.

Mr. R. J. Pike, who was purchasing agent of the Lehigh Valley Transit Company, Allentown, Pa., has become connected with the Mahoning & Shenango Railway & Light Company as secretary to Mr. R. P. Stevens, president of the company.

Mr. L. W. Johnson has been appointed superintendent of the Texarkana (Ark.) Division of the Southwestern Gas & Electric Company, to succeed Mr. C. H. Kretz. Mr. Johnson was formerly assistant superintendent at Texarkana. Before that he was connected with the New Orleans Railway & Light Company.

Mr. E. H. Rowell has been appointed claim agent of the Topeka (Kan.) Railway, to succeed Mr. M. F. Cosgrove. For the last two years Mr. Rowell has been secretary to Mr. W. C. Cartlidge, claim agent of the Rock Island System at Topeka. He was also with the Santa Fe Railroad for a year as stenographer and clerk.

Mr. E. C. Deal, whose appointment to N. W. Coler & Company, New York, N. Y., was noted in the ELECTRIC RAILWAY JOURNAL of Feb. 28, has been elected vice-president and general manager of the North Carolina Public Service Company and the Salisbury & Spencer Railway, Greensboro, N. C., to succeed Mr. J. P. Clark. Both of these properties are controlled by N. W. Coler & Company.

Mr. Thomas Gibson has been appointed purchasing agent of the Lehigh Valley Transit Company, Allentown, Pa., to succeed Mr. R. J. Pike. Mr. Gibson has been connected with railway work for the last twenty-two years. He served as master mechanic of the Philadelphia & Chester Railway for eleven years, as superintendent of transportation with the Montgomery Traction Company, West Point, Pa., for eight years, and was in charge of the real estate department of the Lehigh Valley Transit Company for three years.

C. F. COLE

Mr. Cornelius F. Cole, auditor of the Metropolitan Street Railway, Kansas City, Mo., who devised the method used by the company for cataloging the voters in the Kansas City franchise election, as described elsewhere in this issue, was born at Chanute, Kan., on July 21, 1874. He was educated in the city schools of that place and in the Chanute High School. After leaving school he taught in the district school in Neosho County in 1891 and 1892. In 1892 he entered the employ of the Cherokee Bank at Cherokee, Kan., as assistant cashier. In 1894 he was appointed to the position of secretary of the Mine Creek Coal Company at Pleasanton, Kan., a position which he held until 1896, when he resigned to enter the coal department of the Missouri, Kansas & Texas Railway. In 1900 he was promoted to assistant to the superintendent of construction, with headquarters at St. Louis, Mo. In 1907 he went to Kansas City where he was engaged as accountant by several large concerns. In April, 1909, Mr. Cole entered the auditing department of the Metropolitan Street Railway and was soon advanced to chief clerk. In 1910 he was made auditor of the company, which position he holds at the present time.

Mr. Thomas Hawken has resigned as general manager of the Rockland, Thomaston & Camden Street Railway, Rockland, Maine. Mr. Hawken has been with the company nearly twenty-two years under the presidency of Mr. George E. Macomber. He has built up the company into one of the most prosperous public service corporations of its kind in Maine. The system includes railway, electric and gas properties. Mr. Hawken began his career in 1880 on telephone line construction at Salem, Mass. In 1890 he entered electric railway construction work for the Edison General Electric Company. Mr. Hawken intends to take up active work again after a vacation. The Rockland, Thomaston & Camden Street Railway operates 28.5 miles of line between Rockland, Thomaston, Camden, Rockport and Warren. Included in the system of the company is a park of which Mr. Hawken has been in charge.

THOMAS HAWKEN

Mr. Phillip D. Laird has resigned as chairman of the Maryland Public Service Commission, the resignation to take effect on Aug. 1.

Mr. Phillip J. Kealy, accountant, engineer and appraiser, who in conjunction with Mr. L. R. Ash, city engineer for Kansas City, Mo., drafted the franchise ordinance known as the "Kealy-Ash plan," will become the representative of the company on the board of control of the Kansas City Railways. The Kealy-Ash plan was advanced as a substitute for the Jost administration draft providing for the extension of the franchises of the Metropolitan Street Railway for nineteen years, and the "Kansas City plan," which is in reality the "Kealy-Ash plan," went into effect in part on July 8, following the franchise election in Kansas City. Mr. Kealy was born in Bloomington, Ill., on July 2, 1884. He was educated at the Chicago High School, Lewis Institute and the University of Illinois. He entered the service of Mr. Bion J. Arnold, Chicago, in 1907 and continued with Mr. Arnold until Feb. 1, 1914. He then resigned to become the personal representative of Mr. Robert J. Dunham as special adviser to the receivers of the Metropolitan Street Railway, in which position he remained until with the acceptance of the Kealy-Ash plan by the voters of Kansas City he automatically became representative of the company on the board of control of the new company. Mr. Kealy assisted in the valuation of the property of the Consolidated Traction Company, Chicago; Chicago Suburban Railway; Southern Street Railway, Chicago; International Traction Company, Buffalo; Seattle (Wash.) Electric Company; Toronto (Ont.) Railway and the Chicago Telephone Company. He went to Kansas City on June 2, 1912, as the representative of the Arnold Company to appraise the street-railway property, and so satisfactory was his work that he was directed to value the property of the Kansas City Electric Light Company. During the recent franchise negotiations in Kansas City he acted as campaign manager and adviser to the workers in the field. As previously stated Mr. Kealy becomes by the terms of the franchise the company representative of the board of control of the Kansas City Railways, but pending the discharge of the receivers he will serve together with Mr. Robert P. Woods, the city's representative, as an arm of the federal court.

P. J. KEALY

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Coal Belt Traction Company, Linton, Ind.**—Incorporated in Indiana to build electric railways in Linton. Capital stock, $10,000. Directors: Joseph Moss, D. R. Scott and George A. Baughman.

***Lansing Connecting Railroad, Lansing, Mich.**—Incorporated in Michigan to build electric railways in Lansing. Capital stock, $50,000. George E. Hutchinson, secretary.

FRANCHISES

Benicia, Cal.—A. K. Bowen, president of the Benicia Land & Terminal Company, has asked the Council for a franchise to build an electric railway in Benicia. Application will soon be made to the Board of Supervisors to build an electric line over certain county roads. This is part of a plan to build an electric line to connect Vallejo, Benicia and Winters, via the Berryessa Valley. [E. R. J., July 11, '14.]

***Lindsay, Cal.**—J. R. Hayden, Lindsay, has received a fifty-year franchise from the Council to build an electric railway in Lindsay.

San José, Cal.—The San José Terminal Railway has received an extension of time until April 15, 1915, on its franchise in which to begin work on the line the company proposes to build from San José to a point near Port San José. Financial arrangements have been made whereby work on the extension will be begun soon.

San Diego, Cal.—The Bay Shore Railroad has received a franchise to build an electric railway from Ocean Beach across the channel of False Bay and along the Strand to Bird Rock Beach in San Diego. Work will be begun at once.

Pomona, Cal.—The Pacific Electric Railway has received a franchise from the Council for a line from Lordsburg to North Pomona to connect with the line to San Bernardino.

Stockton, Cal.—The Stockton Electric Railroad has asked the Board of Supervisors for a fifty-year franchise to extend its lines in San Joaquin County.

Carbondale, Ill.—The Murphysboro & Southern Illinois Railway has asked the Council for a franchise in Carbondale. This 7-mile line will connect Murphysboro and Carbondale. A. B. Minton, Murphysboro, is interested. [E. R. J., July 4, '14.]

Chicago, Ill.—The Chicago & Northern Interurban Railway will ask the Council for a franchise in Chicago and it will ask for a certificate of necessity and convenience from the Illinois Utilities Commission in Chicago.

Dixon, Ill.—The citizens of Dixon will on Aug. 11 vote on a proposition to give the Illinois Northern Utilities Company a franchise to build and operate an electric railway on North Crawford Avenue in Dixon from its present line to the city limits. The election was ordered by a recent ordinance passed by the City Council.

Hopkinsville, Ky.—The City Council and the Fiscal court of Christian County have been asked to offer for sale electric railway franchises, providing for a city system and interurban lines in the county. The leaders of the group of local capitalists back of the project are R. E. Cooper and John B. Bell, who will ask for no bonus.

Columbia, Mo.—F. S. Mordaunt, Chicago, has received a fifty-year franchise from the Council in Columbia and is negotiating with the Chicago & Alton Railway for a ninety-nine-year lease on the 50-mile branch of the Chicago & Alton Railroad which connects Mexico and Jefferson. It is proposed to transform the branch into an interurban line and make it the nucleus of a railway which will connect Jefferson City, Mexico, Fulton, Montgomery City, Columbia, Fayette and Glasgow. [E. R. J., July 11, '14.]

Kansas City, Mo.—The Metropolitan Street Railway has received a nineteen-year extension of time on its franchise in Kansas City.

Billings, Mont.—The Billings Traction Company has received a thirty-day extension of time on its franchise from the Council to improve its lines in Billings.

***Toledo, Ohio.**—Philip S. Willis, Toledo, and Charles Newell, Sandusky, have received a franchise from the County Commissioners to build a 2-mile electric railway from Auburn Avenue to Willis Avenue in Toledo. This line will not connect with the lines of the Toledo Railways & Light Company. It is expected that this company will at first furnish the new line with light and power.

Astoria, Ore.—The Pacific Power & Light Company has received a franchise from the Council to extend its lines in the east and west sections of Astoria.

Portland, Ore.—Owing to changes made in the proposed route of the Portland & Oregon City Railway Company's urban and interurban line, application has been made to the Council for an entirely new franchise which will allow the cars of the company to run on the downtown streets and north on the East Side to the city limits. The company has already been granted a franchise allowing it to enter the city on the southeast.

New Castle, Pa.—The New Castle Electric Street Railway has received a franchise from the Council to extend some of its lines in New Castle.

***Mitchell, S. D.**—O. E. Cassem, Mitchell, has asked the Council for a franchise to build a 4-mile electric railway in the northwest section of Mitchell.

Nashville, Tenn.—The Nashville Traction Company has presented to the Board of City Commissioners a schedule of the new lines it proposes to lay under the terms of its recently granted franchise and has asked for the Board's approval. Rails to the amount of 250 tons are on the way for use in the construction.

Fort Worth, Tex.—The Northern Texas Traction Company has received a franchise from the Council to extend the Summit Avenue line in Fort Worth about 1 mile.

Blacksville, W. Va.—The Morgantown & Wheeling Railway has asked the Council for a franchise to extend its line through Blacksville.

TRACK AND ROADWAY

Helena Street & Interurban Railway, Helena, Ark.—An extension on Porter Street to the city limits of Helena is being built by this company.

Fresno (Cal.) Interurban Railway.—Surveys have been completed between Fresno and Clovis, 10 miles, and about 2 miles of track has been laid from Fresno to Esmeralda Vineyard. J. B. Rogers, Merchants National Bank Building, San Francisco, president. [E. R. J., June 6, '14.]

Pacific Electric Railway, Los Angeles, Cal.—An agreement was signed recently between this company and the El Segundo Land & Improvement Company whereby the railway company obligates itself to complete the line from Hawthorne to El Segundo and have it in operation by Aug. 2.

San Francisco, (Cal.) Municipal Railway.—The Mission District Promotion Association's committee on streets, railroads and railway transportation, has formulated a plan to afford transportation facilities to the easterly slopes of the Potrero Nuevo hills and the surrounding district. It is proposed to build an extension of the Potrero Avenue branch line of the Municipal Railway, which will serve this entire section and act as a feeder for the main branches of the municipal system in San Francisco.

Connecticut Company, New Haven, Conn.—The Public Utilities Commission has granted this company permission to relocate its tracks in Derby Avenue from Ellsworth Avenue to the town limits in New Haven.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—An extension of the Washington Street line to Concord Avenue, thence to the Boulevard and back to Twenty-second Street in Wilmington is being planned by this company.

Chicago & Northern Interurban Railroad, Chicago, Ill.—Plans are being contemplated by this company for a line to connect the Fox Lake district with Chicago at Elston, Belmont and California Avenues in the northwest section of Chicago. [E. R. J., July 11, '14.]

Peoria (Ill.) Railway.—Plans are being made by this company to double-track Frye Avenue through the East Bluff section.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next six weeks this company will award contracts to build 2 miles of new track in Manhattan.

Southern Traction Company, Bowling Green, Ky.—It is reported that this company has ordered 15,000 tons of rails preparatory for the extension of the Bowling Green Street Railway.

Orleans-Kenner Electric Railway, New Orleans, La.—Right-of-way is being secured by this company between New Orleans and St. Charles. This 110-mile line will connect Kenner, New Orleans, Hanson City, Harriban and Shrewsbury. J. A. Bowman, New Orleans, president. [E. R. J., May 9, '14.]

North Louisiana Electric Railway, Shreveport, La.—Preliminary arrangements are being made by this company for the early construction of its 120-mile line to connect Monroe and Shreveport via Ruston and Minden. A. B. Blevins, Shreveport, president. [E. R. J., Jan. 17, '14.]

Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine.—Plans are being considered by this company to extend its lines in Augusta.

Portland, Gray & Lewiston Railroad, Portland, Maine.—This company has placed in operation its 10-mile line between Portland and Lewiston.

Frederick & Brunswick Railroad, Frederick, Md.—Plans are being considered by this company to begin work in the fall on this line between Brunswick, Frederick and Jefferson. Oscar B. Coblentz, Frederick, chief engineer. [E. R. J., April 25, '14.]

Bay State Street Railway, Boston, Mass.—Work of laying double tracks from Cliftondale Square to Morton Avenue and Central Street in Cliftondale has been begun by this company.

Worcester (Mass.) Consolidated Street Railway.—This company is asked to consider plans to extend its June Street line and relay its tracks from Abbott Street to Newton Square on Pleasant Street in Worcester.

Detroit, Almont & Northern Railway, Detroit, Mich.—Nearly 11 miles of track has been completed by this company on the section of its line between Romeo and Almont, and surveys have been completed from Almont to Imlay City. F. W. Brooks, 12 Woodward Avenue, Detroit, Mich., president. [E. R. J., Dec. 6, '13.]

Grand Rapids (Mich.) Railway.—Work has been begun on the Madison Square railway extension from Hall Street south to Burton Street in Grand Rapids.

Mississippi Electric Railway, Columbus, Miss.—Preliminary arrangements are being made by this company to build an electric railway from Memphis, Tenn., to Columbus, Miss., and eventually extend it into Alabama through Pickens County, with Aliceville as the terminus. Headquarters: Columbus. F. W. Crisby, Columbus, is interested. [E. R. J., March 28, '14.]

Union Railway, New York, N. Y.—This company has bought the existing franchises for an electric railway from City Island Station to Belden Point, City Island, and work will be begun at once on the construction of the line. As soon as the consent of the property owners can be secured this company will extend its Willis Avenue line into Harlem.

Tri-State Railways, Toledo, Ohio.—This company has awarded a contract to A. C. Lingebach & Company, Chicago, for the construction of its proposed line between Hillsdale, Mich., and Pioneer, Ohio. Surveys have been completed on the line between Hillsdale and Pioneer and are now under way on the branch from Adrian to Jackson. Charles H. Heller, Hillsdale, is interested. [E. R. J., June 20, '14.]

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—An extension of the Mahoning Valley line to West Austintown, a distance of 5 miles, is being considered by this company.

Oil Belt Traction Company, Oklahoma City, Okla.—This company has sent representatives to recent meetings of commercial organizations along the proposed route to ascertain what action will be taken. Many favorable replies have been received. A meeting of secretaries of commercial organizations along the route was held in Oklahoma City on July 9. This railway will connect Fort Smith, Ark., and Shawnee, Okla., via Blackwell, Nowata, Newkirk, Miami, Grove, Tulsa, Westville, Stilwell, Muskogee, Henryetta, Okemah and Checotah. [E. R. J., June 13, '14.]

Toronto (Ont.) Railway.—This company has been ordered by the Ontario Railway Board to extend its line from Agnes Street to College Street in Toronto.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—Plans are being contemplated by this company for an extension from Butler to Youngstown. It is planned to bring the line into Youngstown over the proposed viaduct at Lincoln Park, to follow Ook Street and cross the proposed Oak Street viaduct to Summit Avenue and reach Youngstown this way.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—Right-of-way is being secured for a 2-mile extension from the Missionary Ridge to the Rossville short line.

Nashville (Tenn.) Traction Company.—Work has been begun by this company on Fifth Avenue in Nashville. G. B. Howard & Company, Nashville, engineers. [E. R. J., May 9, '14.]

Bryan & Central Texas Interurban Railroad, Bryan, Tex.—All necessary material has been purchased by this company for the electrification of the line from Bryan to College. It is planned to have this line in operation by Sept. 1.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex.—An amendment to its charter has been filed by this company in Corpus Christi, changing its name to the Corpus Christi Railway & Light Company.

Eastern Texas Traction Company, Dallas, Tex.—At a recent meeting of stockholders of this company a contract was agreed upon with the Stone & Webster Engineering Corporation to complete the construction of the Dallas-Greenville Interurban line. Under the terms of the contract the Stone & Webster company agrees to complete the entire line, including the laying and ballasting of tracks, erection of electric lines, construction of power stations and depots and to put the new line in condition for operation. The work is to begin at once under the direction of L. C. Bradley, assistant district manager of the Stone & Webster interests.

Fort Worth & Denton Interurban Railway, Fort Worth, Tex.—A meeting of the stockholders of this company will be held July 24 to formally transfer the right-of-way and other holdings to the Stone & Webster Engineering Corporation which will build and operate the line. As soon as the formal transfer has been made the company will begin building the railway and it is expected to have cars in operation in about a year. [E. R. J., May 30, '14.]

San Antonio, San José & Medina Interurban Railway, San Antonio, Tex.—Work on the interurban line between San Antonio and Medina Dam will be begun within the next few weeks. The company expects to complete the first section to Kirk before the new year. The line will extend from Kirk to Castroville, via Lacoste, thence to the division dam. J. G. Miller, San Antonio, general manager. [E. R. J., June 27, '14.]

Washington Electric Railway, Chehalis, Wash.—Three condemnation suits were recently filed in the Lewis County superior court by this company to secure the right-of-way for the extension of the old Chehalis & Cowlitz Railroad, recently taken over by the Washington Electric Railway Company, from Newaukum to Randle, which is now under construction. To date 1½ miles of the line has been graded and the laying of rails will begin shortly. A bridge is being built across the Newaukum River. The route of the extension is up the south fork of the Newaukum River.

Willapa Electric Company, Raymond, Wash.—Plans are being considered by this company to rebuild its tracks in South Bend from Water Street to the Kleeb Mill. The entire right-of-way has been secured for the new route.

South Morgantown Traction Company, Morgantown, W. Va.—A 16-mile extension to Fairmont is being considered by this company.

Morgantown & Wheeling Railway, Wheeling, W. Va.—A 55-mile extension is being contemplated by this company from Blacksville to Wheeling.

SHOPS AND BUILDINGS

Lethbridge (Alta.) Municipal Railway.—Plans are being considered by this company for improvements at its carhouses in Lethbridge.

Helena Street & Interurban Railway, Helena, Ark.—A new freight station is being built by this company at Pecan and York Streets in Helena.

Pacific Electric Railway, Los Angeles, Cal.—Plans are being made by this company to build at once a new passenger station at El Segundo.

Bristol & Plainville Tramway Company, Bristol, Conn.—C. H. Tenny & Company, Springfield, Mass., engineers, have prepared plans and specifications for an addition to this railway company's carhouses located on Riverside Avenue in Bristol. The addition will be 50 ft. x 90 ft., one-story with slag roof. It will contain concrete pits and other conveniences. The addition is being erected anticipatory to the purchase of new equipment of double truck cars.

City Railroad, Mount Vernon, Ill.—Work will be begun at once by this company on its carhouses in Mount Vernon. The structure will be 35 ft. x 70 ft.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—Plans are being made by this company to begin work soon on the construction of a new interurban depot at Ninth and Ferry Streets in Lafayette. The company also plans to build during the year new repair shops east of Lafayette. The Terre Haute, Indianapolis & Eastern Traction Company will use the new depot and pay a rental to the Fort Wayne & Northern Indiana Traction Company.

Mesaba Electric Railway, Virginia, Minn.—Work has been begun on the construction of this company's new carhouses in Virginia to replace the structure destroyed by fire last winter. The building will be one-story in height and have a capacity of twenty cars. It is estimated to cost about $20,000.

POWER HOUSES AND SUBSTATIONS

Fresno (Cal.) Interurban Railway.—This company has placed in operation its temporary power station in Fresno where the line branches off Fresno Avenue into the Esmeralda Vineyard. This temporary plant will serve until the new company concludes its contract with the San Joaquin Light & Power Company. J. B. Rogers, president.

Pacific Gas & Electric Company, San Francisco, Cal.—This company will install at its power house in San Francisco one 100-kw, 650-volt, six-phase, sixty-cycle, 600-r.p.m. rotary converter. This appratus was ordered quite recently from the Westinghouse Electric & Manufacturing Company.

Public Service Company of Northern Illinois, Streator, Ill.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for one 300-kw, three bearing synchronous motor generator set, consisting of one 300-kw 600-volt generator on common base and shaft with one 450-hp, two-phase, sixty-cycle, 2400-volt, 900 r.p.m. synchronous motor with one 7½-kw, 125-volt direct connected exciter.

Manhattan City & Interurban Railway, Manhattan, Kan.—During the next six weeks this company expects to build a new power house in Manhattan.

Meridian Light & Railway Company, Meridian, Miss.—Extensive improvements are being made at this company's power plant and new machinery is being installed. Two new boilers, one a 750-hp and another 1500-hp, will be added to the equipment of the plant. The new machinery and other improvements are estimated to cost about $50,000.

Pacific Power & Light Company, Astoria, Ore.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for two 500-kw, two-bearing synchronous motor generator sets consisting of two 500-kw 225-112 ½-volt three wire commutating pole generators, 500 r.p.m., mounted on common base and shaft with two 720-hp, three-phase, fifty-cycle, 2400-volt, 500 r.p.m. synchronous motors.

Bryan & Central Texas Interurban Railroad, Bryan, Tex.—New engines and generators have been purchased by this company and will soon be installed in the power house at Bryan.

Manufactures and Supplies

ROLLING STOCK

Greeley & Denver Railroad, Greeley, Col., expects to purchase two single-truck motor cars.

Rhode Island Company, Providence, R. I., has ordered fifty cars from the Laconia Car Company.

Toledo, Ann Arbor & Jackson Railway, Toledo, Ohio, has leased one 40-ft. Edison storage-battery passenger car from the Railway Storage Battery Car Company.

Central Vermont Railway has leased one 40-ft. Edison storage-battery passenger car from the Railway Storage Battery Car Company, to operate between Brattleboro and Millers Falls, Vt.

New Jersey & Pennsylvania Traction Company, Trenton, N. J., has ordered four 49 ft. 6 in. center-entrance, all-steel, interurban, arched-roof passenger cars from the Cincinnati Car Company, through W. R. Kerschner, its Eastern representative.

Chicago (Ill.) Surface Lines, noted in the ELECTRIC RAILWAY JOURNAL of July 4, 1914, as having issued specifications for 228 semi-steel, double-end motor cars, has ordered these cars, together with trucks and seats, from The J. G. Brill Company. The General Electric Company has received the order for motor, control and brake equipment, which includes 456 type GE-242 tap field motors with K-51 control and CP-27 air brakes.

TRADE NOTES

Curtain Supply Company, Chicago, Ill., has received an order to equip with Ring No. 88 curtain fixtures and Rex all-metal rollers the 100 cars which were recently ordered by the Pittsburgh (Pa.) Railways.

Diamond State Fibre Company, Elsmere, Del., has recently started making Disfico white board at its West Conshohocken Mill. This is an insulating board which will bend but not crack, and is manufactured in thicknesses up to ⅛ in.

Electric Storage Battery Company, Philadelphia, Pa., has received an order from the Puget Sound Traction, Light & Power Company for thirty-four "Ironclad-Exide" batteries of three cells each. These batteries are to be used for lighting the cable cars operated by the traction company.

ADVERTISING LITERATURE

Chicago Pneumatic Tool Company, Chicago, Ill., has issued Bulletin 34-N describing and illustrating its Class N pneumatic steam and power driven enclosed compressors.

Whiting Foundry Equipment Company, Harvey, Ill., has issued Catalog No. 110 describing in detail its various types of cranes. Among numerous illustrations shown of these cranes in actual service are views of electric work car trains employed by the Northern Ohio Traction & Light Company; New York, Westchester & Boston Railway; Los Angeles (Cal.) Street Railway and of an electric locomotive train used by the Union Carbide Company, Niagara Falls, N. Y.

Salomon Brothers & Hutzler, New York, N. Y., have issued a 46-page pamphlet dealing with the subject of short-term securities. The book contains a list of securities arranged according to their maturities so that if the investor has surplus funds to invest for a stated period he can readily find the securities best suited for his purposes. Among some of the public utility issues included in the list are the following: Brooklyn Rapid Transit Company 5's, Chicago Elevated Railway 5's, City Service Company 7's, Denver City Tramways 5's, Delaware & Hudson Company 4's, General Electric Company 5's, Montreal Tramways & Power Company 6's, Pacific Gas & Electric Company 5's, Portland Railway, Light & Power Company 5's, Public Service Corporation of New Jersey 5's, Puget Sound Traction, Light & Power Company 6's, Republic Railway & Light Company 5's, United Gas & Electric Corporation 5's, West Penn Traction Company 6's and Westinghouse Electric & Manufacturing Company 5's and 6's.

NEW PUBLICATIONS

Trolley Wayfinder. Published by the New England Street Railway Club, Boston, Mass. 151 pages; price, 10 cents.

This is the official guide to the electric railways of New England published by the New England Street Railway Club. The information is most conveniently arranged and is supplemented by many maps of the individual systems and group maps which show the possibilities of long excursion tours.

So the People May Know. Published by the Blade Printing & Paper Company, Toledo, Ohio. Fifty-two pages and cover; price, $2, postpaid.

This is a reprint of a series of advertisements written by Henry L. Doherty, of H. L. Doherty & Company, New York, N. Y., for the Toledo Railways & Light Company in connection with the negotiations for the extension of the franchise of that company, and published in the newspapers of Toledo. The advertisements deal with the general franchise situation in Toledo and contain the answers prepared by Mr. Doherty to the criticism leveled at the company from various sources.

Workmen's Compensation. By James Harrington Boyd, A. M., Sc. D. The Bobbs-Merrill Company, Indianapolis, Ind. Two volumes, 995 pages, $7.50.

These volumes are a complete presentation of the subject of workmen's compensation and industrial insurance, setting forth the methods, procedure and results in actual practice and including the full text of the statutes in force Jan. 1, 1913, in Germany, England and the several states in this country. The author points out in a clear-cut manner the distinctive characteristics of the different remedies for the relief of injured workmen—that is, the common law remedy, employers' liability laws, workmen's compensation laws and industrial insurance acts. He presents the economic effects of the operation of these laws from a social, political and ethical point of view, shows their historical evolution in this country and abroad and analyzes their constituent elements. He also devotes considerable space to a discussion of the fundamental legal principles that form a basis of the various kinds of laws and describes in detail the administrative machinery that has been developed to operate these laws in this country.

Volume 1 is taken up with a presentation of the distinctions between compensation remedies, a history of the development of workmen's compensation laws in Germany and the United States and an analysis of the compensation acts in New York, Montana, Washington, Ohio, Wisconsin, New Jersey, California, Nevada, Kansas, New Hampshire and Massachusetts. In discussing the acts of these states the author gives the construction and annotations of the state board or commission which has in charge the administration or execution of the law. This volume also contains a discussion of the legal principles underlying compensation laws and a summary of all foreign compensation laws.

The first part of Volume 2 presents an analysis of the acts for Illinois, Minnesota, Rhode Island, Arizona, Missouri and the federal government. The treatment of the subject thus far has generally been confined to separate compensation acts, but at this point the author groups all the laws and begins to consider matters and constructions common to them all. He discusses the character of workmen included under the laws, the injuries for which compensation is allowed, the question of whether the employee was injured in the course of his employment, the time when injuries were received, dependence of deceased workmen and amount of compensation. The minuteness with which this examination is made is evidenced by the fact that cases are cited on almost every page of this section to prove such statements as these—that compensation allowed for engineers who work "on, in or about" a railway does not cover injuries received in a refreshment room, for this is not used for the purpose of public traffic within the meaning of the law, and that an employee of contractors to build a railway station does not come within the purview of the law, as this work is merely ancillary to the operation of the railroad. In the last portion of Volume 2 there is an account of the procedure under the British compensation act and also the only complete translation of the German industrial insurance code, which is the parent law upon which American legislation is based. The book is not written primarily for electric railways, but it is an exhaustive mine of information for every employer concerning a movement that is becoming daily of greater importance in this country.

Electric Railway Journal

. Published by the McGraw Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY, JULY 25, 1914 No. 4

KEEPING TRACK OF GOOD DATA

Those who consult the page containing the table of contents of this paper, the page just inside the front cover, will have noticed a change in arrangement beginning with this volume. Heretofore this page has been purely a list of the articles in each issue. It is now not only a table of contents but also can be used as a basis for a card catalogue of the leading articles and so serve for the temporary convenience of the reader until the semi-annual index is published. Before the change was made a number of librarians and others were consulted, and it is at their request that it was done. No attempt is made on this page to arrange the titles so as to bring the keyword first in each case. This, it was thought, would confuse the reader who wished to use the page as a table of contents. Moreover, some readers will wish to use one keyword and some will prefer another. The present plan permits the keyword under which the card index is to be alphabetized to be underscored easily when the clipping is filed. A list of a number of the standard keywords used in the regular indexes of this paper was published on the inside of the first page of the semi-annual index. All who wish to follow our general plan of keywords will find this list useful.

MAKING USE OF THE ANNUAL REPORT

Annual reports of public service corporations and, in fact, corporations in general, are usually sad affairs. They appear to be compiled with a view to communicating such information as is given in the least interesting form. This is not only an example of unwisdom but of throwing away an opportunity for effective educational work. An annual report need not consist merely of pages of figures representing more or less understandable accounts. It may, with good effect, tell in an interesting way a year's history of a corporation, what it has been doing and what it has accomplished. In most cases the report can be effectively illustrated. It also affords an excellent opportunity for the discussion of public relations. Statements in annual reports on such subjects carry more weight and make more impression than ordinary declarations on the subject. At the present time the press has no reason to pay much attention to corporation annual reports, but if these reports were prepared as they might easily be with a view to making them interesting and informing along general lines, not only the stockholders but the press and the public generally would pay attention to them, and they would become a useful medium for public education.

VALUE OF CONVENTION EXHIBITS

At this season plans are being made by manufacturers for the exhibits to be made at the Atlantic City convention. Each exhibitor has his own idea as to what constitutes a satisfactory presentation of his product. At the same time there are certain fundamental requirements which it is well to keep in mind. There must be something about the exhibit which attracts visitors to it, not because of some irrelevant "stunt" which is being "pulled off" but because it offers a chance to teach something. The exhibit must be of an instructive character so that the visitor leaves with a feeling that he has been put upon the right track on some matter vital to his welfare. Such exhibits require effort, especially in formulating the original, basic idea. The most original, studious and resourceful man in each business organization should be assigned to this part of the work. Visitors to former conventions could do good service to exhibitors by stating in our "Communications" column some of the exhibit features which impressed them.

THE DAYLIGHT SHOP

Some recent designs of electric railway shops and carhouses show a commendable appreciation of the value of daylight. The old-time buildings were usually constructed with massive brick walls and heavy wooden roof timbers, and for these wide areas of glass were often impracticable. Modern steel and reinforced concrete construction has made it feasible to put up structures which from the glazing standpoint may be likened to exaggerated hothouses. At the same time the manufacture of sash-operating devices and fire and shock-resisting glass have been brought to such a high stage of development that daylight construction is both convenient and safe. Perhaps the most striking of late electric railway installations is the new machine shop of the Detroit United Railway, which was described in our issue of June 13. It appears that the exterior construction of this building was influenced very largely by the designs of the structures put up for the great automobile companies of the City of the Straits. Certainly if manufacturers who require buildings several stories in height can find ways of obtaining ample light, the electric railway company, which rarely requires more than a one-story building, should not be backward in securing the same advantages. Unless a shop or carhouse is of extraordinary breadth with narrow devil-strips there is no excuse for dark pits in the daytime. A well-lighted building also means greater safety for the employees and more effective, even if unconscious, attention to keeping the floors clear of debris and fire-breeding waste and oil. The latest carhouses built in Germany are noteworthy models in this respect. Although they are not generally designed with large glazed areas in the walls, they do have very liberal skylights and the ends, including a large portion of area of the track doors, are usually of glass.

ABSORBING FRESH BLOOD

This is the season when there is a large accession from the schools to the ranks of the workers. Within the past few weeks several hundred thousand young people have been "graduated" from schools and colleges and must now be absorbed by the industries. A considerable number will naturally enter electric railway work. The problem of assimilating a reasonable share of the best available young blood is a serious one, because on its solution depends the future of the industry. There are two aspects of this situation which demand attention. The recruit must begin his work with the determination to make the most of it and of himself. On the other hand, the employer must see to it that the youth has a fair opportunity to make good. It is this second point that appeals to us as particularly important at this time.

The process of adapting young people to their proper places in many of the industries is more complicated now than formerly. Then the demands on the school were few and simple and the learning of a trade was a natural step, as apprentice systems of one kind or another were more generally in vogue and effective. A mechanic, for example, complied with more or less definite specifications and occupied a recognized position in the community. In contrast with former conditions we have at present a complicated school curriculum, which is the subject of much criticism, and a general lack of provision for systematic training in the industries, especially on the part of operating companies. There is for these reasons a new responsibility laid upon the management of such companies to study the "new blood" problem. The fundamentals of this study appear to us to be as follows:

The educational and industrial facts cited above must be recognized. Each applicant for a position must be considered as an individual, not simply as "help," and his qualifications must be studied to enable him to be fitted to the proper task. When set to work he must not be left to his own devices but must have some guidance so that he will develop properly and can utilize all present agencies for his improvement. Original devices must be used as necessary to bring out the latent ability of the neophyte. We can imagine that we hear our older friends, brought up under the good, old-fashioned but now obsolete methods, throwing down the paper at this point, exclaiming, "Bosh! throw the youngster in and let him learn to swim by swimming. This new-fangled coddling business doesn't go with me." We urge these friends to be patient with us. Times have changed. We must have something to do for the boy what the old apprentice system did. We do not advocate coddling but we do deplore neglect.

MAKING THE "SAFETY FIRST" MOVEMENT PERMANENT

Accident prevention campaigns are so much in vogue to-day that they present little novelty to the progressive electric railway man. Nevertheless, every carefully planned campaign in the interests of "safety first" deserves commendation, for such efforts are honest endeavors to cut down the waste, losses and suffering of humanity in a field very much within the control of each individual. The Boston campaign, described elsewhere in this issue, is one of the most thoroughgoing of its kind. The division of the work into six periods, each of which was featured by a keynote poster for dasher service, amplified by signs within cars, stations and elsewhere, unquestionably served to retain public interest in the campaign during its continuance. The figures at its end will be highly instructive as indices of the degree to which the public and the railway employees concerned manifested a real interest in their own welfare and co-operated with the company in its efforts to impress them.

It is of very great importance, once a "safety first" campaign has been waged in a city, that all the lessons shall not be forgotten when the period of publicity is over. As in many other reforms, the avenue of approach most likely to lead to success is the child. Within the Boy Scout movement, in the public schools, in the Y. M. C. A. organization, accident prevention finds a naturally cordial reception, and the idea of making children think of themselves as "street scouts," looking out for the safety of others, is an excellent one. We are inclined to think that if "safety first" work is to continue in any community, the subject must constantly be kept in sight, although revivals of interest in it must be stimulated from time to time by special efforts on a striking scale. The subject is not unlike that of modern advertising, which, to be most effective, calls for varied displays and fresh copy no less than for regular, steady insertions of the appeal.

It is not difficult to keep employees in touch with safety work, but it is far from easy to keep the public from dropping back into the old, careless ways, once a campaign is past. On every large and on most small systems, there is ample material upon which to draw in seeking to show the public what to avoid. That is to say, every accident has a lesson of its own, and so great is the variety of ways in which accidents can happen that special features of the safety movement can be emphasized for many months without giving the people monotonous repetitions of the subject. Out of the daily experience of every representative operating company may be drawn lessons which, when pressed home in the sign racks and elsewhere, should yield much good fruit in the way of individual care to avoid danger. But in the long run, the physical salvation of the individual in relation to the safe use of the streets depends upon himself, and accident prevention from the street railway point of view is in no small degree a matter of supplying the public with the right kind of impressions, appealing to it in English and other languages with statements and arguments of real, human significance, practical, concrete and pithy, and with fresh angles of attack on the inertia and mental conservatism from which we all suffer in varying degree. The material is at hand and its successful use depends upon the operating man, the claim department and upon every employee authorized to devote a part or all of his time to this worthy cause.

COMPARATIVE MAINTENANCE COSTS FOR CAR EQUIPMENT

The maintenance costs on the Hudson & Manhattan Railroad, which appear on another page of this issue, possess a feature of interest beyond the fact that they establish the best record of operating cost yet published. This is because the figures are, in a way, generally comparable to those of the New York, Westchester & Boston Railway which were published in our issue of March 21, and in consequence they serve as an indication of the relative operating results that can be obtained from efficiently operated single-phase and direct-current railways. On the Hudson & Manhattan, the service, with 1.6 stops per mile and heavy grades, is somewhat more severe than on the Westchester road, but to offset this the latter's cars are heavier and a car mile involves the transportation of a greater tonnage. Other conditions, however, display a striking similarity, both roads having been equipped by the firm of L. B. Stillwell, which acted as consulting engineers, and this is reflected in the almost exact agreement of many of the items in a comparison of the subdivided operating costs.

Such agreements will be found in the cost per mile of the control equipment, the trucks, wheels and axles, and the brake equipment when the cost of material, which is not subdivided by the Hudson & Manhattan, is prorated among the various items. Approximately speaking, the cost of maintenance on the Westchester is 2.3 cents per mile and on the Hudson & Manhattan 1.5 cents per mile. Leaving out of consideration the irregularly charged cost of painting, one-third of the total difference of 0.8 cent per car mile is involved in the maintenance of the single-phase motors. However, the Westchester motor costs were increased by the repairs on motors damaged in the early days of operation which were not charged until January, 1913, and if these charges are omitted the cost of motor maintenance is reduced to 0.11 cent per car mile. It will be noted that the main motors on the Hudson & Manhattan cars cost almost nothing for repairs, so that, on account of this unusual condition, practically all of the expense goes against the record of the single-phase equipment. The difference in the cost of maintaining the auxiliaries amounts, roughly, to 0.15 cent, and this, of course, is easily traceable to the fact that on the Hudson & Manhattan cars only the air compressor and governor are included in this item, whereas on the Westchester cars there is, in addition to the air compressor, a blower, a transformer and a motor-generator set for charging the control batteries. Besides these items there is a cost for maintaining pantographs on the Westchester, amounting to about 0.15 cent per car mile, which is not offset by any corresponding charge on the Hudson & Manhattan where the cost of third-rail shoes, since the adoption of the present spring-held type, has become too small to be recorded. In the same way gears and pinions, under the vibrating torque of single-phase motors, cost about 0.05 cent per car mile on the Westchester while those on the Hudson & Manhattan cost practically nothing.

So far as reliability of the two forms of equipment goes, there appears to be little to choose. On the Hudson & Manhattan, leaving aside the record of the exceptional year 1911, when the miles per detention rose to the extraordinary figure of 160,000, the average delay record is very close to 55,000 miles per detention or 22,000 miles per minute of detention. On the Westchester the corresponding figures are respectively 41,000 miles and 13,000 miles, the difference being easily accounted for by the fact that the latter line runs almost entirely in the open, whereas the former is mainly operated in a tunnel.

The mileages obtained from main motor brushes are respectively 26,000 and 21,000, showing that there is little to choose between the two types of motor in this regard. Indeed, this would indicate that the wear upon the commutators is approximately the same in both cases, although judging by the appearance of the commutators at the present time the Hudson & Manhattan seems to have a considerable advantage in this respect. The cost of lubricant on the Hudson & Manhattan averages but 14 cents per thousand car miles as against 21 cents on the Westchester. Probably a considerable part of this is due to the increased amount of equipment on the single-phase cars, and there is no doubt but that some portion is due to the difficulty of oiling bearings and gears that are under the vibrating strains inherent in single-phase equipment, but in the end the item is one of small relative importance, and it is unquestionably affected to a large extent by the number of cars cared for.

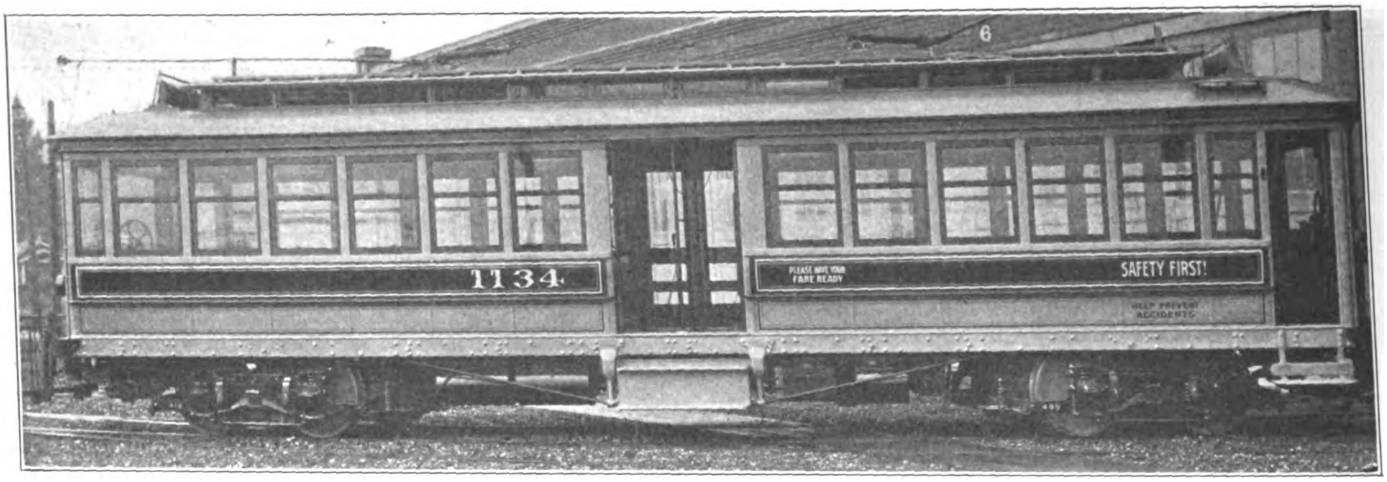
This matter, of course, must be admitted as a factor of considerable influence in every item where irregularity of work is inevitable, such, for instance, as terminal inspection, and as the Hudson & Manhattan is operating 286 cars as opposed to thirty on the Westchester the advantage is all with the former road. Of course, this comparison of the costs of maintenance on the two roads in question is not intended to extend beyond consideration of the two radically different types of equipment which are involved, and it should not be construed in any way as criticism of the methods employed or the results obtained by P. V. See and R. R. Potter, the superintendents of equipment on the two roads respectively. Indeed, opportunity for a comparison of costs on the two types of equipment has been made possible by the highly efficient manner in which the cars on both roads have been maintained, and our comments are congratulatory rather than critical in view of the excellent results that have been accomplished.

Open Cars Changed to Closed Center-Entrance

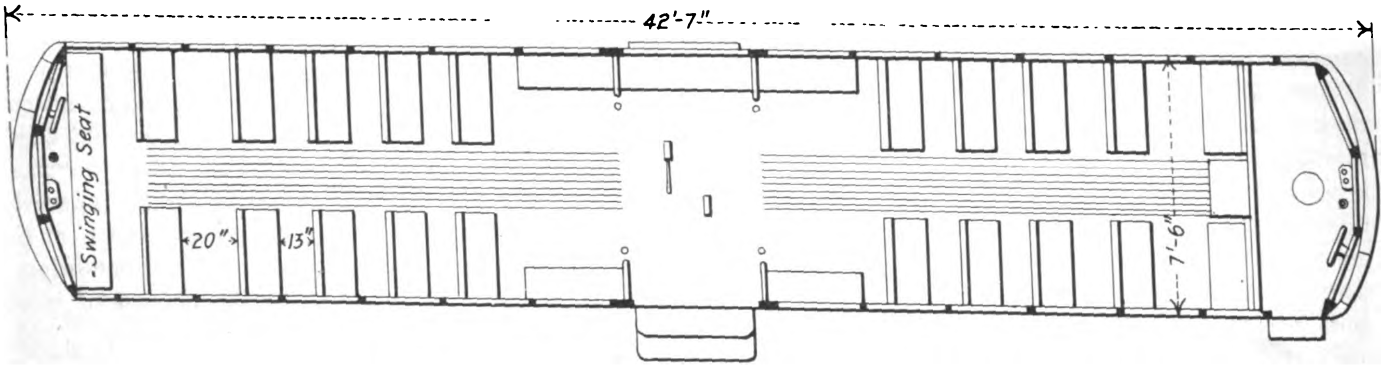
The Portland Railway, Light & Power Company Has Rebuilt a Number of Open Cars to a Center-Entrance Type with Folding Double Step—Among the Most Striking Features Are the Swinging End Seats and In-Sweeping Side Doors

The Portland (Ore.) Railway, Light & Power Company has converted a number of its open-type cars to the center-entrance closed-body design shown in the accompanying half-tones and drawings. Several of these cars are already in service on the Hawthorne line. The rebuilt cars are 42 ft. 7 in. over all and 7 ft. 6 in. wide with a 47½-in. center opening. Separate doors and single folding steps are provided for the motorman.

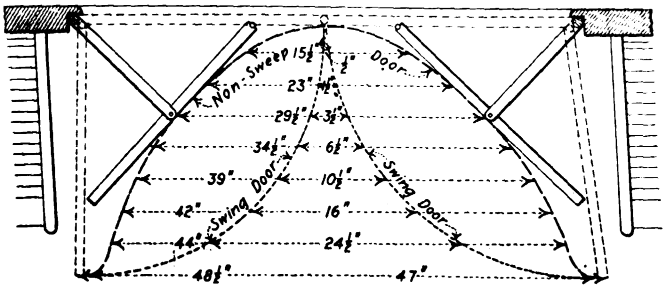
The accompanying plan shows that cross seats are used to the largest extent consistent with freedom of passenger movement. The end seat which occupies the space otherwise used by the motorman is of special interest. It is suspended on levers at either end, thus forming a swing. As the seat is journaled to rotate, it may be rolled over automatically by means of corner rollers. The slotted guides in which these rollers travel are fastened to the sides of the car and serve to support the seat in its lowered position. To clear the motorman's cab the front edge of this seat is raised, thus allowing it to swing in and also allowing a pendent intermediate seat to drop over the aisle in direct line with the first pair of permanent cross seats. This pendent seat and the regular cross seats then form a


6
1134
PLEASE HAVE YOUR FARE READY
SAFETY FIRST!
HELP PREVENT ACCIDENTS

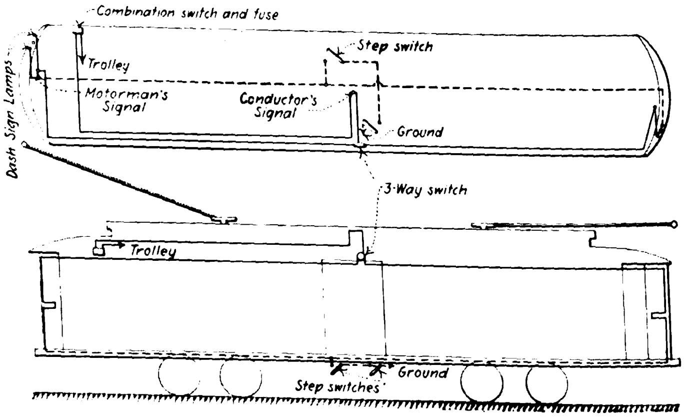
PORTLAND CONVERTED CAR—GENERAL VIEW, SHOWING THE DOUBLE-STEP DOWN, THE DOORS OPEN; ALSO MOTORMAN'S DOOR, SAFETY WARNINGS, ETC.


42'-7"
Swinging Seat
20"
13"
7'-6"

PORTLAND CONVERTED CAR—SEATING PLAN, SHOWING VARIATIONS POSSIBLE AT THE ENDS

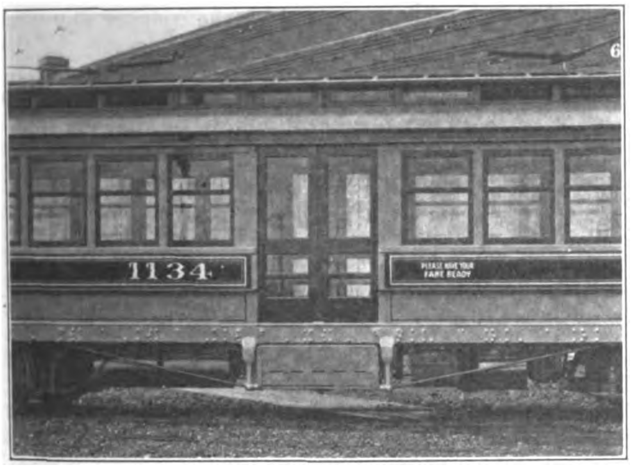

Non-Sweep 15½"
Door
23"
29½"
3¼"
34½"
6½"
39"
10½"
42"
16"
44"
24½"
48½"
47"
Swing Door
Swing Door

PORTLAND CONVERTED CAR—PLAN SHOWING RELATIVE CLEARANCES OF PORTLAND AND ORDINARY SWING DOORS

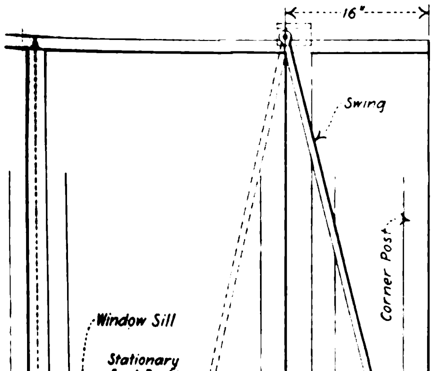

Combination switch and fuse
Step switch
Trolley
Motorman's Signal
Conductor's Signal
Ground
Dash Sign Lamps
3-Way switch
Trolley
Ground
Step switches

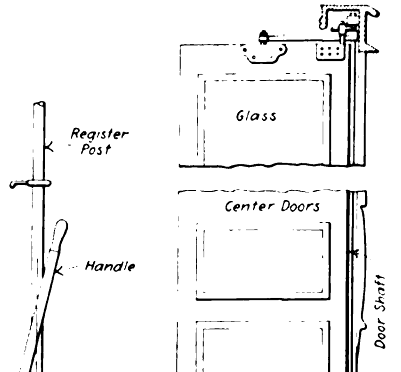
PORTLAND CONVERTED CAR—WIRING FOR STEP AND DOOR SIGNALS barrier between the operative cab and the rest of the car. To bring the seat into use at the rear idle cab, the front edge of the aisle seat is raised slightly and started back, the seat continuing to fall by gravity as it is slightly out of balance. Other temporary seating is used at the center opening alongside the non-operated doors. The total seating capacity of the car is fifty-seven.

A double step, involving the easy successive elevations of 14 in., 13 in. and 12 in., is used between the street paving and the car-body floor. This double step is arranged to fold under the side sill to avoid fouling vehicles or other obstructions. It is of unusual construction in that one riser serves for both steps. Hence the riser folds over just as if a single step was used.


1134
PLEASE HAVE YOUR FARE READY

PORTLAND CONVERTED CAR—VIEW AT CENTER, SHOWING FOLDED RISER OF DOUBLE STEP WITH DOORS CLOSED

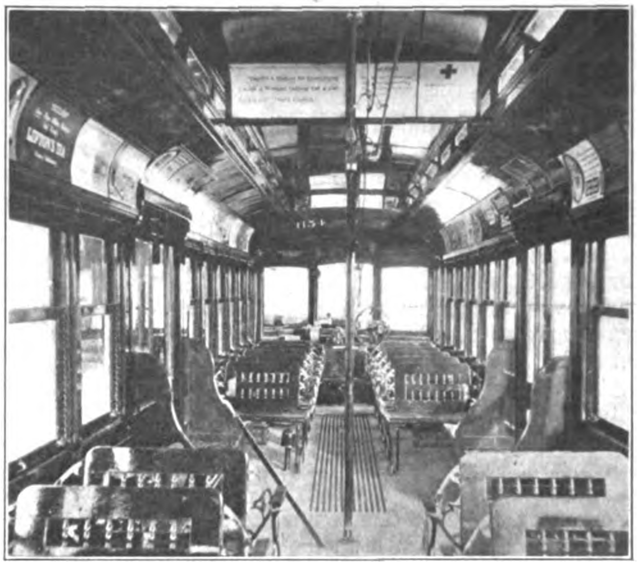

16"
Swing
Corner Post
Window Sill
Stationary Seat Back
72"
Roller Guides
Swinging Seat
Roller Bracket
Bearing
Catch
End Seat End
29"
Floor Line
Socket for Motorman's Stool


Glass
Register Post
Handle
Center Doors
Door Shaft
Bottom Hinge
Anchor
Hand Rod
Lever
18"
Counter Shaft
Spring Sleeve
Door Rod
Step Rod
12"
Toe board
Step
13"
Steps folded under car
℄ of Car
Truss Rod
Step Shaft
14"
Top of Rail

PORTLAND CONVERTED CAR—SWING SEAT USED AT END OF CAR—DOOR AND STEP MECHANISM

The inter-operative door and step mechanism is controlled by the conductor. Owing to the use of a spring on each side of the center balance of the double step, the only friction which resists the movement of the lever amounts to but 7½ lb. at the conductor's grip.

Unlike most folding doors, those used on these cars are not hinged to swing in or out. At its center each door hangs from an arm which extends from a vertical shaft, a screw on this arm serving for ready adjustment. The movement of the door is governed at the outer edge by means of a roller which runs in a slotted guideway over the door. This guideway is so shaped that the door in closing must pass behind any passenger who may be standing within the doorway. Should the passenger be within the sweep of the door, the movement of the latter would force him in and not out, contrary to the action of a hinged door. This action is represented in an accompanying drawing, which shows that a passenger who may be leaning against the center grab post would not block the movement of the Portland door, whereas he would interfere with a hinged door if he was standing 2 ft. within the car. For practical purposes the new door takes less than one-half the room of a swing door.



PORTLAND COVERTED CAR—INTERIOR VIEW, WITH TEMPORARY AISLE SEAT IN BACKGROUND

Another drawing shows a wiring diagram of the signal system, illustrating the connections to the motorman's pilot signal light, the conductor's signal, the switches for breaking the circuit if either door is opened and the bank of dash sign lights. This bank is incased in a box-like reflector to which a "car full" sign is hinged. When this sign is "down" it is brightly illuminated, while the dash sign is kept in shadow; when this sign is "up" its legend is invisible but the light from the bank is reflected downward to illuminate the dash sign.

The technical changes in the cars, as described, are being made under the direction of F. W. Hild, general manager, and F. P. Maize, master mechanic.

Maintenance Costs on Hudson & Manhattan Railroad

Detailed Figures Are Published to Show Costs and Other Operating Records on This Rapid Transit Line—The Average Cost of Maintaining 35-Ton Cars for the Past Four Years Has Been Less than 1.5 Cents Per Car Mile

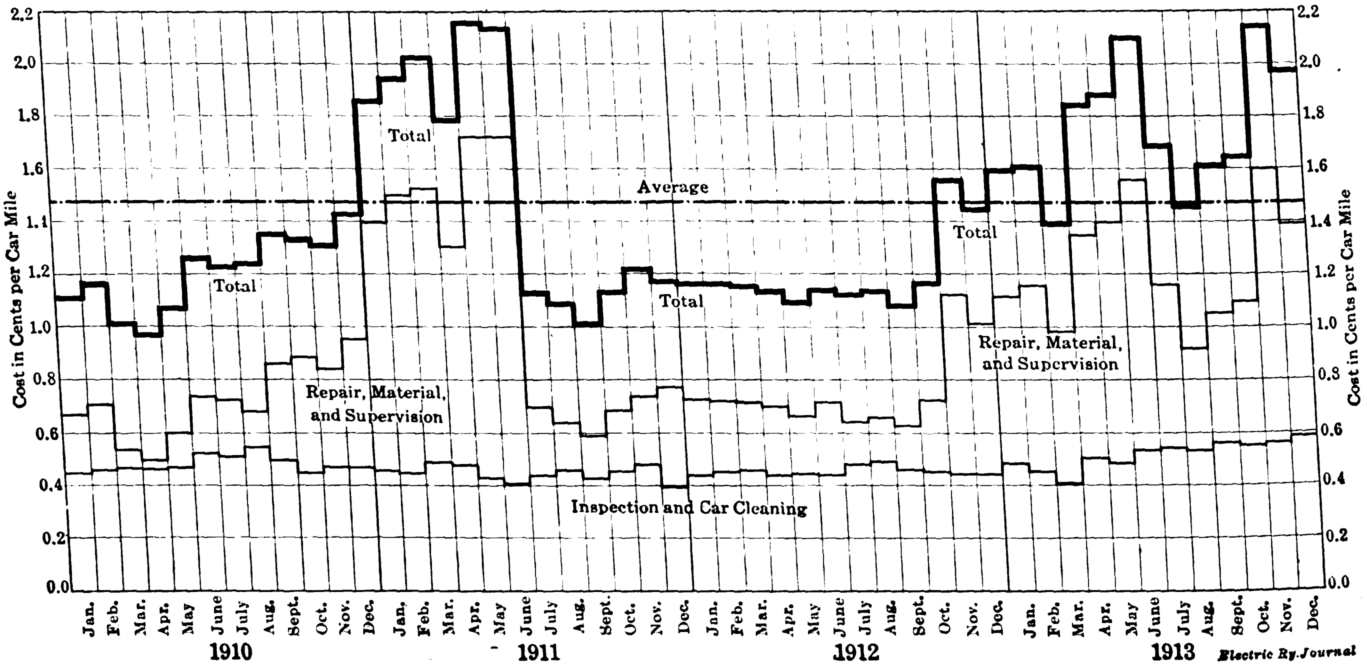
As frequent comparisons of detailed costs of operation on railroads of similar character must ultimately lead to the adoption of apparatus, methods, shop facilities and policies which will produce the maximum reliability of service with the minimum of expense, the following costs of maintenance of car equipment on the Hudson & Manhattan Railroad have been obtained for publication by the ELECTRIC RAILWAY JOURNAL. In presenting these figures an effort has been made to set forth briefly, but as clearly as possible, the actual detailed costs incurred and the operating conditions affecting them.

The Hudson & Manhattan Railroad equipment is operated almost entirely in the Hudson Tunnel system, carrying the heavy commuting service of the Erie, the Delaware, Lackawanna & Western and the Pennsylvania Railroads under the Hudson River to and from New York City. The system comprises 16.9 miles of single-track tunnel. The average distance covered by each car in one day is 118 miles. In making this daily mileage each car encounters curves equal to about 42 complete round turns, the minimum radius of curves being 90 ft., and it ascends grades equivalent to a total elevation of 4685 ft., the maximum grade being 5 per cent. The brakes are used to control the speed in descending the corresponding down grades. The average schedule speed, including 1.6 stops per mile, is 17.32 m.p.h. Trains consists of from two to six cars as required.

The service in the tunnel itself, while free from extremes of temperature, subjects the cars to a humid atmosphere at about 65 deg. Fahr., and on account of the close clearances in the tube the cars always operate against the equivalent of a heavy head wind which has, at times, a pressure equal to 2 in. of water. This causes a considerable amount of dirt to be deposited in and on exposed apparatus, and it also requires the interiors of the cars to be kept unusually clean, as the dust raised by the drafts that are caused by the opening of a door would otherwise be annoying to passengers. As the yards and part of the service are in the open air the low temperatures experienced in winter when the cars are outside involve the same attention to prevent the freezing of the air-operated apparatus as if the service was constantly in the open.

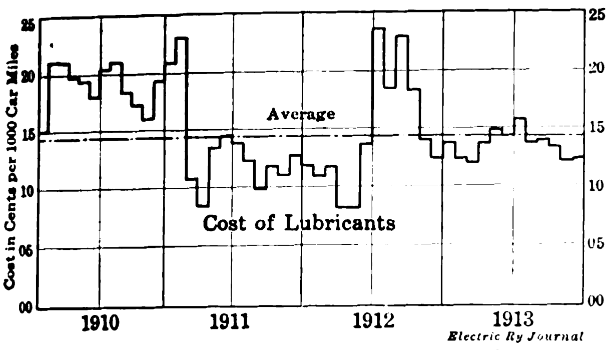
The rolling stock in service consists of 173 motor cars. No trailers are used. All cars are steel, 48 ft. over all, 8 ft. 6 in. wide, 12 ft. high from rail to top of roof. The cars average 70,000 lb. in weight and seat forty-four passengers. Each car is fitted with two GE-76 d.c. motors, each rated at 170 hp at a line voltage of 600. The control equipment is General Electric, Type M, and the air brake is of the Westinghouse, A.M.L.E. type.

The Hudson & Manhattan Railroad was opened for regular operation in February, 1908. For the first three years the inspection of equipment was accomplished on an eight-car length of track, with a pit, at the Hoboken terminal station platform. All inspection was done by artificial light and in very cramped quarters. Necessary repairs during these years were done in the small shop on the surface at Hoboken, reached by raising one car at a time on an elevator. During the year 1910, 140 cars were thus cared for. However, a completely equipped repair shop was built at Jersey City and placed in service in December, 1910, by the firm of L. B. Stillwell, consulting engineers for the Hudson & Manhattan Railroad. This shop was specially planned to provide for the peculiarities of the equipment which it served, the cars having been designed by F. M. Brinckerhoff, a member of the same firm, so that an exceptional opportunity has existed for economical maintenance since the shop has been in use.

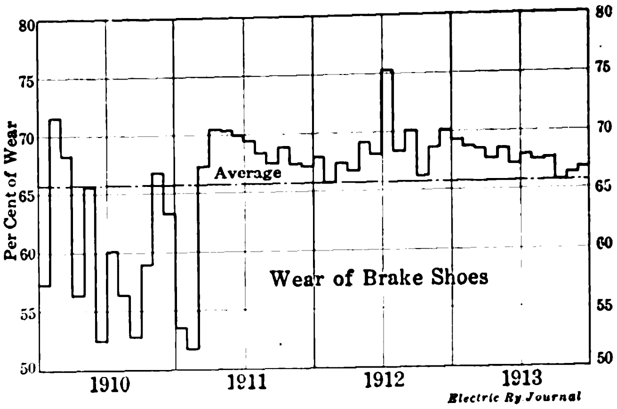


Electric Ry. Journal

HUDSON & MANHATTAN MAINTENANCE—FIG. 1—CURVE SHOWING COSTS OF MAINTENANCE OF CAR EQUIPMENT DURING A FOUR-YEAR PERIOD

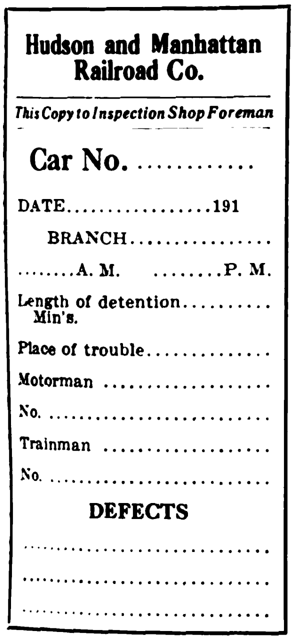


HUDSON & MANHATTAN MAINTENANCE—FIG. 2—COST OF MATERIAL FOR LUBRICATION



HUDSON & MANHATTAN MAINTENANCE—FIG. 3—BRAKE-SHOE MATERIAL UTILIZED IN SERVICE, EXPRESSED IN PERCENTAGE OF TOTAL WEIGHT OF METAL WORN FROM SHOES

As the repair work during the first three years was done under abnormal conditions, the cost of maintenance for only the last one of these years is included in the accompanying tables. However, during the four years for which records are given all of the work of maintenance has been continuously in the charge of P. V. See, superintendent of car equipment, Hudson & Manhattan Railroad.



Hudson and Manhattan Railroad Co.

This Copy to Inspection Shop Foreman

Car No. ....

DATE.................191

BRANCH................

........A. M. ....P. M.

Length of detention..........
Min's.

Place of trouble.............

Motorman ....

No. ....

Trainman ....

No. ....

DEFECTS

....

....

....

HUDSON & MANHATTAN MAINTENANCE—MOTORMAN'S DEFECT REPORT CARD

In the accompanying Table I is shown the total costs of maintenance per car mile for four years, including supervision, repair, car painting, inspection, car cleaning and all shop tools and expenses, the average cost being 1.48 cents per car mile. In Fig. 1 is shown the plotting of the same total figures, a subdivision being made between inspection and repairs. The first heavy peak in the curve of Fig. 1 may be accounted for by changes made in the equipment and by the execution of certain repair work and painting which had been deferred until the new shops were occupied. The peak near the end of the curve is due to a very extensive painting of cars.

Table II is a subdivision of costs for six months, to show in detail how the money is spent. It will be noticed that the labor spent on inspection is comparatively high—over 0.5 cent per car mile, notwithstanding the remarkably low total costs. This is due to the fact that Mr. See believes in doing as much repair work as possible when inspections are made, so that the inspection costs cover all overhauling of brakes and contactors, and other light repair work.

Running inspections are made on all cars at intervals that average 1150 miles, or approximately ten days' service. Every fifth inspection is called a general inspection, and at this time the car is not only given a thorough examination but has all repair work done that may be required to put the equipment in first-class condition. These general inspections are carried on in the inspection shed. Only when heavy work, such as wheel turning or truck repairs, is required are cars brought into the repair shop. Painting is done at such times as cars can be spared from service.

The inspectors are made responsible for finding all defective apparatus, the motormen on trains being required only to report defects that may develop upon the road or may cause train detentions. These detention reports as made by the motormen take the form shown in the accompanying cut. The form is made up in triplicate, and the backs of the upper two of each set of three blanks are covered with carbon copy material. This

TABLE I.—MAINTENANCE COSTS OF CAR EQUIPMENT, HUDSON & MANHATTAN RAILROAD, SUBDIVIDED IN ACCORDANCE WITH I. C. C. STANDARD CLASSIFICATION OF ACCOUNTS

Number and Name of Account	1910	1911	1912	1913
29 Superintendence........	0.1112	0.1128	0.1386	0.1166
30 Car bodies............	0.3501	0.6420	0.3917	0.7472
34 Electrical equipment....	0.1173	0.1941	0.1163	0.1141
35 Shop machinery........	0.0217	0.0374	0.0181	0.0438
36 Shop expenses..........	0.0841	0.1714	0.1635	0.1977
69 Carhouse employees.....	0.5101	0.5071	0.4339	0.5171
70 Carhouse expenses......	0.0083	0.0067	0.0363	0.0387
Total..................	1.2028	1.6715	1.2984	1.7752
Mileage................	6,288,778	6,705,780	6,675,777	6,571,942

r four years, 1.487 cents per car mile.

TABLE II—SUBDIVISION OF MAINTENANCE COSTS IN CENTS PER CAR MILE ON HUDSON & MANHATTAN RAILROAD

Repair, Material and Supervision

1913	Motors	Pumps and Governors	Control	Car Bodies	Trucks	Air Brakes	Wheels and Axles	Painting	Miscellaneous	Material	Supervision	Total
January...............	0.0050	0.0243	0.0132	0.0444	0.0687	0.0391	0.0007	0.0433	0.1388	0.7621	0.0134	1.1530
February...............	0.0030	0.0225	0.0194	0.0324	0.0564	0.0288	0.0004	0.0600	0.1816	0.7344	0.0142	1.1531
March...............	0.0008	0.0179	0.0287	0.0489	0.0564	0.0202	0.0045	0.1276	0.1789	0.6297	0.0129	1.1265
April...............	0.0078	0.0138	0.0266	0.0834	0.0372	0.0248	0.0012	0.1350	0.1376	0.9384	0.0092	1.4150
May...............	0.0054	0.0189	0.0117	0.0788	0.0268	0.0365	0.0028	......	0.1450	1.0699	0.0092	1.4050
June...............	0.0026	0.0212	0.0241	0.0950	0.0256	0.0852	0.0029	......	0.1428	1.1287	0.0099	1.5380

Inspection

1913	Motors	Pumps and Governors	Control	Car Bodies	Trucks	Air Brakes	Brake Shoes	Oilers	Car Cleaning	Miscellaneous	Total	Total Inspection and Repairs
January...............	0.0055	0.0063	0.0507	0.0691	0.0359	0.0526	0.0116	0.0157	0.1838	0.0953	0.5265	1.6795
February...............	0.0067	0.0040	0.0553	0.0702	0.0353	0.0585	0.0114	0.0154	0.1948	0.0984	0.5480	1.7011
March...............	0.0056	0.0055	0.0672	0.0561	0.0337	0.0587	0.0117	0.0166	0.1852	0.0942	0.5345	1.6610
April...............	0.0044	0.0026	0.0541	0.0762	0.0320	0.0617	0.0125	0.0129	0.1870	0.0891	0.5325	1.9475
May...............	0.0047	0.0010	0.0605	0.0767	0.0335	0.0541	0.0106	0.0148	0.1781	0.0985	0.5325	1.9375
June...............	0.0060	0.0057	0.0740	0.0745	0.0387	0.0679	0.0116	0.0190	0.1971	0.1090	0.6035	2.1415

provides the triplicate reports, avoiding the necessity for them to be written out three times. One copy of the detention report is sent to the dispatcher, another to the superintendent of car equipment and the third to the inspection shop foreman. It will be noticed from the reproduction that the indication for the car number has been made in very large letters, as it has been found difficult to get the motorman to enter the car numbers in every case—an absolute necessity if the trouble is to be successfully traced. It will also be noticed that, contrary to the usual custom, no form for explanation of the defect has been used. Instead, a blank space is left and the motorman fills this in by describing the defect or cause of detention in his own language.

Table III gives the cost of oiling, brakeshoes and car cleaning. Table IV gives the average life of brakeshoes, carbon brushes and lamps. The low life of compressor brushes is due to constant pumping that is required to maintain the air pressure with six air-operated doors and frequent use of the brakes. Fig. 2 gives the cost of material for lubrication, the labor being included in the cost of inspection. Fig. 3 gives the percentage of brakeshoe wear.

Table V gives the detentions chargeable to equipment trouble and percentage of trains late, regardless of cause of delay. This shows that the equipment has not been allowed to deteriorate, notwithstanding the low maintenance costs that have been attained and the severe operating conditions to which the cars have been subjected.

In conclusion, it should be said that the low costs of maintenance have been obtained by careful supervision, a liberal use of bonus and piece-work methods, and a systematic employment of the efforts of highly-paid, picked men. That the low costs were not obtained by underpaying the employees is shown by the average daily pay of $2.29 for all classes of labor, including car cleaners and laborers. In addition, of course, the low cost of maintenance and the reliability of service of the rolling stock on the road are to a considerable measure attributable to the special facilities provided for inspection and repair work. Not only were the construction and arrangement of the shop buildings carefully planned to promote rapid and thorough work but the motors and other apparatus on the cars which might require inspection or repair were installed with full regard to the consideration of accessibility by the inspectors. The repair shop is, of course, completely equipped with electric cranes and other devices suitable for handling all heavy material. The energy of the employees is reserved for productive effort, and consequently high-grade workmen are easy to retain. The arrangement and equipment of this inspection shed and repair shop were described in detail in the ELECTRIC RAILWAY JOURNAL of May 6, 1911.

TABLE III—MISCELLANEOUS COSTS AND MILEAGE, HUDSON & MANHATTAN RAILROAD

	Lubricant Cost in Cents per 1000 Car Miles	Brakeshoe Cost in Cents per 1000 Car Miles	Car Cleaning Cost per Car per Month	Annual Car Mileage
1910	15.77	84.15	$4.96	6,288,778
1911	13.66	50.67	$4.85	6,705,780
1912	14.33	42.70	$4.57	6,675,777
1913	13.66	45.99	$5.66	6,543,817
Average	14.36	55.88	$5.01	....

TABLE IV—MISCELLANEOUS DATA, HUDSON & MANHATTAN RAILROAD

	Mileage per Brakeshoe	Percentage of Wear of Brakeshoe	Mileage of Motor Brush	Mileage of Compressor Brush	Life of Lamp, Hours
1910	7,710	....	33,700	8,820	775
1911	10,780	68.0	26,400	8,910	965
1912	12,870	69.1	24,600	5,770	621
1913	11,800	68.8	26,800	5,660	686

One of the features of the cost records on the Hudson & Manhattan Railroad is found in the co-operation of the auditing department with the car department in the matter of charging material during the month in which it is used. This has been found to be a distinct aid in analyzing the relative costs of maintenance each month. Under this system brakeshoes, oil, etc., are charged for when they are drawn and not when they are received in carload lots from the manufacturers. The effect of the introduction of this system is shown by the comparative regularity of the curve in Fig. 3 after 1911, the new brakeshoes having been charged against the car department in carload lots prior to that time in much the same way. The cost of tire and wheel renewals is provided for in advance by charging against the shop, and crediting to a tire reserve fund, an amount equal to the estimated tire and wheel wear during each month, the amount having, of course, a certain relation to the car mileage made. This tire "reserve fund" is, therefore, a sinking fund against the purchase of new tires, when needed, and has, of course, been included in the maintenance costs above given.

All of the foregoing costs and records have been taken direct from the reports made to the Interstate Commerce Commission by the Hudson & Manhattan Railroad, of which W. C. Fisk is president. The subdivisions of the general accounts are those which are kept in the offices of the superintendent of car equipment, P. V. See, for making monthly cost comparisons on the various parts of equipment.

A. B. Slater, Burton, England, in his annual report on the working of Burton Corporation tramways, mentions that a return from thirty-one municipal undertakings of an average age of twelve years was last year published by the Newport tramways manager, and from this it appeared that the average cost of repairs and maintenance was $355 per car per annum, compared with $370 per car per annum in Burton-on-Trent.

TABLE V—DELAY RECORD HUDSON & MANHATTAN RAILROAD

	1910					1911					1912					1913				
Month	Number of Detentions	Minutes Detention	Per Cent of Trains on Time	Miles per Detentions	Miles per Minute Detention	Number of Detentions	Minutes Detention	Per Cent of Trains on Time	Miles per Detention	Miles per Minute Detention	Number of Detentions	Minutes Detention	Per Cent of Trains on Time	Miles per Detention	Miles per Minute Detention	Number of Detentions	Minutes Detention	Per Cent of Trains on Time	Miles per Detention	Miles per Minute Detention
anuary	..	30½	....	....	17,150	15	49½	....	37,200	11,300	8	24½	99.47	77,800	25,400	10	40	99.65	58,500	14,620
February	..	21	....	....	22,300	2	3½	....	282,000	161,500	5	23½	99.65	111,000	23,600	8½	43	99.51	61,600	12,160
March	..	35½	99.18	....	15,050	2	7	99.87	312,000	89,300	5	10	99.67	120,000	59,755	13½	20½	99.87	43,100	28,400
April	..	7	99.47	....	72,100	2	3½	99.79	297,000	169,500	4	12	99.40	145,000	48,300	16	26	99.57	35,500	21,800
May	11	45½	99.52	46,400	11,220	3	21	99.87	196,500	28,100	8	17½	99.44	73,500	33,600	10½	20½	99.85	54,800	28,100
June	12	42½	99.40	39,400	11,130	2	8	99.73	269,000	67,300	14	46	99.72	37,400	11,400	12½	37	99.74	42,000	14,200
July	4	19½	99.73	112,000	23,000	4	21	99.45	123,500	23,600	13	32½	99.73	34,800	13,850	9½	22½	99.81	53,300	22,500
August	6	20	99.67	75,400	22,600	4	14½	99.75	127,800	35,200	10	24	99.71	50,300	20,950	13½	46½	99.71	37,400	10,850
September	7	18	99.60	74,900	29,100	7½	26½	99.55	74,700	21,100	14	44½	99.16	36,100	11,120	6	12½	99.80	85,200	41,400
October	8	19½	99.65	68,700	28,200	12	45	99.81	53,600	15,630	13	38½	99.00	43,300	14,620	9¼	26	99.57	60,400	21,500
November	21	69½	99.34	29,300	8,860	8	57	99.49	87,600	12,280	12	29½	99.50	45,600	18,520	6	22	....	87,700	43,900
December	41	151	99.37	16,650	,4520	6½	12½	99.61	65,800	44,750	11	57	99.61	54,500	10,520	14½	59	....	40,900	10,080
Average per month	14	40	99.493	57,843	22,102	5.75	22.6	99.69*	160,558	56,630	9.75	30	99.505	69,108	22,311	10.8	31.3	99.708*	55,033	23,293

*Average for ten months.

"Safety First" Campaign at Boston

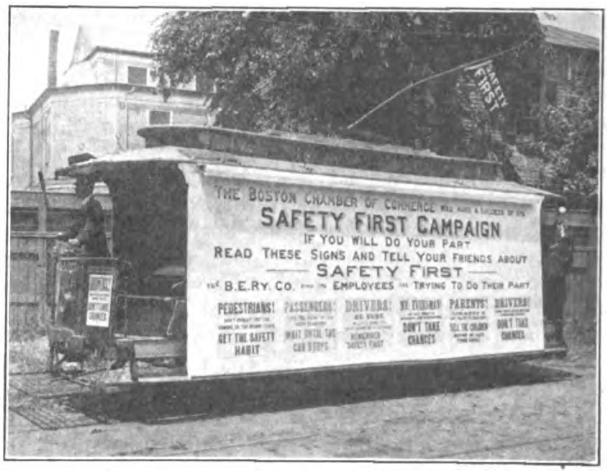
During the Present Month a Comprehensive Campaign Was Inaugurated Under the Auspices of All Interests Concerned and a Definite Impression Made—The Chamber of Commerce Co-operated with the Local Electric Railway Companies

One of the most carefully planned safety campaigns ever inaugurated in this country was begun on July 1 at Boston, Mass., under the co-operative efforts of the Boston Chamber of Commerce, the Boston Elevated Railway, the Bay State Street Railway, the Middlesex & Boston Street Railway and other organizations of semi-public and private character. The campaign is to extend through the entire month and is designed to appeal to the entire population of the Boston and eastern Massachusetts districts. An initial campaign for the safety of school children during the vacation season was waged by the Boston Chamber of Commerce in the middle of June, this being in a sense preliminary to the present extended effort on the part of all interested in safety on highways, to awaken popular appreciation of the problems of modern travel on thoroughfares occupied by the public. An outline of the June campaign and various details of the present one, with particular reference to street railways, is given in the following paragraphs.

"SAFETY FIRST" FOR SCHOOL CHILDREN

The school campaign was opened with a letter from Superintendent F. B. Dyer of the Boston public schools to principals and teachers, the letter being an indorsement of the work of the Boston Chamber of Commerce in sending printed suggestions for teachers and an open letter to parents giving advice to prevent accidents to children. The suggestions for teachers were in the form of an outline of a talk by teachers to their scholars at the close of school. This outline emphasized the increased danger of accidents to children during the vacation season, touching upon the greater use of the streets in summer, the large use of cars when patrons are in holiday mood, the absence of school discipline and the importance of taking care to avoid accidents between the close and the opening of school. The suggestions included a discussion of accident prevention points for both young and old children, with hints as to the creation of vivid mental pictures leading to safety precautions, blackboard mottoes emphasizing the need of personal care, appeals to the sense of prowess in encouraging older children to act as "street scouts" for the younger ones, calls upon the sense of responsibility for others, and appeals to the children's pride as young citizens in trying to make Boston the safest city for children.

The open letter from the Chamber to fathers and mothers pointed out that in the last twenty years, 25,000 children have been killed by trespassing on railroad tracks in this country and that in the last four years more than 30,700 accidents occurred on the lines of a single street railway company, many of these involving injuries to children and almost all arising from carelessness on the part of the persons injured. The letter contained several pithy suggestions regarding the use of streets and street cars, emphasizing the functions of public playgrounds and parks and including tersely worded advice in connection with crossing streets, avoidance of vehicles, waiting for cars to stop before getting on or off, looking both ways and keeping heads, legs and arms inside cars. At the bottom of each of these circular letters was a receipt to be torn off and signed by each child after the circular had been read by its parents, the receipt being returned to the teacher. About 200,000 of these bulletins have been sent by the Chamber to children in the schools of Boston, Brookline, Cambridge, Somerville, Newton and Chelsea, and approximately 7000 circular letters to teachers were sent.



BOSTON SAFETY CAMPAIGN—"SAFETY FIRST" ADVERTISING CAR

THE MAIN CAMPAIGN AT BOSTON

On the Boston Elevated, Bay State and Middlesex & Boston systems the campaign which was started on

SAFETY FIRST

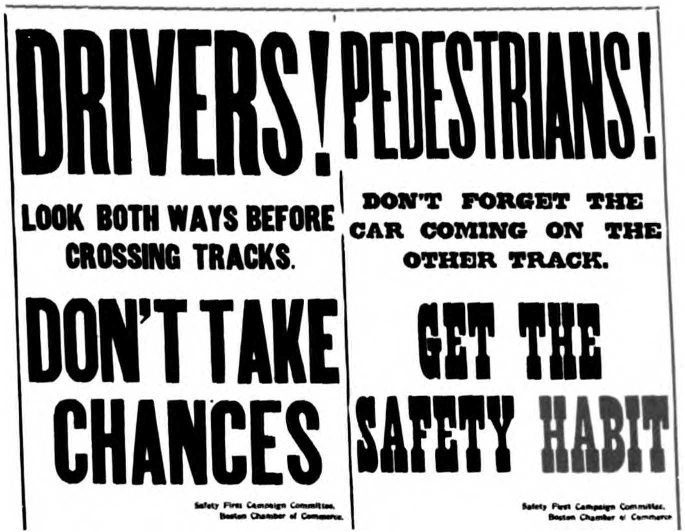
IF YOU DRIVE A VEHICLE You owe it to yourself and everyone else to USE THE GREATEST CARE in crossing or driving on the car tracks.

IF YOU EMPLOY DRIVERS OF VEHICLES you owe it to them and to the community to instruct them carefully and to INSIST UPON THEIR CARE while driving in the streets.

IT PAYS TO BE CAREFUL

Safety First Campaign Committee
Boston Chamber of Commerce

BOSTON SAFETY CAMPAIGN—SAMPLE CLERESTORY SIGN



DRIVERS!

LOOK BOTH WAYS BEFORE CROSSING TRACKS.

DON'T TAKE CHANCES

Safety First Campaign Committee, Boston Chamber of Commerce.

PEDESTRIANS!

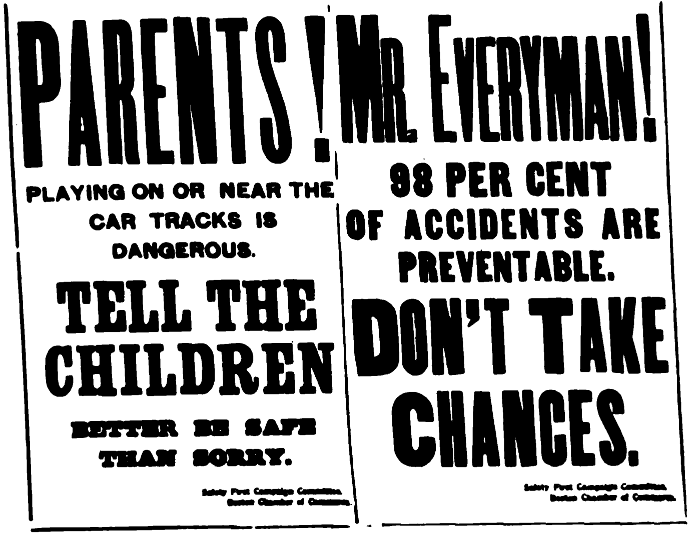
DON'T FORGET THE CAR COMING ON THE OTHER TRACK.

GET THE SAFETY HABIT

Safety First Campaign Committee, Boston Chamber of Commerce.

BOSTON SAFETY CAMPAIGN—SAMPLES OF DASHER POSTERS

July 1 was divided into six stages. In these some particular feature of accident prevention was emphasized for a few days as a keynote to the work as a whole; a few days later another feature was emphasized, and so on. The publicity matter of the campaign is being displayed in dasher signs, clerestory signs, subway and rapid transit line station signs, posters at carhouses, and stickers and bulletins carried on car windows, automobiles, teams, in stores and many other places. The Boston dailies co-operated liberally in the work, much space in the reading columns and a considerable number of editorials being devoted to accident prevention during the month. Every employee of the Boston Elevated Railway received a "safety first" leaflet issued by Second Vice-President M. C. Brush, outlining the accident prevention campaign launched by the Chamber of Commerce and asking for co-operation on the part of all those in the company's service. The Boston Elevated Company fitted up two eight-bench open cars with canvas signs occupying the entire side, the signs calling attention to the six salient features of the campaign periods, and being illuminated at night by ten 23-watt lamps, installed in a reflector trough which cut off all glare from the eyes of persons on the street. These cars were operated eighteen hours per day on the Boston system, and their routes were laid out to cover all quarters of the metropolitan district. The north and west sides of the city were covered from the Salem Street carhouse, in Medford, as a terminal, and the south and east sides from Grove Hall carhouse, in Roxbury. The cars each made a round trip in about seven hours, and attracted much attention on the streets. The local dailies showed views of them in service and gave descriptions of their work.



PARENTS!

PLAYING ON OR NEAR THE CAR TRACKS IS DANGEROUS.

TELL THE CHILDREN

BETTER BE SAFE THAN SORRY.

Safety First Campaign Committee, Boston Chamber of Commerce.

MR. EVERYMAN!

98 PER CENT OF ACCIDENTS ARE PREVENTABLE.

DON'T TAKE CHANCES.

Safety First Campaign Committee, Boston Chamber of Commerce.

BOSTON SAFETY CAMPAIGN—ADDITIONAL SAMPLES OF DASHER POSTERS

KEYNOTES OF THE CAMPAIGN

The Boston campaign was planned after a careful and extended study of safety work in many parts of the country, and the main features as presented to public attention on the various types of signs are given below, with the dates scheduled for their display.

(July 1 Display)

Dasher Signs.

DRIVERS

Look Both Ways Before Crossing Tracks.

DON'T TAKE CHANCES

Clerestory Signs.

SAFETY FIRST

If you drive a vehicle, you owe it to yourself and everyone else to use the greatest care in crossing or driving on the car tracks.

If you employ drivers of vehicles, you owe it to them and to the community to instruct them carefully and to insist upon their exercising care while driving in the streets.

IT PAYS TO BE CAREFUL

(July 7 Display.)

Dasher Signs.

PEDESTRIANS

Don't Forget the Car Crossing on the Other Track.

GET THE SAFETY HABIT

Clerestory Signs.

SAFETY FIRST

Before crossing the street look both ways. Get the Safety Habit. When passing behind a car remember that cars are running in the other direction.

Keep calm. Avoid hasty movements. Watch out.

BETTER BE SAFE THAN SORRY

(July 13 Display.)

Dasher Signs.

PASSENGERS

Face the front of car when alighting.

Wait until the car stops.

Clerestory Signs.

SAFETY FIRST

Statistics show that 75 per cent of the street car accidents are caused by passengers getting on or off while car is in motion.

Don't take chances. Watch your step.

Always face the front of the car in alighting. Help to prevent accident by waiting until the car stops.

SAFETY FIRST

(July 18 Display.)

Dasher Signs.

MR. EVERYMAN

Ninety-eight per cent of accidents are preventable.

DON'T TAKE CHANCES

Clerestory Signs.

SAFETY FIRST

Do you know that ninety-eight per cent of accidents are avoidable? You should do your share towards helping reduce accidents. By using caution in getting on or off cars and in crossing the streets you CAN and WILL prevent injury. Injuries are wasteful, costly and sometimes fatal.

IT PAYS TO BE CAREFUL

(July 23 Display.)

Dasher Signs.

PARENTS

Playing on or near the car tracks is

Dangerous

TELL THE CHILDREN

Clerestory Signs.

SAFETY FIRST

Fathers, Mothers, Relatives, School Teachers, Everyone: Teach the children not to play on or near the car tracks. They do not appreciate the dangers. The motorman will do his level best to prevent injuring them. Won't you do YOUR PART? You are the nearest and closest to them.

(July 28 Display.)

Dasher Signs.

DRIVERS

Be sure no car is behind you when turning on to the tracks.

Remember

SAFETY FIRST

Clerestory Signs.

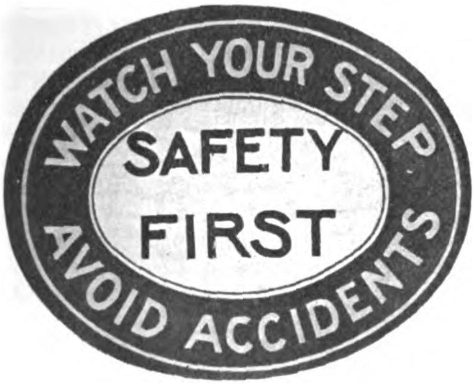
DRIVERS OF VEHICLES

If you are careful not to drive on the car tracks unless necessary, and then only with care, it will mean a great saving in life and limb to drivers and increased safety and promptness in service to the public. Don't take chances.

SAFETY FIRST

In each case the dasher signs and clerestory signs are signed by the "safety first" committee of the Chamber of Commerce. At the rapid transit line terminals the illuminated signs of the company reading "Safety First" are equipped with 5-watt, 55-volt tungsten lamps connected eleven in series and supplied with energy from the local third-rail feeders, the usual size of the sign being 3 ft. x 5 ft. The dasher signs are 14 in. x 21 in., printed on poster paper, and at least 30,000 of these were used. The company also ordered 50,000 oval stickers for use on car windows, doors and walls.

Just before the campaign opened the company's superintendent of inspection wrote a letter to the chief of police and to the chief engineer of the fire department in each of the municipalities served by the Boston Elevated Railway, outlining the proposed program and requesting the co-operation of their departments. In a circular letter to division superintendents at the outset of the campaign Mr. Brush pointed out that an important feature of the preventive work would be the reporting by street inspectors and by superintendents of all instances of flagrant chance-taking on the part of vehicles coming under their personal observation. In each of these instances the inspector made a note of the number of the automobile or the license number of the team, the name of its owner, etc., and the report was forwarded to the claim department. Officials of the company and members of the claim department were also expected to send in reports of this kind. The information thus gained was transmitted by the company to the Highway Safety League of Massachusetts, which then wrote a courteous letter to the vehicle owner cautioning him against a repetition of the act, in the interests of safer travel. During the campaign charts of accidents occurring daily were posted in all car stations on the surface system, and a record of accidents classified by their character and arranged according to rating stations was sent by division superintendents to the Superintendent of the Day at the company's main office for each day. The superintendents had been provided with posters issued by the Chamber of Commerce showing pictures of accidents along the lines as utilized in the San Francisco campaign, and these were freely offered to factory managers, garage owners, etc., in each division. Each superintendent was requested to obtain a list of employment offices in his territory, arranging to supply bulletins and circulars as needed, with special reference to offices where green girls apply for work. Only one accident to a passenger, and that one of the most insignificant character, occurred on the entire Boston Elevated system on the opening day of the campaign.



BOSTON SAFETY CAMPAIGN—STICKER FOR USE ON CAR WINDOWS, DOORS AND WALLS

Arguments on Municipal Ownership at Washington

The Bureau of Public Service Economics, 17 East Thirty-eighth Street, New York, has issued in pamphlet form an abstract of the arguments presented by representatives of the American Electric Railway Association and others at the recent hearing in Washington on the Crosser bill. These hearings were reported in recent issues of this paper. The pamphlet is 6 in. x 9¼ in., contains seventy-two pages and is an excellent summary of the situation compiled from the official stenographic report. It contains abstracts of the arguments presented at the Washington hearing in favor of municipal ownership as well as those against the plan, and the various paragraphs are marked by the page number in which the testimony appears in the official report, so that it is possible for the reader easily to refer from one to the other. In addition, the pamphlet contains a three-page index so that any subject discussed by those who gave testimony can easily be found. The Bureau of Public Service Economics has placed a nominal price of 50 cents per copy on this book.

The Pacific-Electric Opens a New Line

The formal opening of the new San Bernardino line of the Pacific Electric Railway System of southern California on July 11 was a matter of no little importance in electric railway circles. This new line, which extends for 59 miles from Los Angeles to San Bernardino, is the longest in the system, and it represents a construction expenditure of $1,250,000. It penetrates a particularly fertile and wealthy district, which will mean a large additional revenue to the company, and it increases the trackage of the system to a total of about 1067 miles.

There is much of the country which the line traverses that is as yet undeveloped, and there are long stretches where there are no towns of any great importance, so that the cars running over this line will be operated at a very high speed. Later, when the country shall have reached a greater development, additional tracks will be laid so as to accommodate both fast and slow trains. For the present the line voltage will be 1200.

Twenty passenger cars are now being operated, and later the number will be increased to forty-five. The present cars are intended only for temporary use, having been rebuilt for the purpose, but new cars, to cost a total of $675,000 for the forty-five, or $15,000 each, have just been ordered. These cars are to be of all-steel, non-telescopable construction, and they will seat sixty persons each. At present the service consists of ten two-car trains in each direction daily. The new line also affords electric freight facilities to the territory it serves, which is an orange-growing district.

All bridges are of concrete-arch construction, with provisions for additions when the growth of traffic will necessitate putting a second track in operation. The line utilizes country and city highways as much as possible for its right-of-way.

The opening of the new line was marked by a big celebration at San Bernardino, which was attended by about 20,000 persons. The final spike, of solid silver, was driven by Mayor H. H. Rose of Los Angeles and Acting Mayor Claude R. Davidson of San Bernardino, silver-plated hammers being used for the purpose. These, as well as the orangewood tie into which the spike was driven, were presented by local chambers of commerce. The pageant, which was an important feature of the occasion, was a portrayal of the history of transportation in this locality extending from early Indian days down to the present time.

In addition to this newly completed line the Pacific Electric Railway Company has begun the work of improving and extending a number of shorter lines around San Bernardino. Authorizations have been obtained from the State Railroad Commission for the expenditure of $105,000 on the San Bernardino-Highland line, $43,000 on the Redlands-San Bernardino line, and $408,000 on the Riverside-Colton-San Bernardino line.

Pacific Claim Agents' Association

Additional Papers Read at the Spokane Convention Are Published in Abstract—These Include Consideration of the Trespassing Evil and of Progress of the Safety Movement on the Pacific Coast

Several papers presented at the convention of the Pacific Claim Agents' Association held in Spokane, Wash., July 9-11 were received too late for publication in the last issue of the ELECTRIC RAILWAY JOURNAL, and these are published in abstract in the following paragraphs. They include the consideration of a remedy for injuries to trespassers and also an outline of the work done by the various electric railways on the Pacific Coast along the lines of "safety first" and accident prevention.

REMEDY FOR THE TRESPASSING EVIL

BY H. K. RELF, GENERAL CLAIM AGENT SPOKANE, PORTLAND & SEATTLE RAILWAY, PORTLAND, ORE.

The legal duty of railways toward trespassers is to refrain from wantonly hurting or killing them, but from the standpoint of humanity there is a greater duty—that is, to prevent them if possible from placing themselves in a dangerous position or to remove them from the property when found thereon. Transportation companies cannot accomplish this without the aid of the law-making and law-enforcing powers. No amount of care, no amount of supervision on the part of the railways, can stop the trespassing or prevent the trespasser from being hurt. Some of the States have passed laws making it a misdemeanor for outside persons to walk on the right-of-way of a railway company or to ride on a train with the intention of evading the payment of fare, but such laws are of no avail unless they are enforced. Many cities and smaller towns have similar laws. Occasionally these laws are meekly enforced, but more often they are not. They do not cope with the situation, and the railroads are left to deal with the trespasser as best they can. Where such laws exist the railroads should give wide publicity to the statute. They should have it posted in all their depots and in all conspicuous places, advising the public that it is in violation of the law to trespass upon the property of a railway company, and that the railroad does not consent to the use of its tracks as a highway.

Statistics for the past twenty years show that about 5000 persons are killed each year in the United States while walking on railway tracks or beating their way on trains, and a greater number are seriously injured. Analysis of the reports shows that only about 20 per per cent are tramps and hoboes, while 14 per cent are children under eighteen years of age, and 66 per cent are citizens of the locality in which the accident occurred, most of them wage earners.

This unnecessary loss of life could have been to a great extent prevented by the passage and enforcement of effective laws. The railway companies are forced to realize that some effective steps must be taken to put a stop to this drain on our population, and it is for us to do what we can to assist in the work. At many places warning signs are erected on the right-of-way at various points, but few pay attention to them. Special officers are employed to patrol yards and tracks in districts where persons walk along or across tracks, but it seems impossible to break up the practice. When arrests are made and offenders taken before the magistrate, instead of being fined or imprisoned they are let off with the warning not to do it again. If the offender is a resident of the locality the judge refrains from putting a hardship on him or his family, and if not a resident he does not give him a jail sentence on account of the expense to the community in feeding him while serving his time. In some of the Eastern States, where I understand that laws are in effect and enforced, many arrests have been effected and efforts have been made to prevent trespassing on the property of railway companies, and it is high time for our Western States to take the necessary steps to stop the practice. We should have the necessary legislation and rigid enforcement of it.

In Great Britain to walk on railway tracks is a misdemeanor punishable by fine or imprisonment, and the law is enforced. As a result few accidents to trespassers occur. If the legislatures of the various States will not enact laws against the trespass evil that will be enforced, our federal government should pass a law to prevent persons from trespassing upon the property of railroads engaged in interstate commerce. A short time ago the federal government saw fit to pass a law making it a crime to steal from freight cars, and that law has been enforced. Most people fear the federal government more than the State governments, and I believe that a federal law would have more effect if it can be passed.

Our trainmen are instructed that no one shall be permitted to ride upon a train unless transportation is paid for, but they have not received the necessary authority by this State (Washington) to enable them to carry out our instructions. On nearly every train, especially freight trains, will be found men who are beating or attempting to beat their way, and if the brakeman orders them off he does so at the risk of being assaulted. Any number of claims have been made against transportation companies on account of injuries to trespassers, and vast sums of money have been spent in resisting and settling claims of that character. In addition to the expenditures in court cases and judgments directly chargeable to the trespass evil, the railways are confronted by enormous losses through constant pilfering and destruction of property by the trespasser who works inside the cars. A person trespassing is a lawbreaker and should be so regarded, and when injury results he should be left without a remedy.

At the meeting of the Association of Railway Claim Agents held at Baltimore in May, 1913, this question was considered at some length, exhaustive papers on the subject were read and general discussion indulged in by the representatives of various railroads. It seemed to be the general opinion that the only way to handle the matter effectually was to bring it to the attention of our representatives in Congress and have a federal law enacted that could prohibit and possibly prevent trespassing on railroad tracks and trains. A committee of fifteen members was appointed for the purpose of dealing with the trespass problem. In order to assist in this work the committee is gathering statistics for the purpose of showing the necessity for such legislation and to furnish a basis for publicity and agitation of the question. Publicity is one important feature of the work, to the end that public opinion may be moulded, not only for the purpose of aiding in the procurement of proper legislation, but also in its enforcement. While proper legislation and its enforcement are very essential, in addition, in order to reduce trespassing to a minimum, we must have the hearty co-operation and approval of the public and assistance of parents, teachers, office-holders and others.

REPORT OF COMMITTEE ON SAFETY

BY GEORGE C. CARSON, CLAIM AGENT PUGET SOUND TRACTION, LIGHT & POWER COMPANY

The executive committee at its meeting held in Seattle on Feb. 6 instructed the secretary of the Pacific Claim Agents' Association to establish and maintain in his office a library of safety literature and in that connection authorized its chairman to appoint a standing committee on safety "to assist the secretary in this work." Under this order Chairman Handlon appointed Messrs. Carson, Aston, Lee, Boynton, Beck and Winsor as such committee, and, in addition to the duty of assisting the secretary in the work of collecting a safety library, this committee was instructed to make a special report on safety from the standpoint of the public and the companies, and on safety work of the various companies.

The individual reports of the various members of the committee, combined in this report, state among other things, that it must be made difficult for employees to cause accidents or for the public to meet with them. But car men will forget and the public will not wait. It is the business of railway superintendents to repair in part that element of frailty. The first duty that a public service company owes is to its passengers. Therefore, it is very necessary that the safety movement be extended to take care of the public who from day to day travel upon our systems. There is no larger leak than the accident leak, and if it is not properly attended to will soon grow to such volume as very nearly to make it impossible to operate.

Under the safety organization of the Tacoma Railway & Power Company, which, owing to the number of lines operated and other peculiar conditions, differs somewhat, in both form and methods from those of other cities. There is a "safety committee" headed by the superintendent of efficiency as chairman and consisting otherwise of trainmen from the various lines, an inspector of city lines and a number of representatives from shops, track and power departments—eighteen to twenty members in all. This committee meets at noon once a month, has a good lunch and then discusses the safety movement freely. When a man's term as a member of this committee expires, he goes forth a more loyal man and with a much broader view and a more sympathetic understanding of the difficulties of the business from the management's side. The report of this safety committee's first year's work showed that 90 per cent of its 244 recommendations had been adopted by the management, and its work continues to this time to receive like consideration. This company employs a card system of reporting defects consisting of boxes containing "safety first" cards located at convenient places throughout the system. Receipt of each report is acknowledged and its substance in turn is transmitted to the proper department for consideration and action. Later, the party making the original report is notified as to what action has been taken. On form cards provided for that purpose the claim department receives from employees reports of reckless operation of vehicles on the streets, and immediately communicates with the proprietor of such vehicle, calling his attention to the matter and seeking his co-operation for public safety.

The Washington Water Power Company organized its safety committee in 1912. The company encourages members of the committee to make suggestions for accident prevention, this resulting in more than 500 suggestions coming in from all departments, the majority of which the company has adopted. Suggestions are taken up and discussed at general committee meetings once a month. Index files are kept of all suggestions arranged alphabetically under names of members making them. Monthly meetings of car men are held for discussion of safety matters. Safety buttons are issued to members of the safety committee, and men are given special recognition for safety service. The company has provided lectures on safety for children in the schools of Spokane and will continue this line of educational work.

In Seattle the results of the safety movement, as promoted through the safety committee organization of the Puget Sound Traction, Light & Power Company, have been extremely gratifying, both from the standpoint of increased protection to the public and the company's employees against injury by accident and in the reduction of the percentage of gross earnings consumed by claim adjustments. As to the latter phase, it may be stated that whereas the percentage of gross railway earnings going to claim adjustments in the first five months of 1910, just prior to the beginning of active safety organization and work, was nearly 10 per cent, the year 1913 showed only 5.15 per cent used for this purpose. Among the things incident to this company's safety campaign that have contributed largely in bringing about this spirit of co-operation on the part of the men the following may be particularized: 1—Carhouse meetings at which claim department, supervisory and other officials discuss with the men in a spirit of mutual helpfulness, safety and other questions in which they have a common interest; 2—The "carhouse bogie" system, which, briefly explained, is a competitive system among the trainmen of the several carhouses, showing numerically on large specially ruled forms the accidents in which each and all of the carhouses are involved during any month; 3—The publication monthly in the company's magazine, the *Puget Sound Electric Journal*, of carhouse news and personals, with special reference to these accident records, employees' safety reports and local safety matters in general; 4—Carhouse lectures on safety subjects illustrated with stereopticon views; 5—The semi-annual banquets given to each newly-appointed safety committee at the beginning of its term.

With reference to the matter of interesting the public and securing its co-operation in the safety movement the claim department of the Puget Sound Traction, Light & Power Company regards the work being done by it in and through the city schools of Seattle, both public and private, as the most effective means of accomplishing this end. The company employs a safety instructor who goes into the schools and devotes all his time to this work. A circular letter to vehicle owners of the city; the posting of safety bulletins and posters in garages, livery barns and other public places, and a general policy of securing publicity for matters relating to the subject of safety sums up in a general way this company's efforts to reach the general public directly. As to the matter of receiving reports from employees as to reckless operation of vehicles on the streets and the treatment of same, the Puget Sound Traction, Light & Power Company employs practically the same system and methods as those outlined for the Tacoma companies, and regards the results as generally satisfactory.

About seven years ago, on the lines of the Portland Railway, Light & Power Company, an average of thirty-five accidents occurred each day, but, at present, with twice as much traffic less than one-third the number of accidents occur. This was effected by "safety" work.

The first work was to bring in all trainmen for a talk on care and caution, and prevention of accidents, and what to do in case an accident occurred. After all the men had been instructed, they were notified that they must return once every six months and attend one of the schools of instruction, so that they would constantly have the matter before them and always be on the alert. It was also made necessary for all new trainmen, after having been broken in on the different car lines, to attend one of these meetings and be thoroughly instructed along the lines of accident prevention and the care of accidents after they occur. These meetings were started about seven years ago and have been held weekly ever since. These schools were later extended to cover all employees of the company in every department.

After getting this well started, a lecturer on "safety" was sent to the public and private schools to talk to the children to educate them to be more careful, and through them to reach the "grown-ups" in their homes. There have been but two accidents to children of school age in the last five years. For the first two years the lecturer covered the schools twice each year, or once each school term, but he is now making but one annual visit.

On Nov. 1, 1913, there were organized "safety committees" comprised of a central safety committee and sub-committees from every department, numbering about 125 members. Through these safety committees the company is finding all of its danger zones, and most of them were conditions which required but very little work to remedy. Since the organization of these safety committees there have been received about 450 safety suggestions, and more than 300 of them have been acted upon. In comparison with the accidents for the first five months of 1913 the same period in 1914 shows a decrease of 422 accidents.

The company is gradually working toward the point where all of the cars will have folding steps, closed doors and disappearing handles, and this will absolutely eliminate all types of accidents arising from boarding or alighting from moving trains. "Safety" slogans are painted on the sides of the cars, and from time to time different "safety" slogans are carried on the dash signs. The company has had men carry large banners through the streets, moving from one busy corner to another and standing there, the banners being brightly painted with "safety" warnings.

The company is preparing to adopt the plan of moving pictures for the purpose of educating the public along these lines, and it is felt that this will be a great factor in helping get the public interested. The company has also just induced Mayor Albee of Portland to appoint a public safety commission for the purpose of investigating and rectifying any and all dangerous conditions of every name and nature.

Interurbans Excluded from Rayburn Bill

Under an amendment recommended by the Senate Interstate Commerce Committee, electric railways will not be subject to the provisions of the Rayburn "securities issue" bill unless they are a part of the system of an interstate steam railroad. An effort was made to have the House committee exclude the electric lines but failed.

When the question was taken up by the Committee on Interstate Commerce of the Senate a hearing was given on June 16 to representatives of the American Electric Railway Association. Horace F. Clark, attorney for the association at Washington, presented the speakers, who were Arthur W. Brady, Indiana Union Traction Company; Bernard F. Weadock, Detroit United Lines; James M. Barrett, Fort Wayne & Northern Indiana Traction Company, and Charles L. Henry, Indianapolis & Cincinnati Traction Company.

Mr. Brady presented statistics of the interurban electric lines in the country and showed that while some of them did a small interstate business they were primarily local carriers and that the State statutes under which they operated were adequate to regulate the issue of their securities. He also showed that many of the companies owning interurban lines also owned city lines, electric lighting and other public utility systems and that the result of putting the interurban lines under the jurisdiction of the Interstate Commerce Commission, so far as the Rayburn bill was concerned, would also place under the jurisdiction of the commission these other utilities which were purely local in nature. He said that he did not believe that this was ever the intention of Congress. He also cited the case of the Omaha & Council Bluffs Street Railway and the Omaha & Council Bluffs Railway & Bridge Company vs. Interstate Commerce Commission (230 U. S. Rep. 324) in which the Supreme Court had decided that street railways are not covered by the provisions of the interstate commerce act even when they carry passengers across a State line. He also dwelt on the extensive work on which the Interstate Commerce Commission is now engaged in regulating steam railroads and upon the valuation of steam railroads which had been begun, and he spoke of the expense and inconvenience which would be placed upon the interurban companies in case they should be obliged to go to Washington and present before the Interstate Commerce Commission their requests for permission to make the small issues of securities which they required in their business.

Mr. Weadock said that the Detroit United lines operate in 166 different municipalities in Michigan, that under the State constitution the municipalities have almost unlimited home rule and that the Michigan Railroad Commission has also very broad powers, including those to regulate the issue of securities by railway companies. The Michigan commission, he said, was fully acquainted with the property of his company and was continually inspecting the line. Mr. Weadock stated that the commission also knows all of the details of the property and was in a better position to protect the company and the people of the State than could the Interstate Commerce Commission. The interstate business of the company which he represents was less than 1 per cent. It would be a great hardship if the company was obliged to go to Washington to have a hearing before the Interstate Commerce Commission, which it would be obliged to do under the proposed act.

Mr. Barrett and Mr. Henry explained the situation on their roads in Indiana, which was similar to those mentioned by the other speakers, and they cited instances to show that the interstate commerce portion of their business was very small compared with the local business. It was after this testimony that the decision already mentioned was reached.

The completion of the Rayburn bill by the Senate committee was the finishing committee touch upon the administration's "trust legislation" program in the Senate. It is to be considered practically simultaneously with the Newlands interstate trade commission bill, which has been debated for about three weeks, and the Clayton "trust definition" bill reported this week. There will be at least six weeks of debate in the Senate with every prospect that even after the measure has been passed, there will be a long period of "conference" before the Senate and House can agree to compromise their conflicting amendments.

American Association News

Meeting of Joint Committee on Engineering Accounting Results in Completion of Important Report—Accountants' Correspondence Course Passes Halfway Point—Manufacturers' Association Entertainment Committee Appointed—Committee on Education Active.

COMMITTEE ON EDUCATION

On July 22 a sub-committee of the committee on education of the American Association, appointed to prepare plans for courses of correspondence study for young men in the various engineering branches of the industry, held a meeting at the association headquarters. Representatives of one of the prominent correspondence schools were present and presented curriculums which they had prepared in accordance with the committee specifications. These are now being carefully studied by the sub-committee and a definite proposition will be laid before the full educational committee at a meeting to be held within the next few weeks. It is expected that a practicable working scheme is now in sight and will be ready for presentation to the association at the Atlantic City convention.

JOINT COMMITTEE ON ENGINEERING ACCOUNTING

The joint committee on engineering accounting held a two-day session July 22 and 23. In addition to J. P. Barnes, general manager Syracuse & Suburban Railroad Company, who is chairman of the joint committee, there were present F. A. Bagg, chief engineer Fonda, Johnstown & Gloversville Railroad Company; C. H. Lahr, auditor Northern Ohio Traction & Light Company; J. P. Ripley, J. G. White & Company; Martin Schreiber, engineer maintenance of way Public Service Railway, and J. C. Collins, general auditor, New York State Railways, Rochester Lines.

The report of a sub-committee on cost accounting was received, and, after revision by the committee, was adopted. The full report will outline the fundamental principles involved in interdepartmental charges, cost accounting and overhead charges, as well as general systems of application in each of the above divisions. This report is now ready in tentative form and will be sent out by the secretary to all members of the committee for criticism before it is printed and presented to the association prior to the convention.

ACCOUNTANTS' CORRESPONDENCE COURSE

Two hundred of the required 400 enrollments have been secured for the correspondence course described in detail in recent issues of the ELECTRIC RAILWAY JOURNAL. The educational committee of the association desires to emphasize the importance of prompt enrollment of all interested, as it would be unfortunate if the plan should be allowed to lapse through lack of support. Blank application forms can be secured by addressing the secretary of the A. E. R. A., 29 West Thirty-ninth Street, New York City.

ATLANTIC CITY CONVENTION

H. G. McConnaughy, secretary of the American Electric Railway Manufacturers Association, has issued to all manufacturers who have been assigned space at the Atlantic City Convention next fall, rental order blanks covering all kinds and styles of wicker, oak and mission furniture from which to choose their requirements. The blanks contain prices charged for each kind of furniture to be ordered. These charges include placing the furnishings in spaces ready for use and the removal of the same at the close of the convention. Manufacturers are requested to fill out blanks in duplicate by typewriter and return both copies to the office of the A. E. R. M. A., 165 Broadway, New York, N. Y., by return mail. Exhibitors are urged in particular to have their men report to the exhibit hall early so as to have their exhibit set up and completed by Saturday, Oct. 10. This gives all a chance to devote their time to the many delegates who always arrive at Atlantic City for Saturday and Sunday, with an assurance that everyone and everything will be ready Saturday night. Most important of all, it will do away with the extra charge for night, Saturday afternoon and Sunday work, which means double time for electrical connections, etc. The exhibit committee will be ready to assist anyone at a moment's notice as well as all of its contractors, who will co-operate with everyone in finishing all details by Saturday. Blanks will be issued from time to time covering every detail in regard to the convention. Orders should be placed on these blanks only.

In connection with the wireless inquiry received by Mr. McConnaughy last week from a foreign manufacturer, this inquiry has been followed up by the receipt of a cable message from this company, applying for exhibit space.

The Entertainment Committee, as it now stands, is composed of the following members: Chairman, W. G. Kaylor, Westinghouse Traction Brake Company, 165 Broadway, New York, N. Y.; H. G. Barbee, Maryland Steel Company, Boston, Mass.; E. F. Chaffee, O. M. Edwards Company, Inc., Syracuse, N. Y.; Thomas Cooper, Westinghouse Electric & Manufacturing Company, Philadelphia, Pa.; N. M. Garland, Ohio Brass Company, 30 Church Street, New York, N. Y.; Alfred Green, Galena-Signal Oil Company, 17 Battery Place, New York, N. Y.; A. A. Hale, Griffin Wheel Company, Boston, Mass.; W. A. Lake, Pantasote Company, 11 Broadway, New York, N. Y.; E. R. Mason, E. R. Mason & Company, Inc., 70 East Forty-fifth Street, New York, N. Y.; H. N. Ransom, Westinghouse Electric & Manufacturing Company, 165 Broadway, New York, N. Y.; W. H. Wilkinson, Pressed Steel Car Company, 24 Broad Street, New York, N. Y.; L. E. Gould, ELECTRIC RAILWAY JOURNAL, Chicago, Ill.; W. L. Boyer, Bemis Car Truck Company, Springfield, Mass.; Ross R. Hayes, Curtain Supply Company, 50 Church Street, New York, N. Y.; A. L. Whipple, P. O. Box No. 812, New York, N. Y.; H. G. Pearce, 1103 Morris Building, Philadelphia, Pa.; S. W. Trawick, General Electric Company, 30 Church Street, New York, N. Y.; R. M. Campbell, Detroit Graphite Company, 135 Broadway, New York, N. Y.; C. G. Chamberlin, F. W. Devoe & C. T. Raynolds Company, 101 Fulton Street, New York, N. Y.; William V. Dee, G. Drouve Company, Bridgeport, Conn.; H. H. Helms, Aluminum Company of America, Pennsylvania Building, Philadelphia, Pa.; H. A. Hegeman, U. S. Metal & Manufacturing Company, 165 Broadway, New York, N. Y.; William J. Fleming, Jr., Automatic Ventilator Company, 2 Rector Street, New York, N. Y. The foregoing list will be enlarged from time to time and on its completion in September will probably include about thirty-five members altogether.

New members are being steadily enlisted to the

Association. Companies enrolled for the week ending July 23, 1914, are: S. K. F. Ball Bearing Company, 30 Church Street, New York, N. Y.; Index Visible, Inc., Times Building, New York, N. Y., and the Alloy Steel Forging Company, Pittsburgh, Pa.

COMMUNICATION

Interurban Centers in Rank of Importance

THE GREATER DAYTON ASSOCIATION
DAYTON, OHIO, July 20, 1914.

To the Editors:

We understand that Indianapolis holds, without question, the title of the largest interurban center in America. We would like to know how Dayton ranks in this regard. There are four interurban companies, operating eight lines, in and out of Dayton as follows: Ohio Electric Railway System—Cincinnati, Columbus, Richmond and Union City Divisions; Dayton, Springfield & Xenia Southern System—Xenia and Spring Valley Divisions; Dayton, Covington & Piqua System—Piqua Division; Dayton & Troy System—Troy Division. We have been informed that these eight divisions or lines entitle Dayton to rank second in interurban facilities. Would you be kind enough to inform us whether this is true, and if not, what cities precede us?

S. H. ANKENY.

[We think that the degree of importance should depend upon the number of cars in and out each day. Here is an opportunity for some comparative figures.—EDS.]

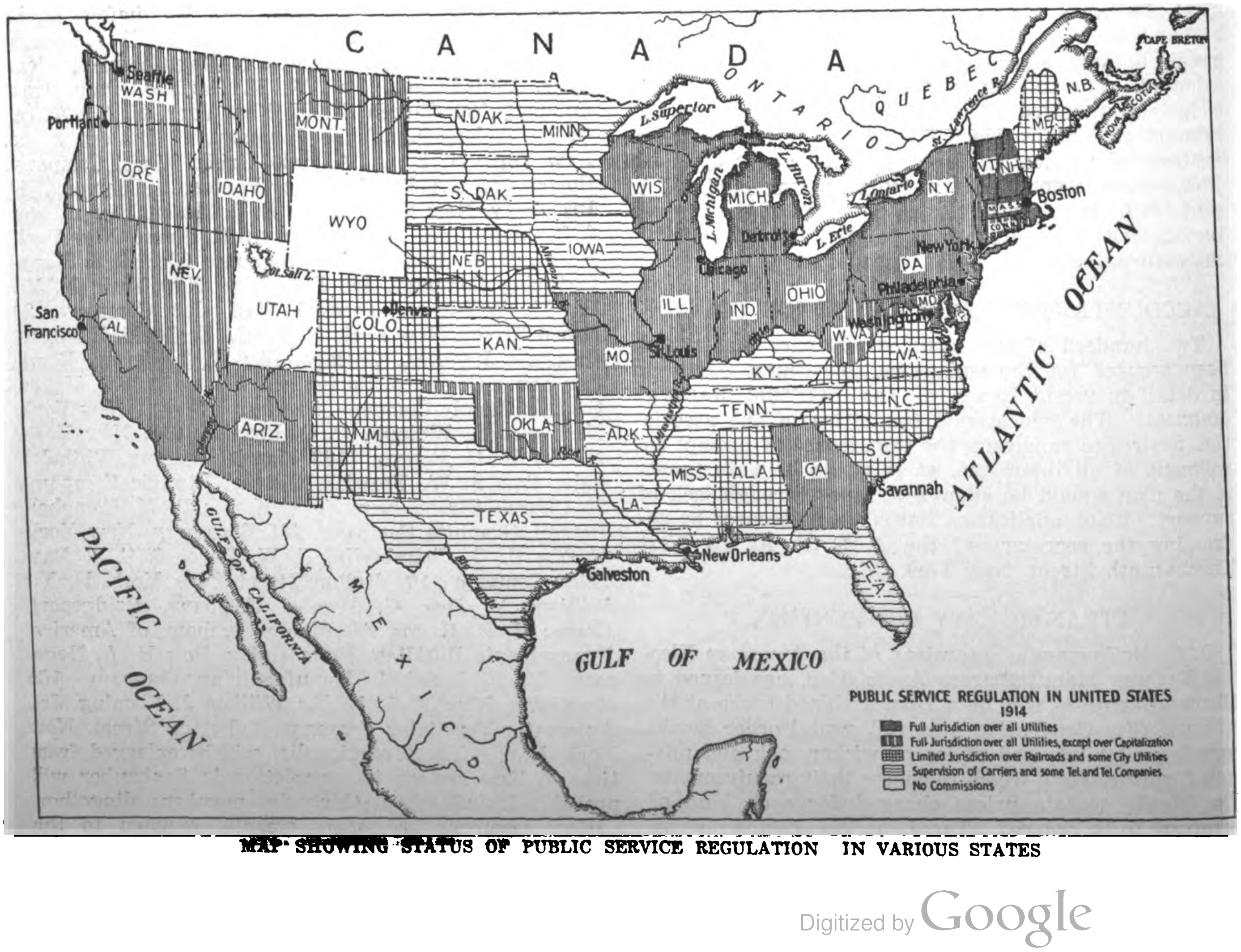
Development of Commission Regulation

In the *Public Service Journal* for July, 1914, issued by Stone & Webster, L. R. Nash, of the Stone & Webster Management Association, contributes a very interesting article on "The Development of Commission Regulation." The article is accompanied by a map, reproduced below, which shows five groupings of States, namely, (1) those in which the commissions have full jurisdiction over all utilities, (2) those in which the commissions have full jurisdiction over all utilities except in regard to capitalization, (3) those in which the commissions have limited jurisdiction over railroads and some city utilities, (4) those in which the commissions have supervision of carriers and of some telegraph and telephone companies, (5) those in which there are no commissions. In the latter group are only three States—Delaware, Utah and Wyoming. Delaware has a commission in Wilmington, which is the only city of importance in the State.

The article is also accompanied by a table showing the States in a somewhat different grouping, giving the names of the regulatory commissions.

Denatured Electricity

An interesting method of preventing the improper use of electric current has been devised by an Italian engineer. The practice of making especially low rates for current to be used in electric power, heating and cooking devices is becoming more and more general, but with the ordinary constant potential current it is difficult to detect the use of lighting devices on circuits intended only for power and heating purposes. This engineer advocates the use of special circuits on which the current is subject to extreme fluctuation of voltage at rapidly recurring intervals, which would make it practically impossible to use lamps, because of the flicker in the lights. As the current is not entirely interrupted and the normal voltage is almost immediately restored the proper operation of power or heating apparatus is not interfered with and the rightful use of the circuits for their respective purposes is assured.


CANADA
ONTARIO
QUEBEC
N.B.
NOVA SCOTIA
CAPE BRETON
L. Superior
L. Michigan
L. Huron
L. Ontario
L. Erie
St. Lawrence R.
Seattle
WASH.
Portland
MONT.
N.DAK.
MINN.
ME.
ORE.
IDAHO
WYO
S.DAK.
WIS.
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Denver
KAN.
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St. Louis
W.VA.
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KY.
TENN.
N.C.
ARIZ.
N.M.
OKLA.
ARK.
S.C.
MISS.
ALA.
GA.
Savannah
LA.
TEXAS
New Orleans
Galveston
FLA.
ATLANTIC OCEAN
PACIFIC OCEAN
GULF OF CALIFORNIA
MEXICO
GULF OF MEXICO
PUBLIC SERVICE REGULATION IN UNITED STATES
1914
Full Jurisdiction over all Utilities
Full Jurisdiction over all Utilities, except over Capitalization
Limited Jurisdiction over Railroads and some City Utilities
Supervision of Carriers and some Tel. and Tel. Companies
No Commissions

MAP SHOWING STATUS OF PUBLIC SERVICE REGULATION IN VARIOUS STATES

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Cost of Bonding

BY CARL H. FULLER, ENGINEER MAINTENANCE OF WAY
MACON RAILWAY & LIGHT COMPANY

The individual cost of various types of bonds may be readily obtained from the salesman who calls periodically. In fact he is inclined to lay particular stress on the cost of his particular bond, but when it comes to the installation of the bond the track man faces a problem peculiarly his own. Where any quantity of bonds is to be installed the field cost becomes an important consideration, although this is not always considered by the purchasing agent. Frequently the cost of applying the bond and its future maintenance is of more concern than the difference in the first cost of the various types of bonds. The writer, therefore, believes that the following data derived from the bonding records of the Macon Railway & Light Company, Macon, Ga., will be found instructive.

The writer looks with disfavor on all very short or rigid forms of bonds, as in most cases the track, where not laid in the concrete base of paving, is subject to considerable vibration at the joint which results in the mechanical destruction of the bond. On this road we have adopted three types of bonds as best meeting our requirements, namely: the concealed, stranded, compressed terminal type used under the splice plates, 7 in. to 9 in. in length, depending on the bolt spacing; the stranded long bond 24 in. to 36 in. in length with compressed terminals, to be used around the plates; and a pin-compressed terminal bond of about the same description, to be used where the rail is too small to admit of good work with the compress or for single replacements to be made by the track men when it is not convenient to send for the bonding crew.

In the two years we have been using these types of bond there has not come to the writer's knowledge a single case of failure due to mechanical conditions, although a few bonds have been melted or burned out. This is more than can be said of many special bonds. The following costs apply exclusively to these types:

Case 1. Paving job. Track laid and surfaced, with two bolts in each splice. Bond crew removed the plates, drilled two holes, applied the concealed bond with a screw press and full-bolted the joint: 174 bonds at $0.2625 per bond.

Case 2. Installation of a crossover in Belgian block paving. Bond crew drilled the holes, applied concealed or long bonds as required, full-bolted the joints: thirty-five bonds at $0.266 per bond.

Case 3. Repaving job. Old plates and bonds were not disturbed. Twenty-eight inch bonds with compressed terminals were placed around the old plates. Bonding crew had a good chance to do record work and placed 128 bonds at $0.175 per bond.

Case 4. Paving job. Bond crew removed two bolts and plates, drilled for and placed concealed bond, replaced the plates with two bolts loose for track gang to finish: 199 bonds at $0.1825 per bond.

Case 5. Paving job. Bonding crew applied concealed bonds while track gang was laying track, but made no special effort to full-bolt the joints: eighty-five bonds at $0.168 per bond.

Case 6. Paving job. Track all surfaced, double track, bond crew following all four rails as they came to the joints, rails 60 ft. long, special effort to get low bonding costs, track gang applying the splice plates: 269 bonds at $0.09 per joint. This was an exceptional case and the same crew has never been able to break its own record.

Case 7. Laying track in dirt roads. Bond crew applied pin-compressed terminal bonds under the plates, doing the bolting up: 113 bonds at $0.136 per bond.

Case 8. Paving job. Remove plates with two bolts, drill two holes, compress bond and replace plates with

DRILLING JOINT PLATES AND APPLYING CONCEALED BOND four bolts, continuous work: 187 bonds at $0.235 per bond.

Case 9. Paving job. Remove plates, drill holes with hand drill, compress bond, replace the plates: eighty-three bonds at $0.375 per bond.

Case 10. Track laid in dirt road and fully surfaced. Remove plates with four bolts, drill holes and compress bond, replacing the plates. The four men in the crew worked continuously: 1020 bonds at $0.2405 per bond.

Case 11. Remove plates having four bolts, drill and press in bond, replacing plates: fifty-four bonds at $0.292 per bond.

SUMMARY

Case 1	174	bonds at	$0.2625	per bond
Case 2	35	bonds at	0.266	per bond
Case 3	128	bonds at	0.175	per bond
Case 4	199	bonds at	0.1825	per bond
Case 5	85	bonds at	0.168	per bond
Case 6	269	bonds at	0.09	per bond
Case 7	113	bonds at	0.136	per bond
Case 8	187	bonds at	0.235	per bond
Case 9	83	bonds at	0.375	per bond
Case 10	1020	bonds at	0.2405	per bond
Case 11	54	bonds at	0.292	per bond
Total	2347	bonds at	*0.215	

*Average cost per bond.

With the exception of the single case noted, all of the drilling was done with a Duntley electric track drill, the crew consisting usually of one man who ran the drill and a helper who helped him move the drill and pressed in the bonds. Both men removed and bolted up the plates as the occasion required. There is some slight gain in making the crew three men if the work warrants.

The accompanying illustration shows our drill runner operating the electric drill, the inside splice plate being removed, the outer one remaining in place during the operation to balance the joint; while his assistant is compressing the terminals of a concealed bond with a screw press, the bond itself being plainly visible as it lies along the web of the rail.

A few minutes prior to photographing, these two men removed one pair of plates, bolted with two bolts, drilled two holes, applied and compressed the terminals of the bond, restored the plates with two bolts tight for paving, making the complete joint in three seconds less than fourteen minutes. If we figure the time of these two men at $0.285 per hour, we get a cost of slightly less than 7 cents per joint. However, this was a stop-watch exhibition record that cannot be maintained on straightaway work with its incidental distractions and attendant interruptions. The nearest approach to it in regular work is Case 6, where the bond was applied around the plates.

The following is a six months' record of bond replacements, the work being scattered into installations of a few bonds here and there. In all cases the cost includes the breaking out of old bolts, removing old plates and old bonds, reaming or drilling new holes and rebolting plates and the time lost moving about. The work usually was done in the intervals between construction jobs and other labor.

First month	85	bonds at	$0.285
Second month	42	bonds at	0.31
Third month	54	bonds at	0.295
Fourth month	37	bonds at	0.35
Fifth month	94	bonds at	0.325
Sixth month	21	bonds at	0.36
Total	333	bonds at	*0.313

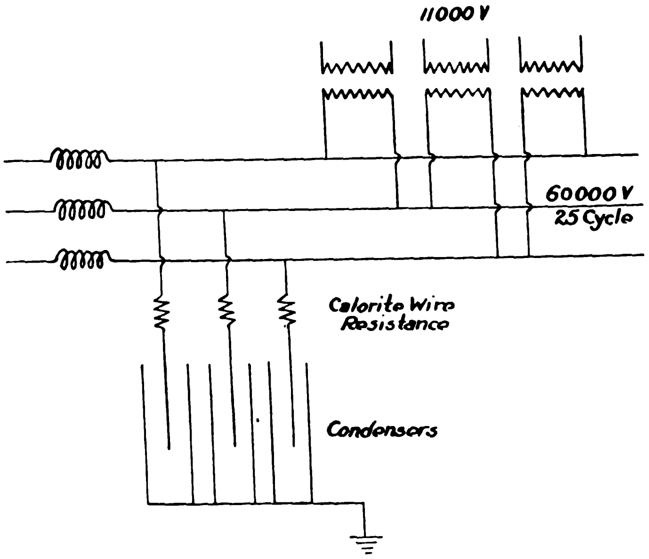
*Average cost per bond.

The foregoing costs represent fairly well the average condition met with in bond maintenance in dirt roads or on private right-of-way. The wage of the drill runner was $1.50 and of the helper $1.35 per day of ten hours.

Surge Protector in Syracuse Substation

BY G. N. BROWN, ELECTRICAL ENGINEER SYRACUSE-UTICA LINES, NEW YORK STATE RAILWAYS

The New York State Railways obtains its power for operating the cars in Syracuse and other cities in central New York from the transmission lines of the Niagara, Lockport & Ontario Power Company. Prior to April 9, 1914, the main supply of power came from Niagara Falls, but since that date the Salmon River hydroelectric plant, described in the issue of the ELECTRIC RAILWAY JOURNAL for June 20, page 1378, has been operated in parallel with the Niagara Falls plant. Since the Salmon River plant was put into operation the Syracuse load had been carried by the Salmon River plant whenever there was an indication of an approaching storm which might cause a disturbance on the transmission line from Niagara Falls. The Niagara Falls line is disconnected from the Salmon River-Syracuse line under these conditions. By this method of operation, line surges, which are necessarily present at times in such a great system of distribution as that of the Niagara, Lockport & Ontario Power Company, have been greatly reduced. The system comprises more than 600 miles of line, including not only the two main trunks from Niagara Falls to Syracuse but also the secondary distribution.



SURGE PROTECTION AT A SYRACUSE SUBSTATION

The segregation of the Syracuse load greatly reduces the danger from surges, but in the summer of 1913 the railway company decided to install a surge protector at the Tracy Street substation on the incoming 60,000-volt line. The surge protector installed has been developed by the General Electric Company at its Pittsfield factory and has been on the test floor for about three years. It consists of three reactance coils, three resistance grids of calorite wire and three condensers, connected as shown in the accompanying diagram. The condensers consist of steel plates immersed in oil contained in tanks 10 ft. high and 30 in. in diameter. Each tank has an insulating bushing which extends through the top and upon which is mounted the resistance grid of fine wire. The calorite wire was used for these grids on account of its high specific resistance and its ability to resist oxidization at high temperature.

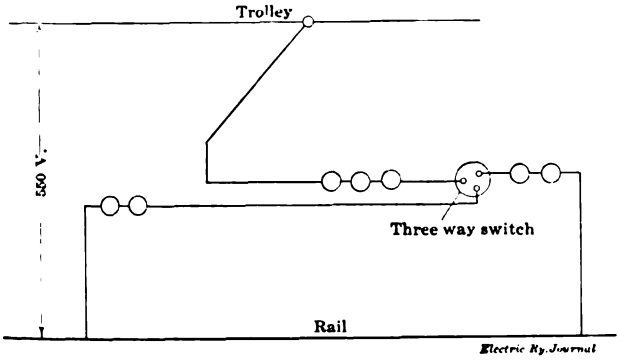
In operation the surge is impeded by the reactance coils, charging the condenser through the resistance wire, which absorbs part of the energy. When the residue is reflected from the condenser into the line, more energy is absorbed in the grids. In this way much of the trouble which would otherwise be caused by the condenser discharge is eliminated. The principle of connecting condensers to a line, ahead of transformers and back of choke coils, is not a new one, but in previous applications much difficulty had been experienced in taking care of the condenser discharge. The present scheme has been tried out in only one other place, on the lines of the Yadkin River Power Company in North Carolina. In the latter installation the necessary capacity was obtained by stringing parallel wires on transmission towers a distance of from 500 ft. to 1000 ft.

The operation of this new apparatus will be watched with interest on account of its novelty. It is planned later to obtain graphic records of surges so as to ascertain just what the apparatus is doing in cutting down the steepness of wave fronts.

Three-Way Switch on a Seven-Lamp Car Circuit

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

The accompanying diagram shows a wiring scheme which was adopted on the Montreal & Southern Counties Railway, St. Lambert, Que., when the writer was power house construction foreman of the company named. These cars have standard interurban closed bodies 49 ft. 4 in. long and 8 ft. 1 in. wide and are of the combination smoking and passenger type. Three lamps are in the smoker and two lamps are on each end platform. However, only five lamps are in use at the same time, as only one platform is illuminated, according to the direction of running. On completing a run the motorman actuates the three-way switch to cut out the two lamps at the end which served as the conductor's platform and then he cuts in the lamps at the conductor's new position. Six cars were equipped in this way owing to the fact that they were originally over-illuminated.



WIRING ARRANGEMENT FOR THREE-WAY SWITCH ON SEVEN-LAMP CIRCUIT

Upkeep of Renewable Center Plates by the Connecticut Company

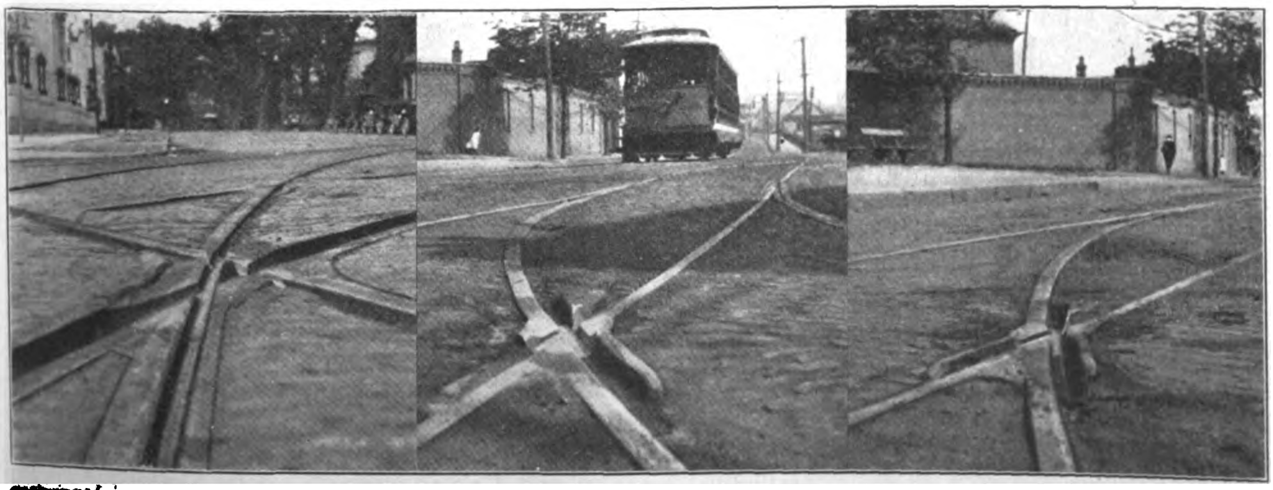
BY "CONTRIBUTOR"

On account of the present interest in iron-bound special trackwork with manganese inserts versus solid manganese pieces, it may be of interest to note that in the last five years the Connecticut Company has maintained a small gang whose duties include the upkeep of renewable center plates.

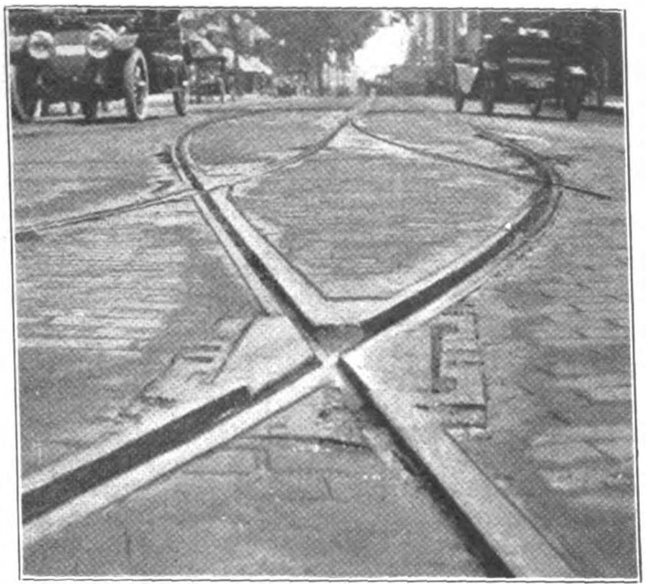
We believe that we have effected a large saving by watchfulness and care along these lines, our aim being to tighten and shim, if necessary, at the first indication of looseness, all renewable center plates in order to be sure of an even surface. The cost of constant effort in this direction is a very small percentage of the money value of special trackwork which becomes unfit for use on account of early and unnecessary disintegration.

By far the most serious thing we have to contend with is the loosening of the rails in the castings. While this is sometimes caused by loose center plates the reverse is usually the case.

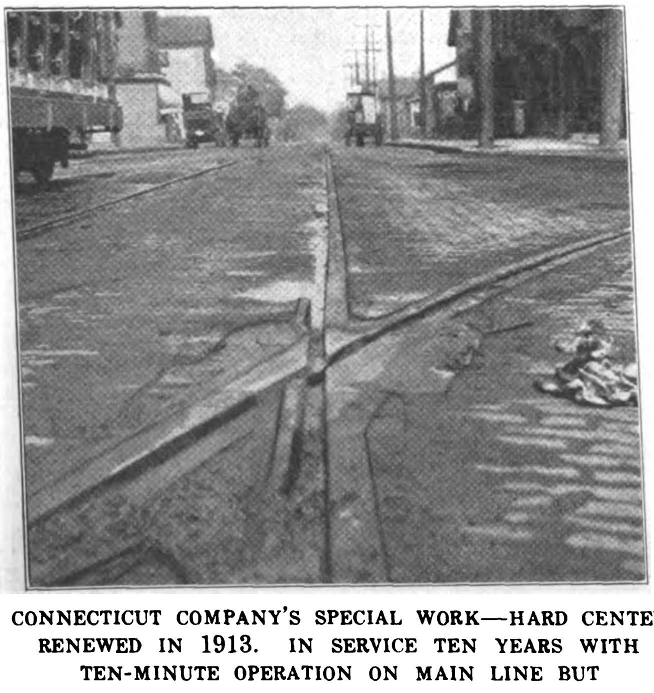
Originally it was our practice to use a heating torch to dry out the plate and the casting, but now we have done away with the torch entirely and are getting very satisfactory results. In resetting a center plate first set fire to a quantity of oily waste, placing the same in the casting immediately after the center is removed. Then clean and wipe the casting thoroughly with kerosene oil, that is to say at all points where the hot spelter will come in contact with it. After the center is properly surfaced and fastened and is ready for the spelter, pour a small quantity of kerosene into the bed of the casting and also over any clay or sand which may have been used in the grooves. Place a match at the highest point of the casting, which is always the correct point for the gate, in order to get an even distribution of metal, then pour. The kerosene is ignited and an intense heat is produced as soon as the hot spelter



CONNECTICUT COMPANY'S SPECIAL WORK—FROG IN SERVICE SINCE FEBRUARY, 1900, ON A LINE WITH TWO AND A HALF-MINUTE HEADWAY. THE CENTER PLATE RENEWED IN 1909 IS NOW IN EXCELLENT CONDITION —ALSO TWO VIEWS OF MANGANESE STEEL INSERT IN SERVICE SINCE 1899 ON A LINE WITH FIVE-MINUTE HEADWAY strikes the match. We have used this method for the past four years and have not had a single explosion, although at times we have poured spelter in emergencies during wet weather with very satisfactory results. Ladle pouring is not satisfactory, as the spelter will cool in layers; a continuous pour should always be made. To avoid accident all men engaged in the removal and the resetting of center plates should wear glasses; painful and sometimes serious injuries to the eyes may otherwise result. The best results can be obtained at night after car service is discontinued, the day gang doing the preliminary chipping and loosening. We find the "keyed-in" and the later types of bolted-in centers the most satisfactory to maintain, with the "keyed-in" fastening somewhat in the lead. When bolts are used, they will occasionally break off short in the casting and very much effort and added expense is necessary to get them out, whereas the simple method of keys or wedges avoids this trouble.



CONNECTICUT COMPANY'S SPECIAL WORK—BROKEN CENTER PLATE IN SERVICE ONE YEAR IN IRON-BOUND MANGANESE INSERT



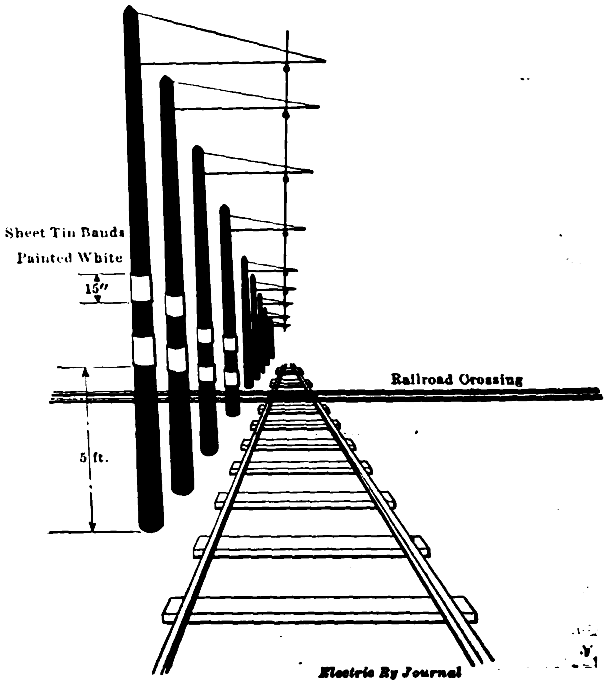
CONNECTICUT COMPANY'S SPECIAL WORK—HARD CENTER RENEWED IN 1913. IN SERVICE TEN YEARS WITH TEN-MINUTE OPERATION ON MAIN LINE BUT INFREQUENT SERVICE ON BRANCH-OFF

The performance of different hard center plates under practically the same conditions varies to such a degree as to require some explanation. The question may properly be asked, why centers in a certain layout will require no attention whatever while similar centers 200 ft. away will flow, chip, become loose and generally give unsatisfactory results. We attribute this to faulty workmanship in the construction of the pieces and to the use of manganese of inferior grade. We believe that their resistance to impact and side-wear varies to a great degree. With this in view, it is natural to expect a variety of results when solid manganese pieces are used.

Whether solid manganese or iron-bound insert work is employed it is certainly not fair to expect good results unless the special work is properly maintained. The number of loose arms in castings at a point where they join the center plate can be reduced by the use of one of the modern grinding machines. A frog, for instance, really has eight joints, and they should all be ground off smooth as required. By doing this, cupping is delayed appreciably. As a matter of fact it is the writer's belief that special trackwork, particularly, is not being maintained as it should be when one considers its great first cost. The time has arrived for refinements in the maintenance of these high-priced structures. The immediate grinding of all joints and uneven surfaces in new and old layouts will serve greatly to lengthen the life of this part of the way construction.

Warning Bands on Trolley Poles Near Crossings

A simple yet effective scheme for warning the motorman that he is approaching a crossing is employed by the Houston (Tex.) Electric Company. As shown in the accompanying illustration the four poles back of the crossing are fitted with bands of 15-in. strips of tin painted white. The lower band of the pole farthest from the crossing is 5 ft. above the ground, the pairs of bands on the succeeeding poles being lower to secure optical emphasis. At night the bands are easily seen because of the illumination afforded by the headlight.



WHITE BELTED POLES AT RAILROAD CROSSINGS

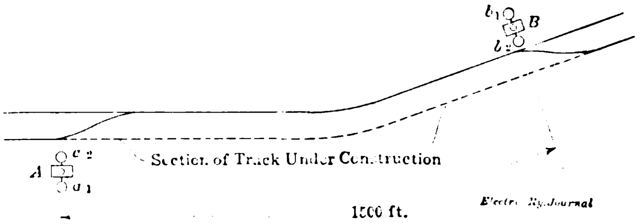
Use of Block Signals Instead of Flagmen on City Track Construction at Boston

An interesting application of automatic block signals to single-track operation is illustrated in the accompanying halftones. These views were taken recently on the Harvard Avenue, Allston, line of the Boston Elevated Railway Company's surface system. The street has recently been widened, and with this improvement the company found it necessary to relay track, traffic being carried on over a single track section during the construction period. Until last year the company has always flagged cars through such sections of single track, at a considerable labor cost. The work is now entirely handled by signals. The installation shown was provided by the United States Electric Signal Company, of West Newton, Mass., this being probably the first application of the kind with the exception of an initial trial installation made last year on Hyde Park Avenue, Boston, under similar conditions.

The section of single track involved is about 1500 ft. long. At the entering crossover at each end a type K signal has been installed, with the signal company's regular No. 5 trolley contactor. Fig. 2 shows one of these signals at close range, the equipment being mounted on a pair of wooden cross-arms U-bolted and braced to one of the trolley poles, with a third arm located at the top of the pole to carry the line wires of the signal system. The arms are the standard 6-in. x 8-in. x 6-ft. size used by the company in feeder work, and the signal is mounted about 19 ft. above the street level. Two through wires are required for the block service. Two contactors are mounted in the trolley wire near the entrance to each cross-over. The general arrangement of signals from the operating standpoint is shown in Fig. 4.

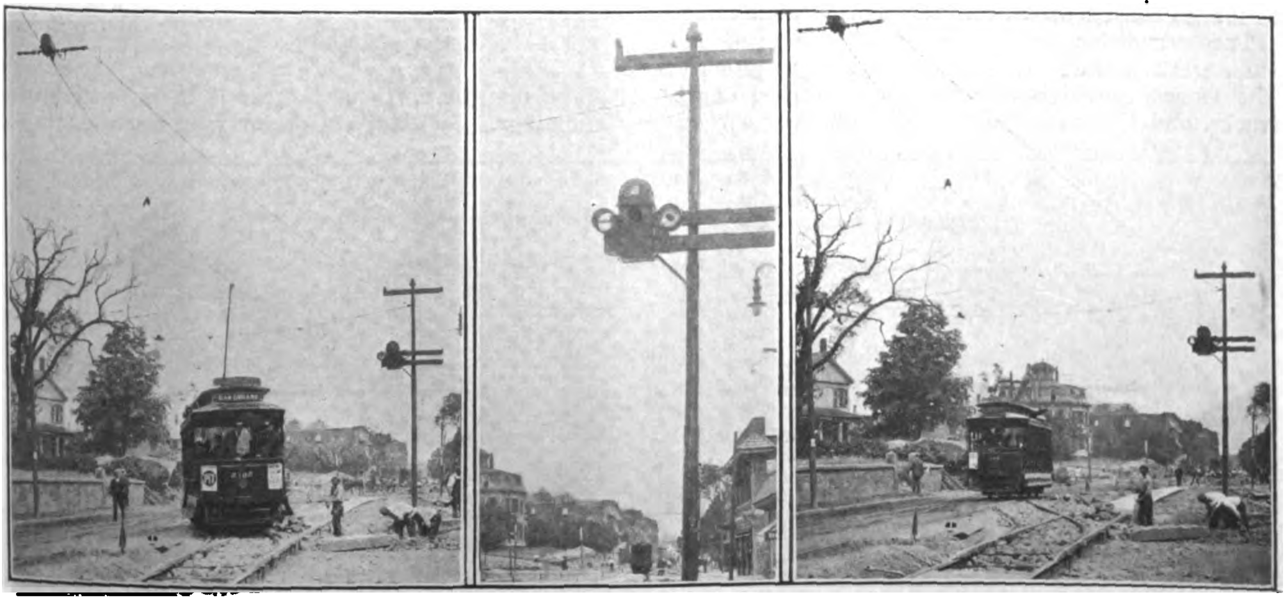
With this type of signal when the signaled section is not occupied no aspect shows. The proceed aspects consist of 8-in. illuminated disks placed on each side of the main case. A car approaching an unoccupied block will, upon passing beneath the setting trolley switch, cause a circuit to be closed to operate the signal relay. This operation cuts in a permanent feed and causes a red light to be displayed at the opposite end of the block and one of the white illuminated disks (either right or left) at the entering end. A second car following will, upon passing beneath the setting trolley switch, restore the white illuminated disk which was displayed by the preceding car and cause the disk and light on the opposite side of the case to be displayed. The white illuminated disks alternate successively in this manner as each following car enters the block, the purpose of the alternation of position being to show each crew distinctly that the signal counting mechanism has been properly operated.

At the distant end of the block a red light only is employed for a danger signal. Referring to Fig. 4 a car on entering the single track section at signal *A* sets the semaphore *a*-1 and lights the red lamp in the center of the signal case at signal *B*. A second car following the first restores semaphore *a*-1 and sets semaphore *a*-2, leaving the red or stop indicating lamp as before. The signals used at Boston are designed to count in two, four, six or fifteen cars, according to their setting when installed or adjusted later. When the last car clears the block at signal *B*, the red light is extinguished and the semaphores *a*-1 and *a*-2 are restored to their normal or horizontal position. With cars running in the reverse direction, signal *B* is operated as was signal *A* in the above instances. On lines with short headway four or six cars represent the maximum that can be passed through without seriously delaying traffic.



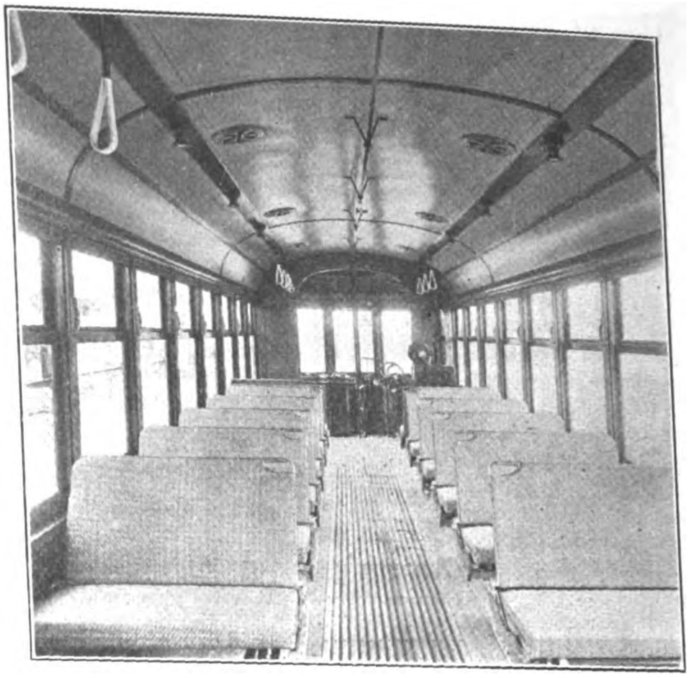
BOSTON BLOCK SIGNALS—FIG. 4—ARRANGEMENT OF SIGNALS DURING TRACK CONSTRUCTION PERIOD

On account of a curve in the track section described above, the signal installation dispenses with the services of six flagmen, three being required per operating shift. A car passes through the block in about two minutes. On Hyde Park Avenue last year four flagmen were dispensed with for two months. The cost of the signals for one block was about $400, of which the



BOSTON BLOCK SIGNALS—FIG. 1—FOLLOWING CAR ENTERING BLOCK UNDER PERMISSIVE SIGNAL. FIG 2—VIEW OF SIGNAL SHOWING CAR-COUNTING DISKS ON EITHER SIDE. FIG. 3—CAR LEAVING BLOCK installation expense represented $60. The signals can easily be moved and hence are available for use on track construction or other work at any time. As a result of its experience the company has ordered a total of nine blocks. In their operation it is necessary for work cars using the idle track to pass the trolley contacts with trolleys down, to avoid setting the signals improperly. This point must always be observed in signaling single-track sections where construction cars move freely to and from the main line, since the irregular operation of these is a matter invariably demanding attention, regardless of the type of signaling system employed.

Vestibule Prepayment Cars for Evanston Railway


INTERIOR OF NON-BULKHEAD CAR FOR EVANSTON, ILL.

The Evanston Railway serves the entire business district of Evanston, Ill., a city of 25,000 population. Its property consists of a single line of street railway with double tracks running from the southern limits of the city to the north-central district and thence westward to the city limits. The total route is about 5 miles. At the southern terminus, Howard Avenue, Chicago, the cars connect with important through routes of the Chicago Surface Lines. Since the present owners of the property obtained control two years ago the track has been rehabilitated, a new carhouse and shop building has been erected, and very recently twelve cars of the type illustrated herewith have been purchased from the St. Louis Car Company.

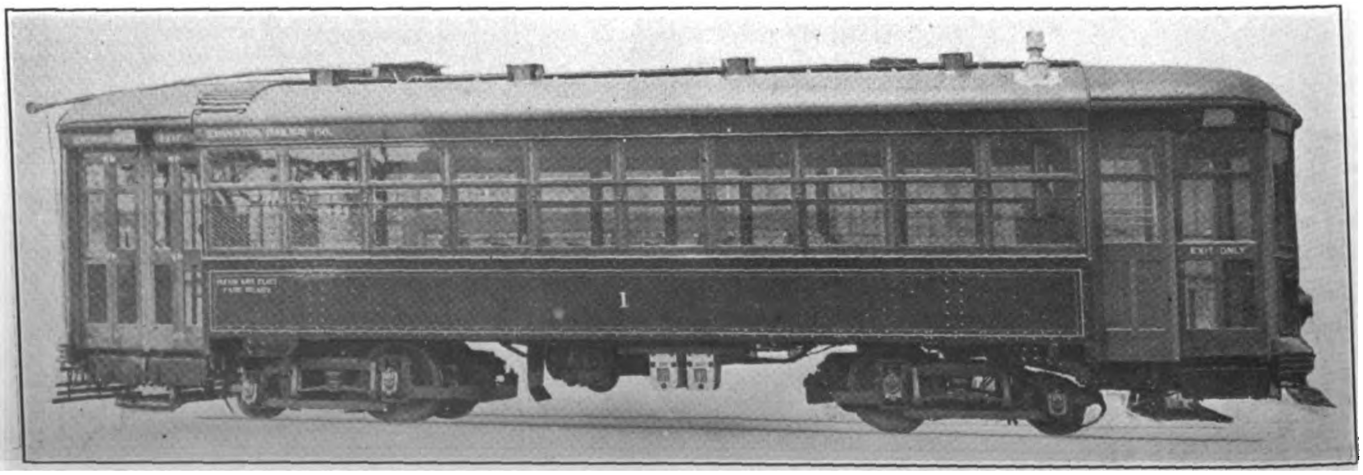
In describing these cars the company points out that the controlling feature in their purchase was the company's desire to get the very best and most complete equipment that could be bought. Quality and usefulness rather than cost were the controlling features. Due to local conditions the Evanston Railway has a great many short-haul passengers. Therefore, exceptionally large cars are not required in order to provide good accommodations for the passengers. The business, however, is sufficient to justify double-truck cars; in fact, these are required by ordinance. After some consideration of the problem of car design the management concluded that cars of the same size as those previously used would be satisfactory if much larger platforms and wider doors were used. Also, since the company buys its power, it was important in designing the car to keep the weight of the car and its equipment as low as consistent with service and durability.

These conditions brought about the choice of maximum traction trucks with their two-motor equipments. The longest possible wheelbase was ordered for the trucks, and the management states that the operation has been very satisfactory. Further, the closed door and folding-step type of car commended itself from the standpoint of safety. The design chosen has no bulkheads. The body and equipment are arranged for double-end prepayment operation under license of the Prepayment Car Sales Company.

The car has a steel underframe, drop platforms and is framed with T-iron side posts running from sill to sill in one piece. The roof is a continuous plain arch and the platforms have closed vestibules. The controlling dimensions of the body are as follows:

Length of car over the body corner posts	28 ft.
Length of car body over the dash	41 ft.
Length of car body over the bumpers	42 ft.
Length of platform to outside of dash	6 ft. 6 in.
Length of platform side opening to left of motorman	5 ft.
Length of platform side opening to right of motorman	2 ft. 6 in.
Width over the sheathing	8 ft. 6 in.
Extreme width at drip rail if storm sashes are used	8 ft. 9¼ in.
Width of aisle using 36-in. seats	25¼ in.
Height from top of rail to top of roof at center	11 ft. 6⅝ in.
Height from top of rail to floor level	3 ft. 3½ in.
Height from top of rail to tread of step, not more than	15½ in.
Height from top of car floor to top of arm rest at window sill	2 ft. 1 in.
Truck centers	20 ft.
Truck design, Brill 39-E.	
Motors, Westinghouse 536 with K control.	

The interior finish of the car is cherry with bronze trimmings. All details of design were planned with the



VESTIBULED PREPAYMENT ARCH-ROOF CAR FOR EVANSTON RAILWAY, EVANSTON, ILL.

idea of making the cars light, clean and attractive. For this reason tungsten lamps with Alba glass shades were installed. The push buttons are placed exceptionally high to be out of reach of children. The levers and mechanism which operate the sliding doors and steps as well as those which operate the folding doors and their steps, are of the car builders' design and have counterbalancing springs.

The window sashes, ten in number on each side of the car, are fitted with Edwards fixtures. The top sash is of wood and is continuous from corner post to corner post. It is fastened to the outside of the T-iron posts. Provision is made for storm sashes. The headlining, which is of 3/16-in. agasote, is divided into three panels and is tinted a light color to obtain good distribution from the ceiling lamps.

The seating plan includes twelve cross-seats, 36 in. long over all, provided with foot rests and corner grab-handles, and five stationary side seats, one of which is removable to permit the installation of a Peter Smith forced-ventilation hot-air car heater, which is located at the end of the car. The coal box is under one of the short seats near the heater. Each end of the cars has a Hedley anti-climber 7 in. high, weighing 10.28 lb. per foot. These equipments extend from vestibule corner post to vestibule corner post and form the bumper. Some of the other special apparatus in these cars is as follows:

St. Louis vertical wheel brake with Peacock-Ackley gearing; Ohio Brass air sanders; Consolidated buzzer system; Consolidated flash signal system; leather hand straps with Rico No. 2 sanitary covering; white porcelain enameled pipe platform stanchions; H. B. life guards, National air brakes and International registers.

All the woodwork used in the frame, bottom of posts and wherever inaccessible for painting, was treated with Avenarius Carbolineum. The scheme of painting adopted was the same as that used on the parlor cars of the Chicago & Northwestern Railway, which consists of green above and below the windows, with golden yellow between the windows and narrow gold striping on the lower panels. The new cars have attracted much favorable comment from local authorities and prominent residents.

Metal Railway Ties in Switzerland

In a recent issue of *Daily Consular and Trade Reports* is a report by Vice-Consul-General Frank Bohr, Zurich, Switzerland, on the use of metal railway ties in Switzerland. The information was furnished by the Central Materials Department (Obermaterialsverwaltung) of the Swiss Federal Railways in Berne.

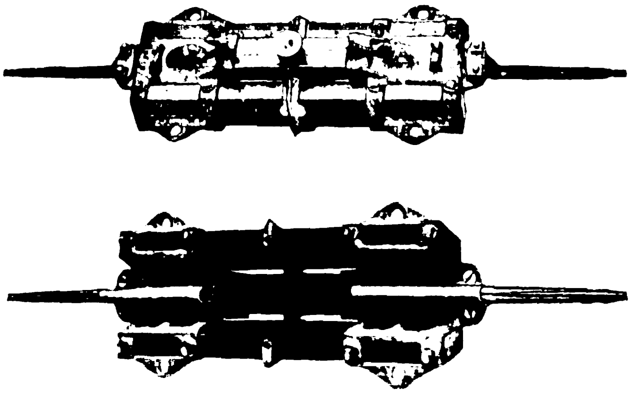
The report says that at present about 65 per cent of the Federal Railways rest upon steel ties and 35 per cent upon wooden ties. All of the steel ties have the form or profile of a trough, into which shape they are rolled in the mills. The ends of the ties are bent down and the trough profile thus closed, and from the point of the attachment of the rails the ties have a slope of 1 in 20 away from the center of the track. The ties have holes for the attachment of the rails by means of clamp plates, and no tie plates are used under the rails. The weight of the trough profile is 25.16 kg (55.47 lb.) per running meter (39.37 in.), and the ties complete with the holes already bored weigh 72.5 kg (159.84 lb.) each.

According to the requirements of the Federal Railways the steel used in making these ties must have a tensile strength of 35 to 45 kg (77.16 to 99.21 lb.) per square mm (0.00155 sq. in.), and the coefficient of quality, or the product of the tensile strength and the ductility expressed in percentage, for lengths of 200 mm (7.874 in.) must be 900. Furthermore, an entire trough piece shall admit of being bent together on its back without showing any breaking fissures. For a year or more the Federal Railways have been installing, at the junction points of the rails, double-trough steel ties instead of two ordinary single-trough ties. These double ties are of the same material as are the single ties, and the rails are attached in the same manner, but they weigh 125 kg (275.58 lb.) each.

The Central Materials Department expresses the wish to receive information descriptive of steel railway ties that are manufactured in the United States.

Triple Beam Section Insulator

The Drew Electric & Manufacturing Company, Indianapolis, Ind., has just put on the market a new section insulator. It has two main side beams of second growth seasoned hickory, treated with a wood preservative to make it impervious to moisture. Heavy bronze castings are provided for each end of the insulator, and these have slots into which the side beams are fitted and anchored with machine bolts. These castings are made to accommodate Drew standard flexible approaches to insure a smooth underrun. The wire is brought into each of the end castings on nearly a straight line and is then securely locked into these castings by means of corrugated wedges which have lugs on the ends so that they can be knocked out with a hammer in case it is desired to remove the insulator.



TOP AND BOTTOM VIEWS OF TRIPLE BEAM SECTION INSULATOR

While the method of attaching the ends of the wire to the ends of the insulator minimizes buckling, the third or middle beam of hickory shown in the top view relieves the stresses due to excessive lengthwise strains. This middle beam fits into cored recesses in the end castings, and at the same time gives a solid underrun for the trolley wheel, which crosses the break section, as shown in the bottom view, on a runner of vulcanized fiber. This fiber runner is laid up against the middle beam, is fitted into slots of the end castings and is secured by means of small flathead machine screws, making it easily removable and renewable in case of wear.

The insulator is 32 in. over all, including approaches, and weighs 17 lb. As illustrated, it has a suitable hanger boss for attachment to the span wire or mast arm. The construction is such that it is amply strong for trolley wire up to and including No. 0000. On each side of the end castings ears are provided for attaching strain guys if desired. The insulator is said to be non-arcing and smooth under-running.

News of Electric Railways

Hearing of California Commission on Calhoun Note

The investigation being conducted by the California Railroad Commission into the finances of the United Railroads of San Francisco, especially into the circumstances surrounding the investment by the company of $1,096,000 in the securities of Solano Irrigation Farms Company, was begun on July 20. As previously published in this paper, the investment was made by Patrick Calhoun, president of the company. Later, upon the request of the directors, Mr. Calhoun gave his personal note for this amount, protected by the securities of the Solano Irrigation Farms Company as collateral, the note later being carried in the assets of the company at $1.

At the hearing on June 20 Jesse W. Lilienthal presented the proposal of the board of directors—which was that the California Railway & Power Company, which controls the United Railroads and is itself controlled by the United Railways Investment Company, should acquire the Calhoun note from the United Railroads and in exchange for it give the United Railroads common stock of the United Railroads which the Power company holds in its treasury, having the par value of $7,950,000. The Power company now owns all of the common stock of the United Railroads, amounting to $17,948,600. Testimony at the hearing showed that the property of the Solano land company is located about midway between San Francisco and Sacramento, being about 50 miles from each city, and that the operation of the company had no apparent connection with the operation of the railroad; also that the money was invested without the knowledge of the directors and was paid in a large number of small amounts on vouchers made by Mr. Calhoun and drawn in the regular way, the treasurer's balance showing the amount so invested as cash. The large amount of money drawn and its use in the land project was discovered only in June, 1913, by Charles N. Black, vice-president of the United Railroads, who immediately advised the directors of the company. Mr. Calhoun was then called to New York to discuss the matter with them. Prior to that time the directors had considered Mr. Calhoun the best informed man regarding the financial needs of the company, so that he had a wide discretion in the direction of the financial affairs of the company. During the hearing the auditor of the commission claimed that the company's books showed a total deficit of $4,880,471, and of this amount he could not account for $3,906,909. After this statement was made by the auditor, Vice-President Black said that the company's auditor would be able fully to account for the last named sum, and the hearing was adjourned until June 28 to allow him to prepare his report.

The commission did not express any opinion as to whether it would accept the offer of the substitution of the common stock of the United Railroads for the Calhoun note, but intimated that if the amount which it considered a deficit in the accounts of the company was not made up in the way which it considered satisfactory it would issue an order stopping the company from paying any dividends. The common stock of the United Railroads is not now paying any dividend. The commission and the company for some time have differed in the proper location of the reserve accounts in the balance sheet, the company's auditors asserting that a reserve should be carried only on the liabilities side of the balance sheet, whereas the commissioners assert there should be a corresponding entry in both the liabilities and assets accounts. It has been suggested that the difference of accounting may explain a portion of the deficiency claimed by the commission.

Mason B. Starring, president of the United Railways Investment Company, made public in San Francisco last week a statement in regard to the situation. He said:

"The application of the funds of the railroad company to such project was made, so far as I know or can ascertain, without knowledge of any officer of the California Railway & Power Company, the United Railways Investment Company, or the Railroads & Power Development Company or of any director thereof other than Mr. Calhoun. He made such application on his own initiative and took full responsibility therefor. During a part of July and August, 1912, I was in California for the purpose of inspecting the railroads and the power companies in which said companies were interested, and to that end traveled through a large part of the country adjacent to their territory, including that part of the Sacramento valley in which the Solano project was subsequently located.

"Neither at that time nor at any other time until about a year ago had I any knowledge of any such application of the funds of the United Railroads of San Francisco, or of any intention on the part of any one to use such funds in or for any land project or to loan to any one any such funds for such purpose. No resolution or resolutions were intended to confer authority on any one to use moneys of the railroad in any such way.

"When I first heard of the Solano project I understood that it was being carried on with the personal funds of Mr. Calhoun and such individual investors as he had been able to interest in the matter, and I remained in this belief until the discovery, about a year ago, that the money of the United Railroads had been used, as Mr. Calhoun stated in New York substantially coincidentally with the time of discovery, without our knowledge. Such application of the moneys of the United Railroads of San Francisco was foreign to any views held by the officers or respective boards of directors of the companies herein named, and contrary to what they understood had been established as the fixed policy of the railroad—namely, to conserve its funds and apply them solely to the improvement of its property, the reduction of its debts and the payment of such reasonable dividends as its earnings might warrant.

"I believe, and can find no evidence to the contrary, that no officer or director other than Mr. Calhoun, or any of the three companies of which I am president, was or is interested in the Solano project directly or indirectly. When the Solano transactions became known here prompt steps were taken to repudiate them and to effect such changes in the management of the United Railroads Company as would put beyond possibility any further such application of its funds, and to secure it so far as possible against loss.

"The statement of May 25, 1914, made by President Lilienthal, correctly represents the situation and states the policy which he laid down and which received and receives our approval, in the hope that Mr. Calhoun might be able so to develop his project as to secure full repayment to the railroads. I made substantially this statement to the respective boards of directors of the three companies, but so far have not published it. You, however, are now authorized to make the statement for those companies and for myself, at such times and in such manner, and to such persons or otherwise as in your discretion may seem fit."

At the annual meeting of the stockholders of the United Railroads held July 14, the following directors for the ensuing year were elected: A. W. Foster, Henry T. Scott, A. H. Payson, Benjamin S. Guinness, J. C. McKinstry, Washington Dodge, L. P. Sherman, John A. Buck, C. N. Black, George B. Wilcutt and Jesse W. Lilienthal. These directors chose the same officers as last year. Jesse W. Lilienthal was elected president; C. N. Black, vice-president; George B. Wilcutt, secretary, and A. M. Dahler, treasurer.

Proposed Report on Detroit Transportation

As announced in the ELECTRIC RAILWAY JOURNAL of July 18, the Board of Street Railway Commissioners of Detroit has presented to the Common Council the name of the firm of Barclay Parsons & Knapp, New York, as its choice of engineers to advise the city as to the proper policy to be pursued with respect to the construction of rapid transit lines and to prepare plans for such subways as may be found necessary. Several interviews have been held between the board and W. B. Parsons and H. M. Brinckerhoff, members of the firm especially experienced in subway construction and management, and a letter has been sent out by the firm to the board submitting in full the outline for the proposed investigation. According to this letter, it will be necessary to procure the following information:

"1. An analysis of the growth of the city by municipal divisions and the present and probable future location of industries and of business sections, and a consideration of commercial conditions localizing traffic.

"2. An analysis of the existing traffic situation and conditions.

"3. An analysis of the question of a subway system and other means of improving street traffic conditions.

"4. A study of sub-surface conditions and abutting property interference, sewers, ducts and pipes."

On the basis of the above investigations, the firm promises to submit a synopsis of the information received and a report covering:

"(a). General plans indicating in what ways the traffic conditions of Detroit can be improved, more particularly in the congested area adjacent to the city hall.

"(b). Plans in sufficient detail to be self-explanatory, showing what subway or subways could be constructed with advantage, either now or in the near future.

"(c). Estimates of cost for constructing the subway, subways or other improvements.

"(d). A discussion of the value of the proposed subway or other improvements in actual earning capacity and in the light of its value to the public."

The opinion of Barclay Parsons & Knapp will be given in an illustrated printed report. The firm has offered to submit a model, if necessary, so as to indicate more clearly to the layman the details of the proposed construction. On the basis that the Board of Street Railway Commissioners will place at the service of the engineering firm all street surveys and the like and provide local offices, the price for the investigation is set at $32,000. The Board of Street Railway Commissioners, however, has requested the Common Council to appropriate $35,000 to defray the expenses of the investigation. The matter has been referred to the committee on ways and means and public utilities.

Six New Rapid Transit Contracts in New York

During the week ended July 18, the Public Service Commission for the First District of New York executed six contracts for the construction of sections of the rapid transit railways embraced in the dual system, aggregating $21,035,185. Among these were the contracts for the construction of the East River tunnels from downtown Manhattan to Brooklyn, the largest let in New York City since the construction of the existing subway. The contracts for these two tunnels totaled $12,444,726, $6,469,916 being the bid price for the Interborough tunnel, extending from Old Slip, Manhattan, to Clark Street, Brooklyn, and $5,974,810, the price for the New York Municipal Railway Corporation's tunnel, extending from Whitehall Street, Manhattan, to Montague Street, Brooklyn. The contracts were awarded to Booth & Flinn, Ltd., and the O'Rourke Engineering Construction Company, who submitted a joint bid. These companies have now formed a new company, known as the Flinn-O'Rourke Company, which will proceed with the tunnel construction work.

Other contracts executed were as follows: Section No. 1 of Route No. 12, being a part of the Eastern Parkway subway in Brooklyn, four tracks for operation by the Interborough Rapid Transit Company and two by the New York Municipal Railway Corporation. This section was awarded to the Cranford Company for $2,195,296. Section No. 2 of Route No. 20, the Canal Street subway in Manhattan, for operation by the New York Municipal Railway Corporation, was let to the Underpinning & Foundation Company for $1,822,994. Section No. 7 of Route No. 5, the Lexington Avenue subway in Manhattan, for operation by the Interborough Rapid Transit Company, extending under Lexington Avenue from Forty-third to Fifty-third Street, was awarded to the Rapid Transit Subway Construction Company for $1,915,165. Section No. 2 of Route No. 4 and Route No. 36, the Broadway subway in Manhattan, extending under Broadway from Twenty-sixth to Thirty-eighth Street, for operation by the New York Municipal Railway Corporation, was let to the U. S. Realty & Improvement Company for $2,657,005.

The commission has approved of certain modifications in the contract for the reconstruction of the existing Sea Beach elevated railway in Brooklyn. The New York Municipal Railway Corporation recently let the contract for part of this work to the Wilson & English Construction Company. The contract is now modified, however, to include the construction, by the same contractors, of a signal tower located near Sixth Avenue. G. W. McNulty, Inc., has the general contract for the reconstruction work on this line, and the entire work must be completed within seventeen months from Oct. 6, 1913.

The Interborough Rapid Transit Company has applied to the commission for permission to award a contract to the Terry & Tench Company, Inc., the Snare & Triest Company and the T. A. Gillespie Company for the construction of its elevated railway extensions in the Bronx. These companies now have the contract for the installation of additional tracks on the present elevated lines. The proposed contract provides that the companies shall do the work at cost plus a percentage, the percentage to be named by the commission, but not to be less than 12½ per cent of the actual construction cost. Action has been deferred pending further investigation by the commission.

Hearing on Toledo Franchises—Proposed City Charter

Not much real work was done by the Toledo Council franchise committee at the meeting on July 20, which was called for the discussion of the four franchise proposals placed before it. These are the original Doherty proposal, the drafts prepared by the Citizens' Franchise Association and the Non-Partisan League and the one arranged by the Council franchise committee. In addition, a municipal ownership ordinance has been initiated and is now being discussed before the voters.

J. R. Cowell, former director of public service, and Ben E. Johnson, attorney, explained the various sections of the proposal prepared by the Non-Partisan League. This proposal, as explained in the ELECTRIC RAILWAY JOURNAL of July 18, provides for a sliding scale of fares, depending upon the condition of the interest fund, similar to the Cleveland plan, and a rate of income on the investment increasing or decreasing inversely with the rate of fare. After hearing the explanation of the proposal, the committee went into executive session, considered a few sections of the document and then decided to meet again on July 22 to discuss the remainder.

It is said that the committee may decide to place the three alternative proposals before Henry L. Doherty, chairman of the board of directors of the Toledo Railways & Light Company. Chairman Dotson has suggested this step after such revisions of the proposals as the committee may desire to make. Another suggestion was to the effect that the committee endeavor "to agree with Mr. Doherty" as to which general basis of fare is the most satisfactory and negotiate on that basis.

It is reported that a suit will be filed in the Common Pleas Court to enjoin the proposed election on Aug. 4 on the question of the municipal ownership ordinance. This was agreed after a conference between John H. Doyle of the Citizens' Franchise Association and City Solicitor Thurston and the refusal of the latter to accede to the demand to enjoin the members of the board of elections from holding the election as planned. The instigators of the suit claim that the petitions filed to initiate the proposed municipal ownership ordinance are illegal.

Under the proposed charter for the city of Toledo, which has been completed and upon which the electors will vote at the regular autumn election, Toledo will have a department of public utilities. The director in charge will supervise all tax-supported utility undertakings, including power and transportation facilities, and enforce all laws relating to privately owned utilities. Rates for service under the charter shall be fixed in the manner provided by ordinance of City Council.

Separate accounts shall be kept of the business of all utilities owned and operated by the city and dependent for their revenue upon the sale of their own products or service. These accounts shall contain proportionate charges for all services rendered such utilities by other departments of the city government. It is the intention that each shall be operated as a separate institution.

Under this charter franchises may be granted to utilities to operate in the streets and public grounds, subject to the general law requiring the consents of owners of abutting property. The grant shall provide the kind and quality of product or service, the rates to be charged and the manner in which the streets and public grounds shall be used. Such grants may be renewed and both original and renewal grants are subject to a referendum vote. No grant thus made shall be exclusive. All such grants or renewals shall reserve to the city the right to purchase or lease all the property of the utility, according to the terms provided in the grant. The city may also acquire such property by condemnation proceedings, but this shall be alternative to the power to purchase.

Permission for extensions and improvements may be secured, but such extensions shall become a part of the general property, and all rights with respect to them shall terminate with the original grant. The City Council shall have complete control of the streets occupied by any public utility and also the distribution of space over, under or across them. The property of a utility is subject to relocation, removal or reconstruction, if deemed necessary by the City Council.

Portions of property lying without the city become subject to the terms of the grant on annexation of the territory concerned. Companies make detailed periodical statements of their business and the operation of the property, as may be directed by the City Council. Should any company take action to have any portion of its grant changed or voided, the city may declare the entire grant nullified. This gives the city power to enforce all contracts, but does not make the result mandatory.

Final vote on the proposed charter as a whole by the charter commission has been postponed until Aug. 13.

Suit Ordered Against New Haven Railroad

President Wilson on July 21 directed that a bill in equity be filed against the New York, New Haven & Hartford Railroad and that the criminal aspects of the monopoly maintained by this company in New England be laid before a federal grand jury. On July 23 suit was filed in the United States District Court in New York, and it is expected that within a fortnight a special grand jury will be impanelled for the criminal proceedings.

According to a statement issued by J. H. Hustis, president of the company, a proposal was made on July 20 to the Department of Justice that the Boston Railroad Holding Company, which has title to the Boston & Maine stock, be put into the hands of trustees agreed upon for that purpose until the Massachusetts Legislature had removed some of the conditions imposed upon the disposal of the Boston & Maine stock. It is understood that the intention of the New Haven directors was to concede all other points that would be raised in a suit under the Sherman law, assuming that these would be the same as those covered by the dissolution agreement affecting steamboats, trolleys and other properties. If this is correct the net result of the filing of suit by the government is about the same as if Attorney-General McReynolds had accepted the proposal that the point concerning the Boston & Maine stock be adjudicated separately by the federal court.

Samuel T. Bodine, president of the United Gas Improvement Company, Philadelphia, Pa., has issued the following statement regarding the Rhode Island trolley properties sold by his company to the New Haven:

"It was a perfectly straightforward transaction. No influence whatever was brought to bear on Mr. Mellen or other officers, or the directors of the New Haven to induce them to make the purchase. We were not seeking to sell the property, having made improvements in its physical condition and operating results. The other side were so urgent to have a price named that we finally named it, and naturally in arriving at the price we discounted the future to a certain extent. It was the case of an eager purchaser and a reluctant seller."

Detroit Lines Make Petition for Appraisal

An application has been made by the Detroit United Railway to the Michigan Railroad Commission for a complete appraisal of its properties, and of the interurban properties controlled by it through stock ownership, viz.: Detroit, Jackson & Chicago Railway, Detroit, Monroe & Toledo Short Line Railway, and Detroit & Port Huron Shore Line Railway. It is represented in the petition that the respective companies have exhausted the bonds issuable under authorized and existing mortgages in the course of the construction, enlargement and development of their properties, and that a necessity exists for a reorganization of the properties in the matter of securities to provide additional funds for continued enlargement and development.

The petition states that the Detroit United Railway has outstanding its entire authorized issue of capital stock, $12,500,000, $25,000,000 in bonds and $2,000,000 in two year notes. It owns about 441.597 miles of track. It owns the entire capital stock, to wit: $2,000,000 of the Detroit & Port Huron Shore Line Railway; $2,581,000 of the Detroit, Monroe & Toledo Short Line Railway, and $25,000 of the Detroit, Jackson & Chicago Railway, as well as various other equities in these and other companies. The Detroit & Port Huron Shore Line Railway owns 132.726 miles of track. It has issued its entire authorized capital stock of $2,000,000, and has outstanding its entire authorized bond issue of $2,890,000. The Detroit, Monroe & Toledo Short Line Railway owns 79.51 miles of track, has issued its authorized capital stock of $2,581,000, and has outstanding $2,941,000 of its total authorized bond issue of $3,000,000. The Detroit, Jackson & Chicago Railway owns 108.138 miles of track. It has issued its entire authorized capital stock of $25,000 and its total authorized bonds of $4,000,000.

The petition points out that the Detroit United Railway is committed to the building and equipping of about 20 miles of new railway in Detroit, and about 14 miles of new railway outside of Detroit, and that it has under way plans for the double tracking of about 40 miles of interurban lines. For the purpose of carrying out these undertakings it will be necessary to issue and sell securities in a sum exceeding $5,000,000 in the form of either stocks or bonds secured by a mortgage.

An order will be issued by the State Railroad Commission for the appraisal to be made, according to Chairman Hemans, under whose jurisdiction such matters fall. The cost will be borne by the Detroit United Railway, as provided by Michigan statutes. The appraisal will be in charge of Dean M. E. Cooley of the University of Michigan, who is in charge of such work for the commission.

The commission, it is understood, will order an appraisal on the basis of reproduction value and also of present value. Each property will be appraised separately and reports will be made to the commission at short intervals as to the progress of the work.

Half-Fare Operation Begun in Kansas City

The half-fare provision for children between the ages of eight and twelve years was put into force by the Metropolitan Street Railway, Kansas City, Mo., on July 20. Half-fare tickets were given general distribution at that time through conductors and business houses in various parts of the city. There is little need for outside distribution, however, as conductors, when receiving a nickel from a passenger entitled to the discount, merely return one of the coupons. Universal transfers are given with the half-fare tickets as well as with full fares. Children under eight years of age may ride free, if accompanied by a passenger paying a fare, even if the latter happens to be between the age of eight and twelve years and is riding on half fare. Half fares are not applicable to traffic originating in Kansas City, Kan., although R. J. Higgins, counsel for that city, has announced he will make an effort to force the adoption of the half-fare system on the Kansas side. The daily papers of July 19 carried advertisements explaining the new system in detail, at the order of the receivers for the company.

P. J. Kealy and Robert P. Woods, members of the board of control for the Kansas City Railways and the city, under the new franchise, returned to Kansas City on July 20 from an inspection trip of roads in the East and Middle West. They immediately took up the question of the location of the proposed central interurban passenger station. Four sites have been proposed and big bonuses are offered by business men interested in the location of the depot. For instance, $500,000 has been offered by business interests desiring the station to be erected at Tenth and Wyandotte Streets. The interurban officials themselves have expressed no particular concern over the location, merely desiring one which will allow proper routing without running over the trunk lines of the local railway.

The Nelson papers have continued their attempts to prove the perpetration of frauds at the recent election, apparently in the hope of influencing the State Public Utilities Commission in its conclusions. The residents who, according to the Nelson papers, knew of fraudulent voting, have failed to materialize for any hearings on the subject.

The name "Metropolitan Street Railway" will be technically banished when the successor company, the Kansas City Railways, is incorporated. This company will then proceed to purchase all the property of the Metropolitan Street Railway and its subsidiaries, for which it is obligated to pay $28,700,000, the present bonded debt of the companies. It is contemplated that six months will be required to do this.

The two members of the board of control will act under the receivers until the legal task of clearing the receivership has been performed. The receivers, however, have already agreed to operate under the terms of the new contract until their work is completed. In the meantime the city will participate in the net earnings of the company. Improvements and extensions to be made under the contract will be carried out as far as possible until the company is placed on a sound financial basis. While the company is being financed anew, there will be no change in the personnel of the Metropolitan Street Railway officers, according to Mr. Kealy. The board of control, however, has authority to recommend and demand such changes as it deems proper. Mr. Wood states that the board will endeavor to operate on an economic basis in an endeavor to keep down expenses.

R. J. Dunham, one of the receivers of the Metropolitan Street Railway, was elected president of the Kansas City Railways on July 20, following a meeting at which the company's six directors were chosen. Ford F. Harvey was made vice-president, and E. E. Ball, an attorney in the office of Frank Hagerman, secretary-treasurer. The directorate for the company includes, besides Mr. Dunham and Mr. Harvey, Frank Hagerman, E. F. Swinney, Charles W. Armour and Clyde Taylor. The city's directors are William T. Kemper, John H. Wiles, D. M. Pinkerton, Frank C. Niles and John W. Wagner.

Electric Division of New Haven Begins Operation

On July 10 the electrified division of the New York, New Haven & Hartford Railroad, extending for 74 route-miles between New York City and New Haven, was placed in regular operation. The line includes the four-track route between the Grand Central Terminal and New Haven, together with the six-track branch from New Rochelle to the Harlem River that is used mainly for freight service. Operations began with the use of electric locomotives for the Knickerbocker Limited and several Boston expresses that make the 74-mile run in one hour and forty-five minutes, and by July 14 a total of eighteen electric trains were in operation each way. On July 19 all Sunday trains were placed permanently in electric operation, and, during the week of July 20, all passenger service on the division, except eight through trains and four local trains between New York and New Haven, was served by electric locomotives. The latter trains will be operated by steam until some time in September, as there are not enough electric locomotives in service at present to haul them.

In addition to the passenger trains six freight trains each way daily are being hauled by electric locomotives. These include one scheduled train consisting of 120 cars and averaging 2500 tons in weight. This runs daily between Bridgeport and the Harlem River, a single electric freight locomotive serving to haul it. A number of freight trains ranging between 2800 and 3000 tons have been operated at various times during the trial period with two electric units coupled and operated by one crew. It is stated that the present power plant can supply sufficient power to operate electrically all trains on the New York-New Haven division, but as a considerable part of the New Haven yards is not yet equipped with overhead construction, only a limited number of freight trains can be handled.

Progress of Strike in Joplin

Indications on July 18, the twelfth day of the strike of the employees of the Joplin & Pittsburg Railway, Pittsburg, Kan., were for a long but peaceful struggle between the men and the company. William A. Satterlee, general manager of the company, announced that the company would await the pleasure of the employees in taking up negotiations looking to a settlement. No violence has characterized the disagreement, for the company decided to cease operations entirely until the employees showed evidences of a desire to resume work. Mr. Satterlee attributes the trouble to a great extent to the fact that his road pierces a coal district, where miners are without exception union men. As noted in the ELECTRIC RAILWAY JOURNAL of July 18, the employees demand an increase from 26 to 40 cents an hour, with stipulations regarding the right of the company to discharge employees.

Employees of the company are accepting the situation joyously rather than philosophically. The various departments have organized ball clubs and a series of games is being held. Daily meetings have been held at Joplin, Mo., by the strikers, this being the only indication that they are interested in the situation. Governor Hodges of Kansas says that he will take no action unless violence develops.

The fact that steam roads operating in this district have installed special service has relieved the situation to some extent, particularly in regard to freight traffic. Mineral, Kan., however, is without electric power, the same being true of several adjacent towns.

Company Forced to Abandon Power Plant.—The Monongahela Valley Traction Company, Fairmont, W. Va., is reported to be about to abandon its $300,000 power plant at Fairmont and build a new gas engine plant at Hutchinson, W. Va. Contamination of water in the West Fork River owing to acids from chemical plants is said to be the cause for this action.

Florida Blue-Sky Law Upheld.—The Florida Supreme Court on July 14 handed down a decision holding that the blue-sky law regulating the sale of stock of companies is constitutional. This decision was the result of a test case made by C. H. Taylor of Jacksonville, to whom was refused a permit to sell stock of a certain company which had not complied with the law.

Branch I. C. C. Office Opened.—The Interstate Commerce Commission has opened a branch office in St. Louis, Mo., from which the commission's activities will be directed throughout the territory east of the western boundary of Colorado, north of the Gulf of Mexico and west of the eastern boundary of Tennessee. The St. Louis office will be in charge of Examiner F. S. Fowler.

Municipal Line Seeks Relief from Depreciation Charges.—The City Council of Brandon, Manitoba, recently asked the Public Utilities Commission to relieve it from providing a depreciation allowance in respect to the municipal railway for one year. The Council asserted that the line is a comparatively new one, that the city is providing a sinking fund and that the revenues from the line are at the present time small.

Storm Damage in Louisville.—Severe wind and electrical storms in Louisville, Ky., during the week of July 13 played havoc with electric railway schedules. Around Louisville, service was discontinued for some time, wires and equipment being damaged and two Brook Street cars being struck by lightning. In Henderson, a cyclone unroofed the municipal electric plant, which furnished power to the city system and the Evansville, Ind., interurban system.

Chicago Traction Wage Differences.—Differences between the North and West Side street car men of the Chicago Surface Lines have reached such a point that the arbitration board that made the present wage award has been reconvened. The employees assert that wages in certain classes were reduced before and after the merger of the surface lines. Chief Justice Orrin N. Carter, Judge K. Scanlon and Herbert B. Fleming are the members comprising the arbitration board.

Arbitration as to Value of Toronto Stub Line.—The Ontario Railway and Municipal Board on July 17 granted the application of the city of Toronto for an order authorizing the Toronto & York Radial Railway and the city of Toronto to submit the question of a price for the Queen Street East stub line to arbitration to determine the value of the physical assets. The representatives of the company and the counsel for the city have decided to come to some agreement as to the worth of the line.

Butte Electrification Project Held Up.—For over a week no work has been done on the transmission line of the Chicago, Milwaukee & St. Paul Railway between Three Forks and Deer Lodge, which was to be completed within a year. The electrical workers employed asserted that electrical workers should be used in setting transmission poles and should be paid $5 for an eight hour day, and demands to this effect were made through a local branch of the American Federation of Labor. The railroad refused to make any agreement for labor except with the men actually in its employ.

To Begin Campaign for Hydro-Electric Lines.—A meeting was held on July 16 in the office of the Ontario Hydro-Electric Power Commission in Toronto to discuss the proposed hydro-electric municipal railway scheme broached several months ago, as noted in the ELECTRIC RAILWAY JOURNAL of Jan. 31. It was decided to inaugurate an educational campaign in York County and other districts, and a committee was appointed to arrange for the holding of thirty meetings at which prominent speakers will present the matter to the people. It is expected that the proposed bill to guarantee the bonds of the commission, amounting to $2,000,000, will be submitted to the electorate on Sept. 21.

Attempt to End Hazleton Trolley Strike.—John P. Jackson, head of the Pennsylvania State Department of Labor, and Dr. Steese, member of the board of mediation of that body, visited Hazleton, Pa., on July 16 in an endeavor to settle the trolley strike, the progress of which was described in the ELECTRIC RAILWAY JOURNAL of July 18. A conference was held with the officials of the Lehigh Traction Company and later with the strikers. The strike situation remains practically the same, however, and from present indications the contest will be fought out on the lines indicated by the attitude of each side since the inception of the dispute.

Foreign Trade Council for United States.—As a result of the recent foreign trade convention in Washington on May 27 and 28, a foreign trade council has been established to advance the export trade of this country. James A. Farrell, president United States Steel Corporation, is chairman, and the membership consists of executives of prominent manufacturing companies throughout the country. Another convention will be held in New York in the early autumn, and one of the first official actions will be the appointment of a committee to co-operate with the committee of the Chamber of Commerce of the United States of America.

Proposal Affecting Common-User Rights in Seattle.—A resolution has been introduced in the Seattle (Wash.) Council directing the corporation counsel to enforce the common-user rights over the tracks of the Puget Sound Traction, Light & Power Company for the cars of the Highland Park & Lake Burien branch of the Seattle Municipal Railway, in order that the north terminus may be at Spokane Street and First Avenue South, instead of at Riverside Avenue. The resolution was referred to the city utilities committee. An ordinance was also introduced providing for the issuance of public utility bonds to cover the cost of extending Division "A" of the municipal line into Ballard. This was referred to the committee on finance and city utilities.

Contract for Newark Terminal Awarded.—A contract involving $2,000,000 was awarded on July 17 to the Heddon Construction Company for the erection of the Public Service Railway terminal in Newark. The structure is to be ready for occupancy by January, 1916. Actual operations cannot be begun much before next March, because under the contract recently let to the Holbrook, Cabot & Rollins Corporation for the excavation, foundation and the subway leading to the terminal, that company has nine months to complete the foundations. The building will be eight stories high, of irregular shape, and will be built of steel, limestone and brick. Its frontage of 184 ft. on Park Place will be faced with limestone. The subway, concourse and elevated train floors will cover a ground area of 70,000 sq. ft. and the office floors will cover 30,000 sq. ft. This proposed terminal building was described in detail in the issue of the ELECTRIC RAILWAY JOURNAL of Feb. 8, 1913, page 247.

No Change in Cleveland Wage Question.—A committee from the local branch of the Amalgamated Association of Street and Electric Railway Employees on July 22 again presented demands to the Cleveland Railway Company for a readjustment of the schedules, improvement in working conditions and a minimum workday of eight hours. J. J. Stanley, president of the railway, again informed the committee that an increase in wages of 1 cent an hour for the men who have been with the company one year or over and a minimum day of five hours is the best the company can do. This will cause an increase in expenses of $150,000 per year, all that can be allowed at this time. G. R. Davies, president of the local branch of the union, recently announced that the schedule used in 1906 and an eight-hour minimum day would be demanded.

Boston Elevated to Build Bridge for Malden Extension.—Lieutenant-Colonel Craighill of the United States Engineers gave a hearing at Boston, Mass., recently upon the plans of the Boston Elevated Railway for the construction of a new bridge over the Mystic River, between Boston and Everett, in connection with the building of an elevated line between Sullivan Square and Malden. The plans have been approved by the Boston Port Directors and by the Public Service Commission, sitting jointly. The work will include the construction of a new bridge for the exclusive use of the company's cars and the relocation of the draw of the present bridge. Both draws will be 75 ft. wide and will be operated from one tower. There was no opposition, and Lieutenant-Colonel Craighill announced that a favorable report on the matter will be sent to the War Department at Washington for final approval. With the construction of the bridge and its connecting elevated line, the rapid transit system will extend from Forest Hills to Everett, a distance of nearly 10 miles.

Appreciation Shown by Newspapers.—The manner in which traffic on July 4 was handled by the Hudson Valley Railway, Glens Falls, N. Y., resulted in much favorable comment on the part of the newspapers. The Glens Falls *Times* remarked: "Never in the history of local street railroad business has a large crowd been handled so satisfactorily. The general manager and his subordinates all come in for unstinted praise—that is, from intelligent, fair-minded, reasonable people, who realize just what is involved in handling abnormal business of any kind with limited facilities." The *Post-Star* wrote editorially as follows: "Ample testimony of the efficiency of the Hudson Valley Railway is found in the success with which the road handled the July 4 crowds. The employees are to be commended for the part they played in making this possible. Glens Falls and her sister communities have a right to be proud of the Hudson Valley Railway. It is contributing every day in the year to the convenience and the pleasure of the people of this section. Under the wise supervision of A. E. Reynolds, the usefulness of the line is steadily increasing, and it will score still greater success in the future."

Meeting of Southeastern Section of N. E. L. A.—Announcement has been made that the Southeastern Section of the National Electric Light Association will hold its next convention at the Isle of Palms, S. C., on August 19, 20 and 21. This section of the National Association has met with rapid progress under the direction of its president, T. W. Peters, of the Columbus (Ga.) Railroad. In this work Mr. Peters has been assisted by a number of electric railway men, including A. A. Wilbur, assistant secretary and assistant treasurer Columbus (Ga.) Railroad; C. D. Flanigan, second vice-president and chief engineer Athens (Ga.) Railway & Electric Company, and W. L. Southwell, of the Macon (Ga.) Railway & Light Company. T. M. Bender, assistant secretary and treasurer of the Charleston (S. C.) Consolidated Railway & Light Company, is chairman of the committee of entertainment. Other members of this committee are R. L. Lindsay, general manager Durham (N. C.) Traction Company; E. C. Deal, vice-president and general manager Augusta, Aiken Railway & Electric Corporation, Augusta, Ga.; J. E. Bigham, assistant treasurer Tampa (Fla.) Electric Company, and W. W. Fuller, general superintendent Charleston-Isle of Palms Traction Company, Charleston, S. C. All the attractions at the Isle of Palms, which are owned by the Charleston-Isle of Palms Traction Company, will be placed at the disposal of the delegates.

Financial and Corporate

Stock and Money Markets

July 23, 1914.

While there were declines to-day at the opening in most of the stocks on the New York Stock Exchange, the initial losses were generally small and were reduced on the next few transactions. There was little indication of a reactional tendency and the leading issues showed an ability to recover whenever pressure was removed. The threatened suit against the New Haven resulted in an over-night loss of two points for that road, but there was a fractional recovery in a short time. Rates in the money market were: Call, 2 per cent; sixty days, 2¼ per cent; ninety days, 2½ @ 3¼ per cent; four months, 3½ per cent; five months, 3¾ per cent; six months, 4 per cent.

A steady tone was manifested on the Philadelphia Stock Exchange to-day, but to the end conditions were dull.

The stock market in Chicago to-day was characterized by irregularity. Bonds, however, were steady.

With the exception of the New Haven and Boston & Maine securities, the tone on the Boston Exchange was firm.

In Baltimore trading on the Stock Exchange was generally dull. The sale of stocks totaled 806 shares and of bonds $23,100, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 15	July 22
American Brake Shoe & Foundry (com.)	90½	91
American Brake Shoe & Foundry (pref.)	138	137
American Cities Company (com.)	*29	*29
American Cities Company (pref.)	60	60
American Light & Traction Company (com.)	328	327
American Light & Traction Company (pref.)	109	108
American Railways Company	37	37¼
Aurora, Elgin & Chicago Railroad (com.)	32½	32½
Aurora, Elgin & Chicago Railroad (pref.)	76	76
Boston Elevated Railway	99	99½
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	50	50
Boston & Worcester Electric Companies (com.)	*6¼	*6¼
Boston & Worcester Electric Companies (pref.)	37	37
Brooklyn Rapid Transit Company	90½	91¾
Capital Traction Company, Washington	98	99½
Chicago City Railway	135	170
Chicago Elevated Railways (com.)	20	22
Chicago Elevated Railways (pref.)	65	75
Chicago Railways, ptcptg., ctf. 1	98½	85
Chicago Railways, ptcptg., ctf. 2	34¾	34⅛
Chicago Railways, ptcptg., ctf. 3	6	6
Chicago Railways, ptcptg., ctf. 4	2	2
Cincinnati Street Railway	103	a104
Cleveland Railway	105	106
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company	*13	13
Columbus Railway (com.)	*53	*53
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	*55	*55
Detroit United Railway	80	80
General Electric Company	146½	148½
Georgia Railway & Electric Company (com.)	121	121
Georgia Railway & Electric Company (pref.)	85¾	86
Interborough-Metropolitan Company (com.)	13⅞	13⅞
Interborough-Metropolitan Company (pref.)	63⅛	63
International Traction Company (com.)	*30	*30
International Traction Company (pref.)	*81	*81
Kansas City Railway & Light Company (com.)	*20½	*20½
Kansas City Railway & Light Company (pref.)	*39	*39
Lake Shore Electric Railway (com.)	6	6
Lake Shore Electric Railway (1st pref.)	90	90
Lake Shore Electric Railway (2d pref.)	22	22
Manhattan Railway	129½	129½
Massachusetts Electric Companies (com.)	10¼	10¼
Massachusetts Electric Companies (pref.)	58	58
Milwaukee Electric Ry. & Light Co. (pref.)	*95	*95
Norfolk Railway & Light Company	*24½	24½
North American Company	71½	72½
Northern Ohio Traction & Light Co. (com.)	63	63½
Northern Ohio Traction & Light Co. (pref.)	97½	97½
Philadelphia Company, Pittsburgh (com.)	39½	38
Philadelphia Company, Pittsburgh (pref.)	35	35
Philadelphia Rapid Transit Company	15¼	15¼
Portland Railway, Light & Power Company	44	44
Public Service Corporation	111	111
Third Avenue Railway, New York	40¾	41⅜
Toledo Traction, Light & Power Co. (com.)	20	20
Toledo Traction, Light & Power Co. (pref.)	a70	70
Twin City Rapid Transit Co., Minn. (com.)	101½	101⅝
Union Traction Company of Indiana (com.)	*11½	*11½
Union Traction Company of Indiana (1st pref.)	*70	*70
Union Traction Company of Indiana (2d pref.)	*14	*14
United Rys. & Electric Company (Baltimore)	27¼	27⅜
United Rys. Inv. Company (com.)	11	10
United Rys. Inv. Company (pref.)	32	28
Virginia Railway & Power Company (com.)	48¾	a50
Virginia Railway & Power Company (pref.)	95	95
Washington Ry. & Electric Company (com.)	87	87
Washington Ry. & Electric Company (pref.)	83	82¾
West End Street Railway, Boston (com.)	69	69¼
West End Street Railway, Boston (pref.)	85	87
Westinghouse Elec. & Mfg. Company	78¼	78¾
Westinghouse Elec. & Mfg. Co. (1st pref.)	122	122

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* Last sale. a Asked.

ANNUAL REPORTS

Philadelphia Rapid Transit Company

The comparative statement of income, profit and loss of the Philadelphia (Pa.) Rapid Transit Company for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Earnings:		
Gross passenger earnings	$23,356,877	$23,020,932
Receipts from other sources	898,936	906,247
Total	$24,255,813	$23,927,179
Expenses:		
Maintenance and renewals:		
Maintenance	$2,668,752	$2,495,513
Reserve fund for renewals	969,620	1,093,564
Total	$3,638,372	$3,589,077
Operation of power plants	1,557,965	1,454,122
Operation of cars	6,297,115	6,129,119
General	1,527,388	1,807,949
Taxes	1,278,406	1,225,488
Total expenses	$14,299,246	$14,205,755
Net earnings from operation	$9,956,567	$9,721,424
Fixed charges:		
Interest	$2,161,696	$1,728,223
Rentals	7,364,634	7,363,618
Sinking fund, city contract	120,000	120,000
Total	$9,646,331	$9,211,841
Surplus	$310,236	$509,583

The increase in gross earnings of the company for the past three years, which averages 4.05 per cent, approximates the normal increase of the system for the last ten years. In the opinion of the company this is the rate that will obtain in the future under normal conditions. The increase in gross earnings for the last year, ended June 30, 1914, was about $328,634 or 1.37 per cent, made up of a 1.46 per cent increase in gross passenger earnings and an 0.81 per cent decrease in receipts from other sources. The total operating expenses increased 0.65 per cent, the net earnings from operation 2.4 per cent, and the fixed charges 4.7 per cent. The resulting surplus was $310,236, as compared to $509,583 for the preceding year, but the surplus earned to June 30, 1914, is more than $800,000 in advance of that estimated for this period at the incoming of the Stotesbury management.

The proportions of earnings devoted to expenses and fixed charges were as follows: Maintenance, 11 per cent; renewals, 4 per cent; operation of power plants, 6.42 per cent; operation of cars, 25.96 per cent; general, 6.3 per cent; taxes, 5.27 per cent; interest, 8.92 per cent; rentals, 30.36 per cent, and sinking fund, 0.49 per cent. The principal items of capital expenditure during the three and one-half years ended June 30, 1914, were as follows: 1500 near-side cars and eighty elevated cars, $5,966,000; two concrete carhouses with capacity for 669 near-side cars and improvements to other carhouses $1,568,000; additional generating machinery, etc., $1,992,000; track additions, betterments and real estate, $1,774,000, and refunding of capital obligations and discounts, $2,068,000.

During the year $969,620 was appropriated to the renewal fund from income, this being the unexpended balance of 15 per cent of gross earnings charged to operation for maintenance and renewals. The policy of the company provides for paying 50 per cent of the total cost of the new near-side cars out of earnings through the medium of renewal reserve, 20 per cent for cash payments and 30 per cent for the retirement of car trust certificates. The car trust certificates retired and the cash payments made during the year amounted to $1,091,561. Besides this amount there was paid from the renewal fund $1,008,041 for renewals and replacements of cars, track, power plant equipment and buildings. The unexpended balance of the reserve for renewals as of June 30, 1914, amounted to $1,042,962. Against this there was held in the treasury for account of renewal fund $1,043,000 par value of the company's 5 per cent bonds of the $10,000,000 issue of 1912.

As of June 21, 1914, fire insurance policies were taken out for a term of three years providing protection to the extent of $23,000,000 at an annual rate of 25 cents per $100, representing an annual premium of $57,500. There has been an aggregate reduction of 25 cents per $100 in the rate of premium during the last three years. The report outlines briefly the changes that have taken place under the Stotesbury management since June 5, 1911, full details of which were published in the ELECTRIC RAILWAY JOURNAL of July 18, page 122. The maximum wage of motormen and conductors during the past two years has been increased from 23 cents to 30 cents per hour, and more than 47 per cent of the men are receiving the maximum wage.

The building up of the property is thought to be well toward accomplishment, but the producing of a return upon the $30,000,000 of capital stock actually paid in is temporarily subordinated to the rehabilitation of the property because of the payment of interest upon more than $14,000,000 of new capital investment. The report states, however, that the surplus earnings of the property as now rehabilitated should rapidly accumulate to the interest of the stockholders, excepting only as the earning power of the company and its ability to secure new capital may be affected by the plans of the city for rapid transit development.

In conclusion the report touches briefly on the proposed subway and elevated lines to be built by the city and operated by the company. It is stated that the suggested agreement has been submitted to the Philadelphia Rapid Transit Company and the Union Traction Company, but that neither these companies nor the city has yet taken any action.

Third Avenue Railway

According to the preliminary report of the Third Avenue Railway, New York, for the twelve months ended June 30, the earnings for the period were as follows:

	1914	1913
Gross income	$10,858,455	$10,117,847
Net after taxes	3,131,978	3,042,015
Other income	79,103	70,170
Total income	3,211,081	3,112,185
*Charges	2,569,842	2,195,227
Net income	†641,239	916,958

*Includes interest on adjustment mortgage bonds.

†Equal to 3.86 per cent earned on $16,590,000 of common stock compared with 5.25 per cent earned on same stock for previous year.

In earning 3.8 per cent upon the $16,590,000 of stock, as noted in the statement above, the company added $641,239 to surplus account, as compared to $916,958 the year previous. In 1913-1914, however, the full 5 per cent was paid on the $22,536,000 of adjustment income bonds, whereas in the year ended June 30, 1913, only 3¾ per cent was paid—1¼ per cent for the first six months and the full 2½ per cent in the second half of the year. If the full amount had been paid for the entire year, the final surplus would have been about equal to the surplus shown this year.

The increase in gross earnings for 1913-1914 was $740,607, or 7.3 per cent over the year previous. Increased expenses took up all but $100,000 of the gross revenue gain, a large part of the heavier outlay being caused by storm damage and heavy paving bills. On this point F. W. Whitridge, president of the company, has issued the following statement:

"The increased expenses can be explained by the unprecedentedly unpropitious weather during practically the whole of the six months and by the very large expenditures for paving, in part caused by the storms. The obligations of the street railways in respect to paving have become, with the entire change of the character and volume of the city traffic trespassing upon the rails, very onerous, and the burden is increased by the manner of the city's administration of the streets. Every pound of coal burned on upper Amsterdam Avenue goes up on the Third Avenue tracks. After and during the snow storm last winter the omnibuses of the Fifth Avenue Company occupied portions of our tracks for thirty days without permit, apology or payment. Some months ago in one single case seventy-nine ton girders were hauled over our tracks in Forty-second Street, smashing over $1,000 worth of manholes and rails. This is all unnecessary and against the interests of the traveling public."

Continuing, Mr. Whitridge states that the company has recently purchased the City Island line for $40,000, which can be completed so as to serve that section to the satisfaction of the citizens at an additional outlay of about $25,000. The board of directors has recently authorized the construction of a printing plant for the printing of transfers, which will save not less than $25,000 a year.

The complete annual report will be prepared after an audit in time for the annual meeting in the autumn.

Augusta-Aiken Railway & Electric Corporation

The annual report of the Augusta-Aiken Railway & Electric Corporation of South Carolina for the calendar year 1913 shows the following income profit and loss items: Gross earnings from all sources, $725,073; operating expenses, including taxes, $403,084; net earnings from operation, $321,989; prior deductions for interest and sinking fund, $55,000; current interest on bonds and floating debt, $150,170; gross surplus, $116,819; dividends, $90,000; net surplus, $26,819.

As compared with 1912, the gross earnings showed an increase of $62,482, or 9.4 per cent; the operating expenses and taxes increased $33,646, or 9.1 per cent; the net earnings increased $28,836, or 9.8 per cent, while the surplus was greater by $16,877, or 16.9 per cent. The gross electric earnings increased $46,299, or 18.9 per cent, with an increase in expenses of $22,051, or 23.4 per cent. The gross railroad earnings increased $18,862, or 5.4 per cent, while the expenses increased $8,192, or 4.2 per cent. The gross earnings from other departments decreased $2,679, or 4 per cent, and the expenses increased $2,157, or 5.9 per cent. The report states that expenses were higher in 1913 owing to an increase in the wages of employees in the transportation department, the conducting of an active new business campaign in the lighting department and the generation of a much larger output of current to take care of new customers, necessitating the use of the steam plant for a greater part of the time, the available water supply from the city canal having been used to capacity.

In addition to the usual maintenance expenses, $94,321 was expended for construction work. More than half of this was for connecting and serving new customers in the electric department; $11,873 for an addition to the switchboard to control the apparatus of both city plants, and more than $10,000 for track work, new waiting stations on the interurban line and shop tools for the railway department.

Further Details of Columbus Refunding Plan

Stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, will hold an adjourned meeting on July 29 to complete the proposed financing plans of the company, referred to in the ELECTRIC RAILWAY JOURNAL of June 6 and July 4. At this meeting the stockholders will vote on the capital stock increase from $11,550,000 to $15,145,000, which is to include an issue of $3,145,000, to be exchanged for the first consolidated mortgage 4 per cent bonds of the Columbus Railway Company, and an issue of $450,000 of 6 per cent Series "A" preferred stock, to be exchanged for the 6 per cent mortgage bonds of the Columbus Electric Company.

In addition to these securities the company proposes to issue approximately $5,000,000 of bonds to exchange for the outstanding bonds of the old companies. It is probable that at the same time the company will ask permission to issue $400,000 to $500,000 of bonds for financing extensions and improvements to properties. These will be a part of the $25,000,000 bonds authorized by resolution of the stockholders on June 29, as noted in the ELECTRIC RAILWAY JOURNAL of July 4.

American Water Works & Electric Company, Pittsburgh, Pa.—In a circular issued to stockholders of the American Water Works & Electric Company, H. Hobart Porter, president, says that earnings accruing from the water properties, together with interest on cash and securities in the treasury, will be more than sufficient to cover bond interest and first preferred dividends, even without income from the West Penn Traction & Water Power stocks owned by the company. It has been decided to close the fiscal year June 30, and quarterly dividends of 1¾ per cent on the first preferred stock will be paid every three months, beginning with Oct. 1. The dividend due Oct. 1, 1914, will be for the period from April 27, 1914, the date on which the present company took over the assets of the American Water Works & Guarantee Company.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—Subject to the usual advertised legal notice of thirty days, the resale of the Chicago & Milwaukee Electric Railroad is soon to be announced. It is expected that the reorganization committee will bid in the property and proceed immediately with a plan providing for exchange of the securities of the two existing companies for those in a new company. This company is to have $6,000,000 of capital stock, first mortgage bonds not to exceed $10,000,000, second mortgage non-cumulative 4 per cent income bonds not to exceed $4,500,000, and third mortgage non-cumulative 4 per cent income bonds not to exceed $6,000,000. For the $4,000,000 of Illinois company 5's outstanding there shall be given 100 per cent in second mortgage bonds; and for the $10,000,000 of Wisconsin 5's now outstanding, 50 per cent in third mortgage bonds. For the $5,000,000 of stock of the old company, 50 per cent in stock is to be offered. An amount not exceeding $4,500,000 of first mortgage bonds is to be used for receivers' obligations and the payment of underlying bonds of $1,080,000 on the Illinois division. The balance will be used for corporate purposes.

Columbus, Marion & Bucyrus Railway, Marion, Ohio.—James H. Caldwell, chairman of the bondholders committee which bought the Columbus, Marion & Bucyrus Railway at foreclosure sale in May, 1913, has turned over the property to a new company, of which George H. Whysall is president and general manager.

Hudson & Manhattan Railroad, New York, N. Y.—The Public Utility Commission of New Jersey recently approved the application of the Hudson & Manhattan Railroad to issue $154,000 of first refunding mortgage 5's of 1913. This amount makes a total of $36,716,633 outstanding.

London & Lake Erie Railway & Transportation Company, London, Ont.—A special general meeting of the London & Lake Erie Railway & Transportation Company has been called for Aug. 18 for the purpose of authorizing a bond issue of $30,000. The proceeds are to be used for retiring existing bonds and for other purposes of the railway.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—The Chicago-Great Western Railroad has leased for fifty years to the Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company the portion of its line extending from Mankato, Minn., to Randolph, Minn., a distance of 57 miles.

The Newell Street Railway, East Liverpool, Ohio.—The Public Utilities Commission of Ohio has authorized The Newell Street Railway, an Ohio corporation, to increase from $17,510 to $35,000 the amount upon which interest is to be paid under the lease made between it and the Newell Street Railway, a West Virginia corporation, under the terms of which the latter company operates over the tracks of The Newell Street Railway in East Liverpool, Ohio. The authorization of this lease were noted by the ELECTRIC RAILWAY JOURNAL of Nov. 8, 1913.

North American Company, New York, N. Y.—Festus J. Wade, St. Louis, Mo., has been elected a director of the North American Company to succeed the late James Campbell. No action has been taken on the election of a successor to Mr. Campbell as chairman of the board of directors.

Ohio Traction Company, Cincinnati, Ohio.—Judge Sater in the United States District Court at Columbus on July 9 held invalid the ordinance recently passed by the Cincinnati City Council providing for a 5-cent fare from Cincinnati to Carthage and Hartwell, instead of the present 10-cent rate. An injunction is granted against the enforcement of the ordinance. The court states that all franchises under which the Mill Creek Valley line is being operated between Fifth and Walnut Streets and the north corporation line of Cincinnati are valid and have not yet expired and that the enforcement of the ordinance would impair the property rights of the Ohio Traction Company. Judge Sater's opinion decided every question raised in the case in favor of the traction company. He states that there is no reason why franchises granted to street railways should not be perpetual any more than in the case of steam railroads.

Pacific Gas & Electric Company, San Francisco, Cal.—According to a preliminary tabulation, subscriptions have been received from 1330 employees of the Pacific Gas & Electric Company for $453,400 of the new first preferred stock. It was expected that $500,000 would be subscribed by them. The subscribing employees constitute nearly 40 per cent of the staff of the company, this percentage, according to the belief of the company, being greater than in any other public service corporation. The plan of financing and reclassification of stock of this company was described in the ELECTRIC RAILWAY JOURNAL of June 13.

Piedmont & Northern Railway, Charlotte, S. C.—The Greenville, Spartanburg & Anderson Railway, Greenville, S. C., and the Piedmont Traction Company, Charlotte, N. C., have been consolidated under the title of the Piedmont & Northern Railway. The new corporation has filed a mortgage to secure an authorized issue of $50,000,000 of forty-year first 5 per cent bonds with the Farmers' Loan & Trust Company, New York, as trustee. As a result of the merger, C. V. Palmer, general freight and passenger agent, will be moved to Greenville, S. C., and C. S. Allen, Jr., will be traffic agent with headquarters in the same city. T. L. Black will remain in Charlotte, S. C., as auditor, all the other officers of the system reporting to this city as the head office.

Southern Pacific Company, San Francisco, Cal.—The New York Stock Exchange has authorized the listing of $54,534,000 of 5 per cent twenty-year convertible bonds of the Southern Pacific Company, due 1934 on notice of issuance in exchange for subscription receipts outstanding.

Stockton Terminal & Eastern Railroad, Stockton, Cal.—The Stockton Terminal & Eastern Railroad recently filed an application with the California Railroad Commission asking for authority to issue a note for the sum of $1,000 to renew a note of like amount of the San Joaquin Valley Bank of Stockton. This note is to be secured by bonds of the company to the par value of $2,000.

The Hagerstown & Frederick Railway, Frederick, Md.—Nelson Cook & Company, Baltimore, Md., are offering for sale at 98½ and interest, to net 6.1 per cent, refunding 6 per cent thirty-year sinking gold bonds of the Hagerstown & Frederick Railway. These bonds are dated April 1, 1914, and are in denominations of $100, $500 and $1,000. They are an absolute first mortgage on the properties of the Frederick & Hagerstown Power Company and the Frederick Railroad, and a mortgage upon all other properties of the company subject to only $1,050,000 of prior lien bonds on constituent companies, against which a like amount of Hagerstown & Frederick Railway first and refunding 6's have been reserved. The property consists of a series of street railways in Hagerstown, Md., street railways in Frederick, Md., an interurban railway extending from Frederick to Hagerstown with extensions to Thermont, Md., and Shady Grove, Pa., with branch lines to Bloomsboro, Md., and Jefferson, Md.

Third Avenue Railway, New York, N. Y.—The Third Avenue Railway has declared a semi-annual interest payment of 2½ per cent on its $22,536,000 of adjustment income bonds for the first six months of 1914. This, with the 2½ per cent paid on April 1, 1914, makes a payment of 5 per cent on the earnings for the fiscal year ended June 30, 1914. The interest payment for the year previous totalled 3¾ per cent.

Toronto (Ont.) Railway.—The traffic receipts of the Toronto Railway for the six months ended June 30 were $3,035,301, as compared to $2,893,843 for the same period in 1913, or an increase of 4.89 per cent. If this rate of increase is maintained for the whole year, the 1914 earnings will approximate $6,344,816. The report submitted by Messrs. Arnold and Moyes in connection with the proposed purchase deal estimated this year's revenue at $6,592,140.

Union Consolidated Elevated Railway, Chicago, Ill.—In the Circuit Court on July 7 Judge Windes held that State Attorney Hoyne should be prevented from proceeding against the Union Consolidated Elevated Railway on the ground of overcapitalization. The court said that if there was any basis for the suit it should have been brought years ago and that by inaction the people had ratified the company's acts.

United Power & Transportation Company, Camden, N. J.—A semi-annual dividend of $1.40 per $25 share has been declared on the $3,592,750 of stock of the United Power & Transportation Company, payable to the holders of record July 16. This payment compares with $1.52 paid on Jan. 1.

United Railways & Electric Company, Baltimore, Md.—Nelson Cook & Company, Baltimore, Md., are offering for sale at 99⅞ and interest, to yield 5.1 per cent, collateral trust 5 per cent convertible gold bonds of the United Railways & Electric Company, dated June 1, 1914, and due June 1, 1916. These notes are convertible into stock at $50 per share and are secured by deposit with the trustee of $1,333,000 of first consolidated mortgage 4's.

Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.—The foreclosure sale of the Warren, Brookfield & Spencer Street Railway, which was originally set for June 4 and postponed until June 16, has been further put over until Aug. 6.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Bangor (Maine) Railway & Electric Company, quarterly (No. 2), 1½ per cent, common.

Brazilian Traction, Light & Power Company, Toronto, Can., quarterly, 1½ per cent, common.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly (No. 2), 1¼ per cent, common; quarterly (No. 2), 1¼ per cent, preferred, Series B.

Cumberland County Power & Light Company, Portland, Me., quarterly, 1½ per cent, preferred.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, 1¼ per cent, preferred.

Railways Company General, New York, N. Y., quarterly, 1 per cent.

United Power & Transportation Company, Camden, N. J., $1.40.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AMERICAN RAILWAYS COMPANY, PHILADELPHIA, PA.					
1m., Jun., '14	$466,969	......	......	......	......
1 " " '13	451,130	......	......	......	......
11 " " '14	5,547,292	......	......	......	......
11 " " '13	5,149,435	......	......	......	......
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, WILLOUGHBY, OHIO					
1m., May, '14	$37,864	*$19,771	$18,093	$11,069	$7,024
1 " " '13	37,245	*20,559	16,686	10,421	6,265
5 " " '14	153,697	*86,269	67,428	54,858	12,570
5 " " '13	147,551	*84,864	62,687	52,149	10,538
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., May, '14	$120,742	*$76,599	$44,143	$35,322	$8,821
1 " " '13	118,179	*73,966	44,214	35,079	9,135
5 " " '14	530,903	*354,944	175,960	176,251	†291
5 " " '13	504,346	*334,229	170,117	174,971	†4,854
MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.					
1m., May, '14	$91,430	$33,245	$58,185	$25,528	$32,657
1 " " '13	79,473	26,771	52,702	24,112	28,590
5 " " '14	403,859	151,656	252,204	127,411	124,793
5 " " '13	363,329	124,241	239,088	120,533	118,555
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., May, '14	$323,037	*$191,808	$131,228	$50,660	$80,568
1 " " '13	279,993	*167,697	112,295	45,214	67,081
5 " " '14	1,403,921	*860,110	543,810	250,815	292,995
5 " " '13	1,205,719	*750,103	455,617	225,510	230,107
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1m., Apr., '14	$171,412	*$97,861	$73,551	$29,354	$44,197
1 " " '13	164,684	*91,341	73,342	24,551	48,791
12 " " '14	2,159,227	*1,207,272	951,955	292,731	659,224
12 " " '13	1,939,862	*1,028,051	911,811	281,683	630,128
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.					
1m., May, '14	$24,552	*$15,571	$8,949	$7,761	$1,218
1 " " '13	25,645	*17,907	7,738	7,425	313
12 " " '14	307,164	*195,690	111,474	91,636	19,838
12 " " '13	285,260	*188,837	96,423	87,569	8,854
PENSACOLA (FLA.) ELECTRIC COMPANY					
1m., May, '14	$22,746	*$14,393	$8,353	$7,173	$1,180
1 " " '13	22,770	*15,635	7,135	6,477	658
12 " " '14	285,349	*178,831	106,519	85,175	21,344
12 " " '13	285,728	*179,252	106,477	76,526	29,951
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.					
1m., May, '14	$706,471	*$431,041	$275,430	$175,324	$100,106
1 " " '13	715,073	*411,192	303,881	171,713	132,168
12 " " '14	8,717,662	*5,048,225	3,669,437	2,091,916	1,577,521
12 " " '13	8,354,255	*4,885,798	3,468,458	2,018,238	1,450,220

*Includes taxes.
†Deficit.

Traffic and Transportation

Service Hearings Ended in Albany

Hearings before the Public Service Commission for the Second District of New York on the complaints against the service of the United Traction Company, Albany, N. Y., were closed on July 21 with the submission of expert testimony for the company. Previous hearings were described in the ELECTRIC RAILWAY JOURNAL of July 18. Charles Remelius, the well-known mechanical expert, and W. E. Rockwell, manager Eastern Pennsylvania Railways, Pottsville, Pa., declared that the service of the United Traction Company, both as to equipment and number of seats run, was one of the best they had ever seen.

Both experts warmly defended the use of single-truck cars. Mr. Remelius stated that he had designed and supervised the erection of the double-truck cars now in use on the Pine Hills line, but he was of the opinion that single-truck cars were capable of better service in a city such as Albany. The single-truck cars now in use there he pronounced to be in a "fair average physical condition." The braking system he called "perfectly safe" and he considered that the addition of any auxiliary system would be inadvisable.

Speaking of the experience of other cities in the use of single-truck cars, Mr. Remelius declared that the manufacturing company with which he was connected last year had built no less than seventy cars of that type, twenty of which were sold to the railway in Covington, Ky., and fifty to Detroit, where they are now in satisfactory use. "The Third Avenue line in New York City," continued Mr. Remelius, "uses many single-truck cars with good effect, and on Staten Island they are used exclusively. There are some in Syracuse, Binghamton, Utica and in many cities in the West. Fifty per cent of the cars in Cincinnati are of the single-truck type."

Mr. Remelius pronounced all of the track of the company to be in excellent condition, with the exception of small stretches in South Pearl Street and South Broadway, which he understood would be improved as soon as adjacent paving projects were got under way by the city. He stated that the United Traction Company furnishes more seats per passenger than any other road within his experience, and the passenger counts show that the service is much better than that afforded in most cities.

Mr. Rockwell's testimony brought out the fact that all the single-truck cars in Albany are equipped with a double-braking system, a very usual completeness of equipment. He declared that no addition to the braking system was at the present time advisable. The 18-ft., 20-ft. and 21-ft. cars operated by the United Traction Company are the standard of single-truck equipment throughout the country, and if Mr. Rockwell were operating the United Traction Company he would put in single-truck cars on all the city lines.

Mr. Rockwell said that the snow-fighting equipment of the company was equal to that of any other road in its latitude, and better than that of any road in the State except that of the Syracuse, Lake Shore & Northern Railroad, through the snowy territory north of Syracuse. In regard to service, he said that he had made a personal inspection during the rush hours and that at no time did he see more than five passengers standing in a car.

C. R. Barnes, electrical engineer of the commission, whose recommendations regarding service were published in the ELECTRIC RAILWAY JOURNAL of June 27, page 1478, testified that he was not objecting to the average of seats furnished by the company during the rush hours. He insisted, however, that there were certain periods during the rush hours when more seats should be furnished.

J. H. Uffert, master mechanic of the company, stated that with the reconstruction proposed for the 400 type cars now in use these cars would compare favorably for comfort, convenience and service with the most modern of the Pine Hill cars. The reconstructed cars should last another ten years and would not need to be renewed during that time. Asked what changes the company contemplated for the coming winter, Mr. Uffert said that all the cars would be put through the shops and the front entrances changed. The new power line would also be available and the erection of the new transformer station would be rushed.

Safety Work in Seattle

George Carson, general claim agent of the Puget Sound Traction, Light & Power Company, recently compiled an interesting history of the development of safety work in connection with this company. According to Mr. Carson, the first safety work was undertaken by Stone & Webster in 1908 when the firm began a campaign of publicity in the daily press of all cities where their properties were located, publishing cuts illustrating various types of accidents. Soon after this officials of the Puget Sound Traction, Light & Power Company and the trainmen began to hold occasional meetings, but it was not until June 21, 1910, that an active organization was formed. At a meeting held on this date, J. H. Wilmot, then chief clerk of the claim department, submitted figures showing that 10 per cent of the gross railway receipts was being spent for accidents. For the month of May, 1910, there were 450 reported accidents. The cost of this number of accidents, together with the expenses of operation for the claim department, brought the total expense for the month up to $26,620. Owing to activity in safety work, however, the present average expense of the claim department and the cost of accidents have been cut to one-half that amount.

In the autumn of 1910 lectures were begun in public and private schools, clubs and universities. The result of this was as follows: Between July 1, 1909, and July 1, 1910, there were 157 accidents in which boys and girls were involved, about thirteen a month. Between Sept. 1, 1910, and May 1, 1911, there were thirty-three accidents to boys and girls. In other words, the accidents of that character averaged during the school year of 1910, when the lectures were begun, and the spring of 1911 approximately four a month, or nine less a month than occurred during the previous period.

Early in 1911 a circular letter was sent to all vehicle owners throughout the city, asking their co-operation, cards illustrating accidents were placed in all barns and garages, and 100,000 desk blotters were distributed in offices and mailed with bills to the company's customers. Large safety pennants were placed in shops and other buildings. In January, 1912, safety committees were organized, and following closely on this the carhouse bogie system was adopted. In the summer of 1912 the transportation department adopted the near-side stop. By the autumn of 1912 all the cars of the company except cable cars were equipped with folding or sliding gates at both ends. Recently the company decided to complete this work by installing the same devices on the cable cars. In August, 1912, a subcommittee of the central safety committee was appointed to take up the matter of carhouse meetings.

In the spring of 1913 a follow-up circular was sent to vehicle owners, and other more elaborate posters illustrating accidents were placed on the premises of vehicle owners throughout the city. The safety committee was reorganized in September, 1913, three divisions of the light and power department being added. In the winter of 1913 stereopticon views were introduced in connection with the carhouse conferences.

The latest move has been the printing and distribution among school children of 50,000 safety guide pamphlets with proper words of warning against accidents. Mr. Carson concludes that with continued co-operation on the part of employees of all departments the outlook for the future in Seattle is highly encouraging, in view of the success of these past endeavors.

Single Fare Petition Dismissed in Massachusetts.—The Public Service Commission of Massachusetts on July 17 dismissed the petition of the selectmen of Watertown relative to the establishment of a single fare on the Boston Elevated Railway and the Middlesex & Boston Street Railway between points in Watertown and Boston.

Accident on Virginia Interurban Line.—Six persons were killed and twenty-two injured as a result of a collision on July 17 between an electric interurban train of the Virginia Railway & Power Company and a coal train of the Virginia Railroad at Fairmont, eight miles from Norfolk. The accident occurred at a grade crossing of the railroad. Two of the three electric cars in the interurban train were completely wrecked.

New Rate Schedule Held Up in Seattle.—Assistant Corporation Counsel R. S. Pierce has been advised by the Public Service Commission that the new schedule of rates will not be put into effect by the Seattle, Renton & Southern Railway, Seattle, Wash., until the city has had opportunity to argue its objection to the proposed 10-cent fare to the south city limits at Ryan Street. The new rates were to have gone into effect on July 10.

Freight Service in Seattle.—The opening of freight service on the Highland Park & Lake Burien line of the Seattle Municipal Railway, known as Division "C," was forecast recently by the introduction of ordinances in the city council appropriating money to build a carhouse and to purchase or construct freight equipment. The proposed legislation is in the hands of the finance and public utilities committee of the City Council, where all the details will be worked out.

Bonus to Employees of Capital Traction Company.—The Capital Traction Company, Washington, D. C., on July 9 distributed to its conductors and motormen $21,680 in bonuses for faithful service during the last year. Employees who had been in the service ten years received $100 each; five years, $75; two years, $50, and one year, $25. The awards were in all cases passed upon by a board consisting of the president, general manager and the division superintendents.

Limited Speed Near Schools and Churches.—As a means of lessening the danger of children being run down by street cars, the City Council of Aurora, Ill., has proposed an ordinance prohibiting the running of cars faster than five miles an hour within a zone extending 250 ft. in every direction from all schools and churches. The ordinance was prepared by City Attorney J. Bruce Amell. The ordinance also provides that posts be erected at the edge of each "speed zone" as warning signs. The new regulation also includes automobiles and other vehicles.

Increase of Municipal Fares in Saskatoon.—The City Council of Saskatoon, Sask., recently passed a resolution increasing the fares of the municipally owned electric railway to a straight 5-cent fare. As heretofore, workmen's tickets are sold eight for 25 cents, for use between 6 a. m. and 8 a. m., and school children are carried at half fare to and from school. The six-for-25-cents tickets outstanding will be honored. The reason for the change was the deficit of $14,000 in operating the cars, which the commissioners expect will be wiped out by the increased receipts.

Stools for Motormen on Platform.—According to a recent order promulgated by the Quincy (Ill.) Railway, the motormen are to be allowed to sit down on stools furnished by themselves. Stools must be uniform in design, material and appearance and must be kept in the lockers in the employees' headquarters. The instructions provide that the motormen must stand up as cars approach and pass over electric railway or steam railroad crossings, or while the cars are passing through business districts or congested sections of the city, under penalty of a revocation of the privilege. The new order went into effect on July 15.

Switching Facilities between Electric and Steam Lines.—The Illinois Public Utilities Commission has filed an order in the case of the Illinois Traction System vs. the Illinois Central Railroad directing the latter company to furnish switching facilities in full to the electric railway. The Illinois Central Railroad asserted that inasmuch as it exchanged no business with the Illinois Traction System or other electric lines in the State, it should not be compelled to furnish switching facilities. The order of the commission, however, recognizes at least the possibility of traffic exchange between the electric and steam transportation systems.

Passing of the Cable Car in Providence.—Superintendent of Transportation R. R. Anderson of the Union Railroad, Providence, R. I., has announced that the last remnant of the old Providence (R. I.) Cable Tramway will disappear between Aug. 1 and Aug. 15, when the College Hill tunnel is opened for traffic. This is one of the last of the counterweight systems in use in this country. Together with the grip car the company will dispose of most of the 149 short trailers now in service. A few, however, will be reserved with the consent of the city for use during rush hours. The counterweight system was originally installed by Milton H. Bronsden, who also installed one at Duluth and one at St. Paul, both of which have been discontinued.

Workmen's Tickets Ordered on Berkshire Street Railway.—The Massachusetts Public Service Commission has ordered the Berkshire Street Railway to place on sale workmen's tickets between Berkshire Village and Pittsfield at the rate of seven tickets for 50 cents. The board found that while the financial condition of the company does not warrant an order reducing the present revenue, this fact does not warrant discrimination in the rates charged. It appeared from the evidence that the present fare from North Adams to Sand Springs in Williamstown and to Williamstown Village, a distance of about 6 miles in each case, and between North Adams and the Brown paper plant in Adams, about 6 miles, is 5 cents. The length of these rides corresponds closely to the distance between Berkshire Village and Pittsfield. The board stipulates that the tickets ordered on sale shall be valid only between the hours of 5 and 7, both a. m. and p. m.

Sunday Service Increased in Brooklyn.—Changes in the Sunday and holiday schedules of the elevated lines of the Brooklyn Rapid Transit Company involving an increase of about 15 per cent in the service are being tried out by that company. This is the result of an agreement reached between Joseph Johnson, chief of the transit bureau of the Public Service Commission for the First District of New York, and John J. Dempsey, superintendent of the Brooklyn Rapid Transit Company elevated lines. The chief changes are the running of the Brighton Beach expresses in the afternoon on a six-minute headway, Franklin Avenue expresses on a 7½-minute headway, and the West End line expresses on a six-minute headway in the afternoon and between 7 p. m. and 9 p. m. Slight changes were also made on the Culver, Myrtle Avenue, Lexington Avenue and Fulton Street lines. A hearing before the commission set for July 16 was postponed for two weeks pending a trial of the increased service.

Application to Eliminate Reduced Round-Trip Fares.—The Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has made application to the Public Service Commission of Indiana for authority to eliminate the reduction on the sale of round-trip tickets over its lines. The petition shows that in Indiana it is unlawful for any public utility to demand, collect or receive a greater compensation for any service than the charge fixed by statute on the lowest schedule of rates for the same service on Jan. 1, 1913. It is stated that the rates provided by the present tariff are not sufficiently remunerative to enable the petitioner to furnish a good and adequate service to its patrons, maintain its property, provide for a reasonable depreciation charge and pay a fair return on the investment. The petition also states that the steam railroad in direct competition with the petitioner does not make any reduction on round-trip tickets sold over its line, and that not many interurban lines in the State make such a reduction. No date has yet been fixed by the Public Service Commission for a hearing.

Investigation of Coney Island Traffic Interruption.—An investigation that has been made of the traffic interruption on July 7 on the Coney Island lines of the Brooklyn Rapid Transit Company, noted in the ELECTRIC RAILWAY JOURNAL of July 18, discloses the fact that the interruption was caused by the failure of high-tension cables supplying the Coney Island and Parkville substations. In his report to the Public Service Commission, Clifton W. Wilder, electrical engineer, states that the exact cause of this burn-out is beyond determination. During the reconstruction of the burned-out machine in the Coney Island substation, the company has placed the Kings Highway substation of the Coney Island & Brooklyn Railroad in operation, and will keep it in condition for immediate service in case of need. The plans for the reconstruction of the existing railroads under the dual transit plan provide for a second set of feeders from the main power station to the Parkville and the New Utrecht substations. These feeders are to be installed in the new Fourth Avenue subway, thereby giving two entirely independent feeder lines for all substations in this vicinity.

Personal Mention

Mr. Edward Wright has been appointed to succeed Mr. G. W. Chynoweth as master mechanic of the Fort Smith Light & Traction Company, Fort Smith, Ark.

Mr. H. B. Smith has been appointed master mechanic of the Grand Junction & Grand River Valley Railway, Grand Junction, Col., to succeed Mr. J. N. Hinds.

Mr. C. Stackhouse has been appointed chief engineer and electrician of the California Street Cable Railroad, San Francisco, Cal., to succeed Mr. A. D. McLean.

Mr. A. R. Hughes has been appointed assistant treasurer of the Republic Railway & Light Company, Youngstown, Ohio, to succeed Mr. W. H. Shubert, resigned.

Mr. W. H. Carnahan, who has been assistant treasurer of the Quincy (Ill.) Railway, has been elected treasurer of the company, to succeed Mr. Edward Woodman.

Mr. C. L. Humphries has been appointed trainmaster of the San Francisco, Napa & Calistoga Railway, Napa, Cal., to succeed Mr. W. J. Davis, acting trainmaster.

Mr. G. Y. Gaillard, who has been general passenger and express agent of the Connecticut Company, New Haven, Conn., has had his title changed to traffic agent.

Mr. O. C. Manly has been appointed general freight and passenger agent of the Ohio & Southern Traction Company, Columbus, Ohio, to succeed Mr. H. H. Falkenbach.

Mr. Ralph R. Wright has been elected secretary and treasurer of the Grand Junction & Grand River Valley Railway, Grand Junction, Col., to succeed Mr. Orson Adams.

Mr. W. H. Edmunds, who has been general foreman of the Denver & Interurban Railroad, Denver, Col., has had his title changed to electrical engineer and trainmaster.

Mr. John Stacy has been appointed roadmaster of the St. Lawrence International Electric Railroad & Land Company, Alexandria Bay, N. Y., to succeed Mr. F. Youngs.

Mr. W. B. Gregory has been appointed engineer of the power station of the Connecticut Company at Berlin, Conn., on the Middletown branch to succeed Mr. S. Sargeant.

Mr. Charles H. Chapman, who has been superintendent of the lines of the Connecticut Company at Bridgeport, Conn., has had his title changed to manager of those lines.

Mr. Charles E. Davies, who has been purchasing agent of the Trenton & Mercer County Traction Corporation, Trenton, N. J., has been appointed claim agent of the company.

Mr. G. S. Brown, formerly storekeeper of the Rockford & Interurban Railway, Rockford, Ill., has been appointed assistant purchasing agent to succeed Mr. C. A. Ingle, resigned.

Mr. Charles Hoopes, who has been secretary of the Oklahoma Railway, Oklahoma City, Okla., has in addition been appointed auditor of the company to succeed Mr. W. R. Frederick.

Mr. Guy W. Fellar, who has been secretary, treasurer and superintendent of the Amarillo (Tex.) Street Railway, has been appointed second vice-president and purchasing agent of the company.

Mr. William B. McKinley, president of the Illinois Traction System, Peoria, Ill., has filed his formal petition with the Illinois Secretary of State as Republican candidate for congressman from the nineteenth Illinois congressional district.

Mr. S. B. Irelan was recently appointed vice-president and general manager of the Bartlesville (Okla.) Interurban Railway, to succeed Mr. L. G. Coleman. Mr. Irelan was formerly connected for six years with H. L. Doherty & Company in their New York office.

Mr. H. S. Gable has been appointed general freight agent of the Philadelphia & Westchester Traction Company, Upper Darby, Pa. Mr. Gable was formerly connected with the Philadelphia (Pa.) Rapid Transit Company for twelve years, serving in the transportation and receiving departments.

Mr. B. G. Campbell has been appointed assistant to A. D. Mackie, general manager of the Springfield (Ill.) Utilities Company. Mr. Campbell was recently with the Jackson

Gas Company, Jackson, Mich., and was for seven years manager of the Jackson properties of Hodenpyle, Hardy & Company.

Mr. Leonard Wheeler, who has been appointed master mechanic of the Manhattan Bridge Three Cent Line, Brooklyn, was formerly electrical engineer of the Chicago, Harvard & Geneva Lake Railroad. He was also manager of the Ruskin Park Interurban Railroad in Florida, and later foreman of construction of the electric railway of St. Petersburg, Fla.

Mr. Judson Zimmer, who has been acting master mechanic of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., has been appointed master mechanic of the company. Mr. Zimmer was graduated from Union College, Schenectady, N. Y. He entered the service of the Fonda, Johnstown & Gloversville Railroad as assistant engineer, maintenance of way department, several years ago.

Mr. E. F. Stone, superintendent of the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., was recently elected president of the Manufacturers' Bureau of that city, which has adopted "Home Goods for Home Folks" as its slogan. The Rocky Mountain *News* of Denver recently devoted several columns to the work of Pueblo's Manufacturers' Bureau, asserting that $50,000,000 is the annual output of Pueblo factories due to aggression of business men backed by the hard working committees of the Commerce Club. Photographs of Mr. Stone and several of Pueblo's industries illustrated the article.

Mr. W. W. Holden has been appointed superintendent of transportation of the San Antonio (Tex.) Traction Company to succeed Mr. T. C. Brown. Mr. Holden took the Westinghouse Electric & Manufacturing Company apprentice course at Pittsburgh between July, 1910, and November, 1912. He spent 1913 as electrical engineer and assistant superintendent of construction for the Southern Engineering & Construction Company, which built the Southern Traction Company out of Dallas, Tex. Prior to his recent appointment Mr. Holden spent two months in Denver and Minneapolis, and also served as a trainman with the San Antonio Traction Company for two months.

Mr. J. W. Coltman, auditor and purchasing agent of the Ashtabula Rapid Transit Company and the Pennsylvania & Ohio Railway, Ashtabula, Ohio, entered railway work in October, 1903, as depot agent of the Big Four Railroad at Shelby, Ohio. After serving for three years in that capacity he was appointed station agent of the company at North Eaton, Ohio, and four years later was made general agent of the Big Four Railway and the Lake Shore & Michigan Southern Railway at Berea, Ohio. In June, 1913, he was transferred to the East 105th Street Station, Cleveland, as assistant ticket agent of the Lake Shore & Michigan Southern Railway. He resigned from the last mentioned position to enter electric railway work.

Mr. H. L. Case, Jr., who has been appointed purchasing agent of the Trenton & Mercer County Traction Corporation, Trenton, N. J., was formerly chief clerk of the company. Mr. Case entered business at the age of thirteen with the East Trenton Machine Works, Trenton. He next became connected with the United & Globe Rubber Manufacturing Company. After serving four years and a half with the last mentioned company he entered the employ of the Geiser Manufacturing Company. A year later he accepted a position with the Pennsylvania Railroad. He served with the company for six years as stenographer in the trainmaster's office of the Belvidere Division, chief clerk to the supervisor of the same division, assistant to the captain of police and at the Pavonia Shops.

Mr. J. S. Clark, who has been appointed auditor of the Northwestern Ohio Railway & Power Company, Toledo, Ohio, entered railway work in the office of the division freight agent of the Chicago, Milwaukee & St. Paul Railway at Winona, Minn. In 1889 he accepted the position of purchasing agent with the Cleveland Stone Company, Cleveland, Ohio, with which he remained for thirteen years. He next went to Toledo with the syndicate which built the Toledo & Western Railway and acted as purchasing agent, paymaster and claim agent during the construction period. After the completion of the road he served for four years as chief clerk to the general manager of the company. Mr. Clark was also auditor and assistant secretary of the Patrick Hirsch Company, which built and equipped the Toledo & Indiana Railway and partly built the Toledo, Ann Arbor & Detroit Railway.

Mr. John F. Meany, private secretary to Governor Walsh, has been appointed a member of the Massachusetts Public Service Commission. In announcing the appointment, Governor Walsh said that he considered Mr. Meany especially well qualified for the position in view of his intimate knowledge of pending railroad questions secured in his four years' service in the Legislature and also at conferences this year concerning the New York, New Haven & Hartford Railroad. Mr. Meany was born in North Scituate, R. I., in 1880, and was educated at the Boston University law school. In 1910 he was appointed special justice of the Second District Court of Southern Worcester County, and later in the same year he served in the Senate. In 1911 to 1913, inclusive, he was a member of the House, becoming the Democratic floor leader. As a member of the judiciary committee he was active in framing the workmen's compensation law of Massachusetts. He was also a member of the recess committee appointed in 1912 to consider the question of trolley development in western Massachusetts. He succeeds Mr. George W. Bishop, who recently resigned after eighteen years' service to become the head of the inspection department of the commission.

Mr. William R. Dunham, Jr., has been appointed engineer of the Connecticut Company, New Haven, Conn., to succeed Mr. E. C. Webster. Mr. Dunham was born in Providence, R. I. He entered the engineering department of the Union Railway, now the Rhode Island Company, in March, 1892, as a rodman and advanced through various positions to principal assistant in charge of civil engineering. He resigned from the Rhode Island Company in July, 1906, to become assistant in the engineering department of the Connecticut Company, formerly the Consolidated Railway, with headquarters at New Haven. On July 1, 1914, he was appointed engineer in charge of the department. Mr. Dunham designed and patented an attachment for street railway switches in 1902 which has since been quite generally adopted. He also worked out and put into operation a new system of transfers for the Rhode Island Company in 1902. Mr. Dunham has also succeeded Mr. Webster as engineer of the New York & Stamford Railway, Port Chester, N. Y., and as engineer of the Westchester Street Railroad, White Plains, N. Y. He is a member of the American Society of Civil Engineers, the Connecticut Society of Civil Engineers and the New England Street Railway Club, and an associate member of the American Electric Railway Association.

OBITUARY

Ernest L. Carr, treasurer of the United Electric Securities Company, Boston, died on July 14 at his home in Melrose, Mass.

Abner C. Goodell, for nineteen years president of the Naumkeag Street Railway, Salem, Mass., which was the predecessor of the Salem division of the Bay State Street Railway, died at his home in Salem on July 20 at the age of eighty-two. He was for many years secretary of the Peabody Academy of Science and was noted in New England as an historian and editor, besides being active in legal and genealogical circles.

William S. Loomis, president of the Holyoke (Mass.) Street Railway, died at Southwest Harbor, Maine, on July 10. Mr. Loomis was closely identified with the banking, business and transportation interests of Holyoke for many years. He was editor of the Holyoke *Transcript* from 1872 to 1888 and in the latter year became general manager of the local horse railway lines, which he gradually developed. At the time of his death he was also president of the Mt. Tom Railroad.

A. A. Anderson, a former president of the Central Electric Railway Association, died at Indianapolis on July 12. Mr. Anderson was formerly connected with the Indianapolis & Louisville Traction Company, Louisville, Ky., and also with the Indianapolis, Columbus & Southern Traction Company, Columbus, Ind., as general manager. Later he was connected with the Springfield (Ill.) Consolidated Railway as general manager, which position he gave up to become associated with the Middle West Utilities Company, Chicago, Ill.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Montecito Railway, Los Angeles, Cal.**—Incorporated in California to build an electric railway in Los Angeles to connect Griffin Avenue, Avenue Forty-three and Mount Gillig, a distance of 2½ miles. Capital stock, $60,000. Incorporators: W. D. Lawrence, E. T. Wright and Ross Welch.

***Export Phosphate Railway & Terminal Company, Tampa, Fla.**—Application for a charter has been made by this company in Florida to build a 50-mile interurban railway to be operated by electricity, steam or any other motive power from Tampa through Hillsborough and Polk counties to a point on the eastern boundary of Polk County. Capital stock, $50,000. Incorporators: E. L. Blood, H. E. Capewell and E. Albert Pierce.

***Lee County Central Electric Railway, Amboy, Ill.**—Incorporated in Illinois to build an electric railway from Amboy to Rochelle, Ashton, De Kalb, Dixon, Mendota, Princeton and intermediate points. Capital stock, $250,000. Incorporators: Sherman L. Shaw, Elijah L. King, Henry W. Hillison, Andrew Aschenbrenner and Alfred H. Nichols.

***Wilmington & Fort Fisher Railway, Wilmington, N. C.**—Chartered in North Carolina to build an 18-mile electric railway from Wilmington to Fort Fisher Sea Beach. This line will have no connection with the Wilmington & Carolina Beach Railway, which plans to build a line between Wilmington and Carolina and Wilmington beaches. Capital stock, $125,000. Incorporators: H. A. Kure, Sr., H. A. Kure, Jr., William L. Kure and Lawrence Kure.

***Dodge County Electric Railway, Mayville, Wis.**—Chartered in Wisconsin to build an electric railway to connect Mayville, Horincan, Juneau, Rolling Prairie, Beaver Dam, South Beaver Dam, Columbus and intermediate points. Capital stock, $25,000.

FRANCHISES

Medicine Hat, Alta.—The City Council has authorized the city engineer to prepare estimates of the cost of electrifying the line built by the city to connect with the Ansley coal mine in Medicine Hat.

Los Angeles, Cal.—The Pacific Electric Railway has received a forty-year franchise from the Council for an elevated railroad from the company's Sixth Street station to San Pedro Street in Los Angeles.

Healdsburg, Cal.—Alfred D. Bowen has asked the Council for a franchise to build an electric railway in Healdsburg. He has also asked the Board of Supervisors for a franchise to build an electric railway from Healdsburg through Sonoma County, 11 miles. Preliminary arrangements are being made to begin the construction of this proposed line in the near future.

San Francisco, Cal.—The Board of Supervisors has requested that the city engineer immediately prepare plans and specifications for the extension of the municipal railway lines into the Potrero and Sunset districts in San Francisco. It is proposed to extend the railway through Golden Gate Park from Tenth Avenue in the Richmond district, to the south side of the park, and the Potrero Avenue line into the Scotch Hills section, according to resolutions introduced in the Council.

Freeport, Ill.—The Freeport Railway & Light Company has received a franchise from the Council to extend its lines in a southwesterly direction on Chicago Street to reach the schools and St. Francis Hospital, thence west to West Street, to a point near the city cemetery in Freeport.

Peoria, Ill.—The Peoria Electric Railway has received a franchise from the Council to double-track its line on Main Street from Elizabeth to Western Avenue in Peoria.

Lafayette, Ind.—The Lafayette & Northwestern Railroad has received a franchise from the Tippecanoe County Commissioners through Tippecanoe County. This is part of a plan to build a line from Lafayette to Chicago via Rensselaer and Hammond. [E. R. J., June 20, '14.]

Hopkinsville, Ky.—The sale of a franchise to maintain and operate an electric railway in Christian County has been ordered for the first Monday in August by the Fiscal Court, the franchise to run for twenty years and to provide for the manufacture and distribution of electricity. R. E. Cooper and John H. Ball asked for the franchise, which has been advertised by L. J. Harris, clerk of the Fiscal Court.

Brockton, Mass.—The Bay State Street Railway has received a franchise from the Council to double track its line on Crescent Street from Quincy Street to the Whitman line in Brockton.

Franklin, Mass.—The Medway & Dedham Street Railway has asked the Council for a franchise on Main Street in Franklin, from Emmons Street to the Medway line. [E. R. J., June 27, '14.]

Portland, Ore.—The Portland & Oregon City Railway has received a franchise from the Council over East Twenty-fourth Street in Portland in place of the original routing over East Twenty-eighth Street.

Montreal, Que.—The Montreal Tramways Company has asked the Council for a forty-year extension of time on its franchise in Montreal.

Nashville, Tenn.—The Nashville Railway & Light Company has received a franchise from the Council to move its tracks on the Harding road in Nashville.

Nashville Tenn.—The Nashville-Gallatin Interurban Railway has asked the Davidson County Court for a franchise along the former roadbed of the Louisville & Nashville Railroad to Ridgetop, from Edenwold, where connection will be made with the Nashville-Gallatin interurban, and for permission to cross county highways at various points.

Nashville, Tenn.—The Tennessee & Kentucky Interurban Electric Railway has received a franchise from the Council along White's Creek pike in Nashville. This company plans to build an electric line from Nashville to Adairville, via Goodlettsville, White House, Cross Plains and Lamont, Tenn. [E. R. J., Jan. 17, '14.]

Dallas, Tex.—John T. Jones and associates have asked the Council for a franchise to build an electric line on Parry Avenue, between Kentucky Street and Henderson Avenue, in Dallas. [E. R. J., May 23, '14.]

Seattle, Wash.—The City Council has refused to grant a franchise on Avalon Way to the Puget Sound Traction, Light & Power Company. The acceptance of the company was based on a discontinuance of service on the line operating through Youngstown. The company refuses to operate both lines.

Seattle, Wash.—A resolution to extend Division "A" of the Seattle Municipal Railway into Ballard over the new bridge authorized by the voters at a recent election has been introduced in the Council by Councilman Ira D. Lundy. Division "A" at present extends from Fourth Avenue and Pine Street to Nickerson Street, which is some distace from Ballard.

Eau Claire, Wis.—The Chippewa Valley Railway, Light & Power Company will ask the Council for authority to abandon its interurban line on Franklin, Fay, Putnam and Omaha Streets upon the completion of its new line along Madison Street, Mount Tom Park and Stary Avenue in Eau Claire.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—The general route of this company's line will be from Lacombe, westerly to the south end of Gull Lake, approximately 11 miles, then west to Bentley, 8 miles, thence following the Blindman River Valley to Rimbey, 14 miles. The line will be built on a private right-of-way, with a gradient 1 per cent compensated, and a maximum curvature of 6 deg. Corrugated iron and cedar box culverts will be used. A wooden trestle 700 ft. long and 60 ft. high will be built across Outlet Creek running from Gull Lake into the Blindman River. The track will be built with 60-lb. steel rails, Grand Trunk Pacific Railway specifications. Farncomb & Inkster, Edmonton, Alta., are the engineers. [E. R. J., June 13, '14.]

Little Rock & Hot Springs Electric Railway, Little Rock, Ark.—Financial arrangements have been completed by this company and plans are being made to begin the construction of this line between Hot Springs and Little Rock in the immediate future.

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company is asked to consider plans to extend its lines on Fifty-fifth Avenue between Victoria Road and Kerr Road in Vancouver. Material is being assembled for the extension of the line from Burnside Road to Harriet Road, Victoria. A contract has been awarded to M. J. Coughlan & Sons for the substructure of a steel bridge across False Creek at Kitsilano, on the Eburne line, to replace the present wooden trestle.

Northern Electric Company, Chico, Cal.—General manager McGovern of this company has been authorized by the board of directors to expend $50,000 for improvements of this railway. The work will consist of reballasting the main roadbed of the entire system and replacing the wooden culverts with concrete.

Fresno (Cal.) Interurban Railway.—This company has placed in operation its line between Fresno and Belmont Avenues in Fresno and Alvina Heights, a distance of about 2 miles. J. B. Rogers, Fresno, president. [E. R. J., July 18, '14.]

***Montecito Railway, Los Angeles, Cal.**—This company has applied to the State Railroad Commission for a certificate of public convenience and necessity to build an electric railway between Griffin Avenue, Avenue Forty-three and Mount Gillig, a distance of 2½ miles in Los Angeles. Among those interested are: W. D. Lawrence, E. T. Wright and Ross Welch.

Pacific Electric Railway, Los Angeles, Cal.—Work will be begun by this company improving its right-of-way on North Lake Avenue in Pasadena. Double tracks are to be placed from Colorado Street to Washington Street and new pavement laid. The company has placed in operation its 1-mile Broadway branch in Glendale.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—This company has awarded a contract to the San Francisco Bridge Company for driving and furnishing creosoted piling along the Key Route mole from the rock bulkhead to the end of the pier in Oakland. The total contract will amount to $270,000.

San Francisco, Cal.—The Board of Supervisors has requested that the city engineer immediately prepare plans and specifications for extensions of the municipal electric railway lines into the Potrero and Sunset districts in San Francisco. It is proposed to extend the system through Golden Gate Park from Tenth Avenue, in the Richmond section, to the south side of the park, and the Potrero Avenue line into the Scotch Hill section, according to resolutions on the subject introduced by Supervisor Vogelsang.

Miami (Fla.) Traction Company.—Plans are being made by this company to expend $150,000 on improvements and extensions of its lines in Miami.

Macon Railway & Light Company, Macon, Ga.—Extensive improvements of its lines in Macon are planned by this company.

Bruneau, Idaho.—J. H. Seaver, assistant superintendent, and W. Wallace, general manager of the Electric Light & Power Company, are making preliminary arrangements to build an electric railway between Bruneau and Glenns Ferry within the next few months.

Idaho-Pacific Railway, Twin Falls, Idaho.—The Twin Falls Commercial Club is back of the proposition to build this electric railway from Twin Falls to Hagerman, via Castleford, to connect with the Oregon Short Line Railroad. It is purposed to raise $100,000 by donations and sale of stock among the citizens of Twin City and other cities which will be benefited. No money will be called for until the grade is completed from Twin Falls to Castleford, when one-half of the money subscribed or donated will be asked for. One-quarter of the money will be called in when the track is laid 12 miles from Twin Falls and the remaining fourth will be due when the track is completed from Castleford to Main and Shoshone Streets, Twin Falls. The co-operation of the citizens of Twin Falls has been requested in securing a right-of-way for a distance of 2 miles from the city limits and in obtaining necessary franchises. A. L. Swim of the Commercial Club is the official head of the proposed company. [E. R. J., June 13, '14.]

Danville Street Railway & Light Company, Danville, Ill.—This company is engaged in the work of laying heavier steel on the east track on North Vermilion Street in Danville, the rails being of the 73-lb. variety. The west track will be relaid as soon as the east track is completed.

East St. Louis & Suburban Railway, East St. Louis, Ill.—Plans are being made by this company to extend its Eighteenth Street line in East St. Louis to Jones Park during the summer.

Freeport Railway & Light Company, Freeport, Ill.—Plans are being considered by this company to extend its line on Chicago Street southwesterly to West Street in Freeport.

Quincy (Ill.) Railway.—A total of $83,959 will be expended this year for improvements to this company's lines in Quincy.

Indianapolis & Delphi Traction Company, Indianapolis, Ind.—No definite plans have yet been made when the construction of this line will be begun between Delphi, Flora, Burlington and Sheridan. Henry L. Smith, general manager. [E. R. J., May 23, '14.]

Evansville & New Harmony Traction Company, Evansville, Ind.—The survey of the proposed line from Evansville to New Harmony has been completed and as soon as the bonds are floated it is announced that construction will begin. The route will pass through the "pocket," a rich trucking region. It is probable that the line in time will be extended to Mt. Carmel, Ind. [E. R. J., May 23, '14.]

Fort Dodge, Des Moines & Southern Railroad, Boone, Ia.—Plans are being considered by this company for an extension of its tracks to West Fort Dodge across the Bennett viaduct.

Tri-City Railway, Davenport, Ia.—Work will soon be begun by this company on the construction of its Fourth Street line in Moline.

Union Electric Company, Dubuque, Ia.—This company has placed in operation its extension which will connect the West Locust Street line and the Eighth Street line in Dubuque.

Kansas-Oklahoma Traction Company, Coffeyville, Kan.—This company has purchased overhead material for its 20-mile line from Coffeyville, Kan., to Nowata, Okla. The line will be of direct suspension 600-volt construction, and Ohio Brass Company material will be used throughout. Ten-foot flexible pole brackets will be used, together with large round top hangers, having a lock feature which gives a tight joint between hanger and car. A 20,000-volt transmission line is to be carried by the trolley poles in addition to feeder and telephone service.

Hutchinson & Northern Railway, Hutchinson, Kan.—Plans are being considered by this company to begin work in the near future on its 14-mile line between Hutchinson and Burrton. George Theis, Jr., president. [E. R. J., March 7, '14.]

Independence, Neodesha & Topeka Traction Company, Independence, Kan.—An election will be held at Neodesha shortly to vote bonds to the proposed interurban line between Neodesha and Independence. Enough names have been signed to the petition to insure the election. T. J. Booth, president. [E. R. J., July 4, '14.]

Arkansas Valley Interurban Railway, Wichita, Kan.—This company will extend its lines from Halstead to Hutchinson in the near future. Negotiations are being held with a view of utilizing the tracks of the Hutchinson Interurban Railway in entering Hutchinson. If this plan fails, the Arkansas Valley Interurban line will apply for a franchise and build its own tracks in Hutchinson.

New Orleans Railway & Light Company, New Orleans, La.—Grading has been begun by this company on its Claiborne Avenue extension in New Orleans.

Winnipeg (Man.) Electric Railway.—Work will be begun at once by this company on the Kern Street line extension to Transcona.

Boston & Western Electric Railroad, Boston, Mass.—This company is still endeavoring to complete its right-of-way. There is yet to be obtained the assent of the Aldermen of Marlboro and of the Selectmen of Maynard to that part of the route, as fixed by the Board of Railroad Commissioners, which is located on highways in these two localities. The local authorities, in giving assent, may impose terms and conditions, which in turn must be approved by the Public Service Commission. Surveys have been completed for this 22-mile line to connect Waltham, Marlboro, Sudbury, Weston, Wayland and Maynard and Boston. [E. R. J., Feb. 1, '13.]

Detroit, Almont & Northern Railway, Detroit, Mich.—Nearly 11 miles of track has been completed by this company on the section of its line between Romeo and Almont, and surveys have been completed from Almont to Imlay City. F. W. Brooks, 12 Woodward Avenue, Detroit, Mich., president. [E. R. J., Dec. 6, '13.]

Grand Rapids (Mich.) Railway.—Work has been begun on the Madison Square railway extension from Hall Street south to Burton Street in Grand Rapids.

Springfield (Mo.) Traction Company.—The immediate construction of three extensions in Springfield and of a line to connect with near-by towns is being contemplated by this company.

Billings (Mont.) Traction Company.—Plans are being considered by this company to extend its lines in Billings and build an extension to Laurel.

Pelham Park & City Island Railroad, Bronx, N. Y.—The Public Service Commission for the First District, New York, received word recently from Edward A. Maher, general manager of the Pelham Park & City Island Railway, that the laying of rails for the new line would begin very soon, and that the work would be completed and the cars would begin to run in a short time. After the line is completed connection will be made with the Union Railway Company's line in the Bronx.

Goldsboro (N. C.) Traction Company.—This company advises that it is now re-establishing the service on ½ mile of its present system, and that as soon as the material can be ordered 1 mile of new track will be laid and $10,000 will be spent on improvements.

Choctaw Railway & Light Company, McAlester, Okla.—This company has placed in operation a 5-mile line between Lawton and Fort Sill.

***Baker, Ore.**—Preliminary arrangements are being made to build an electric railway in Baker and extend it to Eagle Valley, 45 miles beyond Baker in the northeastern part of the county. Among those interested are Joseph Kries, John B. Yeon, Portland, and others connected with the Eagle River Electric Company.

Bucks County Electric Railway, New Hope, Pa.—An extension up North Main Street in New Hope is being contemplated by this company.

North Anderson Street Railway, Anderson, S. C.—This company has placed in operation its new North Anderson extension.

Dallas (Tex.) Consolidated Electric Railway.—This company has placed in operation its new line on Hillcrest Avenue almost to the Southern Methodist University. From its terminus the university officials will construct a line of their own to the institution.

West Virginia Traction & Electric Company, Wheeling, W. Va.—Extensive improvements are being made by this company on its line between Wheeling Park and Greenwood Cemetery. The track is being entirely rebuilt and new ballast is being placed under it.

Janesville & Madison Traction Company, Madison, Wis.—This company has awarded a contract to M. M. Doran, Madison, to build the section of the route between Edgerton and Stoughton. The route of this line is divided into three divisions; the first extends between Janesville and Edgerton, the second between Edgerton and Stoughton and the third between Stoughton and Madison. The railway will connect with the line of the Southern Wisconsin Railway at Fair Oaks. G. Pickhardt, 409 Washington Building, Madison, president. [E. R. J., July 11, '14.]

SHOPS AND BUILDINGS

Edmonton (Alta.) Radial Railway.—Out of the money authorized to be raised under the recent by-laws, $15,573 has been set aside by the Edmonton City Council for a site for a new carhouse in Edmonton.

Georgia Railway & Electric Company, Atlanta, Ga.—Work will shortly be begun by this company on its new freight depot on Butler Street in Atlanta. The structure will be 100 ft. x 200 ft. The cost is estimated to be about $7,000.

Savannah (Ga.) Electric Company.—This company has awarded a contract to A. A. Artley, Savannah, to rebuild its carhouse in Savannah. The new structure will be of brick construction and modern in all the requirements. The cost is estimated to be about $25,000.

Winnipeg (Man.) Electric Railway.—Property has been secured with 300 ft. of frontage on Main Street, Stonewall, for terminals and passenger station for this company.

Public Service Railway, Newark, N. J.—This company has awarded the contract for the erection of the new terminal building in Newark to the Hedden Construction Company. The structure is to be ready for occupancy by January, 1916.

International Traction Company, Buffalo, N. Y.—A new terminal station at Hawley Street in Lockport is being contemplated by this company.

Goldsboro (N. C.) Traction Company.—Among the improvements planned by this company in the near future will be the installation of new tracks and pits in its carhouse in Goldsboro.

Toronto (Ont.) Civic Car Lines.—The plans of the new carhouses for the eastern division of the Civic Car Lines in Toronto were approved by the Board of Works Committee of the City Council, and the commissioner was authorized to advertise for bids for the construction of same.

Seattle (Wash.) Municipal Railway.—Plans are being made by this company to build a new carhouse in Seattle.

POWER HOUSES AND SUBSTATIONS

Quincy (Ill.) Railway.—Among the improvements planned by this company during the year will be the installation of new equipment at its power house at a cost of $3,210.

Union Traction Company, Coffeyville, Kan.—A new substation will soon be built by this company at Delaware, Kan., probably in connection with a new passenger depot to be constructed.

Holyoke (Mass.) Street Railway.—This company has purchased about eight acres of land on the east side of South Pleasant Street at Mill Valley, and will construct a new power plant on the site to be used for the Amherst and Suderland division. On the completion of the large unit machinery in Holyoke to operate the electric cars in the city and immediate environs, the lighter machinery will be removed to Amherst and installed to furnish the additional power which is needed on this side of the mountain.

Ephrata & Lebanon Street Railway, Ephrata, Pa.—This company plans to install in its power house at Ephrata two 300-kw, 600-volt, six-phase, twenty-five-cycle, 750 r.p.m. commutating pole rotary converter; one 300-kw, 600-volt, twenty-five cycle, portable substation car complete, suitable for 11,000-volt high tension. This apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Saskatoon (Sask.) Municipal Railway.—Plans are being made by this company soon to build a new power house in Saskatoon.

Southwestern Gas & Electric Company, Texarkana, Tex.—Two 35-kw, 125-volt, 315 r.p.m. type Q generators have been ordered by this company from the Westinghouse Electric & Manufacturing Company.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company has decided to abandon its $300,000 power plant in Fairmont and will build a new gas engine plant at Hutchinson.

Manufactures and Supplies

ROLLING STOCK

Richmond Light & Railroad Company, New Brighton, S. I., is considering the purchase of thirty new cars.

Macon (Ga.) Railway & Light Company, according to a report, will purchase ten cars.

London (Ont.) Street Railway has issued inquiries on ten 26-ft. double-truck suburban car bodies.

St. John (N. B.) Railway has received two new steel cars from the Ottawa Car Manufacturing Company, Ottawa, Ont.

Wellsburg, Bethany & Washington Railway, Wellsburg, W. Va., expects to purchase a light second-hand double-truck passenger car.

Niagara, St. Catherines & Toronto Railway, St. Catherines, Ont, has received six double-end, double-truck, pay-as-you-enter cars from the Preston Car & Coach Company. They are mounted on standard trucks. The electrical equipment is Canadian Westinghouse 101-B2 quadruple equipment with K28 control, and Westinghouse SM1 air brakes. The cars are 30 ft. 10 in. long over corner posts, platforms 6½ ft. long, seats upholstered in rattan.

Trenton, Bristol & Philadelphia Street Railway, Philadelphia, Pa., noted in the ELECTRIC RAILWAY JOURNAL of May 23, 1914, as having ordered five double-truck closed cars from The J. G. Brill Company, has specified the following details for this equipment:

Seating capacity	48
Length of body	30 ft. 6 in.
Length of vestibule,	42 ft. 6 in.
Width over sills	8 ft.
Width over posts at belt,	8 ft. 2 in.
Height from top of rail over trolley base,	11 ft. 6 in.
Body	Composite
Interior trim	Bronze
Underframe	Metal
Air Brakes	National
Bolsters	Cast steel
Bumpers,	Hedley anti-climber
Car trimmings	Brill
Control	K-36
Couplers	Brill Portable
Curtain fixtures	Cur. Sup. Co.
Curtain material	Pantasote
Destination signs	Hunter
Fenders	H. B.
Gongs	Brill Dedenda
Hand brakes	Peacock
Heating system	Peter Smith
Motors, 2	West. No. 305
Push-button signals,	Consolidated
Registers,	Sterling-Meaker No. 5
Roofs	Wood plain arch
Sanders	Brill Dumpit
Seats	Brill Winner
Seating material	Cane
Track scrapers	Brill
Trolley retrievers	Keystone
Trucks	Brill 39-E

The Ithaca (N. Y.) Street Railway has specified the following details for the five closed prepayment and five open cars recently ordered from the Wason Manufacturing Company:

	Closed Cars	Open Cars
Seating capacity	38	50
Weight of car body	19,000 lb.	15,000 lb
Length of body	20 ft. 8 in.	28 ft. 8 in.
Length over vestibule	31 ft. 2 in.	
Width over sills	8 ft. 5 in.	6 ft. 3 in.
Width over all	8 ft. 6 in.	7 ft. ½ in.
Height, sill to trolley base.	8 ft. 6 in.	
Control	K-36	K-12
Motors	2-GE-201	2-GE-1000
Seats	Brill, Winner, rattan	wood

The following details are specified for both closed and open cars:

Axles	Brill
Bumpers	Brill
Cables	G. E.
Car trimmings	Brill
Couplers	Brill
Curtain fixtures	Brill
Curtain material	Pantasote
Destination signs,	Hunter and special
Gears and pinions	G. E.
Gongs	Brill
Headlights	Golden Glow
Heaters	Consol.
Journal boxes	Brill
Registers	International
Sanders	Brill
Sash fixtures	Brill
Springs	Brill
Trolley base	U. S.
Trucks	21-E.
Underframe	composite
Ventilators	Brill
Wheels	Brill

TRADE NOTES

A. Eugene Michel, New York, N. Y., has changed its Chicago office from the Rookery to 225 East Twenty-sescond Street.

Naugle Pole & Tie Company, Chicago, Ill., has opened an eastern office at 21 South High Street, Columbus, Ohio, in charge of Laurence E. Morier.

Terry Steam Turbine Company, Hartford, Conn., has recently received an order for twenty turbines for the new power station of the Philadelphia (Pa.) Electric Company.

Carnegie Steel Company, Pittsburgh, Pa., has appointed John W. Dix as assistant general manager of sales and structural engineer, succeeding John C. Neale, resigned.

John C. Neale has resigned his position as assistant general manager of sales and structural engineer of the Carnegie Steel Company, Pittsburgh, Pa., to become president and general manager of the Central Steel Company, Massillon, Ohio.

H. W. Johns-Manville Company, New York, N. Y., owing to the rapid growth of its lighting fixture business, has established a new division of its electrical department, which will be known as the Lighting Division. The new division will have charge of the company's business in the Frink and J-M Linolite systems of lighting, and will enlarge the scope of the company's business and service in lighting fixtures in general, by the addition of many new lines. Sales will be under the direction of Edward L. Cox, manager. Mr. Cox is well-known in the trade through his long connection with the Enos & Watkins Company, formerly the Enos Company. G. Eugene Villaret will have charge of designs. The new division will be prepared to furnish from stock, designs in brackets, pendants, hangers, ceiling fixtures, glassware, etc., to meet practically all requirements. The lighting division will be prepared to execute orders for fixtures of all types in all materials, including glass, composition, brass, bronze, etc.

Union Switch & Signal Company, Swissvale, Pa., has appointed W. D. Uptegraff as president, succeeding Col. H. G. Prout, resigned. Mr. Prout graduated from the University of Michigan in 1871. In 1873 he served as major of the engineers and later colonel of the general staff of the Khedive of Egypt. He commanded an expedition in the Soudan and was Governor of the Provinces of the Equator. After this service he became editor of the *Railroad Gazette*, which position he held for sixteen years. In 1903 he was appointed vice-president and general manager of the Union Switch & Signal Company, and about three months ago succeeded the late George Westinghouse as president. Mr. Uptegraff, the new president, has been closely identified with the Westinghouse concerns, including the Westinghouse Machine Company and the Westinghouse Air Brake Company. In 1907 he became financial adviser of the late George Westinghouse. Upon Mr. Prout's appointment as president Mr. Uptegraff succeeded him as vice-president, which office he has held up to the present time. Sydney G. Johnson, vice-president in charge of sales, has also resigned, no successor being appointed. T. W. Siemon, treasurer and assistant secretary of the Westinghouse Electric & Manufacturing Company, has been made secretary-treasurer of the Union Swith & Signal Company, succeeeding James H. Johnson, resigned.

ADVERTISING LITERATURE

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a catalog describing its small motors.

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder entitled "A Game of Checkers," which describes its merit analysis system of fare-registering service.

Buckeye Engine Company, Salem, Ohio, has issued a special bulletin which contains a reprint of an article published in *Power* entitled "First Buckeye Mobile in Commercial Service in America."

Harris Patents Company, Philadelphia, Pa., has issued a large catalog entitled "Stone Cold to Full Power in Ten Seconds," which describes valveless engines, Diesel principle, for power generation, locomotives, interurban cars and other purposes.

Allis-Chalmers Manufacturing Company, Milwaukee, Wis., has issued Catalogs Nos. 100 and 103, written in Spanish, describing and illustrating its machinery for refining metals and its dynamos, motors, steam and gas engines, air compressors and steam turbines. The catalogs contain illustrations of an installation of a double-expansion vertical steam engine in a power house of the London (Eng.) United Tramways, Ltd., and of three large transformers installed outside a power house of the Southern Power Company.

The Allen-Bradley Company, Milwaukee, Wis., has issued Bulletin B-571, describing its speed regulators for slip-ring induction motors for driving fans and other machinery. These regulators are designed to reduce the speed of two and three-phase slip-ring motors by introducing resistance into the secondary circuit. The resistance units are of the carbon compression type. The speed of the motor is changed by turning a hand wheel, and instant adjustment can be obtained between minimum and full speeds regardless of the load of the motor.

H. F. McConnell & Company, New York, N. Y., have issued a 44-page pamphlet giving a select list of public utility investments. In selecting these securities the company states that it has endeavored to compile only those offering sound underlying values, substantial earning power and attractive future possibilities of market improvement. Holding company securities are especially featured. The last pages of the pamphlet are devoted to an interesting compilation of facts concerning public utility development, a table showing what one cent's worth of electricity will do and a tabulation giving the approximate yield of stocks paying from 2 per cent to 9 per cent and ranging in selling price from 10 to 150.

NEW PUBLICATIONS

Electric Light Accounts. By H. M. Edwards. McGraw-Hill Book Company. Leather bound, 172 pages, $2 net.

Mr. Edwards, who is auditor of the New York Edison Company, in this book gives the first adequate treatment of the subject of electric light accounts. The system of accounts is not in all its details the one followed by the New York Edison Company or the one adopted by the National Electric Light Association. The differences are not material, however, and the chief value to the reader lies in the explanations that accompany the accounts or their "significance," as it is termed by the author. The book is divided into three parts, treating balance sheet or indicant accounts, income accounts and miscellaneous subjects. The first two parts take up in a concise and thorough fashion the accounting structure of an electric light system. The third part discusses more at length some of the important topics that arise in electric-light accounting, such as account symbols, a work order system, customers' accounts and records, accounting for supplies, renewal reserves, the contents of the income statement and the analysis of the balance sheet. The book is particularly of value to electric-light employees, but it should be interesting to all accountants in the public-utility field.

Accounting Practice and Procedure. By A. L. Dickinson. Ronald Press Company, New York. 300 pages. Cloth binding, $3; half leather binding, $3.50.

This book is a radical departure from previous accounting works inasmuch as it deals almost entirely with problems of practice which heretofore have had to be worked out largely by judgment and analysis of the individual case. The entire experience of the author is brought to bear in a discussion of the exceptional problems that arise in accounting practice. The general arrangement of the book is such as to bring out the more important features. Bookkeeping is covered in a single chapter in a sufficiently comprehensive manner, but six full chapters are devoted to a discussion of the balance sheet. Corporation accounting and cost accounting are given a full chapter each, and the remainder of the book treats thoroughly of the duties and liabilities of the public accountant and work with involving prospectuses, certificates of financial position, possible earnings, liquidations and the like. Two chapters which should be of particular interest to electric railway accountants are those dealing with repairs, renewals, depreciation and reconstruction, and with special points in corporation accounting and finance. This latter topic covers the following points: accounting for holding companies, previous earnings before date of consolidation and questions arising upon the organization of a corporation. To those accountants who would be interested in having a general view of the English and Canadian law relative to auditing and similar topics the appendices as compiled by the author should prove invaluable.

Express Service and Rates.—By W. H. Chandler. La Salle Extension University, Chicago. 140 pages.

While this book contains only one chapter devoted exclusively to express service in connection with the electric railway industry, it gives a general treatment of the whole subject of express service and rates that should be of value to all electric railway officials. The book is written from both and historical and analytical standpoint and gives a thorough exposition of express service from the time of the first express car (which was merely a valise) up to the ramified service of to-day with its various tariffs. The author discusses the financial relations between express companies and railroads, contracts with carriers, the regulation of express companies and various other points dealing with their rate schedules. He states that in the Central Western States and in the Northern Atlantic Coast and Pacific Coast territory the carrying of freight and express by electric railways has become an established institution, and that while but 1.7 per cent of the gross earnings of these electric railways in 1907 were derived from their freight and express traffic, the advantage of such service has had an important effect upon the interchange of goods in rural districts. The traffic handled at the present time falls into the three general groups of farm produce, carload service in feeding railroad lines, and baggage and light parcels service in cities. The next to the last chapter in the book is devoted to a discussion of the parcels post and the express companies under the new rates. The author concludes that express companies can serve the public better on certain classes of traffic than can the post-office and that these companies will in the future find their sphere of usefulness increased rather than diminished.

A Study of Rapid Transit in Seven Cities.—Bulletin No. 3 of the Municipal Reference Library. Chicago Public Library, Chicago, Ill. 27 pages.

The present pamphlet was prepared under the direction of Theodore K. Long, member of the Chicago City Council, in co-operation with Frederick Rex, municipal reference librarian, City Hall, Chicago. The purpose of the pamphlet is to put in convenient and popular form a digest of rapid transit conditions in New York, Chicago, Philadelphia, Boston, London, Berlin and Paris. The pamphlet opens with tables showing the mileage of rapid transit lines in the cities named, and this is followed by paragraphs on the historical development of rapid transit in the same communities. The historical paragraphs also refer to the methods of financing and the character of franchises.

The section entitled "Comparative Cost of Subway and Elevated Railways" gives figures from such authorities as Bion J. Arnold, William Barclay Parsons, William S. Twining, John Vipond Davies, George K. Mohler, D. F. Wilcox and C. S. Sergeant. Mr. Sergeant's figures are those which were published in the ELECTRIC RAILWAY JOURNAL for Oct. 16, 1913. The Berlin and Philadelphia types of elevated railway construction are commended. Attention is called to the inconsistency of considering elevated electric railways as nuisances at the very time when Chicago demands that all steam railroads be placed on viaducts. Statistics are published of the passengers carried per year, per mile of track and per mile of route in New York, Chicago, London, Paris and Berlin.

The following sections relate to passenger traffic and rates and fare. It is noted that the average revenue per passenger abroad varies from 2.66 cents in Paris to 3.22 cents in London tubes as compared with 5 cents in the United States, but no parallel is given as to length of ride in each case. The longest section of the pamphlet is given up to a comparison of sanitary conditions and noise of subways and elevated railroads. The researches of Dr. George A. Soper on the sanitary condition of the air in the New York subways are quoted extensively, as are also the works of others who have written concerning dust-laden air.

In conclusion, the pamphlet summarizes in parallel columns the comparative advantages of subway and elevated railways as quoted from a report made by E. P. Goodrich and Harry P. Nichols, New York, upon "Elimination of Surface Freight Railroad Tracks of the New York Central & Hudson River Railroads."

Electric Railway Journal

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MAXIMUM PROFITABLE RIDE The report on cost of individual passenger transportation in Boston, abstracted elsewhere in this issue, arrives at the conclusion that a 5-cent fare will permit a 4-mile ride for each passenger and just cover operating expenses, interest and depreciation. This rate of 1¼ cents a mile applies, of course, only to the conditions existing in Boston, and this rate could not be safely applied to any other set of conditions because of the effect upon the result of variations in the determining factors. If the average passenger is transported for his 4 miles in a badly under-loaded car, for example, it is hardly likely that the fare of 5 cents will prove profitable, and the same condition will exist if the schedule speed is unduly low, thereby limiting the effective work obtained from both car and crew. As a matter of fact it is probable that the latter possibility exerts a more potent influence upon profitable haul than the former, and for this reason the time basis really serves better for calculations and comparisons than the distance basis used, in this case, for Boston. Indeed, another of the large systems calculated some time ago that a twenty-two minute ride was the limit that could be given for a 5-cent fare, this, even under the high schedule speed of 10 m.p.h., being the equivalent of a distance of only 3.66 miles, while, with a 7-mile schedule speed, the profitable average haul is not more than 2.57 miles.

THE CONVENTION AND TECHNICAL EDUCATION The American Electric Railway Association, through the committee on education, is calling the attention of the technical colleges to the importance of promoting a closer relation between the teachers and the industry. An obviously simple means to this end is to secure the presence of a large number of representatives of the schools at the annual conventions of the association. One cause for complaint of the results of technical education is that the teachers are not as familiar as they might be with the conditions under which their students are to work later. They are so occupied with formulas and principles that they lack the stimulus which comes from contact with the men who are doing things, and the students suffer thereby. At the convention the teachers might not see many differential equations, which they could safely forget for the time being, but they would see some very fine specimens of adaptation of scientific principles to practice, and would meet the men who have the ability to make such adaptations. We see no valid reason why it is not just as important for the colleges to send representatives from their faculties to the conventions as for the railway companies to do so. The cost would amount to something, but it would be easily returned in the improved quality of instruction which would result. In some respects October is an unsuitable month for teachers to leave their duties, but, on the other hand, the convention inspiration would come at a time when it would have the maximum effect on the school work of the ensuing year.

MODERN SINGLE-TRUCK CARS A few years ago the single-truck car seemed doomed to die a natural death except in cities which were too small to use the large double-truck cars which were becoming more and more popular. No one would have ventured to foretell that the time would come when a large city company would actually discard double-truck cars in excellent operating condition for any kind of single-truck design. Yet this is precisely what the Third Avenue Railway System, New York, has done during the current year in ordering a total of fifty single-truck cars, of which forty-nine will have radial-axle trucks. In all likelihood additional cars of the same type will be ordered as soon as more of the older double-truck cars can be sold. The reason for this remarkable change of front is largely the radial-axle truck, which has made possible the selection of a convertible car body practically 35 ft. over all, a size which the operating company believes will prove ideal for service in the northern suburbs of New York City. This large order certainly shows that American operators are beginning to gain confidence in the principle of the radial-axle truck after a long period of experimental operation, especially on the electric lines of Great Britain. Mr. Steffen's article in this issue on his own recent design is another indication of the renewed interest in the radial-axle truck for moderate speed city service. Even the improved rigid-axle truck is still worthy of consideration. The determination of the Third Avenue System to replace heavy double-truck with light single-truck cars on its suburban lines is significant in many ways, but the one thing worth pointing out at this time is that the operator of a modern single-truck car has nothing to apologize for so long as that type makes ample service an economic possibility. The public must be educated to the fact that it would be as absurd for it to expect a metropolitan car in low-traffic service as to demand big-city standards in theaters and public buildings.

INFORMATIONAL CLEARING HOUSES

G. W. Lee, librarian for Stone & Webster, suggests that there should be created a central clearing house for knowledge on all subjects, to be located preferably in Washington. He calls attention to the present tendency of librarians to broaden their work in the direction of supplying information and believes that this indicates a need for a central reference bureau. As the principle underlying Mr. Lee's suggestion relates to the collecting and distributing of information of real value, it applies in the electric railway field if anywhere and is well worthy of consideration.

The ultimate source of knowledge is experience, but the amount of information which can be secured by an individual in this way is limited. Successful men must know much more than can possibly come within the range of their own personal experiences. Hence each man must spend time and effort in gathering for his own use the results of the experience of others. It is an obvious advantage if, when he does this, the results of his investigation can in some way be placed at the disposal of others. It is, in fact, his duty to do this in return for the help which he receives from other investigators. Suppose, for example, that the problem confronts a railway engineer as to whether it is advisable to creosote the ties in a certain stretch of track. The correctness of his conclusion depends upon his success in obtaining accurate and sufficient information based on the experience of others. His first step is to make a plan to secure this information. He consults the available reference literature and possibly writes to a few friends for their opinions. One source of information leads to another until finally he feels warranted in reaching a decision. The matter of creosoting ties, however, affects not only this one man but hundreds of others. He has done a great deal of work in getting certain information. It is a waste of time for the other hundreds to go through the same tedious process. If the first man had some easy way of filing his memoranda where they would be accessible he would undoubtedly be glad to do so.

At present this man, if he files his information at all, would probably do so with the appropriate committee of the American Electric Railway Engineering Association, the American Wood Preservers' Association, or whatever other society would be interested. This is good as far as it goes. It is possible, however, to imagine the libraries of the country to be so organized, with a central clearing house, that each individual would file his data with the local librarian, who would forward it to the central agency, from which it would be distributed to all libraries in the country. If then another railway man desired to know what there is to be known upon the subject in question, he could apply to any library with a reasonable assurance of success.

The apparent weakness of this scheme is that it depends upon voluntary co-operation. The librarian has a considerable responsibility at this point and, under the proposed scheme, it would be his duty to keep in touch with all research work being done in his territory. This kind of work may seem quite different from that which is ordinarily expected of a librarian, but the librarians of the country are different now from what they used to be. The librarian is coming to be depended upon more and more as a source of information, and the books and periodicals which he keeps in his library are simply a means to an end. In the State of Wisconsin, for instance, one important section of the University extension department furnishes all kinds of information to inquirers, and this is used not only to satisfy the desire for knowledge, but also in the preparation of public addresses, debates, etc. The same principle could be applied on a larger scale for the whole country.

As Mr. Lee suggests, a movement for a central index bureau ought to be inaugurated by leaders in the library field, but it will take time to initiate this movement. In the meantime this paper will be glad to act as a clearing house for information relating to electric railways and will systematize the filing of such data of this kind as may be sent to it, so that the information will readily be accessible to subscribers. The editors believe that this is a part of their duty to their readers.

STORAGE BATTERY CAR LIGHTING

A feature of modern car equipment which illustrates the attention now given toward attaining the ideal of safe service is that of using storage batteries to insure the illumination of several emergency lamps at least. Doubtless the need for such an auxiliary is most acute on third-rail interurban lines operating single cars, where the absence of a train bus line means an annoying interruption of the lights at every grade crossing. A further advance is the introduction of electric marker and tail lights, which, from their character, should be connected to a storage battery rather than to the line. All will admit that an oil lamp is a decided anachronism on an electric car, but safe operation demands its use unless the supply of electricity is certain.

An excellent scheme in service on a large single-phase electrification in the United States is to keep the headlights, marker and tail lights in permanent, and a set of inside lamps in emergency, connection with a 32-volt battery. Again, where the multiple-unit control is operated with a storage battery, it has been found feasible to use it for a few emergency lights inside the car, if not for the operating purposes already named. A still wider use for the storage battery, however, lies in its application to the possible continuous supply of all the car lamps. Such an application was described in connection with the new cars of the Michigan United Railway in our issue of July 18.

For electric cars with the overhead system of line supply this plan may seem an unnecessary refinement. Nevertheless, with interurban lines the variations in voltage which are almost inseparable from operation will produce corresponding variations in illumination, and in such instances a storage battery system will insure an adequate supply of illumination for less money than additional feeders. Furthermore, the increases in

lamp efficiency and the decreases in battery weight so characteristic of recent years make the matter of extra weight of less importance than in the past.

COMPARATIVE COMMENT ON ENGLISH ALL-STEEL CARS

That the advantages of all-steel construction for electric railway cars have not been overlooked by European managements is shown by the description of two new rapid transit cars for London, published elsewhere in the issue. Both cars are intended for heavy, high-speed service and both are designed to haul trailers, so that the installation of 460 hp of motors on each car is not surprising. The fact that in each case this motive power is concentrated in two motors on one truck is, however, hardly in accordance with the trend of American practice, considering the comparatively small size of the car bodies, as is also the fact that the two cars, although they are being purchased by the same interests, display striking dissimilarities in fundamental design. It should be said, however, that each is an evolution from the types existing on the line for which it is intended.

It is of course difficult to subject to analysis types of construction that originate so far away as in England, but it is even more difficult to pass without comment the obvious inference that is to be drawn from a comparison of the two designs, one of which exemplifies the principle of the "house on the flat-car" that American designers are reluctantly beginning to give up.

The car in question is the one intended for the Metropolitan District Railway. Reference to the halftone of the framing which accompanies the article shows that, notwithstanding the superstructure of steel, the strains imposed by the load are obviously carried only by the floor framing, truss-rods even having been installed regardless of the incongruity of such a makeshift. The result is a car body 49 ft. long that weighs, fully equipped but without trucks, 43,680 lb. On the other hand, the car for the London Electric Railway, with 1 ft. more over-all length, has a body weighing but 34,000 lb., making it nearly 10,000 lb. lighter than the Metropolitan District Car which was, presumably, designed for use under generally similar conditions.

The reason for this extraordinary difference in weight is by no means obscure. The London Electric car is sheathed with ⅛-in. steel plate, and this permits the strains to be carried above the floor at least as high as the belt rail and possibly to the roof, the side sheathing acting as a girder to support the load as well as to protect the passengers within the car. By this means the shallow and heavy sills required by the old-style underframe are eliminated, and the weight of the body is obviously reduced to a marked degree. Indeed, it would be difficult to find a more striking practical example than these two cars of the utterly useless weight involved by adherence to the "house on a flat-car" school of design.

However, the mere adoption of sane principles of car construction does not cover all that can be accomplished in eliminating unnecessary weight. Even the lighter one of the two London cars, with its 50-ft. body weighing 34,000 lb., is still some 10 per cent heavier than is deemed necessary for similar service in this country. The body of the standard car of the Hudson & Manhattan Railroad is 48 ft. long and weighs fully equipped 30,000 lb. Even when the weight of the London car is scaled down to allow for its extra length, the Hudson & Manhattan car body is still 2600 lb. lighter. In view of the fact that the Hudson & Manhattan service could hardly be exceeded in severity and that the cars have withstood this service for nearly six years without the least sign of failure, this comparison of weights certainly redounds to the credit of American methods of design.

THE PROBLEMS OF THE INCLOSED PLATFORM

Anything which requires a change of habit on the part of the public is bound to create at first a feeling of dissatisfaction. Therefore it is not surprising to find in a number of cities a good many objectors to the closed-platform car. A newspaper account from St. Louis tells of a recent incident in that city in which ex-Governor Francis of Missouri was the principal actor. He reached a car with the intention of boarding it just after the door had been closed and as the car had begun to start. As he could not get on board he follow the car a block, only to repeat his previous experience in regard to losing the car but in time to break the glass of the door with his cane. He then ran after the car for another block where he boarded it and, as he paid his fare, gave his card to the conductor and asked him to tell the superintendent that he had broken the glass intentionally.

Governor Francis is probably one of those men whose only objection to the fully-inclosed car is that they cannot get on the car when it is in motion. Probably others who have missed a car under the same circumstances have felt the same way that he did but have not had the courage to break the glass. A few moments of thought, however, upon the reasons of the railway company for inclosing the car platform ought to convince such people that the plan is one adopted for their own good. With the rising generation it may be possible to inculcate a respect for this safety precaution, but with the older generation, many of whom learned the trick of boarding a moving car in the old horse-car days, the habit is still strong, and it cannot be stopped except by the fully-inclosed car.

While we are strong advocates of this type of car, we believe that companies would do well to adopt one or two precautions with it which were not necessary with the old type of car. One is to instruct the motormen and conductors to be more observant of passengers waiting to board the car than when the old form of open platforms was used. As we said recently in these columns, it is exasperating for a passenger who is on a corner ready to board a car to be unable to do so because the conductor is looking the other way and cannot be hailed because the platform is inclosed. The short-haul passenger is particularly one whom the railroads want to get, but a number of experiences of this kind will encourage many possible short-haul passengers to walk rather than ride.

COMPENSATION INSURANCE IN NEW YORK

The announced decision of the Brooklyn Rapid Transit Company to insure its own workmen under the new workmen's compensation law on the ground that the premiums demanded by the State fund or by insurance companies would be prohibitive, is of vast interest to the electric railways of New York State. The Interborough Rapid Transit Company, the New York Railways, the Third Avenue Railway and the New York & Queens County Railway have also decided to insure their employees themselves, while the International Railways, of Buffalo, has accepted insurance in the State fund. Of the three methods provided to insure the payment of the compensation fixed by law, it cannot be said that the third, insurance in a stock company, is making a winning appeal to electric railways. One reason for this may be the higher rates charged.

A comparison of the minimum base rates for stock and mutual companies in New York and near-by States shows that the New York rates are appreciably higher. The New York rate for these companies per $100 of payroll for urban or interurban railroad construction (with or without the installation of electric equipment or pole lines, and without blasting, tunneling or bridge building), is $4.37 as compared to $3.38 in Massachusetts and $2.70 in New Jersey. The rate for all urban electric railway operation in New York is $3.24, in Massachusetts $2.20 and in New Jersey $2. For interurban operation the New York rate exceeds that in Massachusetts, but is less than that in New Jersey, the rates being as follows: New York, $5.18; Massachusetts, $5, and New Jersey, $9.37. Subway construction rates (open cut or cut and cover or tunneling) are $13.28 for New York; $7.50 for Massachusetts, and $11.50 for New Jersey. The rates for elevated railway operation, however, are only $3.24 in New York, as compared to $3.50 in Massachusetts and $5 in New Jersey. It is stated that the New York rates are based as far as possible upon actual experience gathered from Massachusetts and other States already operating under workmen's compensation laws and that adjustments have been made only to conform to the increased benefits provided under the New York law.

The base rates quoted above may be reduced for merit rating. To employers who pay attention to accident prevention, whose plants have been inspected, and who will show a favorable record of accident experience, a reduction will be allowed to the extent of 40 per cent, depending upon the physical conditions in the manufacturer's establishment and upon his record of accident experience. This maximum allowance is four times as great as the employers in Massachusetts receive, and it is asserted by the State insurance department that the attainment of this maximum reduction would produce relatively a lower cost for compensation insurance in New York than in Massachusetts.

The State fund rates were originally fixed on a basis of a reduction of 8.39 per cent below the above quoted minimum rates for the stock and mutual companies, but already the compensation commission has authorized an investigation by its actuarial department to report prior to Aug. 1 on a compilation of base rates as much lower than the stock company rates as is consistent with the maintenance of a solvent insurance fund. Estimates as to this reduction run as high as 15 per cent, which would mean that the stock companies' minimum rates would be at least 23 per cent above the equitable rates for compensation risk. Whatever reduction materializes from this investigation, however, it must be granted that it is perfectly feasible for the State to give lower rates than do the stock companies, for the latter must pay solicitors' fees and stockholders' dividends. Under the State fund no such expenses exist, and during its operation for the first two and one-half years the cost is to be met out of the State treasury. Another attraction that the State fund possesses as compared to insurance in a stock company is that the former provides by law an absolute release from liability for the payment of compensation after the premium is paid, whereas employers insuring in a stock company are liable for the continuance of the compensation payment in case of bankruptcy.

Insurance in the State fund and self-insurance are not susceptible of such concrete comparison as given above, but the action of the Brooklyn Rapid Transit Company and the Interborough Rapid Transit Company is mute evidence of the belief that self-insurance in the end may be cheaper than insurance in the State fund for companies with a large organization and extensive resources. For years these companies have been paying compensation to their employees where no liability existed as a part of their welfare work. Then, too, in order to investigate passenger injuries and claims they have developed departments that can with ease and with little additional clerical expense handle the compensation work. The only difference lies in the State fund's provision for medical attention, but the high standard of the Brooklyn Rapid Transit medical inspection bureau and the thorough provisions recently adopted by the Interborough Rapid Transit Company for the medical care of its employees make it doubtful whether the employees would be better cared for under medical attention provided by the State.

One of the most difficult problems, and one that formerly caused great diversity of opinion in regard to self-insurance, is that of providing the proper payments to employees in the event of the bankruptcy of the employer. The fact that compensation payments may extend over a long series of years makes this point of vital concern to the employee and to his family. Ample provision for this point, however, seems to be made in the New York State law. Self-insurers must prove to the compensation commission that they are financially responsible and must file with the commission, to insure faithful discharge of any liabilities, high-class securities in an amount equal to the semi-annual premium in the State fund, less 10 per cent. This latter amount must be deposited in cash with the commission for use in the case of any immediate call for compensation payments. In the case of any death resulting in compensation payments, self-insurers must deposit immediately the full amount estimated to cover the risk involved to maturity. In some cases this might require a lump sum deposit of from $15,000 to $20,000.

The compensation commission recently made an interesting announcement to the effect that if electric railways should come into the State fund they would be put in a group by themselves in order to derive the benefit from their own experience and not have their rates loaded with the risks of more hazardous occupations insured in the State fund. For a group of companies having 3000 employees and a payroll of $3,000,000, this is probably the most satisfactory method of insurance under the new law.

"PROCEED, PROTECTED BY FLAG"—A FALLACY?

The numerous installations of automatic block signals by electric railways during the past year have resulted in focusing the attention of many operating men upon the matter of rules for operation under signals. In many cases, apparently, this attention has failed to disclose the fact that the old rule permitting a train to "proceed, protected by flag" has been eliminated from the standard interurban code. As a consequence of this oversight several roads have adopted block-signal rules, which, at least by implication, concede the right of trains to proceed in this manner.

The process of proceeding, "protected by flag," applies, of course, only to cases where trains on single track roads are unable to get into communication with the dispatcher, and under such circumstances the trainman is placed upon the horns of a dilemma from which he must be rescued by definite advice in the book of rules. In the standard interurban code prior to 1911 the matter was covered by old rules 203 and 203a whereby a train could proceed under control within one-half the range of vision on straight track, the conductor walking ahead at all curves "at a sufficient distance to fully protect his train."

However, at the 1911 convention this rule was eliminated as not being good practice, the record appearing on pages 106, 107 and 217 of the *Proceedings* of that year of the Transportation & Traffic Association. In consequence, under the present rules for movement by train order, when a train is held for any abnormal condition and cannot get into communication with the dispatcher, it can proceed only on time-table rights, which may be acquired by running as a second section behind the next regular train in the same direction.

This procedure is outlined in rule 166 of the present standard code. Obviously it may involve a wait of two hours in case an opposing regular train fails to make a meeting point, because no regular train loses its rights until two hours late. Nevertheless, this possible delay has been considered to be less objectionable than the risk of trusting trainmen to keep a safe distance behind a walking man as called for when proceeding, "protected by flag."

That the presence of automatic block signals should make permissible the return to a procedure that has been declared to be bad practice is hardly a reasonable assumption, and it is to be hoped, if only for the sake of uniformity, that those electric railways which have embodied in their signal codes the flagging rule for opposing movements will remove it. But little is gained by its presence among block signal rules, because it is seldom indeed that any catastrophe can shut down the telephone and not also affect the signals, thus making necessary the operation of the road by timecard only.

In block-signalled territory there are, of course, two general conditions which invite the application of the flagging rule. One of these exists when a signal in stop position holds a train for a period in excess of that required to run through the block in advance. This naturally constitutes strong evidence that the signal is out of order, but that does not justify the train in blindly entering the block without word from the dispatcher, because it is possible for a high-speed opposing train to enter the block without warning at any time before the entry of the first-mentioned train has set the signal at the opposite end of the block. On the other hand, it is obvious that if the train waits in the clear until the arrival of a train in the opposite direction, or else until a trainman has gone to the nearest operative telephone, which in signalled territory will seldom be more than a mile away, the difficulty will be solved without the slightest risk being run.

The only other general reason for using the flagging rule would occur when the whole telephone line was down and a train was working its way over the road with the aid of the signals, the "range of vision," as cited in the old rule, being ample and the signals uniformly showing clear indications. With this phase of the question, however, there enters the matter of signal reliability, and too many incidental problems affect it to permit of its consideration at this time. However, it may be said that the belief of the block-signal committee seems to incline at present toward the use of single-track signals only as a safeguard superimposed upon the structure of operating rules, and for this reason the importance of this argument in favor of the old flagging rule is considerably reduced.

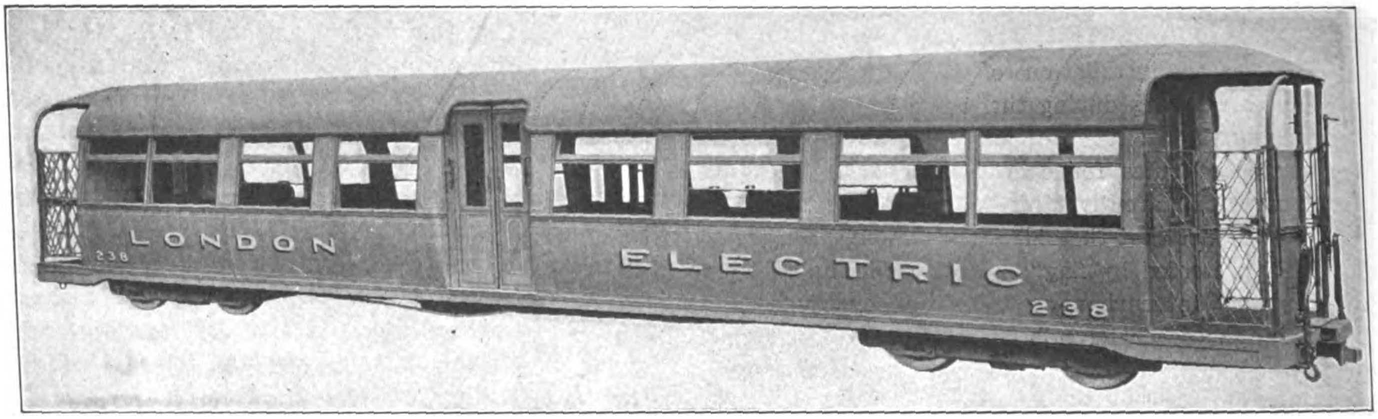
In any event the conditions cited are abnormal, and since normal operating conditions of the present time call for "safety first," the adoption of a block-signal rule that leaves a loophole for accident should be discountenanced by every operating man. The rules should state clearly and positively that a signal blade in stop position must not be passed except upon definite instructions from the dispatcher. This may involve complication in the case of intermediate signals when the telephone is out of order, but it will be safe operation and in accordance with good practice.

New Rapid Transit Cars for London

This Article Describes the Latest All-Steel Cars for the Metropolitan District Railway and the New Center-Entrance Cars for the Tube Service of the London Electric Railway

In the ELECTRIC RAILWAY JOURNAL for Feb. 7, 1914, some particulars were printed of recent improvements in rolling stock undertaken by the Metropolitan District Railway and the London Electric Railway, of which Sir Albert Stanley is managing director and W. A. Agnew mechanical engineer. That article stated that the latest District cars were built up of steel underframes, fireproofed wood and aluminum fittings; also that tests were being made with two tube cars which had been fitted with different types of center doors to provide more facilities for passenger interchange than the original single-platform design afforded. The tube motor cars really have two platforms, but the front end is not available for passengers owing to the installation of the contactor equipment above the floor line and behind the control cab.

Since the foregoing article was published the management ordered thirty all-steel cars for the Metropolitan District Railway and fourteen center-entrance cars for the Bakerloo tube extension to Paddington station. A description of each type follows:



LONDON UNDERGROUND CARS—COMPLETED CENTER-ENTRANCE STEEL CAR FOR TUBE LINES

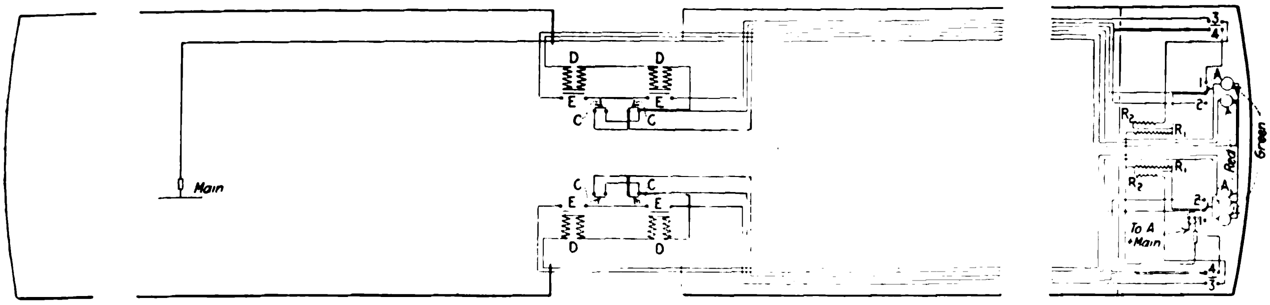
ALL-STEEL CARS FOR METROPOLITAN DISTRICT RAILWAY

The new cars of the Metropolitan District Railway follow the same seating and door arrangement as the car illustrated on page 299 in the issue of Feb. 7, 1914, namely, in the use of sliding doors at each platform and in the center. The main dimensions, which are also substantially the same, are as follows: Length over all, 49 ft.; distance between the truck centers, 34 ft. 1 in.; width over the framing, 8 ft. 8 in., and height from rail to top of carlin, 11 ft. 11½ in. As shown in the accompanying half-tone and drawings, commercial steel sections are used for the framing throughout except that ash serves as a filler where indicated. The end sills are 8 in. x 3 in. x ⅜ in. channels, the sill at the motor end being of pressed steel. The cross-sills and center longitudinal sills are of 6-in. x 3-in. x ¼-in. I-section. Since the windows are more than 4 ft. wide it was not feasible to make the 1½-in. x 1½-in. x ¼-in. angle carlins integral with the side posts. Each post is built up of a pair of reversed angles with short struts between. The diagonal members between the bottom side sill and belt rail are angles 1½ in. x 1½ in. x ¾ in., while the diagonals which brace the 3-in. x 1¾-in x 3/16-in. pressed-steel corner posts are channels 2 in. x 1 in. x 3/16 in. The floor is of ¾-in. "Sanit" composition on 3/16-in. flat steel plate. The interior fittings of the car are of polished aluminum alloy, and the advertisement and other moldings of pressed steel. The aluminum fittings were furnished by the British Aluminium Company, London.

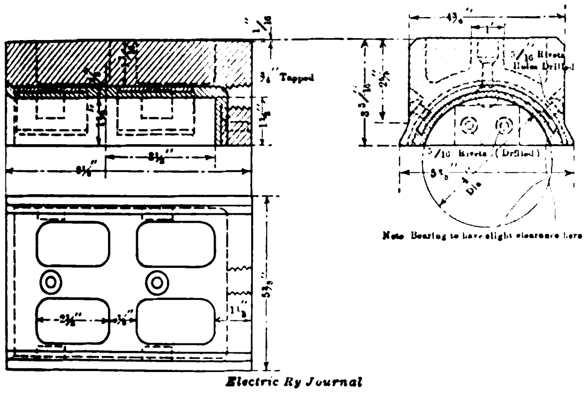
The interior lighting is also of modern type, consisting of obscured bowl fittings in the roof and bracket lights over the cross-seats. The sides, doors and roofs are of steel panels of the thicknesses shown on the drawings. The roof is covered with 16-oz. cotton duck.

The monitor roof has been abandoned in favor of the single-arch design principally to secure better workmanship in steel construction than would have been possible with a monitor roof. This change, however, has not decreased the total weight of the car, as the company preferred to increase the sizes of certain members over those of earlier cars. Ventilation is secured by the use of seven Acme ventilators, in addition to which small movable sashes are provided over the large windows. The entire floor area of 320 sq. ft. is available for passengers except that on the leading car a space of 3 ft. depth x 8 ft. width is reserved for the motorman. This means that on a standard District eight-car train of four motor-cars and four trailers 99 per cent of the total area is available for the accommodation of passengers. The vestibule side doors have a free opening of 2 ft., while the double doors at the center of the car have an opening of 3 ft. 5¾ in. between the glass partitions inside the car, but part of this space is required for the installation of mahogany hand rails. The seating is a combination of cross and longitudinal seats, the former accommodating sixteen and the latter thirty-two passengers. Folding seats are provided for both the conductor and the motorman. The width between the aisles of the 38-in. cross-seats is 19 3/8 in., and between the longitudinal aisles 46 in. The use of pressed steel for the seat legs is in accordance with the company's practice for several years past. The seats are covered with moquette velvet, which passengers prefer to rattan. This velvet is kept clean by brushing it with a special solution related to tetrachloride of carbon, and by vacuum cleaning.

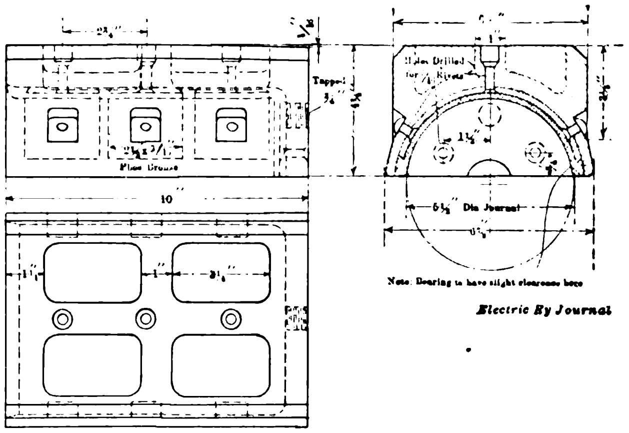
With regard to the trucks, the company had in its original stock motor trucks of the cast-steel Hedley type and trailer trucks of the equalizing type, but the severe service gave a good deal of trouble owing to fractures in various parts, and the riding did not prove all that



LONDON UNDERGROUND CARS—DIAGRAM OF ELECTRIC LOCK OPERATING MECHANISM FOR DOORS



LONDON UNDERGROUND CARS—JOURNAL BOX BEARINGS ON TRAILING AXLE

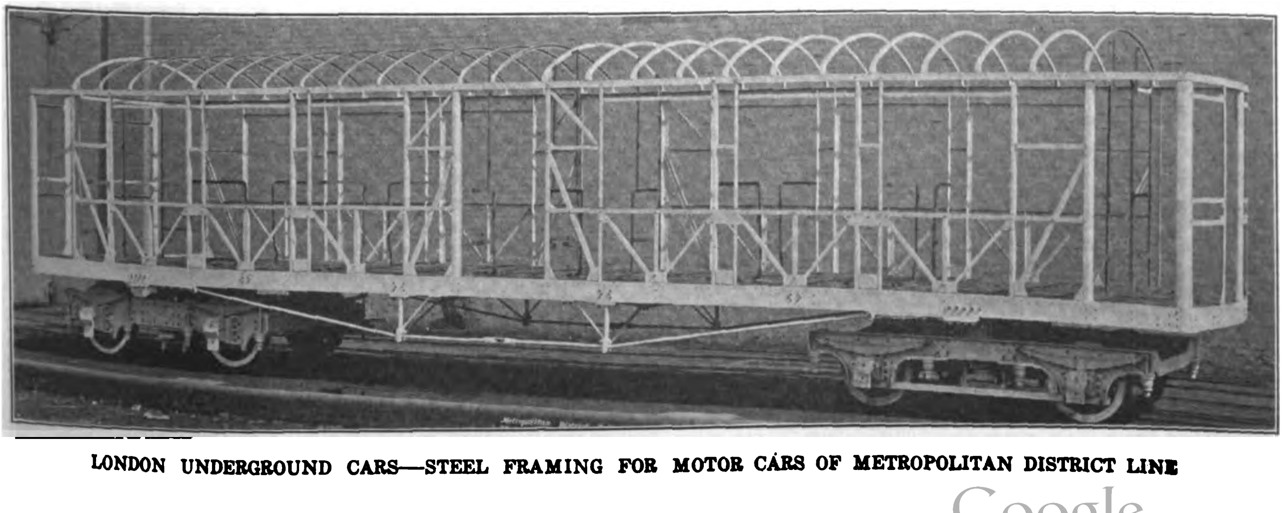


LONDON UNDERGROUND CARS—JOURNAL BOX BEARINGS ON DRIVING AXLE

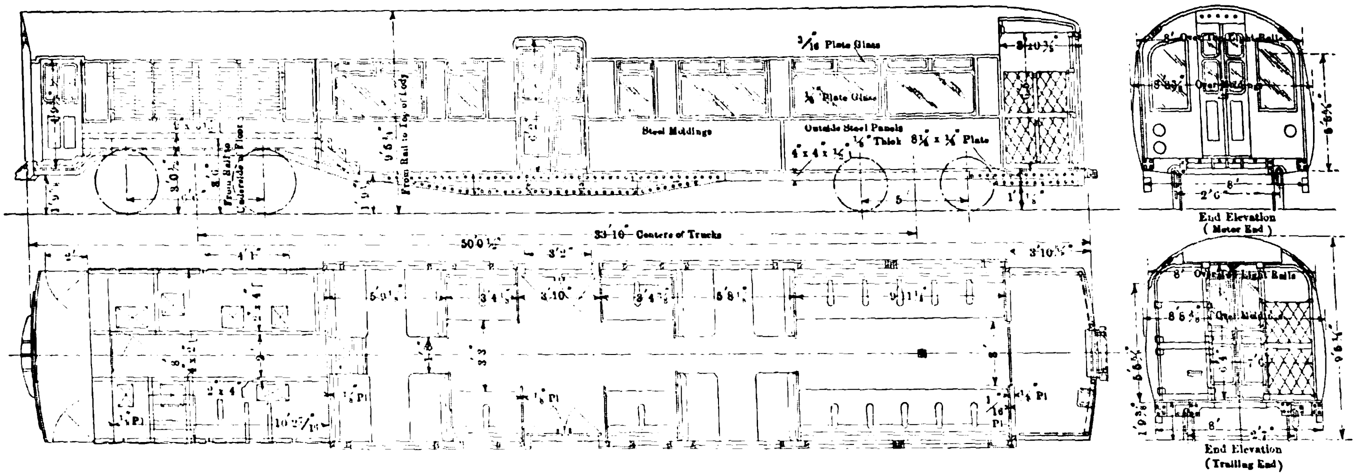
was desirable. The trucks now used have been tried out for four years and, beyond a few troubles which have been overcome, have shown themselves decidedly more economical to maintain and more comfortable in running than the old type. The weight of the new pressed-steel motor truck of 7-ft. 3-in. wheelbase is approximately 12,400 lb. complete with wheels and axles, as compared with the old 6-ft. 6-in. motor truck of 11,300 lb. The new pressed-steel trailer truck of 7-ft. wheelbase complete with wheels and axles weighs approximately 8000 lb., as compared with 7500 lb. for the old trailer trucks of 5-ft. wheelbase. The increase in wheelbase was made to get inside brakeshoes and to reduce the wear on the track.

The new motor truck has a width of 6 ft. 1 in. over end bars, a length of 11 ft. 4 in. over the end bars, and wheels of 36-in. diameter. The trailer truck has a width of 6¼ ft. over the end bars, a length of 11 ft. 2½ in. over end bars, and wheels of 30-in. diameter. Unlike American motor and trailer trucks the springs under the bolster are spiral instead of elliptical, while the springs at the journal boxes are elliptical instead of spiral. On both trucks an anti-vibration packing 1 in. thick is placed between the underside of the bottom spring seat and the top of the spring plank. The journal boxes are of cast steel. Both the motor and journal which are illustrated are combined with the thrust block. This block is of cast steel and is lined with white metal on phosphor bronze strips which serve to key the metal and also to prevent the swaying of the axle if the bearing metal should run out.

The motor truck carries two 230-hp GE-212 commutating-pole motors with a gear ratio of 3.37. The control is Type M. The air-brake equipment includes a CP-30 compressor on each motor car. The weight of each motor is 6100 lb., or 26.5 lb. per rated horse-power. The weight of the motor car complete is 76,160 lb., of the motor truck complete 24,640 lb., of the trailer truck complete 7840 lb., of the motor-car body complete and equipped 43,680 lb. The horse-power per ton (of 2000 lb.) of train is 7.36. The total floor area, as previously noted, is 320 sq. ft., and this figure corresponds to 11.5 sq. ft. per long ton for a motor and trailer car combined, 9.4 sq. ft. for the motor car only and 14.7 sq. ft.



LONDON UNDERGROUND CARS—STEEL FRAMING FOR MOTOR CARS OF METROPOLITAN DISTRICT LINE


3/16 Plate Glass
Steel Moldings
Outside Steel Panels 1/8" Thick
33-10" Centers of Trucks
50'0½"
End Elevation (Motor End)
End Elevation (Trailing End)

Electric Ry Journal

LONDON UNDERGROUND CARS—ELEVATIONS AND PLAN OF CENTER-ENTRANCE STEEL CAR FOR TUBE SERVICE

for the trailer only. The weight per seated passenger is 1280 lb. for motor car and trailer car combined.

The District cars and trucks were built by the Gloucester Carriage & Wagon Company, Ltd., to the designs of the mechanical engineer of the railway company.

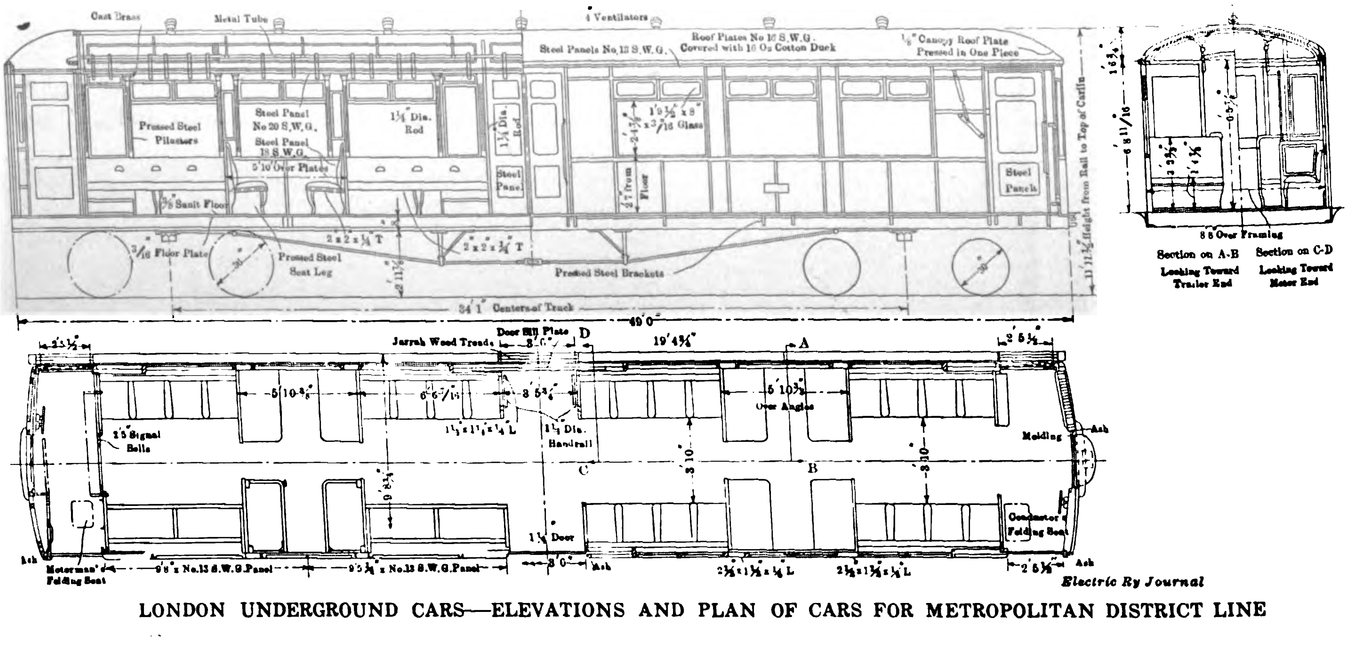
LONDON ELECTRIC RAILWAY CARS

The new motor cars of the London Electric Railway are also of steel construction. The framework is built up of commercial sections with the exception of the fish-belly side girders. The end sill at the trailer end is a 4-in. x 4-in. x ½-in. angle while that at the end sill at the motor end is a special steel pressing. The center longitudinal sills and cross-bars are 4-in. x 2-in. channels weighing 8 lb. per foot. The side posts are 2½-in. x 2 in. x 3/16 in. angles, and the carlins 1½-in. x 1½-in. x 3/16-in. angles. There are no diagonal braces in the side framing, the side plating being sufficient. At the center entrance the framing is reinforced by a fish-belly plate ¼ in. thick and 12 in. maximum depth with a second 4-in. x 4-in. angle. The panels are of ⅛-in. steel plate. Ventilators of an unusual cast-grid type to the number of six are set flush in the ceiling practically over the seats. These lead into an air duct which is open to the atmosphere at each end of the car, the ends being protected by hoods.

It will be observed from the accompanying plan and elevations, that the doors at the control end are for the use of the motorman only. A distance of approximately 11 ft. for the full width of the car is required for the control equipment because the limited clearance in the Bakerloo, Piccadilly and Hampstead tubes does not permit this apparatus to be placed under the car floor. In fact, the over-all height of the car above the rails is only 9 ft. 5¼ in. The control end of the car is mounted on a truck of 6-ft. 6-in. wheelbase supplied with wheels of 36-in. diameter. The trailer truck is of 5-ft. wheelbase and has wheels of 30-in. diameter. The trailer end of the platform is fitted with swinging gates.

The novel feature of this car is the center-door arrangement. The doorway itself is 6 ft. 2 in. high and is equipped with two passenger-operated doors which are pushed inward to give a clearance of 3 ft. 10 in. at the threshold. These hinged doors are self-closing and are supplied with electrically controlled locks. Small signal lamps are installed at the conductor's station to indicate when the doors are closed and locked. These are the first European cars in which light signals have been used for such a purpose.

The electric lock-operating mechanism consists of resistances *R*1 and *R*2, a double-throw switch *A* operated by hand, a double-throw switch *B* operated by the end gates of the car, door contact *C*, and latch-lifting magnets *D*, which also operate contact *E*. For normal operation the switch *A* is closed on contact No. 1. When the end gates and middle doors are closed switch *B* is on contact No. 3. Current then flows through *R*1, *R*2, *R*3, *E* to the green lamp, which indicates to the conductor that the middle doors are closed and locked.

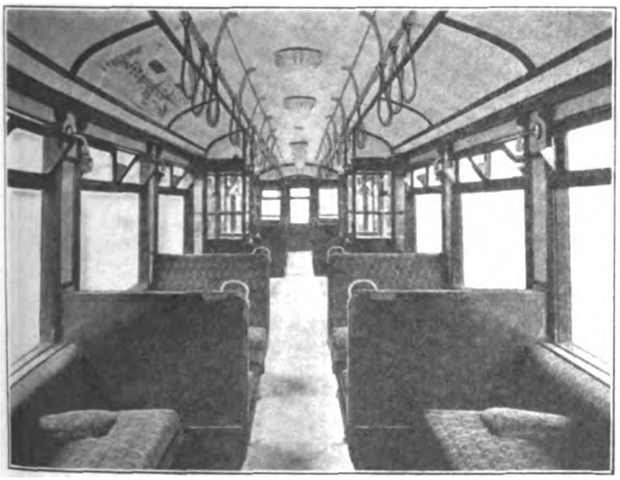

Cast Brass
Metal Tube
4 Ventilators
Steel Panels No.13 S.W.G.
Roof Plates No 16 S.W.G. Covered with 16 Oz Cotton Duck
1/8" Canopy Roof Plate Pressed in One Piece
Pressed Steel Pilasters
Steel Panel No 20 S.W.G.
Steel Panel 18 S.W.G.
5'10 Over Plates
1¼ Dia. Rod
Steel Panel
3/16 Floor Plate
Pressed Steel Seat Leg
Pressed Steel Brackets
34'1" Centers of Truck
49'0"
8'8 Over Framing
Section on A-B Looking Toward Trailer End
Section on C-D Looking Toward Motor End
Jarrah Wood Treads
Door Sill Plate
19'4¾"
Over Angles
2½" Signal Bells
1¼ Dia. Handrail
Molding
Ash
Conductor's Folding Seat
Motorman's Folding Seat
9'8" x No.13 S.W.G. Panel
9'5¾" x No.13 S.W.G. Panel
1¾ Door

Electric Ry Journal

LONDON UNDERGROUND CARS—ELEVATIONS AND PLAN OF CARS FOR METROPOLITAN DISTRICT LINE

When the gates are opened the switch *B* makes contact at *B*4, and the current flows through *B*1, *A*1, *B*4, coils *D* to the red lamp, unlocking the middle doors. If the middle doors are now opened, a circuit is closed through contacts *C*. If the conductor now closes the end gates the current flows through *A*, *C*, *D* to the red lamp, so that this remains alight, indicating that the middle doors are open. When the middle doors close contacts *C* are lifted, opening the circuit through the coils *D*, the latches fall and the circuit is closed again through *E*, lighting the green lamp. If it is desired to open the middle doors without opening the end gate, switch *A* is placed on contact No. 2. To open the end gate without unlocking the middle doors switch *A* is placed in the "off" position. The resistance of *R*1 is 1600 ohms. The resistance of *R*2 is equal to that of the lifting coils, which is 800 ohms.

Each motor car is fitted with two GE-212 motors and Type M control. The motor trucks are similar in construction to those used on the Metropolitan District Railway. The trailer trucks are of special design on account of the low car body, the floor of which is only 22 in. above the rail. The seating arrangement consists of sixteen cross-seats and twenty side-seats. As in the District cars, the side-seats are divided by barriers to form seats for individual passengers. The transverse seats are 38 in. wide, the aisles between the seats are 20 in. wide and between the longitudinal seats 39 in. wide. The cars were built by the Brush Electrical Engineering Company, Loughborough, to the designs of Mr. Agnew.



LONDON UNDERGROUND CARS—INTERIOR OF NEW METROPOLITAN CARS, SHOWING IMPROVED LIGHTING

The floor spaces and weights of these cars are as follows:

Length over end sills	50 ft. 0½ in.	
Centers of trucks	33 ft. 10 in.	
Area of passenger compartment	256 sq. ft.	
Number of seats	36	
Weight of car body without equipment	29,500 lb.	
Weight of equipment in body	4,500 lb.	
Total weight of body and equipment		34,000 lb.
Weight of motor truck without equipment	12,200 lb.	
Weight of motor truck completely equipped		24,500 lb.
Weight of trailer truck complete		6,500 lb.
Total weight of car		65,000 lb.

The accompanying half-tone of the car marked "London Electric" is that of a trailer car, but it will serve to show the general form of the motor car described. The main difference in the outside appearance is that the control section is fitted with louvered openings instead of windows.

Separation of Freight and Passenger Operating Expenses Ordered

The Interstate Commerce Commission, on June 13, handed down a decision requiring railway companies in Class I, or those having annual revenues of $1,000,000 and over, to separate their operating expenses between freight and passenger service as outlined in statistical series circular No. 3. This circular will be revised, and if sufficient progress can be made the carriers will be asked to file a special report for the year ending June 30, 1915.

In its decision the commission reviews the history of this plan. Prior to 1894 such a separation was required, but it was discontinued because the railroads claimed that in only a few expenses was an accurate separation possible. The commission believes that during the past twenty years railway accounting and accounting generally have developed so that a reconsideration of the matter seems warranted. The commission then cites the railroads which are now following the plan. They include approximately half the mileage of the large carriers in the United States. The officials of these roads say that they have made this voluntary separation to secure efficiency and not for rate-making purposes, and that, when conducted on this basis, it is not so important that the arbitraries used are exactly correct or not. The commission states that it is not interested in statistics of this character merely for the purposes of rate making. The statistics would be valuable for making comparisons, and it is the duty of the commission to keep itself informed in regard to the manner in which the railway business is conducted and to have a knowledge of variations in unit costs.

It was urged that if the commission really needed this information a special study should be undertaken at any time for the individual case considered, but the commission thinks that while such special study would be necessary it cannot take the place of general statistics systematically compiled year after year. It was also suggested that the commission should wait until the courts had rendered decisions in certain pending rate cases before making this requirement, but the commission thinks it is justified in making the order because the courts have a right to look to the commission for careful study of railway statistics and accounts.

Another argument urged against the plan was the possible misuse of the information collected. It was urged that to give cost accounting information to the public would be the same as giving dangerous instruments to children. The commission believes, however, that a systematic development of the subject and its free discussion is the best safeguard against the misuse of cost figures. Commissions and legislators are not intentionally unfair, and if any of them have enforced unjust rates, statistics of the kind contemplated might have convinced them that some other schedule would have been more just.

Another argument against the adoption of the plan was its expense. On this point the commission says that the carriers were asked to submit estimates of this expense, and the estimates varied from $78.29 per mile for the Lackawanna to $3.17 per mile for the Southern Pacific. The commission believes that if expense alone were to be the determining factor, a new estimate will have to be made after its revised circular has been published.

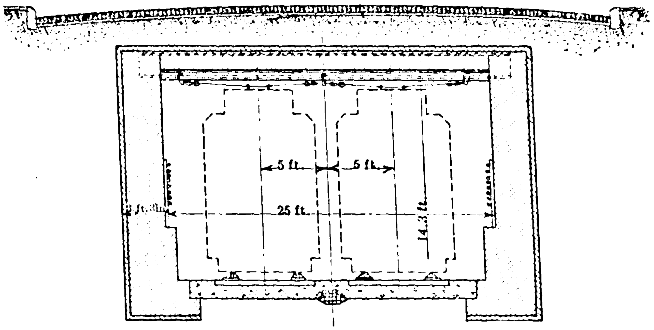
The commission concludes its report by saying that in the light of all the suggestions received a workable plan will be developed which it believes will not be unduly prejudicial to the carriers.

Subway Development at Buenos Ayres

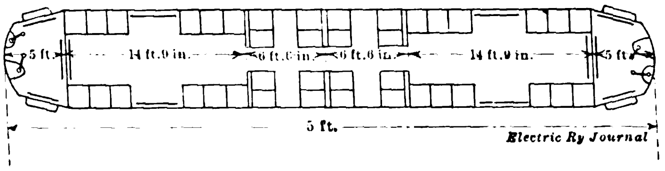
The System Is Remarkable for the Use of 1100-Volts Direct Current, and the Operation of the Same Cars for Subway and Street Operation

In a recent issue of the *Elektrotechnische Zeitschrift* E. E. Wachsmann presents some interesting particulars on the subway lines of Buenos Ayres. The population of Buenos Ayres, in 1913, was 1,457,885, and in the same year the number of passengers carried by the street railway system was 407,252,140, before real rapid transit was inaugurated. The system now in service covers 10 miles and is operated by the Compañia de Tranvias Anglo-Argentine, Ltd. The franchise was obtained Dec. 28, 1909, and construction was begun almost immediately.

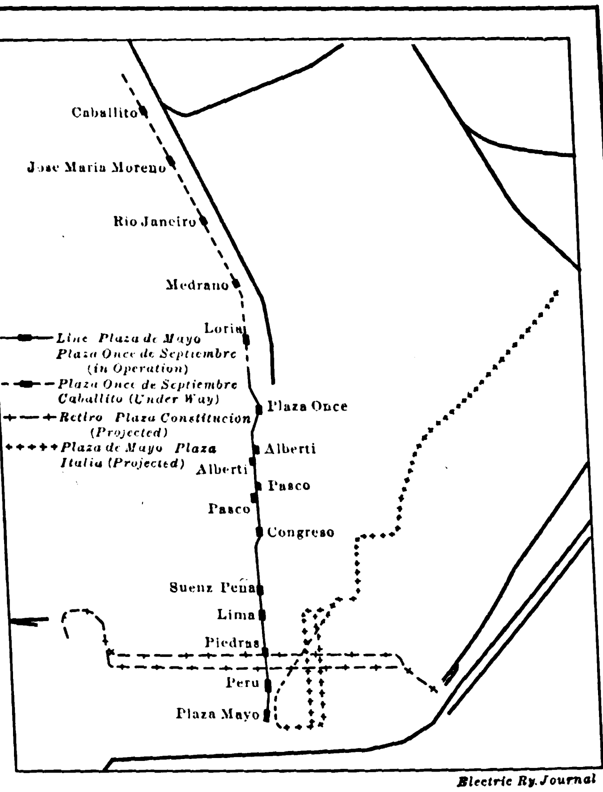
The franchise covers three routes as follows:


5 ft.
5 ft.
3 ft. 3 in.
25 ft.
14.3 ft.
Electric Ry Journal

BUENOS AYRES SUBWAY—PLAN SHOWING PROFILE VIEW OF THE TUNNEL


5 ft.
14 ft. 9 in.
6 ft. 6 in.
6 ft. 6 in.
14 ft. 9 in.
5 ft.
5 ft.
Electric Ry Journal

BUENOS AYRES SUBWAY—ARRANGEMENT OF DOORS AND SEATS IN PASSENGER CARS


Caballito
Jose Maria Moreno
Rio Janeiro
Medrano
Loria
Line Plaza de Mayo Plaza Once de Septiembre (in Operation)
Plaza Once de Septiembre Caballito (Under Way)
Retiro Plaza Constitucion (Projected)
Plaza de Mayo Plaza Italia (Projected)
Plaza Once
Alberti
Alberti
Pasco
Pasco
Congreso
Suenz Peña
Lima
Piedras
Peru
Plaza Mayo
Electric Ry. Journal

BUENOS AYRES SUBWAY—PLAN SHOWING ROUTE OF PRESENT LINE AND FUTURE ROUTES

Line 1.—Plaza Mayo through the Avenida de Mayo to the Plaza Congreso-Plaza Once, with a later extension to Plaza Primera-Junta (Caballito), 4.34 miles, known as the Mayo-Once-Caballito line.

Line 2.—At right angles to the former and running from Constitucione to Retiro, about 2.79 miles long.

Line 3.—Plaza Mayo in a northwesterly direction to Plaza Italia, about 4.03 miles long.

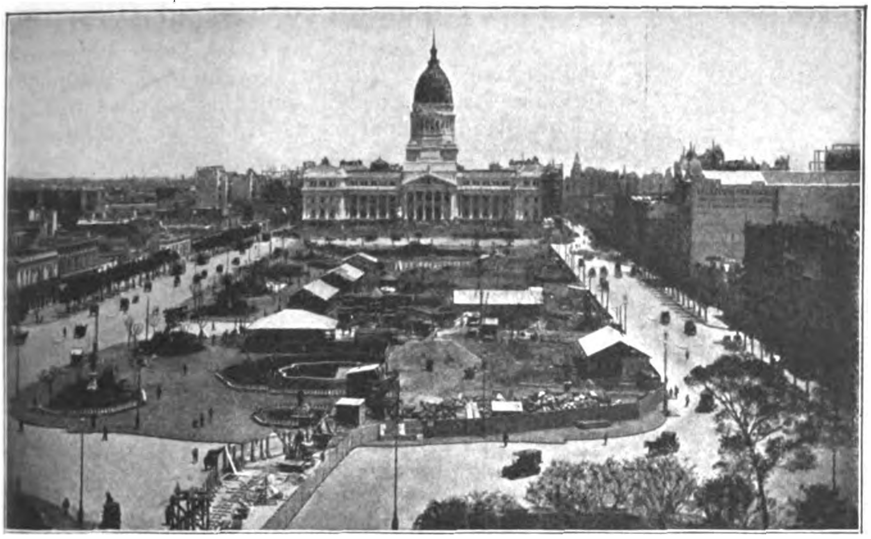
The present installation is double-track throughout, with nine stations, spaced about 1300 ft. apart. The average grade does not exceed 0.5 per cent. The greatest distance between the head of the rails and the surface of the street overhead is 26 ft. and the least is 16 ft. As the accompanying map shows, there are very few curves.

CONSTRUCTION OF TUNNEL

The clear height of the tunnel between the head of the rails and the roof is 14.3 ft. and the clear width 25 ft. No columns divide the tracks. The tunnel roof is usually built up of brick and steel, reinforced concrete being used only at the four-track section near Plaza Once station. Tar paper and asphalt are employed for weatherproofing. Ventilating shafts of 32 sq. ft. opening are installed about 525 ft. apart. Translucent roof coverings are also used wherever possible, so that the subway has many daylight sections. Work on the subway was begun in November, 1911, and ended twenty months afterward. The cost of construction was $7,087,500. The excavation amounted to 527,000 cu. yd. The masonry amounted to 77,500 cu. yd., using 31,000,000 brick and 108,000 bbl. of Portland cement, weighing 374 lb. each. Other quantities were 13,000 tons of columns and 96,840 sq. ft. of waterproofing.

TRACK, LINE AND STATIONS

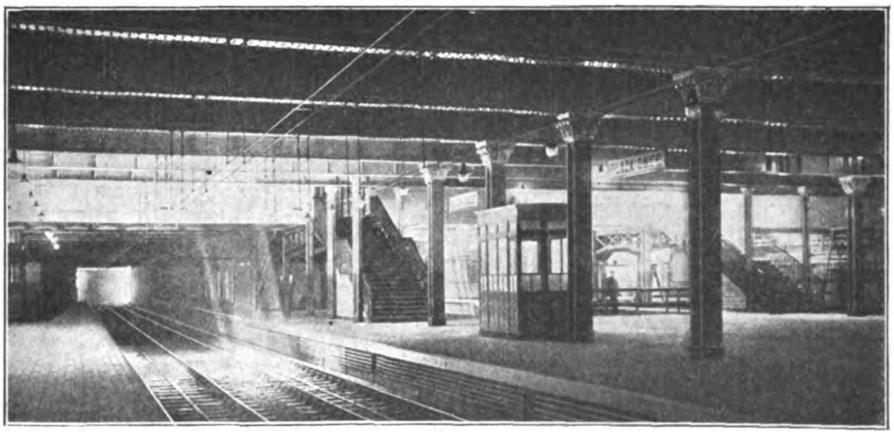
The track consists of 87.5 lb. rails placed on wooden ties. The stations are generally 328 ft. in length, which is enough for six-car trains. They are entered from the sidewalk by two stairways, each having an archway with an illuminated destination sign. A different color scheme is used for each station. At the most important station, Plaza Once, there are six tracks, the four outer ones being used for the subway service and the two middle tracks for interchange of passengers with the Western Railway. Power is purchased from the central station of the Deutsch-Überseeischen Electricitäts-Gesellschaft via four substations. The distribution system includes 550 volts for the surface lines and 220 volts for lighting. In view of the forthcoming operation over surface railway extensions, current collection in the subway is by means of two 1100-volt



BUENOS AYRES SUBWAY—PLAZA CONGRESO, A NOTABLE CENTER OF BUENOS AYRES. EXCAVATION WORK APPEARS IN THE FOREGROUND

100 sq. mm. (about No. 0000) grooved wires per track. Pantograph collectors are used. Of course, overhead current collection meant the high headroom already referred to, but the greater clearances will conduce to a cooler subway. Furthermore, ground water is not a disturbing factor.

The selection of the signal system was of particular importance owing to the intention to operate trains on only 1½-minute headway. The installation is of the semi-automatic type, similar to that used on the Hamburg Rapid Transit System. The indications are visual and are displayed only in the direction of running. The signal attendant also has charge of the switches, which are electrically operated with current from storage batteries. It is proposed to use straight automatic signals on the sections of this line next to be constructed. Every station has a large illuminated clock which is operated electrically from the central office of the company.



BUENOS AYRES SUBWAY—PLAZA ONCE STATION, WHERE PASSENGERS ARE INTERCHANGED BETWEEN SUBWAY AND STEAM RAILROAD

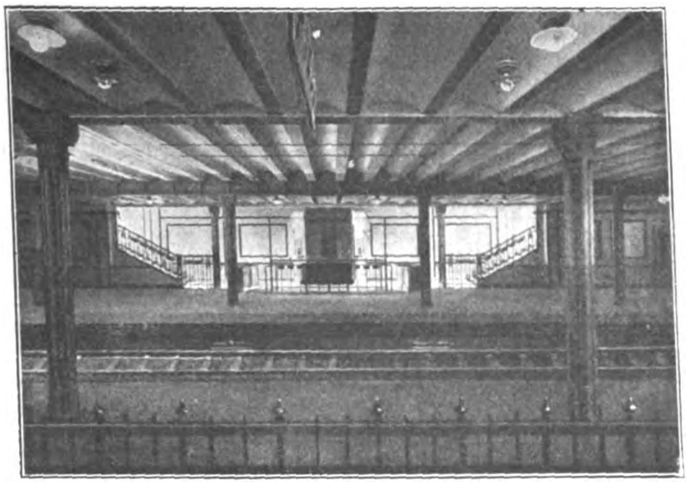
Rolling Stock

The cars are unusual in having end-drop platforms for street railway service and flush-floor side entrances for subway service. They are 52 ft. long, weigh 30 metric tons, and have twenty-four longitudinal and sixteen cross-seats upholstered in leather. The two doors on each side of the cars have a clear opening of 48 in. These doors are locked when the car operates on surface track; contrariwise, the doors on the end platforms are closed when the car is operated in the subway. Each car is equipped with two 115-hp. A.E.G. motors, operated at 560 r.p.m. The driving wheels have a diameter of 36 in. The rate of acceleration is 1.33 m.p.h.p.s. On the surface sections the control current is taken direct from the trolley, but on the tunnel sections it is secured at 500 volts from a motor-generator set. Air is provided for Knorr brakes, sanders and current collectors. Thus far fifty motor cars are in service. They are maintained at a shop with three bays, one for general machine work and two for 100 cars each. No trailers are used. The speed on the 1100-volt sections is 31 m.p.h.

BUENOS AYRES SUBWAY—AVENIDA DE MAYO, SHOWING SUBWAY ENTRANCE

Operation and Service

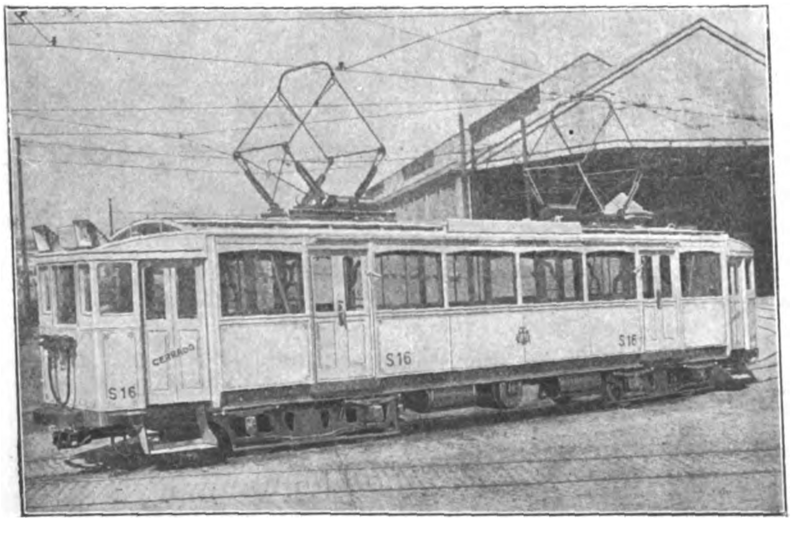
Until the line is extended to Cabalito, and previous to the electrification of the Western Railway's underground lines, the service between Plaza Mayo and Plaza Once will be with two to four-car trains at intervals of three to five minutes. When the line is extended to Caballito the trains will be broken up at Plaza Once into single cars for surface operation beyond that point. On return the cars will be coupled again into trains. The maximum length of the train is six cars.



BUENOS AYRES SUBWAY—SHOWING SIDE VIEW OF A TYPICAL STATION

This means that with a headway of 1½ minutes 16,800 persons can be carried in each direction per hour. The scheduled speed is 12.4 m.p.h., so that the trip between the present terminals can be made in 10 minutes and to Cabillito is 18 minutes. The average stopping time per station is 20 seconds. On the Mayo-Once section stations are about 1400 ft. apart, whereas on the outer or Once-Caballito section they are about 2600 ft. apart.

A unit fare of 10 centavos (Argentine silver) is charged for subway riding plus 5 centavos for a continuation of the ride on surface lines. The city receives 6 per cent of the gross earnings. The company's franchise is for eighty years. Tickets may be bought at the stations from automatic machines, which print the price, the date, the hour, the serial number and station. Service is given from 5 a. m. to 1 a. m. In 1913, 4,080,000 passengers were carried per mile of single track.



BUENOS AYRES SUBWAY—STANDARD MOTOR CAR WITH DOOR AND STEP SYSTEM FOR BOTH SUBWAY AND SURFACE OPERATION

Acknowledgment is due the Allegemeine Company for its courtesy in permitting the use of the halftones which illustrate this article.

The London, Brighton & South Coast Railway has sent about forty of its men, drawn from all ranks, on a visit to Germany to witness the latest electrical developments in that country and incidentally to inspect the Berlin works of the Allgemeine Company which is supplying a large part of the electrical equipment for the suburban lines of this railway.

A Labor Paper on Municipal Ownership

In its issue of July 18, the *Union Labor Advocate*, of Washington, D. C., the official organ of the Washington Building Trades Council, which is affiliated with the building trades department, American Federation of Labor, prints the result of an investigation which it has made of the municipal electric railways in the far western Canadian cities. Of municipal ownership of these railways it says in part:

"Municipal ownership, particularly of street railways, has been absolutely discredited in the house of its friends.

"Members of labor living in cities operating municipally owned street railways have come forward with testimony and evidence proving the abject failure of municipal ownership.

"The *Union Labor Advocate*" this week has received letters from the members of the three typographical unions in Edmonton, Lethbridge and Saskatoon, Canada, telling of the experience with municipally owned and operated street cars in those cities and showing varying degrees of failure in all.

" 'Although the news might be disappointing to you, I must give an unbiased, unpolitical opinion on such a question as municipal ownership—it is an utter failure in Edmonton,' writes J. Hanning, secretary of the Typographical Union of that city, on learning that municipal ownership of the street railways of the American capital is proposed and advocated by some union men.

" 'Our street cars have undoubtedly not been a success. I am no longer a believer in municipal ownership,' writes Secretary J. J. Jones, of Lethbridge.

"In Saskatoon, where the municipally owned street railway is only a year old, Secretary R. J. Moore still believes in municipal ownership, though he says that the railway has not been a success financially and tells of popular distrust in the management and dissatisfaction with the service."

The *Union Labor Advocate* then publishes the letters in question. That from Edmonton is printed complete below:

"Your letter dated June 26 has received my careful consideration, and although the news might be disappointing to you I must give an unbiased, unpolitical opinion on such a question as municipal ownership—it is an utter failure in Edmonton. The street car system is the poorest of five cities I have lived in—Toronto, Vancouver, Portland, Winnipeg and Edmonton—and the fares are equal to the highest—straight 5 cents.

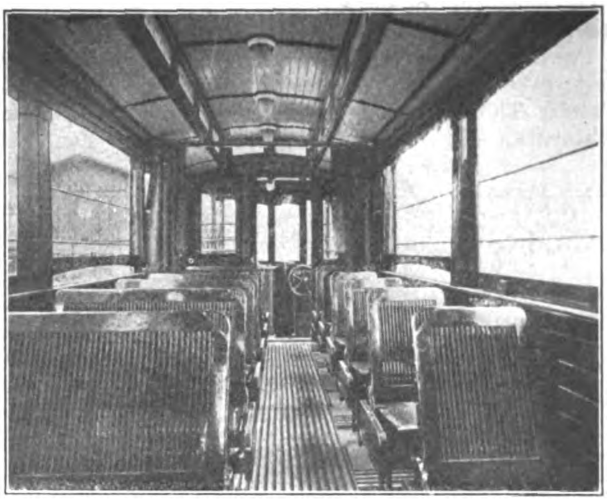
"The reason for the failure of municipal ownership to compete or even compare with private ownership in this city is because the spoils system entirely eliminates all chances of getting competent men to run it. Every year the administration changes and with it the entire staff goes too. Always incompetent men are given the jobs, their ability lying in their power to get votes. We have the real estate alderman who makes it his business to use his influence to get a stub line built at the city's expense to a subdivision in the woods for the purpose of selling town lots and incidentally piling on the expenses of the corporation (city) by running empty cars to unpopulated districts.

"It is true they have lost $400,000 since its inception and it looks as though they will lose more. The city owns the electric light system and sells the street car service power at 2 cents per kw-hr., robbing Paul to pay Peter. Residents pay as much as 8 cents per kw-hr."

Electric Railway at Constantinople

Constantinople, the last stronghold of Turkey in Europe, now has an electric railway service, the present routes of which are shown in the accompanying map. The first section, which was opened in August, 1913, is in the Pera district. The service has proved enormously popular, 20,000 people a day being handled at the Pera station where passengers transfer from a cable line between Galata and Pera. The system is of meter gage and generally is double tracked. The lengths of the present routes total 18.6 miles of single track. Extensions which would bring the total length of the system to 31 miles of single track are now under consideration. One of the most beneficial accompaniments of the electrification has been the leveling and widening of many narrow streets.

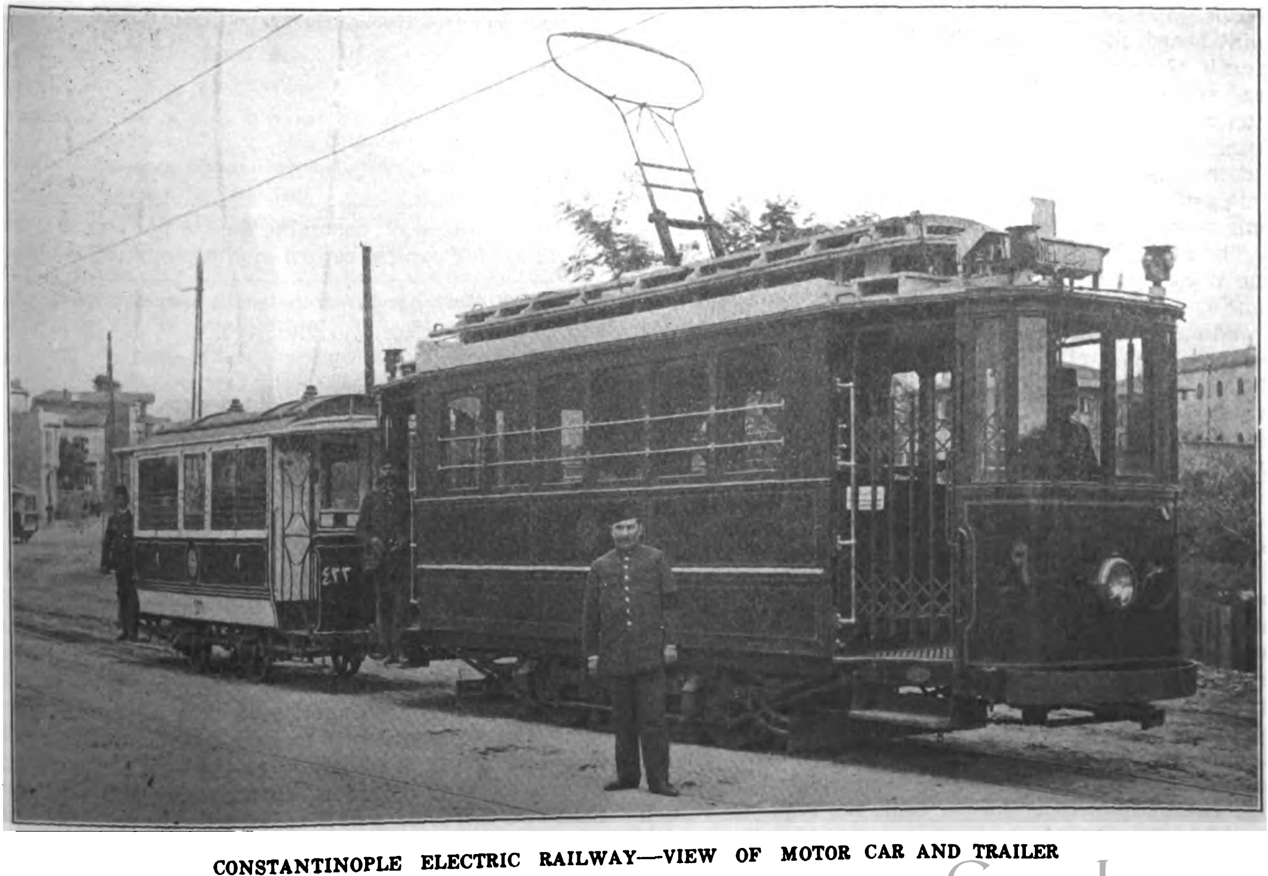
The power plant at Siligthar contains three 6000-hp Brünner turbo-generators, which furnish three-phase current at 9600 volts and fifty cycles. The transmission system has three substations, namely, Bayazid, Galata and Taxim. Each substation contains a 400-kw 600-volt rotary converter. Both the high-tension and low-tension feeders are carried in underground cables. The overhead construction is of the ordinary side-pole type because the construction of the houses did not permit the use of rosettes despite the narrowness of the streets. The poles also carry arc lamps and two sets of telephone wires. On Pera Street, however, the telephone wires are carried underground. Every pole is topped by an ornament made up of a fez and Turkish crescent.



CONSTANTINOPLE ELECTRIC RAILWAY—INTERIOR OF CAR, SHOWING CURTAIN FOR HAREM SECTION

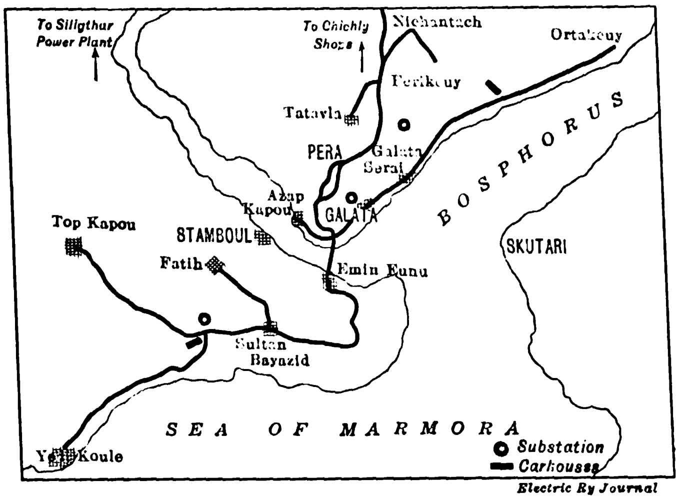
The present rolling stock consists of forty first-class motor cars, seventy second-class motor cars and fifty trailers. Another fifty motor cars are now on order. Each car seats eighteen passengers on reversible cross seats, the narrowness of the car permitting only a single-passenger seat on one side of the aisle. Not more than three standees are permitted inside the car, but seven are allowed on each platform. A feature peculiar to Mohammedan practice is the use of a hanging curtain to screen off one part of the car to form a harem section. This curtain may be shifted according to the number of women in the car.

The trucks of these cars have a wheelbase of about 7 ft. to permit them to operate over curves of 49 ft. The equipment per car includes two Siemens-Schuckert D-58 commutating pole motors which are rated at 40 hp at 420 r.p.m. The maximum speed for motor cars on level track is 15.5 m.p.h. The controllers have nine running and six braking positions. Ordinary braking is done by hand, the electric brake being used only for emergencies. In addition a magnetic track brake is used on grades. Only the first-class cars have electric heaters. Of the three carhouses, that at Chichly is combined with the repair shops, stores and



CONSTANTINOPLE ELECTRIC RAILWAY—VIEW OF MOTOR CAR AND TRAILER a residence for the operating officials. The contractors for the different parts of the line follow:

Power plant at Siligthar, Ganz & Company, Budapest; overhead line, Allgemeine Company; substations, French Thomson-Houston Company; car bodies, Maschinenfabrik Augsburg-Nürnberg A.G., Van der Zypen & Charlier and La Croyere Company; trucks, United Electric Car Company, Ltd.; forty motor car equipments and the bow collectors, Allgemeine Company; all other car electrical equipment, Siemens-Schuckert Company.



Electric Ry Journal

CONSTANTINOPLE ELECTRIC RAILWAY—MAP OF STREET RAILWAY SYSTEM

Maximum Length of Profitable Ride in Boston

In connection with a report upon transportation conditions within the Boston metropolitan district submitted to the last Legislature, the Massachusetts Public Service and Boston Transit Commissions, sitting as a joint board, filed an appendix discussing the maximum length of profitable ride on the Boston Elevated Railway system. The board recognizes that the determination of this question does not admit a general answer, being dependent upon certain assumptions, but it works out the case for Boston on the supposition that the average passenger rides two-thirds of the length of each half round trip. The appendix is abstracted below.

The capital of the Boston Elevated Railway (without the West End company) is $48,229,400; allowing 5 per cent as a fair rate of return on the stock and notes outstanding, and the actual bond interest paid, the total return on the capital is $2,496,784, or 5.18 per cent. If the capital included in the leased West End Street Railway is included, the total capital on which the company is responsible for a return is $86,383,550 (not including the Boston subways, whose rentals are deducted in the following tabulation, and a few small items). The total return upon this is $4,661,435, or an average of 5.40 per cent. The board states that in view of the fact that the capital of these companies has been issued under the approval of the former Railroad Commission and that the same board has in the past fixed the price at which Boston Elevated stock shall be issued at as high as $150 per share (par value $100) it cannot be urged with reason that this average rate of return is too high. If as small a sum as 1.6 per cent is allowed per annum for depreciation charges, the company should earn a total of 7 per cent on its capital; if the depreciation charge allowed is 2.6 per cent, the requisite return would be 8 per cent.

STUDY OF OPERATING DATA

Operating expenses, 1912-1913	$11,135,581.18
Taxes, 1912-1913	1,128,021.51
Interest on West End Street Railway funded debt	776,360.00
Interest on West End stock and other charges on leased property	1,468,819.15
Subway rentals	687,308.54
Total charges except return on Boston Elevated investment	$15,196,090.38
Total number of revenue passengers	326,352,863
Total number of passengers riding on each line, including revenue passengers and those who transfer from the line on which they pay fare to another line, either by check or free bodily transfer, estimating the transfer passengers as 0.6 of the revenue passengers	524,666,992
Total car miles run	57,504,571
Total number of half round trips	13,443,554
Average length of half round trip, in miles	4.28
If it is assumed (contrary to the facts) that every passenger rides the entire length of a half round trip, the total number of passenger miles becomes	2,245,574,726
As each passenger does not do this, it is assumed that two-thirds of each half round trip is the average length of ride, making the following estimated total passenger mileage	1,497,049,817

The actual cost per passenger mile then, excluding return on investment, depreciation and sinking fund charges, is

$$\frac{\$15{,}196{,}090}{1{,}497{,}049{,}817} = 1.01 \text{ cents}$$

If, then, the actual cost of carrying a passenger a mile, not allowing for return on investment, is 1.01 cents, it follows that if a passenger is carried $\frac{5}{1.01} = 4.95$ miles, his fare is entirely used for expenses, leaving no return on capital; in other words, a portion of each 5-cent fare must be reserved for return on capital, leaving only the remainder available for operating expenses and taxes.

Last year the capital of the Boston Elevated Railway received a total return of	$2,496,784
Other charges were	15,196,090
Total	$17,692,874

Every 5-cent fare was divided as follows:

$$\text{Return on capital } 5 \times \frac{2{,}496{,}784}{17{,}692{,}874} = 0.7 \text{ cent}$$

$$\text{Available for expenses and taxes } 5 \times \frac{15{,}196{,}090}{17{,}692{,}872} = 4.3 \text{ cents}$$

The maximum distance which the company could afford to carry a passenger for 5 cents, giving capital the return received last year is $\frac{4.03}{1.01} = 4.25$ miles.

If the total return on capital and for depreciation had been 7 per cent, the result would have been:

Return on capital and depreciation, 7 per cent on $48,229,400	$3,376,058
Expenses as above	15,196,090
Total	$18,572,148

In this case the proportion of the 5-cent fare available for expenses would be represented by the fraction $\frac{15{,}196{,}090}{18{,}572{,}148}$, giving as the return on capital, $5 \times \frac{3{,}376{,}058}{18{,}572{,}048} = 0.93$ cent.

$$\text{Available for expenses and taxes, } 5 \times \frac{15{,}196{,}090}{18{,}572{,}148} = 4.07 \text{ cents.}$$

Maximum length of profitable ride for 5 cents equals $\frac{4.07}{1.01} = 4.03$ miles.

In the same way, assuming that 8 per cent is a fair allowance for capital return and depreciation, we have:

Return on capital and depreciation, 8 per cent on $48,229,400	$3,858,352
Expenses as above	15,196,090
Total	$19,054,442

$$\text{Return on capital, } 5 \times \frac{3{,}858{,}352}{19{,}054{,}442} = 1.01 \text{ cents.}$$

$$\text{Expenses and taxes, } 5 \times \frac{15{,}196{,}090}{19{,}054{,}442} = 3.99 \text{ cents.}$$

Maximum length of profitable ride for 5 cents, $\frac{3.99}{1.01} = 3.95$ miles.

The commission considers these results very illuminating and points out that the only assumptions involved are the estimate of transfer passengers and that every passenger rides two-thirds of a half round trip. If less than six-tenths of the passengers transfer, the actual cost per passenger mile becomes greater than computed, from which it follows that the profitable ride would be less than 4.25 miles on the basis of the present return on capital. If every passenger also rides less than two-thirds of a half round trip, the profitable haul is also found to be less than 4.25 miles. The expense of operation is nearly constant, whether the passenger rides the entire length of a half round trip or only a fraction of that length, for wages and all other expenses except for the additional power necessary. The commission considers the estimate of 4.25 miles as the maximum profitable haul at Boston under present conditions "to be as close an approximation to the truth as can be deduced from the available statistics."

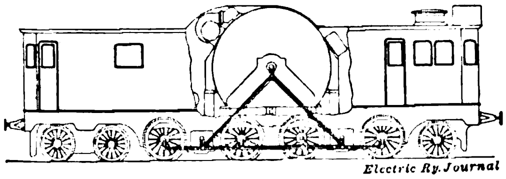
Drive and Equipment of Electric Locomotives*

BY F. LYDALL

Since the author's paper on "Driving Systems of Electric Locomotives" was completed, a few new designs have been developed and more experience has been gained. Two new designs are illustrated, being those brought out by the Bergmann Company for the Silesian Railways.

Type 2-D-1 of the Bergmann Company is shown in the first illustration, the special feature being the provision of two jack shafts coupled by inclined connecting rods to the armature shaft of the single motor. The obvious advantage of this design is that the torque produced by the one powerful motor is divided between two jack shafts. The locomotive is at present in course of construction.

Type 2-B + B-1 of the Bergmann Company is shown in the third illustration. The rating of the two motors on this articulated locomotive is the same as that of the single motor in the one just described. The mechanical arrangement is, however, entirely different, the jack shaft in each half being geared to the corresponding motor shaft. The Siemens-Schuckert Company is also building for the Silesian Railways a locomotive with gear-wheel drive on jack shafts.

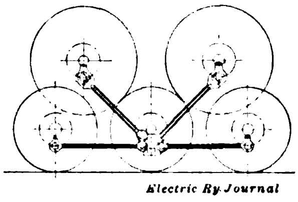


LOCOMOTIVE WITH TWO JACK SHAFTS COUPLED TO ONE MOTOR

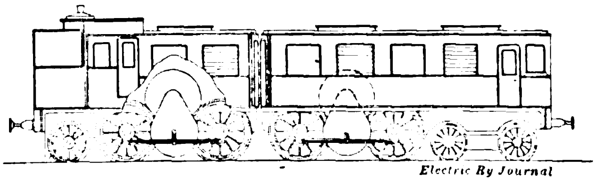
Before leaving the subject of new designs, mention must be made of the so-called "two-rod drive" developed by Brown, Boveri & Company. Two locomotives of the general type 1-C-1 have been ordered from this firm by the Baden State Railway Administration for service on the Wiesental line. The special feature of this design, also illustrated, is that the two motors, which are mounted near the center of the body and well above the centers of the driving axles, drive direct on to the central driving axle without the intermediary of any jack shaft. The arrangement follows the lines of the Scotch yoke system in that the bearing on the crank-pin of the driving axle is free to move up or down in a vertical slot in the connecting rod which connects this crank with the corresponding crank of one of the motors. It differs, however, from the Scotch yoke in that the two connecting rods from the cranks of the two motors are pivoted together at the bottom angle instead of being rigidly connected so as to form a frame. This design is used to eliminate the heavy and expensive jack shafts with their cranks and bearings, etc., and to provide an arrangement in which great accuracy of adjustment of motor axle and jack-shaft positions is necessary.

LOCOMOTIVE EXPERIENCES

Attention has been drawn in the technical press to the difficulties experienced on the Wiesental Railway with the locomotives supplied by the Siemens-Schuckert Company. These locomotives are of the 1-C-1 type with two single-phase motors driving down by connecting rods on to a single jack shaft between two of the three coupled driving axles. Nine of these locomotives were delivered during 1913, and during the first month of working a number of mishaps occurred, some trifling and others more serious. The occurrences of minor importance were due to difficulties with the four-part motor bearings, the sand pipes and other small details. These matters were put right without any serious disturbance or any substantial modifications of the general design. The more serious mishaps were apparently due to some fundamental cause. It was found that at a certain speed the connecting rods and coupling rods on both sides of any of these locomotives started to vibrate and that this vibration gradually increased as the speed rose until, at a speed of about 22.3 m.p.h., it reached a maximum of considerable amplitude. This speed seemed to be the equivalent of resonance, as the vibration practically disappeared as soon as the speed had risen to 24.8 m.p.h.



TWO-ROD DRIVE



LOCOMOTIVE WITH EACH JACK SHAFT GEARED TO ONE MOTOR

This peculiarity of coupling-rod systems is observable on practically all locomotives in which the effort of the motor or motors is transmitted to the driving axles by means of connecting rods, especially where a pair of motors are coupled to a single jack shaft or are rigidly coupled together by any arrangement of connecting rods. It is not confined to the construction adopted for the Wiesental locomotives but is also observable with Scotch yokes, as on the 1-E-1 locomotive for the Lötschberg Railway, on which breakages of the yokes have taken place.

Having determined the fundamental cause of breakage, the Siemens-Schuckert Company devised a new arrangement—particulars of which the author is not at liberty to publish—which, so far as can be seen after several months' working, eliminates the trouble. The new arrangement does not require any far-reaching alteration to the general design, the jack shaft being used as before with the two connecting rods and the coupling rods on each side.

At present there is a tendency on the Continent toward the use of gearing rather than connecting rods for transmitting the torque to the jack shaft or direct to the driving axles. If the author is not mistaken,

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*Abstract of a paper printed in the *Journal* of the Institution of Electrical Engineers, London, and supplementary to Mr. Lydall's previous paper on "Driving Systems of Electric Locomotives," as abstracted in the ELECTRIC RAILWAY JOURNAL for Dec. 27, 1913.

this is also the general conclusion in the United States, where the connecting-rod drive does not find much favor. For express passenger service, however, there still remains the difficulty of excessive gear velocity if gear drive is employed. For speeds which would be required in England, say, 75 m.p.h., it would hardly be practicable to run without some kind of forced lubrication for the gears, as, for example, by jets of oil directed against the surfaces of the gears in contact.

MOTOR AND CONTROL EQUIPMENTS

Motors for locomotives may be divided into two classes, namely, geared and gearless motors. The geared motor seems practically confined to locomotives of moderate speed, as, for instance, locomotives whose maximum speed never exceeds 60 m.p.h. to 65 m.p.h.; whereas for express passenger locomotives, with which speeds up to 80 m.p.h. or 85 m.p.h. may be reached, the gearless motor practically holds the field.

For d.c.-motors of moderate capacity there seems no difficulty in raising the supply voltage to 2400, as in the case of the locomotives for the Butte, Anaconda & Pacific Railroad. A step in advance of this is being tested on the Lancashire & Yorkshire Railway, where motor-car equipments are being supplied by Dick, Kerr & Company, each consisting of four 250-hp 1650-volt single-reduction single-geared motors with driving wheels of 44-in. diameter, the supply voltage being 3300. These equipments are said to work with perfect satisfaction, but it is evident that in some places inside the motor the clearances between live parts and the frame must be comparatively small. The electrical designer would feel happier in making the motor with ample internal clearances, and this could only be done by freeing the motor, by one or other of the various methods available, from the restrictions of the gage and the wheel diameter..

In considering the two a.c. systems the question of frequency is important. For three-phase locomotive motors, especially those operating in cascade, a low frequency is desirable. So far as capacity in relation to weight and bulk is concerned, polyphase induction motors make a very good showing. It must be remembered, however, in comparing induction motors with motors having series characteristics, whether direct current or single-phase alternating current, that the induction motor is rated at its maximum speed, that is to say, at a speed which may correspond to permissible maximum peripheral velocity of the rotor, whereas the series motor is rated on the basis of a speed which may be, and often is, not more than half the maximum. If series motors were especially designed to give their output on the one-hour rating at their maximum speeds they would compare very favorably with induction motors. In practice, the single-phase motor, even at the low frequency adopted as the standard on the Continent (sixteen and two-thirds or fifteen cycles) is undoubtedly more bulky than the d.c. motor.

In the course of the ensuing discussion J. B. Sparks, consulting engineer, London, said that the heavy currents in single-phase motors probably constituted one reason why single-phase locomotives are so much more expensive than d.c. locomotives. The cost of d.c. locomotives is already only $300 or $350 per ton. For example, the average cost of the forty-seven locomotives of the New York Central Railroad works out at just over $35,000, which is a little more than $300 per ton. Very few figures have been published for single-phase locomotives, but the cost is approximately double that of d.c. locomotives. For example, the 800-hp, 53-ton locomotives for the Mittenwald Railway cost nearly $30,000, or $560 per ton.

Preliminaries to the Financing of Electric Railway Projects

BY H. J. DOUDS, IN CHARGE OF DEVELOPMENT DEPARTMENT, J. G. WHITE COMPANIES, NEW YORK

We have presented to us every day from twelve to eighteen projects for the organization of new companies, the development of new properties, and the purchase, sale or extension of existing ones. About 20 per cent of these proposals concern electric railways. About 90 per cent of these projects are submitted to us in very incomplete form. Some suggestions as to the way in which they should be prepared in order to receive attention by bankers should be of interest to readers of the ELECTRIC RAILWAY JOURNAL.

Take a typical case of an electric railway that it is proposed to build between two towns. The first things we want to know are the names of these two places and where they are located. Too often the answer will be that they are so many miles apart, but that their names and situations cannot be disclosed. In such a case naturally there can be no further negotiations, for financiering cannot be initiated on pure hypothesis. But if the names of the towns are given, the information, of course, includes the States in which they are located. This enables us to tell at once the "local color" as to the acts or attitude of the legislature or of the public service commission of the State regarding such public utilities, which may have an important bearing on the proposed investment.

The population of the two places and of the towns and townships in between, as shown by the latest United States census, should be given. We use these figures as a basis, making a proportionate allowance for the number of years that has elapsed since the last census was taken. To determine whether there have been any unusual factors influencing the growth of the population we check these federal statistics with the latest school census, post-office receipts, city and telephone directories. If no survey has been made of the contemplated route, the proposer should furnish approximate distance figures of the route mileage between the two towns.

Next is the question of the community of interests between the two places and the others that will be reached by the new road. Are the people interested in each other's welfare? Is the largest town the trading center of the surrounding country? What is the character of the population? What percentage of them own their homes? Are they thrifty, as shown by savings banks deposits? What industries are there in the region, and what is their history as to continuity of operation, labor troubles, etc.? From such information earnings of the new road are estimated, checked by further calculations as to probable car-mile and per-mile-of-road earnings. The latter are also checked with the gross earnings of analagous enterprises that have been in operation under similar conditions in other parts of the country.

Some of these data should be furnished by the proposer, when placing the matter before the financier. All will be checked by the engineer making the first investigation or reconnoissance survey, which will follow if the proposition seems sufficiently promising. This survey is invariably made at the expense of the proposer. If the project is accepted, the final surveys and all other engineering expenses are defrayed out of the construction funds.

Let me digress for a moment to say that when an owner presents himself or his case to a live, up-to-date concern, his statements are accepted as absolute facts. He is not asked to corroborate anything at the first interview or in the first instance. Everything that he says is considered true until it is proved otherwise. If the project seems attractive, he may be asked to show proof of his statements. If it is not interesting —and the proposer is primarily an optimist who puts his best goods in the show window—it is no use discussing whether he is telling the truth or not.

From the data originally supplied and subsequently verified, and from the additional data gathered by the investigating engineer, the estimated cost of the road is arrived at—complete with all its right-of-way, grading, track, overhead, terminals, power houses, rolling stock, signal system, telephone lines, waiting stations, fencing, cattle guards, and all the little items that mean large amounts. In this the item of carrying charges during construction—the "dead" interest on the investment—should not be overlooked.

With all these items added together you have the total cost of the railroad. Assuming that the underwriting will be taken on a basis of 80 per cent for the bonds, the result is a bond issue of one-fourth more than the cash cost. From the rate of interest they bear the total fixed charges may be calculated instantly. How much will be available to pay these interest charges is arrived at by deducting from the gross earnings the operating expenses, taxes and depreciation.

Now we come to a point which no two bankers look at in exactly the same way. One banker will not touch a construction proposition if it does not show net earning of two and one-half times the interest charge. Another will be satisfied with less. These net earnings are applicable to the payment of interest and retirement of bonds through a sinking fund and to the payment of dividends on the preferred and common stock, in the order named.

If the road is being promoted by the "boosters" in the towns, the local interests will care only for the benefit that the community will derive from the line. These expect to reap their profits from the new road by the enhancement of real estate values, by increased sales of merchandise and by general trading. Their returns come quickly, and it is not of vital consequence to them how long it is until the road gets on a sound financial footing. The banker, however, has no other interests in that vicinity than the return from his bonds and the possible dividends on his stock.

Therefore the problem is to keep the interest charges down by making the bond issue low. A certain amount of money must be provided, outside of donations, subsidies, etc., and the financier or the owner must raise the additional sum. This money must be derived from the sale of securities that rank lower than the first mortgage bonds—preferred or even common stock.

Thus far we have dealt with the financing of a projected electric railroad. In the case of an existing property—a going concern—being offered for sale similar information should be supplied by the owner. The names of the towns through which it passes, the full corporate name of the road, a history of its ownership from the beginning (to show if it has been in financial difficulties, had strike troubles, or has been afflicted with any other ills) should be given. The financier must also know the exact route of the line. This, of course, should include a profile showing grades, together with a full statement of the line's general physical condition. Furthermore, the conditions under which the franchises have been granted and the length of their unexpired terms must be clearly set forth. The political complexion of the towns and of the regions roundabout them also are of much importance. The owner also should furnish annual reports, in detail, and balance sheets for several years back. The financier also desires to know where the outstanding securities are held, and if they can be taken up and retired by exchange or otherwise.

Not only present conditions, but also the future possibilities of the property are important. What profitable extensions could be made? How much would they cost and how much would they earn? Are there any other utilities in the towns that might be operated from the same power station, thereby reducing the cost of individual operation? The answers to these and to other questions that will occur to the experienced railway man are essential.

Finally the purchase price of the property comes up for discussion. This is technically known as the "basis" on which the property is to be bought. By this is meant that if a man wishes to sell a property for $1,000,000, including all bonds and stocks, free of all indebtedness, and that if the property shows earnings from operation, before the bond interest is deducted, of $100,000, the investment will return 10 per cent. The property would then be bought on a 10 per cent basis. If it earns only $70,000, it would be on a 7 per cent basis, and so on.

This "basis of purchase" is one of the fundamentals that is asked for by every financier, but the average man who brings a property up for sale seldom knows what it means. The basis of purchase varies. One banker may want a greater return than another. It depends on many things. A banker may buy a property on a 5 per cent basis because he has other interests that will fit in, and he may turn around and issue 5 per cent bonds against the property, making no profit on that particular investment, but deriving his gain from the enhancement of his other properties that will be benefited by it. On the other hand, some properties might not be considered even on a 10 per cent or 12 per cent basis because of their location or for a score of other reasons.

What class of electric railway projects are bankers most interested in at present, city or interurban? They are most interested in going concerns in the larger cities and centers of population. Under conditions as they are at present they do not care much for projected interurban roads. This is because the best earning locations are already occupied. Many small cities of from 5000 to 15,000 population are coming into the market and asking for financial help in building roads. Usually towns of this size are not regarded as favorable fields for financing. The average earning power of an electric road in such communities is too small.

It is hardly possible, in my opinion, to say what parts of the country bankers and investors look upon with the greatest favor, so far as electric railways are concerned. It depends entirely on the size of the city—the larger the better, for the earnings of electric railroads depend almost altogether on passenger traffic.

It has been generally considered that from 800 to 1000 population per mile of track exclusive of the principal terminal city should be the minimum for an electric interurban railway. That means the population in a strip 3 miles in width on each side of the track, or 6 miles in total width. There are many individual cases, however, where the character of the population or industries is such as to make interurban railways good investments yielding satisfactory earnings from a lower population per mile. With a city railroad the distances of travel must be sufficient to induce patronage of the cars, and this fact explains the general lack of success of lines in small towns.

What would be considered the minimum earnings per mile of track to be attractive? About $5,000. To explain: If a road earns $5,000 per mile and its operating expenses are 60 per cent of its gross income, the net earnings from operation would be $2,000 per mile. If the road costs $25,000 per mile in bonds to construct (a very low figure), its interest charges, at 5 per cent, would be $1,250 per mile. Deduct this from the $2,000, and there will be $750 a mile left to take care of the sinking fund, operating contingencies, shrinkage in business due to various causes, and so on. Five thousand dollars a mile would be about the minimum that would be attractive to a financier.

What percentage does the banker require for underwriting? That cannot be answered because each project stands on its own merits. If a project is to be built solely from funds accruing from the sale of first mortgage bonds, which the banker has to handle, he would naturally expect to have a sufficient margin in the price at which he takes the bonds to cover his selling expenses and profit. This may vary from 8 per cent to 15 per cent. He would also naturally expect to control the stock—to have more than 51 per cent of it, for, if he put in all the money, he would want control of his property. But if there were a large equity, making the bonds a safer investment—due, for instance, to local interests taking junior securities, then the price at which the banker would take the bonds might be higher and his proportion of the stock might be decreased.

Lastly, what percentage of the projects submitted are rejected for one reason or another, and how many are finally financed? Not to exceed 1 per cent of the projects submitted are financed by anybody, principally for the reason that 99 per cent of them do not show sufficient earning capacity. That is practically the sole reason. Other things can be overcome, but not that. It is the touchstone of every proposition in every field.

Inefficiency and Extravagance in Municipal Operation

Logan G. McPherson, chief of the Bureau of Railway Economics in Washington, has been delivering a series of lectures on modern railway problems at Johns Hopkins University. One of his recent lectures related to objections to government ownership of railways, and a number of new points were brought out in connection with this subject. The lecture applied particularly to interstate carriers and federal ownership and operation, but a great deal of what Mr. McPherson said applies with equal or even greater directness to the municipal ownership and operation of electric railways. The following are some of the points mentioned by Mr. McPherson:

"A prime distinction between political activities and economic activities is that the former are not engaged in the production of wealth, while the latter are. The underlying effort of all industry and commerce is to make 'two blades of grass grow where but one grew before,' or at least to see that 'a new dollar is returned for the dollar that is expended.' Political government has been under no necessity of making its activity immediately productive. To it, making both ends meet means no more than the levying of taxes sufficient to meet the expenditures. The people of the United States have many reasons to be proud of their government, but the manner in which public money has been expended is not among them.

"The folly that has characterized many Congressional appropriations for the improvement of waterways, to enable them to carry traffic that never by any possibility will come to them; for the erection of public buildings for the purpose of enhancing the value of real estate in a struggling town, and the ease with which millions after millions have been added to the pension roll, causing its aggregate to increase after the time when in the nature of things it ought to decrease, is known to all men.

"Such appropriations entail expenditure in utter disregard of sources of income. All sorts of committees initiate all sorts of expenditures, and the wherewithal comes from taxation. States and municipalities add recklessly to the burdens of taxation, and yet the administration of most of our large cities is so far inferior to that of cities of corresponding size in Europe as to make their condition a by-word.

"As the franchise in this country is held by virtually all male adult citizens, it is natural that great bodies of voters should seek to obtain, through governmental action, benefits which they have been unable otherwise to secure for themselves.

"Manufacturers have sought advantages through protective tariffs; railroad promoters have sought vast grants of land. It is not many years since it was common belief that legislation was controlled by the men in charge of the large business interests, and oftentimes by unworthy methods. Admitting that there was a large measure of foundation for this belief, it is a sad commentary upon the quality and the integrity of the men elevated to public office by the votes of their constituents.

"Now the tables are turned. It is the organizations of great bodies of voters, such as the trades unions, who have lobbies at the federal and State capitals; who negotiate with a candidate before his election as to what he will do in return for their vote; who send telegrams of congratulations to governors when they approve bills instigated by the labor organizations.

WOULD CONDITIONS BE BETTER UNDER GOVERNMENT DIRECTION?

"Would the problem be solved, would the condition of the country be advanced, if the control of industry and commerce were placed directly under the auspices of the office-holders elected by the political democracy, instead of under the executives chosen by the industrial democracy? The army and navy are large organizations administered by the government, but they are not concerned with obtaining return for the money expended. The condition of the army at the beginning of the Spanish war did not afford a high testimonial to the efficiency of its administration, and it has often been claimed that there is a log-rolling in connection with the navy yards, as well as in appropriations for government buildings.

"As has time and again been pointed out, when a large organization is under the control and administration of a governmental body, that administration is affected in many ways by political influence. A public regulatory body, especially an appointed commission of the type now exemplified by the Interstate Commerce Commission and by the railroad and public-service commissions of the many States, is far less responsive to political influence than is a legislative body whose members are elected for short terms and who persistently seek re-election. Such a body may be an efficient critic and censor of the conduct of a business organization, although its own organization be defective and poorly administered. With proper authority it can bring pressure to bear upon those actually charged with the administration of business organizations that will cause them to remedy abuses such as a political organization would have great difficulty in remedying within its own ranks.

"If the railroads were taken over by the government it would be inevitable that no end of questions would come into politics that are not now subject to political decision.

"It is almost inevitable that the tremendous voting power of the railway employees would cause their votes to be sought by politicians with various promises of increases in pay and easier working conditions. The party in power, by having control of the railways, would have control of the nation. Should there come to the Presidency a man with the ambition to establish a dictatorship, his pathway would be the less difficult.

PERSONNEL LARGELY THE SAME

"It is impossible that under governmental ownership the railways would be manned in any appreciable degree by other than the employees now in their service. There probably would be more or less change in the officers charged with administration and management, but there could not be a great deal of change even in these, because men capable of filling such positions are now all too few. The great body of under-officials and employees would, of necessity, be constituted almost entirely of the same men of whom it is now constituted. Responsibility for their performance would rest ultimately with government officials elected by the people, instead of with officers owing their positions to their efficiency and retaining their positions only so long as their efficiency continues.

"The experience of the country with appropriations for river and harbor improvements and for public buildings gives ample reason for belief that if the building of new railroads were to become a matter of Congressional appropriations, Congressmen would endeavor to get railroads for their districts, and there would ensue interminable log-rolling and wasteful appropriations. It is almost inevitable that the shippers of a particular section of the country would cast their influence for the candidate who would endeavor to obtain rates that might give them an advantage in competitive markets. The result would be that the freight-rate structure of the United States, that has been undergoing a gradual adjustment to the needs of commerce, would be thrown into confusion.

DEFECTIVE PUBLIC ACCOUNTING

"That which the people through this regulatory body have been able to do in bringing to the clear light the receipts and expenditures of the railways, they have never been able to bring about for the receipts and expenditures of the political governments through the officers they have elected to administer those governments. The nearest approach that the government now makes to conducting a business enterprise is in the distribution of the mails, and the Post-office Department has never even been self-sustaining. A recent Postmaster-General reported that the deficit in the operation of the Post-office Department has been turned into a surplus, but that report was arrived at through distorted accounting, as reprehensible as any ever undertaken by financial buccaneers in railroad exploitation.

"In so rich a country as the United States the burden of taxation has not fallen heavily upon the people, although it has been asserted that if the aggregate taxation, direct and indirect, of the federal government, the State governments, the municipalities, and other political entities having the taxing power were assigned per capita, the proportion would be found to be greater than in any of the heavily-taxed countries of Europe.

"If the government were to take over and operate the railroads with the same degree of business inefficiency and business laxity that has characterized other phases of its administration, it would not be many years before taxation would bear severely upon every taxpayer.

"If the government were to take over and operate the railroads, the express service, the telegraph and telephone service, it would be the largest purchaser of coal, of iron, and steel, likely of lumber, and other of the great commodities of commerce, and its payroll would be increased by over two million employees. With their families this would mean that over ten million persons, or one out of every ten in the United States, would be directly dependent upon governmental disbursement.

"The entire country is in a ferment of economic education. The theory of our government is that its institutions rest upon the will of the people, and that they shall be determined only after thorough popular discussion and deliberation. It is to be hoped that the present discussion will not be cut off by a precipitate decision on the question at issue, but will continue until there is thorough understanding of the economic transition which has been taking place during the last half century."

A Warning for the Operator of a Power Plant

The zest of operating engineers to save time on repair work is sometimes too keen for their welfare. A recent discussion of the dangers of attempting to repair boilers, tanks and piping while such apparatus is under pressure which appeared in an accident insurance company's bulletin contains a valuable hint in the interests of safety. The man who undertakes work of this kind probably realizes that some danger inheres, but the disposition to overlook the risk of accident and to take chances should be frowned upon by all executives. Strict orders prohibiting the practice should be issued, and severe penalties should follow their violation.

A calking tool should never be used to stop a leak under pressure, nor should pipes, unions or couplings be turned up, nor nuts be tightened, until the pressure has been entirely removed. The occurrence of leakage, in a pipe or fitting or elsewhere, is often an indication that there is a weakness at that point, or that the parts are improperly fitted together. In making up pipe into fittings some of the threads may be destroyed if the work is not done carefully; and when the fittings are bolted together there may also be stripped or defective threads on some of the bolts. It is evident that no good can be accomplished in cases of this kind by overstraining the already weakened parts in any way, and safety requires that the pressure should be taken off before an attempt is made to remedy the trouble. A thorough and complete examination of all the parts can then be made, and the repairs can then be properly handled and without danger to the operator.

Leakage is often caused by poorly fitting gaskets around manholes and handhole openings, by worn or displaced valve packings, or by corrosion. In every case of this kind the trouble should be remedied in a workmanlike way and not by trying to force a fit by screwing up a nut so as to seriously overstrain a bolt that may already be carrying all the load which should be allowed upon it. The attempt is often made to stop leakage around the header caps of sectional boilers by setting up the nuts that hold them. Threads may be stripped in this way when the attendant knows well enough that the real trouble is that the caps do not seat properly, owing to corrosion or to the accumulation of scale or dirt on the bearing surfaces. The only possible gain is the saving of a little time and trouble, and the chance of accident accepted in such cases is altogether too great a price to pay in return for trivial benefits of this kind.

Corporation Morality and Business Unrest

The leading article of the public utilities number of the Chicago *Herald*, published on June 30, was contributed by Timothy S. Williams, president Brooklyn Rapid Transit Company. Mr. Williams discussed the effect of past corporation practices upon the present business unrest and said in part:

"Measured by practical results of business enterprise, what justification is there, or has there been, for recent legislation or official administrative action that has reduced earning capacity of city transportation and industry, forced thousands of men out of employment, impoverished widows and orphans dependent upon the income of investment, imposed excessive and burdensome taxes, and actually threatens the right of property supposed to be secured by the Constitution?

"Take the case of the steam railroads—is there any real or general dissatisfaction with rates or service? If some railroad investors have made excessive profits, a very much larger number have made losses, and the great majority have had unreasonably small returns. In the meanwhile, whether railroads were struggling to meet operating expenses and interest or not, every individual affected by railroad operation has been a beneficiary. There is not any product of capitalized human effort so cheap to-day, considering the great cost of production, as transportation.

VALUE OF PUBLIC UTILITIES

"What is true of the steam railroads is equally true of other public utilities—the street railways, the telephones, the electric lights. The expansion and consolidation of street railways have made possible the growth and development of cities corresponding to what steam railroads have done for the country. They have been important factors also in improving the social conditions of cities. They have made it possible to relieve congestion of population—to enable the workers of small means by reason of low fares to have their homes where children can be brought up under healthful conditions, with fresh air and sunlight and wholesome exercise.

"With all the abuses which have accompanied prosperity's growth, the material results have not suffered net injury therefrom. The stimulus to enterprise and investment even under bad influences and by means of wrongful practices has given to the people lower rates for transportation, illumination and telephones, and lower prices for monopolistic products than would have been brought about without that stimulus.

"The inherent and principally controlling cause of business troubles is the feeling engendered throughout the country by the exposure of some conspicuously flagrant misdeeds of business, due to plain violations of some very old moral maxims. Owing to the activities of politicians violating the same maxims, the punishment inflicted, instead of being, as it should have been, personal to the offender, has been unjustly meted out to enterprise and effort generally, and the sins of a few fathers of industry and finance seem likely to be visited upon the children of many generations.

REMEDY FOR PRESENT CONDITIONS

"What is the remedy for existing conditions? Is it still more drastic legislation? In government ownership and operation of public utilities? In more severe regulation, covering additional activities? Even in government price-fixing of exchangeable commodities? And finally, perhaps, in a radically changed form of government—socialistic, despotic or anarchistic? It is to be hoped not. Some men in public utility work urge the education of the public to clearer economic and political views, to closer acquaintance with the difficulties and burdens of discharging corporate obligations. This is proper, but the most important thing is to make the people forget and respect, and this can be done only by convincing them that business is conducted honestly, sincerely and fairly.

CORPORATE MORALITY

"The standard of morality is vastly higher in business life to-day than it is in political life. The fact that the larger part of the country's business is done through the medium of corporations presents in itself the opportunity for encouraging a high plane of conduct. For the corporations are after all merely the organized expressions of individual aims and substance, and the list of stockholders are a constantly increasing constituency.

"In such organizations there are behind corporate activities the sentiments and convictions of citizens who are stockholders and who, as a rule, prefer to intrust their investments not only to those who are capable but to those who are honest and intelligently progressive. The day has passed in large corporations when any individual stockholder or any combination of stockholders can, if disposed, force dishonest methods or fraudulent practices upon their operating staffs.

"If I am right in these observations as to present ideals among the managers and stockholders of corporations, then it is only a question of time when public sentiment will change. When the public is once convinced of corporate sincerity and honesty we need have no apprehension of the ravages of demagogues and politicians. We can then state our problems frankly to the people, confident of their intelligent co-operation and support."

OTHER ARTICLES

Two other articles in the public utilities number of the *Herald* of interest to electric railway officials are those written on the subjects of intangible values and of small-denomination bonds by L. R. Nash, of Stone & Webster, Boston, and J. W. Wilder, of N. W. Halsey & Company, New York, respectively. Mr. Nash says that the last year has witnessed some noteworthy developments with reference to certain elements which enter into "fair value" for rate-making purposes. There is reasonable consistency among the state commissions in determining the costs of physical property and the "overhead" charges in connection therewith. On the other hand, there has been radical disagreement in the treatment of so-called "intangible" values. The broad contention underlying the decisions of courts, however, is that public utility enterprises involve other elements of value on which return should be allowed than the existing physical property. Such property is only the "bare bones" of a system which, as a whole, is a live, serviceable entity.

According to Mr. Wilder, bond houses are awakening to a new opportunity in the sale of small-denomination bonds. The time has passed when a little investor can offer as an excuse for not buying high-grade bonds that these bonds are not issued in $100 denominations. Furthermore, he is being educated to their benefits by widespread campaigns of education through magazines and newspaper advertising, booklets, correspondence and the personal solicitation of salesmen. There can now be found on the lists of the most responsible bond houses issues which come in denominations of $100 and $500 as well as $1,000, and the bond houses are going after the business of the small investor as well as that of the man of wealth. A bond house will even assist the small buyer by letting him purchase bonds on partial payments.

American Association News

Meetings of Committee on Way Matters and Joint Committee on Claim Accounting Result in Formulation of Recommendations—Convention Exhibit Plans Making Encouraging Progress

COMMITTEE ON WAY MATTERS

A meeting of the committee on way matters to pass upon reports to be presented at the annual convention was held at the board rooms of the Washington Railway & Electric Company on July 17 and 18. Those present were the chairman of the committee, C. S. Kimball, engineer of maintenance of way Washington Railway & Electric Company; E. H. Berry, engineer of roadway Cincinnati Traction Company; C. H. Clark, engineer of maintenance of way Cleveland Railway Company; E. P. Roundey, engineer of maintenance of way New York State Railway, Syracuse Lines; W. F. Graves, chief engineer Montreal Tramways Company, and R. C. Cram, assistant engineer way and structure department Brooklyn Rapid Transit System.

After considerable discussion the committee adopted reports upon "The Use of T-Rails in Paved Streets" and "Alloyed Steel Rails." A supplementary report on "Interurban Tracks" was also considered, but the committee concluded that there was not sufficient time to give the matter attention this year and the report will be turned over to the committee on subjects for such action as it may see fit to take. The committee had also collected interesting information regarding the topic "Pavement for Use in Connection with Girder and High T-Rails," but, as there was not sufficient time to give the subject the attention it deserved, the material will be turned over to the ensuing committee. In response to a request that this year's committee present T-rail standards for consideration of the convention, the decision was reached that it would be unwise to go into this matter this year and the correspondence on the subject will be turned over to the secretary for the use of the committee on subjects.

JOINT COMMITTEE ON CLAIM ACCOUNTING

A meeting of the committee on claim accounting was held in New York on July 27 and 28. It was attended by H. J. Davies, secretary Cleveland Railway, and P. C. Nickel, claim agent New York Railways, co-chairmen, and H. K. Bennett, claim agent Fitchburg & Leominster Street Railway. The committee considered a scheme of classification of accidents which had been prepared in preliminary form. This will be revised and sent to all members of the joint committee for approval.

ATLANTIC CITY CONVENTION

The accompanying illustrations show the marked improvements in appearance which have been made in the interior of Machinery Hall, Atlantic City, in preparation for the convention of the American Electric Railway Association next fall. The front part of Machinery Hall, which was used as a power plant for years, has been refloored, repainted, the ceiling and pillars covered with lattice and the floors with Crex. This space will be used as a rest and reception room. The rest of Machinery Hall, that is Machinery Hall proper, has been repainted, recarpeted, and furnished with easy chairs and is used as a rest and reading room for pier patrons. There will be no high partitions between the main building and Machinery Hall as in former years.

The removal of these partitions now makes Machinery Hall a part of the main building. A good view of it can be had from the main entrance to the pier.

Mr. McConnaughy, of the Manufacturers' Association, calls attention to the fact that the championship baseball games occur at about the same time as the convention. He fears that this may interfere with the preparation of the exhibits and, as everything must be ready on Saturday, strict attention to business during the week preceding the convention will be necessary. Mr. Eldredge will not deliver goods or furnish help on Sunday, and all Saturday night and Sunday work will be charged at double time.

MACHINERY HALL IMPROVEMENTS—FRONT OF HALL, SHOWING NEW LATTICE WORK

MACHINERY HALL IMPROVEMENTS—SOUTH SIDE OF HALL, SHOWING REPAINTING AND REMOVAL OF PARTITIONS

The following new companies have been enrolled as members in the Manufacturers' Association during the week ending July 30, 1914: Prest-O-Lite Company, Inc., Indianapolis, Ind., and Street Railway Signal Company, Philadelphia, Pa.

Under the caption of Foreign Trade Opportunities, No. 13,390, the *Daily Consular and Trade Reports* contains a note to the effect that an American consular officer reports the need of a new electric light plant for a city in his district. Contracts have been signed for carrying out this work. The contractor states that most of the material to be used will be imported from the United States. It is also probable that an electric tramway will be built. A copy of the complete report containing further details can be obtained from the Bureau of Foreign and Domestic Commerce, United States Custom House, New York, or 629 Federal Building, Chicago, Ill.

COMMUNICATIONS

The Economy of First-Class Maintenance

SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION
DALLAS, TEX., July 28, 1914.

To the Editors:

In the article by "Contributor" on the subject of manganese renewable-wearing-part special work there is evidenced not only ingenuity in overcoming the difficulties of replacing the worn parts but, also, an appreciation of some particular points that are nearly always at the bottom of the complaints as to trouble with pieces of special work and with straight track itself. I refer particularly to the second and last paragraphs in which he speaks of the necessity of extra first-class work in original construction and later maintenance and of the necessity of constant inspection.

It is safe to say that, outside of some elevated and some underground roads, and at points on surface roads where there is very congested traffic, the average street railway, even in the large cities, pays less attention to the proper inspection and true maintenance of its track and special work than it does to any other portion of its property, and this in the face of the fact that its track is often the most costly section of that property, is subject to wear, tear and abuse that is beyond its control and is the most difficult portion of the property to properly and thoroughly inspect and the most costly to repair. It would seem that such an array of adverse and difficult conditions would naturally lead to the most perfect installation that was possible, to an inspection that caught the stitch before it dropped and to a "maintenance" that maintained and did not content itself with mere "renewal or repair."

"Contributor" contributes a vital truth, unheeded by most track and roadway departments, when he says: "The cost of constant effort in this direction (true inspection and maintenance) is a very small percentage of the money value of special track work which becomes unfit for use on account of early and unnecessary disintegration."

He could have gone further and applied this to the whole track and to the cars running thereon, for the character of track is a large factor in the life and cost of maintenance of every portion of the rolling-stock.

When one considers the great initial cost of track materials and the extraordinary cost of replacing any portion of them, especially in city streets and during operation of the cars, it would seem that, of all the different sections of the property, the track and roadbed would be that which would receive at least as careful inspection and maintenance as the power station, the overhead or underground lines and the rolling stock. Instead of this and excepting, possibly, the current return circuit, track is trusted to inexperienced men, usually to a "track foreman" and a gang of track hands. Even where there are men of higher rank in the track and roadway department they are apt to be "technical" and "office" men, engineers, draftsmen, designers and superintendents rather than "practical detail" men trained and competent to insure proper inspection and prompt and thorough maintenance.

Were the subject not so serious financially, the contrast between the liberality with which the average street railway treats the inspection and maintenance of its power station, rolling stock and its transmission lines, and the costly stinginess with reference to the exact and timely inspection and maintenance of its track would be ridiculous. Here is track that nearly equals in original cost all the other portions of the property, that costs from 50 to 100 per cent more to replace, but its inspection is either neglected and reports of trouble are allowed to come through thumping cars and derailments, or else the whole matter of inspection, report and repair is left to those whose only instruments of precision are an iron track gage, a wooden level and a bundle of "shims."

In an article on another item of track construction written some time since, the writer said this: "A piece of new track so laid that there is no lost motion whatever between its component parts is in position to maintain itself in that condition for a long time; whereas a piece of new track with lost motion, or the opportunity to produce such early, is already in process of disintegration. The one is a compact unit, resisting as a whole; the other is a cluster of self-destroying pieces."

And I would say further that what is true of new track is equally true of track in use. If the integrity of the "compact unit" is properly maintained, if threatened lost motion and undue wear are caught when their very first symptoms are manifested and the original integrity is promptly restored, the life of the track and rolling stock is greatly increased and repairs and power loss are greatly decreased.

There is no part of a system of a street or interurban railway that pays so good a rate of interest on perfect construction and maintenance as the roadbed and track, and there is no portion that is so neglected in construction and maintenance. Track that costs from $15,000 to $20,000 per mile and whose "rate of depreciation" is high under the best conditions, is left to the tender construction mercy of a partially supervised contractor or a "gang boss." "Inspection" is left to motormen or conductors, and "maintenance" to a track boss to whom an eighth of an inch is a miscroscopic refinement of measurement. And this not only applies to the little "neck-of-the-woods" electric railway company but to almost every street railway in the larger, and even largest, cities in America. I have yet to see a street railway system where, while riding in its cars, I could not pick out joints, blocks and whole streets and sections that told their tale of faulty construction and faultier maintenance through the car.

In these days of "scientific management" and "efficiency engineering" it seems astonishing that more exact and particular attention is not paid to this subject. The manufacturers of rail, fastenings and special work are willing and anxious to better their products if the way is shown them, but their efforts are liable to be brought to naught by the neglect, carelessness or ignorance of those who install and use their products. What would be thought of the constructor of a central station who built his engine and generator foundations unstable and out of level, who assembled the parts by rule-of-thumb and fastened them together insecurely? What would be thought of the chief engineer whose prime movers were continually thumping, heating and "getting out of whack," whose auxiliaries were out of efficient commission about half the time? And yet these are the average conditions of a large proportion of the street railway track of the country. Outside of some sections of a few cities where track has been in use some time and has been properly built and maintained and excepting brand-new track, smooth, free-riding track is an exception. It is, ordinarily, "bump, twist and rattle" to the discomfort and annoyance of the passenger, and the mutual destruction of track and car. For "bad track" is not only a contagious infection to the cars that run on it but it is a mutually cumulative evil, the worse the track the greater the deterioration produced by the cars and the more the track injures the cars, increases the fuel bill and swells the accident-damage account.

We are spending large sums for costly and intricate machines that repair while we refuse to pay the price of the human instruments that would prevent. We buy unpickable locks for the empty stable of the stolen horse and yet grudge a good one or a watchman for the next new stable and horse that we buy.

It is true that track is mostly "out of sight," but that is no excuse for its being "out of mind." It is true that it is subject to use and abuse by the general public over which we have no control, but that fact should not be a deterrent of foresight on our part. It should make us the more careful in our construction and maintenance; it should be an added factor for which we must provide fully. It is true that as we now build track many of its parts come to us crude, rough, scaled, rusty, dented, bent, loose and of anything but exact size, but is not this the greater reason why we should remove the defects before we put them in place?

Then we should inspect and keep on inspecting, not with a hammer or a car wheel or a derailment, but with trained men equipped with suitable instruments. Having accurate information, we should not merely repair or replace but should so do the work that the fault discovered shall never occur again.

It may be said that such refinement would increase track cost to a prohibitive amount. As a matter of fact it would increase slightly the initial cost of construction but, in reality, it would be an "insurance charge" to be distributed over the increased life of the track and paying big dividends on a comparatively small increase of investment.

Similarly the amount devoted to proper inspection and true maintenance should not be considered as merely an increase in operating expense. If a 10 per cent increase in operating expense in one place saves ten times its amount in another, that "expense" is really an "investment." H. S. COOPER.

Indianapolis as an Interurban Center

INDIANAPOLIS TRACTION AND TERMINAL COMPANY
INDIANAPOLIS, IND., July 27, 1914.

To the Editors:

Referring to the letter of S. H. Ankeny of the Greater Dayton Association, published in the ELECTRIC RAILWAY JOURNAL of July 25, requesting information as to how Dayton ranks as an interurban center, I give below for comparative purposes the total number of interurban passenger and freight cars arriving at and departing from the Traction Terminal Station at Indianapolis for the year 1913, number of passengers carried, and daily averages in each case.

There are five interurban companies operating fourteen lines out of the Indianapolis terminal as follows: Terre Haute, Indianapolis & Eastern Traction Company—Brazil Division (Indianapolis to Terre Haute), Eastern Division (Indianapolis to New Castle and Richmond), Northwestern Division (Indianapolis to Lafayette), Crawfordsville Division, Danville Division and Martinsville Division; Union Traction Company of Indiana—Northern Division (Indianapolis to Peru and Fort Wayne and Indianapolis to Logansport), Indianapolis to New Castle and Muncie, Indianapolis to Anderson, Muncie and Fort Wayne, and Indianapolis to Marion; Indianapolis & Cincinnati Traction Company—Greensburg Division and Connersville Division; Interstate Public Service Company—Indianapolis to Louisville.

YEAR OF 1913

Arriving and Departing—Traction Terminal Station

Total passenger cars	246,823
Total freight cars	23,501
Total number interurban and suburban passengers	6,524,366

AVERAGE PER DAY—YEAR 1913

Interurban passenger cars	676
Interurban freight cars	64
Interurban and suburban passengers	17,875

On account of the interruptions to travel caused by the floods during the last week in March, and the strikes which occurred during the latter part of the year, the above figures are somewhat below normal.

HARRY H. LLOYD.

Progress of French Electrification

A recent issue of the *Revue Industrielle* contains a list of electric railways in France, including steam lines which have been electrified, electric lines in course of construction and lines that are under consideration.

The electric lines of the French State Railways now in operation include Paris-Invalides to Perpignan, 6 miles; Paris to Auteuil, and Champs de Mars, 9 miles; Paris to Versailles, 16 miles; St. Cloud to Etang-la-Ville, 10 miles; Paris to St. Germain, 15 miles; and Asnieres to Argenteuil, 3 miles; making a total of 59 miles.

The Paris-Lyon-Mediterranean Company has in operation a line between Le Fayet, Chamonix and Vallorcine, 22 miles; the Orleans Company, the Paris-Juvisy line, 14 miles; and the Midi Company, the Perpignan-Bourg Madame line, 64 miles, and others from Montrejeau to Luchon, 23 miles; from Lannemezan to Arreau, 16 miles; from Tarbes to Bagnere-de-Bigorre, 14 miles; from Montrejeau to Pau, 70 miles; from Lourds to Pierrefitte, 13 miles; from Pau to Bedous, 37 miles, and from Buzy to Laruns, 12 miles. Out of a total of 350 miles electrified no less than 249 miles are on the Midi system.

At the present time 96 miles of new electric railways are in course of construction, namely, Auch-Lannemezan, 24 miles; Castelnau-Magnoac-Tarbes, 32 miles; Arreau-St. Lary, 7 miles, and Hagetmau-Pau, 33 miles. A further 80 miles of electric railways are awaiting government sanction before the work of construction is taken in hand, viz., Quillan-Belesta, 16 miles; Villefranche-Vernet les Bains-Sahorre, 6 miles; Montlouis la Cabanasse Quillan, 55 miles, and Bourg Madame to the Spanish frontier, 4 miles.

Hydroelectric Development in Chippewa Falls, Wis., District

Through the merger of the Chippewa Valley Railway, Light & Power Company with the LaCrosse Gas & Electric Company, the latter a subsidiary of the American Public Utilities Company, the parent corporation now controls and operates the new property under the name of the Wisconsin-Minnesota Light & Power Company.

The new company owns hydroelectric generating plants, with a present installed capacity of 10,000 hp, on the Chippewa and Menomonie rivers in the State of Wisconsin. The largest development is situated on the Menomonie River at Cedar Falls and comprises a reinforced concrete dam and power house of the most modern type with a present capacity of 5300 hp. The capacity of this plant may be doubled at any time by the installation of two additional units, space for which is already provided. The other plants are located as follows: On the Menomonie River, three miles below Cedar Falls, an installation of 1600 hp capacity; on the Chippewa River at Chippewa Falls, two installations with a capacity of 2400 hp, and at Eau Claire, a small development furnishing an additional 700 hp.

By means of high-tension transmission lines this power is available for electric power, light and street railway purposes in Chippewa Falls and Eau Claire, and for the operation of the interurban railway connecting these two cities. The company owns a total of over 100 miles of transmission lines.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

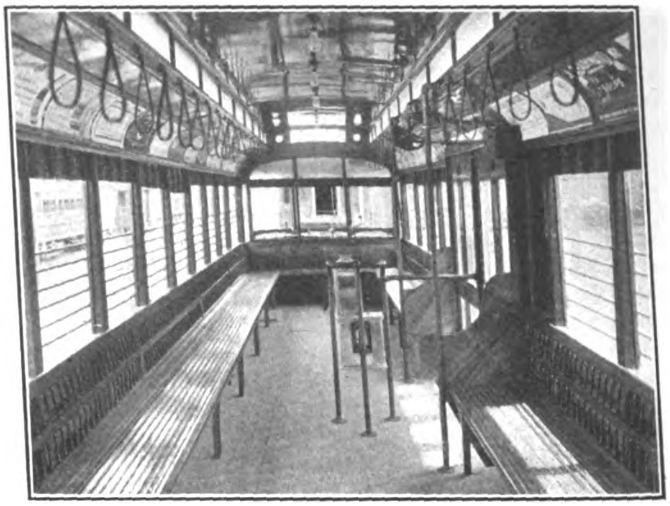
Rebuilding Summer Cars to Center-Entrance Type

BY G. M. CAMERON, MASTER MECHANIC NEW YORK STATE RAILWAYS COMPANY, ROCHESTER LINES

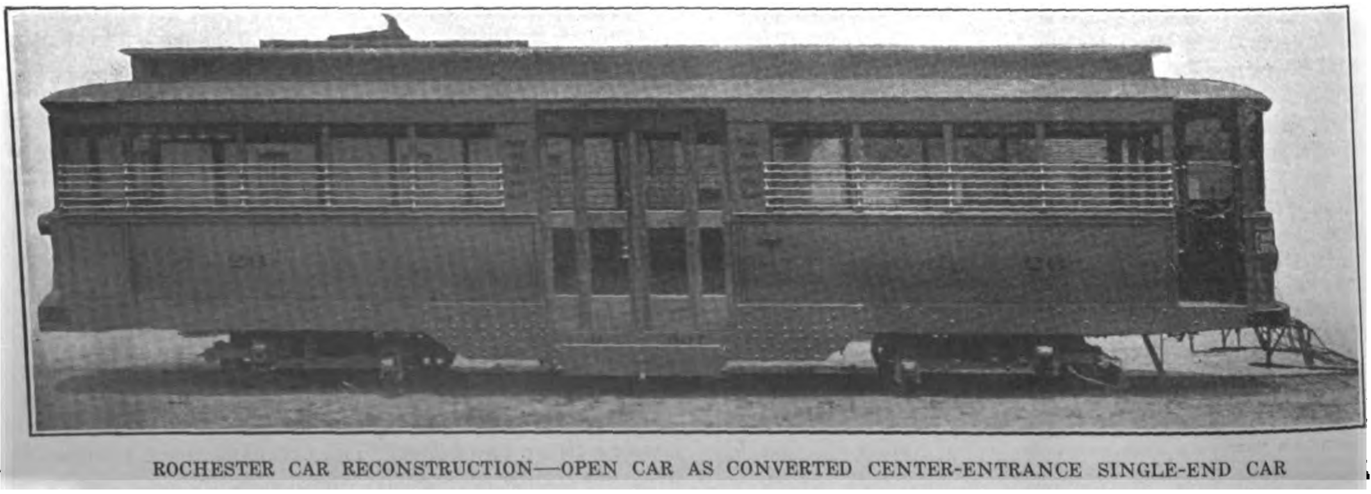
The New York State Railways, Rochester, N. Y., has operated eighteen open cars during the summer months for several years. These cars were of the cross-bench, running-board type. On account of the extended running boards along the sides of these cars, they were found to be somewhat dangerous for operation and especially so where large crowds were handled. It was also very difficult to collect the fares when these cars were crowded. Early in the present year the mechanical department made a study of a method for remodeling these cars in such a way as to eliminate, as far as possible, the objectionable features enumerated.

A plan and elevation of the cars before remodeling are shown in one of the accompanying drawings. As the motor equipments for these cars are used on snow plows and sweepers during the winter months, and as some dimensions of the cars were not suitable for making closed cars for service during the entire year, it was decided to retain the open feature. Two methods were open for consideration: One was to build a vestibule of the usual prepayment type on one end of the car and arrange the seats on each side of a center aisle; the other was to cut out one sill near the center and build in steps with a lowered sill at this point properly reinforced. Estimates and plans were made up for both methods, and the center-entrance scheme was followed, as it was more economical and was believed to be a better plan from the operating standpoint.

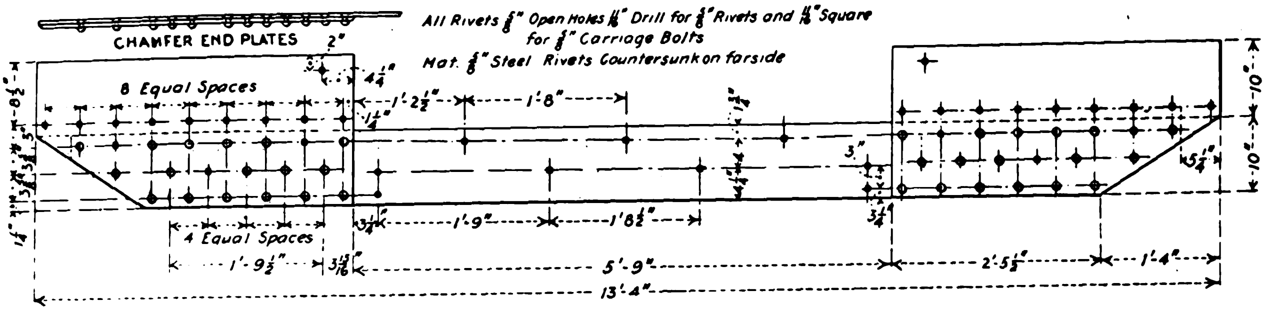
Steel-plate panels were attached to the car posts. These plates extend from the sills up to the usual window heights, and a neat wood rail was placed around the top. From this rail up the car was left open, no sash being used. High window guards were placed along the open spaces. Longitudinal seats were placed along both sides of the car and seats built in across each end. The wood cross-benches were placed end to end and adapted for the longitudinal seats. The cars were originally equipped for operation from either end, but the rebuilt cars are adapted for operating from one end only. Accordingly, the bulkhead partition was removed from one end of the car and seats were carried out to that end. At the entrance a piece of the side sill was cut out and a lower sill attached and securely fastened at the ends of the original sill. A 5/8-in. steel reinforcing plate was run along the outside of this lower sill and attached to the main reinforcing plates by means of ample gussets. One step was built within the inclosure and a folding step arranged to extend out from the car body when doors are opened. Two pairs of wooden doors with glass panels were installed at the center opening. These doors are arranged to be operated in unison by the New York State Railways standard overhead operating mechanism. The outward step is arranged to fold in conjunction with the operation of the doors. The center opening is divided into two parts, the one to the rear or left being used for the entrance and the one to the right for the exit of passengers. A fare collection stand is placed within the car. At the time of remodeling, the cars were also equipped with air brakes and electric starting signals. This signal



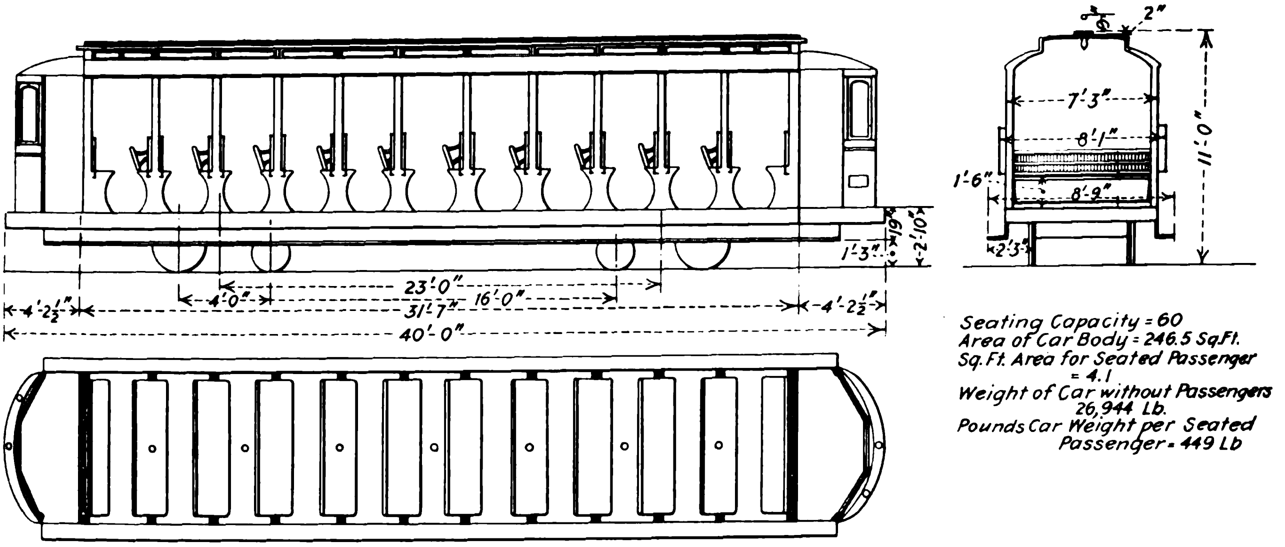
ROCHESTER CAR RECONSTRUCTION—INTERIOR OF REBUILT CAR EQUIPPED FOR SERVICE



ROCHESTER CAR RECONSTRUCTION—OPEN CAR AS CONVERTED CENTER-ENTRANCE SINGLE-END CAR

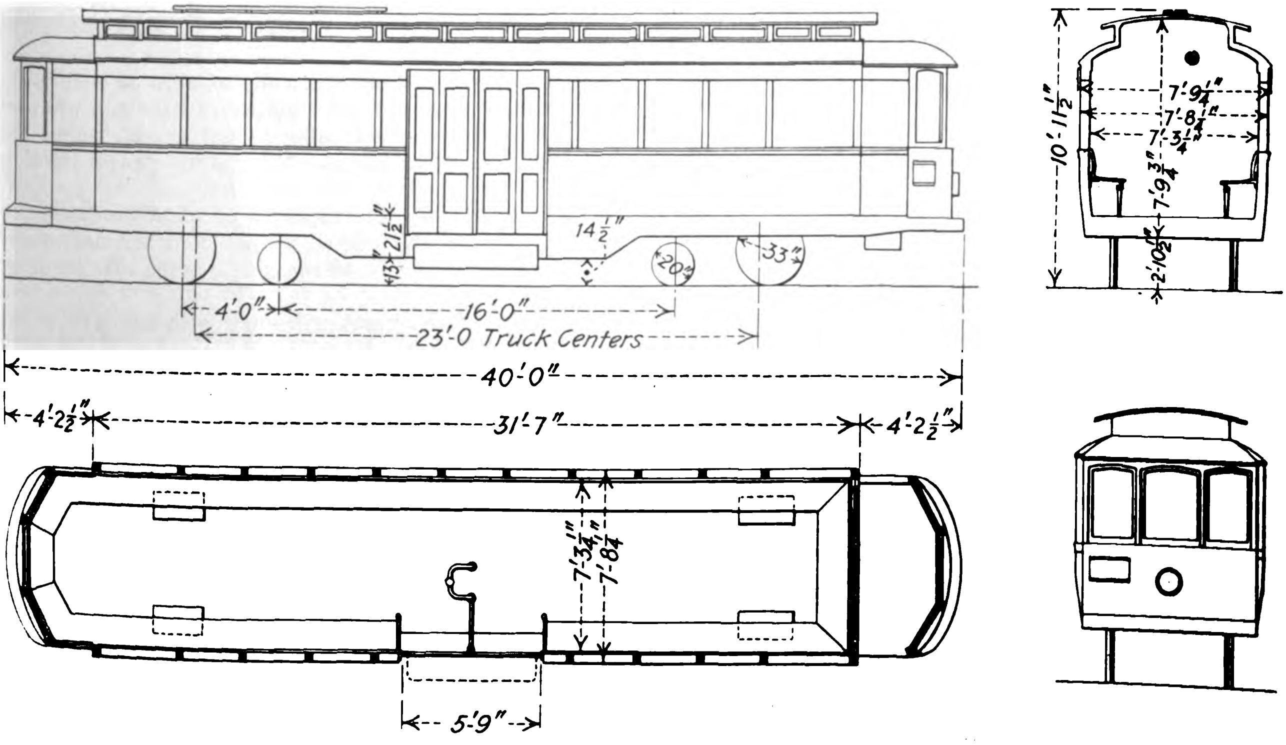

CHAMFER END PLATES
All Rivets 5/8" Open Holes 11/16" Drill for 5/8" Rivets and 11/16" Square for 5/8" Carriage Bolts
Mat. 5/8" Steel Rivets Countersunk on farside
8 Equal Spaces
4 Equal Spaces
1'-2½"
1'-8"
1'-9"
1'-8½"
1'-9½"
5'-9"
2'-5½"
1'-4"
13'-4"
10"
3"

ROCHESTER CAR RECONSTRUCTION—STEEL DROP SIDE SILL FOR REMODELING OPEN CARS


23'-0"
16'-0"
4'-0"
31'-7"
4'-2½"
40'-0"
1'-3"
2'-10"
1'-6"
7'-3"
8'-1"
8'-9"
2'-3"
11'-0"
2"

Seating Capacity = 60
Area of Car Body = 246.5 Sq.Ft.
Sq.Ft. Area for Seated Passenger = 4.1
Weight of Car without Passengers 26,944 Lb.
Pounds Car Weight per Seated Passenger = 449 Lb

ROCHESTER CAR RECONSTRUCTION—ELEVATIONS AND SEATING PLAN OF BENCH-TYPE OPEN CAR BEFORE REMODELING


21½"
14½"
20"
33"
4'-0"
16'-0"
23'-0 Truck Centers
40'-0"
4'-2½"
31'-7"
7'-3¼"
7'-8¼"
5'-9"
10'-11½"
7'-9¼"
7'-8½"
7'-3¼"
2'-10½"

Seating Capacity 49 at 17" per Seat

ROCHESTER CAR RECONSTRUCTION—ELEVATIONS, SECTION AND PLAN OF CAR AS REMODELED consists of a lamp located in motorman's cab which lights when the doors are closed. The steel work was purchased from a local concern, framed and ready for installation. The total weight of the rebuilt car fully equipped is 26,000 lb. This brings the weight per passenger seat to 530 lb.

These remodeled cars have been in service for nearly two months and have proved their worth, especially when large crowds are handled. They have also been very satisfactory to the crews operating them. A second drawing shows a plan and elevation of cars after their reconstruction.

The Practical Side of Vacuum Car Cleaning—Layout

BY S. L. GUTHORN, E.E.

When distributing vacuum from a stationary plant for cleaning purposes, the principal factor which determines the outlet location is transmission losses in the hose. Not that the losses in hose vary greatly from those of pipe of corresponding size, but because convenience of operation and established practice always fixes the former as much smaller. Depending upon the selection of the diameter only, even within the province of standard lengths and sizes, the displacement losses vary from less than 25 per cent to more than 50 per cent.

The accompanying displacement versus hose length curves, their discussion and the conclusions therefrom, clearly establish the foregoing statements. Examining these curves for a few critical values, we note that of the 90 cu. ft. of air displacement at the hose outlet, there is available as free air at the end of 50 ft. of hose 70 cu. ft. if transmitted through a 1½-in. hose, or a loss of 22 per cent, i. e., 78 per cent is available; 62 cu. ft. if transmitted through a 1¼-in. hose, or a loss of 31 per cent, 69 per cent being available; 54 cu. ft. if 1-in. hose is used, or a loss of 40 per cent, 60 per cent being available.

At the end of 100 ft. of hose with the same initial displacement of 90 cu. ft. we note: 68 cu. ft. of free air for the 1½-in. size, or a loss of 24 per cent; 53 cu. ft. for the 1¼-in. size, or a loss of 41 per cent, and only 42 cu. ft. for the 1-in. size, or a loss of 53 per cent. Comparing these values, we note that in the case of 1½-in. hose an increase from a 50-ft. to a 100-ft. length causes only a loss of 2 per cent compared with a loss of 9 per cent for 1¼-in hose and of 13 per cent for 1-in. hose.

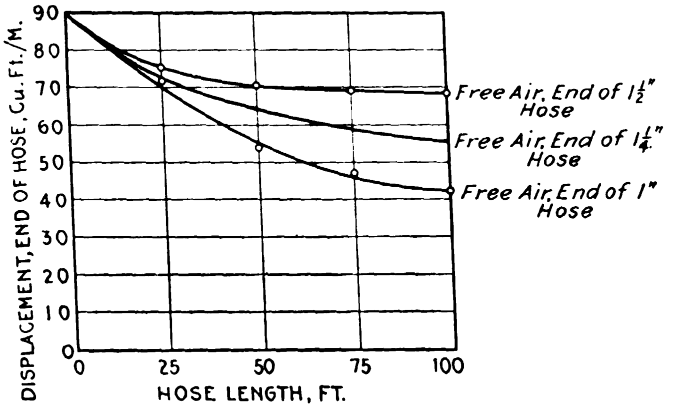
From these examinations we may conclude that for 1½-in. hose the loss for the first 50 ft. is least and that the increased loss due to an additional 50 ft. is negligible. Therefore good and uniform sweeping performance is assured under conditions of service where varying lengths of hose will be required. This is evident from the flatness of the curve. For 1¼-in. and 1-in. hose the loss in the first 50 ft. is greater and is too considerable for an additional 50 ft. length to be neglected, thus giving inferior service should variable lengths of hose be required.

These facts are within 5 per cent for all practical displacements. Larger sized hose has not been discussed because it is too cumbersome, it lacks mechanical strength when made in sufficiently light weights and it is not sufficiently flexible when strong enough. Smaller sized hose is absolutely inadmissible because the ordinary materials swept will obstruct it, the transmission losses are prohibitive and their variation with respect to length is too great to warrant uniform sweeping.

Where possible, in the pipe layout for car cleaning in shops, the distance between adjacent outlets should equal two car lengths, i. e., 100 ft. for 50-ft. cars. This will permit cleaning with a 50-ft. or 60-ft. length of hose and the cleaning of two cars or four cars if tracks are adjacent for each hose connection, thus saving the shifting of hose. It is also advisable to locate the first outlet of a series one car length from the bumpers. This will insure the outlets being in line with the platforms and will eliminate taking hose through the windows. Only one set of outlets is necessary for each two tracks. If local conditions require 100 ft. of hose for cleaning never use the 1-in. size.

The pipe layout should always be the shortest possible. This is invariably accomplished by extending the main longitudinally, with branches at right angles and parallel with the ties, rather than the reverse. Since this arrangement will not involve any additional pipe for an outlet for each track, the sufficient condition of one outlet for two tracks as above set forth may be doubled.

All piping should decrease in size as it branches out and extends from the exhauster, but no pipe should be less than 2 in. All deflections should be made by means of long-turn drainage fittings, plugged for cleanout, and so placed that the cleanout is trailing and not facing the material conveyed. A minimum pitch of 1 ft. in 50 toward the exhauster is desirable. The complete reaming with a reamer and not a file of all pipe ends is absolutely essential. If the condition of the soil will permit black pipe is preferable to galvanized, unless the latter is free from lumps of zinc due to early freezing of the bath.



RELATION BETWEEN AIR DISPLACEMENT AND HOSE LENGTH

For determining the capacity of plant necessary for a given shop, allow 3000 sq. ft. per hour per man, which for a car 50 ft. x 9 ft. allows six to seven cars per hour per man.

The cost of the plant will vary with the type of exhauster, method of separation and disposal of the materials swept, type of control and nature of current available. A reliable plant, complete and ready for operation, but exclusive of the piping, will cost from $500 per sweeper in a small plant to $400 per sweeper in a larger unit. Others may be purchased for half this price.

Terms have been agreed upon between the Italian government and the subconcessionary company constructing the Ambertide-Todi-Terni railway and the branch to Ponte S. Giovanni Perugia for the conversion of the system to electric traction. Instead of a subsidy of 7500 lire per km ($2,400 per mile) for seventy years, the government is to pay 10,000 lire ($3,200 per mile) for fifty years, and to accept 15 instead of 20 per cent of the profits. These modifications are induced by the special importance of the projected lines, and the advantages accruing to the public by their electrification.

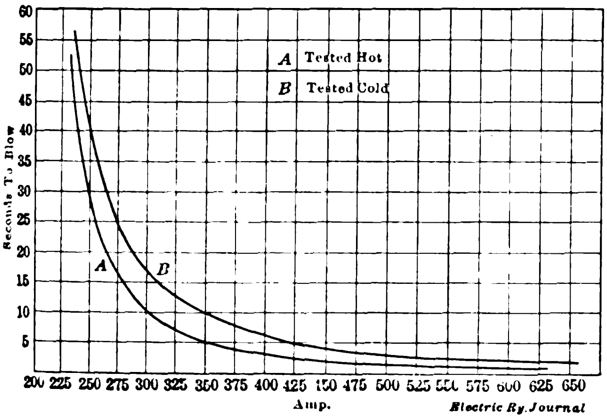
Equipment Defects—Fuses, Fuse Blocks and Fuse Boxes—I

BY C. W. SQUIER, E.E.

The electrical equipment of all cars should be protected by a device which will automatically open the circuit under abnormal conditions, as great losses may be caused by overloads or short-circuits. This automatic form of protection is, therefore, an exceedingly important one, and too much care cannot be exercised in its selection. Fuses are the most elementary type of devices for performing this function. At first they were made of metals with a low melting point such as lead, but as the capacities needed increased other metals such as zinc, copper and aluminum were found to be better adapted because a less volume of material is required to be melted when the fuse is blown.

OPEN FUSES AND INCLOSED FUSES

The first types of fuses were open and usually consisted of a porcelain block with terminals to which a piece of lead wire was attached. Such fuses have the objectionable features of the spattering of melted metal and the consequent fire hazard when they open the circuit; also they cannot be rated accurately or be depended on to blow uniformly due to the exposure of the fusible strip. To overcome these objections cartridge or inclosed fuses have been developed.



OVERLOAD TIME ELEMENT CURVES OF 150 AMP FUSES

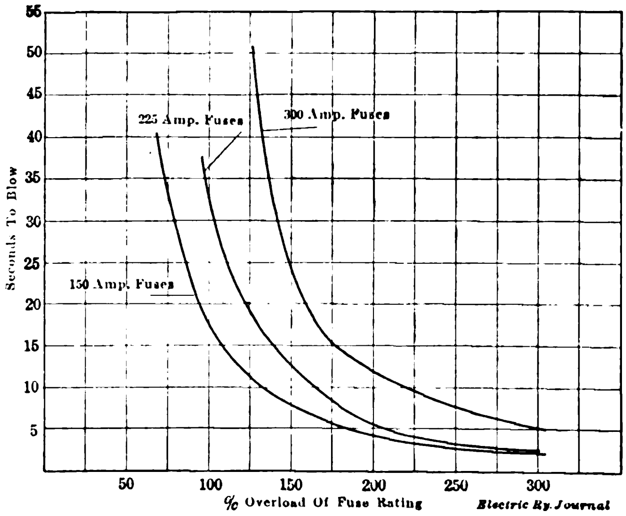
Inclosed fuses have the fusible element inclosed within a tube of fiber or paper which is filled with a refractory material to keep out the air and to aid in the breaking of the arc when the fuse blows. Suitable terminals are provided at either end for mounting the fuse easily and quickly in a fuse block. Each manufacturing company developed a line of fuses to its own dimensions. As a result fuses of the same capacities but of different makes had different dimensions. The different manufacturers also rated their fuses differently, some fuses being rated at their maximum carrying capacity while others were rated at about 80 per cent of this capacity.

STANDARDIZATION

The lack of uniformity in fuses resulted in much confusion. Finally standard dimensions and ratings were agreed upon at a conference which was held between representatives of the Underwriters' National Electric Association and the fuse makers. Fuses conforming with this standard are known as National Electric Code standard fuses, and all the principal manufacturers now make them. This standard divides inclosed fuses into classes according to their voltage and ampere capacity, and dimensions are specified for each class. Fuses are rated so that they will carry indefinitely a current 10 per cent greater than their rating; and with a current 25 per cent greater than that at which they are rated, they will open the circuit without reaching a temperature which will injure the fuse tube or the terminals of the fuse block. With a current 50 per cent greater than their rating and with a room temperature of 75 deg. Fahr., fuses starting cold must blow within the following specified times:

0-30	amp	1 min.
31-60	amp	2 min.
61-100	amp	4 min.
201-400	amp	12 min.
401-600	amp	15 min.

This standardization of fuses has been of great value to operating companies, and much credit is due the members of the Underwriters' committee and to the various fuse manufacturers for their co-operation. The dimensions of fuses were carefully worked out and are as small as it is safe to make them. The use of special dimensions for fuses, and particularly those smaller than the standard, should be discouraged.



CURVE SHOWING THAT TIME ELEMENT FOR FUSES LENGTHENS AS THEIR CAPACITY INCREASES

FUSE TESTING

To blow a fuse it is necessary to heat up the fuse metal to its melting point, and this takes a certain length of time depending on the amount of current passing through the fuse. This overload time element, or time lag, as it is commonly called, decreases rapidly as the current increases. One cut shows overload time element curves for some 150 amp 500-volt inclosed fuses. Two classes of tests were made; the first, shown by curve *B* starting with the fuses cold, namely, at the temperature of the surrounding air which was about 70 deg. Fahr.; the second, shown by curve *A*, was made after raising the temperature of the fuses to the degree of heat that they would reach in actual service on cars. Tests which had been previously made on fuses in service to determine what this temperature should be indicated that 170 amp flowing through the fuses continuously for 7¾ minutes would raise their temperature approximately the same amount as was obtained by the intermittent conditions of actual service. When tested cold, the time was taken from the instant the current was turned on till the fuse blew, this current being kept constant by means of a water rheostat. The tests of the fuses hot were made by placing 170 amp through the fuse for 7¾ minutes, then increasing this to overload conditions and taking the time from the instant the current was increased till the fuse blew. By referring to the curves it will be seen that these particular types of fuses will carry currents below 225 amp indefinitely, that they will open the circuit with 250 amp flowing in forty seconds when cold and twenty-eight seconds when hot, and also that with 400 amp through the fuses they will open the circuit in 6¼ seconds when cold and three seconds when hot.

The time element for fuses lengthens as their capacity increases. This is illustrated by the second set of curves, which show the time necessary for three different sizes of fuses to open the circuit with an overload a certain per cent of their normal rating. With 200 per cent overload these 300-amp fuses required twelve seconds to blow, to 5½ and four seconds respectively for the 225 and 150-amp fuses.

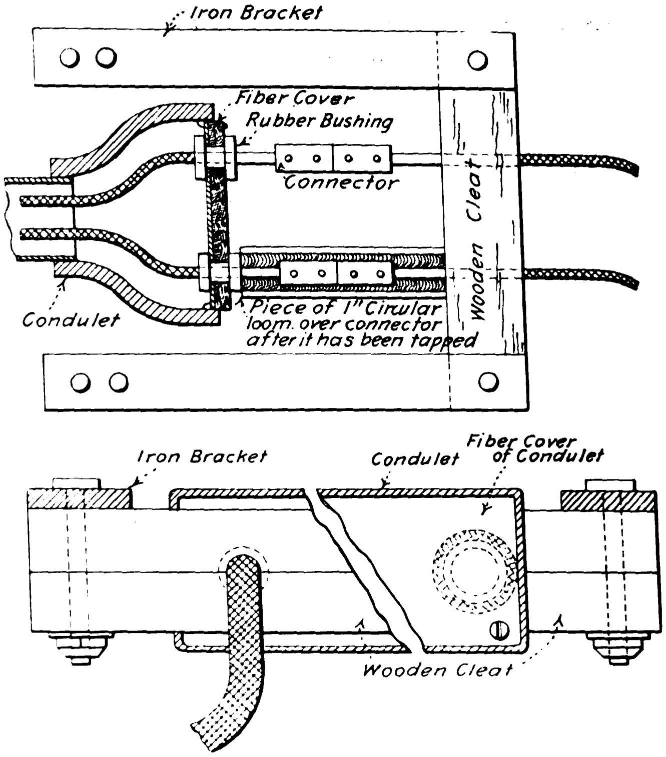
The Installation of Grid Resistors, Motor Leads and Fuse Boxes

BY R. H. PARSONS, ELECTRICAL FOREMAN

The accompanying sketches show arrangements of resistance, motor lead and fuse box connections to illustrate approved methods of installing these parts.

Fig. 1 represents a set of three-box resistors, suspended with iron hangers from the car floor or framework to which are fastened two wooden hangers covered with asbestos lumber. A sheet of ¼-in. asbestos lumber is placed below the wooden hangers, and the grids are attached under the asbestos by bolts through the wooden hangers. Care should be exercised to allow sufficient space between the grids and between the two outside grids and the iron hangers. The iron hangers should be grounded.

Fig. 2 illustrates the resistors and their conduit connections. It will be noted that the wires are separated as they leave the fiber cover of the condulet and that they touch nothing until they reach the terminal of the grid. As a rubber bushing lines the fiber outlet to the condulet, it is safe from grounds and short circuits.


Iron Bracket
Fiber Cover
Rubber Bushing
Connector
Wooden Cleat
Condulet
Piece of 1" Cirular loom over connector after it has been tapped
Iron Bracket
Condulet
Fiber Cover of Condulet
Wooden Cleat

FIGS. 3 AND 4—TOP AND FRONT VIEWS OF SAFE ARRANGEMENT OF MOTOR LEAD CONNECTORS

Figs. 3 and 4 are top and front views of a good layout for motor lead outlets and connections. It consists of a condulet similar to the Type A with a fiber cover having two outlet holes. These holes are lined with a rubber bushing. At a point 2 in. out from the bushing the terminal is soldered on to the wire. At each side of the condulet, at intervals of 6 in., are fastened two flat iron brackets which extend for a length of approximately 12 in. A split cleat is bolted across the ends of these brackets to hold the wires securely. The connector receives a layer of friction tape, and a piece of circular loom cut to fill exactly the space between the condulet and cleat is slipped over the conductor, the whole

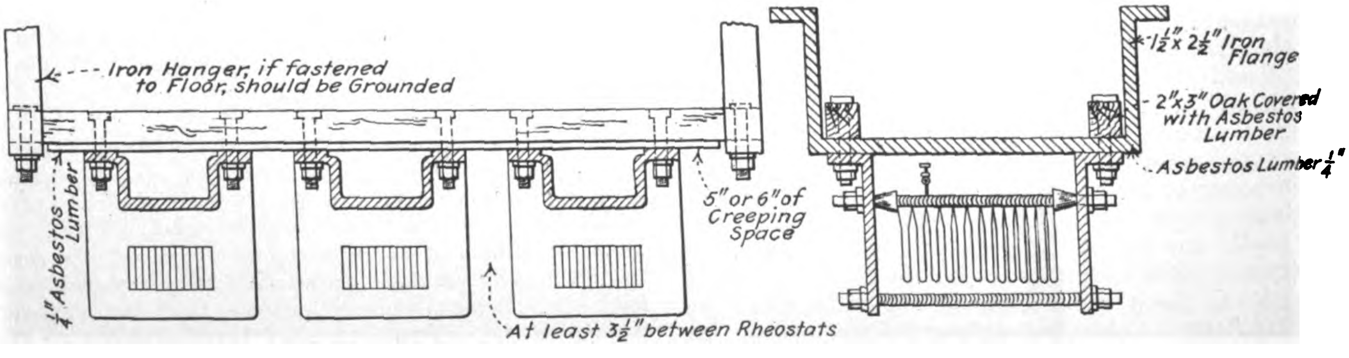

Iron Hanger, if fastened to Floor, should be Grounded
¼" Asbestos Lumber
5" or 6" of Creeping Space
At least 3½" between Rheostats
½" x 2½" Iron Flange
2"x3" Oak Covered with Asbestos Lumber
Asbestos Lumber ¼"

FIG. 1—FRONT VIEW OF A SAFE INSTALLATION OF GRID RESISTORS

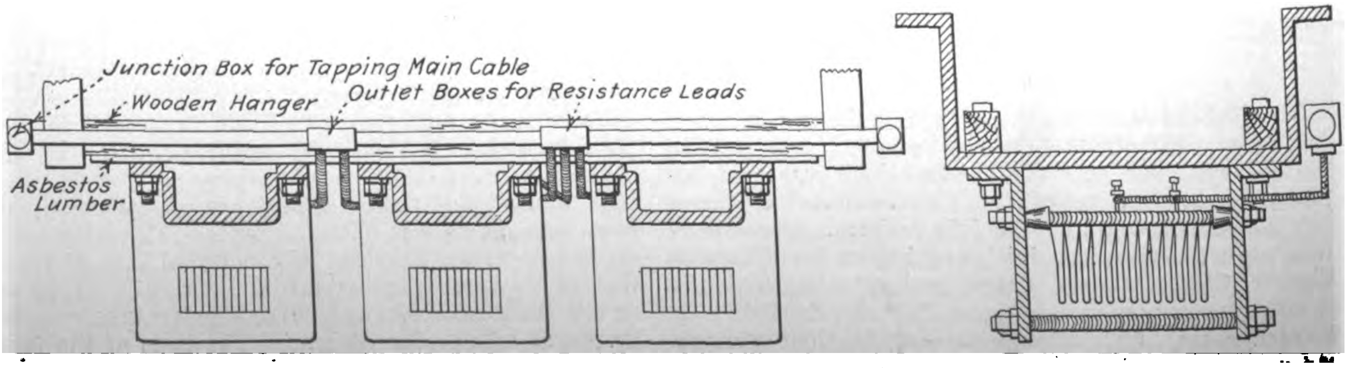

Junction Box for Tapping Main Cable
Wooden Hanger
Outlet Boxes for Resistance Leads
Asbestos Lumber

FIG. 2—VIEWS OF GRID RESISTORS SHOWING METHOD OF ARRANGING CONDUIT AND LEADS

making a well-insulated job which will not be affected even by water.

Fig. 5 illustrates a safe way to suspend a ribbon fuse box. The fuse box is first bolted to a hard wooden board, but with a layer of ¼-in. asbestos lumber intermediate. The board in turn is then bolted to the floor, platform framework or other convenient part of the car, with 2-in. wooden fillers between. This arrangement gives an air space between the fuse box and the board and between the board and the floor, enabling the parts to dry out quickly after they have been subjected to water. It also gives a sufficient insulation for the fuse box, the asbestos lumber affording protection in case a loose connection or heavy arc subjects the wood above to flame. It is also best to run the conduit which carries the wires not less than 4 in. or 5 in. from the fuse box.

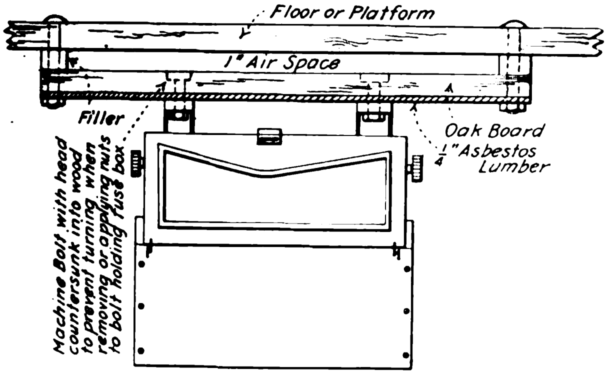

Floor or Platform
1" Air Space
Filler
Oak Board
¼" Asbestos Lumber
Machine Bolt with head countersunk into wood to prevent turning when removing or applying nuts to bolt holding fuse box

FIG. 5—SAFE METHOD OF INSTALLING A RIBBON FUSE BOX BENEATH THE FLOOR OF A WOODEN CAR

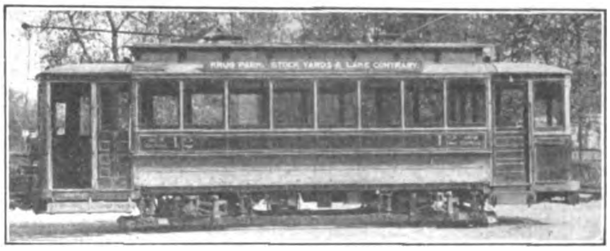
Radial Axle Truck Adapted for Sharp Curves

BY FRED STEFFENS, MASTER MECHANIC ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER COMPANY

The writer has recently secured a patent on a radial axle, long wheelbase truck, of the type shown in the accompanying drawings and halftones. This truck was built in our shops and the latter part of April it was put under car No. 12. It made its first trial trip on April 30, when it was taken over all the worst tracks and curves in St. Joseph. Although the truck was new and rigid it did not refuse to go over any of our tracks. It entered regular service under car No. 12 on May 1 and has been in service ever since. The truck frame is 22 ft. 5 in. long over all. The wheelbase is 15 ft., which the writer believes is the longest ever built to run under a car successfully. This wheelbase was used because the car would not take a longer truck; otherwise the writer would have built the truck with a 16-ft. or 18-ft. wheelbase, as his design is adapted for lengths as great as 25 ft.

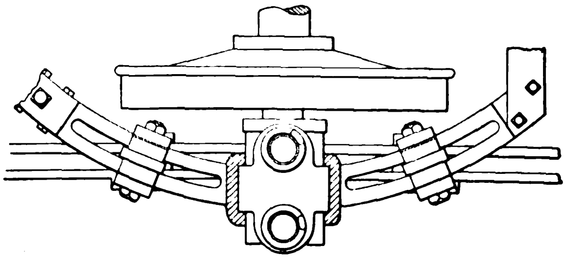
Car No. 12 is 22 ft. 8 in. over the corner posts, and 36 ft. 9 in. over the bumpers. Previously it was mounted on an 8-ft. wheelbase Dupont truck. Thus the overhang and the oscillation were so great and the swing was so heavy when it entered a curve that very unsatisfactory service followed, but the use of a radial axle truck makes it ride as steadily as a double-truck car.

This truck is equipped with a curved horizontal frame which nearly encircles each axle, as shown in the drawings. At the intersection of this curved frame and the normal position of the axle, the frame carries an inverted "U" member which can slide vertically outside and above the adjacent journal box. On each side of the journal box the curved frame is provided with concave runways on which rollers are mounted. Normally these rollers rest in the lowest portions of the runways, but when the trucks turn a curve they run up the runway for a distance proportional to the degree of curvature. Gravity tends to return the rollers to the lowest positions when the trucks return to straight track.



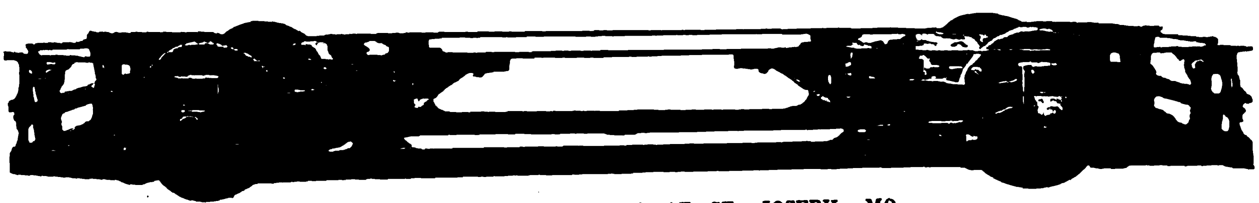
ST. JOSEPH CAR WITH RADIAL AXLE TRUCK ON CURVE

However, to assure the prompt return of the axles to their proper position each truck has a supplemental spring actuated mechanism of the character shown in the plan view. It will be seen that the middle point of the circular frame carries a lever which is pivoted on a vertical pin. At the other end of this lever are two mounted friction rollers against which two leaf springs bear. These springs are secured to an angle bar and press toward each other, thereby resisting the movement of the lever from the central position. After the car wheels have turned a curve and are on a straight track the springs assist the hanger rollers to return the axle and car wheels to their proper position. In going up or down grades the leaf springs insure the proper positioning of the axle relative to the frame in case the runway rollers alone do not effect this function.



DETAIL OF ROLLER MECHANISM AT JOURNAL BOX

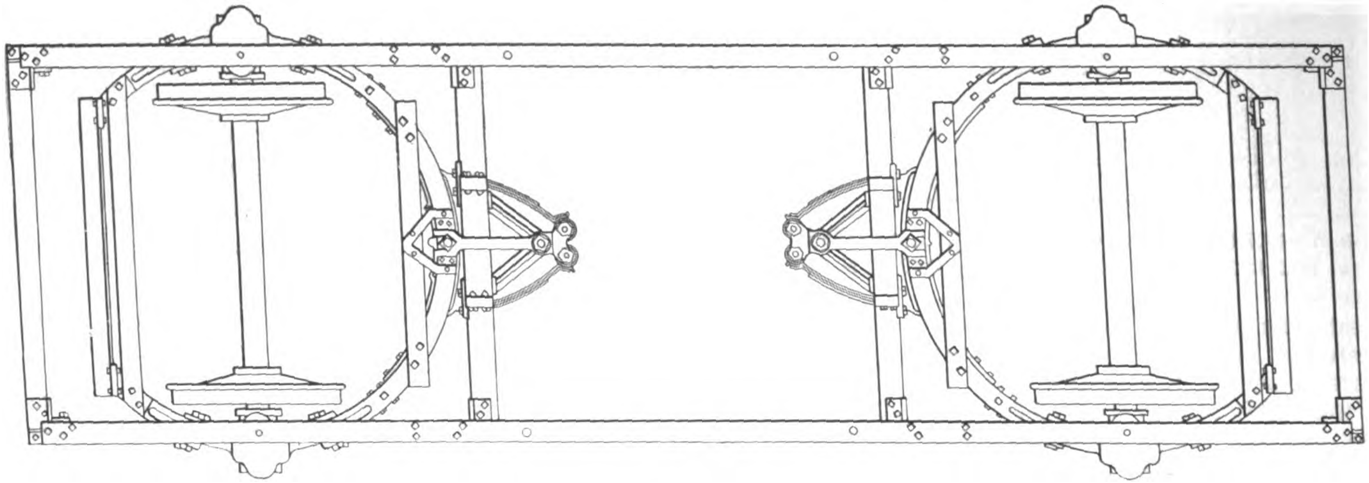
While in this particular truck the car body supporting frame connects the two pairs of wheels, it will be readily seen that each pair of wheels are in a frame by themselves. They could be separated by leaving out the center top and bottom plates, and continue to work

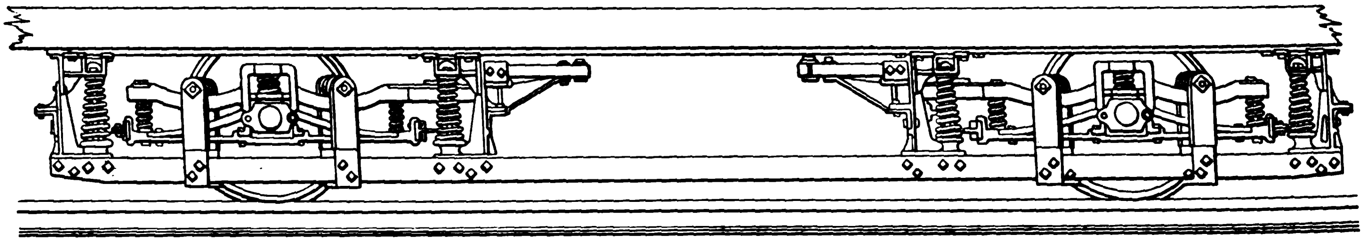


RADIAL AXLE TRACK USED AT ST. JOSEPH, MO.

just as well if not better in case a wheelbase longer than 14 ft. is used. This radial truck should supersede all other single or double trucks for two-motor equipments, for since it permits the weight of the motors to be carried on two axles instead of four it gives better propelling power and therefore less skidding, spinning and energy consumption.

This truck has the best brakes on our system, although we have several kinds of brakes. We use many types of single trucks, double trucks and maximum traction trucks. Some of these have very good brakes, but none that will compare with the brakes on this truck. Car No. 12 is equipped with National straight air brakes and two GE-80 motors. This truck is unlike other radial trucks now in use. In the others the wheelbase has been lengthened from 8 ft. to 10 ft. and 12 ft. This does away with the oscillation, but introduces a snake movement which is worse than the oscillation. The writer's truck does away with all undesirable movements.


TOP VIEW OF RADIAL AXLE TRUCK


SIDE VIEW OF RADIAL AXLE TRUCK

Diesel Electric Cars in Saxony

The Saxon State Railways have had constructed two Diesel electric motor cars, which they propose to try on the line between Dresden, Coswig and Meissen, for passenger traffic. The cars have been built by the Rastatt Works, and the Diesel equipment supplied by Sulzer Bros., Ludwigshafen, while the electrical equipment is by the Brown Boveri Company, Mannheim. The Diesel motor is of the six-cylinder type, of 200 to 250 hp, at 400 to 450 r.p.m. Coupled direct with the motor is a d.c. dynamo of about 190 hp, which supplies energy to the motors, of which there are two, each wound for 300 volts. The car is on two trucks, one of which has three axles and the other two axles. The Diesel motor and the dynamo are carried on the three-axle truck and the working motors on the two-axle one. At each end of the car are third-class compartments with accommodation for ninety passengers, as well as cabs for the driver. The car weighs about 70 tons. It is able to run at a speed of 43.4 m.p.h. on the level, or to haul a trailer at a lower speed. The car is fitted with the Westinghouse two-cylinder air brake. For electric lighting a battery is provided, charged from the dynamo. The Diesel motor cylinders are water-cooled, the heated water being discharged in summer, but in winter it is passed through tubes to heat the car.

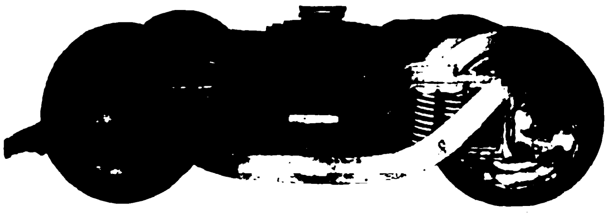
Electric Motor Trucks for City and Suburban Service

There are few classes of electric railway service in which rolling stock is subjected to conditions more severe than those found in city and suburban work. Among the causes contributing to this are excessive overloading, frequent starting and stopping, accompanied by rapid acceleration and heavy brake applications, and shocks caused by frequently passing over switches and crossings. The brunt of all this must be borne by the trucks, which should be of light weight in order to reduce energy consumption as far as possible, but which must at the same time be of ample strength to stand up with a minimum expense for maintenance.

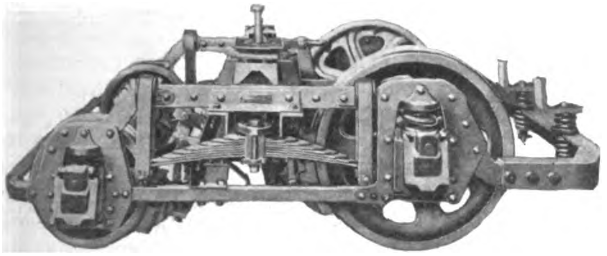
The illustrations show two types of Baldwin trucks which are specially fitted for work of this character. The truck for the Conestoga Traction Company represents the type built by the Baldwin Locomotive Works for city service where a single motor equipment is desired. This truck has a carrying capacity of 14,600 lb. on the center plate, and is operated at speeds up to 30 m.p.h. The track gage is 5 ft. 2½ in., and the sharpest curves have a radius of 32 ft. 6 in. The truck wheelbase is 54 in. The motor is outside-hung, and is spring-supported on a piece of angle iron which extends across the truck and is bolted to the side frames. The latter are supported on coil springs placed over the journal boxes, while the bolster is supported on two half-elliptic springs which are hung from the side frames by swing links. The driving and pony wheels are of chilled cast iron, their respective diameters being 33 in. and 21 in., while the journals measure 3¾ in. x 7 in. and 3 in. x

6 in. Commercial shapes are used as far as practicable, in this type of truck; and the simplicity of its construction and the ease with which it can be repaired commend it for service where severe conditions must be met.

The truck for the Philadelphia & Garrettford Street Railway is used in suburban service, running at speeds up to 40 m.p.h. This truck is of the equalized pedestal type without end frames. The transom gussets are of sufficient strength to hold the frames square and prevent diamond pointing. Equalizing beam springs of the twin helical pattern, and double elliptic bolster springs insure excellent riding qualities. A special feature of this truck is an angle-iron brace at one end, which is secured to the pedestals to support the sand pipes. This truck is built for a track gage of 5 ft. 2¼ in. The wheelbase is 78 in., and the wheels are of solid rolled steel, 34 in. in diameter. The journals are 4¼ in. x 8 in. The carrying capacity on the center plate is 21,100 lb.



TRUCK FOR PHILADELPHIA & GARRETTFORD STREET RAILWAY FOR SUBURBAN SERVICE UP TO SPEEDS OF 40 M.P.H.



TRUCK FOR CONESTOGA TRACTION COMPANY WITH CAPACITY OF 14,600 LB. ON CENTER PLATE

Reverse-Power Relays for Protection of Parallel Feeders

The need for a reliable reverse-power relay has been appreciated for a long time, particularly in substations fed by parallel feeders. In case of a short-circuit or ground on one feeder a selective reverse-power relay that will not operate on overload is the only means for completely isolating the feeder, the reversal of power at the substation end causing the relay on the defective line only to operate. The accompanying diagram explains this.

The diagram shows two parallel feeders from the generating station to the substation. For simplification, the layout is single-phase, but three-phase operation is similar when three relays are so connected that voltage and current are in phase in each relay. At the generating station are plain overload relays, set for a comparatively long-time element. At the substation are two sets of Westinghouse selective reverse-power relays, one set for each feeder. When the direction of power is normal, both feeders supplying power to the substation, the reverse-power relays cannot trip their breakers no matter how heavy the load may be.

If a ground or short-circuit occurs at *D* on feeder No. 1 a heavy current will be caused on both feeders, for feeder No. 2 will supply power through the substation and back on feeder No. 1 to the point of short-circuit. Thus the direction of power is reversed at relay *B* in the substation. This reversal of direction of power is the only thing that can cause relay *B* to operate. As soon as circuit-breaker *F* is opened, the load on feeder No. 2 falls back to normal, and it continues to operate the substation.

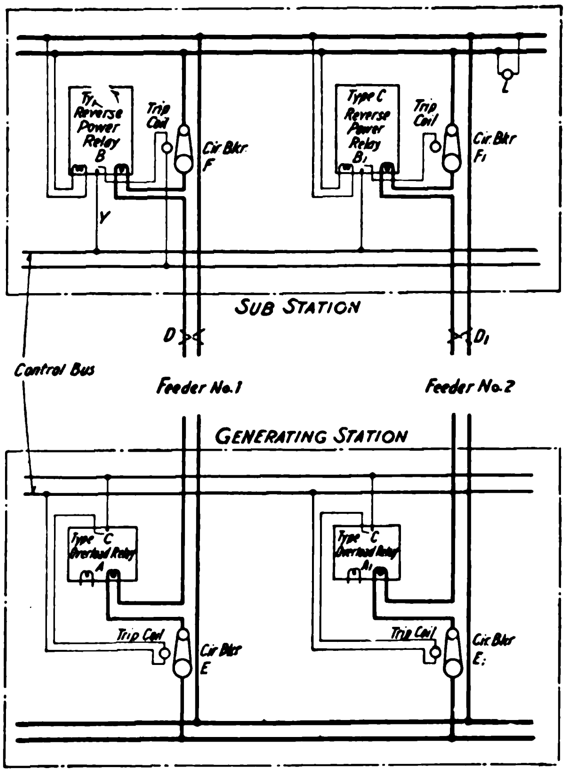


DIAGRAM OF CONNECTIONS OF RELAYS FOR PROTECTING PARALLEL FEEDERS

This condition is effected in approximately two-fifths of a second after the short-circuit occurs. If the short-circuit continues the overload relay *A* in the generating station will trip its breaker and the line is clear. Similarly, if a short occurs at D^1, reverse power at B^1 will trip the breaker F^1, and an overload at A^1 will trip its breaker. In case of a heavy short-circuit near the substation, the voltage may drop very low, but these relays are so sensitive that they will operate correctly even if the voltage drops to 2 per cent. The Westinghouse Electric & Manufacturing Company furnishes reverse-power relays especially for this purpose.

An interesting experiment to prevent overcrowding was tried recently by the District Railway Company of London on a train leaving Ealing Broadway for the Mansion House. Because of constant growth in passenger traffic the number of trains has been increased, and an extra coach, labeled "Mansion House only," has been added. As the trains, with the added coach, were too long to draw up at the platforms of most intermediate stations, the last coach stopped in the tunnels at the entrance to stations. A special guard is attached to each "Mansion House" coach. If successful, the innovation will probably be extended.

Poles for the Chicago, Milwaukee & Puget Sound Electrification

A tangible sign of the approaching electrification of the Chicago, Milwaukee & Puget Sound Railway, concerning which a statement was published in the ELECTRIC RAILWAY JOURNAL for Jan. 3, 1914, is the shipment of the 45-ft. red cedar poles which will carry the 100,000-volt transmission line of the Great Falls Power Company.

The order calls for 2705 45-ft. and 255 50-ft. poles for use on the transmission lines proper. In addition to this the railway is using 3625 6-in. top 25-ft. poles for a telephone line paralleling the transmission line. All of these poles are being shipped from the Priest River, Idaho, yards of the pole contractor, Lindsley Brothers Company, Spokane, Wash. Every pole is treated with Avenarius Carbolineum by the open-tank process, the immersion lasting for fifteen minutes at a temperature of approximately 200 deg. Fahr. The 25-ft. poles are treated for 6 ft. of the butt and the 45-ft. and 50-ft. poles for 8 ft. of the butt.

New All-Steel Cars for the Albany Southern Railroad

Two 51-ft. all-steel arched roof, combination passenger cars of the neat design shown in the accompanying illustration have been recently placed in service by the Albany Southern Railroad, Albany, N. Y.

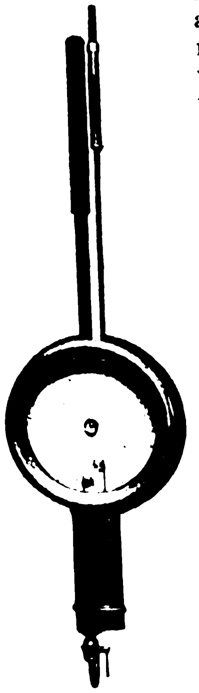
The cars, manufactured by The J. G. Brill Company, are mounted on Brill 27-A trucks which are equipped with third-rail brackets and paddle shoes of the General Electric type. The wheels are of 34-in. diameter solid rolled steel. Brakes are of the Westinghouse straight-air type with 12-in. brake cylinder, type M L slack adjuster and P. V. brake valves. All car wiring is in conduit.

The switches are installed on an inclosed panel board inside the smoking compartment. The cars are lighted with fifteen 23-watt tungsten lamps equally spaced on each side.

The seating capacity per car is sixty-two. The seats in the main compartment are of the reversible type with high back and arm rest and with Pantasote covering, while the longitudinal seats in the smoking compartment are of rattan. The floor is of wood and double, and the ceiling is of agasote painted in light green. The interior is finished in a dull cherry. The exterior is of Pullman green and striped and lettered with gold leaf. Other equipment for these cars includes Brill ventilators, Van Dorn No. 6 couplers, Ohio Brass air sanders and double-spring roller bearing trolley bases, GE trolley poles, the Universal Trolley Wheel Company's trolley wheels and Earll No. 7 trolley catchers.

Combined Recording Barometer and Vacuum Gage

One of the most important factors in the economy of steam consumption for power purposes is the absolute back pressure. To reduce this back pressure to a minimum is the office of the condenser, and it is, therefore, most desirable if not absolutely necessary to keep close watch on the condenser. For this purpose vacuum gages and recorders are installed.

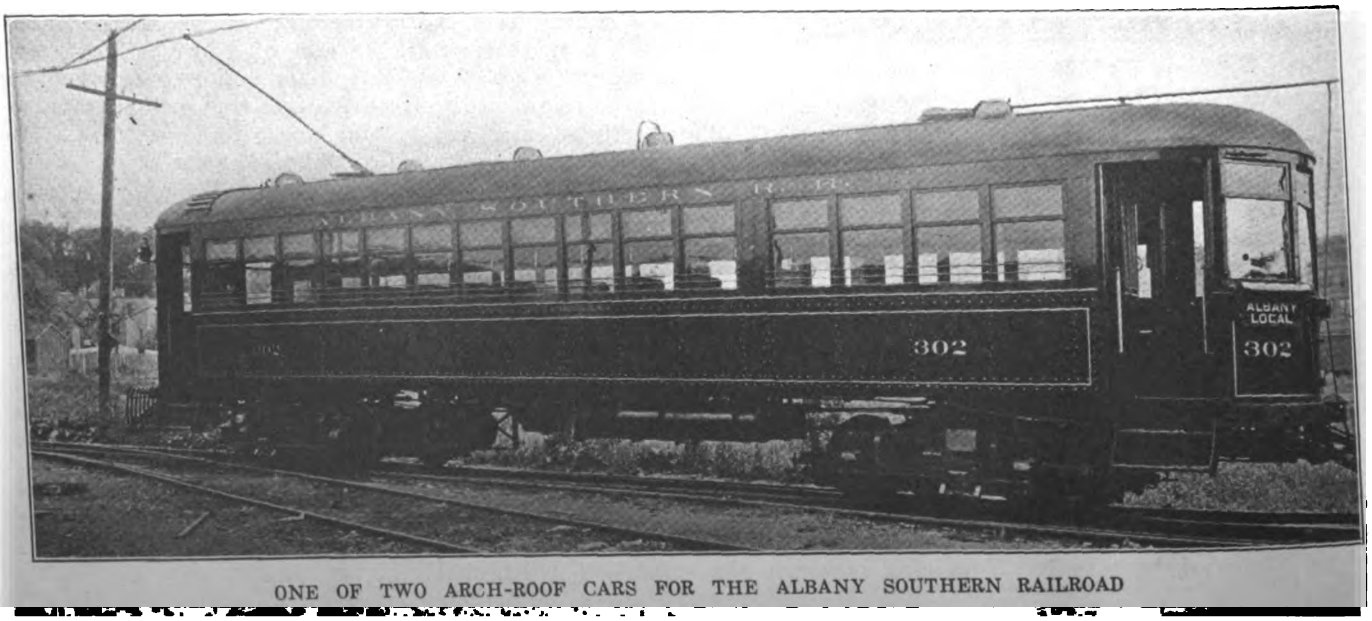


DUPLEX PRESSURE RECORDER

The ordinary vacuum gages and recorders, however, do not indicate or record the back pressure directly nor correctly. The vacuum as recorded varies with the barometer at the same time and place, whereas the absolute back pressure in the condenser is independent of the barometric pressure but is always equal to the difference between the two. The nearer the vacuum approaches the barometer, the lower the back pressure and vice versa.

The Uehling combined barometer and vacuum recorder of the Uehling Instrument Company, Passaic, N. J., has been developed to put these two records in juxtaposition on the same chart. With the barometer record used as the base line the absolute back pressure can be correctly read off directly from the chart. The device consists of two float chambers, one connected with a barometric mercury column, the other with a mercury column in communication with the condenser. These columns and double-float chambers are secured to the case of the recorder.

The pens of the recorder are actuated by the floats and move in correct harmony with the barometric pressure and the vacuum.



ONE OF TWO ARCH-ROOF CARS FOR THE ALBANY SOUTHERN RAILROAD

LONDON LETTER

(From Our Regular Correspondent)

The traffic analyses of the past few weeks have proved that the new moving stairways at Charing Cross and Oxford Circus are a success, and plans for the construction of additional stairways are being advanced as rapidly as possible. The Metropolitan and Bakerloo lines will be linked at Baker Street in about three months, and other moving stairways are contemplated at Oxford Circus (to connect with the Central London Railway), Shepherd's Bush, the Bank and Piccadilly Circus. The Underground Railway managers are somewhat baffled by the problem of utilizing the old lift wells and sections of tube left derelict by the installation of the stairways.

In consequence of the conditions imposed by a committee of the House of Commons in connection with the bill promoted by the Great Northern and Metropolitan Railway Companies for the acquisition and joint operation of the Great Northern & City Railway, and for its extension to the Bank station of the City & Waterloo Railway, the scheme has been withdrawn. This tube suffered from a lack of adequate provision to insure its proper co-ordination with other railways. The original intention was to have a physical connection between the tube and the Great Northern Railway near Finsbury Park. With this object in view the tube was built much larger than any of the other London tubes in order that it might admit the Great Northern rolling stock. The completion of this plan, however, had not been adequately secured, and a compromise was arranged by the tube terminating under Finsbury Park station. The working of the new railway was thus hampered from the very outset. Its large size had increased the cost of construction and equipment and made its trains more cumbersome than those of other tube railways, and it was getting no compensation for this in the way of interchange of traffic facilities. Its sale to another railway was a natural solution of its difficulties. The Great Northern seemed the most suitable purchaser, and much surprise was caused the year before last when the Metropolitan Railway purchased the tube. The proposed acquisition met with strong opposition from a large body of the Metropolitan shareholders, most of whom, however, were mollified when informed of the directors' plans for the line. Since the purchase was completed, however, these plans have failed to receive Parliamentary sanction.

At the ordinary general meeting of the Imperial Tramways, the chairman, Sir George White, in referring to the accounts, made some striking statements with regard to the future of motor omnibuses in connection with tramway enterprises. Some time ago this company considered the question of introducing motor omnibuses where it was considered they could be used as feeders to the tramways. A number of these vehicles were put in service on the streets of Middlesborough to the great satisfaction and benefit of the public. The company has secured a large building, formerly used as a skating rink, which is being made the headquarters for a motor department. Sir George White said that public requirements could no longer be met by tramcars alone. His company's experience in Bristol showed that, notwithstanding the smaller carrying capacity of the motor omnibus, the receipts per mile on city and country regular services alike actually equalled the receipts per mile of the tramway cars, while the touring car receipts were 70 per cent more per mile than the tramway car receipts.

As a commentary upon the above paragraph, a few words regarding the West Ham Corporation Tramways are appropriate. This year there is a deficit of more than £14,000, as compared with a deficit in the previous year of slightly more than £3,000, whereas for the year ended March, 1912, there was a surplus of £4,000. The whole of this deficit is attributed to the motor omnibuses now run by the London General Omnibus Company.

The accounts of the Wolverhampton Corporation's electric tramway system are always interesting, as showing the results of the only surface contact system in Great Britain. The results this year are again most satisfactory, although they are now being amplified by those of a motor charabanc service, instituted about three years ago. The average traffic revenue per car mile reached 11.3d., and the working expenses, including power cost, 6.6d. Including renewals, the total expenses per car mile averaged 9.8d., leaving a substantial balance of profit.

To mark the completion of twenty years' operation of the Glasgow Tramways under the management of the Corporation, 104 tramwaymen, who have been in service for that period, were presented with silver badges. Councillor Kirkland, convener of the Tramways Committee, said that in July, 1894, when the tramways were taken over by the Corporation, there were 538 conductors and drivers employed, while at the present day there were 3200 motormen and conductors in the service. Sir James Bell, who was Lord Provost in 1894, said that at that time many people foredoomed the enterprise to failure, but that to-day the tramways were bringing in a large revenue and the service was probably unequalled.

In pursuance of the policy of educating the public in methods of safety on the streets, the Glasgow Corporation Tramways recently displayed on the cars a large placard headed "Always Face Forward," and bearing the Scripture reference "Proverbs, Chapter 3, 23." This was one of a series of weekly texts affixed to the city cars. The verse to which attention was directed reads as follows: "Then shalt thou walk in thy way safely, and thy foot shall not stumble."

The Tramways & Light Railways Association held a two days' conference in Newcastle last month and some interesting papers were discussed. Councillor R. Mayne, vice-chairman of the Newcastle Tramways' committee, read the first paper, his topic being "Features of the Newcastle Corporation Tramways." Other subjects were: "Tramway Experiences in Brazil," by H. M. Sayers; "Standard Tram Rails: A Comparison of English and Foreign Sections," by F. Bland; "Rail Joints: Their Construction and Maintenance," by R. Humphries, of the Birmingham and Midland Tramways joint committee; and "Town Planning in Relation to Local Traffic," by J. A. Brodie, city engineer at Liverpool.

The directors of the British Electric Traction Company, which operates numerous tramway systems in England, have prepared a scheme for the reduction of the company's capital. When the capital was rearranged in 1911-1912 there was no reduction, but the further accumulation of unpaid dividends on the preference shares was arrested. The sum of £908,372, by which it is now proposed to reduce the capital, will, with the existing reserve, fully cover the depreciation in the assets. The amounts now proposed to be written off are 50 per cent of the 6 per cent preferred ordinary stock and 70 per cent of the deferred ordinary stock. The new share capital will consist of two classes of stock only, viz., 6 per cent cumulative preference stock, with priority as to capital, and ordinary stock entitled to all surplus profits and assets.

The select committee of the House of Commons considering the London, Brighton & South Coast Railway bill has decided that the terms of contract for the supply of electricity shall be submitted to the London County Council, which has the power to purchase the electric companies in 1931. The railway thought that the County Council should have no voice in the matter before 1931. The committee has further decided that the railway shall have power to use, but not to sell, its electricity in Croydon, but that the use shall be limited to traction and station lighting. The corporation, as the authorized distributor, objected to another distributor offering a supply of electricity for sale in Croydon.

The work of electrification has progressed so far on the Kingston route of the London & South-Western Railway that delivery of the electric trains intended for the new service is now being made. The first of these trains is already under test upon the District Railway. This train, which consists of three cars, will carry 190 passengers. The coaches are of the compartment type. There is no intention of copying the big open compartments adopted on the tubes, which have never been popular with the average Englishman. The work of electrifying the South-Western service is making rapid progress. The company will not wait for the completion of the electric power station which it is erecting outside Earlsfield, but will, in the first instance, obtain its electrical power from an outside contractor.

A. C. S.

News of Electric Railways

Hearing by California Commission on Solano Project

Further details in regard to the hearing by the California Railroad Commission regarding the Solano land project, in which moneys of the United Railroads of San Francisco were invested by Patrick Calhoun, are now available. The article in the issue of last week was based upon telegraphic advices.

The testimony at the hearing indicated that the funds taken by Mr. Calhoun from the treasury of the United Railroads were withdrawn on receipts said to have been authorized by him and signed by him or in his behalf by certain employees of the company, for amounts varying in size. The treasurer of the company testified that it had been his custom to honor calls of this kind from President Calhoun. He did not suspect any impropriety and carried the payments as cash because they were cash items. Several directors of the United Railroads testified that they knew nothing about the transactions until June, 1913. The testimony was not clear or conclusive as to whether or not all of the $1,096,000 involved in the transaction was invested in the Solano Irrigated Farms project. As the commission took the position that it was unable legally to go into the affairs of the Solano Irrigated Farms, Jesse W. Lilienthal. president of the railway, agreed to do what he could to discover the sources of the money contributed to the enterprise. The hearing has been adjourned to Aug. 14.

As this transaction was placed upon the company's books at a memorandum value of $1 prior to the publication of its balance sheet of a year ago—June 30, 1913—any recoupment that the company may make from the Solano affair will add to its surplus. It is understood that the financial position of the company actually remains unchanged.

Mayor Blankenburg Appoints Utility Experts

With the approval of his co-workers, including the Mayors of New York, Chicago, Cleveland and other cities, Mayor Blankenburg of Philadelphia on July 23 appointed eight men of nation-wide prominence as members of the board of trustees of the National Bureau of Public Utilities Research. This body, as noted in the ELECTRIC RAILWAY JOURNAL of July 4, was suggested by Mayor Blankenburg to the heads of other cities in this country as a means for assisting in the efforts of cities to obtain lower rates from lighting, transportation and other public utilities.

The men selected and their qualifications are as follows:

Louis D. Brandeis, lawyer, Boston; counsel for Interstate Commerce Commission on application of Eastern railroads for 5 per cent increase in freight rates.

Charles R. VanHise, president University of Wisconsin, Madison, Wis.

S. S. Fels, manufacturer, Philadelphia.

Frederick W. Taylor, consulting engineer, Philadelphia; past president American Society of Mechanical Engineers; leader in scientific management movement.

Frederick A. Cleveland, director New York Bureau of Municipal Research; formerly chairman of the President's commission on economy and efficiency.

Leo S. Rowe, professor of political science University of Pennsylvania, Philadelphia; president American Academy of Political and Social Science.

Charles F. Jenkins, publisher, Philadelphia; proprietor of the *Farm Journal.*

Felix Frankfurter, administrator and lawyer, Cambridge, Mass.; professor of law Harvard University; chief legal adviser of the Colonial Administration of the United States under Presidents Roosevelt, Taft and Wilson; played important part in trials of Morse, Heinze and the Sugar Trust.

M. L. Cooke, director of public works, Philadelphia, is quoted as follows:

"The board appointed by Mayor Blankenburg voluntarily to perform this work has been chosen with the idea of securing the services of men who have made notably successful records for themselves, but who are known all over the country as being enlisted beyond the chance of recall in the battle for decency in government and fair dealing in private affairs. Not one of the members is in politics, nor is one of them at the present time a holder of any elective or political office. Their names will guarantee to all cities, and to the customers of utility corporations throughout the country, that the work of the bureau will be pushed with vigor, balanced by experience, and that its activities will have the necessary effectiveness."

It is stated that Mayor Blankenburg will increase the membership of the board by the addition of three or more experts in the near future. According to Director Cooke, the utilities bureau is now ready for business. Such a temporary administrative staff as may be needed to carry on its work between now and Nov. 12, 13 and 14, when the conference of Mayors will be held in Philadelphia, has now been provided. In addition to gathering general data, individual cities will be advised and assisted in making such application of the bureau's researches to local conditions as will be most likely to secure favorable consideration from public service commissions and other similar bodies.

Municipal Ownership Election Injunction Denied

Judge Stephen Young, of Norwalk, Ohio, sitting in Common Pleas Court at Toledo, on July 28 denied the application of John Craig, a taxpayer, for an injunction against the election for municipal ownership of the street railway properties at Toledo, which is set for Aug. 4. The court sustained the demurrer of City Solicitor Thurstin and held that it has no jurisdiction in the premises. John Craig is the nominal plaintiff in the case, although the Citizens' Franchise Association really brought the action, as noted in the ELECTRIC RAILWAY JOURNAL of July 25. It was decided to carry the case to the Court of Appeals at once.

The arguments were completed on the evening of July 27. Judge John H. Doyle, a member of the Citizens' Franchise Association, presented the principal argument for the plaintiff. He asserted that the petitions to initiate the ordinance were filed under neither the old nor the new law. The new law went into effect, he said, on June 8, 1914, while a copy of the petitions, required by the new law, was certified to the city auditor on May 22. If the petitions were legal under the old law, the board of elections had no authority to issue a call for a special election. Neither did the board have authority to call an election under the new law, because the certified copy of the petitions, being filed before June 8, was of no effect and because the signed petitions were not properly certified by the auditor to the board.

W. W. Campbell made the general defense that the 1913 initiative and referendum law was in full effect until the amendatory law went into effect, and that the petitions started under the old law could not be suspended by the new law. The certification of the ordinance to the solicitor was merely an extra precaution in anticipation of the new law, and was not really necessary to make the petitions valid.

Meetings are being held nightly by the Municipal Ownership League. The objections to the municipal ownership plan, as indicated by discussions of the subject, are to the effect that the ordinance is crude in its requirements and in its wording. It has been decided to ask the election board to print the entire ordinance on the ballots.

The franchise committee of the City Council, in session on July 22, deferred action for a week on the sliding scale proposal submitted by the Non-Partisan League. Nothing of importance has yet developed along this line, although both this proposal and that submitted by the Toledo Citizens' Franchise Association were discussed to some extent. After the meeting on July 22 Mayor Keller said that the committee might modify its own proposal and that some fixed rate of fare other than three cents might be considered. He would not go into details, however, and further information along this line was not obtainable.

Mayor Keller on July 24 issued a proclamation calling attention to the election to be held Aug. 4 to pass on "an ordinance to provide for the ownership and maintenance of and operation by the city of Toledo of street railways, electric lighting plants, electric power plants and artificial power plants and public utilities."

Wage Increase in Kansas City

The 3500 employees of the Metropolitan Street Railway, Kansas City, Mo., will, beginning with Aug. 1, receive 1 cent an hour more pay than heretofore, as the result of a recent order issued by Federal Judge William C. Hook. The order, dated July 20, was filed several days later. It covers all employees working upon an hourly basis in the operating, electrical, mechanical and maintenance of way departments, and the increased cost resulting will amount to between $110,000 and $125,000, according to an estimate by the receivers of the company. While the order came from Judge Hook, it was made at the instance of the receivers, as an indication of appreciation of the employees' loyalty during the recent campaign for an extension of the franchise. The company is now working out the details of the wage increase.

The receivers for the company agreed recently to extend to Kansas City, Kan., the half-fare rate for children between the ages of eight and twelve, the use of which began in Kansas City, Mo., on July 20, as noted in the ELECTRIC RAILWAY JOURNAL of July 25. The franchise on the Kansas side provides that any reductions made in Missouri shall be extended to Kansas. The petition asking for the extension was signed by the Kansas City officials and the receivers and forwarded to Judge Hook, who is expected to grant the request without delay.

Much interest was created when the Metropolitan Street Railway, in announcing through the daily papers that the half-fare rate for children was in operation in Kansas City, Mo., selected the Nelson papers, the *Star* and the *Times*, as two of its advertising mediums. Those dailies fought bitterly against the recent franchise granted to the Kansas City Railways, the successor company to the Metropolitan Street Railway. Advertising men were especially interested in the situation, in view of the fact that it is usual for advertisers to patronize the papers which maintain at least noncommittal attitudes regarding projects in which they are interested.

The Kansas City election board announced that a hearing on alleged frauds in the recent franchise election would be held on July 23. The investigation was to be directed particularly to the twelfth precinct of the First Ward, where the vote was 245 to 5 in favor of the franchise. The announcement followed a meeting of the board at which the the names of twenty-three men were presented who were alleged to have said they voted against the measure. It was stated that subpoenas for the judges, clerks and challengers who served in the precinct and for each of the twenty-three voters would be issued.

Merchants and property owners of the downtown district of Kansas City, Mo., have pledged $400,000 of a $500,000 fund to build an interurban station at Tenth and Wyandotte Streets, if the new management of the street railway system will accept that location. It is stated that this location is adjacent to the heart of the shopping district, is accessible from street car lines and offers the least grade of any of the sites proposed. New members have been added to committees to raise the additional $100,000 within the next ten days.

Pittsburgh Wage Arbitration Ended

The arbitration proceedings in the dispute between the Pittsburgh (Pa.) Railways and its employees, noted in the ELECTRIC RAILWAY JOURNAL of July 18, came to a close, as far as the taking of testimony is concerned, on July 20. During the ten days of the hearing the attorneys for the employees of the company introduced more than seventy witnesses, whereas the railway attorneys offered the testimony of only eleven witnesses. The testimony during the latter part of the investigation dwelt with the subject of minimum wage, new uniforms, dinner-hour relief and the character of runs.

George C. Wilson, attorney for the railway, announced his closing argument would be that the wages now paid the employees are too high and in view of the testimony introduced concerning the cost of living in Pittsburgh should be reduced. Mr. Jones, general manager of the company, testified that the employment office of the company was closed from March 17 to June 9 because the company had a sufficient number of employees. He also stated that the company has twenty-five employees who have been in the service for twenty-five years or more.

By the aid of a chart that he had devised Mr. Jones explained how the scheduling of cars will be rearranged so as to give better service and incidentally grant the men more free time at noon and a general improvement in working conditions. According to Mr. Jones' plan, the men are to have one and one-half hours for dinner and the company will pay them for thirty minutes of that time. At present the company handles 31,000 cars in the morning rush hours, 6000 at noon and 28,000 at night, all within half an hour.

Electric Railway Issue in Detroit Election

That the railway issue will again be brought up in the Detroit mayoralty campaign is indicated by the petitions which have been filed by candidates for that office. Mayor Marx, in the course of whose administration the seven-for-a-quarter day-to-day agreement with the Detroit United Railway was effected, is a candidate for renomination on the Republican ticket. He will be opposed by John McVicar, who, it is stated, is to run on a municipal ownership platform. F. F. Ingram, who has announced his candidacy on the Democratic ticket, is also running on a municipal ownership platform, charging Mayor Marx with a surrender to the Detroit United Railway and with the betrayal of municipal ownership.

The appraisal of the railway within the city is proceeding as rapidly as possible under the direction of Prof. E. W. Bemis. Edward Burch, chief assistant to Professor Bemis, in his first report states that the organization required for the appraisal is complete. With 33 engineers at work he expects that the work will be completed within the three months specified in the contract.

Andrew Sangster, public accountant, has been retained by the Board of Street Railway Commissioners to assist in the appraisal of the railway. He will be assisted by eight public accountants. The purpose of examining the company's books is to determine from the vouchers and other records the original cost of the property. Mr. Sangster has previously been connected with the appraisal of the Chicago Telephone Company, the Southern Bell Company, the Omaha Gas Company, the St. Paul Gas Company and the Springfield (Ill.) Gas Company.

Dual Subway Progress in New York

The Public Service Commission for the First District of New York during the week ended July 25 opened bids for the construction of one section of new rapid transit railroad and held a public hearing on the proposed form of contract for the construction of another. Bids were received for the construction of Section No. 5 of Routes No. 4 and No. 36, this being a part of the Broadway-Fourth Avenue subway in Manhattan. This section extends eastward from Fifty-ninth Street and Seventh Avenue to Fifth Avenue, where it divides into two branches, one branch continuing through Fifty-ninth Street and the other through Sixtieth Street to Second Avenue. It will be a two-track section, with stations at Fifth Avenue and Lexington Avenue. According to the unofficial report of the bids, the Degnon Contracting Company, New York City, was the lowest bidder at $2,808,661. The work in this section must be completed within twenty-nine months from the execution of the contract.

The section on which the public hearing was held is known as Section No. 3 of Route No. 33, mainly an extension of the East River tunnel from Whitehall Street, Manhattan, to Montague Street, Brooklyn, for operation by the New York Municipal Railway Corporation. This section will also include part of the connection between the Interborough Rapid Transit Company's East River tunnel, extending from Old Slip, Manhattan, to Clark Street, Brooklyn, and the existing subway at Fulton and Willoughby Streets, Brooklyn. Stations on the New York Municipal Railway Corporation will be at Montague Street and Court Street; and on the Interborough Rapid Transit Company line at Borough Hall. This contract will now be put into permanent form and will soon be advertised for bids.

The commission also opened bids for the construction of station finish on the six stations in Sections No. 1 and No. 2

of Route No. 11-B, the extension of the Fourth Avenue subway in Brooklyn from Forty-third to Eighty-sixth Street. The stations are located at Forty-fifth Street, Fifty-third Street, Bay Ridge Avenue, Seventy-seventh Street and Eighty-sixth Street. Under this contract the stations must be absolutely completed, the work including the electric wiring, all hardware, tile work, mosaic, hand rails, etc. The contractor will be required to finish the work within six months after the execution of the contract. According to the unofficial totals of the bids, the Station Construction Company, New York City, was the lowest bidder at about $250,000.

In compliance with the request of property owners along William Street, Manhattan, and with an opinion of the Appellate Division, the commission agreed to draw up the liability clause in this contract on this district in a different manner. Heretofore the contractor for any section of work assumed all liability resulting from such work. The work in William Street, however, will be through very low and partly made ground, and for that reason the property owners wish the city to be primarily responsible for any damages that may result to their buildings. The commission has acquiesced in this matter, but the contract will be drawn in such a manner that the contractor will still be responsible, although he will have the backing of the city.

Operating Results in Cleveland

According to the report rendered to the board of directors of the Cleveland (Ohio) Railway on July 25, the deficit for June is $59,366, based upon the ordinance allowances. The actual deficit was $170,037. On June 1 the interest fund was $395,942. With a reduction for the ordinance deficit, the fund is now $336,575. Should the deficit for July be as large as that of June, the interest fund will be reduced to a point below the minimum of $300,000. By some it is believed that this will be the result and that the 1-cent charge for transfers will be put into force again about Sept. 1. It is stated that there is little reason to believe that the figures for July will be any more favorable than those for June. The operating revenue for May was $665,513, while for June it was $642,637. The car mileage in June was greater than in May.

The seven men who formed the grievance committee of the local branch of the union recently returned to work. George R. Davies, president of the local branch, said that this did not mean that the effort to secure a modification of schedules and a minimum day of eight hours had been given up. The men might be called back to committee duty at any time and it was possible that the officers of the employees' association might come to the city to take part in the matter. The union has taken no action regarding the repeated proposal of J. J. Stanley, president of the railway, to grant an increase in wages of 1 cent an hour for all men in service one year or more and a minimum day of five hours, as noted in the ELECTRIC RAILWAY JOURNAL of July 25.

Revocation of Charters for Proposed Railways.—One hundred and seventy-five proposed street railways in Kansas were eliminated when the Secretary of State revoked their charters for failure to file annual statements and pay the corporation tax. None of the railways ever passed the blue-print stage.

New Automatic Block Signal System Opened.—On July 20 the Rochester & Sodus Bay Railway, Rochester, N. Y., placed in operation its new automatic block signal system for preventing head-on or rear-end collisions. The cost of this improvement was approximately $170,000. The contract for the installation of the system was let in August, 1913. The Wright-Wilson semaphore system is used.

Next Southwestern Electrical & Gas Convention.—At a recent meeting of the executive committee of the Southwestern Electrical & Gas Association, held in Dallas, Tex., July 18, it was unanimously decided that the next annual convention of the association would be held in Galveston, Tex., May 19, 20, 21, and 22, 1915. Further information can be obtained from H. S. Cooper, secretary, 405 Slaughter Building, Dallas, Tex.

Agricultural Expert Employed by Portland Company.—The Portland Railway, Light & Power Company, Portland, Ore., has created an agricultural department in charge of H. E. Cross, Gresham, Ore. Mr. Cross is an expert in farming and agricultural problems and his services will be at the disposal of farmers along the interurban lines of the company. It is the intention of the railway to furnish farmers with the proper information regarding the growing of feed for hog and cattle raising.

Doctrine of Regulated Monopoly Sustained in Idaho.—The Supreme Court of Idaho recently upheld the validity of the order of the Idaho Public Service Commission in which the commission adopted the doctrine of regulated monopoly in public utility service. The commission had refused to issue a certificate to the Idaho Power & Light Company to enter Twin Falls, holding that this community was already adequately served. The court decided the policy of the commission in preventing destructive competition of public utilities was legal.

Joplin Strike Shows No Change.—No changes have taken place in the strike situation on the lines of the Joplin & Pittsburg Railway, Pittsburg, Kan. Neither side has shown a disposition to make advances, though the tie-up had lasted since July 7. A three-year contract was recently signed with the overhead linemen of the company, who had been working on the "white way" at Pittsburg since the strike began. John Fennimore, superintendent and claim agent, signed the agreement for the company in the absence of W. A. Satterlee, general manager.

Legal Rate of Fare Law in Kentucky Voided.—The law enacted by the last Kentucky Legislature seeking to establish the legal passenger rate in Kentucky at 2½ cents has been held unconstitutional by Judge Gregory, of the Jefferson Circuit Court, on the ground that there is no enacting clause in the act, as required by the State Constitution. The Kentucky Traction & Terminal Company, Lexington, Ky., the only electric road in the State affected by the act, has announced that its old rate, which was less than 2½ cents a mile, would be re-established on its lines. This reduction was voluntary on the part of the company.

Women Conductors for Special Charity Work.—Women will be used as conductors on the lines of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., for one day during the second week in October. They will be furnished by the Federation of Women's Clubs, and this organization will be given all money collected in excess of the average daily receipts. The project is in behalf of the children's charities of St. Joseph. Special attractions will be offered at Lake Contrary, a pleasure resort owned by the traction company. The members of the federation are urging a campaign to have owners of automobiles discard them for the occasion in favor of street cars in order to swell the receipts as much as possible.

Pulmotors Free for Public Use.—The Pittsburgh (Pa.) Railways, the Duquesne Light Company and the Equitable Gas Company have made arrangements to give the public the benefit of pulmotors belonging to them. Pulmotors have been placed in stations throughout Allegheny County, and physicians have been encouraged to become acquainted with their use and to call for them in cases of emergency. They are available upon call of any physician free of charge at any hour of the day or night, and when possible an expert employee will accompany the apparatus to supervise its use.

Hearing on Brooklyn Marginal Railroad.—The Board of Estimate and Apportionment of New York City set July 30 as the date for a hearing concerning the plan for the proposed South Brooklyn Marginal Railroad along the waterfront. It has been estimated that this road will cost the city at least $3,831,000. This sum covers construction work, a two-track elevated road from Poplar Street to Forty-second Street, with a surface classification yard at Erie Basin and a surface transfer terminal yard at the Eighth Ward Market. In case the line is authorized, the property required for the railroad and yards not already owned by the city will be purchased at private sale, or the city will institute condemnation proceedings for its acquisition.

Short Strike in St. John.—On July 22 the members of the street railway employees' union in St. John, N. B., went out on strike because of matters arising out of the dismissal of a conductor for a breach of rules. On the evening of July 23 two persons were seriously wounded as a result of rioting. Two of the company's cars were overturned and set on fire. The strike was ended by the signing of an agreement at 10 p. m. on July 24, under which the men returned to work the next morning. All the discharged employees were reinstated except Frederick Ramsey, the president of the union, over whose case the strike originated. Of the eleven other men dismissed, nine returned to work at once, and the cases of two more were take under advisement.

Commissioner Refuses Rehearing to Force Extension.—The Ohio Public Utilities Commission on July 22 refused to grant a new hearing of the case in which the Cincinnati (Ohio) Traction Company was relieved of extending its Warsaw Avenue line to Price Hill in accordance with an ordinance enacted by the City Council. City Solicitor Schoenle has expressed his determination of appealing the case to the Ohio Supreme Court. The complaint of the railway against the extension, sustained by the commission, was noted in the ELECTRIC RAILWAY JOURNAL of July 11. Mr. Schoenle has notified the company that it must reduce its fare to Kennedy Heights from 8 cents to 5 cents, in accordance with an ordinance requiring the reduction when this village came into the city, which recently occurred.

Examination as to Value of Franchise Extension.—Mayor Bennett of Rockford, Ill., has retained an expert of the Illinois Public Utilities Commission to examine the properties of the Rockford City Traction Company and to advise the City Council of the monetary value of the twenty-year franchise extension which the company has asked for. The authorization of the City Council in regard to securing the services of an expert was noted in the ELECTRIC RAILWAY JOURNAL of July 11. Secrecy has been maintained by the joint committee which has the franchise matter in charge, in regard to the name of the expert now chosen. It is reported that the series of demands to be made by the city before a franchise extension is granted include the payment of from 1 per cent of the gross earnings for the first five years up to 4 per cent for the fourth five years, the building of numerous extensions and the interchange of transfers between city and suburban cars. It is not expected, however, that the committee will make a definite report until the commission expert has completed his examination.

Compulsory Depreciation Accounting in Massachusetts.—The Massachusetts Public Service Commission on July 22 issued on its own initiative an order to railroads and street railways warning them to be prepared to show how they account for depreciation. In connection with this order the commission says: "It is manifest that no system of inquiry or of supervising the management of common carriers is sound and enduring which does not adequately take into account depreciation, not only the depreciation caused by ordinary wear and tear but also obsolescence caused by a great variety of things. Unless and until depreciation is taken care of—and shown in the accounts to be taken care of—there is no accurate way of determining whether dividends have been properly paid or whether a floating debt has been properly incurred for lawful purposes. Ultimately the method of dealing with depreciation adopted by the Interstate Commerce Commission is likely to be made applicable by this commission not only to railroads but to street railways as well."

Special Report Printed on Boston Transit Conditions.—The special report of the Massachusetts Public Service Commission and the Boston Transit Commission to the 1914 Legislature on transit conditions in metropolitan Boston has been printed as Senate Documents 448 and 474. In addition to the analysis of traffic conditions and fare problems outlined in the ELECTRIC RAILWAY JOURNAL of March 21, the publication includes twenty-two valuable appendices, with the most modern maps of the Boston transit system, graphic studies of traffic, earnings, seating facilities, etc.; comparisons of steam and electric railway fares within the Boston and suburban district, investment in transit facilities, an analysis of the profitable haul on the Boston Elevated Railway system, statements of rush-hour traffic at Boston Elevated Railway terminals, statements of fare reductions and increases and changes in transfer privileges on the Bay State Street Railway from 1900 to 1913, inclusive; the names of the constituent companies of the Bay State Street Railway, mileage and other data. An interesting account is also given of the inception and present use of the 8-cent inter-company checks now used at Boston.

Injunction against Sea Beach Line Embankment.—Judge Veeder in the United States District Court, Brooklyn, on July 23 issued a temporary injunction against the Brooklyn (N. Y.) Rapid Transit Company, restraining it from proceeding further with the construction of the new Sea Beach line embankment across the Gravesend meadows. Application for the injunction was made by J. Youngs, United States attorney for the district, who asserted that the "fill" being used in the construction was blocking up the navigable waters of Coney Island and Hubbards Creeks, and that unless steps were immediately taken to correct the damage done these two bodies of water would soon disappear. Assistant Engineer Harry T. Kerr, of the United States War Department, and Assistant United States District Attorney L. R. Bick on examination found that the dual subway system operations had caused a complete change in the line of the two creeks, because the soft marshland was unable to bear the weight of the material dumped upon it for the embankment and it had bulged forward into the creek beds. Whether or not the injunction will be made permanent is of grave concern because of its effect on the completion of the Sea Beach work within the contract time.

Improvements for Boston Subway.—The Boston Transit Commission has asked for bids covering the cost of improvements at the Park Street subway station in Boston, which will do away with objectionable curves in the tracks approaching and leaving the platforms immediately below the Common and enlarge the platform areas in connection with the approaching completion of the Boylston Street subway and the future extension of the Cambridge subway to the South Station and Dorchester. The Park Street station is one of the most densely patronized in the world. The platforms at present in use are narrow at their south ends, affording passage for barely more than a single person at their extremities. Under the proposed plan, however, the area of the east platform will be increased from 7200 sq. ft. to 9900 sq. ft., and that of the west platform from 8600 sq. ft. to 12,800 sq. ft. All main tracks will be straightened throughout practically their entire length, with the exception of the loop tracks at the north end. The south entrances to the station will also be slightly altered. Bids will close Aug. 4, the intention being to complete the alterations before the end of the year. Arrangements have been made for immediately utilizing the new incline for surface cars south of the Public Garden, and in about a month the Boston Elevated Railway will begin the installation of electrical equipment in the Boylston Street subway.

Washington Railways Almost Relieved of Paving Expenses.—Through an error of Congressional clerks, the street railways of Washington were recently almost freed from the requirement that they pay for the paving between their tracks. In the final draft of the appropriation bill for the expenses of the District of Columbia government for the next year, the following paragraph was discovered, after the measure had been sent to President Wilson for his signature: "Provided, that where the width of the street, avenue, or road to be paved or completely resurfaced from curb to curb or gutter to gutter, as the case may be, shall exceed 40 ft., the excess, including the cost of intersections or spaces within which street railways are required to pave, shall be paid for one-half out of the Treasury of the United States, and one-half out of the revenue of the District of Columbia." This proved to be an error of the conference clerks who collated the House and Senate amendments. The following has now been written into the bill: "Nothing contained in the District of Columbia appropriation act for the fiscal year 1915 shall be construed as relieving street railways from bearing all of the expenses of paving street or avenues between the exterior rails of the tracks of their road in the District of Columbia and for a distance of 2 ft. from and exterior to such tracks on each side thereof, as previously required."

LIBRARY OF THE UNIVERSITY OF CALIFORNIA

Financial and Corporate

Stock and Money Markets

July 29, 1914.

There were heavy overnight declines through the entire list on the New York Stock Exchange to-day and all weakly margined stock went by the board. After the initial transactions were made, however, there were evidences of support at the new low level. The exchange for the first time was called upon to stand as a solitary free market in view of international complications on foreign exchanges. Rates in the money market to-day were: Call, 5 per cent; sixty days, 4 per cent; ninety days, 4 @ 4½ per cent; four months, 4½ per cent; five months, 4¾ per cent; six months, 5 per cent.

In the Philadelphia market to-day the general tendency was toward firmness. Philadelphia Rapid Transit closed at 13 @ 13¼ and Union Traction at 40¾ @ 41½.

The stocks on the Chicago market were weak, the prices being lower. Bonds were active at firm prices.

The Boston market showed low levels early to-day with gains toward a normal basis later, with a net gain of over a point in the general list.

The chief feature on the Baltimore Exchange to-day was trading in coal issues. The total sale of stocks was 1033 shares, of bonds $39,000, par value.

Quotations of traction and manufacturing securities as compared with last week follow:

	July 22	July 29
American Brake Shoe & Foundry (com.)	91	89
American Brake Shoe & Foundry (pref.)	137	133
American Cities Company (com.)	*29	*29
American Cities Company (pref.)	60	60
American Light & Traction Company (com.)	327	320
American Light & Traction Company (pref.)	108	108
American Railways Company	37¼	37
Aurora, Elgin & Chicago Railroad (com.)	32½	a40
Aurora, Elgin & Chicago Railroad (pref.)	76	75
Boston Elevated Railway	99½	96
Boston Suburban Electric Companies (com.)	7	7
Boston Suburban Electric Companies (pref.)	50	50
Boston & Worcester Electric Companies (com.)	*6¼	6¼
Boston & Worcester Electric Companies (pref.)	37	37
Brooklyn Rapid Transit Company	91¾	87
Capital Traction Company, Washington	99½	99½
Chicago City Railway	170	170
Chicago Elevated Railways (com.)	22	25
Chicago Elevated Railways (pref.)	75	75
Chicago Railways, ptcptg., ctf. 1	85	a88½
Chicago Railways, ptcptg., ctf. 2	34⅛	32½
Chicago Railways, ptcptg., ctf. 3	6	8
Chicago Railways, ptcptg., ctf. 4	2	a2
Cincinnati Street Railway	a104	104
Cleveland Railway	106	105
Cleveland, Southwestern & Columbus Ry. (com.)	*4	*4
Cleveland, Southwestern & Columbus Ry. (pref.)	*30	*30
Columbus Railway & Light Company	13	13
Columbus Railway (com.)	*53	13
Columbus Railway (pref.)	79½	79½
Denver & Northwestern Railway	*55	*55
Detroit United Railway	80	80
General Electric Company	148½	143
Georgia Railway & Electric Company (com.)	121	120
Georgia Railway & Electric Company (pref.)	86	85½
Interborough-Metropolitan Company (com.)	13⅞	13⅞
Interborough-Metropolitan Company (pref.)	63	58⅜
International Traction Company (com.)	*30	*30
International Traction Company (pref.)	*81	*81
Kansas City Railway & Light Company (com.)	*20½	*20½
Kansas City Railway & Light Company (pref.)	*39	*39
Lake Shore Electric Railway (com.)	6	6
Lake Shore Electric Railway (1st pref.)	90	90
Lake Shore Electric Railway (2d pref.)	22	22
Manhattan Railway	129½	130
Massachusetts Electric Companies (com.)	10¼	10
Massachusetts Electric Companies (pref.)	58	*58
Milwaukee Electric Ry. & Light Co. (pref.)	*95	*95
Norfolk Railway & Light Company	24½	24½
North American Company	72½	70⅜
Northern Ohio Traction & Light Co. (com.)	63½	63½
Northern Ohio Traction & Light Co. (pref.)	97½	97½
Philadelphia Company, Pittsburgh (com.)	38	37¾
Philadelphia Company, Pittsburgh (pref.)	35	35
Philadelphia Rapid Transit Company	15¼	14½
Portland Railway, Light & Power Company	44	44
Public Service Corporation	111	111
Third Avenue Railway, New York	41⅜	37½
Toledo Traction, Light & Power Co. (com.)	20	20
Toledo Traction, Light & Power Co. (pref.)	70	70
Twin City Rapid Transit Co., Minn. (com.)	101⅝	97
Union Traction Company of Indiana (com.)	*11½	*11½
Union Traction Company of Indiana (1st pref.)	*70	*70
Union Traction Company of Indiana (2d pref.)	*14	*14
United Rys. & Electric Company (Baltimore)	27⅜	26¼
United Rys. Inv. Company (com.)	10	7
United Rys. Inv. Company (pref.)	28	25½
Virginia Railway & Power Company (com.)	a50	48
Virginia Railway & Power Company (pref.)	95	95
Washington Ry. & Electric Company (com.)	87	87
Washington Ry. & Electric Company (pref.)	82¾	82¾
West End Street Railway, Boston (com.)	69¼	68½
West End Street Railway, Boston (pref.)	87	85
Westinghouse Elec. & Mfg. Company	78¾	74
Westinghouse Elec. & Mfg. Co. (1st pref.)	122	120⅛

* Last sale. a Asked.

ANNUAL REPORTS

Brooklyn Rapid Transit Company

The comparative statement of income, profit and loss of the Brooklyn (N. Y.) Rapid Transit Company for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Gross operating revenue:		
Transportation	$25,246,452	$23,865,260
Miscellaneous	311,797	287,028
Total	$25,558,249	$24,152,288
Operating expenses:		
Maintenance of way and structure	$2,021,647	$1,678,125
Maintenance of equipment	2,315,990	2,202,208
Operation of power plant	1,463,284	1,421,123
Operation of cars—trainmen's wages	4,520,023	4,062,796
Operation of cars—other expenses	1,696,132	1,572,661
Damages	543,885	605,092
Legal expense in connection with damages	219,759	217,211
General law expenses	65,098	61,934
Other general expenses	822,857	746,870
Freight and mail expenses	325,054	264,324
American Railway Traffic Company—expenses	823	1,112
Total	$13,994,552	$12,833,456
Net earnings from operation	$11,563,697	$11,318,832
Income from other sources	451,771	339,947
Total income	$12,015,468	$11,658,779
Less taxes and fixed charges	6,699,763	7,161,851
Net income	$5,315,705	$4,496,928
Surplus at beginning of year	7,904,607	5,863,812
Coney Island & Brooklyn Railroad surplus at time of acquisition	506,625	....
Total	$13,726,937	$10,360,740
Other credits to surplus during year:		
Miscellaneous items	30,653	7,484
Settlement of Brooklyn City Railroad suit	582,567	....
Sale of easement South Brooklyn Railway	738,987	....
Total	$15,079,144	$10,368,224
Appropriations:		
Accounts written off	$2,315	$28,513
Adjustment of taxes prior years	10,801	*116,255
Adjustment of expenses prior years	*948	66
Supercession and depreciation	174,339	60,522
Amount set aside as reserve	1,500,000	50,000
Dividend on stock outstanding	3,660,048	2,440,770
Total	$5,346,555	$2,463,618
Balance sheet surplus	$9,732,588	$7,904,607

*Credits.

A comparison of the financial results of the Brooklyn Rapid Transit System for the two years shown by the above statement is affected by two special influences, one being the inclusion of the statistics of operation of the Coney Island & Brooklyn Railroad for the last six months of the fiscal year and the other being the conversion into stock of the greater portion of the Brooklyn Rapid Transit Company's first refunding gold mortgage bonds. As a result of these influences the passenger revenues showed an abnormal increase of $1,381.192, or 5.79 per cent. Miscellaneous revenues increased $24,769, or 8.63 per cent, giving a total increase in operating revenues of $1,405,961, or 5.82 per cent.

Higher wages and increased cost of materials are reflected in the operating expenses. Of the total increase for the year of $1,161,097, or 9.05 per cent, $343,523 (20.47 per cent) was for maintenance of way and structures, $113,783 (5.17 per cent) for maintenance of equipment, $457,227 (11.25 per cent) for operation of cars—trainmen's wages, $123,471 (7.85 per cent) for operation of cars—other expenses, $3,164 (5.11 per cent) for general law expenses, $75,986 (10.17 per cent) for other general expenses and $60,730 (22.98 per cent) for freight and mail expenses. Damages showed a decrease of $61,206 or 10.12 per cent in spite of the heavier traffic. The expenses generally showed relatively less increases than the increase in business, except appropriations in connection with employee's welfare work. The net earnings from operation increased $244,865, or 2.1 per cent, while net income showed an increase of $818,777, or 18 per cent. The fixed charges, even after making provision for the interest on the cost of the Coney Island & Brooklyn Railroad shares, reflected a substantial decrease of 6.4 per cent.

An amount of $4,177,000 par value of the refunding mortgage 4 per cent bonds had been converted into stock prior to June 30, 1913. The conversion privilege expired on July 1, 1914, and the total number of bonds converted was $29,619,-

000, leaving outstanding in the hands of the public $3,459,000, and owned by the companies of the system, $18,714,000. The increase of stock by reason of the conversion of bonds was $29,619,000, making the total capital stock on July 1, 1914, $74,520,000. The operating results for the year show a surplus of $5,315,704.86 after paying $553,826.68 of interest on the refunding bonds which have now been converted into stock. With this interest saved the surplus earnings would have been equivalent to 7.87 per cent on the stock if the issued stock on July 1, 1914, after conversion, namely, $74,520,000, had been outstanding during the year.

On June 9, 1913, the number of stockholders was 3,709. On the same date of 1914 there were 6,319, an increase of 2,610, or over 70 per cent. The report states that this increase is accounted for partly on account of the conversion of bonds into stock and partly on account of wider distribution of the company's shares.

According to the report, the burden of taxation continues to increase, crippling the company's ability to furnish the best facilities and service. For the fiscal year the taxes paid by the system were at the rate of over $4,800 per day. Inasmuch as the net return per passenger was less than one cent, it required the transportation of over 540,000 passengers each day to yield profit enough to pay the tax bills. Capitalized at 5 per cent, the annual tax bills would permit an expenditure of over $35,000,000 for added improvements, facilities and extensions.

The year's schedule of track and paving renewals was the largest in the transportation history of Brooklyn, covering more than forty-four miles. The expenditures for maintenance of equipment are also the largest on record. The construction charges (outside of those made for rapid transit additions and extensions under contracts with the city) aggregated $1,543,316. During the year the company lost $248,000 in expenses on account of interruptions of service caused by the operations of contractors for the city in constructing sewers, to say nothing of the loss in earnings. The freight business during the year yielded a gross revenue of $497,569, an increase over the preceding year of $126,716.

The New York Municipal Railway Corporation, which was formed in the interests of the Brooklyn Rapid Transit Company in connection with the latter's dual rapid transit allotments, prosecuted as vigorously as conditions would permit the work of construction and equipment of rapid transit lines required under its contracts with the city dated March 19, 1913. Expenditures for construction and equipment to June 30, 1914, under the city contracts were as follows:

On account of contribution to city-owned lines	$8,230,256
On account of equipment of city-owned lines	1,647,982
On account of additions, extensions, improvements of existing railroads	4,798,868
Undistributed	593,487
Total	$15,270,593

The report states that the operation of the Centre Street Loop has during its eleven months of operation failed to provide the company's preferentials by $219,687, and has also failed to provide the city's charges on the cost of construction of property placed in operation during this period by $310,060, leaving a total deficit in both the company's preferentials and the city's charges of $529,747. The report states that only by merging the operation of this line and the Fourth Avenue subway with the entire new system will the city eventually be able to make them self-supporting.

The system of compulsory medical inspection and free medical attendance for employees excused on account of illness, affecting nearly 10,000 men in the operating department, completed its first year Dec. 31, 1913. A comparison of records of time lost on account of illness for the entire year as to the surface lines, and for the year, exclusive of Sundays and holidays, as to the elevated lines, indicated a reduction of time lost of approximately 24 per cent.

The report states that it is too soon to estimate the full effect of the order of the Public Service Commission under which a new transfer system went into effect on June 1, 1914, increasing the total number of transfer points from 721 to 1008. The passenger earnings of the companies affected, however, fell off during the month $67,827. In regard to fire insurance, it is noted that the companies with a view to finally insuring their own fire risks, have gradually been accumulating an insurance reserve fund, which on June 30, 1914, aggregated $599,197.

Brazilian Traction, Light & Power Company, Ltd.

The first annual report of the Brazilian Traction, Light & Power Company, Toronto, Ont., covering the period from the incorporation in July, 1912, to Dec. 31, 1913, gives the following income statement for the period:

Revenue from securities owned and under contracts with subsidiary companies		$11,266,698
Interest on advances to subsidiary companies		256,698
Total		$11,522,836
Head office, general and legal expenses, interest, discount and exchange		324,343
Surplus available for dividends		$11,198,493
Dividends No. 1, 2 and 3, on 6 per cent preferred shares at 1½ per cent each		$450,000
Dividends No. 1, 2, 3, 4 and 5, on common shares at 1½ per cent each		7,735,495
		$8,185,496
Surplus carried to profit and loss		$3,012,997

The report states that the consolidation of the interests of the Rio de Janeiro Tramway, Light & Power Company, Ltd., the Sao Paulo Tramway Light & Power Company, Ltd., and the Sao Paulo Electric Company, Ltd., undertaken in July, 1912, has been successfully carried out and on Dec. 31, 1913, practically the entire capital stock of these three companies had been acquired by the Brazilian Traction, Light & Power Company, Ltd.

At the conclusion of 1913 the Brazilian Traction, Light & Power Company, after payment of the regular 6 per cent dividend on its ordinary shares, had a credit balance to profit and loss of $3,012,998, apart from the credit balances of the general reserve funds and profit and loss accounts of the subsidiary companies. This credit balance for the Rio de Janeiro Tramway, Light & Power Company, Ltd., amounted to $6,807,374; for the Sao Paulo Tramway, Light & Power Company, Ltd., $5,151,660, and for the Sao Paulo Electric Company, Ltd., $56,112. The combined reserves and surpluses of the Brazilian Traction, Light & Power Company and its subsidiaries at the present time, therefore, total $15,028,144.

The combined net earnings from the operation of the subsidiaries for 1913 showed an increase of $1,709,437 over the corresponding period for 1912. The operation of the Rio de Janeiro division resulted in an increases of gross income of $1,690,766. There was an increase of 12,000,000 passengers for 1912, and the company now has under order and construction one hundred new cars to provide for additional traffic. The gross earnings of the Sao Paulo division increased $842,000 during 1913. A total of 104 electric passenger cars was added to the equipment and the tramway lines were extended 15.4 miles. The total passengers carried increased from 48,113,109 in 1912 to 56,776,702 in 1913.

Great Berlin Street Railway

The Grosse Berliner Strassenbahn (Great Berlin Street Railway) report for the calendar year 1913 shows the following comparison with the year 1912, the figures for which are given in parentheses: The number of passengers carried was 466,300,000 (463,300,000) and the gross earnings from passenger business were $11,104,540 ($11,036,730). The mileage was 65,995,687 car miles (64,826,991 car miles), and the earnings per passenger car mile 16.69 cents (16.88 cents). The total gross earnings were $11,443,829 ($11,395,993) and the operating expenses $6,711,134 ($6,457,052). The ratio of operating expenses to gross earnings was 58.64 per cent (56.66 per cent). Salaries and wages totaled $4,057,758 ($3,925,534), and expenses for employees' welfare $260,990 ($235,756).

The company operated 1757 motor cars and 1091 trail cars. As 1396 cars were passed through the shops during the year, it appears that cars are completely overhauled about once every two years. The maintenance of rolling stock cost $896,990 ($878,253); of buildings, $67,630 ($60,605), and of way and line for 592.4 km (367.3 miles), $430,944, as compared with $333,594 in 1912 for 570.5 km (353.7 miles) of track. Accidents, including contingent expenses, cost $215,999 ($218,389). To the renewal funds a total of $625,000 was assigned, of which $137,500 was applied to the car renewal fund. The sum of $816,668 was paid for franchises, taxes, etc. The share of the Berlin Municipality

alone was $158,310. A dividend of 8 per cent was declared on a capital stock of $25,020,600.

The company employed 12,540 people, of whom 9268 were members of the pension society. During the year the pension fund received $135,215 from the members, $159,860 from the company and $116,833 from investments. The sick benefit society comprised practically all of the employees. The average number of persons carried a day was 1,277,534, equivalent to 3449 passengers per mile of track. During the year sixteen persons were killed, 132 badly injured and 919 slightly injured. The company was blameless in the case of five deaths, twenty-four severe injuries and 351 slight injuries.

New York Railways Income Bond Suit

On July 27 the New York Life Insurance Company brought suit against the New York (N. Y.) Railways, charging improper retention of interest on the company's 5 per cent non-cumulative income bonds for the benefit of its stockholders. Beside the New York Railways the following are named in the suit: Farmers Loan & Trust Company; Edward S. Markston, president Farmers Loan & Trust Company; Alexander J. Hemphill, president Guaranty & Trust Company; Guy C. Tripp, chairman board of directors Westinghouse Electric & Manufacturing Company, and Harry Browner, director Equitable Trust Company. The New York Life Insurance Company, together with the co-operating bondholders, represents about $6,500,000 of the $30,626,977 affected by the alleged transaction.

The chief point at issue between the two companies is the treatment of the unexpended reserves for injuries and damages, as noted in the ELECTRIC RAILWAY JOURNAL of May 7. The insurance company does not object to reserves being set up by the railway, but it alleges that 8 per cent was set aside, while in 1911 only 6.45 per cent and in 1912 only 5.95 per cent of the passenger revenue was expended. The insurance company contends that the unexpended amounts should automatically revert to surplus. It demands that the approval of the directors of the statements of semi-annual earnings be set aside and it asks for an accounting of all railway earnings and income during 1912 and 1913. Furthermore, it requests that any money found to be applicable to the payment of interest be placed in the hands of a receiver for disposal by court direction.

Since Jan. 1, 1912, the New York Railways has set up a reserve of 8 per cent of the passenger revenue for injuries and damages, the calendar year 1913 being included. In February, 1914, however, the company after an investigation by outside engineers changed the reserve for 1913 to 7½ per cent at the instigation of the insurance companies, but this move was criticised by the Public Service Commission on account of its retroactive features.

Batavia (N. Y.) Traction Company.—The Batavia Traction Company, which was incorporated in New York March 19 to purchase the Buffalo & Williamsville Railway, as noted in the ELECTRIC RAILWAY JOURNAL of May 9 and June 18, has issued $25,000 in stock in $1 shares and $25,000 (total issue) of first mortgage 5 per cent gold bonds, dated July 1, 1914, and due in 1944, but callable on sixty days' notice at par. Of the bond issue $16,000 has already been subscribed for in Batavia.

Binghamton (N. Y.) Railway.—The Binghamton Railway has announced that no dividend can be declared for two years. The last dividend paid was 2 per cent in February, 1914.

Boston (Mass.) Elevated Railway.—At a meeting of the directors of the Boston Elevated Railway on July 27, the board authorized the payment of a quarterly dividend of $1.50 per share on Aug. 15. This action restores the company to the 6 per cent class, in which it stood from 1902 to 1913, when the stock was put on a 4 per cent basis as a result of losses incurred during the strike of 1912. A 2 per cent dividend was declared in February, 1914. It is stated that the company's earnings increased about $900,000 in the year ended June 30, 1914.

Cape Town (S. A.) Consolidated Tramways & Land Company, Ltd.—According to the report of the Cape Town Consolidated Tramways & Land Company, Ltd., for the year ended Dec. 31, 1913, after payment of administration expenses and interest charges, a balance of £1,797 was shown to the debit of profit and loss. This, added to the balance brought forward from 1912, makes a total debit to profit and loss of £8,103. No dividends were declared by the subsidiary companies during the year. The operation of the Camps Bay Tramways resulted in a profit of £1,599, as compared to a profit of £2,973 the previous year.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—According to a petition presented to the Ohio Public Utilities Commission, unless the commission authorizes the Hocking-Sunday Creek Traction Company to issue $300,000 of twenty-year 6 per cent bonds for the completion of its road and the refunding of present obligations, a receiver must be appointed for the property. This road extends from Nelsonville to Athens, a distance of 14 miles. It is half completed and the finished part has been in operation for almost two years. The remainder of the road is graded and bridges have been constructed.

Jersey Central Traction Company, Keyport, N. J.—The Jersey Central Traction Company has executed a general refunding improvement and extension mortgage for $5,000,000 to the Girard Trust Company, Philadelphia, as trustee. This mortgage secures bonds dated March, 1914, and due 1939, but subject to call March 1, 1917, or on any interest date at 102½. Of the bonds, $1,500,000 is reserved to retire the outstanding $230,000 of first 5's and $1,270,000 of general mortgage bonds. The mortgage provides that the discount on the sale of the bonds be amortized during their life. The authorization of this mortgage was noted in the ELECTRIC RAILWAY JOURNAL of May 23.

Kankakee & Urbana Traction Company, Urbana, Ill.—The Illinois Public Utilities Commission has authorized the Kankakee & Urbana Traction Company to sell $213,000 of preferred capital stock for the purpose of extending its line from Rantoul to Paxton. The company has been operating 15 miles of track from Urbana to Rantoul and has now under construction 5 miles between Rantoul and Ludlow.

Lincoln Railway & Light Company, Lincoln, Ill.—James E. Hoblit, cashier of the Lincoln State Bank, has been appointed receiver of the Lincoln Railway & Light Company. He assumed charge of the line on July 18. The receivership is the result of two suits brought against the company, the first by F. G. Hudson, Charlestown, Ill., and F. M. Maury, Philadelphia, Pa., and the second by T. F. Kuhl, trustee for the company. The suits charged that the company had failed in the payment of interest and principal of its outstanding bonds.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The Los Angeles & San Diego Beach Railway has filed an application with the California Railroad Commission asking for authority to issue $825,000 of bonds, secured by a trust deed of all the company's property. The funds are to be used in electrifying certain portions of the company's lines, as previously ordered by the commission in approving those now in existence. The company also proposes to acquire new terminal grounds in San Diego and to erect a terminal building at a cost of $25,000. The company also wishes to purchase sixteen passenger cars and seventeen passenger trailers at a cost of $125,000. The total sum which the company plans to expend is $723,198, divided as follows: plant investment, $371,612; new equipment, $131,000; refunding indebtedness, $180,586, and interest for first year, $40,000.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—The Massachusetts Northeastern Street Railway has petitioned the Public Service Commission of Massachusetts for the approval of an issue of mortgage bonds not exceeding a par value of $1,000,000. These are part of a proposed twenty-year 5 per cent issue of an aggregate face value not to exceed $2,000,000 at any one time outstanding, dated May 1, 1914. The commission on Sept. 13, 1913, approved an issue of mortgage bonds by the company in the amount of $1,000,000, but since that time the stockholders have voted to authorize the bonds to be dated July 1, 1914, instead of Jan. 1, 1914.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—An application was filed with the California Railroad Commission on July 21 by the Oakland, Antioch & Eastern Railway asking authority to issue $900,000 of 6 per cent convertible gold notes to be secured by first mortgage thirty-year gold bonds in the ratio of two to one. The notes are to be convertible before maturity at the holder's option on the basis of 80 per cent of the par value of the bonds and accrued interest for par value of the notes and accrued interest. The notes are also to be redeemable in whole or in part at the option of the company on any interest date at face value and accrued interest on not less than thirty days' notice. The proceeds of the issue are to be used to pay off the floating indebtedness, which on April 30 amounted to $1,349,960, with cash on hand of $44,562 and accounts receivable of $89,144.

Ottawa (Ont.) Electric Railway.—The gross earnings of the Ottawa Electric Railway for the year ended Dec. 31, 1913, were $1,041,282. Operating expenses and maintenance were $629,122, giving net earnings of $412,160, as compared to $400,059 in 1912. The net earnings were disposed of as follows: Four quarterly dividends at 3 per cent and a bonus of 3 per cent, $281,535; interest on bonds and loans, $20,772; mileage payments, $13,737; taxes, $12,-222; credit of contingent account, $55,000, and credit of profit and loss, $28,894. During the year 23,987,883 passengers were carried, as compared to 21,815,798 in 1912, an increase of 2,172,085. The record of the company shows an increase in gross receipts from $71,000 in 1892 to $1,041,282 in 1913.

Philadelphia Company, Pittsburgh, Pa.—The Philadelphia Company, which controls the street railway lines in Pittsburgh and vicinity, recently filed notice of a reduction in capital stock from $73,000,000 to $69,433,400.

Piedmont & Northern Railway, Charlotte, N. C.—The merger of the Piedmont Traction Company, operating 23 miles of electric railway between Charlotte and Gastonia, N. C., and the Greenville, Spartanburg & Anderson Electric Railway, operating 102 miles of electric line between Spartanburg, Greenville, Anderson and Greenwood, S. C., into the Piedmont & Northern Railway, was noted in the ELECTRIC RAILWAY JOURNAL of July 25. It is deemed improbable that any of the securities of the new company will be on the market soon. Both of the merged lines were built by J. D. Duke and associates and to a large extent have been privately financed. The $50,000,000 mortgage which has been executed by the new company is to cover bonds for the purchase of the merged lines, their equipment, real estate and other property and for the construction of additions, extensions, branches and improvements of existing lines. It will require the construction of 50 miles of railroad to connect the north and south divisions. The equipment is all high speed and the company is inaugurating a freight service in conjunction with the steam railroads with which it connects.

Porto Rico Railways, Ltd., Toronto, Ont.—According to the seventh annual report of the Porto Rico Railways, Ltd., which controls the Porto Rico Railway Light & Power Company, San Juan, Porto Rico, the gross earnings for the year ended Dec. 31, 1913, amounted to $850,122, as compared to $828,084 for the previous year, an increase of $22,037. The net income of $447,375 compared with $373,405 was an increase of $73,970. After providing for interest charges and preferred dividends the surplus was $222,156, equal to 7.4 per cent on the common stock. The number of passengers carried during the year was 7,283,479, or an increase of 572,176. The freight hauled amounted to 165,958 tons, an increase of 18,030 tons. There was expended on capital account during the year $483,326. Maintenance expenses amounted to $104,677.

San Joaquin Light & Power Corporation, Bakersfield, Cal.—The California Railroad Commission has authorized the San Joaquin Light & Power Corporation to issue promissory notes in the amount of $249,967 to renew other notes outstanding. Steps are now being taken by this corporation to pay off its floating indebtedness of $1,615,-661 and to provide funds for new construction. The commission has also made an order granting the company additional time in which to issue $1,776,000 of bonds which it proposes to pledge as security for certain two-year 6 per cent collateral trust notes. The authority as now granted will expire Dec. 31, 1914.

Titusville (Pa.) Electric Traction Company.—The receiver of the Titusville Electric Traction Company has been authorized by the court to sell the property at public auction subject to outstanding mortgages and liens. The capitalization of this company, which was chartered in 1897, is reported to be $300,000 of stock and $300,000 of first mortgage 6 per cent gold bonds. The company has 16¾ miles of track connecting Titusville, Pleasantville, and Fieldmore Springs. The results of operation for the year ended June 30, 1913, were as follows: Gross earnings, $37,108; net income, $6,527, and deficit, after interest payment of $6,370 and taxes, $611.

Underground Electric Railways, Ltd., London, England.—The London Stock Exchange recently listed the following additional securities of the London & Suburban Traction Company, Ltd.: 9649 ordinary £1 shares, 16,426 5 per cent cumulative preferred £1 shares, and £4,224 of 4½ per cent first mortgage debenture stock, making the total amounts listed on the exchange £1,842,785, £1,597,485 and £180,976 respectively.

Winnipeg Electric Company, Manitoba, Can.—G. M. Manton, Winnipeg, Man., was on July 24 elected vice-president of the Winnipeg Electric Railway, to succeed the late Sir William Whyte. G. V. Hastings was elected director of the company.

Dividends Declared

Connecticut Railway & Lighting Company, New Haven, Conn., quarterly, 1 per cent, preferred and common.

Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.

Illinois Traction Company, Peoria, Ill., quarterly, three-quarters of 1 per cent, common.

Monongahela Valley Traction Company, Fairmont, W. Va., 2½ per cent, preferred.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio, quarterly 1¼ per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, SANFORD, ME.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June,	'14	$29,864	$24,075	$5,788	$681	$5,107
1 " "	'13	34,420	28,109	6,311	642	5,669

BATON ROUGE (LA.) ELECTRIC COMPANY

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$14,964	*$9,650	$5,314	$2,109	$3,205
1 " "	'13	12,231	*7,550	4,681	2,076	2,605
12 " "	'14	172,633	*112,603	60,030	25,292	34,738
12 " "	'13	150,336	*92,257	58,079	22,163	35,916

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$10,999	*$9,936	$1,063	$1,083	†$20
1 " "	'13	10,279	*8,537	1,742	1,106	636
12 " "	'14	122,375	*102,318	20,057	12,899	7,158
12 " "	'13	121,768	*94,184	27,584	12,807	14,777

CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$29,486	*$16,095	$13,391	$6,438	$6,953
1 " "	'13	29,989	*19,115	10,874	6,082	4,792
12 " "	'14	374,595	*207,657	166,938	74,916	92,022
12 " "	'13	372,592	*199,622	172,971	69,932	103,039

COLUMBUS (GA.) ELECTRIC COMPANY

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$54,087	*$25,476	$28,611	$24,781	$3,831
1 " "	'13	55,983	*25,809	30,174	20,350	9,824
12 " "	'14	641,478	*280,681	360,797	296,720	64,078
12 " "	'13	645,135	*290,522	354,614	233,735	120,879

DALLAS (TEX.) ELECTRIC COMPANY

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$184,844	*$105,649	$79,196	$27,493	$51,703
1 " "	'13	184,737	*108,829	75,908	24,616	51,292
12 " "	'14	2,270,244	*1,336,740	933,504	314,939	618,565
12 " "	'13	1,982,032	*1,161,467	820,565	295,736	524,829

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$55,084	*$32,836	$22,248	$8,377	$13,871
12 " "	'14	596,137	*362,682	233,455	94,679	138,776

EL PASO (TEX.) ELECTRIC COMPANY

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$83,286	*$47,521	$35,764	$4,200	$31,564
1 " "	'13	71,023	*39,330	31,693	4,184	27,509
12 " "	'14	956,602	*521,694	434,907	51,285	383,622
12 " "	'13	855,963	*460,169	395,794	53,831	341,963

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., May,	'14	$210,528	*$112,367	$98,162	$35,669	$62,493
1 " "	'13	202,470	*111,516	90,954	34,755	56,199
12 " "	'14	2,442,274	*1,376,513	1,065,761	433,156	632,605
12 " "	'13	2,180,999	*1,256,545	924,453	409,692	514,761

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*Includes taxes.
†Deficit.

Traffic and Transportation

Accidents on Interstate Railways

The Interstate Commerce Commission, Washington, D. C., has issued a summary for the three months ended Dec. 31, 1913, of the casualties to persons on railways under its jurisdiction.

The total number of casualties of all classes reported to the commission amounted to 2792 for persons killed and 50,776 for persons injured. This statement includes 85 passengers killed and 4136 passengers injured and 826 employees killed and 14,576 employees injured. The casualties were sustained by employees while at work, by passengers getting on or off cars, by persons at highway crossings, by persons doing business at stations, etc., as well as by trespassers and others. In addition 117 persons were killed and 29,007 persons injured in "industrial accidents," which term covers accidents not involved in train operation but occurring to railway employees, other than trainmen, on railway premises. The report for interstate electric railways in particular shows that the list of those killed during the three months was 124, or 4.44 per cent of the total, and the list of injured 1445, or 2.84 per cent.

From the statement of the commission for electric railways, which is appended, the columns have been eliminated which show casualties to employees not on duty and to trespassers. Two of the former class were killed and six injured, while of trespassers thirty-nine were killed and thirty-seven injured. The summary as given by the commission, with the eliminations noted above, is reproduced as follows:

Causes	Number of Accidents	Passengers Killed	Passengers Injured	Employees on Duty Killed	Employees on Duty Injured	Other Persons Not Trespassing Killed	Other Persons Not Trespassing Injured	Total Persons Killed	Total Persons Injured
Collisions	57	2	170	3	30	...	...	5	203
Derailments	15	1	27	1	4	...	...	2	31
Accidents to trains, cars, or engines, except collisions derailments and boiler explosions	1	...	...	..	...	...	...	...	....
Bursting of, or defects in, locomotive boilers, or boiler attachments	...	...	...	..	...	...	...	...	....
Total train accidents	73	3	197	4	34	...	...	7	234
Accidents to roadway or bridges not causing derailment, such as fires, floods, landslides, explosions, etc.	...	...	...	..	...	...	...	...	....
Coupling or uncoupling cars (exclusive of accidents with air or steam-hose)	***	...	...	..	9	...	...	...	9
While doing other work about trains (not in shops or enginehouses) or while attending switches	***	...	...	2	51	...	...	2	51
Coming in contact while riding on cars with overhead bridges, tunnels, or any signal apparatus, or fixed structure above or at side of track	***	...	2	..	9	...	...	...	11
Falling from cars or engines	***	1	26	2	8	...	1	3	37
Getting on or off cars or engines	***	5	347	..	23	...	1	6	375
Other accidents on or around trains not here named	***	...	107	..	6	1	12	1	125
Being struck or run over by engines or cars at stations or yards	***	...	...	1	2	3	9	5	13
Being struck or run over by engines or cars at highway grade crossings	***	...	...	..	...	29	182	32	187
Being struck or run over by engines or cars at other places	***	...	4	1	1	16	87	52	114
Other causes	***	...	26	..	...	2	10	3	41
Total other than train accidents	***	6	512	6	109	51	302	104	963
Grand total, exclusive of industrial accidents	***	9	709	10	143	51	302	111	1,197
Industrial accidents to employees	***	***	***	13	248	***	***	13	248
Grand total	***	9	709	23	391	51	302	124	1,445

NOTE: *** means not totalized.

The bulletin of the commission also contains the following statement of the collisions and the derailments on electric railways during October, November and December, 1913:

Classes	Number	Damage to Road and Equipment and Cost of Clearing Wrecks	Number of Persons Killed	Number of Persons Injured
Collisions:				
Rear	24	$6,024	2	115
Butting	14	10,173	3	40
Train separating	..	......	..	...
Miscellaneous	19	8,864	..	48
Total	57	25,061	5	203
Derailments due to—				
Defects of roadway	1	25	..	1
Defects of equipment	3	1,650	..	1
Negligence of trainmen, signalmen, etc.	2	115	..	2
Unforeseen obstruction of track, etc.	2	2,200	1	...
Malicious obstruction of track, etc.	1	250	..	1
Miscellaneous causes	6	5,400	1	26
Total	15	9,640	2	31
Total collisions and derailments	72	34,701	7	234
Total for same quarter of—				
1912	79	37,513	7	415
1911	65	33,395	10	376
1910	67	49,677	41	455

Puget Sound Electric Railway Fare Case Reviewed

The history of the Puget Sound Electric Railway fare case concerning rates between Seattle and Tacoma, to which reference has been made previously in the ELECTRIC RAILWAY JOURNAL, is reviewed as follows in an editorial "Liberty" in the July *Public Service Journal* published by Stone & Webster, managers of the railway:

"The Public Service Commission of the State of Washington not long ago abolished an order of the old Railroad Commission which was put in force in 1910, the only effect of which was a waste of energy and accomplishment. In 1910 the Railroad Commission of Washington ordered a reduction in the passenger rates of the Puget Sound Electric Railway, which had been previously fixed by the company at 2 cents a mile, with commutation rates to regular riders of 1.4 cents a mile. At the same time it announced that the corporation was entitled to earnings of 7 per cent on the investment, after operating expenses, taxes and depreciation had been provided for. The commission estimated that under the tariff ordered this result would be accomplished. For seven years up to and including 1908, the fares of this road had been fixed at considerably less than 2 cents a mile, which was too low for the service furnished, but it was hoped that the general and traffic conditions would enable it to maintain these rates. On account, however, of financial losses it was found necessary to advance the rates to approximately 2 cents, with a commutation rate, as we have stated, of 1.4 cents. Compared with steam railroad rates and with interurban rates in Washington and throughout the country, it was felt by the Puget Sound Railway that its rates were not at all excessive. Complaint, however, was made to the Railroad Commission of the State of Washington, which placed a cash value on the company's property of $4,070,237 and forced the company to lower its rates to figures which it believed would admit of a return of 7 per cent on this amount.

"The matter was carried to the courts, but eventually, on Oct. 14, 1911, the order was put in force in order that the rates of the commission might be tested to ascertain if the commission's estimate was correct. After this tariff had been in force for approximately two years, it was found that the rates, instead of yielding a net return of $289,179 (7 per cent on the commission's valuation) for the year 1912, yielded only $89,655, with no provision made for accrued depreciation. In other words, instead of yielding 7 per cent the rates had yielded only 2.2 per cent. The showing for the year 1913 was even worse, the net return being only $67,718, or 1.66 per cent, instead of 7 per cent as estimated by the commission on the actual money invested by the company.

"Since this order was forced upon the company, the

Railroad Commission has been superseded by the Public Service Commission in the State of Washington. In view of the facts just stated, it will easily be seen that it was necessary for the Puget Sound Company to seek relief in order that the property might be maintained and that a fair return might be given the owners on their investment. Consequently an application was made to the Public Service Commission, asking that the order of the Railroad Commission be set aside and the company be allowed to operate under a new tariff. The hearing on this application began on April 15, and on May 13 the Public Service Commission abolished the order of the old Railroad Commission which was put in force in 1910."

Near-Side Stop in Operation in Indianapolis.—The Indianapolis (Ind.) Street Railway has begun to stop its cars on the near side of the street, in compliance with a new traffic ordinance recently drafted by the City Council.

Near-Side Stop for Pine Bluff.—An ordinance was recently passed by the Council at Pine Bluff, Ark., requiring the cars of the Pine Bluff Company to stop on the near side of the street and to discharge passengers from the front end of the car.

Pole Signs for Information of Patrons.—The Galesburg & Kewanee Electric Railway, Kewanee, Ill., has installed signs on all poles along its route where cars are supposed to stop, to inform its patrons as to just what time the cars are due to pass.

Increase in Fare Authorized in West Virginia.—The Public Service Commission of West Virginia on July 23 sustained the appeal of the Parkersburg-Marietta Interurban Railway, Parkersburg, W. Va., to increase its rates between Parkersburg and Marietta by way of Williamston from 10 cents to 20 cents by creating four traffic zones. The company is required, however, to issue commutation tickets that will be equivalent to a 5-cent fare for 6½ miles from Parkersburg.

Montpelier Fare Increase Case Postponed.—The Barre & Montpelier Traction & Power Company, Montpelier, Vt., and the city of Montpelier have reached an agreement to the effect that there will be no increase in fares pending continuation of hearings on Aug. 21 in the equity suit brought by the city to determine the legal right of the company under its franchise to charge a greater fare than 5 cents. The counsel of the railway asked for a continuation in order to have more time for the preparation of the company's case.

Pay-As-You-Enter Plan for Covington.—An ordinance providing for the installation of pay-as-you-enter devices and collapsible seats for conductors on all cars of the South Covington & Cincinnati Street Railway, Covington, Ky., was recently introduced by Mayor Phillips at a meeting of the city commissioners. The ordinance provides that these devices must be installed upon one-third of the cars within three months and upon all of the equipment within nine months. The matter has been referred to the committee of the whole.

Reduction of Fares for Holden.—The Massachusetts Public Service Commission has ordered the Worcester (Mass.) Consolidated Street Railway to reduce its fares between Holden and Worcester from 15 cents to 10 cents. The decree orders that the railway shall furnish special tickets at the rate of 10 cents each, good between 5.40 a. m. and 7.40 a. m. and between 4.55 p. m. and 6.55 p. m. for the use of its regular patrons traveling between any part of Holden and Worcester city hall. The distance between Holden and Worcester is 9 miles.

Springfield Traction Company Increases Wages.—The Springfield (Mo.) Traction Company on July 21 announced a voluntary increase in wages amounting to 1½ cents an hour for both conductors and motormen. About 100 employees will be benefited by the increase, which will add $5,000 annually to the payroll. Motormen and conductors who have been employed less than one year will receive the minimum scale of 17½ cents; more than one year and less than two years, 19 cents; more than two years and less than three years, 20 cents, and three years, 21 cents. Those who have been with the company five years or longer will get the maximum, 22½ cents an hour. About 50 per cent of the men affected by the increase are in this group.

Armed Guards Proposed for Suburban Cars.—As a result of a recent car hold-up in Los Angeles in which a conductor was fatally injured, a meeting of all the peace officers of the city and county and the heads of both the Los Angeles Railway and the Pacific Electric Railway has been called to devise ways of protection for car crews. It is expected that special armed deputies will be placed on all cars going to the outskirts of the city and that men will be posted at all line terminals.

"Safety First" Campaign in Louisville.—The cars of the Louisville (Ky.) Railway on both city and interurban lines are carrying large black and white placards announcing that "safety first" is the slogan of the league of employees of the company, the formation of which was noted in the ELECTRIC RAILWAY JOURNAL of June 27. In most cases the cards are hung at the front end of the cars, over the upper part of the front windows. The Louisville papers have called attention to the appearance of the placards and have commented favorably upon the objects of the movement.

Fatal Trolley Crash at Westport.—Three persons were killed outright, another died later and forty were injured as the result of a head-on collision at Westport, Conn., on July 22 between a three-car electric train carrying Sunday school picnickers and a trolley express car on the Norwalk division of the Connecticut Company. It is alleged that the motorman in charge of the train was running at high speed in order to reach a siding ahead of the express car, which was approaching on the same stretch of single track. C. H. Chapman, superintendent of the Bridgeport division, states that it is apparent one of the motormen ran by his signal, and the investigation will disclose the one at fault.

Guard on Rear Platform of Elevated Trains.—As a result of complaints made to the Public Service Commission for the First District of New York in regard to rowdyism on the back platforms of the rear cars of elevated trains in Brooklyn, the commission has served an order on the New York Consolidated Railroad, the Nassau Electric Railroad and the South Brooklyn Railway, the operators of the elevated lines, directing them to provide and maintain an employee during the morning and evening rush hours on the rear platform of all such trains. This employee shall control the conduct of passengers, to the end that the safety and convenience of other passengers shall be guarded from boisterous or improper conduct. The order is to go into effect immediately.

Springfield Company Petitions for New Rate Hearing.—The Springfield Gas & Electric Company, Springfield, Mo., on July 25 filed a motion for a new hearing of its rate case by the State Public Utilities Commission. The order of the commission reducing the company's rates 7 per cent, and fixing 7 per cent as a fair return on the investment, as noted in the ELECTRIC RAILWAY JOURNAL of July 11, is characterized by the company in its motion as unfair, unjust and unreasonable. The petition alleges that the commission is an administrative body solely, and when passing on questions of a judicial nature is violating the Constitutions of Missouri and of the United States. The brief that was presented by the company in the original hearing was abstracted in the ELECTRIC RAILWAY JOURNAL of May 20.

Massachusetts Commission Orders Reduction in Height of Steps.—Upon the petition of the Worcester board of aldermen, the Hyde Park Current Events Club and other organizations, the Massachusetts Public Service Commission has issued an order providing that all electric cars hereafter purchased and operated in the State must be equipped with steps not exceeding 15 in. in height, the first step being measured from the top of the rail. The order also requires that all cars now operated by electric railways in the State shall be so altered so that by July 1, 1915, no bottom step shall be more than 17 in. above the rail. The commission reserves the right, however, to extend this time limit for financial or other satisfactory cause. Another section of the order stipulates that electric railways, before purchasing new cars or making changes in present equipment, shall submit to the board for its approval drawings in sufficient detail to show the type of cars to be purchased or the changes contemplated.

Personal Mention

Mr. Sidney Ossoski has severed his connection as general claim agent of the Chicago (Ill.) Railways.

Mr. R. S. Rowley has been appointed general claim agent of the Chicago (Ill.) Railways in place of Mr. Sidney Ossoski.

Mr. A. E. Dedrick has been appointed secretary and auditor of the Newcastle & Lowell Railway, New Castle, Pa., to succeed Mr. E. D. Gaul.

Mr. William Dods has been appointed vice-president of the Carbon Transit Company, Mauch Chunk, Pa., to succeed Mr. C. H. Latta.

Mr. E. T. Chapman has been appointed assistant treasurer of the Connecticut Company, New Haven, Conn., to succeed Mr. T. F. Paradise.

Mr. Peter M. Miller has been appointed assistant treasurer of the Jacksonville (Fla.) Traction Company, to succeed Mr. Arthur F. Butler.

Mr. H. E. Harley has been appointed chief engineer of the power station of the Jacksonville (Fla.) Traction Company, to succeed Mr. F. D. Barry.

Mr. Charles N. Hebner has resigned his position as secretary of the Illinois Public Utilities Commission, the resignation taking effect on July 24.

Mr. R. A. Anderson has been appointed chief engineer of the power station of the Portsmouth (N. H.) Electric Railway, to succeed Mr. John Kirk.

Mr. J. D. Kline has been appointed superintendent and purchasing agent of the Montgomery (Pa.) Transit Company, to succeed Mr. E. W. Goss.

Mr. A. M. Nanton, Winnipeg, Man., Can., was on July 24 elected vice-president of the Winnipeg Electric Railway, to succeed the late Sir William Whyte.

Dr. Robert Pattai has been elected president of the Austrian Association of Local & Light Railways. This association now numbers fifty-four electric and forty-three steam railways with a total length of 1503 miles.

Mr. William B. McKinley, president of the Illinois Traction System, addressed the Jefferson City (Mo.) Commercial Club on July 23. Mr. McKinley asserted that Missouri's drastic corporation laws have retarded the development of the State more than any other factor. He referred particularly to the measure providing that a foreign corporation cannot hold more than 10 per cent of the stock of a domestic company.

Mr. T. R. Veach has been appointed auditor of the San Francisco, Napa & Calistoga Railway, Napa, Cal., to succeed Mr. George Maxwell. Mr. Veach was formerly employed with the Central California Traction Company, San Francisco, Cal., and the Reno (Nev.) Traction Company for about two years as assistant auditor. Prior to this time he was with the Great Western Power Company as bookkeeper, cashier and traveling auditor for a period of about five years.

Mr. T. H. Blaikie has been appointed auditor of the Albany (N. Y.) Southern Railroad, to succeed Mr. A. L. Linn, resigned. From April, 1904, to December 31, 1911, Mr. Blaikie was head bookkeeper and chief clerk of the Consolidated Railway Company and the Connecticut Company at New Haven, Conn. When the United Electric Light & Water Company began operations Jan. 1, 1912, at Waterbury, Conn., he was offered the position of chief accountant, which he filled until May 15, 1914.

Mr. J. B. Rannie, who has been connected with the British Columbia Electric Railway, Ltd., Vancouver, B. C., for nearly twenty-five years, has severed his connection with the company. Mr. Rannie's career with the company dates from September, 1889. After serving as conductor and motorman for a number of years in Vancouver city service, he was appointed traffic superintendent of the Vancouver lines in 1900. In 1911 he was appointed traffic agent, a position which he occupied up to the date of his resignation. Mr. Rannie has purchased a small ranch near Chilliwack, B. C., where he will engage in agricultural pursuits.

Mr. J. T. Huey has been appointed superintendent of the railway department of the Birmingham Railway, Light & Power Company, Birmingham, Ala., to succeed Mr. Geo. H. Harris, resigned. Mr. Huey's entire railway experience has been confined to the Birmingham Railway, Light & Power Company and its predecessors. He has been in the service of these companies for the last twenty years, during which time he worked in practically all departments. Prior to his promotion to the position of superintendent of the railway department, he was assistant superintendent of this department under Mr. Harris.

Mr. C. F. Hewitt has been appointed assistant general manager of the United Traction Company, Albany, N. Y. He resigned some time ago as vice-president and general manager of the Des Moines (Ia.) City Railway and vice-president and general manager of the Inter-Urban Railway, Des Moines. Mr. Hewitt, as noted in the ELECTRIC RAILWAY JOURNAL of May 18, 1912, has been connected with the Elmira Water, Light & Railroad Company, Elmira, N. Y., as superintendent; with the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., as general superintendent, and with the East St. Louis & Suburban Railway, East St. Louis, Ill., as general superintendent.

Mr. David W. Houston, whose appointment as superintendent of the Regina (Sask.) Municipal Railway was noted in the ELECTRIC RAILWAY JOURNAL of June 20, was born in Bathurst, N. B., Jan. 3, 1879. He entered transportation service in July, 1899, and until 1902 was clerk with the Chicago, Burlington & Quincy Railroad, Omaha, Neb. From 1902 to 1907 he studied at the School of Mining, Queen's University, Kingston, Ont., being graduated therefrom with the degree of B.Sc. From May to October, 1907, Mr. Houston was inspector of mining claims, Ontario Government, Montreal River District. In 1908 he became auditor and acting manager of the Tabor & Northern Railway, Tabor, Ia., which position he left in July, 1913, to become assistant superintendent of the Regina Municipal Railway. From March 12, 1914, Mr. Houston was acting superintendent of this line.

Mr. C. S. Banghart, superintendent and master mechanic of the New York & Queens County Railway, Long Island City, N. Y., has been appointed general manager of the Binghamton (N. Y.) Railway. Mr. Banghart has been superintendent of the New York & Queens County Railway since October, 1908, at which time he had been master mechanic of the company for five years. His first railway position was with the line department of the Allentown & Bethlehem Traction Company, after which he was engaged in the electrification of the Union Railway, New York, for the Thomson-Houston Company. Later he joined the M. A. Greene Engineering Company, Allentown, Pa. In 1895 he became master mechanic of the Union Traction Company, Reading, Pa., which position he filled until his connection with the New York & Queens County Railway. Mr. Banghart will take up his duties at Binghamton on Sept. 1.

OBITUARY

William E. Clark, representative of the Rail Joint Company, New York, N. Y., died July 5. Mr. Clark was born in Manchester, Mass., Nov. 5, 1847. After service in the Civil War he engaged in railroad bridge building. Later he served as roadmaster for the Connecticut division of the Boston & Maine Railroad for nearly twenty-five years. About 1897 he accepted the position with the Rail Joint Company.

James W. Benham, secretary and treasurer of the Naugle Pole & Tie Company and president of the Northern White Cedar Association, was killed on July 27 in an automobile accident. Mr. Benham was born in Minneapolis, Minn., in 1866 and received his early education in San Francisco, Cal. While still a youth he went into Arizona and became identified with the cattle industry. He became a Legislator, a member of the first livestock sanitary board and a member of the first forestry organization of Arizona Territory. In 1901 Mr. Benham went into business in New York City. He moved to Chicago in 1906 and became a member of the Naugle Pole & Tie Company, then a partnership. When it was incorporated in 1910 he was made secretary and treasurer.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Alton & Jacksonville Railway, Alton, Ill.**—Incorporated in Illinois to build an electric railway between Alton and Jacksonville. The incorporators and first board of directors are: Frank L. Butler, Wade T. Meloan, James S. McClellan, Harry Okin, Louis W. McIntyre, Berthold P. Bergold and Jerome J. Cermak.

Pekin (Ill.) Street Railway.—Application for a charter has been made by this company to take over the present railway system in Pekin, and it is the intention, if the City of Pekin does not favor municipal ownership, to improve the line and extend it to the Mineral Springs Park. The company has made an offer to sell to the city, but will apply for a franchise if municipal ownership is voted down. Capital stock, $15,000. Incorporators: W. E. Lautz, D. D. Velde and W. P. Herget.

***Richmond-Hamilton Traction Company, Richmond, Ind.**—Application for a charter has been made by this company in Indiana to build an electric railway from Hamilton, Ohio, to Richmond, Ind. Partial surveys have already been made. Capital stock, $10,000. Directors: Eugene Purtelle, E. Leslie Cole and F. C. Gillen.

***San Marcos Interurban Railway, San Marcos, Tex.**—Incorporated in Texas to build an electric railway in San Marcos. Capital stock, $2,000. Incorporators: G. J. Merritt, Justin Merritt and Thomas Merritt.

Detroit, Pontiac & Owosso Railway, Owosso, Mich.—Incorporated in Michigan to build an electric railway to connect Pontiac, Owosso, Clarkston, Detroit and Fenton. Capital stock, $50,000. Oliver Lau, Detroit, is interested. [E. R. J., March 14, '14.]

***Dodge County Electric Railway, Madison, Wis.**—Chartered in Wisconsin to build an electric railway to connect Mayville, Horicon, Juneau, Beaver Dam and Columbus. Capital stock, $25,000. Incorporators: Charles R. Roberts, I. B. Luther and Charles D. Smith.

FRANCHISES

Victoria, B. C.—The British Columbia Electric Railway has asked the Council for a franchise to double-track its line on Esquimalt Road between Dundas Street and Catherine Street in Victoria. The company plans to build a double track on the entire line from Point Ellice bridge to the terminal.

Healdsburg, Cal.—The Board of Supervisors will open bids on Sept. 10 for the sale of the franchise of the proposed electric line which extends from Healdsburg to Alexander and Dry Creek Valley. A. D. Bowen and associates plan to extend this line from Dry Creek to Cloverdale. [E. R. J., July 25, '14.]

San José, Cal.—The San José Railway has asked the Council for a forty-two-year franchise in San José for a line from East San José to Kirk Avenue in San José.

Miami, Fla.—The Miami Traction Company has received a franchise from the Council to build a 2½-mile electric railway in Miami. B. B. Tatum is interested. [E. R. J., June 13, '14.]

Peoria, Ill.—The Peoria Railway has received a franchise from the Council to double-track its line on Main Street from Elizabeth to Western Avenues in Peoria.

Lafayette, Ind.—The Lafayette & Northwestern Railroad has asked the Board of Supervisors for a franchise in White County to build an electric railway through Round Grove, Princeton and West Point. This line will connect Lafayette and Chicago via Rensselaer, Hammond, Princeton, Round Grove and West Point. [E. R. J., July 25, '14.]

Lafayette, Ind.—The Indiana & Northwestern Traction Company will ask the Board of Supervisors for a franchise through White County.

Hopkinsville, Ky.—On August 22 a twenty-year franchise, providing for an electric railway and giving the right to sell current for light and power, will be offered for sale to the highest bidder. This step was taken at the request of R. E. Cooper, who represents Eastern interests. Recently an interurban franchise was ordered sold in the same way by the local court. It is said that there are ample means to back the proposition and it is believed by some that this is part of an interurban traction plan, probably in connection with one of the companies already interested in this section of the country.

Alexandria, La.—The Southern Traction & Power Company has asked the Council for two franchises to extend its lines on Sixteenth Street to the city limits and on Thirteenth Street to Marye Street in Alexandria.

Shreveport, La.—The Shreveport Traction Company has bought two electric railway franchises from the Council in Shreveport, one to extend the present Fairfield line and the other to extend the franchise for the existing track in Shreveport.

Augusta, Maine.—The Lewiston, Augusta & Waterville Street Railway has received a franchise from the Council to extend and improve some of its lines in Augusta.

Bangor, Maine.—The Bangor Railway & Electric Company has asked the Council for a franchise to double-track its line on Central Street and through Post-office Square in Bangor.

Revere, Mass.—The Bay State Street Railway has asked the Council for a franchise for an alteration and relocation of its tracks on Beach Street and Central Avenue in Revere.

Westfield, Mass.—The Springfield Street Railway has asked the Council for a new location of tracks on the Springfield highway from the West Springfield town line to a point east of Frog Hole.

Elizabeth City, N. C.—T. J. Markham and associates have received a franchise from the Board of Aldermen to build an electric railway in Elizabeth City. This is part of a plan to build an electric line to connect Weeksville, Nixontown, Elizabeth City, South Mills, Deep Creek and Norfolk. [E. R. J., June 6, '14.]

Raritan, N. J.—The application of the Jersey Central Traction Company for approval of an ordinance of Raritan Township, Monmouth County, giving permission to the company to operate an electric railway in Raritan, has been granted by the Board of Public Utility Commissioners.

Buffalo, N. Y.—The Buffalo & Lake Erie Traction Company has received a franchise from the Council for new track in State Street from Twelfth Street to Turnpike in Buffalo.

Jefferson, Ohio.—The Chardon, Jefferson & Meadville Interurban Railway has received a franchise from the Council in Jefferson. This 30-mile line will connect Chardon, Hampton, Fontville, Rock Creek and Jefferson, Ohio, and Linesville, Pa. [E. R. J., June 20, '14.]

Portland, Ore.—The Portland & Oregon City Railway has asked the Council for a franchise from Oregon City to Portland via the East Side.

Harrisburg, Pa.—The Harrisburg & Mechanicsburg Electric Railway has received the approval of the Public Service Commission for an extension of its route in Harrisburg. The company will now ask the Council for a franchise to build the line.

Nashville, Tenn.—The Nashville Traction Company has asked the Council for a franchise along the Murfreesboro pike in Nashville. [E. R. J., July 18, '14.]

Temple, Tex.—The Southwestern Traction Company has received a franchise from the Council to extend several of its lines in Temple.

TRACK AND ROADWAY

Fresno (Cal.) Interurban Railway.—The Railroad Commission has rendered a decision granting this company until Oct. 1 to secure a franchise through Clovis. The securing of this franchise was one of the conditions of the Commission's recent order authorizing the railway company to issue $120,000 of bonds and 600 shares of stock.

Montecito Railroad, Los Angeles, Cal.—Application has been made by this company to the Railroad Commission asking authority to issue and sell 50,000 shares of its authorized capital stock at the rate of 90 cents a share. The company proposes to construct an electric railway from the north end of Griffin Avenue, Los Angeles, to the summit of Montecito Hill, a distance of 2¼ miles. The company also plans to acquire certain property at the upper terminus of the line to be used as an amusement park. [E. R. J., July 25, '14.]

Pacific Electric Railway, Los Angeles, Cal.—Plans have been completed and work will be begun at once by this company on the extension of its elevated railway from the company's Sixth Street station to San Pedro Street, via Maple Avenue in Los Angeles.

***Bay Shore Railroad, San Diego, Cal.**—This company has applied to the Railroad Commission for a certificate of public convenience and necessity authorizing it to construct an electric railway from the intersection of Voltaire Street and Bacon Street, San Diego, northeasterly across the entrance of False Bay to Pacific Beach. The authorized capital stock of the company is $200,000, of which $7,000 has been subscribed. Upon being granted the necessary franchises and permits, the company proposes to apply to the Railroad Commission for authority to issue sufficient capital stock to finance the project.

***Jesup, Ga.**—A stock company that will be capitalized at $10,000 is being organized at Jesup to build an electric line between Jesup and Doctortown. M. Arlino, Jesup, is among those interested.

Urbana & Champaign Railway, Gas & Electric Company, Champaign, Ill.—This company will build an extension of its lines to the new shops of the Illinois Central Railway located 2 miles north of Champaign. It is reported that this company will build a loop through a new residence district of Urbana adjacent to the University of Illinois.

Kankakee & Urbana Traction Company, Urbana, Ill.—The Public Service Commission has authorized this company to sell $213,000 of preferred capital stock for the purpose of extending its line from Rantoul to Paxton.

Evansville & New Harmony Traction Company, Evansville, Ind.—Bonds to cover the cost of construction of this line will be first offered for sale in Cynthiana, Ind., one of the cities along the proposed route. After Cynthiana, other towns lying between New Harmony and Evansville will be visited by the promoters of the company, and those which offer the best support will be included on the routing of the new line. [E. R. J., July 25, '14.]

Public Utilities Company, Evansville, Ind.—Residents of the West Side have prepared a petition asking this company to extend its line on Franklin Street from Fulton Avenue to Mary Street in Evansville. This would give a direct route between the North and West Sides. A committee from the North Side Business Men's Association has been appointed to work in favor of the extension.

Interstate Bridge & Terminal Company, Muscatine, Ia.—Plans are being considered by this company to build an electric railway between Muscatine and Galesburg, Ill., and a bridge across the Mississippi River.

Southern Traction Company, Bowling Green, Ky.—This company, which recently purchased the Bowling Green Street Railway Company's property, has begun extension of its lines and has placed a large order for new rails. The first extension will apply to the Broadway line. Rather extensive improvements are being made by the new owner of the property.

***Thibodaux, La.**—Plans are being considered to build a 40-mile electric railway between Lockport, Thibodaux and Donaldsonville. Right-of-way has been obtained between Lockport and Thibodaux. Among those interested are: L. P. Caillouet, H. S. Smith and Alfred Picot, Thibodaux, and Walter Ohimeyer, Plattenville.

Hagerstown & Frederick Railway, Frederick, Md.—The interests which control this company have recently purchased the Frostburg Illuminating & Manufacturing Company, which is the first step toward the building of an interurban electric railway to connect Johnstown, Frostburg, Cumberland and Hagerstown. Surveys have been made for an extension to Hancock.

Grosse Isle Railway, Detroit, Mich.—This company, which plans to build a 10-mile electric line around Grosse Isle, has completed a new bridge below Wyandotte at a cost of $250,000. It has not yet been decided when construction of this line will be begun. E. W. Voigt, Butler Building, Detroit, president. [E. R. J., Nov. 4, '11.]

Detroit, Pontiac & Owosso Railway, Owosso, Mich.—The State Railroad Commission has authorized this company to issue $3,000,000 in bonds. The company was recently incorporated to build an electric railway from Owosso to Detroit. This company will obtain the power to operate its proposed line from the Independent Power Company, Fenton. [E. R. J., March 14, '14.]

Columbia (Mo.) Railway.—Preliminary arrangements are being made by this company to build an electric railway to connect Jefferson City, Mexico, Fulton, Montgomery City, Columbia, Fayette and Glasgow. W. J. Delaney, St. Louis, is interested. [E. R. J., July 18, '14.]

Dover, Somersworth & Rochester Street Railway, Dover, N. H.—Plans are being considered by this company for an extension from Dover to Portsmouth via the New Hampshire side of the river.

Hiawassee Valley Railway, Andrews, N. C.—Preliminary arrangements are being made by this company to begin work within the next few weeks on the 35-mile line from Andrews to Hiawassee, Ga., via Hayesville, N. C. J. Q. Barker, Andrews, N. C., is interested. [E. R. J., Feb. 28, '14.]

New Bern-Ghent Street Railway, New Bern, N. C.—An extension several miles beyond New Bern is being considered.

Williston & Northern Electric Railway, Williston, N. D.—Surveys have been completed and contracts will soon be awarded by this company to build its 60-mile line from Williston north along the west side of Little Muddy Valley. A. H. Brown, president. [E. R. J., June 6, '14.]

East Liverpool Traction & Light Company, East Liverpool, Ohio.—Plans are being made to extend the Pleasant Heights line about 1½ miles in East Liverpool.

Dayton (Ohio) Street Railway.—Plans are being made by this company soon to build an extension from Philadelphia Drive to Fort McKinley in Dayton.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—Application has been made to the Public Utilities Commission by this company for permission to issue $300,000 of bonds to run twenty years and draw 6 per cent interest. It is stated that of the 14 miles of proposed track between Nelsonville and Athens, about half has been completed and that the returns from operation over this portion will not pay the interest charges. The company proposes to use the money secured by the bond issue to complete the line and refund present obligations.

Windsor, Essex & Lake Shore Rapid Railway, Kingsville, Ont.—The Windsor City Council has asked this company to remove its tracks on Howard Avenue, from the side to the center of the road. The city has let a contract for paving the avenue, and the proposal is that the tracks will be moved while this work is in progress.

Pease River Tramway & Navigation Company, Ottawa, Ont.—Adequate financial arrangements have been made by this company to build an electric railway from Smith's Landing, on Pease River, to Port Smith, on the northern boundary of Alberta, and a line from Vermilion Rapids easterly along the northern bank of the Pease River to Vermilion Falls, with branch lines. D. A. Thomas is interested. [E. R. J., Jan. 24, '14.]

Rainy River Radial Railway, Ottawa, Ont.—The Dominion Parliament has granted an extension of time to this company in which to begin the construction of its projected railway in the Rainy River district.

Pacific Power & Light Company, Astoria, Ore.—This company has a portion of the grade stakes set for the extension of the railway to Taylor's Addition, but the work has not been completed. Nothing can be done at present on the extension of the line to Alderbrook, until the city shall have completed certain street improvements in Uppertown. The extension to Taylor's Addition will be rushed as rapidly as possible.

***Roseburg, Ore.**—Plans are being considered to build an electric railway between Roseburg and Marshfield.

Hershey (Pa.) Transit Company.—Contracts have been awarded by this company, for a 10-mile line between Hershey and Elizabethtown, to the King, Evans, Riley Company, Pottsville, Pa. This extension will be known as the Elizabethtown & Deodate Railway.

Northwestern Railways, Meadville, Pa.—This company has awarded a contract to the Erie Steel & Construction Company for the relaying of tracks from Cambridge Springs to Meadville. Work will be begun at once.

Reading, Birdsboro & Pottstown Railway, Reading, Pa.—Surveys have been completed and work will soon be begun by this company on the 18-mile electric railway to connect Reading, Millmont, Flying Hill, Gibraltar, Birdsboro, Baumstown, Weavertown, Amityville and Stowe, where it will connect with the line of the Pottstown Traction Company. The route as surveyed goes through private right-of-way for its entire distance. This is part of the project which contemplates the construction of a bridge across the Schuylkill River at the foot of Sixth Street, Reading, the company taking advantage of a charter granted a dozen years ago. Abbott Witman, general manager.

Wilkes-Barre (Pa.) Railway.—Work will be begun at once by this company on the extension of its Avoca line from the present terminus at the boundary between West Avoca and Duryea to the Lehigh Valley Railroad cut-off tracks. This will bring the line within a short distance of Main Street, Avoca.

Glengarry & Stormont Railway, Montreal, Que.—This company, which plans to build a 27-mile line between St. Polycarpe and Cornwall, Ont., will operate the railway by steam and not by electricity. G. W. Farrell, Montreal, Que., president.

Three Rivers (Que.) Tramway.—Interest has been revived in the construction of an electric railway in Three Rivers. James Bennett, Three Rivers, is interested. [E. R. J., Oct. 12, '12.]

Nashville Railway & Light Company, Nashville, Tenn.—This company has decided to extend its Fatherland Street line to the entrance of Shelby Park in Nashville.

Dallas (Tex.) Consolidated Electric Railway.—As soon as the material ordered arrives this company will begin work double-tracking its line from Main Street and Lamar Street to Elm Street in Dallas.

Southern Traction Company, Dallas, Tex.—During the fall of 1914 this company will build the connecting line between the Corsicana and Waco division. It will connect Waxahachie and Ferris, a distance of 15 miles.

Houston (Tex.) Electric Railway.—This company is asked to consider plans to double track its line on Fannin Street, and Travis Street from Franklin to Dallas Avenue and to route all of its lines over that loop, which will embrace all of the business district in Houston.

Southwestern Traction Company, Temple, Tex.—Plans are being made by this company to begin work on several extensions within the next few weeks in local territory now unprovided with transportation facilities. The first extension will be to the hospital on Bentley Hill, and material for same has been ordered. Among other improvements contemplated is a thirty-minute service on the interurban between Temple and Belton.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—An extension of this line to Saratoga Springs, Utah, is being considered.

Everett Railway, Light & Water Company, Everett, Wash.—It is reported that this company plans to extend its line in Lowell.

Washington Water Power Company, Spokane, Wash.—This company will extend its Bonne Avenue line as soon as it receives a franchise from the Council for the extension in Spokane.

Wheeling (W. Va.) Traction Company.—Work has been begun by this company on the extension to Warwood.

SHOPS AND BUILDINGS

British Columbia Electric Company, Vancouver, B. C.—This company has awarded a contract to the Westinghouse, Church & Kerr Company to build a new carhouse at Fourteenth Avenue and Main Street in Vancouver. The cost is estimated to be about $300,000.

Washington Railway & Electric Company, Washington, D. C.—Plans are being made by this company to expend about $3,000 on repairs at its carhouse at Tenth Street and Florida Avenue, N. W., in Washington.

Bloomington & Normal Railway & Light Company, Bloomington, Ill.—This company is asked to consider plans to remove its carhouse on North Park Street in Bloomington.

Public Service Railway, Newark, N. J.—This company has awarded the contract to the Hedden Construction Company to build its new eight-story terminal building in Newark. Provision is made for every department of the various Public Service Corporation activities. Including the subway, the concourse, which will be at the ground level, and the elevated train floor, the new building will provide nearly 9 acres of floor space. Above the elevated train floor the structure will rise six stories, all of which will be used by the corporation and its affiliated railway, gas and electric companies.

Piedmont & Northern Railway, Charlotte, N. C.—Plans are being made by this company to build a new depot and warehouse in Spartanburg. The structure will be 108 ft. x 110 ft. The cost is estimated to be about $40,000.

Ohio Electric Railway, Cincinnati, Ohio.—Plans are being made by this company to build a new depot on East Main Street in Newark.

Montreal & Southern Counties Railway, Montreal, Que.—This company has received permission from the Montreal Council for improving the city terminals. The company will be allowed to cross McGill Street and establish the terminal on Youville Square in Montreal.

Utah Light & Railway Company, Salt Lake City, Utah.—This company has plans in preparation for the erection of a new freight and passenger terminal station south of the general office building on West Temple Street in Salt Lake City.

POWER HOUSES AND SUBSTATIONS

Southern Iowa Railway & Light Company, Centerville, Ia.—One 200-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter has been ordered by this company from the Westinghouse Electric & Manufacturing Company.

Detroit (Mich.) United Railway.—Plans are being made by this company to build a new power plant in Detroit. Contracts for the work will soon be awarded.

Northern Ohio Traction & Light Company, Akron, Ohio.—One 5000-kva, three-phase, sixty-cycle, 22,000-volt high tension, 2300-volt low tension O. I. W. C. transformer has been ordered by this company from the Westinghouse Electric & Manufacturing Company.

Lake Shore Electric Railway, Cleveland, Ohio.—An order has been placed by this company for three 185-kva, single-phase, twenty-five-cycle, 17,350-volt high tension, 456-volt low tension O. I. S. C. indoor transformers and one 15-kw induction motor generator set for exciter service. This apparatus will be installed by the Westinghouse Electric & Manufacturing Company.

Hershey (Pa.) Transit Company.—This company has completed the addition to its substation in Hershey.

Northern Texas Traction Company, Fort Worth, Tex.—This company will install at its power house in Fort Worth one 1000-kw, 600-volt, six-phase, twenty-five-cycle, 750 r.p.m. commutating pole rotary converter; three 367-kva one-phase, thirty-five-cycle, 15,000-volt O. I. S. C. transformers. The apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Charleston (W. Va.) Interurban Railway.—This company has placed an order for one 300-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary converter; three 110-kva, sixty-cycle, OISC transformers, 6600-volt high tension to rotary and one switchboard to control same. The apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Manufactures and Supplies

ROLLING STOCK

Empire United Railways, Syracuse, N. Y., is in the market for twelve interurban cars.

Rio De Janeiro (Brazil) Tramways is reported as expecting to purchase 250 cars.

Connecticut Company, New Haven, Conn., will order within the next few weeks about ninety passenger cars.

Santiago (Cuba) Tramways is reported as having ordered about twenty-five open cars from The J. G. Brill Company.

Albany Southern Railroad, Rensselaer, N. Y., is expecting to purchase one express car and snow-plow and ten 80,000-lb. freight cars.

Canadian Northern Railroad, Toronto, Ont., has ordered six city passenger cars from the National Steel Car Company, Hamilton, Ont.

Third Avenue Railway, New York, N. Y., has ordered twenty-five additional low-level, single-truck, radial axle cars from The J. G. Brill Company, thus making a total of forty-nine cars of this type ordered.

Springfield (Mass.) Street Railway, noted in the ELECTRIC RAILWAY JOURNAL of July 4, 1914, as expecting to purchase ten city passenger cars, has ordered these cars from the Wason Manufacturing Company.

Worcester (Mass.) Consolidated Street Railway, noted in the ELECTRIC RAILWAY JOURNAL of July 4, 1914, as expecting to purchase ten city passenger cars, has ordered these cars from the Osgood Bradley Car Company, Worcester, Mass.

New York Municipal Railway, Brooklyn, N. Y., has been authorized by the Public Service Commission, First District of New York, to purchase 100 additional subway car bodies similar in design to those ordered at the beginning of the year. It is understood that the order will be placed with the American Car & Foundry Company.

Greeley & Denver Railroad, Greeley, Col., noted in the ELECTRIC RAILWAY JOURNAL of July 18 as expecting to purchase two single-truck motor cars, has ordered these cars from the American Car Company. The cars will be mounted on Brill No. 21-E trucks and will be equipped with GE electrical equipment.

Jersey Central Traction Company, Keyport, N. J., has specified the following details for the six center-entrance prepayment cars which were recently ordered from The J. G. Brill Company:

Seating capacity	50
Bolster, centers, length	28 ft.
Length over vestibule,	43 ft. 2 in.
Width over sills	8 ft. 6 in.
Body	composite
Interior trim	cherry
Headlining	Agasote
Roof	arched
Underframe	metal
Air brakes	West.
Axles	hammered steel
Bumpers,	Brill angle-iron, Hedley anti-climbers
Cables	West.
Car trimmings	bronze
Conduits and junction boxes,	West.
Control	West.
Couplers	Brill channel iron
Curtain fixtures	Natl. L. W.
Curtain material	Pantasote
Destination signs	Hunter
Fare boxes	International
Fenders	Philadelphia
Gongs	Brill Dedenda
Hand brakes	Brill
Heaters	Consol.
Headlights	Neal
Motors	4 West. 307-C
Sanders	Ohio Brass air
Sash fixtures	Brill
Seats	Brill Winner
Seating material	cane
Springs	Brill
Track scrapers	Brill
Trolley catchers	Wilson
Trucks	Brill 27 M.C.B. 2X
Wheels	Midvale

TRADE NOTES

Graphite Lubricating Company, Bound Brook, N. J., regrets to announce the death of its president, Charles H. Libbey, on July 20, 1914.

V. D. Stearns, who has been assistant sales manager of the Lord Manufacturing Company, Brooklyn, N. Y., for the past four years, announces his resignation from this company, effective Aug. 15, 1914.

Naugle Pole & Tie Company, Chicago, Ill., has appointed Laurence E. Morier in charge of the new office which the company has opened at 21 South High Street, Columbus, Ohio. Mr. Morier has been affiliated with the company for the past nine years, having started in the capacity of timekeeper and assistant foreman in the Chicago yards. After three years of this work he was transferred to the North, acting as assistant to the superintendent of Minnesota operations. He was later recalled to Chicago and made a salesman.

Union Switch & Signal Company, Swissvale, Pa., at a recent meeting of its board of directors decided upon certain changes in the business policy of the company and these brought about a number of changes in the personnel of the management, in addition to those which were mentioned in the ELECTRIC RAILWAY JOURNAL of July 25. W. H. Cadwallader has been appointed general manager of the company at Swissvale, Pa. Mr. Cadwallader came to the organization about twenty-four years ago as an office boy. Since then he has worked his way up step by step through various departments by constant attention to business, until he was made assistant to the general manager about a year ago. During the recent changes in the management, he received the promotion to his present position. J. S. Hobson, who had formerly charge of the Western district with headquarters in Chicago, has been appointed as acting sales manager with headquarters in Swissvale, Pa. A. Dean has been appointed to take charge of the Chicago office. All members of the New York office not directly connected with the Eastern sales district will be transferred to the Swissvale office, where hereafter the head sales department will be located. The Eastern sales office at 30 Church Street, New York City, will be in charge of G. A. Blackmore.

ADVERTISING LITERATURE

Goldschmidt Thermit Company, New York, N. Y., has issued a postal showing an interesting illustration of welding repair work done on a large steel crankshaft.

National Tube Company, Pittsburgh, Pa., has issued the second edition of its "National" Bulletin No. 13, which describes and illustrates its iron body brass mounted wedge gate valves.

Chicago Savings Bank & Trust Company, Chicago, Ill., has issued a fifteen-page booklet entitled "A Promise to Pay." This gives a very interesting discussion on the subject of bonds, taking up in turn the definition of the word "bond," the different classes and forms of bonds and the right and wrong ways to buy bonds. The booklet mentions three factors in bond investment, viz.: security, convertibility and interest return, and closes with an outline of the work of the bond department of the bank.

International Steel Tie Company, Cleveland, Ohio, has issued bulletin No. 2, illustrating the most recent development of an installation of a support for crossings at the intersection of the Union Traction Company of Indiana and the Chicago, Cincinnati, Columbus & St. Louis Railway at Muncie, Ind., and at the intersection of the Cleveland, Southwestern & Columbus Railway with the New York Central & St. Louis Railroad at Lorain, Ohio.

St. Louis Steel Foundry Company, St. Louis, Mo., has issued a catalog describing and illustrating its solid cast manganese steel track work for steam and electric railroads. The work illustrated is all machine-ground to template and dimension and is absolutely interchangeable. The types of track work described include protected heel tongue switches of standard and tadpole styles, solid manganese steel point mates, steel railway girder frogs of U-section and double and triple intersection, slot-rail and combination gauge girder crossings, steel layouts and insert castings.

Gould Storage Battery Company, New York, N. Y., has issued an attractive catalog describing its storage battery cars. The bulletin also points out in an interesting way the field of the storage battery car, its powers and its limitations, and explains the small amount of care required for its operation, its low maintenance cost and its general economy. A number of illustrations are shown of the storage battery cars equipped by this company, among them being cars of the Central of Florida Railway, Gardenas Tramway and the Third Avenue Railway. This company has also issued helpful data for figuring on the storage battery proposition in regard to results to be expected from storage battery cars.

Electric Railway Journal

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PROTECTION BY FLAG ON SLOW-SPEED LINES

A question has arisen as to the scope of the editorial comment appearing in last week's issue about the revival of the old operating rule that permitted train movement under the protection of a flag in advance. Obviously our conclusions were intended to apply only to high-speed service. That city or semi-suburban service, where the train movements are slow, should be hampered by the limitations imposed in the interests of safety upon interurban lines is by no means a necessity, and in view of the fact that signals on slow-speed lines are installed more often for accelerating traffic than for any other reason the rules for operation under them should manifestly permit a considerable degree of flexibility. Certainly when speed is so low that stops can be made in a few score feet, and even when head-on collisions involve no more than crumpled vestibules, there is no reason for the rigid imposition of the precautions necessary for high-speed trains, and the use of somewhat primitive forms of signals which lack the practically perfect reliability of the more elaborate types is entirely logical. Under such conditions it would be unreasonable to hold a train at a deranged signal in stop position until orders were obtained from the dispatcher, because, in the first place, it is seldom that the expense of installing a telephone at every signal is permissible for the traffic involved, and in the second place a signal failure is by no means likely to be such an infrequent occurrence as it is on a completely equipped interurban line.

DEFINING THE LIMITS OF ARBITRATION

Experience shows that in the arbitration of labor disputes one of the most important requirements of a successful proceeding is a preliminary agreement sharply defining the jurisdiction of the tribunal sitting in the case and stating with the utmost clearness the points agreed upon in conference, if any such have been settled prior to the official hearings. Failure to enter into such an agreement opens the door to grave difficulties in the carrying out of the final decision, since the party which considers itself aggrieved by the finding is naturally tempted to challenge the authority of the board unless that authority is put down in black and white in clear-cut terms, understood and accepted by the disputants. Of course, no arbitration can be entered into without mutual agreement of some sort, but this agreement must be perfectly plain as to interpretation and comprehensive within its scope if it is to stand the test of controversy. Too much care cannot be taken to make sure that an agreement to arbitrate a wage issue on an electric railway leaves nothing uncertain with respect to the time when the awarded schedule of pay shall take effect, as to the definition of platform time and method of compensation to be employed, and with regard to any other technical matters the interpretation of which might otherwise be unrestricted. The time and trouble required to start right in such proceedings is well expended, for in the interests of the permanent settlement of specific controversies it is important that no loopholes be left through which disputes may come into being.

RATE DECISION A PARTIAL VICTORY

The recent I. C. C. decision in the Eastern freight rate case, noted elsewhere in this issue, may be considered a partial victory for the railroads, in that they have been allowed a 5 per cent increase in many of the rates requested. On the other hand, the increase in rates is restricted to the Central Freight Association territory, and the longed-for $50,000,000 increase has dwindled down to between $9,000,000 and $15,000,000. It must be admitted that the commission points out paths of economy along which revenues may be further increased, although the availability of such routes is difficult of determination. It is interesting to note the intimation that passenger traffic has not been bearing its full share of railroad expenses. If this is true, an accurate separation of operating expenses as between freight and passenger traffic, according to the recent order of the commission, may prove a most effective means for securing passenger rate increases. A careful perusal of the entire decision shows that the commission has not dealt so harshly with the alleged delinquencies of railroads as predicted in some sources. It more than delicately hints, however, that the propaganda directed toward it as if it had the legislative power to promote general industrial welfare, has been ill-advised, for the law covering rate-making does not embrace general endeavors to restore financial and business confidence. The commission may be correct as to its legal position, but it should not belittle the anxiety with which the public was waiting for the rate decision. Unfortunately for the exact settlement of this question, the effect of the decision cannot be determined on account of present international complications. It is indeed a strange coincidence that this rate decision, which security holders and exchanges have been awaiting with bated breath for several years, should now be handed down when the stock exchanges are closed because of the war in Europe.

EFFECT OF WAR ON FINANCE AND COMMERCE

Ordinary calculations of the effect which the rush of nations against each other now in progress in Europe will have upon American markets, both financial and commercial, seem almost futile, in view of the fact that the present suspension of trade on all the world's exchanges, the collapse of the European credit machinery and the complete upheaval of all international commerce are without precedent in the history of the world. It is no wonder that many American investors and manufacturers look with doubtful eyes toward the future. However, America has already rallied to meet the opportunity offered to her in the face of such unparalleled conditions, and we are sanguine enough to believe that a way will soon be found to ameliorate the situation.

Elsewhere in this issue we have noted the record low prices of American electric railway issues which are traded in on foreign exchanges, brought about through the heavy liquidation before the foreign and New York exchanges closed. This, of course, is temporary, for the foreign investor has been too well educated as to the high investment value of American public utility securities for a market not to be established for them as soon as European conditions again become settled.

So far as the earnings of electric railway companies in this country are concerned, we see little in the foreign complications to affect them. Indeed, this comparative immunity of properties of this kind to outside commercial conditions is one of the advantages which electric railways have always possessed over the steam railroads and general industrial undertakings. With the street railways in the affected district the situation is, of course, far different, the war dispatches from Belgium, for instance, reporting that the lines in Brussels have been brought practically to a standstill, because most of the train force has gone to the front.

In the meantime, the war will change conditions elsewhere. Public utility projects in Asia and South America, which have heretofore depended largely on German and English capital, may find it necessary to make advances that will prove attractive to American capital. London and Brussels have hitherto been the headquarters for enterprises of this kind, Brussels being the headquarters of many of the international syndicates which have controlled tramway enterprises in the southern hemisphere and in the Far East. German capital has also been active in such outside undertakings, particularly when combined with electric light and power supply, working usually through the finance companies which are associated with the large electrical manufacturers of Germany.

Manufacturers of electric railway apparatus in this country, also, may do well to consider the opportunities which the parts of the world which we have mentioned offer. Many of the existing roads of this kind have looked to Germany for their supplies in the past, not only for electrical equipment but for rails, etc., and if American manufacturers are willing to extend the long credits to which these buyers are accustomed, new lines of trade for this country may advantageously be developed.

PAYMENT OF INTEREST ON INCOME BONDS

According to a well-known author on corporation finance, income bonds, while sometimes desirable in reorganization proceedings because they do not impose any fixed charges on a corporation, are quite liable to lead to an acrimonious dispute between the corporation and the bondholders as to whether or not the interest charges are actually earned. Yet this objection, it is stated, can be obviated in part by the insertion, in the bonds, of such a detailed statement of the method by which the net income available for bond interest is to be determined as to make any disagreement on this point impossible. Sound theory this is, assuredly; but how difficult it may be to put it into practice is well exemplified by the present New York (N. Y.) Railways income bond controversy.

As noted in last week's issue of the ELECTRIC RAILWAY JOURNAL, a suit has been brought against the New York Railways by the New York Life Insurance Company, on the ground that the railway has retained from its bondholders interest which ought to be paid on its 5 per cent non-cumulative income bonds. The point is made that the reserve for injuries and damages is greatly in excess of the total actually expended, although the actual amount of excess is unknown to the plaintiff. According to the bondholders, the indenture provides that the unexpended reserve for injuries and damages for any six months shall be automatically returned to income and shall be applicable to interest on the income bonds. The company contends, however, that the indenture does not make such a step obligatory, and the resulting deadlock can be broken only by the adjudication of the present suit.

While waiting for this decision we may well call attention to another income bond interest dispute, which was decided a few years ago. Holders of the 1895 reorganization income bonds of the Central of Georgia Railroad alleged that the profits of a subsidiary, the Ocean Steamship Company, whose stock was almost entirely owned by the railroad, had been appropriated by the railroad under the fiction of "loans," so that the subsidiary earnings did not appear at all in the form of dividends declared in the income statement of the railroad. The decision of the court, which was rendered after long and hard-fought litigation, was in favor of the complaining bondholders, it being clear that the subsidiary corporation was here used as a device to prevent the income bondholders from securing profits justly accrued. It is easily conceivable that in cases of this character, where income bondholders are dealing with corporations carrying on several activities, care must be taken lest through the separate companies earnings be diverted from rightful creditors to the stockholders.

Besides such a case, however, the present New York Railways suit is based upon a pretext almost puerile. At best the issue resolves itself into one of judgment concerning the operating needs of the company and its accounting principles, on which points the right of the insurance company to act as judge is not wholly comprehensible. It may be that the reserve of 8 per cent of the passenger revenue maintained since Jan. 1, 1912, is slightly excessive. As noted elsewhere in this issue, an engineering determination of the exact amount required was 7½ per cent, but the Public Service Commission ruled that the company could not make any retransfer to surplus until all 1913 claims had been liquidated, moreover, that it was "wiser to manage a company over-conservatively and have a little margin of safety than to attempt to share the divisible profits down to the last tenth of 1 per cent."

Under the New York State law accident claims may be filed any time within three years after the date of accidents, so that the number of claims that may be made against a company for a given year is indeterminate until that time has elapsed. The New York Railways has now been in operation as a reorganized company for a little more than two years, and for it now to pay back a portion of its accumulative reserve would seem to be an unwise procedure. With a company which has been in operation for a long time it may be possible to work to a very close margin in matters of this kind, but we are inclined to believe that even in such a case a broader margin would tend to a greater uniformity of income bond interest.

COMMITTEE ACTIVITY

This is the period of the year when the American association committees are completing their reports, and it seems an appropriate time for this reason to review some of the aspects of committee activities.

Appointment upon one of the many committees of the American Electric Railway Association should be an incentive for earnest endeavor on the part of the individual so assigned, not for the reason that his ability was considered sufficient to warrant the appointment but because a threefold opportunity has been opened to him. In the first place it is an opportunity to participate in activities which have for their basis a much wider range than exists in the individual property and which are, therefore, the principles of the business of street railway transportation as it has been developed to the present date. In the second place the broader vision derived from such participation offers a means of strengthening the company with which the member is associated. The third opportunity is that of self-improvement. If every advantage is taken of the interchange of ideas among the members of the committee old facts assume new appearances, and the flow of original thought is likewise stimulated.

Committee members should realize that the reports submitted to the annual conventions ought to mark milestones of progress on the particular subjects with which they are concerned, and such a result can be obtained better by quality than quantity.

After the appointment of committees the up-to-date chairman should endeavor by correspondence to arrange for a meeting, at which all members could be present, as early as possible. Every effort should be made to insure a full meeting by inter-communication among members until a common date is determined upon. The time which any committee can have in meeting is very limited, consequently it is of such value that it should not be wasted. A rough outline ought to be prepared so that progress might start from the first meeting, instead of using this meeting to review the previous history of the subjects assigned. The meeting should then, if the right men have been chosen, become a clearing house of ideas.

An important qualification for committee work is the get-together spirit, the ability to seize upon the other fellow's thoughts or practices and examine them in good faith, not to find the weak points but to detect the strong points. Oftentimes the subjects assigned to a committee are wide and quite far-reaching. It is more a sign of strength than weakness in the committee if it deliberately postpones investigation on one or more subjects for the ensuing year and concentrates its energy upon what seems best adapted to the experience and make-up of the committee.

In committee reports the desirable feature is definiteness of aim and concreteness of recommendation. Presumably each committee is appointed with a definite object and its work is satisfactory only if it accomplishes definite results. Committees with indefinite commissions are likely to fail of real accomplishment and to become useless cogs in the association machinery.

THE WAR AND ELECTRIFICATION

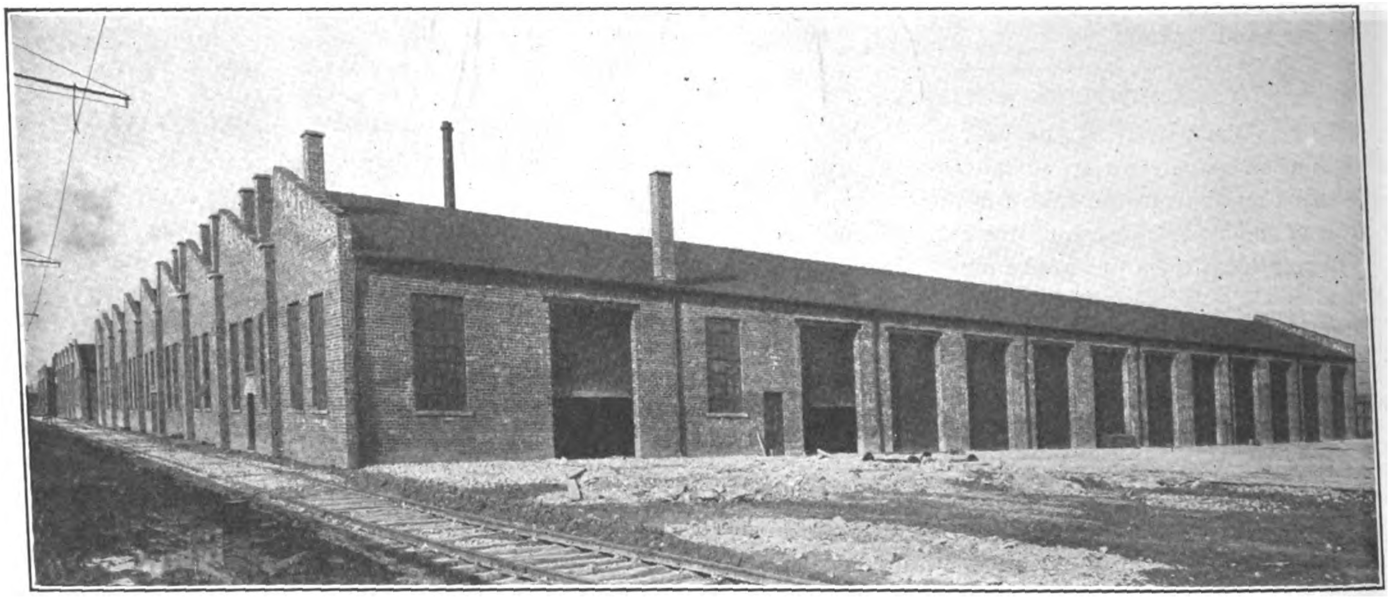
Among the many large engineering improvements which will be seriously delayed because of the great war now in progress on the Continent are the electrifications of steam railroads in Germany, France and other countries. The greatest delay may be expected in Germany partly because of the diversion of government funds to war purposes and partly because of the fact that the latest electrification, that in Silesia, is close to the Russian border. In any event, the railroads will be so overcrowded because of troop and provender transportation that no such interruptions as are incident to a change from steam to electricity would be permitted. It is doubtful, also, whether the Stadtbahn electrification will be furthered in a time of such financial stress.

In France, where the privately owned Midi Railway has taken the lead in electrification, less delay may be experienced because there is no dependence on government funds for the change and the lines are at a great distance from the war zone. It is questionable, however, whether the suburban electrifications of Paris will be continued at this time. Russia also was reported to have in hand great electrification projects which will now have to be postponed. Even if Italy, Spain, Sweden, and Norway succeed in maintaining their neutrality, the electrifications planned in those countries will be held up for two reasons: diversion of government funds, and assignment to army duty of the most vigorous and technically trained men in the country. In general, the Continental countries give preference to retired soldiers for railway workers; therefore the men who would build and operate the electrified roads are among the first reservists to be called back to the colors. No matter from what angle the situation is viewed, even a very short war must mean a serious delay to the electrification of steam railroads in Europe.

New Repair Shops at Louisville

These Shops in Their Fireproof Construction, Sawtooth Roofs for Natural Lighting, Mercury Vapor Lamps for Artificial Illumination, Thorough System for Transporting and Storing Materials and Other Features Are a Worthy Example of Modern Car Maintenance Standards

Positive evidence of the healthy growth of an electric railway is exemplified in its demand for larger and more modern repair shops and generating stations. This is particularly applicable to the Louisville Railway, Louisville, Ky., which recently completed the power station, described in ELECTRIC RAILWAY JOURNAL of Feb. 21, 1914, on page 402, and has now just completed its new general repair shops. Like the generating station, the new shops represent the best modern practice in electric railway shop construction and arrangement. Their necessity was brought about by the overcrowding of the existing shop buildings, the first of which was built in 1897. Although centrally located, the expansion of this lay-out was limited by the high price of surrounding real estate. The new shops are almost as centrally located as the old ones, but have the additional advantages of being on the same property as the largest carhouse and in a factory district where property for future expansion may be had at a fairly reasonable price. Furthermore, the new plant lends itself more readily to progressive shop movements, resulting in greater economy in shop operation.



LOUISVILLE SHOPS—FRONT VIEW OF REPAIR SHOP TAKEN BEFORE SHOP WAS OCCUPIED

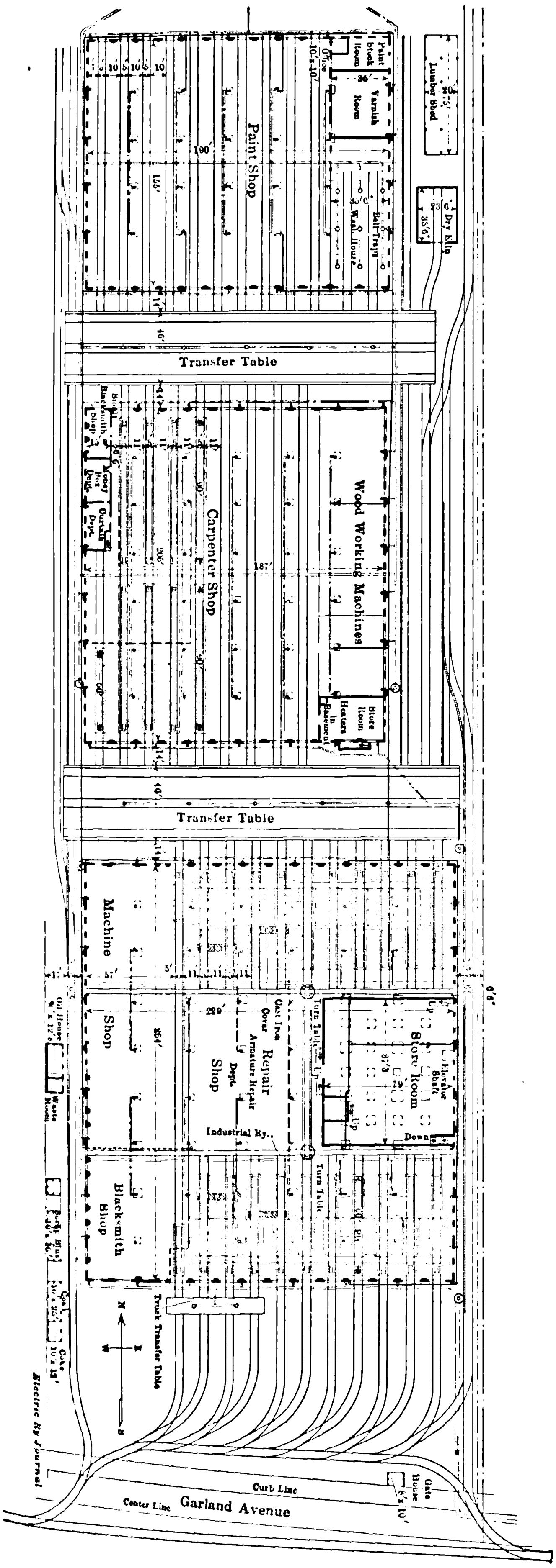
Three important city car lines reach the site which is a strip of property 277 ft. wide x 1221 ft. long, immediately in the rear of the Twenty-ninth Street and Broadway carhouse and fronting on Garland Avenue. This location is only 1½ miles from the center of the business district, so the dead mileage from all lines is quite small. While situated in the manufacturing district as noted, the shops are also quite near a desirable home district where the employees live.

General Lay-Out

Prior to deciding on the design of these shops, the construction and mechanical departments of the Louisville Railway made a survey of other shops in the Central States territory to obtain information on general lay-outs, equipment and methods. To a certain extent the dimensions of the property, which had already been bought, limited the character of the general plan. This land included a 277-ft. strip of property more than 1000 ft. in length and extending between two parallel streets occupied by important street railway lines.

Many different groupings of buildings which could be constructed on the proposed site were considered. One scheme included grouping the buildings along one side of the property with track entrances from the opposite side by way of a ladder track. This plan was not deemed practicable because of the larger number of turn-outs necessary as well as the reduction in the property area available for the shops. Another plan provided for grouping the shop buildings along each side of the property, with transfer tables and pit between the two groups. This arrangement reduced the depths of the buildings to a point where the tracks were too short and so would have seriously retarded car movement. Any shift as the car progressed through the various shop departments would require the use of a transfer table. Many other lay-outs were considered, but the one finally adopted and illustrated herewith included three main shop buildings occupying the center of the property with an aisle on each side to provide for run-around tracks. Two aisles, 74 ft. in width, separated the three buildings which formed the shop group. These aisles between the buildings were occupied by two 46-ft. transfer tables with 14-ft. walkways between the edges of the shallow transfer-table pit and the buildings.

Since one end of the shop property was occupied by the Twenty-ninth Street and Broadway carhouse, the shop lay-out was designed with the main shop entrance at the Garland Avenue or opposite, end of the property. This entrance included two turn-outs, one on each side of the property leading from the track in Garland Avenue and connecting to a ladder track paralleling the front of the repair shop. That part of the special work in the street was laid with 9-in. 149-lb. grooved rail and that on the property with 108-lb., 7-in. rail, all of which was furnished by the Buda Company. This lead also


Paint Shop
Paint Stock Room
Office 10'x10'
Varnish Room
36'
Lumber Shed
Dry Kiln
35'6"
Belt Traps
Wash House
190'
156'
Transfer Table
40'
14'
Blacksmith Shop
Money Box Dept.
Outfit Dept.
Carpenter Shop
Wood Working Machines
Store Room
Heaters in Basement
187'
Machine Shop
Repair Shop
Armature Repair Dept.
Cast Iron Cover
Industrial Ry.
Turn Table
Store Room
Elevator Shaft
Up
Down
87'3
220'
264'
Oil House
Waste Room
Blacksmith Shop
Coal
Coke
Truck Transfer Table
N
S
E
W
Curb Line
Center Line
Garland Avenue
Gate House 8'x10'
Electric Ry Journal

LOUISVILLE SHOPS—GENERAL PLAN, SHOWING SIZES AND RELATIVE LOCATIONS, TRACK FACILITIES, ETC.

connects to run-around tracks each side of this building, one being so connected to the ladder track as to provide a wye track for turning cars.

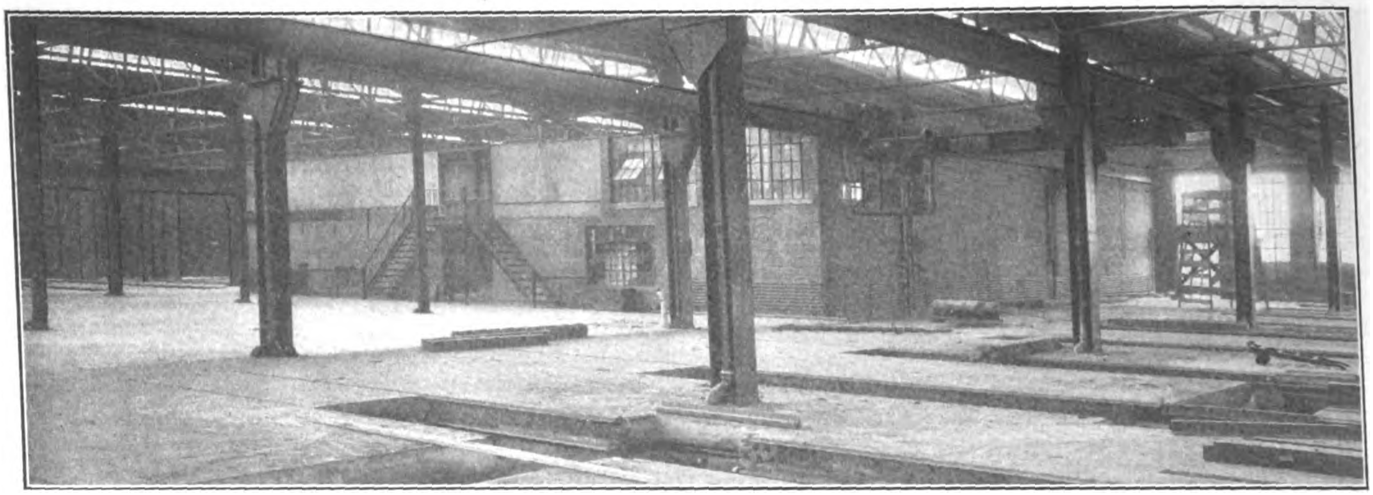
REPAIR SHOP ARRANGEMENT

Eleven tracks lead into the repair shop, and the relative location of the ladder track and the front of the building provides clearance for two cars on each, outside of the building. Only two of these ladder tracks extend through the repair shop building, the other nine stub-ending approximately two car lengths, or 80 ft., inside the entrances. In a similar way eleven tracks enter the rear end of the repair-shop building. Two of these are the through tracks from the front entrance, and the other nine are short sections of track sufficient in length to store two cars inside the building.

Each short track passes over an inspection and repair pit, each equipped with pit hoists fitted with two 24-ft. I-beams which recede into slots in the reinforced concrete floors. These hoists occupy the building entrance end of each inspection and repair pit. From this point defective trucks are run to the inner end of the repair pits where the motors or other truck parts may be removed by the 10-ton Whiting bridge crane, or a jib crane with a 14-ft. beam attached to the building column. From this point they are deposited on a small truck mounted on a narrow-gage industrial railway and transported to the various sections of the repair department. The repair shop proper occupies the central floor space of the repair shop building and extends from an inclosed storeroom, 79 ft. by 87 ft. in plan, at one end to the building wall at the other. The blacksmith shop occupies the corner of the repair shop building beside the Garland Avenue track entrances, the machine shop and armature room the central portion of the building, as well as the corner beside the rear track entrances.

As shown in the illustrations this shop area is contained in one large room with the exception of the storeroom, which is separated from the rest of the building by a 15-ft. brick partition wall. This arrangement permits the repair shop foreman to get a clear view of the entire floor area including the machine shop, blacksmith shop and armature repair departments. The advantage of the short stub tracks leading in from both sides of the repair shop building, each equipped with a pit car hoist, is the number of cars which may be handled at one time. In case several cars are undergoing a general overhauling, they may be run to the transfer table between the repair shop and carpenter shop, and set on any open track at the rear of the repair shop building, where the body is raised from the standard trucks, set on dummy trucks and shifted to the carpenter department for body work. At the same time the stub tracks at the front end of the building, or nearest the street, may be used for emergency repair work, such as changing trucks, adjusting brake equipment or making other slight repairs to the electrical equipment. In other words, it is the intention to keep these front tracks for handling rolling stock which is in the shop only for slight repairs, and those at the rear of the building for general overhauling purposes. In addition to the pit hoists a truck transfer table intersecting four tracks and of 10-ft. width has been provided immediately in front of the repair shop building. This, too, is emergency equipment, being provided to change trucks in case the stub tracks at this end of the building are completely filled with cars undergoing emergency repairs.

The run-around tracks on each side of the shop buildings make it possible to reach any of the buildings without passing through the others or using the transfer tables except for direct entrance to a building.



LOUISVILLE SHOPS—INTERIOR VIEW OF REPAIR SHOP, SHOWING LONGITUDINAL REPAIR PITS, CRANE RUN, ETC.

These run-around tracks were also provided to deliver steam-railroad cars from the track connection near the repair shop site to the several buildings. In order to do this, however, it was necessary to provide a second running rail at standard gage, 4 ft. 8½ in., because the Louisville Railway's lines are all laid with a 5-ft. gage. This difference in gage also necessitated an extra rail on the transfer tables, so that foreign cars can be shifted from one side of the repair shop to the other.

Carpenter Shop

Immediately back of the repair shop is the carpenter shop, which is somewhat smaller in floor area, being 187 ft. x 205 ft. in plan. One corner of this building is set aside for the heating plant, and the remainder of the aisle which this plant occupies serves as space for the woodworking machine tools. The rest of the building is occupied by nine tracks which are continuous from the transfer tables each side of this building, except the one which was stub-ended to provide floor space for a small blacksmith shop, the fare box and curtain repair departments. Four of the through tracks along with the stub-ended track have pits, those under the through tracks being 90 ft. in length and two to each track. All tracks are spaced at 16-ft. centers, thus providing between adjoining track rails an 11-ft. aisle, which is ample for the delivery and removal of material to and from cars undergoing overhauling.

The space provided for woodworking machine tools is ample for present needs, with an allowance for future addition. Each machine is served by an exhaust which connects into an overhead duct leading to the boiler room. The carpenter shop also contains space for a small blacksmith shop, it being provided to make emergency changes in metal fittings or any other light forge work which frequently accompanies car carpentry. The fare-box and curtain departments adjoin the forge room, and are completely inclosed so that they are out of the dust incident to car overhauling. Over these two latter rooms is the shower bath and locker room. It is reached by an ornamental iron stairway, and is inclosed with 8-ft. "Hy-rib" and concrete partitions, with an 18-in. opening along the base. As shown in one of the illustrations, the fittings are complete, and the shower bath room is provided with an individual gas hot-water heater. The lockers are of the usual metal type. Likewise each shop building is equipped with similar shower bath and locker rooms on balconies.

Paint Shop

The paint shop building is separated from the carpenter shop by a 76-ft. aisle, and is 190 ft. wide x 155 ft. long. It is divided into four rooms: the paint shop proper, which occupies the major portion of the building; a washroom, 35 ft. 6 in. x 93 ft. in plan; a varnish room, 35 ft. x 40 ft. in plan, and a stockroom and office, 35 ft. x 20 ft. in plan. The stockroom was built with an underground tank storage system for oils so as to reduce fire hazard as well as insurance rates.

Twelve tracks enter this building from the transfer table, two being stub tracks which lead into the car-washing room while the other ten extend through the building. The tracks in the paint shop proper are at 15-ft. centers, thus providing a 10-ft. aisle between adjoining rails of parallel tracks, and the two tracks in the washroom are of 16-ft. centers. It is not the intention at present to connect the tracks at the rear end of the paint shop building, but when the shop scheme is entirely completed a ladder track will be provided here so that cars may enter the paint shop from either side.

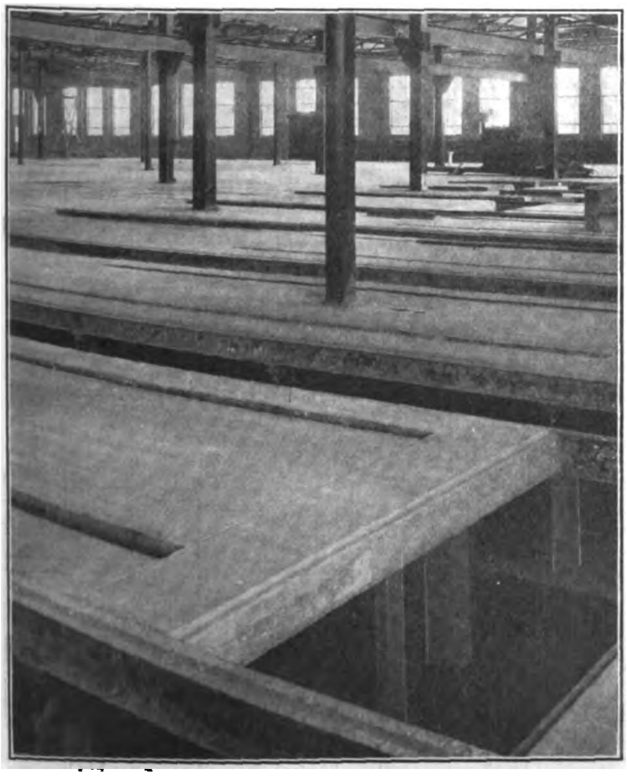
On the east side of the paint shop building are provided a lumber shed and dry kiln, each being served by the east run-around track on one side and a stub-

LOUISVILLE SHOPS—TOILET ROOM GALLERY OVER CURTAIN, FARE-BOX AND FORGE ROOMS end, double-gage track between them and the paint shop building. A short section of the stub track also extends from the transfer pit into the dry kiln so that lumber may be unloaded direct from the car upon the racks in this building. Two storage tracks in addition to a side track are supplied in the east run-around aisle beside the carpenter shop building so that cars may be stored without blocking run-around. In the west run-around aisle beside the repair shop, and situated so that material may readily be handled from the run-around track, are the oil and waste house and the scrap and fuel bins.

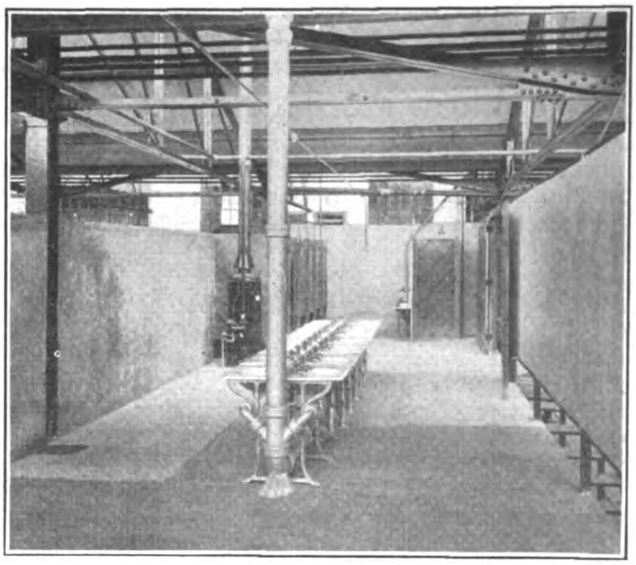
BUILDING CONSTRUCTION DETAILS

One of the most interesting features in connection with the construction of these shop buildings, as well as one which lends itself readily to construction economy, was the adoption of sawtooth roof construction for all buildings, accompanied by a standard longitudinal and transverse spacing of columns. As shown in the accompanying cross-section, the standard longitudinal column spacing is 29 ft. 5 in. The transverse spacing is 32 ft. By adopting this design and using it throughout the three structures it was possible not only to reduce design cost, but to simplify fabrication and erection to a point where the cost of the completed buildings was materially reduced. The only exception to this standard bay construction was made necessary in the two transverse panels adjoining the repair shop floor, at the inside ends of the repair and inspection pits. This alteration was made to provide additional strength in the columns to carry a 29-ft., 10-ton bridge crane.

Other standards adopted in the design of these buildings to reduce the purchase cost of materials as well as the cost of erection were the United steel sash, used in the sawtooth roof skylight construction, and a standard size of window frame and sash for use in all three buildings. The skylights were arranged with a continuous operating mechanism to provide ventilation, and each of the lower window sashes was equipped with a pivoted panel and adjustable brackets for ventilation. In addition to these, all track entrances are fitted with 10-ft. 6 in. x 16-ft. Wilson corrugated rolling doors arranged with chains and sprockets for hand operation.



LOUISVILLE SHOPS—INTERIOR OF REPAIR SHOP, SHOWING REAR REPAIR PITS, MERCURY-VAPOR LIGHTING, ETC.



LOUISVILLE SHOPS—INTERIOR VIEW OF TOILET AND BATHROOM

Other construction details somewhat unusual in character include the manner of providing partitions around the storeroom which occupies a portion of the repair shop floor, as well as the rooms in the carpenter shop and paint shop. As mentioned heretofore, these take the form of a 13-in. brick partition wall 8 to 15 ft. in height, and are intended only to serve as a barrier between these rooms and the rest of the building. It was believed that it was unnecessary to carry them higher, and besides it would have added to the construction expense without increasing economy in shop operation. All floors with the exception of those over that portion of the repair shop building set aside for blacksmith shop, are of concrete finished with a toughened wearing surface, made so by using "Ferrofax." This toughener is a combination of iron dust with cement, and it is believed that it will appreciably increase the life of the shop floors.

The roof covering is quite unusual, it being composed of a 2-in. continuous slab reinforced with "Hy-rib," a trade name for a trussed, expanded metal. The use of this material permitted the construction of the roof slab without forms, as the reinforcement was stiff enough to permit the concrete to be placed on top without sagging. After this was troweled and set, it was plastered underneath to form the ceiling. This slab is covered in turn by a two-ply asbestos, saturated composition roofing.

REPAIR AND INSPECTION PITS

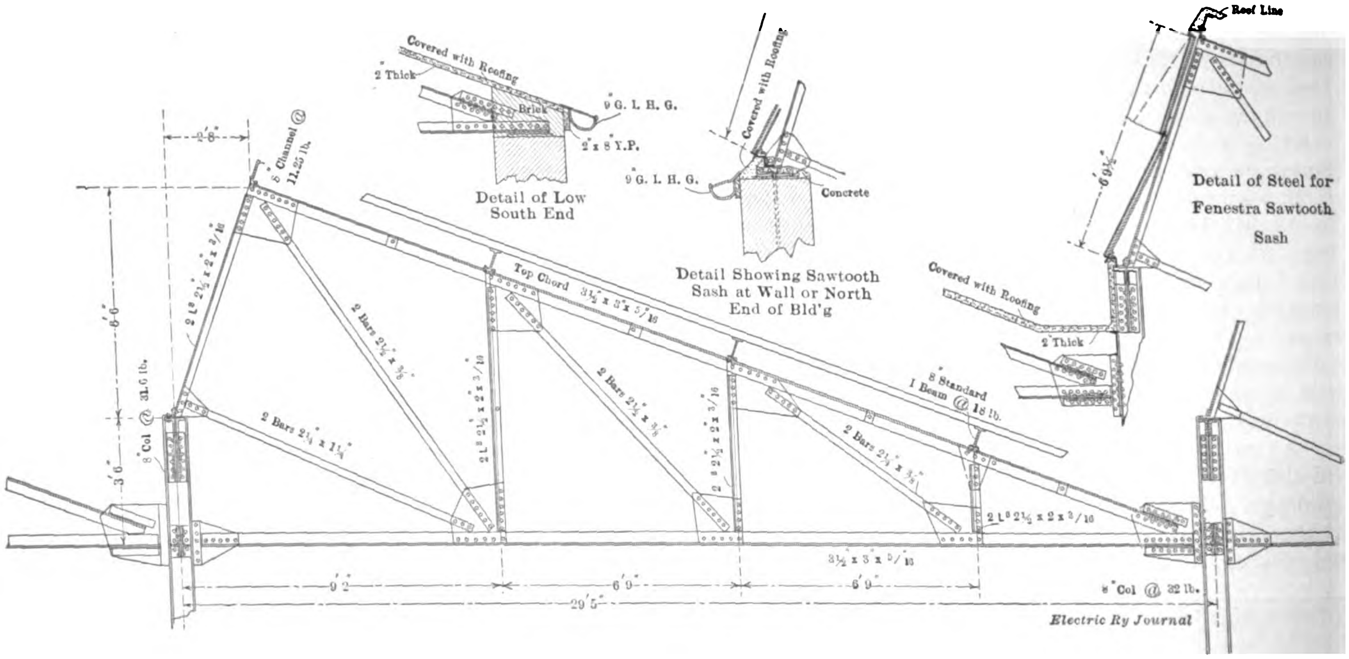
As shown on the plan, the repair and inspection pits in the repair shop are of a uniform length, being 60 ft. over all, and 5 ft. 6 in. in depth. The track rails are 9-in. 90-lb. tram rails on I-beam pedestals which also serve to carry the I-beams supporting the reinforced-concrete floors. These pit rails are attached to the floor beams by the usual bolts and rail clips. The reinforced concrete floors are 6 in. thick and those carried on earth foundations are 5 in. thick.

One set of pits, namely, those at the track entrance from Garland Avenue, will be fitted with pit car hoists, arranged for individual motor drive with gear and continuous shaft connections. Those pits at the rear of the building were equipped with similar hoists, but of an older design, operated by a continuous shaft extending along the ends of all pits, each pit being fitted with chain and sprocket connections which are controlled by hand levers and clutches. These latter pit hoists were taken from the old shops. Several of the pits are built with removable rail sections at the ends nearest the repair shop floor, so that wheel renewals may be made without the use of a pit hoist. Cross-sections of these pits are shown in the illustrations.

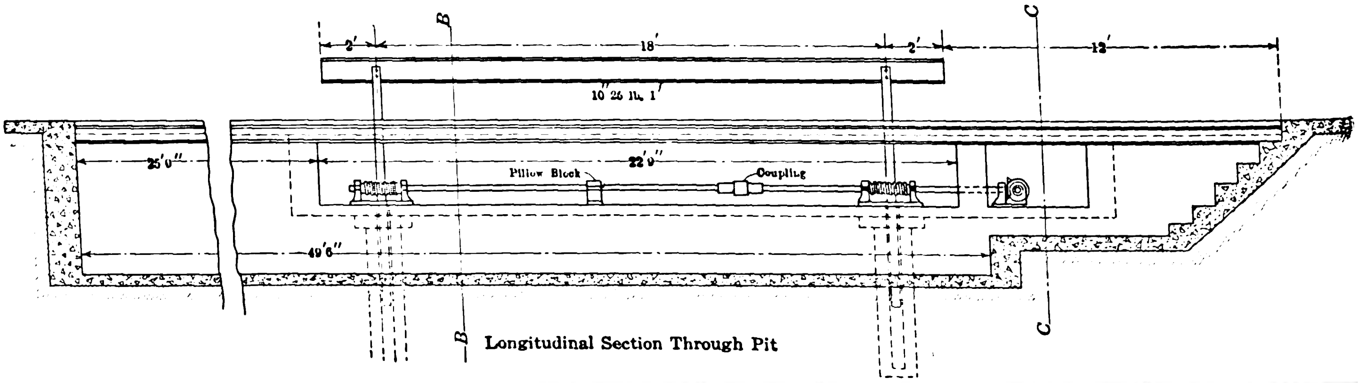
STOREROOM ARRANGEMENT

Another construction feature of interest included in these shops was the arrangement of the storeroom. As mentioned elsewhere in this article, this is 79 ft. x 87 ft. in plan and separated from the repair shop by a 15-ft. brick partition wall. The storeroom proper is designed with 8-ft. balconies on the four sides, two of which will serve as additional storeroom space, one for the master mechanic's office and the shop drafting rooms, and the fourth is partially occupied by the employees' shower bath and clothes locker rooms. The partitions on this balcony floor are built of the Trussed Concrete Steel Company's 26-gage "Hy-rib" plastered with concrete on both sides. This type of partition was employed to obtain one of minimum thickness and at the same time of substantial construction. All the partitions around the toilet, locker and washing rooms have their bases elevated about 18 in. above the floor level so that the foreman on the shop floor may observe loiterers. This balcony is reached from the repair shop by an ornamental stairway.

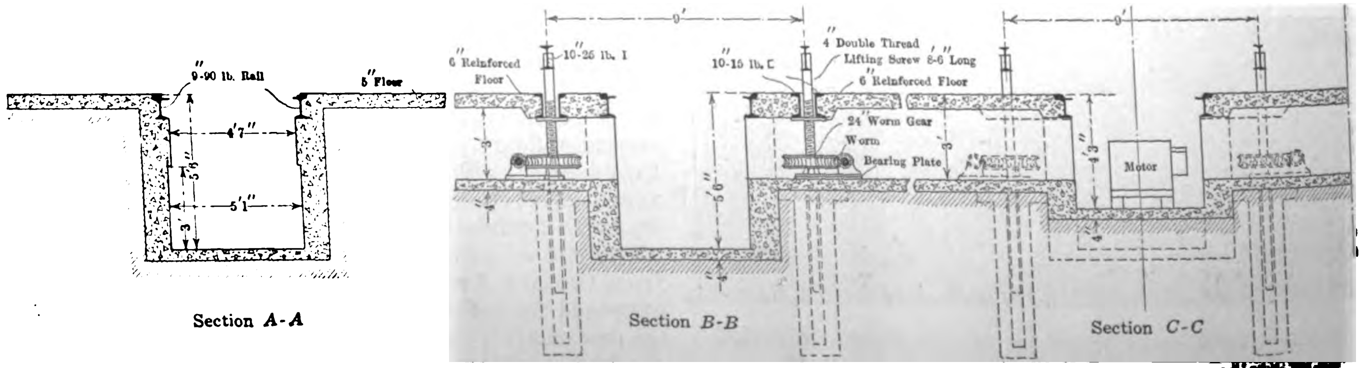
A basement below the storeroom floor is used to store such rough, heavy material as is drawn out of the storeroom at infrequent intervals. Both the basement and balcony are served by an electric freight elevator. All shelving and bins used in the storeroom are of the adjustable metal type, thus conforming to the fireproof construction of the building and giving the maximum storage space per square-foot area occupied by bins and shelving. A wide door opening to the east run-


Covered with Roofing
2" Thick
Brick
9 G. I. H. G.
2"x 8"Y.P.
Detail of Low South End
Covered with Roofing
9 G. I. H. G.
Concrete
Detail Showing Sawtooth Sash at Wall or North End of Bld'g
Roof Line
6'9½"
Detail of Steel for Fenestra Sawtooth Sash
Covered with Roofing
2" Thick
2'8"
5" Channel @ 11.25 lb.
6'-6"
3'6"
8" Col @ 31.6 lb.
2 L^s 2½ x 2 x 3/16
2 Bars 2¼ x 1¼
2 Bars 2¼ x 3/8
Top Chord 3½ x 3 x 5/16
2 L^s 2½ x 2 x 3/16
2 Bars 2¼ x 3/8
2 L^s 2½ x 2 x 3/16
2 Bars 2¼ x 3/8
8" Standard I Beam @ 18 lb.
2 L^s 2½ x 2 x 3/16
3½ x 3 x 5/16
9'2"
6'9"
6'9"
29'5"
8" Col @ 32 lb.
Electric Ry Journal

LOUISVILLE SHOPS—CONSTRUCTION DETAILS OF FRAMING AND COVERING AND SAWTOOTH ROOF


B
C
2'
18'
2'
12'
10" 25 lb. I
25'0"
22'9"
Pillow Block
Coupling
49'6"
B
C

Longitudinal Section Through Pit

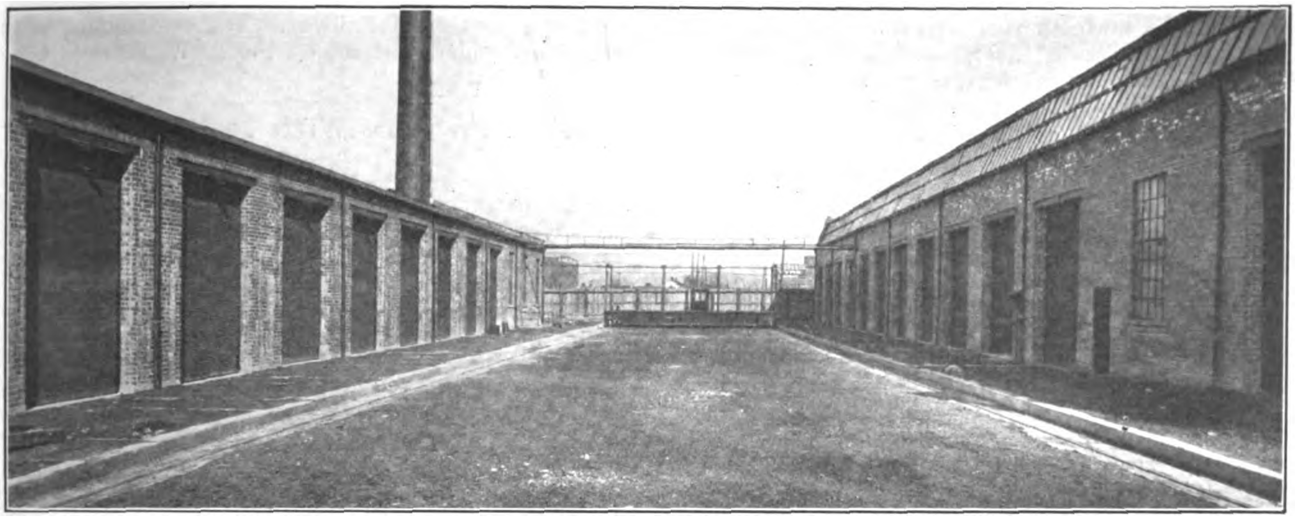

9-90 lb. Rail
5" Floor
4'7"
5'1"
3'6"
3'
9'
6" Reinforced Floor
10" 25 lb. I
10" 15 lb. C
4" Double Thread Lifting Screw 8'6" Long
6" Reinforced Floor
24" Worm Gear
Worm
Bearing Plate
Motor
3'
5'6"
9'

Section A-A

Section B-B

Section C-C

LOUISVILLE SHOPS—LONGITUDINAL AND CROSS-SECTIONS THROUGH PIT



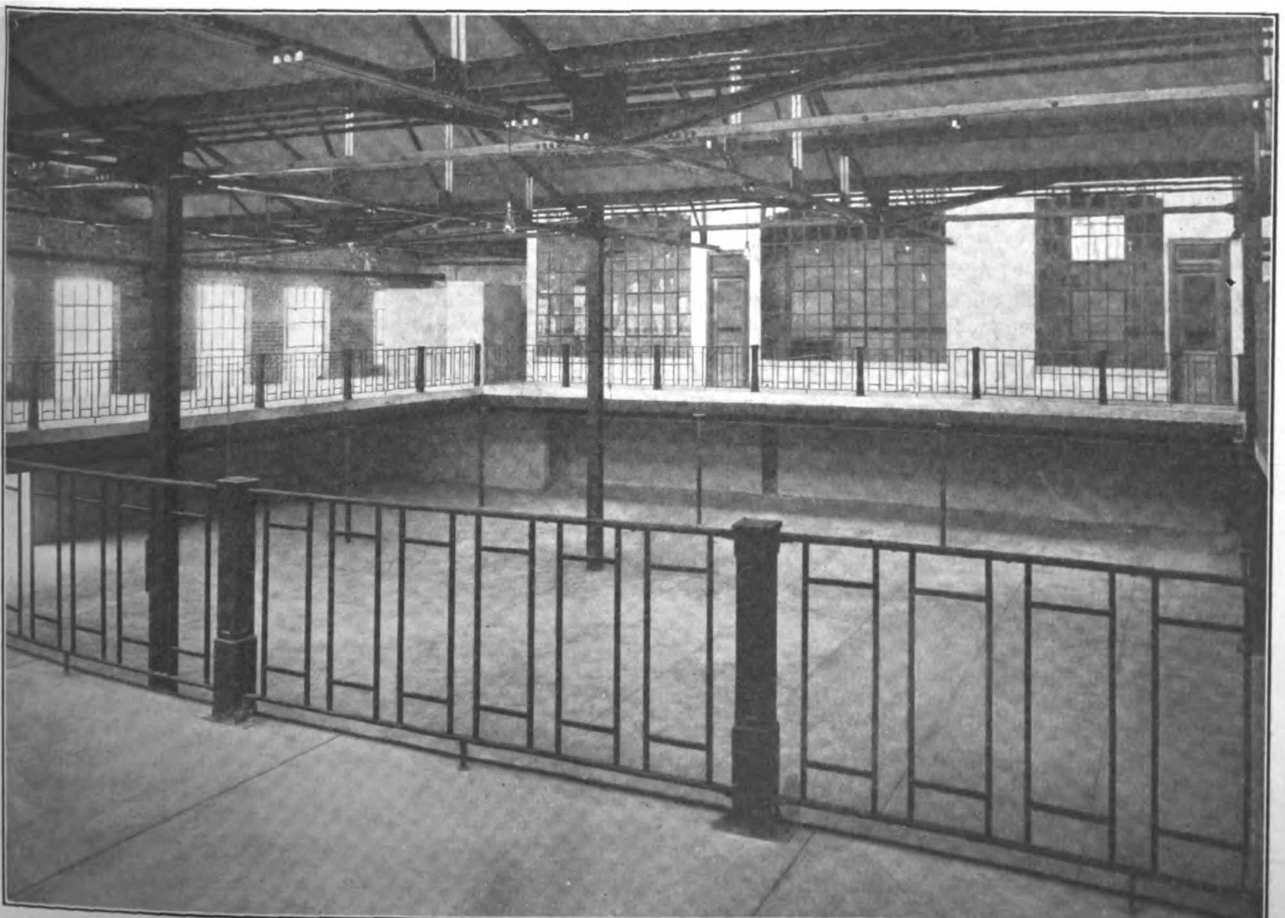
LOUISVILLE SHOPS—VIEW OF TRANSFER TABLE AND PIT

around track aisle leads to an unloading platform so that material may be handled direct from the car to the storeroom.

The use of a narrow-gage industrial railway in the repair shop of a railway is somewhat uncommon, but it is believed that this railway will aid materially in handling heavy repair parts from the pit areas either side of the floor to the several repair departments and the storeroom. This industrial railway extends along the ends of the repair and inspection pits, and serves as an auxiliary to the two bridge cranes. It is equipped with flush turntables at the intersections of the industrial railway and the through track immediately in front of the storeroom. Those machine tools used in work on the heavy repair parts were installed, of course, convenient to the industrial railway tracks.

Heating System

The heating plant in one corner of the carpenter shop has two Henry Vogt boilers of 150 hp. each and a 150-ft. self-supporting, unlined steel stack. Concrete coal bins, under one of the storage tracks beside the boiler room, were provided for heating-plant fuel storage. The space over the heating plant, which is in a depressed room below the shop-floor level and inclosed in brick walls, serves as a storeroom for miscellaneous material. All heating coils are of the built-up type, vacuum return, arranged on racks on the building walls and on the lower



LOUISVILLE SHOPS—VIEW OF STOREROOM AND OFFICE BEFORE USE, WITH FLOOR LEVEL ENTRANCE AT LEFT cords of the sawtooth roof trusses. Heat also is provided in the pits in the repair and carpenter shops, the pipe being set in recesses in the concrete walls or arranged on coil racks under the shop floor in the space adjoining each pit. In addition to the coils for general heating in the paint shop, four pipe coils have been installed in a shallow open duct along the center line of each track. These were included to expedite paint drying, and are arranged in sections with individual control.

ELECTRIC WIRING AND ILLUMINATION

For general shop illumination in the repair and carpenter shops, 550-volt, 385-watt, 300-cp single and double-tube Cooper-Hewitt mercury arc lamps were used and spaced at frequent intervals. These were supplemented by tungsten lamps on drop coils, where individual light was desired as well as in the bath rooms and offices. Paint shop illumination was supplied by tungsten lamps on drop cords. It was believed that direct lighting would be more satisfactory in this shop. All wiring to the general illumination fixtures is exposed and carried on porcelain insulators attached to the overhead steel work. In possibly hazardous places this wiring was run in metal conduit. Overhead trolley wire was provided over the pits in the machine shop, in the carpenter shop and paint shop. The usual rolling door clip with the trolley dead-ended each side of the building wall at the entrance was furnished. Inside the buildings the trolley wire was carried in wooden trolley trough bolted to the lower cords of the transverse building trusses.

TRANSFER TABLES

The grouping of the three shop buildings necessitated the use of transfer tables between them to facilitate progressive shop movements. In order to reduce the aisle width to a minimum and to eliminate the old style deep pits, a shallow floor type table was purchased from George P. Nichols & Brother. The flush type of table would have required the use of track aprons, consequently wider aisles between the pits and the face of the buildings. The use of aprons also was prohibited by the low car fenders. The apron was eliminated by dropping the pit level 9½ in. below the top of the shop track rails.

These two shallow floor transfer tables are 46 ft. long and were designed to carry a 35-ton loaded freight car. In order to accommodate steam-railroad equipment it was necessary to place a double running rail on one side of the table. The supporting girders are 11 ft. 3 in. center to center, giving a clear width of 9 ft. 6 in. The elimination of the aprons made it possible to place the stirrups carrying the table wheel bearings at the end of the girders and the first floor beam 6 ft. 1½ in. in from their ends. The diameter of the wheels and the location of the bearing allows 1¼-in. clearance between the shallow floor and the top of the pit rail. The table is self-propelled by a 15-hp motor supplied with energy from the 550-volt trolleys which parallel the pit.

These new shops represent an expenditure of approximately $250,000, which is quite low for the cubic foot building content of fireproof shop construction. They were designed by J. B. Hutchings and E. T. Hutchings, architects of Louisville, under the direction of T. H. Minary, assistant general manager, and John Zoll, master mechanic Louisville Railway. The construction work was done under contract by the L. W. Hancock Company, Louisville.

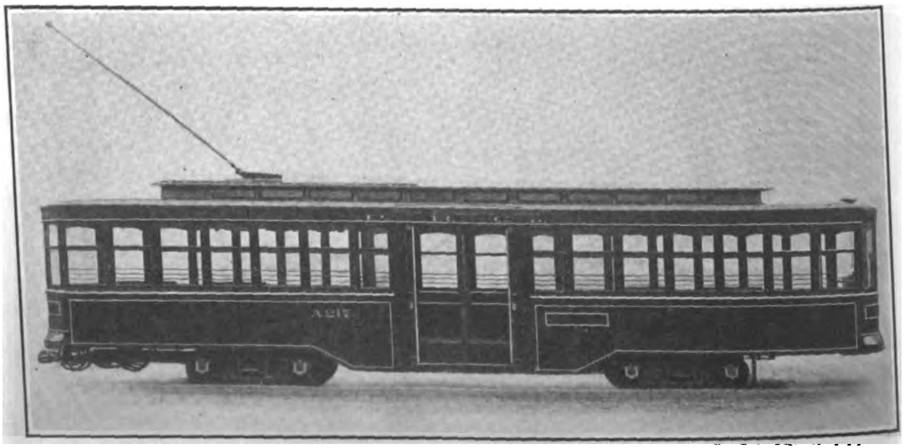
Interurban Cars With 26-In. Wheels for Pittsburgh

The Pittsburgh Railways Company, which originated the "low-floor" car with 24-in. wheels, is now planning the extension of the use of small wheels to its interurban service. Quotations have been asked for ten interurban cars with 26-in. wheels. Four 50-60-hp motors will be used, and to these will be applied the same principles of design that were so successful with the original 30-hp "baby" motor design. The new cars, of which a floor plan is shown in the accompanying line cut, are to be 52 ft. 8 in. long, and they are estimated to weigh complete 45,000 lb. A large part of the great reduction in weight is obtained through the use of the small wheels, motors and trucks.

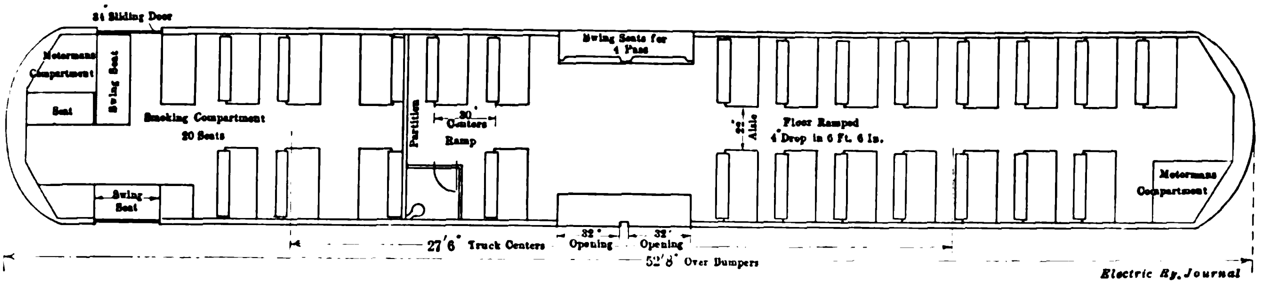
The decision to build cars with such a radical innovation as the small wheel for high speed was only made after extended tests had been carried on with a small-wheel car in interurban service. This test car, shown in the accompanying half-tone, was one of the original "low-floor" cars developed by P. N. Jones for city service in Pittsburgh. The wheels, however, were specially made to be suitable for interurban work, and the gearing was changed from the high ratio of 15:58, as regularly used, to a ratio of 23:50, so that the car could make the high speed required by the run.

A number of extended tests were made with this car upon the Charleroi and Washington lines out of Pittsburgh. In all cases the car was able to operate on a schedule easily equal to that of the standard interurban cars, making all stops and operating satisfactorily on all grades. In one case a test run was made down a grade of 1½ per cent, and 2 miles were covered in two minutes twenty-two seconds, a speed of 51 m.p.h. No nosing of the car was found to exist, and it is reported that the riding qualities of the car even at this high speed were equal to those of the heaviest interurbans. Following the experiments the test car was placed in regular interurban service between Cannonsburg and Washington, and it is still giving perfect satisfaction.

The cars now in service on the interurban lines of the Pittsburgh Railways weigh from 33 tons to 37 tons and are equipped with four 100-hp motors. The regular run on the Washington line is 30 miles and it is made in one hour and fifty minutes. The run to Charleroi is 34.6 miles long and this is made in two hours and fifteen minutes. The first 7 miles of both runs take thirty-three minutes, as this distance is run in city or



PITTSBURGH SMALL-WHEEL INTERURBAN CAR—TEST CAR WITH 24-IN. WHEELS THAT WAS OPERATED AT 50 M.P.H.



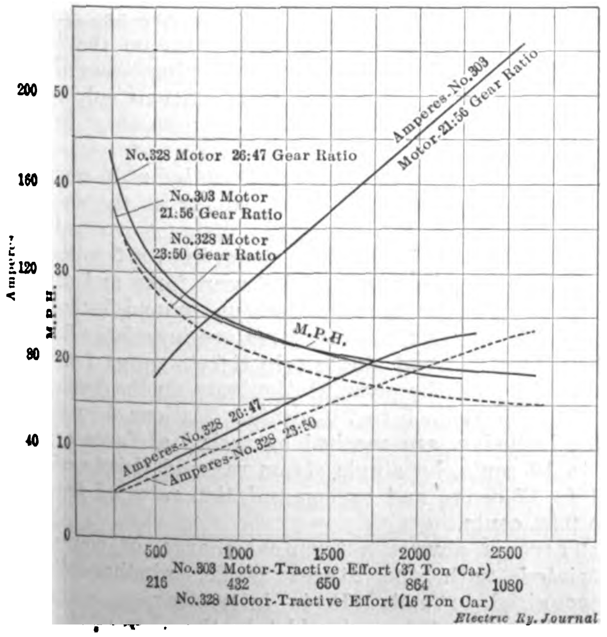
PITTSBURGH SMALL-WHEEL, INTERURBAN CAR—PROPOSED FLOOR PLAN

suburban streets, and much of the time is consumed in passing through some long narrow towns.

The result of the use of a light car with small wheels and motors is graphically shown in the accompanying diagram, which indicates the values of the current in amperes and the speed in miles per hour for various tractive efforts at the motors. The tractive efforts of the different motors used on the test car and on the regular interurban car are prorated in accordance with the weights of the two cars so that the speed and current consumption curves fall within the same range for the large motor and for the small one. As shown by the diagram, two gear ratios were tried for the small motor. One of these, namely 26:47, was not used in the actual tests, the gear ratio of 23:50 being considered to be more generally desirable.

The curves of current consumption show graphically the marked difference between the small and the large motors, most of this being due, of course, to the great decrease in weight. In addition, it was found that when starting the small car with all motors in series the draft of current was about one-fourth of what it was when starting the large car with motors in pairs, two in series. The worst grade on either one of the lines is 6 per cent, and on this the present interurban cars usually require about 500 amp. However, it was found that the small car took but 220 amp.

It will be noticed from the half-tone that the test car has very short truck centers, the trucks being only 21 ft. 6 in. apart. On the new cars, however, this dimension will be increased to 27 ft. 6 in. It was found during the tests that the short truck centers on the test car had no very great influence on the riding qualities of the car, but the increased length is undoubtedly safer. The wheels on the test car were 24 in. in diameter with a 7/8-in. flange and a 2 7/8-in. tread. On the new cars, however, the wheel diameter will be increased to 26 in. to accommodate the larger motors.



PITTSBURGH SMALL-WHEEL INTERURBAN CAR—SPEED AND POWER CONSUMPTION OF LARGE-WHEEL AND SMALL-WHEEL CARS

The Interest of the Banker in State Regulation*

Numerous functions of the Pennsylvania Public Service Commission are of interest to bankers, especially the functions in connection with rates, values and the financing of public utilities. The state and its municipalities grant rights, and the public is entitled to a supervision which will prevent improper use of such powers, and insure adequate service and reasonable charges therefor. On the other hand, the companies have their right to fair treatment so that they shall be able to give the service that is required of them, and also be assured the return to which those who have invested in their securities are entitled.

A great difficulty in arriving at this proper fairness in regulation is that the public service companies are not starting afresh, simultaneously with these new regulating bodies. It would seem simple enough for a commission to fix proper rates; and, in the case of a new company, satisfied that rates will be maintained sufficient to provide for a fair return from the outset, investors might be entirely willing to put their money into the enterprise. But regulation enters the field when public service corporations are in full swing. Their stocks and bonds have been issued and outstanding for years—sometimes too generously issued perhaps but generally in accordance with law as it existed prior to the limitations of to-day. Many of these enterprises were financed on bonds issued at a discount with a bonus of stock thrown in. On the one hand there are utility companies so floated asking commissions to fix rates to provide a return on the face value of all those securities; on the other, some commissions are disposed to restrict the rates to a bare return on the actual cost of the physical plant. Something fair between these extremes must be determined. Certainly the old method of financing was necessary to some extent. Within certain limits it was legal, and even if the speculative element which seemed essential to make the proposition attractive in the past is now cut out, the readjustment should not be done in such a way as to put necessary and efficient utilities into bankruptcy.

It has been feared that state regulation may tend to drive away enterprise and capital through the possible cutting out of any capital expenditures for the compensation of promoters, through not allowing for expenses or losses in the development of the business and through failure sufficiently to make provision for the cost of money, all of which are expenditures quite as necessary in the establishment and conduct of such a business as the purchase of poles, wires, pipes, tracks and ties. It cannot be expected that men will give their time, brains, abilities and efforts to promote an enterprise, procure the money for it and through preliminary years have no return or only a small return on the cash invested, without compensation. Such initial services are as proper a charge against capital as services in obtaining the charter. Such continued services are as much entitled to remuneration as those of the lawyer in preparing by-laws and certificates for full paid common stock, mortgages, merger agreements, or in applying for ultimate receiverships.

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*Abstract of address by Parker S. Williams, Philadelphia, Pa., at convention of Pennsylvania Bankers' Association, Bedford Springs, Pa., June 27, 1914.

A witness at a certain commission hearing, familiar for years with utilities and their financing, expressed his opinion in effect as follows:

"Government regulation involving the matter of the fixation of maximum return eliminates the speculative element of value. The immediate effect is to make it more difficult to raise money. With proper regulation companies can raise money more cheaply. A fair return is the return that will be necessary to attract money into the enterprise whenever it is needed and in the amounts needed, in order to take care of the development of the business, that being the lowest return possible. Regulation in the end, when the companies know how to deal with it and the commissions know how to deal with it, when both sides know what is required and what has got to be done, unquestionably is going to make it possible for the companies to raise money on a better basis. Speculative value is not necessary for the future. Regulation is preferable to speculative conditions, assuming that regulation is worked out and that it takes into account all the elements of value and all the questions that enter into the operation of the utilities."

It is to the interest of every banker to do all in his power to establish a fair basis of regulation. If it discloses a disease, regulation cannot be charged with causing it. If some over-capitalized corporations have to go through reorganizations, if some soundly established corporations have to suffer from temporary uncertainty if from nothing more, the outcome may be hoped to be generally beneficial. The banker cannot dodge his responsibilities to help make it so. We are not ready for state or municipal operation of many of our public utilities. Facts and experience as to the character of service and the cheapness of service by private operation compare too favorably with the results of management capable of being affected by politics.

In such legislation as that dealing with the regulation of public utilities, all good citizens, and in the van the bankers, must take a hand. Every proper effort should be made to make certain of retaining well qualified men as commissioners. The commission should be supported with respect such as is accorded to the bench. Whenever a matter of rate making or valuation affecting a utility in which bankers are interested directly, or only as they represent financial interests in a community they wish to see progress, let them make sure that every consideration which should have weight in the matter of fairness is presented to the commission.

Practically all of the principal jewelers in Louisville, Ky., are equipped to demagnetize the watches of the trainmen on the Louisville street railway and the various interurban railways which run into Louisville. One of the jewelers has distributed leather billfolds and controller handle pads to the trainmen to secure their business.

Suburban Fares at Boston

Although it is well known that, in general, electric railway fares are less than those charged by competing steam railroads in suburban districts, the extent of the differences in favor of the former in a given metropolitan area is sometimes very striking. In the recently published report of the Massachusetts Public Service Commission and Boston Transit Commission upon transit conditions at Boston, an appendix of much interest is devoted to a comparison of steam and street railway fares between Boston and sixty-eight stations in the suburban district lying from 3 to 12 miles away from the heart of the city. All of these stations are on the lines of the Bay State Street Railway, and many are reached by the cars of the Boston Elevated Railway Company. Either the Boston & Maine Railroad or the New York, New Haven & Hartford Railroad provides the steam service to and from these points.

Of the sixty-eight stations listed, street railway fares are lower than the single ticket steam railroad charge in sixty-four instances. Forty-three stations are accessible by trolley at a 5-cent fare from Boston, this rate applying to a maximum distance of 9 miles from the steam railroad terminal. Twenty-five stations are reached by trolley at a 10-cent fare. The maximum distance available on the steam systems for a straight 5-cent ticket is 4 miles. A detailed comparison with existing single ticket fares shows that the transient patron of the local transportation facilities will in general be carried from 150 to 200 per cent as far for a given expenditure on the trolley lines as for the same outlay in steam railroad fares. The commission report does not include any data bearing upon the single trip ticket charge, but the foregoing points have been brought out by independent analysis.

The bulk of the traffic in the Boston suburban district naturally moves upon the basis of commutation rates, and the commission's tabulation of these in comparison with the corresponding trolley fares affords interesting deductions. Considering the one-way commutation rate upon the twelve-ride ticket available at each of the sixty-eight stations listed in the report, one finds that the electric railway fares are lower in forty-two cases; that in no instance is the trip charge less than 5 cents on the steam road and in thirty-four cases it exceeds 5 cents. Fifty-one stations are accessible on the steam lines at commutation rates on the twelve-ride basis at single trip charges running between 5 and 10 cents, but of the entire list of stations only ten are accessible on single-ride tickets at less than 10 cents by steam.

The maximum distance reached by a 10-cent electric railway fare is 12 miles, so far as the suburban list goes, while the maximum distance reached by a straight 10-cent fare on the steam lines is 9 miles.

Examining the relations between fares and distance it is interesting to note that up to and including 5 miles, the electric railway fares are invariably 5 cents; the steam railroad single trip tickets range from 5 to 10 cents, and the commutation rate on the twelve-ride basis runs from 5 to 7½ cents. Stations 6 to 9 miles out, inclusive, are reached by trolley at fares of from 5 to 10 cents, by single steam railroad tickets of from 11 to 17 cents, and by commutation rates of from 7½ to 9.58 cents.

There is always a terminal charge, of course, associated with the steam traffic, whether directly recognized or not. It is interesting to note, also that if a 6-cent fare should take the place of the present 5-cent charges on the electric railway lines to and from these stations on the north and south sides of Boston listed in the report, in thirty-four cases the commutation rates would still be higher.

Welfare Work of the Public Service Corporation of New Jersey

The Public Service Corporation of New Jersey has just issued the third annual report of the welfare committee. The employees of the company are protected by four types of insurance: health, life, old age and accident. The first three kinds are embraced in the company's welfare plan, which was inaugurated Jan. 1, 1911, and which is distinctive in that the corporation assumes the entire cost. Accident insurance is provided under the state employers' liability act, which became effective July 4, 1911. The elective compensation feature, which the Public Service Corporation accepted, is operated in conjunction with its own welfare plan, thereby increasing the scope of the act.

Under these insurance plans the employees, their relatives or their dependents have received during the year 1913, through the welfare committee, $104,282.50, of which $56,424.76 was paid for disability due to illness and for death therefrom, and for superannuation. The remaining $47,857.74 was paid for injury and death from accidents arising out of and in the course of employment. During the last three years the employees, their relatives or their dependents have received $248,945.01, of which $157,548.33 was paid for insurance, sick benefits and pensions and the remainder for accidents arising under the workmen's compensation act and for death therefrom.

TABLE I.—Showing Details of Cases Handled

Year	Welfare Applications and Accident Reports Received	Cases Investigated: Number	Cases Investigated: Per Cent to Cases Received	Cases Payments Begun: Number	Cases Payments Begun: Per Cent to Cases Received	Cases Payments Begun: Per Cent to Cases Investigated	Calls Made Upon Employees
1913 ...	4608	3629	79	2208	48	61	6410
1912 ...	4235	3809	90	2076	49	55	*7161
1911 ...	....	....	..	1405	..	..	....

*Estimated upon records kept for nine months.

Upon the basis of the number of employees in service Dec. 31, 1913, the cost of the welfare plan and accidents for the year 1913, including operating expenses, averaged $9.17 per man, and for three years, $7.16. Thus, during the past three years, the employees of the Public Service Corporation have been provided with health insurance of $1 per day, life insurance of $300 and old-age pensions. Furthermore, they have been protected by accident insurance, giving, in general, half wages during disability and provision for dependence for a period of six years in case of death.

Table I shows the number of cases investigated and other details of handling cases for the last three years.

The Public Service Railway, with approximately one-half of the employees of the Public Service Corporation, expended in welfare work $42,662.26 during 1913. Of this $10,972.30 went for insurance, $20,632.08 for sick benefits, $7,571.24 for pensions and $3,486.64 for administrative expenses. The death rate shows a record of decreases during the last three years as follows: for 1911, 6.18 per thousand; for 1912, 5.96, and for 1913, 5.10. More than 60 per cent of the mortality resulted from four causes as follows: Pneumonia, 22 per cent; tuberculosis, 10 per cent; heart trouble, 15 per cent, and Bright's disease, 11 per cent. The rate of illness per hundred employees for 1911 was 10.46; for 1912, 10.31, and for 1913, 11.35. The accompanying diagram shows the occupational tendency toward disease among the various employees. The most common diseases are influenza, rheumatism and gout, acute and chronic bronchitis, and ordinary diseases of the stomach. Those most frequently affecting trainmen are influenza, rheumatism, bronchitis, quinsy, tonsilitis and diseases of the stomach. The welfare committee continued its policy of prevention during 1913 by issuing several bulletins upon hygiene, sanitation and the prevention of disease.

There were fifty-three pensions in force during the year among all the employees of the Public Service Corporation, and the average amount paid upon each was $278.12, the total cost being $14,740.12. The minimum pension rate is $240 per year. During 1913 the Public Service Railway paid 51.36 per cent of the cost of service annuities.

There were 3070 reports of accidents to employees received during the year, upon 878 of which, or about 28 per cent, some compensation was paid to the employee or a series of payments begun. The total cost of accidents, as shown by Table II, was $56,418.98 during 1913. This was an increase of $12,717.08 over the year 1912, made up as follows: Compensation paid to employees or their dependents, an increase of $8,015.27; medical service, etc., rendered to employees, together with funeral expenses and court costs, an increase of $3,061.12; other expenses, an increase of $1,640.69. Of the $32,457.48, the total compensation paid, $8,322.63 applied to thirty-three cases upon which payments continued from 1911 and 1912 into or through 1913. Of these thirty-three cases, seven were the outcome of fatal accidents requiring compensation for 300 weeks, and sixteen were cases of permanent injury resulting in payments for many weeks, the amounts involved during the year being $2,305.19 and $5,450.34, respectively.

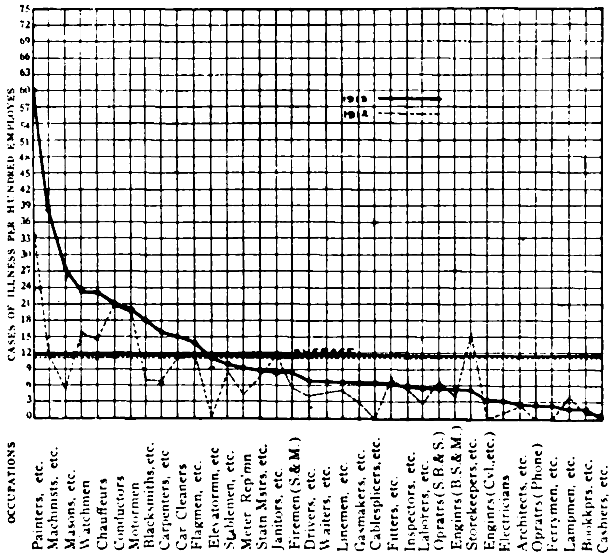


DIAGRAM SHOWING OCCUPATIONAL TENDENCY TOWARD DISEASE AMONG EMPLOYEES

TABLE II.—Total Cost of Accidents†

Company and Year	Total	Compensation on Account of Employees	Medical and Hospital Services, Funeral Expenses and Court Costs on Account of Employees	Other Expenses
All companies, 1913..	$56,418.98	$32,457.48	$15,400.26	$8,561.24
Electric company....	19,057.04	11,795.87	4,480.35	2,780.82
Gas company........	12,507.96	6,133.10	3,663.86	2,711.00
Railway company....	24,848.98	14,528.51	7,251.05	3,069.42
Corporation	5.00	.00	5.00	.00
All companies, 1912..	43,701.90	24,442.21	12,339.14	6,920.55
All companies, 1911..	*9,051.94	*5,211.22	*1,546.37	*2,294.35
Three years.........	109,172.82	62,110.91	29,285.77	17,776.14

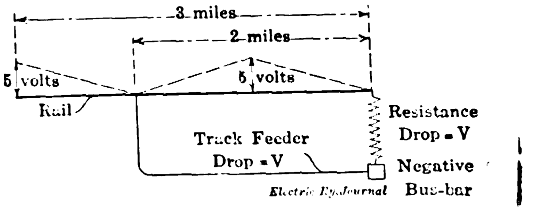
*Six months only in 1911.
†Includes payments begun this year and those carried over from former years.

It is interesting to note that of the $47,857.74 paid during 1913 for accidents, $37,300.22 was paid under compensation law requirements, while $10,557.52 was added under the corporation's welfare plan in accordance with its general policy of caring for its employees. This was 28.3 per cent beyond the legal requirement. Similar payments made during the last three years amounted to 18.59 per cent.

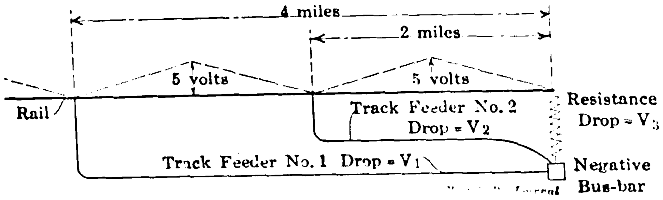
Rail Feeders for Tramways

In the *London Electrician* for July 17 Henry M. Sayers contributes an article based upon that of Messrs. Rosa and McCullom, printed in the ELECTRIC RAILWAY JOURNAL for Jan. 3, 1914, page 37. Mr. Sayers argued for a further consideration of boosted insulated return feeders and by a calculation showed that they may be cheaper in some cases than the "regulated" feeders advocated by Messrs. Rosa and McCullom. He stated that the booster plan lends itself readily to calculation and to the use of feeders of the most economical sizes, as determined by the application of Kelvin's law.

In applying this law to the regulated feeder Mr. Sayers showed that when a feeder is tapped into the rails at some point as indicated in the first figure and the rails at the station are connected to the negative busbar through resistance, the most economical size of feeder is that in which the interest charge on the cost of the cable equals the annual cost of energy lost in the feeder and in the resistance.



RETURN FEEDERS—SINGLE FEEDER ARRANGEMENT



RETURN FEEDERS—TWO-FEEDER LAYOUT

When two feeders are connected as shown in the second figure the cost of copper for any drop, V, is proportional to $[(I_1 \times l^2_1) + (I_2 \times l_2^2)] \div V$, where I_1 and I_2 are the currents in feeders 1 and 2 respectively, and l_1 and l_2 are the respective lengths of these feeders. The cost of wasted energy is proportional to $V\ (I_1 + I_2 + I_r)$, where I_r is the current in the resistance connection.

These two costs are equal for the minimum total cost. Hence

$$A\left(\frac{I_1 \times l_1^2 + I_2 \times l_2^2}{V}\right) = B\ (I_1 + I_2 \div I_r)\ V,$$

where A and B are numerical or "value" constants. From these equations,

$$V = \sqrt{\frac{A\ (I_1 \times l_1^2 + I_2 \times l_2^2)}{B\ (I_1 + I_2 + I_r)}},$$

the most economical voltage drop for this case. In applying the formula, values for cost of copper, annual charges and cost of electrical energy are assumed and the magnitudes of the currents are estimated from a diagram of the system.

In estimating the corresponding costs of boosted feeders, Mr. Sayers allows for the losses in the boosters and for the costs of the boosters which, he states, are very cheap machines. The boosted energy may cost per unit about 40 per cent more than unboosted energy. Even with these extra losses he finds that in an assumed case the booster plan may be cheaper than the regulated feeder plan if the boosted energy does not cost too much. The booster feeders also have certain operating advantages, namely: they can be made to automatically provide for voltage drop with increase of load and can be readily adjusted to meet the requirements of varying traffic conditions; they make unnecessary the use of more copper than considerations of economy dictate; they keep the line voltage drop down to the rail drop, i.e., not more than seven volts if the Board of Trade regulations be met. Mr. Sayers' general conclusion is that in every case where track feeders are necessary there is a choice of systems making it worth while to calculate closely the relative costs.

Minority Report on the Crosser Bill

The minority report on the Crosser Bill providing for municipal ownership of street railways in the District of Columbia was filed this week. It is signed by Representatives Winslow, Reed, Walton, Keister, Prouty, Caraway and Johnson.

Representatives Prouty and Caraway added a postscript to the report in which they declared themselves in favor of municipal ownership "where local conditions make it practicable." They consider, however, that in Washington "it is unfair to the inhabitants of the District of Columbia to have so large an indebtedness imposed upon them by the Federal government without their consent or expressed wish."

The report criticises both the principle and the details of the bill. In speaking of the latter, it says that while the bill provides for the purchase of the existing roads by condemnation, nothing is said in the bill about the way in which the value of the roads is to be obtained, an omission which clearly indicates general carelessness and complete lack of business acumen on the part of the framers of the bill. It also says that no data were presented to the committee as to the probable amount of the award. The District Commissioners are also criticised for their "blind enthusiasm in advocating the general principles of municipal ownership" as well as their "gross carelessness in studying the structure of the bill." The committee believes the House of Representatives is entitled to more efficient service.

Meeting of Public Service Association of Virginia

A meeting of the Public Service Association of Virginia, which is composed of the principal street railway, electric light, gas and water companies throughout the State, was held at the Chamberlin Hotel, Old Point, Va., on Aug. 4. Matters of interest to the association were discussed and the usual routine business disposed of. The officers elected for the ensuing year are as follows: President, J. W. Hancock, of the Roanoke Railway & Electric Company; first vice-president, J. F. Rison of the Danville Traction Company; second vice-president, B. B. Fergerson, of the Portsmouth Gas Company; third vice-president, J. N. Shannahan of the Newport News & Hampton Railway, Gas & Electric Company; secretary and treasurer, W. J. Kehl, of the Virginia Railway & Power Company.

The Congress of Costa Rica has provided for the construction of a tramway between Alajuela and San Ramon, Costa Rica.

COMMUNICATIONS

The Kansas City Franchise

KANSAS CITY, MO., July 30, 1914.

To the Editors:

There appeared in your issue of July 18 a communication signed by Delos F. Wilcox, containing several criticisms of the franchise, as adopted in Kansas City on July 7.

Mr. Wilcox was engaged to come to Kansas City during the campaign preceding the election by the local newspaper opposing the franchise. He wrote several lengthy communications attacking the agreement, and these established only one fact—that he did not understand the document. This is made evident by taking up in detail the eight objections set out in his communication to you. These are, in their order, as follows:

1. The recognized value is too large.
2. The forfeiture clause is a joke.
3. The extensions are inadequate.
4. The system of dual control is without precedent and inefficient.
5. The franchise violates the fundamental rules of law, accounting and morality, by making personal injury claims subordinate to the company's returns.
6. The franchise provides for the inflation of the capital account.
7. The franchise holds out the false promise of municipal ownership.
8. The city was not in a position to effect a favorable settlement.

Of these in detail:

1. In regard to the valuation. There were a number of valuations made of the property of the Metropolitan Street Railway System by different individuals. Mr. Wilcox was not included.

Bion J. Arnold valued the property for the Federal Court on the basis adopted in the valuation of the Chicago traction properties and found it to be approximately $35,026,000. Mr. Arnold also valued the property on a basis adopted by the Wisconsin Commission in the Antigo Water case and, allowing a 6 per cent return, found it to be on this premise, $35,044,000. He also made a thorough audit of the company's records, which were found to be unusually complete. This established the fact that there had been invested in this system the sum of $34,200,000 in cash, on which the average return had been slightly over 5 per cent.

L. R. Ash, then city engineer of Kansas City, Mo., valued the property for the city, and found it to be worth $32,000,000.

Mr. Moxey, a well-known government accountant, on behalf of the city, audited the books of the company and reported that the investment in the property was approximately $37,000,000.

The value written into the contract for the whole properties is $30,000,000. This is $2,000,000 less than the minimum value fixed by the city's own appraiser; $7,000,000 less than the maximum value fixed by the city's accountant, and $4,000,000 less than the minimum value found by Mr. Arnold on either of these premises. These are the findings of the only men who investigated the value of the property, and Mr. Wilcox must admit that he is in no position to criticise their findings, as he had never made even a casual inspection of the properties under discussion.

Mr. Wilcox states that the $30,000,000 valuation at 6 per cent is equivalent to a $36,000,000 valuation at 5 per cent, as allowed in Chicago. This is untrue, and certainly the statement would never be made in good faith by anyone familiar with the provisions of the Chicago and Kansas City ordinances. In Chicago, in addition to the 5 per cent return on the capital value, the company is allowed 5 per cent for financing and 10 per cent for contractor's profit, so that for every $100 added in property, $115 is added to the capital account of the company. In the new Kansas City franchise nothing is allowed as contractor's profit, nor is one penny allowed for the exchange of $28,700,000 of securities. In addition, in Chicago the company participates immediately to the extent of 45 per cent of the net earnings, after payment of fixed charges, whereas in Kansas City the participation is deferred for a period of seven or eight years, and then only to the extent of 33 1/3 per cent of the net. The company would have much preferred a contract similar to that granted in Chicago—that is, allowing it a higher valuation at a lesser fixed return and immediate participation, together with the 15 per cent allowance above noted. This proposal was rejected by the city, and a five-minute calculation will show that the basis of settlement embodied in the new ordinance is much more advantageous to the city than the Chicago settlement.

Further, the cost of a loan is very closely proportional to the equities covered by the mortgage, a point which Mr. Wilcox altogether overlooked. This company could most assuredly borrow $30,000,000 at a lower rate had a valuation of $36,000,000 been placed on the property, than it can borrow $30,000,000, but with the $30,000,000 valuation so fixed.

2. In regard to the forfeiture clause. The forfeiture clause contained in the ordinance is taken from an ordinance granted to the Kansas City Terminal Company in 1908-1909, which ordinance is referred to by Mr. Wilcox in his book on "Municipal Franchise" as a "most comprehensive and carefully drawn document." The forfeiture clause under criticism is a model. Its purpose and effect is not to forfeit or destroy property but to insure compliance with the contract. It provides that if the grantee violates the contract, then the city shall take possession and operate the property consistent with the contract and correct the delinquency. It is hardly likely that the city would make a profit during this time, so there is little danger of the company being retired on three-quarters salary. It should not be the purpose of a forfeiture clause to confiscate a property but to insure that the contract will be complied with at all times.

The only honest purpose that should be had in mind with respect to this character of clauses is not that the city should make money or acquire property by virtue or violation of contract, but that it should be in a position that it may, by virtue thereof, insure that the contract will at all times be complied with on the part of the grantee.

Notwithstanding the suggestion of Mr. Wilcox that this clause is a "joke," it is confidently expected that it will be accepted as a standard in contracts hereafter entered into in other cities.

3. In regard to extensions. The new contract contains the most liberal provisions covering extensions ever embodied in a street railway franchise. There are four conditions under which extensions can or will be built:

First—The company is obligated to build between 20 and 25 miles of track within three years, and thereafter not less than 4 miles of single track per year.

Second—All additional trackage, wherever situated within the city limits, which, in the opinion of the board of control, will pay 6 per cent on the investment in addition to operating expenses may be built.

Third—Any group of citizens may construct track within the city limits, and when this track is connected with the lines of the company, the company is required to operate thereover and the track becomes the property of the city.

Fourth—The city may, by the creation of benefit districts, build any number of miles of track, assessing the cost of same against the property within the district, and the company is obligated to operate cars over such tracks.

The Kansas City system is now largely over-built, as there are more miles of track per inhabitants than in any other American city, with one possible exception. The same franchise conditions which brought about this excessive mileage have been embodied in the new contract and the three further provisions above enumerated included, so that Mr. Wilcox, by stating that the extension clause is totally inadequate, is certainly unfair and writes without regard to the facts.

4. The system of dual control objected to may or may not be inefficient. It was felt that the largest part of the duties assigned to the board of control, which consists of one representative for the city and one for the company, were of a character upon which the representatives could agree, and that there would be no necessity for the continual expense of a third member. In matters which require arbitration, the selection of an arbitrator is not cumbersome. It is provided that the Kansas City Court of Appeals, consisting of judges who reside in this community, ride on the street cars and are members of the every-day social, business and political life of the city, shall name the third member. The Kansas City Court of Appeals was decided upon for these reasons.

As to the other objections raised in this paragraph by Mr. Wilcox, a mere reading of the ordinance will disprove any claims set up by him.

5. That the franchise violates the principles of accounting with respect to the provisions of personal injury claims. This is a very curious error, to say the least, in which Mr. Wilcox has fallen and further illustrates how casually he has read the ordinance. Personal injury claims are not subordinated to the return of the company on capital account. Under "disposition of earnings" it is provided first, that there shall be paid all expenses of management and operation, and we do not need Mr. Wilcox to tell us that personal injury claims are one item of the expense of operation, as this is self-evident.

What is provided is, that all the old personal injury claims which have not been litigated and which occurred prior to June 3, 1911, are to be paid as a special operating expense. The wording of the contract is as follows: "All liabilities for personal injuries and damages to property including claims due the city *up to the time of the adoption of this contract*." In other words, all the old claims, which under no rule of accounting could be considered operating expenses of the new company, are to be paid as a special operating expense, and the company does not participate in the surplus earnings until these claims are discharged.

6. That the capital value can be inflated. The provisions as to the addition to capital are taken verbatim from the Chicago ordinance and provide that before one dollar can be added to capital account this expenditure must be authorized by the board of control; the expenditure supervised by the board of control, and the board of control in writing to certify to the city comptroller by the twentieth of each month the amount so authorized and expended during the preceding month. In addition, it is provided that an audit shall be made by independent accountants, other than those of the board or of the company, every six months, with respect to all disbursements of the company. Under such conditions how capital value can be inflated is beyond comprehension.

The difference between the present or depreciated value of the property and the value written into the contract is to be made good by extensions and additions out of the earnings and not added to capital account. The 21 per cent which Mr. Wilcox discusses, of course, never will exist in physical property but will exist in the nature of a depreciation reserve or fund, which is a possession of the property, so that when the intangible value is made good out of the earnings of the company, as provided in the contract, the depreciated value of the property, together with the renewal fund and the additions and extensions made out of earnings, but not added to capital account, will equal $30,000,000.

It is further provided in the contract that the amount of outstanding stock and bonds shall never exceed the capital value of the property. Furthermore, the issuance of all securities, bonds, stock or any other form of securities, must be approved under the laws of this state by the Public Service Commission.

Considering all the above, how is it possible to inject one dollar of water into the capitalization of this company under the proposed contract?

7. That municipal ownership is a false promise. The company agrees in the contract to sell out to the city at any time, on sixty days' notice, at an agreed value. The company is limited to a 6 per cent return, and under such conditions how it would be possible to reduce fares at the expense of the company is inconceivable. After a certain period the city participates in the earnings, and the city may use its participation for the reduction of fares, if it sees fit, or for two or three purposes enumerated in the contract.

The meat of the objection made by Mr. Wilcox is that the company has given to the city a right to buy the plant, but it has not furnished the city the money with which to effect the purchase.

8. The city was in a most advantageous position to effect a settlement. The company has been in a receivership for three years, and Judge Hook stated that the receivership could not, in justice, be longer continued. The company has outstanding $28,700,000 of funded obligations, in addition to approximately $6,000,000 of stock. Of the funded obligations $22,000,000 are past due, and the creditors long since petitioned for a foreclosure under their respective mortgages, and testimony has been taken in regard to such foreclosures.

The company in the new contract has agreed to a valuation of $30,000,000. Since the funded obligations aggregate $28,700,000, out of $1,300,000, therefore, the company must meet the expenses of three years of receivership and the attendant foreclosures, refinance the above amount of obligations and provide some sort of an equity for almost $6,000,000 of stock. Mr. Wilcox may be able to figure out the "velvet" in this sort of a proposition, but neither the owners nor the managers of the property have yet been able to do so.

The new Kansas City franchise, as fixed, is the result of negotiations extending over a two-year period. The city was represented by a large staff of eminent council, among whom was United States Senator James A. Reed. The company was likewise well represented. During the negotiations both parties submitted the contract provisions to prominent street railway experts and financiers, and solicited suggestions. The draft of the ordinance, as it now stands, was open to suggestions for more than eight months. Hundreds of individuals have been listened to by the various committees formulating the document in the two-year interval, and in view of this fact it seems somewhat presumptuous on the part of Mr. Wilcox, after a three or four-day review, to say that the contract "has not been carefully worked out in detail" and contains "lapses from sound judgment and just bargaining," "it is vague and apparently inconsistent" and a "theoretical hodge-podge."

As to the guarantee of the company's return, the contract very clearly states "if and when earned," and if it is a crime in this country for a street railway company, after providing "best first-class modern service" to be entitled to a 6 per cent return "if and when earned," then the Kansas City document perhaps is open to criticism.

During the campaign which preceded the adoption of the contract, one of the greatest sources of annoyance to the company, which was trying by every legitimate way to educate the populace to the provisions of this ordinance, was the misleading and half-baked information put out by the newspaper opposing this contract under the guise of interviews with so-called prominent street railway experts. We were troubled with the usual corps of "soldiers of fortune." There were several stories from the ex-reverend Bigelow of Cincinnati. Mr. Barcroft, the gentleman who obtained notoriety in his appraisal for the "committee of fifty" in the city of Detroit some years ago, contributed; Peter Witt entered the "going"; another gentleman, N. D. Cochrane, editor of a Toledo newspaper, qualified as an expert and advised the citizens of this community how to settle the matter; and last but by no means least, Mr. Wilcox appeared on the scene in the closing week and wrote a series of letters which certainly, even in the eyes of Mr. Wilcox's friends, did him little credit, as they proved only one thing, as did the communication of Mr. Wilcox referred to in this letter, that Mr. Wilcox had very hastily read the new contract and certainly did not understand even the essentials upon which it is based.

I trust that you may find a way to publish this letter in full in an early issue of your paper, in order that a wrong impression of the new contract may not prevail, and especially the idea that any advantages or "jokers" are contained in the proposed contract, because of the possible injurious effect on other cities which are seeking franchises.

PHILIP J. KEALY, Engineer for the Receivers.

Boosters and Regulated Feeders in Electrolysis Mitigation

DEPARTMENT OF COMMERCE, BUREAU OF STANDARDS
WASHINGTON, D. C., Aug. 4, 1914.

To the Editors:

In an article in the London *Electrician* for July 17, page 607, Henry M. Sayers* gives a comparison of the results obtained with boosters and with insulated negative feeders, as described in the article in the ELECTRIC RAILWAY JOURNAL of Jan. 3, 1914, page 39. The author remarks that this article does not explicitly state that the negative busbar is insulated. It was taken to be perfectly obvious that the use of insulated negative feeders, which are all connected to the track at one end and to the busbar at the other, requires that the busbar be not grounded directly. Indeed, in a second article (ELECTRIC RAILWAY JOURNAL, Jan. 17, 1914, page 116) the fact that in some of the tests the busbar was grounded, in order to permit a comparison of results obtained with grounded and ungrounded buses, was expressly stated. The resistance taps which are placed between the rail and the busbar for the purpose of maintaining the necessary difference of potential between them would, of course, be ineffective if the busbar were grounded directly. Mr. Sayers assumed that the use of a potential drop of 1 volt per thousand feet on the average for twenty-four hours was advocated. This, however, is a mistake. Such a figure was taken merely for illustration, as the first article discussed principles and not numerical details. In the second article the statement was made that 1 volt per 1000 ft. at peak load had been used as the basis of calculation, which would be, perhaps, 0.4 volt per 1000 ft. reduced to a twenty-four-hour average. A uniform drop is not advocated in all cases, however, as conditions are so different that what is a sufficiently small drop at one place may not be such in another.

Mr. Sayers assumes in his calculation that the drop in potential is equal on all the feeders. This is an ideal condition which we have never yet attempted to reach in practice. For the sake of economy we have always allowed some slope of potential on the tracks toward the substation in order to utilize the conductance of the track as much as possible, keeping below the permissible potential gradient. There has been, therefore, a smaller drop of potential in the short feeders and the resistance taps closest to the station than in the longer feeders.

In reference to the advantage of negative boosters over insulated feeders with resistances, in that the boosters provide automatic voltage regulation due to their series winding, the author seems to have overlooked the fact that the resistances give the same regulation since the drop across them is proportional to the load on the feeder with which they are connected. By selecting a resistance material with the proper temperature coefficient the action of a compound-wound generator can be approximated, the only difference being that there will be a slight lag in the regulation of the resistance due to the time required for changes in temperature. Provision can be made for hand adjustment of the voltage drop as easily as in the case of the generator. Such adjustments will not usually be necessary, except in the case of a permanent change in the relative traffic distribution or of a large increase in the station load.

As to the possibility of designing feeders with reference to maximum economy, it has always been our custom to design the negative feeder system in such a way as to make the cost of energy lost in feeders and resistances approximately equal the annual charge on the entire negative feeder system, and to make the sum of the two charges as low as the limit of over-all potentials and gradients will permit. We also carefully estimate the cost of producing the same results by other methods including the use of boosters.

In our calculations of the relative cost of using boosters and insulated feeders without boosters, we have never found a case where the saving in power by the use of boosters was sufficient to justify the extra investment, the space occupied by the machines and the care of the machines. As we have pointed out, inverted boosters might be used to advantage in some cases for recovering some of the energy otherwise expended in the short feeders and resistance taps, but although inverted booster are possibilities and in some cases their use may prove advantageous, we have not as yet found a case where we could recommend their installation. There must be cases, however, where ordinary boosters, and other cases where inverted boosters, would be entirely practicable.

As to Mr. Sayers' remark that using boosters obviates the necessity of raising the voltage on the main generators, this is something that we have not overlooked but we consider it better to get the extra voltage needed by means of the main generators rather than by the boosters, inasmuch as the former are more efficient and it is simpler to produce the needed voltage in this way.

We thoroughly agree with Mr. Sayers' concluding re-

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*An abstract of Mr. Sayers' article is published on page 254 of this issue.

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mark that in every case it is worth while to calculate the expense of installation and operation by different methods before proceeding with the work. It is not our intention to advocate any particular system of electrolysis mitigation, but to use and recommend the methods that give the best results for each particular case.

E. B. ROSA, Chief Physicist.

Control for Highway Crossing Signals

NACHOD SIGNAL COMPANY
NEW YORK, Aug. 3, 1914.

To the Editors:

Your interesting editorial on highway crossing signals in the issue of July 11 does not, to my mind, convey the fact that the ideal control given by the continuous track circuit is attained by intermittent contact devices only when the control is car-counting and directional at the same time. For a single track crossing having three contactor locations this combination is rather difficult, but has been worked out.

CARL P. NACHOD.

Maintenance Costs of Car Equipment

L. B. STILLWELL, CONSULTING ENGINEER,
NEW YORK, Aug. 6, 1914.

To the Editors:

The editorial in your issue of July 25, in reference to the comparative maintenance costs of car equipment on the New York, Westchester & Boston Railway and the Hudson & Manhattan Railroad, has been read with interest, as it calls attention to the operating results which can be attained with either a. c. or d. c. equipment when the three essential elements of apparatus, facilities and organization are selected, developed and associated in a harmonious manner, to meet the specific conditions of operation of a transportation system.

It is obvious that if the motive power apparatus is inadequate or of faulty design; if the shop facilities are insufficient or unadapted to the purpose, or if the personnel of the shop organization is untrained or incapable of developing full efficiency due to specific causes, the results will be reflected in the cost of operation and in the reliability of service.

Every item of car equipment on the Westchester and on the Hudson & Manhattan cars was selected or developed to meet its special duty, every feature of shop construction and equipment was selected and arranged to best promote its usefulness. That the organization, in both cases, is in efficient hands is obvious from the results secured.

It would seem that the results attained in the operation of both of these roads are such as should go far to convince even the most skeptical that both d. c. and a. c. motive power apparatus is now developed to a point where the cost of inspecting and maintaining the rolling stock and its equipment is a comparatively small factor in making up the aggregate costs of operation. Moreover, the development of both types of apparatus is progressing steadily, through the co-operation of various manufacturers, operating men and engineers, and further, although minor, economies in operating costs and gain in reliability of operation will result. Of the contrasted systems, the a. c. is the newer, and it is to be expected, therefore, that additional equipment for the Westchester road will show still further improvement in operating characteristics, and as the overhead charges now carried by thirty cars will not be materially increased, the cost of maintenance per car mile with the Westchester a. c. equipment, on the basis of 100 cars, should be well under 2 cents.

In comparing the two systems it should be noted that the ratio of horse-power of motors per ton of rolling stock is much greater in the case of the Hudson & Manhattan than in that of the Westchester. In other words, the a. c. equipment of the latter performs much heavier duty than does the d. c. equipment of the former.

The excellent results attained in both cases are due in no small measure to the intelligence and vigilant skill of the respective operating organizations.

L. B. STILLWELL,
By F. M. BRINCKERHOFF.

Production of Steel Ingots and Castings

The bureau of the American Iron & Steel Institute has issued Statistical Bulletin No. 5, which contains figures relative to the production of all kinds of steel ingots and castings in the United States, which in 1913 amounted to 31,300,874 tons, against 31,251,303 tons in 1912. While the production in 1913 was the largest in the country's history, it was only 49,571 tons greater than the output in 1912. Of the total production in 1913, 30,280,130 tons were ingots and 1,020,744 tons were castings, against 30,284,682 tons of ingots and 966,621 tons of castings in 1912.

In 1913 there were 304 works in thirty states, the District of Columbia and the Canal Zone, Panama, which made steel ingots or castings, as compared with 306 works in thirty-one states, the District of Columbia and the Canal Zone, Panama, in 1912.

The following table gives the production of all kinds of steel ingots and castings by processes since 1904, in gross tons.

Years—Ingots and castings —Gross tons	Bessemer	Open-hearth	Crucible	Electric and all other	Total ingots and castings
1904	7,859,140	5,908,166	83,391	9,190	13,859,887
1905	10,941,375	8,971,376	102,233	8,963	20,023,947
1906	12,275,830	10,980,413	127,513	14,380	23,398,136
1907	11,667,549	11,549,736	131,234	14,075	23,362,594
1908	6,116,755	7,836,729	63,631	6,132	14,023,247
1909	9,330,783	14,493,936	107,355	22,947	23,955,021
1910	9,412,772	16,504,509	122,303	55,335	26,094,919
1911	7,947,854	15,598,650	97,653	31,949	23,676,106
1912	10,327,901	20,780,723	121,517	21,162	31,251,303
1913	9,545,706	21,599,931	121,226	34,011	31,300,874

Bulletin No. 6 shows that the production of iron and steel plates and sheets in 1913, excluding nail plate and skelp, but including black plates, or sheets, for tinning, amounted to 5,751,037 tons, against 5,875,080 tons in 1912, a decrease of 124,043 tons, or more than 2.1 per cent.

Joint Committee on Stresses in Railroad Tracks

The American Railway Engineering Association and the American Society of Civil Engineers have appointed a joint committee of about eighteen members, including a number of very prominent railway officials, to investigate the problem of stresses in rails, ties and ballast. A large sum of money has been set apart for the initial tests. Professor A. N. Talbot, of the University of Illinois, is chairman of the committee, and the testing work will be done in the laboratory of applied mechanics in that institution. Professor H. F. Moore is acting as engineer of tests and Professor H. R. Thomas will assist as a testing expert. Preliminary designs have been prepared and the trying out of special apparatus for testing is now in progress in the laboratory at Urbana.

Professor Talbot states that it is planned first to make tests of the track under static load and that, as soon as the proper instruments can be developed, tests will be made with locomotives at various speeds. The joint committee plans to hold a meeting in the near future and definite plans of testing will then be outlined.

American Association News

Below Are Given a Preliminary Announcement of the Program of the Atlantic City Convention—Brief Minutes of Standards Committee Meeting—Notes on Committee Activities—Additional Details Regarding the Award of the Brady Medal

PROGRAM OF AMERICAN ASSOCIATION

Secretary Burritt, of the American Electric Railway Association, has just made public a list of the topics which will be considered at the meeting in Atlantic City next October. These topics, with a short explanation of each as prepared by Mr. Burritt, follow:

1. Mooted Principles in Valuation. The importance of valuation of the property of electric railway utilities is growing, and there appears to be an attempt on the part of at least one of the national engineering societies to formulate definite economic principles to serve as a guide for engineers in the valuation of such properties. An extended discussion of the various theories, so far developed for the purpose of measuring the value of public utility properties, should prove desirable.

2. The Organization and Functions of a Valuation Staff. This discussion will deal with the organization and functions of a staff for the valuation of the property of a public utility, and will indicate the relations that should properly exist between the legal, engineering and accounting departments.

3. Electric Securities from the Standpoint of the Corporation. At the last two annual conventions there have been presented papers on electric railway securities. Mr. Harris' paper at the last convention on "Electric Railway Securities from the Investor's Viewpoint," treated the subject almost exclusively from the standpoint of the investor. There are many other things related to electric railway securities that have not been covered by the papers heretofore presented which it is important for the public, the investors and the corporations to know.

4. The Milwaukee Zone System in Practice. There has recently been installed in operation a zone system of fares outside the single-fare limits in Milwaukee, and the other communities served by the lines of the Milwaukee Electric Railway & Light Company and Milwaukee Light, Heat & Traction Company, which has for its basis a fare unit of 2 cents, associated with a distance unit of 1 mile. The operation of this system of fares is being watched by a number of electric railway people with interest.

5. Aspects of Workmen's Compensation Acts. The increase in the number of States providing for a definite compensation for workingmen injured while engaged in their employment makes this subject of more than passing interest to the employers of labor. Experience in the operation of such laws in this country and abroad may indicate directions in which modifications are desirable, and in which legislation of this nature should properly tend.

The secretary also says that the committee on public relations will present a "Platform of Principles," and that the committee on the joint use of poles will present a form of agreement and specifications.

CONVENTION RAILROAD RATES

The several passenger associations have announced their respective provisions in regard to rates to and from Atlantic City, as follows:

Trunk Line Association (New York, New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, northern part of Virginia and West Virginia); two cents a mile with minimum of $1 for a round trip, going and returning by same route only; tickets to be sold and good going Oct. 10 to 12 and returning to starting point by Oct. 20.

Central Passenger Association (West of Buffalo, Pittsburgh, Wheeling, Parkersburgh and Huntington, W. Va., to and including Chicago, St. Louis, north of the Ohio River, including Cincinnati, Louisville, and Cairo, Ill.); two cents per mile, same date limits as above.

New England Passenger Association (East of New York Central & Hudson River Railroad and a line drawn from Albany north through the Hudson River and Lake Champlain, but not including Rouse's Point, N. Y.); two cents per mile, going and returning by same route only and over which one-way tickets are regularly sold. Reductions apply only from principal stations where tariffs are on file and through tickets are in stock. Forty-eight hours notice will be required at other stations. Date limits same as above and reductions will not apply on Bangor & Aroostook Railroad.

Transcontinental Passenger Association (Pacific Coast and other Western territory not otherwise covered); no special rates have been made but the regular excursion tickets can be secured at a rate of fare of about two cents per mile.

NEW MEMBERS, A. E. R. A.

The Kansas City, Kaw Valley & Western Railway Company, Bonner Springs, Kas., has enrolled as a company member. During the past month fifteen individuals also have joined the association.

MEETING OF THE STANDARDS COMMITTEE.

A meeting of the standards committee of the American Electric Railway Engineering Association was held in New York August 6 and 7. The meeting was an exceptionally important one owing to the fact that it was the last to be held before the convention of the association in October, and a large number of recommendations from the various standing committees were taken under consideration.

At the meeting were present: H. H. Adams, superintendent shops and equipment, Chicago Surface Lines, chairman; Martin Schreiber, engineer, maintenance of way, Public Service Railway of New Jersey, vice-chairman; F. R. Phillips, superintendent equipment, Pittsburgh Railways; G. W. Palmer, Jr., electrical engineer, Bay State Street Railway; E. R. Hill, consulting engineer, Pennsylvania Railroad; W. H. Roberts, superintendent motive power, Northern Ohio Traction & Light Company; F. B. H. Paine, consulting engineer, New York, and E. B. Katté, chief engineer electric traction, New York Central Railroad.

R. C. Cram, assistant engineer of way and structures, Brooklyn Rapid Transit Company, was also present as the representative of the committee on way matters, in place of C. S. Kimball of the Washington Railway & Electric Company. E. B. Burritt, secretary American Electric Railway Association, also attended the meeting, and J. H. Hanna, chief engineer Capital Traction Company, president of the American Electric Railway

Engineering Association, and B. F. Wood, chief engineer United Gas & Electric Corporation, New York, were present on Friday.

During the two-day session there were considered nine recommendations of the committee on equipment, eight recommendations of the power distribution committee, five recommendations of the committee on way matters, and one of the committee on heavy electric traction.

ANTHONY N. BRADY MEDAL COMMITTEE APPOINTED

The committee on award of the Anthony N. Brady medal has been appointed. The conditions under which this medal is to be presented to the electric railway company making the best record for safety and safety appliances were published on page 1037 of the issue of this paper for May 9. The medal has been given by the family of the late Anthony N. Brady and will be awarded by the American Museum of Safety, New York, upon the recommendation of a committee appointed by the American Electric Railway Association.

The committee on award now appointed consists of: B. J. Arnold, chairman, Board of Supervising Engineers, Chicago, Ill.; James H. McGraw, president, ELECTRIC RAILWAY JOURNAL, New York; Will J. French, commissioner, Industrial Accident Commission, San Francisco, Cal.; Prof. Geo. F. Swain, chairman, Transit Commission, Boston, Mass.; Frank J. Sprague, consulting engineer, New York.

Under the conditions of competition the railway companies who desire to compete for the medal must file a report showing the extent to which they have conserved the safety and health of the public and their employees during the twelve months ending June 30, 1914. These reports are to be on a special form, supplied by the American Museum of Safety, New York, and drawn up by a committee of the American Electric Railway Association composed of Arthur W. Brady, C. S. Sergeant and Frank Hedley. Blanks of this kind were mailed to all operating electric railway companies under date of June 15, and the returns must be filed by Aug. 31, 1914.

The American Museum of Safety reports that it has already received communications from a number of the principal electric railway companies indicating great interest in the competition. It has also complied with a number of requests for additional copies of the forms where these have been desired, presumably to enable a large company to send copies to the heads of the different departments so that the data could more easily be compiled. As yet few returns have been received, and the Museum wishes to call attention to the fact that all reports of this kind must be received by the end of this month.

MANUFACTURERS' ASSOCIATION.

The American Electric Railway Manufacturers' Association has sent out a circular letter inviting advance registration for hotel accommodations for the convention of the American Electric Railway Association, which is to be held in San Francisco from Oct. 4 to 8, 1915. While the hotel rates are not given, the statement is made that the committee of the association and the local committee in San Francisco have done everything possible to secure the best rates and arrange for location of rooms, all of which will be guaranteed. Reservations are to be made in the Palace, the San Francisco or the Fairmont Hotel. No definite assignments are to be made now, but applicants who return the forms properly filled in before Aug. 20 will be assured of accommodations.

During the past week six new members have been secured for the association, as follows: the Standard Corporation, Philadelphia, Pa.; the Imperial Car Cleaner Company, Newark, N. J.; the Wyoming Shovel Works, Wyoming, Pa.; the Blake Car-Step Company, Charlotte, N. C.; the Johnson Fare Box Company, Chicago, Ill., and the Morgan Crucible Company, Ltd., New York, N. Y. Secretary McConnaughy is literally bombarding the members with circular letters dealing with details of the exhibits and entertainments planned. He calls attention to the closing of the Hotel Traymore, which is now being remodeled, and suggests that those who have been in the habit of going there can secure similar accommodations at the Strand Hotel, where a chair station will be located for the convenience of the attendants at the convention. Other letters explain the arrangements for furnishing flowers, plants, etc., and oriental rugs.

Results of Public Utility Regulation in California

The question "Does regulation hurt business?" was discussed by John M. Eshleman, president of the California State Railroad Commission, before the Chamber of Commerce of San Francisco on July 31. Figures were quoted to show that there had been a greater development of public utility enterprises since the commission had received jurisdiction over stock and bond issues (March 23, 1912) than during any other period of equal length in the history of the State.

Up to June 30, 1914, the commission has authorized the issue of $284,000,000 in securities, Mr. Eshleman said, and had denied or dismissed applications for $32,000,000, and is now considering applications for issues totaling $82,000,000. For the steam railroads of the State in that period there has been authorized $126,000,000 of securities; for electric railways, $41,000,000; for gas and electric companies, $80,000,000. A total of more than 700 miles of railway has been undertaken and carried forward under the regulation of the California commission. This is only a part of the actual development, he said, as the sums for new equipment will approximate $15,000,000. Gas and electric companies are spending $80,000,000 for projects under regulation.

Mr. Eshleman said that the California commission had adopted the principle of protecting a public utility in its field of operation so long as that utility properly performed its duties to the public. Nearly all the men in control of public utilities regard regulation as helpful, he pointed out, as an aid in financing new utility projects or the extension of those already established.

On the other hand, rates shown to be discriminatory or unjust have been adjusted to the great benefit of the patrons. Instances cited were cheaper freight rates and reduced long distance telephone tolls. The former in some cases were so abnormal as to contribute a positive barrier to business enterprise. Wells, Fargo & Company, for instance, had been reaping annually in California a profit of 136 per cent in the express business. Mr. Eshleman said that if it was hurting business to reduce that profit to a 10 per cent rate, then this was a business that ought to be hurt.

A public utility is monopolistic in its nature as it deals directly with the individual. Alone, the individual is powerless. Simple justice requires that the State provide a tribunal to control the relations between the public utility and the individual patrons. It was pointed out that jurisdiction over public utilities should embrace the regulation of rates, service and finances, and that the question is no longer "Does regulation hurt business?" but has now become "shall it be regulation or shall it be public ownership?"

Equipment and Its Maintenance

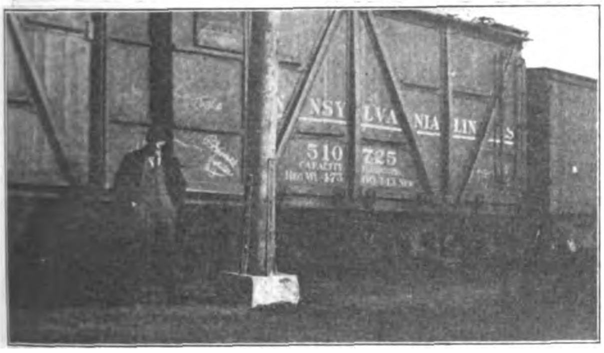
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

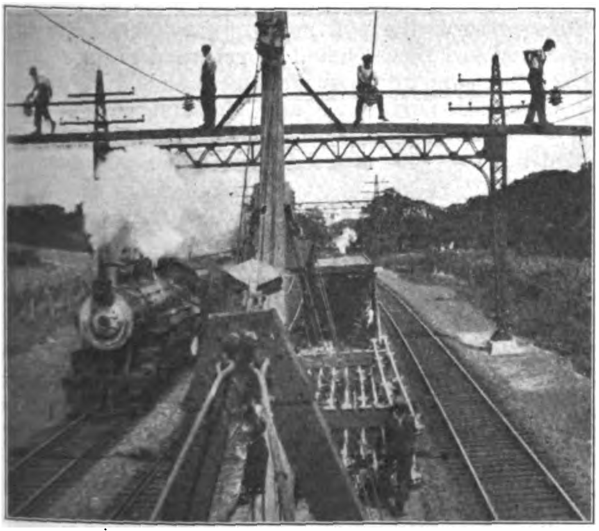
New Haven Railroad Construction Notes—Lengthening Catenary Poles

BY R. M. M. BURTNETT, FORMERLY INSPECTOR NEW HAVEN RAILROAD ELECTRIFICATION

At one of the sidings installed during the electrification of the New Haven Railroad it was necessary to use a longer pole than we had on hand. To do this we made a concrete base of 1:3:5 mixture. The base was made in oblong form about 2 ft. x 2 ft. x 6 ft. high, fitted with four pieces of 2½-in. x ½-in. strap iron which extended about 4 ft. above the base and about 5 ft. into the concrete. At the top this form was reinforced by an 18-in. diameter ring of 2-in. x ½-in. strap iron. The vertical pieces of strap iron had holes in the ends above the top of the base spaced about 12 in. apart for ¾-in. bolts 13 in. long. These bolts were so set in the form that the holes would come opposite each other in pairs but the pairs themselves were in staggered relation. The pole holes were dug, the forms put directly into the hole and then the concrete was poured in. After the forms had hardened the pole to be set was raised with a gin-pole and lowered into the iron form. However, to facilitate drainage the pole was raised and kept 1½ in. above the foundation by inserting a block under it. Then the pole was bored to correspond to the holes in the iron strap and ¾-in. bolts were inserted through the holes to hold the pole firmly in place. These poles were installed late in 1913 and, so far as I know, have stood up satisfactorily. One of these poles during and after its erection is shown in two accompanying views.



COMPLETE POLE IN CONCRETE BASE



SETTING THE POLE IN CONCRETE BASE

Equipment Defects—Fuses, Fuse Blocks and Fuse Boxes—II

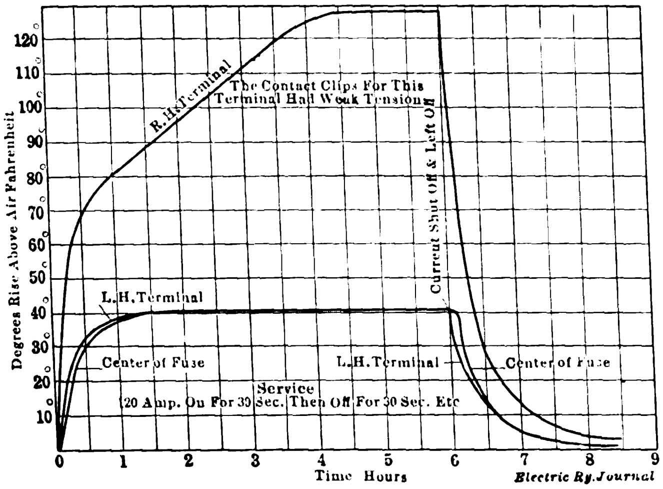
BY C. W. SQUIER, E.E.

In deciding on the proper size fuse for any particular service, the overload time element should be considered in connection with the smallest current that would prove dangerous to the equipment. Where these are to be used in the main motor circuit of cars, and consequently where fuses of large capacity are required, it is better to make tests of the fuses rather than try to choose one from the rating given by the National Electrical Code, because this standard rating allows a greater variation in the time fuses will blow cold than is desirable or will be found with most standard fuses. The accelerating current for the motors of railway equipments is much higher than the full load rating of the motors. Hence in selecting proper fuses for traction motor service it is necessary to use those large enough not to blow under maximum service conditions and still small enough to provide ample protection against dangerous overloads. Thus on a particular class of cars it was found that the equipment would stand overloads of 450 amp for from six to eight minutes. The main wiring, however, was No. 3 rubber insulated wire, and when a current of 450 amp was passed through a piece of this it was found that after four minutes the insulation on the wire started to melt, at the end of nine minutes the insulation started to burn, and then as the solder began to run out of the terminals it was necessary to shut off the current. Tests were then made on several sizes of fuses by blowing them cold with 450 amp continuously. It was found that the 300-amp fuses blew in from three minutes forty-nine seconds to four minutes and five seconds. It is evident from this that these particular 300-amp fuses could be used on this equipment, while we could not think of using a 300-amp fuse from the National Electrical Code standard rating, which allows a maximum of twelve minutes to blow with 450 amp.

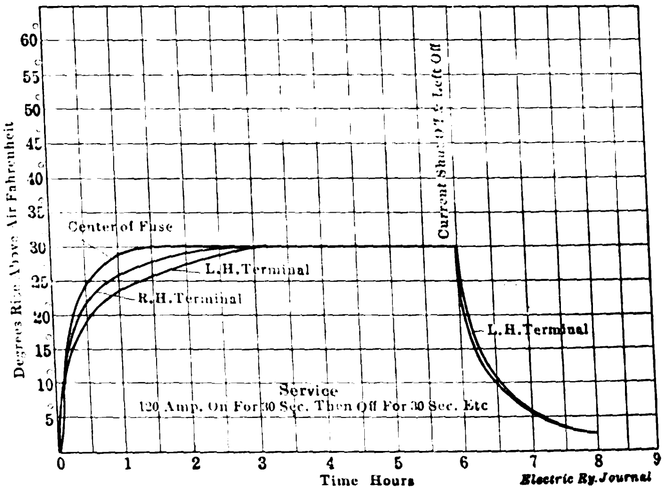
In order to determine if fuses of smaller capacity than 300 amp could not be used temperature tests were made under conditions approximating actual service. This test service consisted of placing 200 amp through the fuses for thirty seconds and then shutting the current off for thirty seconds, when it was again turned on, etc. These tests showed that 250-amp fuses would perform the service satisfactorily if the fuse block terminals were kept in good condition with firm contact pressure, but with terminals and clips as found in service in most cases 250-amp fuses would be blown due to the excessive heating.

As an example of the high temperatures that may be caused by poor contact pressure on the fuse terminals, examine the temperature curves for a 150-amp fuse. The test was made with a fuse and fuse block just as it was removed from a car, and these, as far as external inspection would show, were in good condition. This test was made by placing 120 amp through the fuse for thirty seconds and then turning the current off for thirty seconds, etc. A temperature rise of 128 deg. Fahr. above the surrounding air was obtained at the right-hand terminal, while the left-hand terminal and center of the fuse showed but 41 deg. rise. A second test was made on this fuse with a new fuse block with the results also reproduced. The maximum rise of all parts of the fuse in this latter case was but 30 deg. Fahr., and this temperature became constant after being in service 3¼ hours.

Some curves in the first part of this article show the effect of the temperature of fuses on the time taken for them to blow, so it can readily be seen how important it is to maintain proper contact at the terminals in order to keep fuses from blowing under normal operating conditions. Excessive heating may also be caused by poor contact in the construction of the fuses themselves, as between the caps and terminals, if they are not properly soldered or at the joints of the fusible material and its terminals. The specifications of the National Electrical Code have provided against such faulty construction by calling for the attachment of the fusible element to its terminals by a thoroughly good connection, such as to make it difficult for the element to be replaced when melted.



CURVE SHOWING HIGH TEMPERATURE DUE TO POOR CONTACT PRESSURE ON THE FUSE TERMINAL



CURVE SHOWING REDUCTION IN TEMPERATURE RISE AFTER APPLICATION OF NEW FUSE BLOCK

The warping of the fiber cartridge also causes poor contact at the terminals, and its shrinking causes loose ferrules or caps. Such fuses are dangerous to operate because the arc escapes through the opening and is liable to cause a short-circuit.

Vent holes, which are closed by screens, are provided in the ends of the caps. These vent screens should be of a material which will not absorb moisture readily and which must also be strong as they must withstand much pressure when the fuse opens. The blowing out of the flame through the vent holes is another source of trouble and danger.

Some manufacturers provide their fuses with telltales or indicators to show when the fuse is blown. These are a great convenience and aid in locating a blown fuse quickly, thus preventing many annoying delays in service. Indicators are not required by the insurance interests but are purely the result of trade demand. The most common form of indicator consists of a piece of very fine wire connected to the fuse terminals in parallel with the fusible element. At the center of the tube this wire is looped through to the outside and covered with a small spot of flash powder. When the fuse blows current passes through this fine wire and its heating causes the flash powder to explode. On low-voltage fuses trouble has been experienced by the failure of these telltales to blow when the fuse opens because the resistance of the fine wire is so high that the low voltage cannot force enough current through it to heat up the wire sufficiently. As the circuit still remains closed through this high resistance, however, false operation of the equipment is obtained.

REFILLING FUSES

Three or four manufacturers have developed lines of fuses so constructed that the fusible element can be easily and cheaply renewed by the user. This would be an advantage if we could be assured that the reliability which we have been led to expect of all fuses is not lessened and the fire hazard to the electrical equipment thus increased. Inclosed fuses require great care in their construction to make them operate satisfactorily and uniformly. Any type of fuse which provides for their reloading by a class of labor unskilled in fuse construction will not prove reliable. For this reason inclosed fuses should be returned to the factory for refilling, and the manufacturers should be allowed to replace any parts with new material, so that when a fuse is returned after being refilled it can be depended upon to give as good service as a new one.

RIBBON FUSES

For large railway equipments a fuse consisting of a copper ribbon with a hole at the center, or a bare copper wire is used. When copper ribbon is used it is clamped at the ends by wedge-shaped blocks, which draw into place with hand screws and exert a great pressure at the contact surface. The fuse and terminals are mounted in an insulated box having a magnetic blow-out to aid in extinguishing the arc when the fuse blows. Where such fuses are used as contact shoe fuses they are usually mounted on the shoe beam, and the principal troubles are the result of the excessive vibration to which they are subjected. Copper ribbon fuses break at the center and at the edge of their support. Small insulated projections on either side of the fuse to give it support have greatly reduced the number of broken fuses. A spring-supported fusebox will also remedy much of the breakage. The attachment of the fusebox covers has also proved a serious problem. Where hinges are used they are likely to shake loose and even thumb screws work loose and drop off. A through bolt provides the most satisfactory fastening, but it has the disadvantage of requiring a long time to remove when necessary to replace a fuse.

The Practical Side of Vacuum Car Cleaning—Tools

BY S. L. GUTHORN, E.E.

For the adequate cleaning by vacuum of cars equipped with cross-seats, the mere general requirements of vacuum cleaning are insufficient. Certain additional conditions are necessary. These relate to the renovator or tool equipment. Unless this is good, the system is a failure even though the remainder be perfect. The sufficient and necessary special tools are here discussed.

THE BARE FLOOR RENOVATOR

Correct and necessary manipulation for car floor cleaning is not possible within the space available. Most of the dirt occurs beneath the seats, and this part of the car is the most difficult surface a vacuum tool is called upon to sweep. To sweep such a car floor properly the tool must have the following characteristics:

a. It must be able to assume the best possible, and all necessary, positions on the floor beneath the seats, independent of any obstruction due to the legs.

b. It must be capable of removing and passing all such bits of paper, cigar butts, etc., which the bore selected will transmit without plugging.

c. It must not push surface dust in advance of it.

Of these requirements, the first is difficult to obtain and needs a construction which permits the following:

1. With the tool on the floor, the handle must be able to assume any and all angles necessary to work beneath a seat, these angles being taken in any vertical plane.
2. The control of the tool must be such that the operator may rotate it on the floor at will by means of the handle and yet not disturb its correct position, thus obtaining any angle in a horizontal plane.
3. Conditions 1 and 2 must be capable of occurring simultaneously.
4. The length of the tool must not exceed the distance between adjacent seat supports.

The basis of such a tool is a modified ball and socket joint. The joint *A* of Fig. 1 fulfils condition 1. The studs *B B*, which are integral with the socket and connected to the ball through the grooves, *C*, fulfil condition 2 and permit condition 3. The length into the clear is fixed by condition 4 but should not exceed 10 in.

Condition *b* calls for a long central "gobble up" orifice, *D*, which by its conical shape accelerates the material swept and crumples pieces of paper, cigar butts, etc.

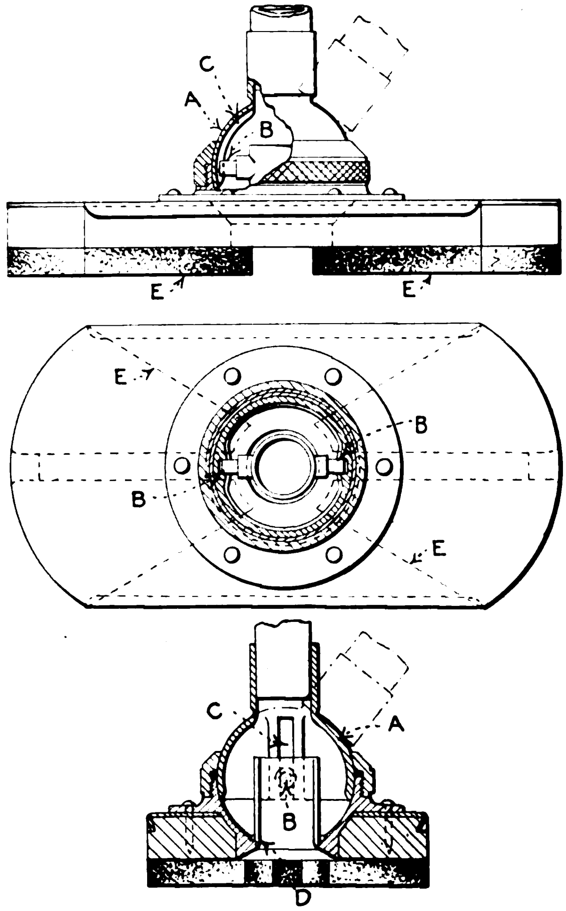
Condition *c* calls for dust ducts, *E*, in the front and back of the tool, instead of at the ends only. These ducts, inclining toward the center orifice, direct the material swept toward the same and effectively prevent the pushing of surface dirt.

The tool when operated with a 3-ft. handle and a handle valve allows a free and unrestricted universal movement which enables the operator to rotate the tool on the floor and around the seat legs, as required, while the handle is at any angle which the conditions may impose. Thus he directs the front or end dust ducts, namely, the air inrush, as the sweeping requires, without fatigue and independent of the obstructions caused by their upper parts. The felts are of ½-in. stock.

THE MOP

If the exhauster equipment is of a type which will handle water as well as air, the use of a pneumatic mop is advantageous. The mop will remove scrub water from a car floor and discharge the same direct to the soil line. A successful mop must possess the following characteristics: (*a*) it must remove and not soak up the water; (*b*) it must dry the mopped surface; (*c*) it must not streak the floor; (*d*) its speed must warrant its adoption; (*e*) it must be operative on both forward and return strokes, and (*f*) it should be operative beneath the seats.

Of these requirements a solution fulfilling conditions *a-e* inclusive is shown in Fig. 4, while one fulfilling all conditions is shown in Fig. 5. In both cases the construction accomplishes the following: the orifice, and no other point of mop, must be the part at which the tool meets the wetted surface; the moving of the tool over the surface must automatically raise the crest of the water sufficiently to tend to seal the orifice, decreasing the effective orifice area and thus increasing the air velocity so that the water is carried through the tool to the hose in the form of a water spout.



FIGS. 1 TO 3—BARE FLOOR RENOVATOR

In use the tool, shown in Fig. 4, requires the lowering of the handle on the forward stroke and the lowering on the return, and therefore it will not work well beneath seats. The tool shown in Fig. 5 permits the handle to be held in any working position. The movement of the mop proper is accomplished by operating the slide *c*, it being pushed for the forward stroke and pulled for the return.

The use of a plain squeegee mop with a plain rubber edge to push the water "into a pile" to be removed with mop, has worked well.

SUMMARY OF GENERAL REQUIREMENTS

In addition to the foregoing specific requirements, the purchaser should insist upon certain general ones which apply to any vacuum cleaner tool. These are:

1. The selection and distribution of materials for strength, weight and life, being brass or iron if any moving parts.
2. Dead smooth-cored parts, insuring smooth and unobstructed air passages.
3. Large radii of curvature of the tool passages.
4. Proper distribution of areas through the tool to insure uniform acceleration.
5. Interchangeability of parts.
6. Connection between tool and handle.
7. Appearance and finish.

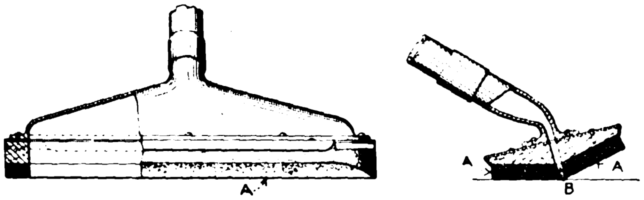


FIG. 4—MOP WHICH FULFILS CONDITIONS A TO E

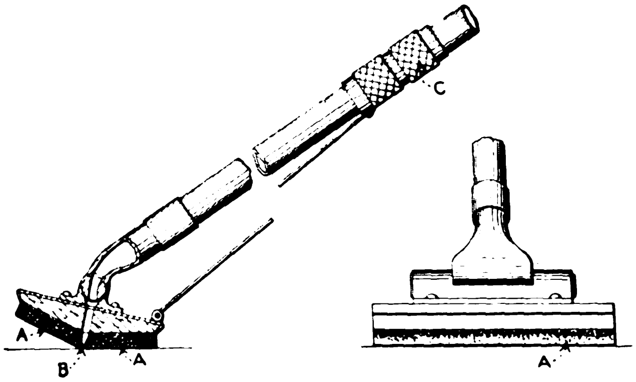


FIG. 5—MOP WHICH FULFILS ALL CONDITIONS

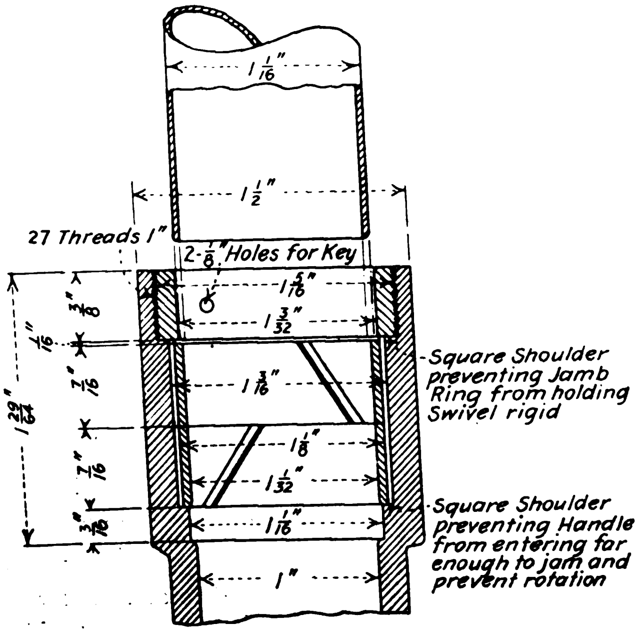


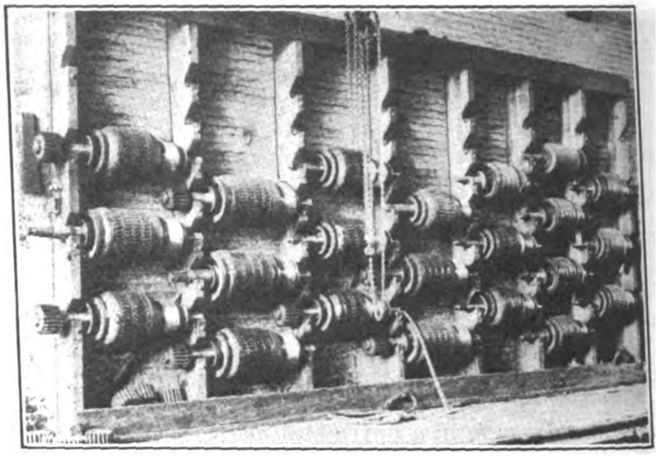
FIG. 6—DOUBLE SPLIT RING

Of these, requirement 6 is worthy of further reference. Of the forms in use the double split-ring type is commendable. This device is shown for a 1-in. tool in Fig. 6. Here the duct formed by one split ring, which of itself would permit leakage, is baffled by the second split ring. Also if the periphery in contact with a ring is not circular, due to a dent or other cause, the seal is preserved by the second ring which works independent of it. The dimensions allow for the free turning of the handle in tool, and under no conditions will they stick as in other prevailing types. The upper or jamb ring screws down against a square shoulder in the shank, thus preventing it from holding the split rings rigid.

The tapered ends of the handles should be formed by swedging or rolling and never by filing or cutting. Swedging or rolling strengthen the ends while filing or cutting weakens them to a surprising extent. Hose ends for connecting to the piping system or to other lengths of hose should always be of such thickness as to fit into an outlet of a hose of the next size larger. This will warrant their having sufficient thickness to withstand car shop usage, particularly if of the tapered type.

A Vertical Armature Rack

At the Carew Street shops of the Springfield (Mass.) Street Railway armatures are conveniently stored for immediate service on a home-made rack illustrated in the accompanying half-tone. The rack is located at the side of a pit track and near the entrance of the building, so that the least possible amount of time is lost in changing an armature on a car momentarily withdrawn from service. The rack is 11 ft. high and 20 ft. long, and has a capacity of twenty-eight armatures of various sizes. It consists of notched vertical posts spaced from 2 ft. 8 in. to 3 ft. 1 in. apart on centers and tied together at top and bottom by cross timbers, the vertical members being fastened into the adjoining brick wall by ½-in. bolts forced home against iron plates to form a bearing surface on the outside of the timber. The vertical pieces are 12 in. wide and 2¾ in. thick, and the rack is served by a 1-ton "Triplex" hand-operated hoist. Armatures are supported in alternate pairs of gains as shown, the clearance being sufficient to allow for the projection of the pinion over the vertical member and to facilitate the attachment of the chain to the shaft in handling the armatures. There is a clearance of 5 ft. between the largest armature and the nearest pit rail when the rack is filled. At the bottom of the rack a storage space 8½ in. deep with a 1½-in. flooring is left for pinions in loose storage.



HOME-MADE COMPACT ARMATURE RACK, SPRINGFIELD, MASS.

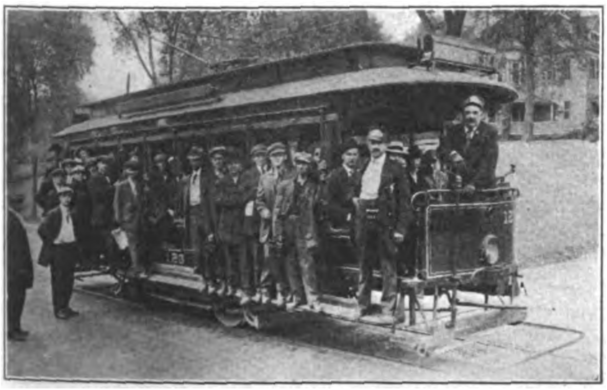
The Allgemeine Company has recently received final permits in connection with the construction of the Gesundbrunnen-Neukölln Underground Railway. The franchise is for ninety years, and it is specified that the line must be completed for operation by Sept. 30, 1918, on penalty of $50,000 for any delays. A penalty of $25,000 is also fixed if operation is discontinued or interrupted without due cause. The present terminal in Neukölln is to be at Weser Street, but provision must be made for its extension beyond that point.

Long-Lived Car Bodies

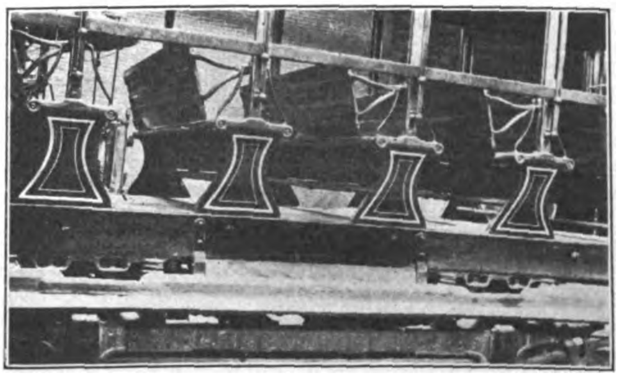
Included in the serviceable rolling stock of a large Eastern railway are twenty-two cars which were built about twenty years ago by J. M. Jones & Sons, of Troy, N. Y. Fifteen of these cars are of the open type, all but one being ten-bench equipments. The seven box cars are all of the single-truck type and are regularly employed in tripper service in the winter, the open cars being operated daily in the morning and afternoon rush hours the rest of the year. Some of the features of these cars are described below, special attention being paid to the open cars for the reason that these were equipped with motors early this summer and were accessible for closer detailed examination.

A typical open style car of this group is shown in service in Fig. 1, the photograph having been taken in June of this year. The car has ten benches and was built in 1893. The body length is 28 ft. 8 in., the platform length 3 ft. 10 in., and the over-all length 29 ft. 8 in. At present the car is equipped with a Bemis "standard" truck, two Westinghouse 12-A motors, geared 18:64, side-bar suspension and K2 controllers. The motors are inside-hung, a view of the under side of the car and a portion of each motor being shown in Fig. 4. The total width of the car is 7 ft. 9 in. The roof is of the open deck type and the weight of the car body is 7500 lb. The truck weighs 4800 lb., and the wheelbase is 7 ft., the wheels being of chilled cast iron, 30 in. in diameter, with a tread of 2½ in. and a flange depth of ¾ in. The weight of the electrical equipment complete is 5338 lb., and of the car complete 17,638 lb. Other features of the car are the use of Pantasote curtains, New Haven registers, Pfingst fenders, slat seats, U. S. trolley base and pole with G. E. harp, Wilson trolley catchers and Murphy sanders. Five 23-watt lamps provide for the inside lighting, the same size being used in the headlights. The height from the top of the rail to the trolley board is 11 ft. 1 in. Ratchet hand brakes are used, none of these cars being equipped with air. The running boards are 8 in. wide.

The inside of the body is finished in maple and mahogany. The framing, which is perhaps the most interesting feature of the car, is outlined in Fig. 2, which is a sketch of the principal members of one-half the body supporting structure. Fig. 5 shows an underside view of the drawhead and adjacent flooring. The side sills are of hard pine, the cross-pieces being of oak. No center sills were used in these cars. The side sills are each 4½ in. wide, the height varying from 7 in. at the center of the car to 5 in. at the platform ends. Across the center of the car is run a transverse member 2¾ in. wide by 5 in. high, reinforced by a ½-in. truss rod shown in one view. The posts are of oak, and they are about 2½ in. square in horizontal cross-section. There is little or no sign of misalignment or lost motion in the roof at the supporting points.

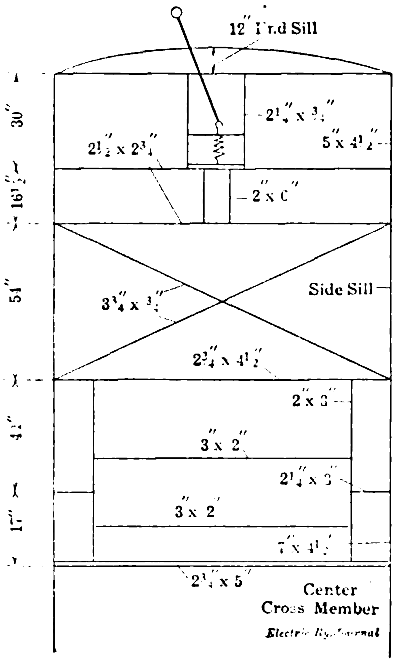


LONG-LIVED CARS—FIG. 1—TWENTY-YEAR-OLD OPEN CAR CARRYING HEAVY LOAD



LONG-LIVED CARS—FIG. 3—SIDE VIEW OF OPEN CAR SHOWING CANVAS STRIP SERVING AS MUDGUARD

The sizes of the various subordinate members of the underframing are indicated in the diagram. In each case the cross members carried from side to side are reinforced by a truss rod as in the central member referred to. The end sills are 12 in. wide at the center, curving to a width of 3 in. at the side of the car. Two cross-braces are provided under the platform, each being 2½ x 3¾ in. in section, and behind these are two 3¾-in. x ¾-in. diagonal braces. All the cross members are bolted into the side sills. This construction has proved sufficietnly rigid to stand the wear of service.

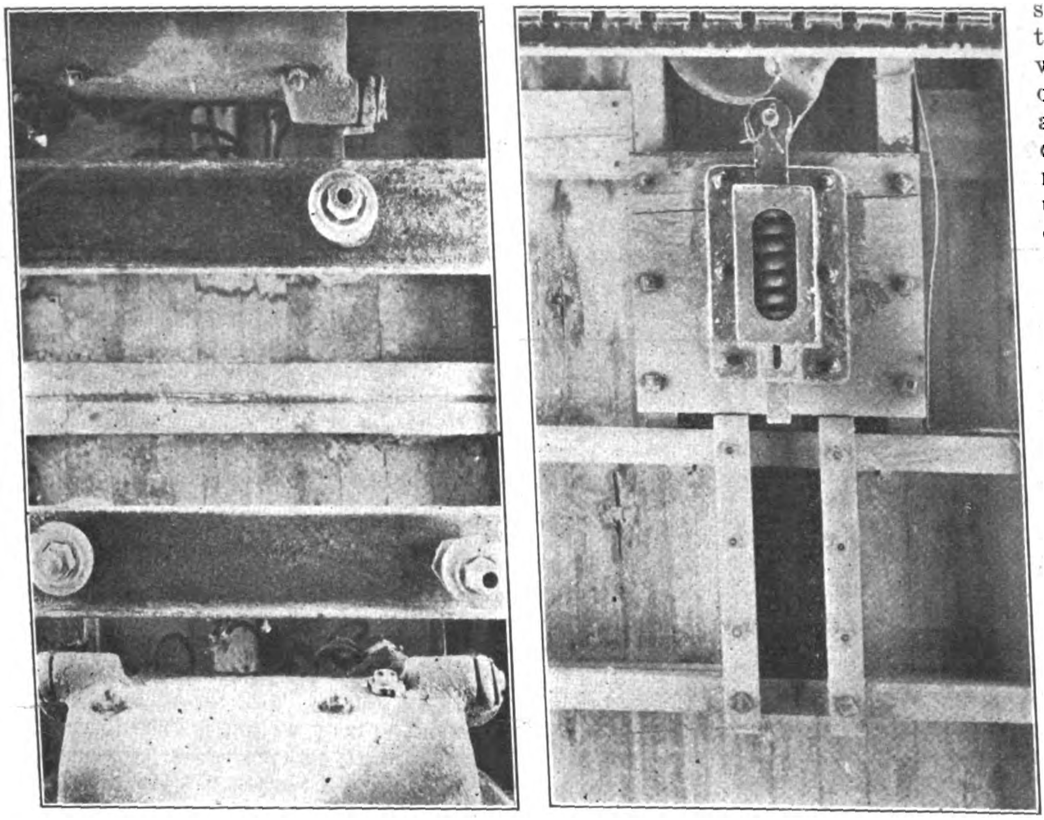


LONG-LIVED CARS—FIG. 2—SKETCH OF ONE-HALF UNDERFRAME OF TWENTY-YEAR-OLD OPEN CAR

The box cars of the Jones make are of the same general design as to framing, but naturally the platforms are wider and the vestibule construction made it necessary to stiffen the underframing at the ends of the car. The bodies of these cars are 18 ft. long, the platforms being 3 ft. 10 in. long. The over-all length of the car is 27 ft. 6 in. The body weight is 7500 lb., and the roof is of the open-deck type, carried on posts mortised into the side sills and fastened by ½-in. x 1-in. strap-iron bolts. The side sills are 3 in. x 3¾ in. in cross-section, and these are supplemented under the platforms by two knee braces from 7 in. to 3 in. deep which take care of the loads in the middle portion of the platform.

The center cross-sill is 4¾ in. x 2¾ in. in section, and through bolts are used in the open cars to reinforce the cross members. The posts are of oak, 3 in. x 1¾ in. The knee braces are offset to take care of the difference between the car floor level and the platform level. The intermediate framing construction is much like that in the open cars. All these closed cars are also in first-class operating condition, and although used mainly in tripper service, are thoroughly reliable pieces of rolling stock. The principal drawback to their extended use is their small capacity and low speed. The closed cars are equipped when in service with two Westinghouse 12-A motors each, Bemis "standard" trucks with a 6-ft. 6-in. wheelbase, and the gear ratio is 18:64. The maximum speed on a level track is 18 m.p.h. The weight of the car equipped is 17,638 lb.

The maintenance requirements of these cars are light. A yearly overhauling is given, and painting, varnishing and minor renewals of flooring, panels or other parts subject to wear or shocks from without fairly complete the work which has to be done on these bodies. On one open car body the platform has never had to be repaired since the first day of service. The following tables of maintenance cost give an excellent idea of the way in which these equipments are standing the test of time. It is noteworthy that the records begin the year with 1909, when the cars were sixteen years old. In the case of the car the figures for 1914 cover only the first six months, but include a thorough overhauling for the summer season.



LONG-LIVED CARS—FIGS. 2 AND 4—UPPER SIDE OF TWENTY-YEAR-OLD OPEN CAR SHOWING MOTOR SUSPENSION REINFORCEMENT OF CENTRAL CROSS MEMBER OF FRAME; DRAWHEAD AND UNDERFRAME OF TWENTY-YEAR-OLD OPEN CAR

First Car—Body Repairs (Open Type).

Year	Labor	Material	Varnishing (Labor and Material)
1909	$1.28	....	....
1910	1.50	....	$20.00
1911	4.00	$2.00	9.00
1912	4.40	6.00	4.00
1913	9.10	4.20	....
1914	1.50	3.00	*75.00

*Entire car repainted, including thorough scraping.

Second Car—Body Repairs (Closed Type)

Year	Labor	Material	Varnishing (Labor and Material)
1909	$0.57	....	$6.00
1910	5.25	$3.50	5.00
1911	2.55	1.25	2.75
1912	5.40	4.00	6.00
1913	....	....	3.90

The roofs, trolleys and trucks are painted yearly. Bodies revarnished when necessary.

Reduced Energy at San Francisco Due to New Motors and Rebuilt Trucks

In 1895 the United Railroads of San Francisco received 123 cars equipped with GE 1000 motors. These cars have been operating in regular service up to the present time, but it was recently decided to replace the old motors with new equipment, at the same time endeavoring to effect a saving in power consumption by decreasing the weight. Accordingly, one of the cars was re-equipped at the company's shops, and on May 2 was put on a regular run to try out under actual working conditions the features proposed for the cars to be altered. Incidentally, the alterations were to lower the car floor level.

Car No. 1367, typical of the 123 cars to be given new motors, was selected for tests of the features to be embodied in the alterations. It has a length of 44 ft. 11 in., a seating capacity of fifty-two and weighed 43,140 lb. with the old motors on Peckham 14-B-3 trucks. In the shops the trucks were taken from this car and completely dismounted, so that other changes could be made while new motors were being placed. The trucks were fitted with 24-in. instead of 30-in. wheels, brakes were hung inside instead of outside, and the bolsters clamped beneath instead of above the half-elliptic springs. These changes lowered the level of the car floor 6 in., and in order to maintain the 12½-in. height of the bottom step, made necessary by the dips and crowns of the line, the risers of each of the other two steps were reduced from 13 in. to 10 in.

No other changes were made in the car until it had been in service long enough to permit a number of tests. After these were made it was sent to the shop again, one of the two resistance boxes was removed and the K-12 control was rearranged for operation on seven points, in accordance with the Jones patent described April 11. This rearrangement, without changing the car wiring, resulted as follows:

Point 1—All four motors in series with resistance.
Point 2—Four motors in series.
Point 3—No. 3 and No. 4 motors in series.
Point 4—Series-parallel (two motors in series and two in parallel).
Point 5—No. 1 in parallel, Nos. 3 and 4 in series.
Point 6—Nos. 1 and 4 in parallel.
Point 7—Four motors in parallel.

The total cost of these alterations per car were about as follows:

Rebuilding trucks	$150
Rewiring control	20
Cutting down step heights	12
Four Jones baby-type motors	1,500
Total	$1,682

RESULTS OF TESTS

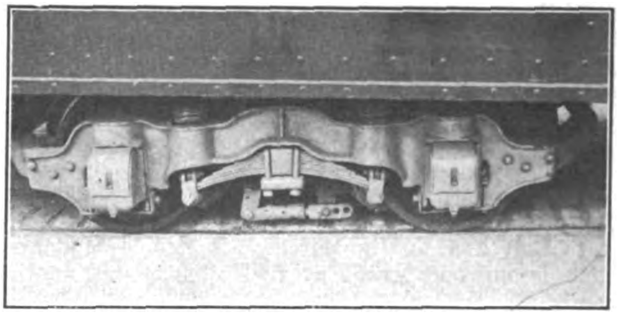
The tests were made on the Fillmore Street run which extends from Broadway to Sixteenth and Bryant Streets and involves about the average number of stops and several hills, the steepest grade being 11.7 per cent for two blocks. Typical results obtained in the three all-day tests made under conditions as nearly identical as possible in practice are given in the following table.

COMPARATIVE TEST RESULTS

Test Series	Motor	Car Weight Pounds	Control	Number Trips	Total Miles	Total Kw-hr.	Av. Kw-hr. per Car Mile
1	GE 1000	43,140	K-12	12	79.342	307	3.869
2	West. 328	36,920	K-12	13	85.530	287	3.355
3	West. 328	36.920	Rearranged K-12	13	84.594	258	3.049

The difference between Series 1 and 2 represents the saving in energy consumption due to the substitution of the new motor and the reduction of car weight. This amounts to 0.514 kw-hr. per car mile, or 13.28 per cent. The difference between Series 2 and 3 shows the further economy due to the rearranged control, which amounts to 0.306 kw-hr. per car mile, or 9.121 per cent more. The total saving shown between Series 1 and 3 is 0.82 kw-hr. per car mile, or 21.19 per cent. Series 3 was made on May 7, which was "California Day" at the Exposition, so that any variation in the number of passengers carried probably tended to make for heavier loading during Series 3.

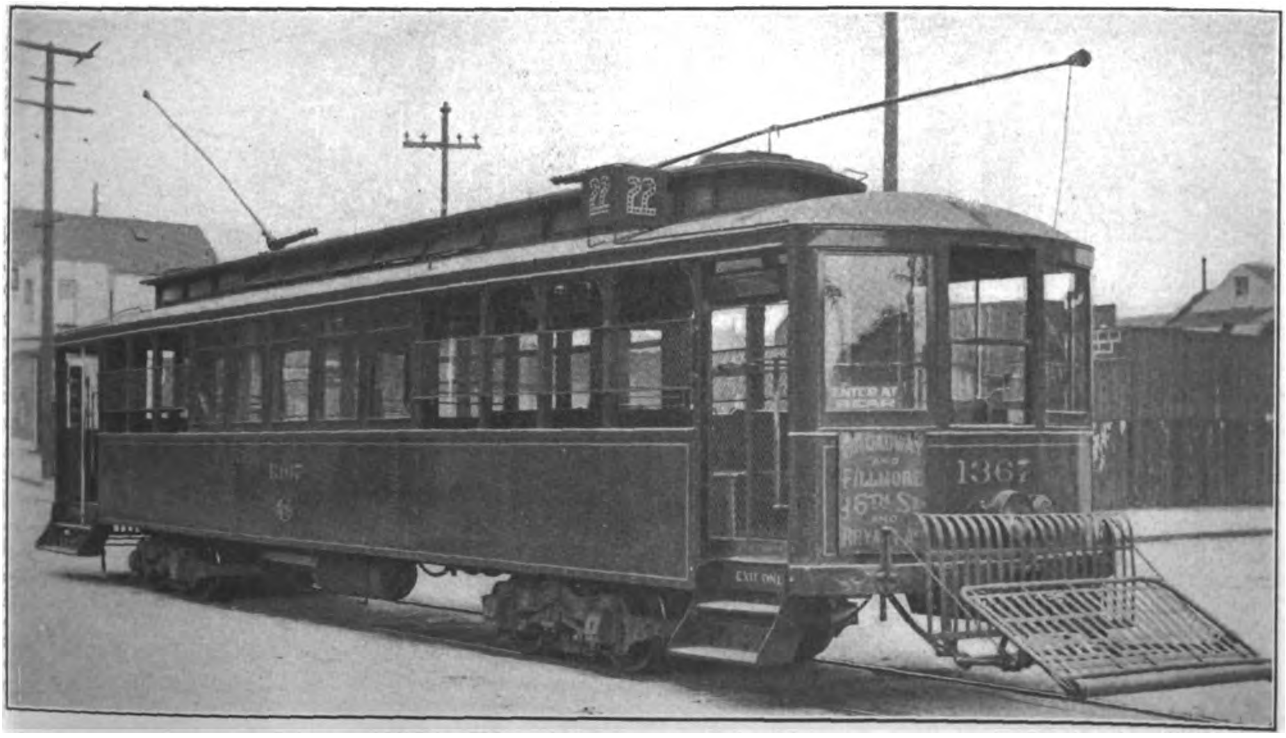
The load curve for the rewired seven-point control was taken with a graphic ammeter and in connection with this there was also used an integrating watt-hour meter made with mercury bearings especially for railway use by the General Electric Company. The resultant curve differed from those of the old-type control by its lesser area, of course, but it also had a sharp, high peak due to the reduced resistance used. This peak was often as high as 350 amp, but its apex was nearly always 100 amp above the point where there was any perceptible width between the two lines made by the rising and falling pen while the paper was advanced at the rate of 2 in. per minute. The sharpness of the peak was not due to the inertia of the moving element in the meter, however, as an external dampening current of constant value was used, which is said to have kept the instrument practically dead beat.



UNITED RAILROADS OF SAN FRANCISCO—TRUCK REBUILT FOR LIGHTER CAR AND LOWER FLOOR

The trucks were rebuilt and the control rewired under the supervision of J. M. Yount, master mechanic, and the tests were made by W. T. Bivins, engineer of electrical equipment, both acting under the direction of Charles N. Black, general manager United Railroads of San Francisco.

The Société des Tramways et Electricité de Constantinople was formed at Brussels recently for the purpose of becoming the principal shareholder in the Constantinople tramways, and obtaining a monopoly of electric lighting in Constantinople by agreement with the firm of Ganz, Budapest.



UNITED RAILROADS OF SAN FRANCISCO—ONE OF THE OLD CARS AFTER ITS ALTERATION

Largest Diesel Engine Built in America

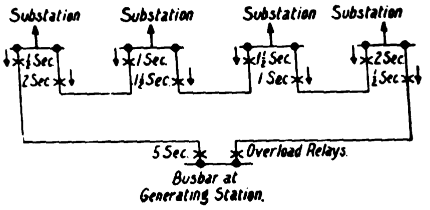
The Lyons Atlas Company, Indianapolis, Ind., has recently completed and shipped the largest Diesel engine constructed to date in this country. This engine is composed of four cylinders, 21-in. bore x 30-in. stroke, and is of the vertical, four-cycle type, rated at 600 brake hp with an overload capacity of 15 per cent, or 690 brake hp maximum. The engine was sold to the Hawaiian Commercial & Sugar Company through its New York agents, Alexander & Baldwin, Ltd., and is intended to supersede one of its steam plants for irrigation purposes, to be direct-connected to a two-stage turbine pump with a capacity of 15,000,000 gal. at 200-ft. head.

The conditions covering the acceptance of the engine were severe. The purchaser insisted that the engine should operate continuously 710 hours out of each 720 hours per month at rated load, using the ordinary 14 deg. to 18 deg. asphaltum base California fuel oil, similar to that used in the purchaser's steam plant, and which is the only grade of fuel oil available on the islands.

The test was conducted by the chief engineer of the Hawaiian Commercial & Sugar Company, and the engine was given a preliminary, continuous run of forty-eight hours with Eastern paraffin base fuel, after which all parts connected with the combustion chambers were inspected in order to determine a basis for comparison between the effect of the two fuels. It was then subjected to a 144-hour continuous run at full load with fuel shipped by the purchaser from California to the manufacturer's works. At the completion of this run the combustion chambers were again examined, and as there was no evidence of deposit on the heads, valves or pistons, the engine was accepted and is now en route to the islands, to be erected by the purchaser's own engineers without any assistance from the manufacturer.

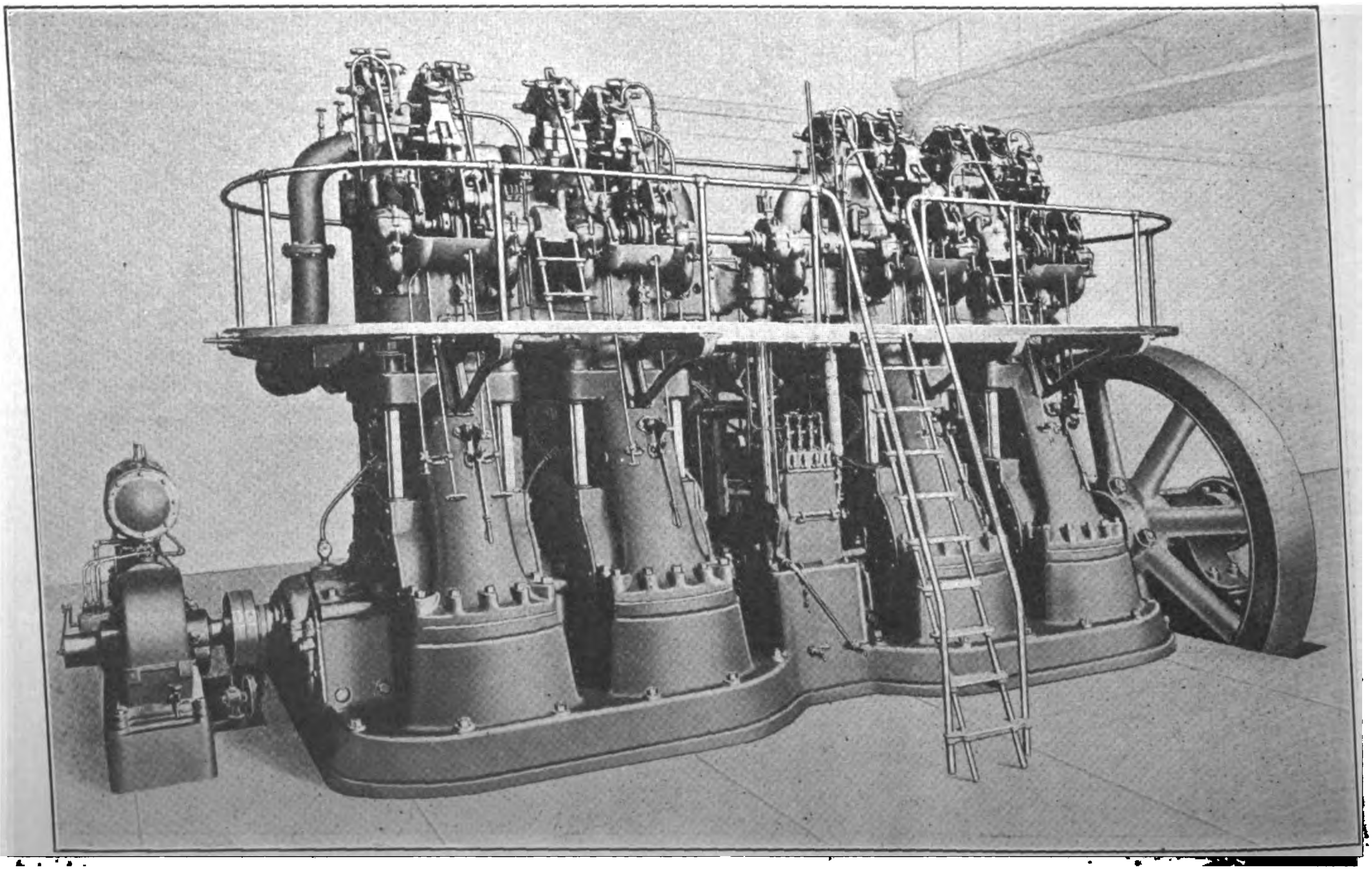
Reverse-Power Relays for Ring-Type Systems

The new reverse-power relays of the Westinghouse Electric & Manufacturing Company can be furnished with definite time-element characteristics by means of torque compensators, and thus can be used for protecting certain ring-connected distributing systems where differential relays with expensive pilot-wire connections would be otherwise required. The diagram shows a typical system of this kind. The relays can trip only when overload flows in the direction shown by the arrows. Each relay is set for the definite minimum time indicated. If a ground occurs on either feeder or connecting line, power flows to that point from both ends. It will be seen that the relays on each side nearest the fault trip first, thereby cutting out the defective line and not interrupting the supply of power to the substations. In case of heavy short near the substation, the voltage may drop very low, but these relays are so sensitive that they will operate correctly even if the voltage drops to 2 per cent of normal.



USE OF REVERSE POWER RELAYS

A good shop practice is to apply a mixture of oil and white lead to the shafts of compressor and other armatures before storing them on their racks. This coating prevents the formation of rust and thus permits the armature to be installed with the least trouble.



FOUR-CYCLE, VERTICAL TYPE DIESEL-TYPE ENGINE OF 690 BRAKE HP MAXIMUM CAPACITY

News of Electric Railways

Prominent American Electric Railway Men in the War Zone

The news from Europe published in the papers in the East contains information which indicates that a number of men prominent in the electric railway industry in America and in England have had rather trying experiences. Sir Albert H. Stanley, managing director of the London Underground Railways, is said to have tried to motor back to the coast from Baden-Baden. His automobile was commandeered by the German Army. He is said to have bought another and then a third, but all were taken away from him and he is said to have had to finish by train. Upon his return to London Sir Albert sent $2,500 in gold and silver to each of ten hotels to accommodate Americans.

Thomas Fortune Ryan was last heard from a few days ago at Aix-les-Bains. Leonard F. Loree, president of the United Traction Company, Albany, N. Y., the Delaware & Hudson Railroad and other companies, with Mrs. Loree and Miss Louise Loree, were last reported on the Continent. J. H. Pardee, vice-president of J. G. White & Company, Inc., sailed from New York on the *Kronprinzessin Cecilie,* which put back to Bar Harbor on Aug. 4.

The statement that tourists will not be permitted to leave Germany during the mobilization period has caused some anxiety as to the prospects of the Chicago terminal delegation securing transportation home. Bion J. Arnold, who was a member of this party, was reported on Aug. 5 to be at some unknown point in Germany. John F. Wallace, Walter L. Fisher and a number of Chicago Aldermen also were in this party. Theodore P. Shonts, president of the Interborough Rapid Transit Company and the New York Railways, and his two daughters, returned hastily from Villar-sur-Ollon to Paris on Aug. 4. At the office of the Interborough Rapid Transit Company it was said that the only other official of the company in Europe was Richard Reid Rogers, general counsel of the company. When last heard from Mr. Rogers was in Germany. None of the officers of the Brooklyn Rapid Transit Company is in Europe. This is true also of the officials of the Public Service Corporation of New Jersey.

Guy E. Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, who left New York on July 7, cabled on Aug. 4 from the Savoy Hotel, London, that the sailing of the boat on which he had secured return passage had been cancelled. The New York office was unable to say when he would return as up to Aug. 6 nothing more had been heard from him. H. H. Westinghouse was last reported to have gone from Paris to London. Albert H. Wiggin, a director of the company, is en route to New York by the American line. Walter Terry when last heard from was on his way to Germany. Dr. Peter Cooper-Hewitt of the company has just returned from Europe. At the office of the General Electric Company it was said that probably twenty-five or thirty employees of the company were in Europe on pleasure or business, but that among this number there were no officers, directors or heads of departments, so far as was known.

Henry W. Thornton, formerly general superintendent of the Long Island Railroad and now manager of the Great Eastern Railway, London, sent a steamboat on Aug. 4 to The Hague, where many Americans were marooned, brought away 750 and on Aug. 5 sent another boat, which returned with nearly 600 more. On Aug. 6 Mr. Thornton sent the German Ambassador, the embassy staff and some 200 other Germans over his line.

F. W. Whitridge, president of the Third Avenue Railroad, who sailed from New York on July 14, is believed to be in Scotland, which was his destination. At the office of the company in New York it was stated on Aug. 5 that he had not been heard from since the present crisis became acute.

Chairman MacLeod of the Massachusetts Public Service Commission, who planned to sail on the *Franconia,* has decided to call off his proposed study of electrification on the Continent this summer. Commissioner Stone's plans for studying electrification in the western part of the United States are unchanged.

Effects of European Conflict on Electrical Manufactures

At the New York office of the Westinghouse Electric & Manufacturing Company it was stated that of the company's subsidiaries in England, France, Italy and Austria, only the British company pays any dividends to the American company. These dividends amount to about $85,000 a year. This, then, in case of an entire shut-down of its European branches, is the most the Westinghouse company would lose from that cause. The other subsidiaries pay no dividends to this country and the Russian company is now practically liquidated. The company has 150 cars loaded with freight in New York awaiting shipment.

The General Electric Company has no subsidiaries on the continent of Europe, and, its only interest abroad lies in its control of the British Thomson-Houston Company. This company, however, has not been paying dividends and at times has needed help from the home company. The General Electric Company sells its American products to foreign firms and thus creates a market. Therefore, its only loss in Europe would be in the purchase price of the British Thomson-Houston Company and in the absence for the present of a European market. The exports of the company average about $1,000,000 a month, and the company now has goods valued at between $300,000 and $400,000 on the high seas.

Eastern Freight Rate Case Decided

On Aug. 1 the Interstate Commerce Commission by a vote of four to two granted an increase of 5 per cent in freight rates to railroads operating in the Central Freight Association territory. It has been estimated that the railroads will gain from $9,000,000 to $15,000,000 by this decision. The grant of higher rates to only the Central Freight Association territory is justified by the commission on the ground of causes contributing to a greater reduction of earnings on these lines than on other roads in official classification territory. The difference in the character of the freight traffic handled in the favored territory is noted, and attention is also directed to the fact that class rates effective in and through Ohio, Indiana and Michigan, and controlled by the Central Freight Association scale, are lower than comparable rates prevailing in any other part of the country.

The commission asserts that increased revenues resulting from increases in rates in Central Freight Association territory will afford some relief practically to all the lines on official classification territory in need of additional revenues, except the New England lines. The great trunk lines, according to the commission's decision, have a large mileage in the central territory and their revenues will therefore be materially augmented.

Besides the direct rate increase granted, the commission in its decision points out other means whereby the railroads' revenues can be increased. These include an increase of passenger rates, a close examination of freight rates to determine unremunerative individual rates, the abolition of free transportation, the increase of freight-car efficiency, and the abolition of interlocking relations with construction and equipment companies.

One of the commissioners, Winthrop M. Daniels, of New Jersey, in a strong dissenting opinion, says: "In the conclusions reached in the majority report I am unable to concur except as to the increase in the Central Freight Association territory. The majority opinion, however, falls far short of giving even to the carriers in that region the relief to which the evidence of record clearly shows they are entitled. For more than a decade the operating and maintenance expenses of the railroads of the United States have constantly risen, but the rates charged have been either static or declining. A living wage is as necessary for a railroad as for an individual. A carrier without a sufficient return to cover costs and obtain in addition a margin of profit large enough to attract new capital for extensions and improvements cannot permanently render service such as is commensurate with the needs of the public."

The Hazleton Strike and Boycott

Under date of July 16 Alvan Markle, president of the Lehigh Traction Company, Hazleton, Pa., issued a statement dealing at great length with the issues involved in the strike of the employees of the company declared on Jan. 1, 1914. When the strike was begun the company made its position clear upon three propositions:

"(1) That it would decline to reinstate those members of the committee of strikers who had deliberately lied and broken faith with the company.

"(2) That it must reserve the right to itself to discharge or suspend employees either because of infraction of rules or because of such conduct as might lead to inefficiency or dishonesty.

"(3) That it would not engage in any contest against honest labor unions, but would permit all of its employees to become affiliated with any legal organization."

Mr. Markle says that the attitude of the company was grossly misconceived and misconstrued by the striking employees as an attack upon the principles of labor unions and that the committee in charge adroitly used every circumstance so as to make the company's position appear as antagonistic to labor in general. In this connection he said:

"The infusion of this element served merely to becloud the real issues involved and injected a phase which had absolutely no place in the controversy. This company then had, and now has, no hostility to honest labor unions, and it had then, and now has, no censure of its advocates and supporters. But, because of the introduction of these outside elements into the controversy this community has, even since the resumption of traffic, rested under the pall of a menacing and unlawful boycott whose effects have been felt not only by the company itself, but by every merchant, tradesman, banker and business man of every description, resident within the territory traversed by the lines of this railroad.

"Recent developments have confirmed and justified our attitude to such an extent that we would be remiss in our duty to the public if we did not seize this opportunity for such elaboration. If, in the course of this statement, allegations are made which reflect upon the integrity of individuals, it is not because we find a pleasure in making such averments, but the situation has assumed such a condition that the naked and bare truths must be asserted no matter whom they hit or whom they hurt.

"Our first reason for not agreeing to reinstate in positions of trust those who had broken faith with us was founded upon the belief that a deliberate breach of faith is equivalent to dishonesty; that an employee who violates a solemn promise is one likely to stoop to other breaches of confidence even to the misappropriation of moneys.

"At the time that this company arrived at that decision there were current and rife in this community rumors to the effect that some of the striking employees had been guilty of the grossest kind of dishonesty in embezzling the moneys of the company while conductors or motormen acting as conductors. The company was implored by the public and by the press to investigate such rumors, to produce the proof thereof, and base its refusal to reinstate these men upon that ground. The company at that time declined to make such direct accusation. It would not accept idle rumor or gossip as proof. It believed that breach of faith was in itself sufficient to justify its attitude. Since then, however, the company, desiring to fortify its attitude towards these individuals, has caused an investigation to be made. It now proposes publicly to announce the result of that investigation as disclosed at a judicial hearing, and it proposes to ask in connection therewith whether these men are now, or ever were, worthy of reinstatement in the employ of this company."

Mr. Markle then gives the details of the disclosures regarding the activities of the company's employees as brought out at the hearing before the Alderman on July 15. He then says in part:

"The facts disclosed at the judicial hearing before the Alderman indicated a remarkable condition of affairs when employees of this company, whose monthly income averaged about $70, could afford night after night to lose a week's salary at gambling. It constitutes a direct accusation and indictment against the integrity of the men involved. They fully vindicated and fortified the position taken by this company, that at least three of the men who had deliberately broken faith with the company in the preliminary negotiations incident to the strike were unworthy to remain in the employ of this company. The three men were present at the hearing before the Alderman. They made no denial of the truth of these accusations. They entered no refutation of most of the facts involved therein, although they had ample opportunity so to do and acknowledged their guilt by paying the full fine imposed under the law."

He then asks whether the company was not right at the inception of the strike in refusing to arbitrate questions regarding employees' dishonesty and if it is not still right in refusing to arbitrate questions of this character. A series of questions is then put to the honest labor unionists, the business men and the community in general. The statement is then concluded as follows:

"We say to the community in general that the time has arrived when the business interests, large or small, powerful or humble, rich or poor, merchant or laborer, must choose between two alternatives:

"(1) To countenance the continuance of this menacing and unlawful boycott thus vitally impairing your commercial and material interests and forfeiting the constitutional rights, guaranteeing personal and individual liberty; or,

"(2) To co-operate with the forces of law and order restoring a spirit of equal justice and building up the industrial peace and prosperity of the community.

"We say to you, our former employees, that there are vacancies now open to a considerable number upon the lines of the Lehigh Traction Company. We say to every one of you who is worthy of confidence that we will be glad to receive your application and to place you at work as soon as the circumstances warrant. No one of you will be discriminated against because of union affiliation. It is fundamentally wrong that a majority of you should suffer for the misdeeds of a dishonest minority. We regret that all worthy employees cannot be taken back at this time. We cannot repudiate our existing contracts with our present employees, but we will unhesitatingly covenant with all of you that you will receive fair, courteous and honest treatment such as every honest and deserving man is entitled to receive.

"You must take one of two positions:

"(1) Either be honest, God-fearing and courageous men, asserting your inviolate right honestly to support yourselves and families; or,

"(2) Ally yourselves with the forces of dishonesty and be one of them, for there is no middle ground to take."

References to the strike have appeared previously in the ELECTRIC RAILWAY JOURNAL in the issues of Jan. 24, page 201; April 18, page 894, and July 18, page 140.

Rapid Transit for Cincinnati

The report of Prof. George F. Swain of the Boston Transit Commission, on the probable cost of a complete rapid transit system for Cincinnati, consisting of an interurban entrance to the city, a belt line and an elevated system, is expected to be made to the Cincinnati Rapid Transit Commission shortly.

About two years ago the Council of Cincinnati authorized the Mayor to appoint a rapid transit commission, which is now composed of E. W. Edwards, chairman; George F. Dieterle, Dean Herrman Schneider, William Cooper Proctor, W. A. Julian and George Puchta. Shortly after the appointment of the commission, Bion J. Arnold was retained to make a preliminary survey with the view of working out an interurban entrance to the city. Mr. Arnold suggested the use of the canal right-of-way and a belt line to take care of all lines. The canal is owned by the State, and subsequent to Mr. Arnold's report the city secured a perpetual lease on the canal at a rental of $30,000 a year.

Professor Swain took charge of the work of getting a definite survey made, on which to base an estimate of the probable cost of a complete rapid transit system, and secured George Edwards, New York, to oversee the survey and have charge of the work in Cincinnati.

The preliminary report of Professor Swain was referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 13, 1913, page 1252, and Dec. 27, 1913, page 1349.

Investigation of New Haven's Massachusetts Electric Railway Holdings

The Massachusetts Public Service Commission has sent a communication to Attorney-General Boynton, referring to him for investigation and whatever action he may deem proper a report of the Interstate Commerce Commission as to the relation of the New Haven railroad to certain electric railways in western Massachusetts. The Interstate Commerce Commission report alleged that, although a decree of the Massachusetts Supreme Court prohibited the New Haven from holding directly or indirectly stock in the electric railways the railroad retained its control of these lines, formerly through the New England Investment & Security Company, and now through Sanderson & Porter. The report alleged further that the firm of Sanderson & Porter was connected by financial and business dealings with the New Haven. Appended to this report was a letter from C. S. Mellen, formerly president of the New York, New Haven & Hartford Railroad, to Bentley W. Warren, marked "personal and confidential" and dated July 20, 1908, in which Mr. Mellen wrote of advantages to be derived from owning common shares of the New England Investment & Security Company, and stating that through this company, control of the electric railways concerned was "left in friendly hands." In conclusion, Mr. Mellen expressed the opinion that the time would come "when good sense will prevail and the policy of the commonwealth be changed so far as railroads controlling railways is concerned."

In concluding its communication to the attorney-general, the Public Service Commission said:

"Detailed evidence upon which these findings are based has not yet come to this commission, but we are informed that it will shortly be in print and available for your examination. The Public Service Commission hereby reports this apparent disregard of the law of Massachusetts and the decree of the court of last resort of the commonwealth to your department for such investigation and action as you may deem requisite. It is perhaps proper to add that this commission would be glad of any suggestions as to what further duty, if any, in the premises you may deem to rest upon this commission."

Salt Lake & Utah Railroad Opened

Electric service was inaugurated on the Salt Lake & Utah Railroad on July 24, between Salt Lake City and Provo, a distance of 48½ miles. The roadbed for this line was completed early in the season and steam service was installed pending the completion of the delivery and installation of the electrical equipment. The installation of the equipment for the two substations and the outdoor switching stations was made in six weeks. The equipment, which was furnished by the Westinghouse Electric & Manufacturing Company, was installed under the direction of M. R. Davis, district superintendent of the Westinghouse company, with headquarters at Salt Lake City.

W. C. Orem, president and general manager of the Salt Lake & Utah Railroad, and W. R. Armstrong, assistant general manager and chief engineer, were congratulated on the excellent showing made. Just sixteen months was consumed in completing the line after construction work had been started. Approximately $2,000,000 had been expended for construction, equipment and right-of-way. The company owns all the right-of-way over which it operates, except the portions within incorporated towns. There are thirty-two scheduled stops between Salt Lake and Provo, many of which have heretofore been without direct rail connection with either of the present terminals of the road.

The road traverses the Salt Lake valley almost in its center. On either side there is an uninterrupted view of the mountains, and after the Jordan Narrows are passed one can see for miles on either side. The view of Utah Lake is so superb at one point that the officials of the company have named the place Lake View and will erect a station there. The cars are built entirely of steel. The present schedule of the road calls for seven trains each day between the terminals. The running time is one hour and forty-five minutes. Just as soon as the operation of the present road has been perfected construction will be started on the extension to Payson, the ultimate terminus.

Working Out Kansas City Franchise Details

The details of the new franchise of the Metropolitan Street Railway, Kansas City, Mo., are gradually being worked out, but it will require some time before the Kansas City Railways, the successor company, has complied with all the terms. The interurban roads have not all made new contracts, as the franchise provides they shall, and they are asking extension of time from the city and from the company.

There is now practically no chance of the question being raised as to the legality of the franchise election. One man who confessed to voting illegally has been sentenced to the penitentiary, and the charges of fraud are being dropped. Judge Seehorn of the District Court refused to allow the opening of ballot boxes in one precinct where charges had been brought against judges of tampering with the ballots. The court said that the law was clear that unless the election is contested or election officials are made defendants in a criminal action, the ballot boxes cannot be opened. Neither of these two things seems likely to happen.

Interest is keen in the selection of the site for the interurban station. If the interurban officials are unable to agree on a site it is possible that the public may vote on the subject.

New Subway Construction Contracts in Brooklyn

The Public Service Commission for the First District has before it reports from Alfred Craven, its chief engineer, with respect to two stations on Fifty-ninth Street, Manhattan. There are two schemes for the remodeling of the present station at Columbus Circle. In the first scheme passages are provided from the sidewalk from four points of the circle, with ramps to a mezzanine constructed beneath the tracks at their present grade. This would cost about $900,000. The other scheme would cost about $1,500,000. The plan to be followed out has not yet been decided upon.

During the week ended Aug. 1 the commission awarded two rapid transit contracts and authorized advertisements for two more. The contract for the construction of Section No. 5 of Routes Nos. 4 and 36, that part of the Broadway subway in Manhattan in Fifty-ninth and Sixtieth Streets, between Seventh and Second Avenues, was awarded to the Degnon Contracting Company, for $2,819,511. This is a two-track extension of the Broadway subway, and will have two stations, one at Fifth Avenue and the other at Lexington Avenue. The other contract awarded during the week was for the construction of station finish at the six stations on the extension of the Fourth Avenue, Brooklyn, subway from Forty-third to Eighty-sixth Street. On Aug. 21 the commission will receive bids for the construction of Section No. 3 of Route No. 33, in Brooklyn, and also for the supplying of more special work for the Fourth Avenue, Brooklyn, subway.

The commission has approved of a contract to be made by the New York Municipal Railway Corporation with the Federal Signal Company for the installation of track signals in the Centre Street loop subway. The Federal Signal Company was the lowest bidder for this work. The Union Switch & Signal Company protested to the commission, alleging that the Federal Company could not meet the requirements of the specifications without infringing on its patents. Commissioner Robert C. Wood held hearings in regard to this, but in view of possible delay that might ensue the commission determined to approve of the award of the contract to the Federal Company, subject to its giving assurances of indemnity against patent claims.

A letter has been sent to the Board of Estimate and Apportionment by the Public Service Commission in regard to subway train operation over the Queensboro Bridge and the necessary reconstruction of the bridge to accommodate such operation. There is a roadway on the bridge 52 ft. wide for vehicular use, but part of this space is also occupied by trolley tracks. Under the plan of reconstruction it is proposed to make two 26-ft. roadways on two levels, and each of these roadways will be free of all tracks and still give plenty of room for the subway and elevated railroad tracks that must go over the bridge. The estimated cost of this improvement is $2,116,000.

The Public Service Commission has approved a supplementary contract between the New York Municipal Railway Corporation and George W. McNulty, Inc., for the reconstruction of the Sea Beach Railroad. The McNulty Company has the present contract for the reconstruction of this line. Under the supplementary contract the road will be made a four-track line, and the entire line will be ready for operation about May 1, 1915. The supplemental contract will involve an expenditure of about $300,000.

Development Throttled in Missouri

Brief mention was made in the ELECTRIC RAILWAY JOURNAL of Aug. 1 of the address made recently by William B. McKinley, president of the Illinois Traction System, before the Commercial Club of Jefferson City, Mo. Mr. McKinley is quoted in part as follows:

"I have had many letters from people of Missouri soliciting my assistance in a movement to construct a system of interurban electric railroads in the State. Some of the propositions presented were entitled to consideration. Missouri's laws affecting corporations act almost as a complete bar to the building of an interurban electric system. One statute provides that not more than 10 per cent of the stock of a Missouri corporation can be held by a foreign corporation. This is a deadener to transportation development such as the State needs. Nobody will buy bonds and stock in an enterprise which is not backed by some other corporation with established credit. This means that the larger corporations must own the stocks and bonds and put up the money for the construction of the road. This statute I consider is a tremendous handicap to Missouri. We could never have built 575 miles of interurban railway in Illinois if that State had a law such as your 10 per cent statute.

"You have, too, in Missouri a Utility Commission composed of high-class men. They, like utility commissions in other States, want to be fair to the public and the public service corporations. But they must track the letter of the law laid down by the Legislature, and this law is a considerable handicap to new enterprises. But the commission law does not affect the transportation development of Missouri to the extent that the 10 per cent statute does. That statute practically acts as a bar to the construction of a railway.

"Another thing. People are deterred from putting their money into a utility corporation with all its uncertainties if they are restricted to 6 per cent dividends if they win and nothing at all if they lose. Why invest money in an untried and uncertain proposition when substantial loans upon lands return the investor from 6 per cent to 7 per cent on his money?"

New Construction in Cleveland

It is asserted by Peter Witt, street railway commissioner of Cleveland, that the section of Euclid Avenue between East Twenty-second Street and East Fortieth Street will be occupied by railway tracks within another year. This section has always remained free from railway tracks through an agreement among the owners of abutting property. It was occupied by residences of some of the most prominent people in the city. The trend of the residence and the business district is toward the hills east of the city. The property owners' agreement will expire early in 1915, it is said, and an attempt will then be made to secure consents for the railway tracks. The special track has already been laid at the Fortieth Street end of the section and only a short time will be required to construct the remainder. The company has always used a section of Prospect Avenue, the next street south, to complete its Euclid Avenue line east and this has been a source of inconvenience and loss of time.

The Cleveland Railway is repairing the pavement between and along its tracks on many streets, in compliance with a request from the public service department of the city. Pavements in general are in poor condition and the company hoped that work would be left until the city was ready to go ahead with the work that it eventually must do in the street.

On account of borings made on Euclid Avenue the impression became prevalent recently that the Cleveland Underground Rapid Transit Company and the Pennsylvania Railroad were planning a joint terminal in the vicinity of Euclid Avenue and East Fifty-fifth Street, but W. R. Hopkins, president of the Rapid Transit Company, who was in New York, failed to confirm the report. He said that the borings were being made in accordance with a general plan of investigation along the proposed rights-of-way.

Contracts for the new division buildings at Superior Avenue and East 103d Street have been awarded to the William I. Thompson Company. There will be four buildings and they will be completed by January, 1915, when the old carhouse at Superior Avenue and East 105th Street will be abandoned and perhaps sold. The cost of the improvement will be about $150,000.

Toledo Municipal Ownership Ordinance Carried

The municipal ownership ordinance, initiated at the instance of the labor unions by the Municipal Ownership League, carried by a plurality of 1100 at the election in Toledo, Ohio, on Aug. 4. Out of about 37,000 possible votes, approximately 20,000 were cast. This is only a little more than twice the number that were signed to the petitions for the initiation of the measure and the result indicates that interest was lacking on the part of those opposed to it. An appeal for an injunction against the election was refused on July 30 by the Court of Appeals.

The Toledo Railways & Light Company made no stand against the ordinance. This is in accord with the policy that has been followed. The officials desire that the people shall thoroughly understand the necessities of the city and the requirements imposed on the company, so that, once settled, the present question will remain settled.

The ordinance merely expresses the will of the electors who cast their votes and does not carry with it authority to issue bonds. Another election will be necessary on the bond proposition, a two-thirds vote being then required.

On the morning following the election there seemed to be some doubt at Toledo as to whether a majority or a two-third vote is necessary to enact an ordinance such as was voted upon. Should it be found true that a majority is sufficient, the injunction suit against the election may be carried to the Supreme Court. The judges of this court are now taking their vacation and the case, if appealed, cannot be heard until some time in the fall.

Decision Against Cincinnati.—The Public Utilities Commission of Ohio has decided that the Cincinnati Traction Company cannot be compelled by the city to extend its Warsaw Avenue line to Price Hill, as the physical difficulties involved in the construction of such a line would entail a tremendous outlay of money and the line be extremely dangerous to operate. The city solicitor has asked for a rehearing before the State Supreme Court.

New York State Railways Wage Arbitration.—The board selected recently to arbitrate the question of whether the wages of the employees of the New York State Railways shall be increased began holding sessions in Syracuse on July 28. The arbitrators are Thomas Spratt, Ogdensburg, N. Y., representing the company; James E. Roach, Schenectady, representing the men, and Charles P. Neil, chairman, formerly United States Commissioner of Labor.

Municipal Ownership Election in Pekin.—The City Council of Pekin, Ill., has set Aug. 21 as the date for holding a special election to vote $48,000 of bonds for the purchase and rehabilitation of the Pekin & Petersburg Railway in Pekin and the building of an extension. The report of the Mayor and the Corporation Counsel of the city to the City Council favoring the purchase and giving the details of the cost of rehabilitation was referred to in the ELECTRIC RAILWAY JOURNAL of May 9, page 1055.

Springfield Rate Rehearing Denied.—The Public Service Commission of Missouri has overruled the motion of the Springfield Gas & Electric Company for a rate rehearing, the application for which was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1. The commission recently made an order reducing the company's rates in an amount equal to 37 per cent of its earnings in 1913. The commission also struck off from the company's ratemaking valuation $18,000 paid for managerial services to the officers of the Federal Light & Traction Company of New York, and limited the company's return to 7 per cent.

Ouster Suit in Seattle.—Argument in the controversy between the City of Seattle, Wash., and the Seattle, Renton &

Southern Railway is being heard before United States District Judges Cushman and Neterer. The question before the court is whether the railway so violated its contract as to give the city the right to pass the ordinance repealing its franchise. The temporary injunction prohibiting the city from interfering with the operation of the road has been continued pending the decision by the court. Harold Preston, representing the company, opened the case by calling William R. Crawford, former president of the line. Mr. Crawford averred the line had been operating under city franchise No. 15919, amended, and had acquired "deeds or possession to all the right-of-way." Presumably this was to combat the assertion of the city that the road is operating on public property and must govern itself accordingly.

Home Rule Agitation in Washington.—The City Commission of Tacoma, Wash., favors home rule as regards its public utilities and has approved a motion of Commissioner of Finance Atkins to write representatives of other cities to confer with the Tacoma commissioners. Mr. Atkins is quoted as having said: "The Public Service Commission is a public service nuisance. It voted against our law hitting at strap-hanging on street cars and it prevents the city from regulating the public service corporations as they should be. There is no reason why 140 persons, mostly farmers, in the House of Representatives, should pass laws that will prevent cities of 100,000 or more ruling themselves. When the State Public Service Commission comes into a city like Tacoma and tries to tell the city what it shall and shall not do in regulating its street railway traffic, it is time a halt was called. What do three men down at Olympia know about our local conditions that they should try to regulate us?"

Municipal Railway Affairs in Seattle.—The purchase of the Loyal Railway, Ballard, Wash., and its use as one section of the Seattle municipal railway, is being considered by the City Council. The question of purchasing this line arose when the matter of extending the existing municipal line to Ballard was being considered. This was noted in the ELECTRIC RAILWAY JOURNAL of July 25. The City Council contemplates extending the line from its present terminus across the Lake Michigan Canal into Ballard, probably by way of Leary Avenue to Market Street and up Market Street to Sixty-fifth Street. Here the line will be connected to the Loyal Railway, providing that property is purchased or taken over by the city. If the city finally gets the right to run cars in the Rainier Valley, extends the Highland Park & Lake Burien Railroad across Spokane Avenue to Fourth Avenue and up Fourth Avenue to the southern terminus of Division "A" and then builds the Ballard extension, its system will extend from one end of the city to the other.

Newspaper Appreciation in Dubuque.—The Union Electric Company, Dubuque, Ia., came in for unstinted praise in articles about the company's activities which were published in the Dubuque *Times-Journal* of July 19, and the Dubuque *Telegraph-Herald* of July 26. The article in the *Times-Journal* dealt particularly with the new loop system of the company. It was illustrated with pictures of the loop at Union Park and of Eagle Point Park, which overlooks the Mississippi River. The article in the *Telegraph-Herald* was about the general recent improvements of the company, and contained an estimate of $115,000 as the probable increase in land values by a line into what is now sparsely settled territory opened recently by the company. The article was concluded in part as follows: "And to return to the simile of painting the barn—the one who furnished the paint (in this case the Dubuque Electric Company) does not profit a cent from the increase in real estate values, but must be content to wait until the territory has been built up and take its revenue from the nickels that the patrons of the line offer. And these nickels will not be as plentiful as in another city, because Dubuque rejoices in a half-fare workingmen's schedule."

PROGRAM OF ASSOCIATION MEETING

Colorado Electric Light, Power & Railway Association

The Colorado Electric Light, Power & Railway Association will hold its twelfth annual convention at Glenwood Springs, Col., on Sept. 3, 4 and 5.

Financial and Corporate

World's Stock Markets Suspended

The recent declaration of war by Austria on Servia and the subsequent broadening of the conflict by the inclusion of Germany, Russia, France and England has brought about an unparalleled condition of panic on all Continental and American stock exchanges. Most of the Continental exchanges closed on July 28 or July 29, but the New York Stock Exchange remained open until the morning of July 31 and was throughout the week virtually the only free market in the world for securities. During this week the work of financiers has been devoted to the substitution of special machinery for that which customarily supplies the needs of trade, on account of the stoppage of the ordinary processes of international relations in trade and finance and the conditions created by heavy foreign drafts upon the American gold supply.

According to the *Wall Street Journal*, there has been a large foreign liquidation in unlisted issues of public utility securities, which has driven the prices of these stocks down to record low prices in several instances. In the last few years the stocks of many public utilities have been sold to foreign investors, who also have been heavy buyers of public utility bonds. A number of issues have been listed on the London Stock Exchange and have been regularly quoted there. Until the war liquidation there was a steady increase in the movement of utility securities to London, and large buying particularly by English investors. For some weeks these stocks and bonds have been coming back to the American market. For a time the liquidation, being well distributed, was fairly well taken care of, but the buying power was finally exhausted and now only nominal quotations can be obtained.

Among the American public utility issues listed on the London Stock Exchange are Cities Service Company, New York, N. Y., common and preferred stocks; Consolidated Cities Light, Power & Traction Company, New York, N. Y., 5 per cent bonds; Georgia Light, Power & Railways Company, Macon, Ga., common stock and first lien bonds; Pacific Gas & Electric Company, San Francisco, Cal., first and refunding general mortgage bonds; Philadelphia Company, preferred stock and debentures; Alabama Traction, Light & Power Company, Ltd., New York, N. Y., stock and first mortgage bonds; Havana (Cuba) Electric Railway bonds; Manila Electric Railroad & Light Corporation, Manila, P. I., stock, bonds and debentures; Michigan United Railways, Jackson, Mich., first and refunding bonds; Portland Railway, Light & Power Company, Portland, Ore., first mortgage bonds, and Porto Rico Railways, Toronto, Ont., general and refunding bonds.

The issues having the most general market in London are those of the Cities Service Company and the Alabama Traction, Light & Power Company. It is probable that the Cities Service Company's issues have suffered more than any other securities from the foreign liquidation, as they have been much more generally distributed abroad. Large blocks of both the common and the preferred stocks of this company were liquidated in New York during the last two weeks, forcing prices to a new low level.

According to a circular sent to stockholders of the Cities Service Company, the directors have decided to defer the payment of further cash dividends until a reliable forecast can be made of the outcome of the present strained condition in the financial markets. The board feels that all cash resources of the company should be conserved. The decision of the board was undoubtedly hastened by the practically prohibitive rate of exchange now applying to dividend payments abroad. Another meeting was set for Aug. 7 further to consider the matter of dividends in the light of the then existing situation. The board is planning to issue a weekly letter to the stockholders until normal conditions are established.

In addition to the above stocks having a market both in New York and London, there are a number of stocks in Canadian companies traded in on the London Stock Exchange which have their markets in Montreal and Toronto. Among these are Mexico Tramways, Mexico City, Mexico; Montreal (Que.) Tramways; British Columbia Electric

Railway, Ltd., Vancouver, B. C.; Quebec (Man.) Electric Railway; Brazilian Traction, Light & Power Company, Toronto, Ont., and several others. The closing of the Montreal and Toronto exchanges left these stocks practically without a market and attempts made to sell them on the New York Stock Exchange were without much success. The Brazilian Traction, Light & Power Company, the largest of the above electric railways, having $1,041,772 of ordinary stock, slumped badly in Montreal on London selling.

While public utility operators in the United States deplore the events which have caused so many issues to be thrown back on the American market at ruinous discounts to the investor, they believe that with more settled conditions there will be no great difficulty in again establishing a foreign market for American public utility securities, for the foreign investor has been too well educated as to the value of such securities.

Middle West Utilities Company

The total earnings and expenses of the Middle West Utilities Company, Chicago, Ill., for the fiscal year ended April 30, 1914, follows:

Income:	
Total income (including securities valued by the board of directors at $362,348)	$1,466,761
Expenditure:	
Administration expense	$141,263
Miscellaneous charges, including taxes, depreciation of office furniture, etc	16,699
Depreciation and losses on investments	7,096
Total	$165,058
	$1,301,702
Interest on three-year 6 per cent gold notes	$146,829
Other interest	80,687
Total	$227,516
	$1,074,186
Appropriated for writing off discount on three-year notes and expenses in connection with issue of capital stock	75,000
Available for dividends	$999,186
Dividends on preferred stock paid and accrued	566,925
Balance carried to surplus	$432,261
Middle West Utilities Company's proportion of aggregate surplus of subsidiaries	147,416
Combined surplus earnings accruing to company	$579,677

The report of the company states that its policy in keeping the junior securities of the subsidiary companies as far as possible in its own treasury is being continued, and its holdings of their preferred and common stocks has been greatly increased during the past year. During the year $3,500,000 of three-year 6 per cent collateral gold notes, dated June 1, 1913, and secured by the deposit of $4,667,000 par value of mortgage bonds of subsidiaries, were sold and the proceeds used for corporate purposes.

The combined earnings of the various subsidiaries during the company fiscal year follow:

Gross earnings	$7,345,350
Operating expenses, including taxes	5,036,696
Net earnings from operation	$2,308,654
Fixed charges to outside holders	$908,032
Interest on junior securities, dividends on stock and proportion of undistributed earnings due outside holders	474,817
Total deductions	$1,382,849
Earnings accruing to securities owned by Middle West Utilities Company	$925,805

Of the earnings as shown above $336,127 came into the company's treasury as interest on bonds and debentures and $442,262 as dividends on stocks owned, leaving the balance of $147,416 as the company's proportion of the surplus carried in the aggregate surplus accounts of the subsidiaries on their own books. It is stated that during the past year subsidiary operating companies were engaged in making considerable physical improvements to their property, from which they have not as yet received full benefit. They are at present serving an aggregate estimated population of between 900,000 and 950,000 people in 333 communities embraced in ten states. Among the companies controlled by this corporation are the following: Central Illinois Public Service Company, Freeport Railway & Light Company, Interstate Public Service Company, Louisville & Northern Railway & Lighting Company, Kentucky Utilities Company, Marquette County Gas & Electric Company, and Twin State Gas & Electric Company.

Income Bonds and Injuries Reserves

In view of the suit brought against the New York (N. Y.) Railways, charging the retention of excessive injuries and damages reserves instead of the full payment of interest on income bonds, as noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1, the report, just available, of a hearing held before the Public Service Commission for the First District of New York on May 14 is interesting. At this hearing officials of the company testified that the receiver of the old Metropolitan Street Railway had set aside a reserve of 8 per cent of the gross passenger revenue for injuries and damages and that the reorganized company, the New York Railways, had continued this percentage from Jan. 1, 1912, until the end of the calendar year 1913.

In the latter half of this year the holders of the company's income bonds began their present complaint concerning the size of the reserves, and after a report on the subject by Ford, Bacon & Davis, the board of directors decided that 7½ per cent of the passenger revenue was sufficient to provide for injuries and damages during 1913. In establishing this figure, the firm did not make any allowance for the factor of safety, but based its result upon the company's experience during the last five years. A reduction of the 1913 reserve from 8 per cent to 7½ per cent would have helped the income bondholders to the extent of one-quarter of 1 per cent, but the Public Service Commission ruled against this proceeding on the ground that the railway had no right to make the transfer until all the 1913 liabilities had been liquidated.

Consolidation Approved in Youngstown

The directors of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, have approved a plan for unifying the corporate organization of the company, which now consists of thirteen electric railways and six electric light companies. Under the proposed plan the following railways will eventually be consolidated with the Mahoning & Shenango Railway & Light Company: Mahoning Valley Railway, Mahoning Valley Southeastern Railway, New Castle Electric Railway, New Castle & Lowell Railway, New Castle & Mahoningtown Street Railway, Poland Street Railway, Sharon & New Castle Railway, Sharon & New Castle Street Railway, Sharon & Wheatland Street Railway, Valley Street Railway, Wheatland Street Railway, Youngstown Park & Falls Street Railway and Youngstown & Sharon Street Railway.

An application has been filed with the Pennsylvania Public Service Commission for permission to acquire the stocks of the Pennsylvania companies owned by the Youngstown-Sharon Railway & Light Company, and the Sharon & New Castle Railways, the capital stock of which is owned by the Youngstown-Sharon Railway & Light Company. On July 16 the Ohio Public Service Commission granted an application to sell the property of the Youngstown Consolidated Gas & Electric Company to the Youngstown & Sharon Street Railway. The Pennsylvania Public Service Commission has before it at the present time in other cases the question as to whether electric light companies in Pennsylvania can be merged with electric railways.

New Haven Directors Sued by Stockholder

A suit for an accounting has been filed in the Federal District Court against the estate of J. P. Morgan and the officers and directors of the New York, New Haven & Hartford Railroad as well as some of the former directors. The complainant is T. D. Clark, holder of twenty shares of New Haven stock. The plaintiff lays the blame for the alleged "looting" of the road at the door of a "triumvirate" consisting of the late J. P. Morgan, Charles S. Mellen and William Rockefeller. The suit calls for the appointment of a receiver, "not for the New Haven corporation, but to take charge of a disbursement to stockholders of any moneys that may be recovered by the stockholders through the suit." An injunction is sought to prevent the directors from authorizing further a diversion of $3,048,000 of the New Haven funds to cover up a deficit in the overhead charges and operating expenses of the New York, Westchester & Boston Railway, and the Connecticut and the Rhode Island electric railways.

Albany Southern Railroad, Albany, N. Y.—The Public Service Commission for the Second District of New York has so amended a recent order authorizing the issue of $98,000 of bonds by the Albany Southern Railroad as to authorize the company to apply $2,500 of the proceeds to the purchase of an overhead coal conveying cable to its power plant at Stuyvesant Falls, and $7,500 for the purchase of a new electrical express car equipped with auxiliary snow attachments. This sum of $10,000 was originally to have been expended for the construction of a track to the Stuyvesant Falls plant, which the cable conveyor will make unnecessary.

American Light & Traction Company, New York, N. Y.—The gross earnings of the American Light & Traction Companay for the year ended June 30 were $4,415,611. Expenses amounted to $139,466, leaving $4,276,145 of net earnings. The total surplus earnings were $13,249,291, and after deducting $3,671,627 for cash and stock dividends, there was left a net surplus of $9,577,664.

Chicago (Ill.) Elevated Railways.—The following particulars have been made public regarding the reissue of $7,000,000 of ten-year 6 per cent debentures made in connection with the payment on July 1 of $30,000,000 of three-year 5 per cent notes. The debentures are dated July 1, 1914, and due July 1, 1940, but redeemable in whole or in part when drawn by lot at par and interest on any interest date up to and including July 1, 1919, and thereafter at a premium of 2½ per cent upon public notice in New York for at least four weeks prior to redemption. Interest and principal are payable in gold at the National City Bank of New York without deduction for any tax or taxes other than such as may be imposed upon the holders under the authority of any federal income tax laws under present or future legislation. Previous references to the refinancing of the $30,000,000 note issue were made in the ELECTRIC RAILWAY JOURNAL of June 30 and July 11.

Chicago & Interurban Traction Company, Chicago, Ill.—According to the operating statement of the Chicago & Interurban Traction Company for the year ended Feb. 28, 1914, the revenue from transportation was $209,811, as compared to $253,126 the year previous. Other revenues showed a slight decrease, while operating expenses increased from $127,272 in 1913 to $137,414 in 1914. Bond interest and taxes increased from $78,008 in 1913 to $79,123 in 1914, giving a net income of $76,474 in 1914, as compared to $50,101 in 1913. The balance sheet of the company shows that the cost of the property increased from $2,507,930 in 1913 to $2,551,780 in 1914, and current assets from $25,393 in 1913 to $42,375 in 1914. Bills payable increased $10,000 in 1914, but the current liabilities showed a slight decrease, giving an increase in surplus of $52,474 for the year.

Cincinnati (Ohio) Traction Company.—The report of the Cincinnati Traction Company to the city auditor for the quarter ended June 30 shows that the receipts for April were $440,918; for May, $478,417, and for June, $469,444, or a total of $1,388,779. Of this the city received 6 per cent, or $83,327. For the same period last year the receipts aggregated $1,205,584.

Columbus Railway, Power & Light Company, Columbus, Ohio.—At an adjourned meeting on July 29 the stockholders of the Columbus Railway, Power & Light Company, Columbus, Ohio, voted to approve the proposed increase in capital stock from $11,550,000 to $15,145,000 which was referred to in the ELECTRIC RAILWAY JOURNAL of July 4 and July 25. This action of the stockholders, it is believed, will render possible a rearrangement of securities that will permit of making such improvements and extensions as are now needed to furnish increased service. More than three-fourths of the stock was voted in favor of the financing plan. The increased capitalization is to be issued in prior preferred stock to be exchanged for $3,145,000 of first consolidated mortgage forty-year 4 per cent bonds of the Columbus Railway Company, and $450,000 of twenty-five-year 6 per cent mortgage bonds of the Columbus Electric Company. It is understood that the company will ask the Public Utilities Commission for permission to issue $5,000,000 of bonds to be exchanged for other outstanding bonds and $500,000 to use for improvements and extensions. The fixed charges of the company will not be increased to any extent, as the interest charges on the additional bonds will be offset by the cancellation of the floating debt made possible by a second assessment paid by stockholders.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The recent acquisition by the Commonwealth Power, Railway & Light Company of the old Danville (Ky.) Gas Company's franchise and plant is declared to be the first step in the extension of interurban railway service from Lexington to Danville. The announcement carried in the papers of the State results from the recent inspection visit of Samuel E. Wolff, of New York, and A. C. Blinn and F. J. Haas, of Evansville, Ind., representatives of the Commonwealth Power, Railway & Light Company, to Danville. The projected railway is to run through Boyle, Mercer and Jessamine counties, touching the county seats of Danville, Harrodsburg and Nicholasville. At the latter place it would connect with the existing line out of Lexington.

Detroit (Mich.) United Railway.—In regard to the application recently made by the Detroit United Railway to the Michigan Railroad Commission for authority to issue securities and for an appraisal, as noted in the ELECTRIC RAILWAY JOURNAL of July 25, an officer of the company is quoted as follows: "The commission will begin soon the work of appraising the properties of the Detroit United Railway, the Detroit, Jackson & Chicago Railway, the Detroit, Monroe & Toledo Short Line and the Detroit & Port Huron Shore Line Railway. The appraisal will cover not only Detroit, but also the other cities served by the interurban lines. This appraisal will have nothing to do with that now under way in the city of Detroit. It is distinct and for a different purpose."

Hudson & Manhattan Railroad, New York, N. Y.—The Hudson & Manhattan Railroad has been authorized by the Public Service Commission for the First District of New York to issue $202,500 par value of first lien and refunding mortgage bonds. The bonds must be sold at not less than 80, and $162,000 of the proceeds is to be used to reimburse the company for moneys expended from income or other moneys in the treasury not secured by or obtained from the issue of stocks, bonds, etc., and applied to construction, completion, extension or improvement of the company's facilities. In addition $40,500 is to be allowed for the expenses of the sale of bonds but must be amortized by the company.

Ithaca (N. Y.) Traction Corporation.—The Ithaca Traction Corporation, which succeeds the Ithaca Street Railway and its receivers, as noted in the ELECTRIC RAILWAY JOURNAL of March 7 and April 11, was authorized by the Public Service Commission for the Second District of New York on Aug. 3 to give a mortgage to the Columbia-Knickerbocker Trust Company of New York for $2,000,000, to secure an issue of first refunding mortgage 5 per cent fifty-year gold bonds. To acquire all of the property of the Ithaca Street Railway $211,000 of the bonds and $400,000 capital stock will be issued. In addition, $277,000 of the new bonds will be sold for cash at not less than 80, to net $221,600, for improvements.

Kansas City Railway & Light Company, Kansas City Mo. Committees representing the holders of certificates of deposit for the 6 per cent five-year collateral gold notes of the Kansas City Railway & Light Company, due Sept. 1, 1912, have decided that the holders are entitled to receive new certificates or cash pursuant to the reorganization of the company. Aug. 15, 1915, has been fixed as the closing date.

London & Lake Erie Railway & Transportation Company, London, Ont.—The $30,000 of mortgage bonds, upon the issuance of which the shareholders of the London & Lake Erie Transportation Company are to vote Aug. 18, as noted in the ELECTRIC RAILWAY JOURNAL of July 25, are to be secured by a first mortgage covering such portion of the property now constructed and to be constructed as the directors may decide. The proceeds are to be used for retiring $700,000 of first mortgage 5's due 1950, for paying certain outstanding liabilities and for making authorized extensions and improvements.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—Merrill Oldham & Company, Boston, have purchased $1,000,000 of twenty-year 5 per cent mortgage bonds of the Massachusetts Northeastern Street Railway. The proceeds of these bonds, the petition for whose authorization was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1, are to be used for refunding the outstanding bonds of electric railways taken over by the company and for the payment of $130,000 of floating debt. The order of the commission authorizing these bonds was made in substitution of an order dated Dec. 31, 1913, authorizing the same amount of bonds, none of which have been issued.

New Orleans Railway & Light Company, New Orleans, La.—It is reported that the New Orleans Railway & Light Company has negotiations under way with the Louisville & Nashville Railway for the purchase of the Pontchartrain Railway extending from Pontchartrain Junction to Milneburg, La., a distance of 4.96 miles. It is proposed to convert the road into an electric line. An enabling act to permit steam roads to be leased or sold to electric railways was recently introduced in the Louisiana Legislature.

Pennsylvania Tunnel & Terminal Railroad, New York, N. Y.—The operating revenues of the Pennsylvania Tunnel & Terminal Railroad, which owns the North and the East River tunnels of the Pennsylvania Railroad, were $322,785, an increase of $11,459, for the year ended Dec. 31, 1913. The operating expenses, including $1,088,067 for taxes, amounted to $2,792,052, an increase of $109,559. There was an excess of expenses for the period of $2,469,266. Other income amounted to $542,424, giving a gross income deficit of $1,926,842. Mortgage interest amounted to $900 and hire of equipment $115,697, leaving a total deficit of $2,043,439. The total amount to the debit of profit and loss on Dec. 31, 1913, amounted to $6,007,899. It is to be noted that the operating revenues of the company do not include any proportion of the revenues from traffic carried over this line and the Pennsylvania Railroad. The operating company paid all operating deficits.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—On Aug. 3 the Ohio Public Utilities Commission granted authority to the Portsmouth Street Railroad & Light Company to issue $250,000 of 6 per cent preferred capital stock and $500,000 of 6 per cent twenty-year bonds. The proceeds are to be used, it is understood, in extending the interurban line and making other betterments and improvements.

Southwestern Utilities Corporation, New York, N. Y.—The Southwestern Utilities Corporation, which controls the Southwestern Power & Light Company and through it the Paris Transit Company, Dallas, Tex., recently called for tenders on its five-year 6 per cent notes at not exceeding 101 and interest, sufficient to exhaust $590,217 deposited with Bankers' Trust Company, New York, trustee. Proposals for the sale of the notes had to be submitted to the trustee by Aug. 6, and notes purchased were delivered by Aug. 10, when interest on the notes purchased ceased.

Titusville (Pa.) Electric Traction Company.—The approaching sale of the Titusville Electric Traction Company by William J. Smith, receiver, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1, has been set for Aug. 25 at Titusville. All the rights, franchises and property of the line, running from Pleasantville through Titusville to Tryonville, will be sold. The sale will be subject to the liens of the mortgage of the company to E. T. Hazeltine, trustee, dated 1898, for $100,000, and the mortgage to the Knickerbocker Trust Company, dated March 25, 1912, for $200,000. The terms of sale are 20 per cent of the amount of the bid at the time of sale and the remainder upon confirmation of sale and delivery of deed.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—At the annual meeting of the stockholders of the Toledo, Bowling Green & Southern Traction Company on Aug. 4, the following directors were elected: H. A. Rothier, F. C. Lawson, B. L. Kilgour, A. J. Becht, Charles Kilgour, Morris McGrew, A. J. Buvinger and Charles Blackburn, all of Cincinnati, and Charles F. Smith, of Findlay. The directors then elected the following officers: President, B. L. Kilgour; vice-president, Charles Kilgour; secretary-treasurer, A. J. Becht, and general manager, Charles F. Smith.

United Railways Investment Company, San Francisco, Cal.—It is stated that the United Railways Investment Company has been taking advantage of the low prices of its first lien 5 per cent collateral trust bonds to anticipate its sinking fund purchases. Bonds to the par value of $100,000 have recently been purchased at an average price of 70, leaving $17,300,000 outstanding. The bonds have an annual sinking fund of $181,500, of which about $100,000 has been utilized.

Virginia Railway & Power Company, Richmond, Va.—The Virginia Railway & Power Company has applied to the New York Stock Exchange to list $750,000 of additional first refunding mortgage 5 per cent bonds, due 1934.

Washington-Oregon Corporation, Vancouver, Wash.—On the petition of the Fidelity Trust Company, Philadelphia, the United States District Court at Tacoma, Wash., has appointed a temporary receiver for the Washington-Oregon Corporation, which operates on an electric line between Vancouver and Sifton (Vancouver division) and Centralia and Chehalis (Twin City division). The trust company is trustee for $5,000,000 of bonds which the corporation issued in April, 1911. Of this issue an amount of $1,563,000 has already been sold.

Dividends Declared

Boston (Mass.) Elevated Railway, quarterly, 1½ per cent.

Detroit (Mich.) United Railway, quarterly, 1½ per cent.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent.

Massachusetts Consolidated Railways, Greenfield, Mass., quarterly, 1¼ per cent, preferred.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

HOUGHTON COUNTY (MICH.) TRACTION COMPANY

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$24,177	*$15,669	$8,508	$5,357	$3,151
1 "	"	'13	24,644	*15,108	9,536	5,630	3,906
12 "	"	'14	290,024	*177,505	112,520	67,219	45,301
12 "	"	'13	312,743	*178,067	134,676	68,058	66,618

JACKSONVILLE (FLA.) TRACTION COMPANY

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$76,647	*$44,571	$32,076	$12,561	$19,515
1 "	"	'13	59,834	*37,665	22,169	11,185	10,984
12 "	"	'14	727,976	*459,214	268,761	152,524	116,237
12 "	"	'13	586,487	*396,545	189,942	126,303	63,639

JOPLIN & PITTSBURG RAILWAY, PITTSBURG, KAN.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	June,	'14	$46,228	*$29,108	$17,120	$12,542	$4,578
1 "	"	'13	47,895	*29,069	18,826	12,542	6,284
12 "	"	'14	582,166	*360,230	221,936	150,500	71,436
12 "	"	'13	560,285	*328,650	231,635	150,500	81,135

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	June,	'14	$176,470	$78,197	$98,273	$57,697	$40,576
1 "	"	'13	148,222	75,043	73,179	67,518	26,661
12 "	"	'14	1,841,442	897,910	943,532	656,708	286,824
12 "	"	'13	1,661,961	826,181	835,781	534,590	301,191

PORTLAND (MAINE) RAILROAD

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	June,	'14	$93,108	*$55,584	$37,524	$20,143	$17,381
1 "	"	'13	93,150	*62,817	30,333	11,214	19,119
12 "	"	'14	1,046,674	*642,867	403,807	247,561	156,246
12 "	"	'13	1,007,479	*711,240	296,239	125,003	171,236

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	June,	'14	$530,974	*$283,049	$247,925	$183,987	$63,938
1 "	"	'13	568,875	*291,684	277,191	171,538	105,653
12 "	"	'14	6,701,878	*3,344,610	3,357,268	2,116,201	1,241,067
12 "	"	'13	6,683,215	*3,310,139	3,373,076	1,851,786	1,521,290

SAVANNAH (GA.) ELECTRIC COMPANY

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$71,500	*$46,310	$25,190	$22,916	$2,274
1 "	"	'13	70,026	*45,209	34,817	22,727	2,090
12 "	"	'14	844,556	*560,820	283,737	273,712	10,025
12 "	"	'13	782,654	*562,086	220,569	218,007	2,562

TAMPA (FLA.) ELECTRIC COMPANY

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	May,	'14	$83,719	*$44,264	$39,455	$4,453	$35,002
1 "	"	'13	69,556	*38,158	31,398	4,528	26,870
12 "	"	'14	921,648	*511,968	409,680	55,776	353,904
12 "	"	'13	771,535	*404,078	367,457	54,977	312,480

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m.,	June,	'14	$790,335	*$392,533	$397,801	$225,274	$172,527
1 "	"	'13	754,495	*363,242	391,253	232,097	159,156
6 "	"	'14	4,517,553	*2,386,708	2,130,845	1,358,557	772,288
6 "	"	'13	4,230,531	*2,166,225	2,064,306	1,401,440	662,866

*Includes taxes.

Traffic and Transportation

The I. C. C. Hearing at Peoria

At the hearing before the Interstate Commerce Commission at Peoria, Ill., on July 14 evidence was introduced by the Chicago, Ottawa & Peoria Railway that it was an interstate carrier and engaged in the business of handling freight, passengers and express in interstate commerce; that it had entered into negotiations with steam railroads to be joined as party defendants for obtaining through routes and through joint rates in connection with these several defendants, so that traffic originating upon or consigned to points and industries on the line of the Chicago, Ottawa & Peoria Railway could be handled in connection with these lines. It appeared from the testimony that under present conditions it is impossible for a shipper to ship his product satisfactorily over the Chicago, Ottawa & Peoria Railway, as in most cases the shipper would have to pay the full local rate to the point of interchange with the steam line and the local rates from such point of interchange to the point of destination.

Among the principal shippers represented at the hearing were A. Bryant & Sons Nursery, Princeton; C. A. Omen Lumber & Coal Company, Princeton; Morris Grain Company, Morris and Wilson Siding, Ill., and the General Roofing Manufacturing Company. All of these shippers testified that they were either entirely dependent upon the Chicago, Ottawa & Peoria Railway for handling their business, inbound and outbound, or were penalized by the lack of through routes, being compelled to pay a switching charge or cost of hauling their traffic from 1 to 3 miles to the nearest steam railroad station. It was shown by the testimony of these witnesses that in case through routes and joint rates were put into effect, the shippers would save several thousand dollars a year in switching charges and the cost of hauling. It was also brought out that in certain instances the steam lines had stated as their reason for refusing to establish through routes as requested that they had no interchange relations with railroads operated by electricity.

The matter will be taken under advisement by the commission. Both parties have been required to submit briefs. It is not expected that the case will be determined by the Interstate Commerce Commission before late in the fall.

Interurban Traffic in Milwaukee

Statistics of the Milwaukee Electric Railway & Light Company for 1913 and 1914 show the following average daily number of interurban cars operated in and out of the Public Service Building, Milwaukee, Wis., by months:

	1913	1914
January	242	232
February	244	226
March	246	230
April	252	242
May	296	316
June	400	328
July	418	380
August	400	...
September	332	...
October	278	...
November	246	...
December	232	...

The maximum number during any day during 1914 was 548.

Rhode Island Company Denies Fare Increase Is Excessive

The Rhode Island Company, Providence. R. I., has filed with the Public Utilities Commission of Rhode Island its answer to the complaint of the City Council of Woonsocket against the Woonsocket Street Railway relative to the fare charged between Manville and Fairmount. The company admits that it charges two 5-cent fares but denies that the distance between Manville and Fairmount is approximately 5 miles and avers that the distance is 7.57 miles. It admits that a 5-cent fare is collected between Manville and a point in Main Street near the center of Woonsocket and says that for passengers who have come from points beyond the limits of Woonsocket another fare is charged from Woonsocket to Fairmount. It avers that passengers boarding cars in Woonsocket are charged only one 5-cent fare in the Woonsocket, Cumberland line and Fairmount district, 4.84 miles. In short, the company contends that the conditions surrounding the Fairmount line will naturally adjust themselves when the territory is developed sufficiently and that owing to recent increases in operating expenses, due particularly to the new scale of wages granted to employees in July, 1913, and the recent renewal of tracks in Woonsocket and elsewhere, much of which was renewed not because of its poor condition but because of municipal requirement, the company is in a position where it can ill afford to grant or meet concessions that would in any way reduce its revenues.

Rock Island Southern May Use Terminal.—The Illinois State Public Utilities Commission has ruled that the Chicago, Burlington & Quincy Railroad has no right to exclude the Rock Island Southern Traction Company from terminal facilities at Galesburg, Ill.

Reduction in Fare in Marquette.—The Marquette City & Presque Isle Railway, Marquette, Mich., began the sale of six tickets for 25 cents on Aug. 2, in accordance with the terms of the ordinance under which it operates. The company has charged a straight 5-cent fare for the last five years.

Peculiar Heat Prostration in Louisville.—Overcome by the recent heat in Louisville, Ky., reaching 112 deg., a motorman on a Bank Street car of the Louisville Railway fainted. His car ran nearly a block before an inspector who chanced to be on board noticed that the motorman was incapacitated and stopped it. No harm was done to the passengers of the car.

New Ticket Plan on Connecticut Line.—The Hartford & Springfield Street Railway, Warehouse Point, Conn., has decided to give a six months' trial to the plan of selling a book of 100 tickets for $5 without regard to any time limit. These tickets will be issued to each patron individually and will be non-transferable and good until used. They will be on sale in each community served by the company and it will also be possible to obtain them by application to the conductors.

Increase in Average Length of Car Service.—A new schedule for the Mahoning & Shenango Valley Railway has been approved by the City Council of Youngstown, Ohio, and an ordinance will shortly be introduced to make it effective. Under this schedule the average length of service of all cars on all lines will be twenty hours and forty-eight minutes, or eighteen minutes longer than before. This is one of several changes being made by the railway to improve the local service.

Railway Men as Automobile Spotters.—Charles S. Hubbard, director of public safety of Pittsburgh, Pa., wrote a letter recently to P. N. Jones, general manager of the Pittsburgh Railways, suggesting a plan of co-operation by which the operating employees would aid the police by reporting the numbers of automobiles operated by drivers who persist in running by street cars which are taking on or discharging passengers, or who otherwise take chances which endangers the lives of persons in the automobiles or the passengers on the cars.

No Excess Fare on Brooklyn Rapid Transit.—The Brooklyn (N.Y.) Rapid Transit Company has been ordered by the Public Service Commission of the First District of New York to cease collecting an extra nickel from Rockaway Beach passengers who fail to buy through tickets. Such passengers are charged 5 cents to pass through the turnstiles, and then a 15-cent fare to Manhattan. The company is ordered to stick to the 15-cent rate, the commission holding that the law providing that steam railroads may collect excess fare when tickets are bought on a train does not apply to rapid transit lines.

Decrease in Electric Railway Fatalities.—The report of the National Highways Protective Society shows that 141 children were killed by vehicles in the streets of New York City since Jan. 1; twenty-three of them during July. Since the first of the year automobiles killed seventy-five children, trolleys twenty and wagons forty-six. Street fatalities in July totaled forty. Col. Edward S. Cornell, secretary of the society, says that electric railway fatalities are decreasing. Deaths by vehicular traffic in Manhattan are the lowest since July, 1908, but in Brooklyn there has been an increase, especially in automobile fatalities.

Opinion Concerning Regulation of Seats for Passengers.—David O. Mastings, city solicitor of Wilmington, Del., has rendered an opinion to the City Council relative to a pending ordinance requiring electric railways to provide seats for all passengers. Mr. Mastings states that if any city body has jurisdiction in the premises it is the Board of Public Utility Commissioners and not the City Council. In his opinion the commission can enact such regulation if reasonably drawn. He is of the same belief relative to a section of the ordinance prohibiting waits of more than ten minutes between cars, but in each case contingencies would have to be provided for.

Illinois Traction System Employees' Picnic.—The employees of the Illinois Traction System, Peoria, Ill., and of the Urbana & Champaign Railway, Gas & Electric Company, a subsidiary utility, held their annual all-day picnic on July 23 at Homer Park. About four hundred persons, mostly employees and their families, were present. They were transported to the picnic grounds in seven interurban cars, which left Champaign at 9 a. m. and returned at various times during the evening. The picnic was in charge of H. J. Pepper, general superintendent of the Urbana & Champaign Railway, Gas & Electric Company, and the expenses were paid by the Illinois Traction System.

Reduction in Duluth Fare Upheld.—Judge Stevens in the Circuit Court of Dane County has affirmed the order of the Railroad Commission of Wisconsin requiring the sale of six tickets for 25 cents by the Duluth-Superior Traction Company in Duluth. The company contended that the 5-cent fare was stipulated in the franchise and could not be revoked by the Railroad Commission. Judge Stevens cited the Milwaukee fare case in overruling this order and added that "the wording of the Superior franchise more clearly indicates that the provision as to a 5-cent fare is merely a limitation on the amount of the fare that may be charged than did the language under consideration in the Milwaukee case."

Cannonball Express on Interurban Line.—Officials of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.; the Union Traction Company of Indiana, Anderson, Ind.; the Winona Interurban Railway, Warsaw, Ind.; the Southern Michigan Railway, South Bend, Ind.; the Benton Harbor & St. Joseph Railway & Light Company, Benton Harbor, Mich., and the Wells-Fargo Express Company decided at a recent conference in Warsaw to institute on Aug. 2 the "Cannonball Express," a limited interurban fast freight between Indianapolis, Ind., and Benton Harbor, Mich. Through express cars leave Indianapolis at 7 p. m. and arrive at Benton Harbor at 10.30 a. m. the next day. Trains leaving Benton Harbor at 5 p. m. arrive at Indianapolis at 5.10 the next morning. This is said to be the fastest interurban service of its kind in the Central West.

Changes in Fare Ordered on Long Island Line.—The Public Service Commission of the Second District of New York, has issued an order requiring certain changes in fares on the New York & Long Island Traction Company's lines through Floral Park, New Hyde Park, Garden City Estates North, Mineola and vicinity. The commission has ordered the company to extend its local fare limit in New Hyde Park to Seventh Street. The commission has also ordered the company to sell its return trip tickets between Mineola and the New York City line on its cars or else to provide more agencies for their sale. At present there are agencies in Mineola and in Floral Park, but all persons boarding the cars at other than these points cannot avail themselves of the 15-cent return rate. The company is given thirty days to decide which of these alternatives for the further sale of round-trip tickets it will accept, and the case in this respect is kept open. The order of the commission becomes effective on Aug. 15.

Suspension of Proposed Fare Increase Ordered.—The Public Service Commission of Massachusetts has issued an order suspending the proposed change in the rate of fare for passengers on the Middlesex & Boston Street Railway, Newtonville, Mass. The proposed change in the fare was to have become effective on Aug. 3, 1914, as follows: 6 cents for every ride between any two fare limits, wherever situated, with an additional charge of 1 cent for every transfer issued. The commission has ordered that the operation of the new schedule be suspended and that the use of the new rates an charges be deferred until Oct. 1, 1914, unless otherwise ordered by the commission. The request by the company to be allowed to raise its tariff came as a result of the recent dispute between the line and its employees, and the decision of a board of arbitration that the carmen are entitled to a 15 per cent raise and back pay from June 1, 1913. It is estimated that the award will cost the company about $25,000 for back pay and about the same amount each year in addition to the amount heretofore paid for wages.

Express Service in District of Columbia.—The Public Utilities Commission of the District of Columbia has received requests from the public and applications from the street railways to install express service on certain lines. Conferences were held with representatives of the companies with a view to removing certain objections made by the public to the present methods of operating express cars in the District of Columbia. The commission says that the object of express service on a line is to segregate short-haul and long-haul passengers during the rush hours of traffic and that the necessity for this class of service exists only in the case of traffic on interurban lines from the center of the city towards the suburbs and on suburban lines. A trial was made of express service on the routes and under the conditions specified by the commission, and as this trial resulted in an improvement in the service and the companies concerned expressed their satisfaction with the provisions of the order establishing the experimental service, the commission has modified the order and made it a permanent one.

Massachusetts Commission on Car Equipment.—The Massachusetts Public Service Commission has issued a statement upon the petition of the executive committee of the conference board of street railway employees of Massachusetts relative to the equipment of cars with suitable wheelguards, fenders, heated glass vestibules and air brakes. The commission points out the tendency to equip all except light cars operated at slow speeds with air brakes and the use of fenders under the supervision of the board. With respect to heated vestibules and glass wind shields, the commission states that it would not be justified in requiring companies to furnish facilities for heating all car vestibules in winter or in providing glass vestibules or wind shields on all open cars. It appears that while very few vestibules are heated, a number of companies have provided wind shields on many of their open cars, and there are some long-distance high-speed lines on which heated vestibules on box cars in the winter and wind shields or glass vestibules on open cars in the summer may be required. The commission informs the petitioners that it will continue its studies along this line.

Hearing on Berkshire Street Railway Fares.—A hearing was held by the Massachusetts Public Service Commission at Boston on July 28 upon the petition of the town of Cheshire for a reduction in fares between Cheshire and Pittsfield on the Berkshire Street Railway, Pittsfield, Mass. Criticism was directed against the existing 15-cent fare in comparison with a 10-cent fare in force between Cheshire and North Adams during morning and afternoon rush hours. Bentley W. Warren, for the company, pointed out that on some parts of the line the fares are already too low. Cheshire has a population of 2000, and the fares are about 1.5 cents per mile on the Berkshire system. Mr. Warren contended that this rate is not too high. The steam railroad fare between Cheshire and Pittsfield is 20 cents. Outside of so-called workingmen's hours the fare to North Adams is 15 cents. Commissioner Anderson said that where only a few persons travel a higher fare is a necessity. He suggested the desirability of operating workingmen's cars into and out of Pittsfield morning and night. Mr. Warren brought out the point that the company is about to attempt a revision of fares over its system as a whole, and urged the commission to permit a trial at the new rates before ordering a change on the basis of the petition. The company also intends to take up the question of safeguarding its high-tension line construction in Cheshire, and is endeavoring to reduce the noise of the rotary converters in its local substation. In closing the hearing, Commissioner Anderson favored postponing action until the above changes have been effected.

Personal Mention

Mr. Thomas L. Wolfe has resigned as acting rate clerk of the Illinois State Public Utilities Commission.

Mr. Frederick J. MacLeod has been elected chairman of the Public Service Commission of Massachusetts.

Mr. C. A. Smith resigned recently as auditor of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind.

Mr. W. F. Breese has recently been appointed master mechanic of the Columbus (Ga.) Railroad, to succeed Mr. H. K. Jarvis.

Mr. A. C. Mann has succeeded Mr. J. C. Kuhns as purchasing agent of the Kensington & Eastern Railroad, Chicago, Ill.

Mr. H. G. Kessler has been appointed auditor of the Springfield (Ill.) Consolidated Railway, to succeed Mr. J. Benedict.

Mr. R. A. Clark has been elected treasurer of the Waterbury & Milldale Tramway, Waterbury, Conn., to succeed Mr. E. S. Todd.

Mr. W. T. Lamb has been appointed auditor of the Galesburg & Kewanee Electric Railway, Kewanee, Ill., to succeed Mr. W. H. Epps.

Mr. W. O. Hoover has been appointed secretary of the Center & Clearfield Railway, Phillipsburg, Pa., to succeed Mr. F. E. Taylor.

Mr. J. C. Morton has been appointed chief engineer of the Pacific Power & Light Company, Astoria, Ore., to succeed Mr. D. F. McGee.

Mr. L. W. Jacques has resigned as master mechanic of the Rockford & Interurban Railway, Rockford, Ill., to engage in other business.

Mr. J. M. Anderson has been appointed chief engineer of the power station of the Pensacola (Fla.) Electric Company, to succeed Mr. H. Harley.

Mr. A. N. Pearce has been appointed superintendent of the Center & Clearfield Railway, Phillipsburg, Pa., to succeed Mr. H. J. Thompson.

Mr. J. E. Vaughn has been appointed purchasing agent of the Shore Line Electric Railway and the Norwich & Westerly Traction Company, Norwich, Conn.

Mr. W. H. Acker, formerly electrical engineer of the Shenango Railway & Light Company, Youngstown, Ohio, has been appointed transmission engineer of the West Penn Traction Company, Pittsburgh, Pa.

Mr. W. W. Waterson has been appointed superintendent of the Peoria division of the St. Louis, Springfield & Peoria Railroad, included in the Illinois Traction System, with headquarters at Mackinaw Junction, Ill.

Mr. H. S. Curry has been appointed chief dispatcher of the Illinois Traction System, with headquarters at Staunton, Ill., to succeed Mr. Edward R. Heine, who has been promoted, as noted elsewhere in this column.

Mr. A. S. Bergschneider has been appointed superintendent of the Illinois Central Traction and the Bloomington, Decatur & Champaign Northern Divisions of the Illinois Traction System, with headquarters at Decatur, Ill.

Mr. E. N. Sanderson has been elected president of the Tucson (Ariz.) Rapid Transit Company to succeed Mr. C. C. Chappelle. Mr. Sanderson has also been elected president of the Hot Springs (Ark.) Street Railway, to succeed Mr. C. C. Chappelle.

Mr. B. E. Bramble, general auditor of the Illinois Traction Company, Champaign, Ill., has also been appointed general auditor of the Western Railways & Light Company, Champaign, Ill., succeeding Mr. W. J. Achelpohl, who has been appointed to another position with the same companies.

Mr. F. R. Edmonston has been appointed superintendent of transportation of the Illinois Traction System, Peoria, Ill., having jurisdiction over all lines west and north of Decatur, and south of Springfield, with headquarters at Springfield, Ill.

Mr. W. J. Achelpohl, general auditor of the Western Railways & Light Company, has resigned that position to become supervisor of operating expenditures of both the Illinois Traction Company and the Western Railways & Light Company.

Mr. Edward R. Heine has been appointed superintendent of the Springfield and the St. Louis divisions of the St. Louis, Springfield & Peoria Railroad, included in the Illinois Traction System, with headquarters at Staunton, Ill., succeeding Mr. J. C. Ferritor, resigned.

Mr. C. E. Warwick has resigned as superintendent of the Fort Wayne & Northern Indiana Traction Company's city lines in Fort Wayne, Ind., to become superintendent of the railway department of the Vicksburg Light & Traction Company, Vicksburg, Miss., which is controlled by the Ellison-Clifford Company.

Mr. George U. G. Holman, New York and Boston, recently resigned as an officer and director in the South Fork-Portage Railway, Johnstown, Pa., though retaining a substantial interest in the company. Mr. Holman will take a rest before engaging in any other undertaking. He promoted and nearly completed the construction of the road mentioned and it will be finished by local interests.

Mr. Ludwig Spängler, director of the Vienna Municipal Tramways, has been elected vice-president of the Austrian Association of Local & Light Railways. Mr. Spängler is a keen student of American transportation practice, the Vienna tramways being the first European railway to operate cars with separate passages for entrance and exit. At the present time Mr. Spängler is conducting some interesting experiments with double-deck and electric trailer operation.

Mr. George W. Bishop, who retired recently as a member of the Public Service Commission of Massachusetts, has been appointed chief of the inspection bureau of the commission. In the eighteen years that he sat as a member of the Railroad Commission and then for thirteen months more as a member of the Public Service Commission, Mr. Bishop gave special attention to the physical inspection of railroads and street railways. He has also traveled extensively at home and abroad to study railroad building and upkeep. The inspection bureau of the commission is now more distinctly a department than it has been before. It has been considerably enlarged since the creation of the Public Service Commission.

Mr. R. L. Caldwell has been appointed superintendent of the Warren-Bisbee Railway, Warren, Ariz., to succeed Mr. Jesse Yoakum. Mr. Caldwell was formerly superintendent of transmission line construction for the Black Mountain Mining Company, Magdalena, Sonoro, Mexico, and assistant manager of the Bisbee (Ariz.) Improvement Company. He later became superintendent of construction for the Warren Company during the building of the Warren-Bisbee Railway, and afterwards superintendent of the operating department. This position he left to go with the Northern Contracting Company as superointendent of construction on the hydroelectric development at Tallulah Falls, Ga., for the Georgia Railway & Power Company. Upon the completion of this plant he returned to the Warren-Bisbee Railway to take charge of rebuilding.

OBITUARY

McKendree Hayes Chamberlin, for four years secretary of the Illinois State Railroad & Warehouse Commission, died recently at Los Angeles, Cal. He was a former president of McKendree College at Lebanon, Ill.

J. R. McLain, who was connected with the electrical department of the H. W. Johns-Manville Company, New York, for a number of years, died at the Hahnemann Hospital, New York, on July 28. The remains were removed to Cincinnati, Ohio, for interment.

John Wilkie Harper, superintendent of transportation of the Manhattan & Queens Traction Corporation, Long Island City, N. Y., died on Aug. 1, following an operation. Mr. Harper was born in Scotland forty-two years ago, and had been superintendent of transportation of the Manhattan & Queens Traction Corporation for the last two years. Before that he was with the predecessor company, the South Shore Traction Company. He had previously been in the employ of the Union Railway, the Brooklyn Rapid Transit System, the Metropolitan Street Railway, Kansas City, and in 1906 was with the United Railroads, San Francisco, during the reconstruction after the fire.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Cairo, Pelham & Moultrie Railway, Pelham, Ga.**—Chartered in Georgia to build an interurban railway from Pelham to Moultrie, 50 miles. Capital stock, $75,000. Incorporators: J. J. Hill and D. Turner, Pelham; Mrs. B. H. Polk, Ochlochnee; T. H. Hester and J. T. Forester, Cairo, Ga.; J. M. Mize, J. L. Prince, W. McCord and D. W. Jones, Meigs, Ga.

***Westmoreland (Kan.) Interurban Railroad.**—Incorporated in Kansas to take over the old Kansas, Southern & Gulf Railroad, which extends from Westmoreland to Blaine, a distance of 11 miles. This line will be operated as a gasoline railroad. Capital stock, $40,000. Incorporators: Charles E. Morris, J. W. Arnold and J. N. St. John, Westmoreland; A. C. Wheeler, Garden City; O. C. Collman, Lincoln, Neb.; J. E. Smith and S. E. Smith, Beatrice, Neb.

Casper (Wyo.) Street Railway.—Chartered in Wyoming to build an electric railway in Casper from the Burlington depot to the southern boundary of Casper, via the Butler addition and McKinley Avenue, to connect with a crosstown line which extends from Capitol Hill to the Midwest refinery. It is planned to use storage-battery cars. Capital stock, $100,000. Officers: John Fleming, Casper, president and treasurer; Harley B. Beagle, vice-president and secretary; E. Richard Shipp, general attorney, and Joseph G. Spangler and Charles T. Lynch, directors. [E. R. J., Nov. 29, '13.]

FRANCHISES

***Phoenix, Ariz.**—R. W. Martin, Phoenix, has asked the Council for a franchise to build an electric line on Van Buren Street and thence south on First Avenue to the city limits in Phoenix.

Clovis, Cal.—The Fresno Interurban Railway has received a franchise from the Council along Woodward Avenue and Ninth Street to the Southern Pacific depot in Clovis.

San José, Cal.—The San José Railway has received a franchise from the Board of Supervisors from East San José to Kirk Avenue in San José.

Wilmington, Del.—The Wilmington & Philadelphia Traction Company has received a franchise along the boulevard in Wilmington from Twenty-second Street to Concord Avenue, thence along Concord Avenue to Washington Street and back along Washington Street to Twenty-second Street, completing a loop.

Clearwater, Fla.—C. H. Evans, Clearwater, has received a franchise from the Council to build an electric railway in Clearwater.

Cedar Rapids, Ia.—The Waterloo, Cedar Falls & Northern Railway has received a franchise from the Council in Cedar Rapids. It is also given the right to operate its lines over all the lines now used by the Iowa Railway & Light Company in Cedar Rapids.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—Plans are being made by this company to begin work at once on the extension from Bonner Springs to Lawrence.

Boston, Mass.—The Dedham & Medway Street Railway has received permission from the Public Service Commission to extend its railway into the towns of Medway and Franklin and to exercise the franchise rights of the Dedham & Franklin Street Railway and the old Medfield & Medway Street Railway, through Medway and Franklin in connection with a plan to reopen and operate the electric line between these towns. The Dedham & Medway Street Railway has been organized as a successor to the Dedham & Franklin Street Railway. [E. R. J., June 27, '14.]

Springfield, Mass.—The Springfield Street Railway has received a franchise from the Council to extend its line on North Fountain Avenue from the present line of the company on McCreight Avenue at the intersection of McCreight Avenue and North Fountain Avenue to the Home Road in Springfield.

Worcester, Mass.—The Worcester Consolidated Street Railway has asked the Board of Aldermen for permission to relay its tracks in Pleasant Street and also for a relocation of tracks at Grafton Square and in Main Street near Curtis Street in Worcester. The company is asked to consider plans for an extension to include Sixth Street and Mechanic Street, thus making a loop in the east side of Worcester.

Newark, N. J.—The Public Service Railway has asked the Council for franchises to extend its lines in Newark. A new line on Rector Street from Broad Street to Park Place is planned.

Morrisville, N. J.—The Bucks County Interurban Railway, Trenton, has received a franchise from the Council to extend its tracks on Trenton Avenue from the river bridge to Pennsylvania Avenue in Morrisville.

Portland, Ore.—The substitute franchise sought by the Portland & Oregon City Electric Railway has been granted by the City Council in Portland, and after it is advertised for a period of a few weeks it will be acted upon by the Council. The new franchise proposes to allow the company to come into Portland from the south on a considerable portion of East Twenty-fourth Street. Another franchise sought by the same company giving it the right to operate lines through the downtown business section and portions of the central east side, then north to the Columbia River is now pending. Should both franchises be granted a complete system will be in operation competing with the Portland Railway, Light & Power Company.

Avoca, Pa.—The Wilkes-Barre Railway has received a franchise from the Council to extend its tracks through West Avoca to the Lehigh Valley Railroad tracks. Plans are being made to begin work on this extension at once.

TRACK AND ROADWAY

Pine Bluff (Ark.) Company.—Plans are being made by this company to extend the tracks on East Sixth Avenue, from Ohio Street, the present terminus, to Wisconsin Street in Pine Bluff.

Northern Electric Railway, Chico, Cal.—The roadbed between Woodland and Sacramento is being ballasted and the bridges on the entire route will be renewed and strengthened.

Pacific Electric Railway, Los Angeles, Cal.—The line between El Segundo and Los Angeles has been placed in operation by this company.

Visalia (Cal.) Electric Railroad.—Work has been begun by this company on the 3-mile extension from Wood Lake to the base of the foothills in Tulare County.

Denver (Col.) Tramway Company.—Within the next week this company plans to award a contract for the wrecking of a steel viaduct 3000 ft. in length. The viaduct contains about 700 tons of metal. This metal will be sold to the highest bidder within the next thirty or sixty days. The timber stringers and ties will also be disposed of to the highest bidder. The company plans to build a larger new viaduct.

Connecticut Company, New Haven, Conn.—Plans are being considered by this company for a line on Roseland Avenue in Waterbury.

Pekin (Ill.) Street Railway.—The directors of this railway have perfected their organization by the election of the following officers: W. E. Lautz, president; Richard Luick, vice-president; J. M. Rahn, secretary and treasurer. [E. R. J., Aug. 1, '14.]

Augusta & Livermore Street Railway, Augusta, Maine.—No definite plans have yet been decided upon by this company to build its electric railway to connect Augusta, Manchester, Winthrop, Readfield, Mount Vernon, Fayette, Chesterville and Livermore. Charles P. Hatch, Augusta, is interested. [E. R. J., April 12, '14.]

Minnesota Northwestern Electric Railway, Minneapolis, Minn.—Grading has been completed by this company on its line from Thief River Falls to Goodridge, 20 miles, and track has been laid between Thief River Falls and Silverton, 5 miles. Daniel Shaw, Thief River Falls, president. [E. R. J., April 25, '14.]

St. Louis & Western Traction Company, St. Louis, Mo.—Plans have not been definitely decided when construction will be begun by this company for its 40-mile electric line between St. Louis and Gilmore. James D. Houseman, 701 Roe Building, St. Louis, president. [E. R. J., May 24, '13.]

Big Horn Canyon Irrigation & Power Company, Billings, Mont.—Surveys are being made for the storage of water at the reservoir of the Big Horn Canyon. This reservoir will be filled by damming up the water in the mouth of the Canyon. After these surveys are completed, which will be about Sept. 1, 1914, the location surveys for the irrigation feature of the project will be made. Surveys have been completed for the railway location 3 miles east of the mouth of Big Horn Canyon to Custer, via Foster, Hardin and St. Xavier. John J. Harris, Hardin, Mont., president. [E. R. J., May 2, '14.]

Belmont & Northern Traction Company, Lincoln, Neb.—No definite plans have been decided upon by this company as to when construction will be begun on the 3-mile electric railway from Thirteenth Street and P Street in Lincoln to Belmont. [E. R. J., April 12, '13.]

Lincoln (Neb.) Traction Company.—An extension of this line to Thirty-third Street in Lincoln is being contemplated by this company.

Public Service Railway, Newark, N. J.—This company has placed in operation a new crosstown line in the extension of the Kinney line from South Tenth Street and Twelfth Avenue to the Roseville carhouse in East Orange.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—Material is arriving and plans are being made by this company to begin work at once on its 2½-mile extension from Yardville to Crosswicks.

Union Railway, New York, N. Y.—This company has informed the Public Service Commission that the route of the new line from the Bronx across the Willis Avenue bridge will run from the present terminal of the Third Avenue line at Bedford Park, which is also the terminal of the Third Avenue Elevated Railroad, down Third Avenue to its intersection with the Willis Avenue bridge, across the bridge, and westerly on 125th Street, to the Fort Lee Ferry. The new line will issue transfers to all Union Railway lines and the lines of the New York City Interborough Railway Company.

Frontier Electric Railway, Niagara Falls, N. Y.—Right-of-way has been obtained, with the exception of a short distance, and construction will be begun in the fall by this company on its line to connect Niagara Falls, Buffalo, Tonawanda and North Tonawanda. James S. Simmons, Niagara Falls, general manager. [E. R. J., June 13, '14.]

Hiawassee Valley Railway, Andrews, N. C.—Work has been begun by this company on the construction of its 25-mile line between Andrews and Hayesville. S. E. Cover, Andrews, president. [E. R. J., Feb. 28, '14.]

Atlantic & Carolina Railroad, Kenansville, N. C.—The 10-mile line between Kenansville and Warsaw has been completed by this company and will soon be placed in operation. H. D. Williams, Kenansville, N. C., is interested. [E. R. J., May 2, '14.]

Waynesville & Canton Electric Railway, Waynesville, N. C.—On account of inability to secure financial backing this company has abandoned the project to build the 12-mile electric railway to connect Hazelwood and Canton, via White Sulphur Springs, Clyde and Lake Junaluska. Henry T. Sharp, Asheville, promoter. [E. R. J., Jan. 3, '13.]

Wilmington-Carolina Beach Railway, Wilmington, N. C.—This company, which plans to build an electric railway between Wilmington and Carolina Beaches, has organized and elected the following officers: C. C. Chadbourn, Wilmington, president; A. E. Leckie, Washington, D. C., vice-president; Joseph L. Loughlin, secretary and treasurer, and Hall Davis, Petersburg, Va., general counsel. [E. R. J., July 4, '14.]

Wilmington & Fort Fisher Railway, Wilmington, N. C.—Preliminary arrangements are being made by this company for its 18-mile electric railway between Wilmington and Fort Fisher Sea Beach. L. Kure, Wilmington, secretary. [E. R. J., July 25, '14.]

Cleveland (Ohio) Railway.—The 1-mile extension of the St. Clair Avenue line from London Road to Dille Road, in Cleveland, has been placed in operation by the company.

Morrisburg & Ottawa Electric Railway, Ottawa, Ont.—The contract for the construction of this railway has been awarded and plans are being made to begin work at once. Further details concerning the contract will be given out later. This 47-mile railway will connect Ottawa and Morrisburg. J. G. Kilt, Citizens' Building, Ottawa, president. [E. R. J., July 11, '14.]

Baker, Ore.—Promotors for an electric line between Baker and Richland with a local line in Baker with a branch from South Baker to the depot and possibly one or two other lines, tapping the east and north side of Baker, have been busy in Baker and the Eagle Valley during the past month. Joseph Kreis, Portland, is promoting the project, and according to his statements sufficient capital is back of him to build the proposed lines. Citizens of Baker and farmers in Eagle Valley have signified their willingness to assist in every way possible in the construction of the project.

Puget Sound & Willapa Harbor Railway, Portland, Ore.—This company has begun the work of laying tracks in Chehalis.

Hershey (Pa.) Transit Company.—Work has been begun by this company on the Elizabethtown & Deodate extension, from Hershey to Elizabethtown.

Monongahela, Ellsworth & Washington Railway, Washington, Pa.—This company has received an extension of time from the Public Service Commission in which to place in operation its line in Monongahela City. This line will connect Monongahela and Washington, via Pigeon Creek, Bentleyville and Ellsworth. James Bryant, Pittsburgh, engineer. [E. R. J., Jan. 10, '13.]

Williamsport (Pa.) Passenger Railway.—This company is asked to consider plans for an extension along the route of West Third Street to Newberry.

Rhode Island Company, Providence, R. I.—Work has been begun by this company on Broad Street, Pawtucket, laying new rails and crossovers preparatory to the elimination of all railroad crossings at grade and relocation of the roadbed and station of the New York, New Haven & Hartford Railroad at the Pawtucket-Central Falls division line.

***Prince Albert, Sask.**—A by-law to raise $250,000 to build an electric railway in Prince Albert is to be submitted to ratepayers.

***Brenham, Tex.**—Plans are being considered to build interurban lines extending out from Brenham to half a dozen different directions, making Brenham the center for the entire system. The various points of the proposed circle include Independence, William Penn, Washington, Chappell Hill, Phillipsburg, Millersville and Gay Hill. Frank Eberle, Brenham, of the Young Men's Business Association, is interested.

Dallas, Tex.—Preliminary arrangements are being made by the Southern Methodist University to build an electric railway from the University to the terminus of the Dallas Consolidated Electric Railway. Myers & Noyes, 403 Juanita Building, Dallas, are the engineers.

***Dallas, Tex.**—A local company has been formed in Dallas for the purpose of building a 95-mile electric railway from Dallas to Paris. It is understood that the route of the line will follow the Gulf, Colorado & Santa Fé Railroad, passing through Carland, Wylie, Celeste, Wolfe City, Ladonia and intermediate points. Details of the project have not yet been announced, but it is known that many leading business men of Dallas are back of the project.

Southern Traction Company, Dallas, Tex.—An extension of the East Waco Street line to Bellmead, 1½ miles, is being contemplated by this company.

Fort Worth & Denton Interurban Railway, Fort Worth, Tex.—In order that condemnation proceedings might be started by the Tarrant County Traction Company on the few miles of the right-of-way of the Fort Worth-Denton Interurban line not yet secured, the Fort Worth-Denton Interurban Railway, organized here to build that line, was formally dissolved at a recent meeting of the stockholders. The company turns over to the Tarrant County Traction Company the right-of-way so far secured and a $75,000 bonus and also guarantees a franchise at Denton. Stockholders from Denton who were present at the meeting announced that that city will grant as liberal a franchise to the new company as its charter will allow. E. E. Baldridge, president of the old company, will go to Denton to look after the franchise proposition. It is expected that construction will be begun as soon as all of the right-of-way deeds are filed and the franchise is obtained at Denton. [E. R. J., July 18, '14.]

San Antonio & Austin Interurban Railway, San Antonio, Tex.—Financial arrangements are being completed by this company and plans are being made to begin the construction of this 27-mile electric railway to connect Austin, San Antonio and New Braunfels in the near future. W. B. Tuttle, San Antonio, vice-president. [E. R. J., May 9, '14.]

Ogden (Utah) Rapid Transit Company.—This company has awarded a contract to the Ohio Brass Company, Salt Lake City, for the material for the electrification of the extension north from Brigham City to Preston, Idaho.

Salt Lake & Utah Railroad, Salt Lake City, Utah.—This company has placed in operation its 48½-mile railway between Salt Lake City and Provo. It is planned to extend this line from Provo south to Payson, 20 miles in the near future. W. C. Orem, Salt Lake City, president.

Blaine-Lynden Electric Railway, Blaine, Wash.—Announcement was recently made that practically all of the right-of-way for this railway has been secured and that the construction of the line will begin at once. The City Council here has already granted the company a franchise in Blaine and a similar franchise has passed first reading before the Council at Lynden. The line when completed will pass through 14 miles in northwest Washington and will join with the Great Northern Railway at Lynden, thus greatly increasing the shipping facilities in this section. An anthority asserts that before this line is completed a second line will be started, extending from Bellingham to Blaine via Lynden. [E. R. J., June 6, '14.]

Everett Railway, Light & Water Company, Everett, Wash.—It is reported that the Stone & Webster Corporation, which operates this railway, will extend the electric line in Everett from the depot to the main part of the town. Two routes are under contemplation, either of which can be easily secured.

Seattle (Wash.) Municipal Railway.—A tentative routing for the Ballard division of the municipal railway in Seattle was outlined recently by the City Utilities Committee contingent upon the purchase or gift to the city of the Loyal Heights Street Railway. Negotiations for that line will be opened immediately. The route as planned by Councilman Erickson leads from the northern extremity of Division A at Third Avenue west and Nickerson Street over the new Fifteenth Avenue northwest bridge into Ballard. Thence the line will proceed up Leary Street to Market and over Market to Sixty-fifth Street where connections will be made with the Loyal Heights line in Seattle.

Appalachian Power Company, Bluefield, W. Va.—Grading has been completed and tracks are being laid by this company on its South Bluefield extension in Bluefield, from Golf Street to the Bluefield-Graham fair grounds.

Parkersburg, Maretta & Interurban Railway, Parkersburg, W. Va.—Plans are being made by this company for an extension on Second Street in Parkersburg.

West Virginia Traction & Electric Company, Wheeling, W. Va.—Plans are being considered by this company to double-track its line in the western section of Fulton on the National Road and Bow Street.

SHOPS AND BUILDINGS

Illinois Traction System, Peoria, Ill.—The foundations of the station and office building at Hamilton and Jefferson Streets, Peoria, are now finished and a permit for the superstructure will be issued soon. The contract for the steel work has been let to the Decatur Bridge Company, Decatur, Ill., and other contracts will be awarded from time to time. The building will cost $400,000 and the general construction permit will approximate $300,000. The main building will be seven stories in height, fronting 72 ft. on Jefferson Street and extending about 100 ft. on Hamilton Street. Back of this seven-story structure will be a two-story building to the alley. Parallel to the 72-ft. front office building there will be a five-track terminal train shed of ornamental construction, also fronting on Jefferson Street.

Butte (Mont.) Electric Railway.—During the next two weeks this company will award contracts to build a new carhouse in Butte. The structure will be 46 ft. x 200 ft. and of concrete foundation, pit walls and wooden superstructure. It will contain four tracks.

Cleveland (Ohio) Railway.—A contract has been awarded by this company to the William I. Thompson Company for the construction of the new Superior Avenue carhouses at Superior Avenue and 103d Street in Cleveland. The group of new buildings, four in number, according to the contract, will cost approximately $150,000. The buildings are to be completed by Jan. 1, 1915, when the present carhouse at Superior Avenue and East 105th Street will be abandoned and the property sold. The first group of buildings forming the Harvard Avenue carhouses at Harvard Avenue and East Forty-ninth Street will be ready for occupancy Sept. 1.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—This company is now building a new freight house at Toledo. The structure is 50 ft. x 160 ft. and of brick, steel and concrete construction and will have three tracks for loading and unloading.

Hull (Que.) Electric Railway.—Plans are being made by this company to award the contract soon to build a 60-ft. tower with a capacity of 20,000 gallons at its carhouse at Deschenes.

POWER HOUSES AND SUBSTATIONS

Illinois Traction System, Champaign, Ill.—This company will soon construct a new high tension transmission line from its power house in the north part of Champaign, through the extreme northern parts of both Champaign and Urbana, joining its present line at a point about 2 miles east of Urbana. The new line will be about 5 miles long.

Southern Iowa Railway & Light Company, Albia, Ia.—This company has recently placed an order with the Westinghouse Electric & Manufacturing Company for one 200-kw, 600-volt, three-phase, sixty-cycle, 1200 r.p.m. rotary; one 150-kw motor generator set consisting of one 150-kw, 125/250-volt, three-wire, 900-r.p.m. generator and one 182-kva, 2200-volt, three-phase, sixty-cycle, 100 per cent P. F. motor; three 75-kva, single-phase, sixty-cycle, 2200-volt high tension rotary voltage low tension type SK transformers; one eleven-panel switchboard; two three-phase, 2200-volt, two-phase, 2200-volt auto transformers; two 17-kw regulators; 186 street hoods; fifty brackets; nineteen arc lamps, and nineteen auto current transformers.

Winnipeg, Selkirk & Lake Winnipeg Railway, Winnipeg, Man.—Plans are being made by this company to build a new substation at Stoney Mountain.

Toledo, Bowling Green & Southern Traction Company, Findlay, Ohio.—This company is now building a new coal-crushing device at its power house in Findlay.

Lebanon & Ephrata Railway, Lebanon, Pa.—This company has ordered two 300-kw, 600-volt, six-phase, twenty-five-cycle, 750 r.p.m. commutation pole rotary converters and two three-panel switchboards to control same; two 250-kva transformers O. I. S. C. outdoor type, three-phase, twenty-five-cycle, 11,000-volt high tension rotary voltage low tension. One complete portable substation car including 300-kw, 600-volt, six-phase, twenty-five-cycle, 750 r.p.m. rotary converters. One 250-kva, three-phase, twenty-five-cycle, 11,000-volt high tension O. I. S. C. outdoor type transformer, and necessary switching equipment. This apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—This company has been awarded a five-year contract for all the city lighting in Chattanooga. The present annual income from the contract will approximate $28,109. The city maintains 823 lamps as against 585 three years ago.

Jackson Railway & Light Company, Jackson, Tenn.—During the next few weeks this company plans to purchase shaker grates for four boilers, and also a 250-kw rotary converter for its power house in Jackson.

Manufactures and Supplies

ROLLING STOCK

Cleveland (Ohio) Railway has ordered 100 center-entrance motor cars from the G. C. Kuhlman Car Company.

Albany Southern Railroad, Albany, N. Y., has been authorized by the Public Service Commission of the Second District of New York to purchase an express car to be equipped with auxiliary snow fighting equipment.

New York Municipal Railway Corporation, Brooklyn (N. Y.) Rapid Transit System has been authorized by the Public Service Commission of the First District of New York to order 100 additional new steel cars, for operation in the subways that will go to that company under the dual system agreements. Some time ago the company ordered 100 cars, and these will be delivered in December. The second order will be placed very soon, and the delivery of the cars will take place in the spring or summer of next year.

TRADE NOTES

Sidney G. Johnson has been elected a vice-president and director of the General Railway Signal Company, Rochester, N. Y., with headquarters at 55 Liberty St., New York City.

M. H. Loughridge, formerly on the engineering staff of the Union Switch & Signal Company and the New York, Westchester & Boston Railway, has recently been appointed office engineer in the New York office of the Federal Signal Company.

Street Railway Signal Company, Inc., Philadelphia, Pa., has been awarded the contract for the signals which are to be installed by the New York & Queens County Traction Company on its Jamaica Division in accordance with the order issued by the Public Service Commission of the First District of New York. The work of installing the signals must be completed by Oct. 1.

Lagonda Manufacturing Company, Springfield, Ohio, is building a new addition to its factory in order to accommodate its increased business and increase its facilities for specialty manufacturing. Its present factory will be given over entirely to the manufacture of tube cleaners and specialties and the new addition will be equipped for handling the larger and heavier class of work, such as automatic cut-off valves and multiple water strainers, the castings of which run into very large sizes.

H. W. Johns-Manville Company, New York, N. Y., has announced that Frank E. Brown has become associated with the company, and will act as a special representative, devoting his attention to the further sales development of "Noark" service meter protective devices. Mr. Brown was electrical engineer for the department of water supply, gas and electricity of New York City from 1889 to 1909 and was prominent in creating the demand for and in urging the adoption of meter protective devices among the lighting companies of the country.

Federal Signal Company, New York, N. Y., reports that the Public Service Commission, New York, First District, has approved the acceptance of the Federal Signal Company's proposal for the installation of an alternating-current automatic block-signal system on the Centre Street Loop. This is part of the first section of the new subway system to be put in operation. The contract is for 2.1 miles of double-track automatic block signaling and three interlockings including automatic stops. As direct current is used for propulsion, alternating-current track circuits and apparatus of the Federal Signal Company's design and manufacture will be used throughout.

Electric Service Supplies Company, Philadelphia, Pa., has sold 200 Keystone car signs to the New Orleans Railway & Light Company, New Orleans, La., for installation on its new cars. Other recent orders for Keystone signs have been received from the Altoona & Logan Valley Electric Railway and the Wilkes-Barre Railway. The Electric Service Supplies Company has also recently sold the Reading Transit & Light Company complete equipments of Keystone motorman's seats for its interurban cars. The Keystone motorman's seats are permanently attached to the car. They are adjustable in height and may be instantly collapsed so that they will be entirely out of the way when not in use.

William R. Garton has been appointed sales manager and associate engineer of the Protective Signal Manufacturing Company, Denver, Col., and hereafter the main sales office of this company will be under Mr. Garton's direction at 299 Broadway, New York. The Protective Signal Manufacturing Company manufactures a complete line of highway crossing alarms, which are in use on a number of steam and electric lines in the East and West. The company's chief product is a circuit opening and closing device of the oscillator type, which clamps to the base of the rail and against the web and is operated by the movement of the rail due to the passage of trains. It also makes crossing bells of several types, automatic relays and automatic cut-outs for highway crossing alarms and a complete line of battery boxes and masts provided with signs, illuminated or non-illuminated, and with or without audible signals.

Theodore W. Siemon has been elected secretary and treasurer and a member of the board of directors of the Union Switch & Signal Company, Pittsburgh, Pa., succeeding James H. Johnston, retired. Mr. Siemon was born and educated in Pittsburgh. He began his business career in 1877 with Lewis, Oliver & Phillips, now the Oliver Iron & Steel Company. In 1887 he accepted a position with the Philadelphia Natural Gas Company as assistant to the secretary, who also had charge of the distribution and selling of the company's product. In 1893 he was placed in charge of the business of the Allegheny Heating Company, a subsidiary of the Philadelphia Company, as assistant treasurer. Two years later he was elected treasurer of the Philadelphia Company. From that position he was promoted to the office of general manager. When Mr. Westinghouse disposed of his interests in the Philadelphia Company in 1899 Mr. Siemon was elected assistant treasurer of the Westinghouse Electric & Manufacturing Company, with headquarters in New York. He succeeded to the treasurership in 1906. During 1907 and 1908 he was also a director in the company. He has been a director in the Bryant Electric Company and the Perkins Electric Switch Manufacturing Company since 1906.

Union Switch & Signal Company, Pittsburgh, Pa., announces the following change in its organization: W. H. Cadwallader, general manager, Swissvale, Pa.; J. S. Hobson, acting general manager, Swissvale, Pa.; C. E. Denney, assistant general sales manager, Swissvale, Pa. Mr. Cadwallader, the new manager, was born in Pittsburgh in 1876. In 1901 he entered the employ of the Union Switch & Signal Company as blue-printer. In February, 1892, he was made messenger in the office of the superintendent of works, later on becoming clerk in the same office and in the general manager's office. In 1901 Mr. Cadwallader was put in charge of the specification department. Later he had charge of the estimating department, and in 1912 he was made assistant general manager, from which position he was promoted to the general managership. Mr. Hobson entered railroad service as engineer apprentice in the shops of the Great Southern & Western Railway of Ireland in 1884. In 1889 he entered the employ of the Chicago, Burlington & Quincy Railway. In January, 1892, he became construction foreman for the Union Switch & Signal Company in the Chicago district, and in 1895 was appointed supervisor of electric signals for the Michigan Central at Detroit. When the position of signal engineer was created by the Santa Fe in 1897 Mr. Hobson was chosen to fill it and he remained in the position until he re-entered the service of the Union Switch & Signal Company in January, 1901, as assistant engineer. Later he became assistant general manager and western manager. The company has contracted with the Indianapolis, Columbus & Southern Traction Company to install a.c. automatic block signals operated by the T.D.B. system, which will permit two trains to follow each other between sidings, but prevent opposing movements. The total distance signaled will be 23.1 miles, and this will be protected by thirteen blocks, controlling 26 Style "B" one-arm semaphore signals, and 26 model "13" electric light signals. Galvanometer relays will be used on the track circuits, and vane relays on the line circuits. The company has also contracted with the Illinois Traction System to install Saxby & Farmer mechanical interlocking plants at four points in Illinois. One of these plants is north of Staunton, where the Illinois Traction System crosses the Wabash, one at Benld, where the Northwestern is crossed, one east of Mt. Olive at the crossing with a spur of the Wabash, and the fourth plant is in Staunton, at another crossing with the Wabash. The signals are mechanically operated and there are no distant signals for the signals covered by the interlocking plant. The signals on the Illinois Traction System stand normally clear, and the plant is equipped with a time lock. The switches and derails are operated by switch and lock movements. Another T.D.B. installation of automatic block signals is being completed on the Cleveland, Southwestern & Columbus Railway near Cleveland, Ohio.

ADVERTISING LITERATURE

Ohmer Fare Register Company, Dayton, Ohio, has issued a circular on fare boxes in which it has summarized the apparent advantages of fare boxes and the general objections to such boxes and has described and illustrated its own safe deposit box.

W. S. Barstow & Company, Inc., New York, N. Y., recently published a thirty-five-page, leather-bound book, giving in convenient form general data regarding public utilities companies under its management. Each company is discussed individually in relation to its geographical location, its intercorporate relations, its capitalization, earnings and expenses for the last fiscal year, franchises, population served and other matters affecting its corporate life. There is also a map showing the exact location and extension of properties of each company. Of the forty-seven companies covered by the book, twenty-nine are electric railways. The company announced that reports of engineers and accountants for the various companies are on file at the main office and that any statistics regarding the individual companies not presented in the book will be furnished to the holders of securities of the companies upon application.

Galena Signal Oil Company, Franklin, Pa., has reprinted in pamphlet form its answer to the quotation in the brief of Louis D. Brandeis, special counsel for the Interstate Commerce Commission, in the rate increase case, in which he referred to economies in the use of oil for lubrication said to have been effected in Panama. In conclusion the company says: "If comparative estimates were made by qualified experts as to the costs per unit of work performed by the railroads, it would be found that the railroads in the United States are lubricating their equipment much cheaper than this service is performed on the isthmus. The inference is that low-priced oils and the supervision given on the isthmus are set up as standards, whereas railroads in the United States have been following this practice of supervision for many years, and if a fair comparison were made with accurate statistics, considering character of service and comparative units of work performed, it would be demonstrated that the railroads in the United States are lubricating at a cost much less than is obtained on the isthmus."

NEW PUBLICATION

Corporate Promotions and Reorganizations. By Arthur S. Dewing. Harvard University Press, Cambridge, Mass. Cloth bound, 615 pages, $2.50.

This book, which is a study of the financial policy of certain individual corporations which at one time or another have found it necessary to undergo a reorganization of their capitalization, is a scholarly contribution to the literature of trusts and corporation finance. The major portion of the book is devoted to a detailed study of a selected group of industrial corporations, each of which has passed through the cycle of promotion, failure and reorganization. The consolidations discussed are: the United States Leather Company, the starch consolidations, the glucose combinations, the National Cordage Company, the Westinghouse Electric & Manufacturing Company, the National Salt Company, the United States Realty & Construction Company, the American Bicycle Company, the American Malting Company, the New England Cotton Yarn Company, the cotton duck consolidation, the asphalt consolidation, the United States Shipbuilding Company and the American Glue Company. The cases chosen, while not exhaustive, serve to illustrate best all phases of corporate history in a comparatively brief period. The book abounds in notes and tabulated data that give complete information on the smallest auxiliary points.

The chapter devoted to the analysis of the history of the Westinghouse Electric & Manufacturing Company is probably of greatest interest to the electric railway field. The author gives the best exposition of the financial successes and difficulties of the Westinghouse Company that has ever appeared. As Mr. Dewing states, the history of the Westinghouse Electric & Manufacturing Company is a record of marked achievement in the application of scientific knowledge to practical uses. To the mind of the author, both the strength and the weakness of the Westinghouse Company lie in the inventive genius of its founder. The company has always been strong from the side of technical achievement, but weak from the side of the administration of its finances and its control over the avenues of capital and investment. The main cause for the two reorganizations of the company was the fact that the owners failed to note that a business of large magnitude, even though its credit be excellent, must be fortified by considerable reserves in the form of fluid assets not affected by the ordinary fluctuations in the demand and supply of money. The author notes that the methods used to secure relief in each of the company's reorganizations were identical. In neither instance was the reorganization accomplished through the judicial loss of the property, or was there an exchange of entirely new securities for old, or a new funded debt created. The positive expedients were the same—the merchandise creditors and bankers funded their debt into stock, and new stock in suitable amounts was issued at par. In regard to the future, the author closes with words of optimism.

The last chapters of the book are devoted to a summary of the promotion of consolidations that have undergone reorganizations, of the conditions and causes leading to reorganization and of reorganization expedients. Mr. Dewing states that the link between the promotion of a corporation and its subsequent failure and reorganization often lies in the early management, and in cases where early interests have been willing to forego immediate profits and conserve the funds, the enterprises have been placed on a sound footing. The same problem of conservatism of management presents itself in the period immediately before reorganization in connection with the payment of unearned interest or unearned dividends. In summarizing the reorganization expedients discussed in the book, Mr. Dewing states that most reorganizations have sought to relieve accumulated and unmanageable floating debt brought about by the deflection of money from the needs of the business to the payment of interest and dividend charges. All plans of reorganization have sought to improve the company's position so that the amounts required for interest payments should be within the minimum earnings of the corporation, and the preferred stock dividend records no longer a hopeless burden upon the future credit of the reorganized company.

The *laissez-faire* point of view of the author throughout the book is worthy of notice. He states that he has been impressed in his study of corporate promotions and reorganizations by the powerlessness of mere aggregates of capital to hold monopoly and also by the tremendous importance of innate individual ability or its lack in determining the success or failure of any enterprise. With these observations in mind, the author hazards the belief that whatever trust problems exist will work out their own solution. Legislative regulation is liable to perpetuate the unfortunate corporation by furnishing an artificial prop to support natural weaknesses. It is on this point that other men may take issue with the conclusions of the author.

While unfortunate management and vigorous competition may have worked out the disintegration of some trusts, in the case of combinations having a wide monopoly of raw material or patent rights and possessed of enormous capital, these forces may work out too slowly to make a passive policy of dealing with them advisable.

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FINING RAILROAD TRESPASSERS IN ILLINOIS

The move to arrest and fine all trespassers on Illinois railroad property, recently made by the Public Utilities Commission of Illinois with the consent of Governor Dunne, cannot be commended too highly. To this end municipal and railroad authorities have been instructed to arrest all trespassers. While railroads, both steam and electric, have taken every possible precaution to reduce the number of trespassers to a minimum, they have not been aided by the state or local authorities. Accordingly, this move is of great importance to them, and it is to be hoped that it is merely the beginning of a national campaign. When it is considered that more than one-half of the people killed by railroads in the United States are trespassers, it should be cause enough to make trespassing not only illegal but subject to fine. The fact that these trespassers illegally were on dangerous ground did not serve as sufficient notice to keep them from using railroad right-of-way as public thoroughfare. On the other hand, railway companies are being forced to take every precaution to protect their passengers, hence it seems right and proper that the public should be forced to protect itself in this matter.

DISCUSSIONS ON THE WAR

One of the companies in a large city has given instructions to its trainmen to refrain from discussion of the war. The very good reason stated by the management is that as this is a nation with many elements of foreign birth or descent in its citizenship, disputes may arise easily from casual remarks and the final result might be an outbreak of some nature. The motive behind the order is the same that has led to the discouragement of public gatherings in a large city by adherents of one side or the other. If neutrality is to be preserved successfully, the responsibility for this safe policy will lie not only in the executive officials of the government but also in the rank and file of the population. It is plain that if the confidence which both factions in Europe now appear to have is succeeded, as is likely to be the case soon, by a realization that the cause of one is desperate, there may be an effort, both from Europe and from sympathizers in this country, to drag this nation into the conflict. Neutrality is easy to preserve under the present conditions, but it may be less easy if pressure should be directed against this country. It is hard to restrain trainmen from expressing their feelings, but in observing the strict neutrality which should prevail, it is desirable that the dangers of the contrary course be appreciated. Trainmen are in close contact with the public at all times and will be provoked or tempted to reply to sallies. Later, when bitterness succeeds the first sentiments of surprise and horror inspired by the war, it will be still harder to keep from talking. Whether or not companies issue strict orders to their men in this matter, they will improve their own position with the public by discouraging argument with passengers.

EXPORT TRADE DURING WAR

The present European war should eventually redound appreciably to the benefit of American manufacturers. The countries now involved in war have in general been our smallest patrons of electrical apparatus, owing chiefly to the operation of protective tariffs. The exception to this is England, where American manufacturers have been compelled to meet the competition of German exports. On the other hand, Canada, Japan, Mexico, South America, South Africa, East Indies and China have all been good customers, and we still have access to their markets. If the English admiralty plans result in keeping the high seas clear for English shipping, our manufacturers will probably do a fairly large export trade with that country, for supplies from Germany will be held back by blockade. There are some latent possibilities in Italy also, provided the Italians succeed in maintaining their condition of neutrality in Europe. The export trade in strictly electrical goods from America has reached a height of more than $25,000,000 a year. During the last year or two a slight tendency toward a decline has been in evidence, but exporters have generally looked upon this as a sympathetic reduction caused by a general falling off in the volume of world trade. The present closing of the purchasing markets of Europe affects so small a percentage of our total export trade in electrical appliances that it can easily be omitted from calculations. On the other hand, in the opinions of those who have studied the subject, the electrical export trade of America, which last year reached a total of about $25,000,000 should greatly increase during the next twelve months.

PROBLEMS TO BE SOLVED

Before the present opportunity for increasing our electrical export trade can be fully grasped, there are certain problems that must be more fully solved, such as that of packing goods for foreign shipment and that of establishing better credit relations abroad. The safe packing of goods has been a particularly persistent and annoying problem of American shippers in connection with South American trade, but this should not be a difficulty that would long baffle American ingenuity. Much emphasis also has always been placed upon the advantages enjoyed by our European competitors, especially in South America, by virtue of their longer credits. During the last few years, however, European and American manufacturers have been brought much closer together in the matter of credits. The Germans have displayed a tendency toward a retrenchment from a previous rather excessively liberal policy regarding credits, and American merchants have shown an appreciable relaxation from their former rigid cash policy. Our principal commercial agencies have established branches or chains of correspondents throughout South America, and some of our largest banks have developed their own foreign credit departments. It must be admitted that the average merchant has not yet been clearly educated up to using our existing South American credit system and European manufacturers still have the advantage of service by branches of important home banking institutions. Nevertheless, the progress that has already been made in South America in the face of competition, seems to us an auspicious sign of the complete development that should now take place in the face of the present restricted competitive market.

THE SPECIFIC VERSUS THE GENERAL

A most striking contrast exists between the majority report regarding the Crosser bill for the government ownership of electric railways in the District of Columbia, abstracted in the ELECTRIC RAILWAY JOURNAL of July 4, and the report recently submitted by the minority members of the District committee. Whereas the bulk of the majority report (thirty out of thirty-five pages, to be exact) was devoted to a general exploitation of economic theories regarding public ownership and only 2 in. to an unsupported conclusion of seven points concerning the District railways, the minority report confines itself specifically to the proposed bill, its faulty construction and the advantages claimed by its proponents. The majority report is at best an incomplete and unauthoritative discourse on the general principle of government ownership, while the minority report is a complete analysis of the proposal, good or bad, as it relates to the matter actually under consideration. In other words, it deals with the facts. This difference is worthy of note as being characteristic of two modes of thought—the loose and the analytical.

The first part of the minority report deals with several aspects of the faulty construction of the Crosser bill. The point covering the obligation of the city to take over the railways at an award to be made by the Public Service Commission, whether excessive or not, is particularly interesting in view of the fact that out of the total fifteen witnesses in favor of the bill only four discussed the question of cost. As pointed out, it is impossible at present to ascertain what a condemnation award would amount to, but the minority members are quite correct in their assertion that in the light of current decisions the supporters of the bill have no reason for expecting the award to be limited to a bare physical value, exclusive of going concern allowances. Moreover, it is pointed out that the street railways operating within the District of Columbia extend beyond the limits of the District into a territory over which the federal government has no jurisdiction. The commission is empowered to condemn the outlying lines, but no intelligent method has been suggested for so doing and no indication made of the cost that would result.

The loose construction of the entire bill is also exemplified by Section 9 and Section 10. The first of these provides for the operation of the condemned railways under rules not in conflict with existing acts of Congress. Whether the railways would thus become amenable to all existing laws pertaining to the District is a matter of conjecture, but the efficient electric railway manager would not desire even to admit the possibility of employees receiving thirty days' leave with pay annually and thirty days' sick leave annually, and that purchases over $25 in amount should be placed in federal government hands. Section 9 authorizes the appropriation of $50,000 out of the District funds for the expenses of the condemnation proceedings, an appropriation which is not to be reimbursed out of the sale of bonds and which, in the light of the $1,000,000 paid by the City of Holyoke, Mass., for condemnation proceedings to acquire its gas and electric plants, is palpably absurd. It does not require much discernment to see in this very section the entering wedge for a continual chopping into the District funds for money to run the railways under government ownership.

The second main division of the report is devoted to a general refutation of the local advantages of government ownership so nonchalantly asserted by the majority section of the committee. To use the latter's own words: "The experience of the British Isles with city operation of street car lines shows what may be reasonably expected to be the experience here." We had supposed that every schoolboy recognized the worthlessness of the device of analogy as a means of proof except in cases where absolute similarity of structure, education or environment could be shown. Why this fundamental principle of argumentation should be so slighted by representatives in our national halls of debate is certainly not comprehensible. As we have often stated in these columns, the political conditions and ideals in Great Britain and Germany do not obtain in this country, and with all the assumptions one may care to make regarding these countries, no valid argument may be derived in support of the trial of the proposition here.

We are not compelled to be content with such a general rebuttal of the contention of the committee majority, however, for the minority group has taken up one by one and, as far as is possible in a few words, punctured the advantages of municipal ownership for

Washington claimed by the advocates of the bill. Neither in public nor in private operation can there be found any reason for asserting that municipal ownership in Washington would result in a great reduction of fares, or a large increase in wages to correspond to the San Francisco Municipal Railway wages. Even if the railways were bought at the absurdly low $25,000,000 valuation of the parent of the bill and the burden of taxes were dodged by shifting it to the other taxpayers of the District, the granting of the wage increase which has been dangled in the report would mean an annual deficit of more than $250,000, and fare reductions would make the financial disaster still greater. If the railways were bought at any price tending to equal the present market value of the securities, a deficit would be quite possible without either reduction in fares or increase in wages. In regard to improved service and extensions of lines, the minority report pertinently points out that no admissible testimony was offered at the hearing in regard to complaints along these lines. If these or other conditions, such as those of labor and publicity, are now unjust, as the minority members do not believe, then the Public Service Commission should be required to carry out the functions for which it was created.

It is said that universal transfers are desired in Washington. The minority members of the committee frankly say that the city is entitled to this improvement at the earliest possible moment, but they also point out that the Public Service Commission has ample authority to compel free transfers if the railways can afford them. If the excessive cost of such service can be proved, however, it is obvious that universal transfers under municipal ownership would be established only at the expense of other service and at the sacrifice of needed income. If the District of Columbia commissioners realized more deeply their important position as impartial arbitrators between the utilities and the public, as did the New York commissioners in the recent Brooklyn transfer case, they might take some steps to find out the financial possibility of a universal transfer system instead of spending their time in blind advocation of the theory of municipal ownership.

It would be impossible to leave the minority report without referring to the light it throws upon the state of public sentiment in Washington regarding the proposed bill. It may be recalled that one of the witnesses, as previously mentioned in the ELECTRIC RAILWAY JOURNAL, stated that the people of Washington were "overwhelmingly" in favor of the bill, but that during a four-hour session, even though assisted by a city directory, he could name only sixteen people who favored government ownership, four of these being the three public service commissioners and the corporation counsel. Just as entertaining as the above incident is the fact that after repeated invitations, public notices of meetings and prolonged meetings, only fifteen of the 350,000 citizens were interested enough to testify in favor of the bill, and of these fifteen only four were taxpayers, and these four represented a property valuation of only $23,197 out of the total of $380,000,000.

STEEL SHEATHING FOR CAR SIDING

A surprising diversity of opinion exists in regard to the most desirable thickness for the sheet steel that is now so generally used for the side sheathing between the sills and belt rails of electric railway cars. In the case of the semi-steel car, the sheathing on each side acts as a girder supported on the body bolsters to carry the weight of the car body without the aid of side or center sills. The girder has to be reinforced by the belt rail along its upper edge, as the inherent stiffness of such a member is a feature of importance. This may account for the fact that with cars of side-girder construction a thickness of side sheathing of ⅛ in. is widely used, although many cars of this type, notably those of the Chicago Railways and the Pittsburgh Railways, have a side-sheathing thickness of 3/32 in. However, in the case of all-steel cars, side sheathing of ⅛-in., 3/32-in., and 1/16-in. plate seems to be used indiscriminately.

The use of ⅛-in. plate for side sheathing undoubtedly originated from a belief that this was a minimum workable thickness, and that in city service safety against collisions with the poles or wheel hubs of vehicles demanded more resisting power than was supplied by very thin sheets of steel. However, that the use of even 1/16-in. side sheathing is permissible is demonstrated by the stepless cars of the New York Railways. These cars are now being operated upon Broadway in New York City, where the traffic is exceptionally congested, and notwithstanding the very low sides necessitated by the stepless design no difficulty on account of puncturing the 1/16-in. side sheathing has been experienced.

In these cars, of course, the side sheathing does not act as a girder in the commonly accepted meaning of the term. Instead, the entire car side acts as a truss, of which the belt rail is the compression member, and the side sill, which is composed of a 3-in. angle, acts as the tension member. Therefore the side sheathing, when it enters into the truss action of the side at all, is in tension throughout its entire width. No doubt the sheathing, in this case, acts as a gusset plate to hold the posts and belt rail square, but in general the difficulty of riveting such a thin sheet obviously limits its action except for short distances away from the stiffening members.

Certainly the successful operation of the New York cars upon one of the most congested thoroughfares in the country disposes of the argument, so generally heard in favor of ⅛-in. sheathing, that a thinner sheet will not afford the required protection against vehicles. As a corollary, the argument that strains need not be carried up to the letter board or plate also fails, and with it disappears the only logical reason for the popularity of the side-girder construction as opposed to one of all steel. However, even where the side-girder construction is retained there seems to be no longer any good cause for carrying 250 lb. of extra weight in two girder plates that are ⅛-in. thick when it has been so thoroughly demonstrated that 3/32-in. plates will satisfactorily serve the same purpose.

Single-Unit Power Plant and Substation at Alton, Ill.

The East St. Louis & Suburban Company Has Completed a Unique Addition to Its System Which Is Tied in with the Existing Steam Station and the Keokuk Hydroelectric Development

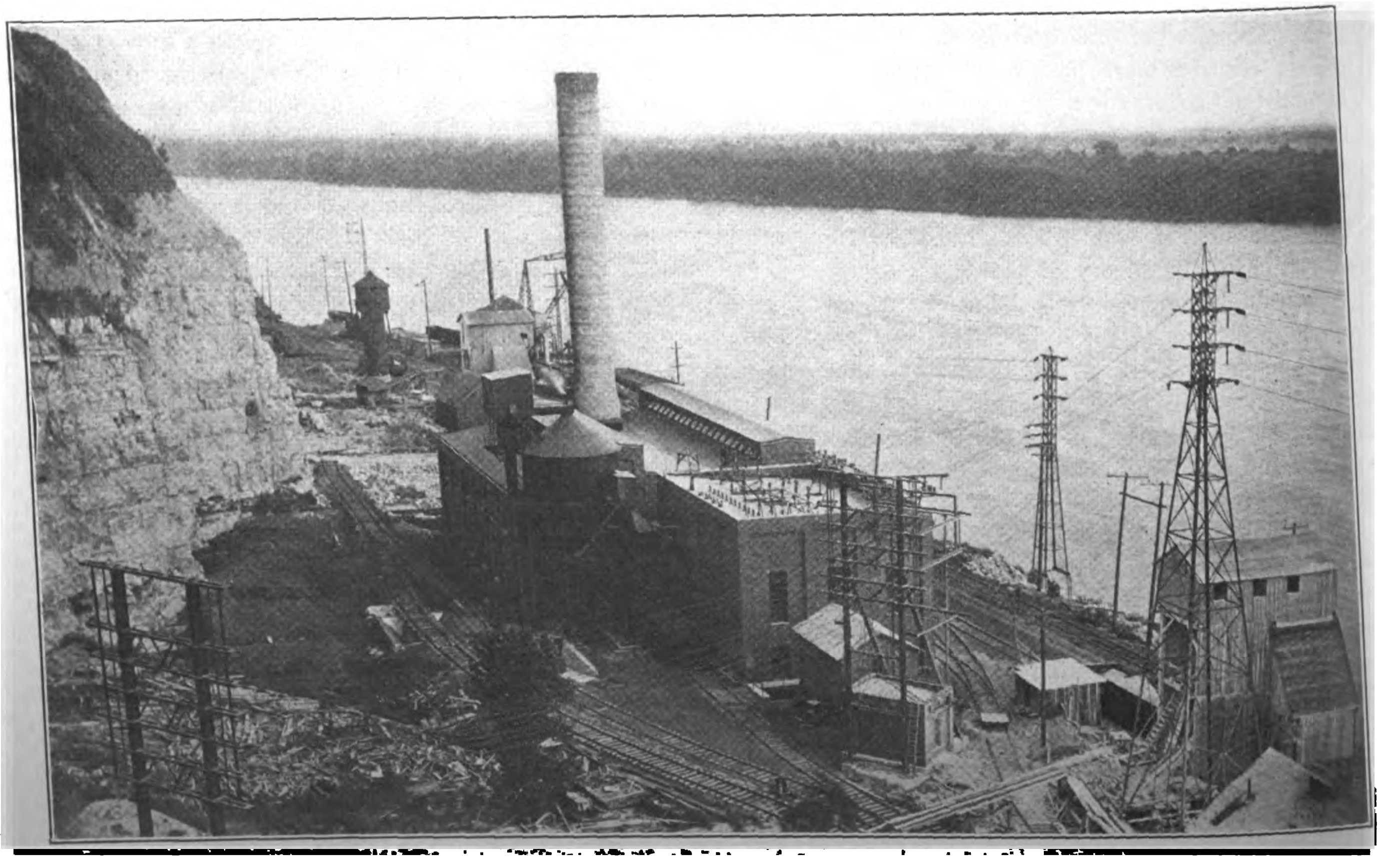
An addition to the generating system of the East St. Louis & Suburban Company, which is replete in unique features, has just been completed at Alton, Ill. Essentially, this installation includes a single-unit, 5000-kw steam generating plant supplying power to the railway, lighting and power transmission and distribution system, and a 6000-kw substation connected through a 66,000-volt a.c. transmission line with the hydroelectric plant at Keokuk, Ia. The power from the steam and the hydroelectric stations is transformed to 13,200 volts, and the lines connect with those from the Winstanley steam station of this company at East St. Louis, Ill. Power is supplied to 185 miles of city and interurban lines radiating from East St. Louis, Ill., as well as to lighting and power circuits in the territory served by the railway system. At Alton is also a terminal house from which transmission lines, carried on steel towers, lead to East St. Louis, a distance of 27 miles.

STEAM STATION ARRANGEMENT

A fireproof building on concrete foundations with red pressed-brick walls, and floors and roof of ferroinclave concrete construction, houses the steam station generating units. This building is divided into generator room and boiler room, each provided with a basement. In the engine room, 42 ft. x 112 ft. in size, is a 6250-kva 600-volt, twenty-five-cycle, General Electric generator, driven by a five-stage, horizontal Curtis turbine operating at 1500 r.p.m. The neutral of the generator is grounded. The generator terminals are connected to a three-phase, 3125-kva auto-transformer, which steps up the voltage to 13,200, and the high-tension terminals are connected, through a three-phase, 300-amp, 15,000-volt oil switch, to the 13,200-volt bus in the substation. The station is designed for an ultimate capacity of 10,000-kw and, with but slight changes, it can be arranged to house machinery of double this capacity. Practically two-thirds of the generating room is occupied by a synchronous condenser, two frequency changers, two synchronous converters, two motor-driven exciter sets, a steam-driven exciter, switchboards and control apparatus. An overhead, 30-ton, electric traveling crane serves the entire generating room.

MOTOR-DRIVEN VERTICAL PUMPS

An Alberger 8200-sq. ft. Spiroflo surface condenser, installed beneath the turbine, is connected to it by a 52-in. x 17-in. expansion joint. Circulating water is supplied to this unit through a syphon-type system, and is lifted from the Mississippi River by an 18-in. vertical centrifugal pump, driven by a 100-hp, 250-volt, d.c. variable-speed motor located on the engine-room floor. This pump has a capacity of 9000 gal. per minute against a total head of 16 ft. when operating at 395 r.p.m. Since the Mississippi River is free from sand bars and other obstructions at this point, it was possible to lay the 18-in. intake pipe, fitted with flexible joints, directly on the river bottom. To prevent large particles of foreign matter from entering the intake system, however, the end of this pipe was provided with a coarse screen, and in addition a twin strainer was placed inside the station. In order to provide for



EAST ST. LOUIS & SUBURBAN PLANT—GENERAL VIEW OF PLANT AND SURROUNDINGS variations in the load on the turbine and in the stage and temperature of the river water, the motor driving the circulating water pump was chosen to permit a variation in speed from 350 r.p.m. to 750 r.p.m. A rotary dry-vacuum pump, 12 in. x 30 in. x 18 in. in size, handles the non-condensible vapor in the condenser, while a steam-turbine-driven, hot-well centrifugal pump removes the condensate from the condenser and lifts it to the overhead feed-water storage tank in the boiler room.

125-250-VOLT EXCITERS

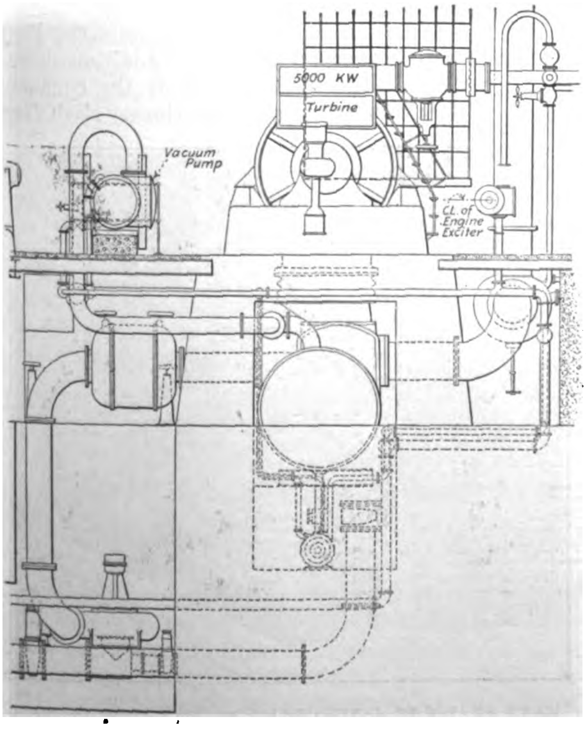
As it was desired to use 250 volts d.c. for the motors driving the circulating pump, the coal-weighing hopper and the traveling crane, three-wire, 125-250-volt exciter units were selected. There are three 75-kw exciter sets, two driven by 220-volt, three-phase, twenty-five-cycle induction motors, and the third by a steam engine. Double exciter buses were installed so that a portion of the machines may be excited from one bus while the others receive their excitation from the second bus. The exciters were so connected also that they can supply power to the station lighting system in emergency. A storage battery used in the operation of the remote-control oil switches is also connected to automatically supply energy for switchboard lighting when the station voltage falls below a predetermined limit.

SYNCHRONOUS CONDENSER FOR POWER FACTOR CONTROL

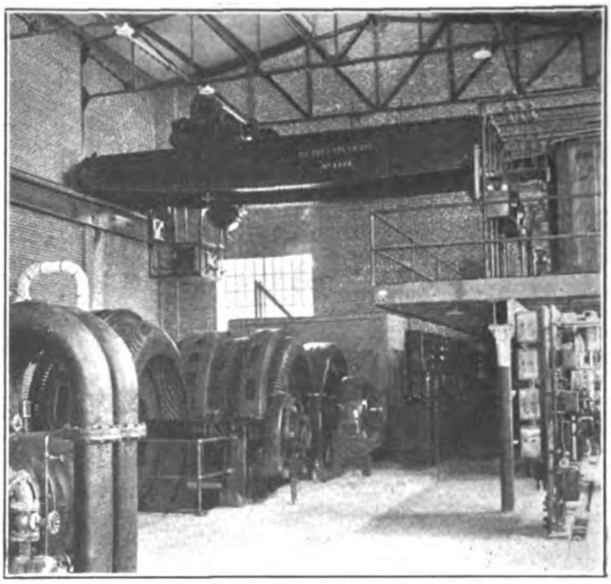
The substation equipment located in the power plant includes a 13,200-volt synchronous condenser connected to one section of the ring bus and designed to permit the maintenance of constant potential and high power factor on the railway end. There are also a frequency changer rated at 500 kw and another rated at 1000 kw, used to supply fifty-cycle power for motor service and light in Alton, and a 500-kw, 600-volt synchronous converter for railway lines in Alton. Another converter of the same capacity has been provided for.

SWITCHBOARD ARRANGEMENT

The twenty-five-cycle switchboard is divided into five sections, namely, one controlling the twenty-five-cycle, 13,200-volt equipment and the twenty-five-cycle 66,000-volt equipment; another the sixty-cycle, 2300-volt equipment; a third, the 600-volt d.c. railway unit, and a fourth for the arc lamp and the exciter sets. The fifth is a twenty-five-cycle, 220-volt panel for controlling the low-tension a.c. circuits to the various motor-driven auxiliaries.



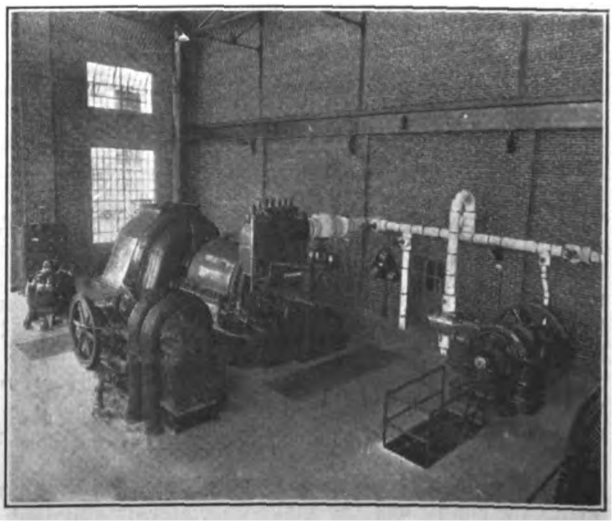
EAST ST. LOUIS & SUBURBAN PLANT—DETAILS OF TURBINE CONDENSING EQUIPMENT



EAST ST. LOUIS & SUBURBAN PLANT—FREQUENCY CHANGER END OF TURBINE ROOM

Each panel is a separate pedestal separated from its neighbor approximately 4 ft. Seven pedestals with the synchronizing post, have been installed. One post at the end of the row of pedestals supports a swinging bracket carrying a synchroscope, a frequency indicator and two voltmeters. One of the voltmeters is so arranged that it can be connected to any section of the twenty-five-cycle buses, while the other can be plugged into any machine or into the outgoing lines.

Switchboards for the sixty-cycle a.c. and the d.c. railway feeders, the exciter and the synchronous condenser face the switchboard. A balcony over both switchboards carries the oil switches for the sixty-cycle, 2300-volt lighting and power feeders. This balcony also accommodates the transformer and switching equipment for the series arc and the incandescent lighting circuits.



EAST ST. LOUIS & SUBURBAN PLANT—TURBO-GENERATOR AND AUXILIARIES company has also contracted with the Illinois Traction System to install Saxby & Farmer mechanical interlocking plants at four points in Illinois. One of these plants is north of Staunton, where the Illinois Traction System crosses the Wabash, one at Benld, where the Northwestern is crossed, one east of Mt. Olive at the crossing with a spur of the Wabash, and the fourth plant is in Staunton, at another crossing with the Wabash. The signals are mechanically operated and there are no distant signals for the signals covered by the interlocking plant. The signals on the Illinois Traction System stand normally clear, and the plant is equipped with a time lock. The switches and derails are operated by switch and lock movements. Another T.D.B. installation of automatic block signals is being completed on the Cleveland, Southwestern & Columbus Railway near Cleveland, Ohio.

ADVERTISING LITERATURE

Ohmer Fare Register Company, Dayton, Ohio, has issued a circular on fare boxes in which it has summarized the apparent advantages of fare boxes and the general objections to such boxes and has described and illustrated its own safe deposit box.

W. S. Barstow & Company, Inc., New York, N. Y., recently published a thirty-five-page, leather-bound book, giving in convenient form general data regarding public utilities companies under its management. Each company is discussed individually in relation to its geographical location, its intercorporate relations, its capitalization, earnings and expenses for the last fiscal year, franchises, population served and other matters affecting its corporate life. There is also a map showing the exact location and extension of properties of each company. Of the forty-seven companies covered by the book, twenty-nine are electric railways. The company announced that reports of engineers and accountants for the various companies are on file at the main office and that any statistics regarding the individual companies not presented in the book will be furnished to the holders of securities of the companies upon application.

Galena Signal Oil Company, Franklin, Pa., has reprinted in pamphlet form its answer to the quotation in the brief of Louis D. Brandeis, special counsel for the Interstate Commerce Commission, in the rate increase case, in which he referred to economies in the use of oil for lubrication said to have been effected in Panama. In conclusion the company says: "If comparative estimates were made by qualified experts as to the costs per unit of work performed by the railroads, it would be found that the railroads in the United States are lubricating their equipment much cheaper than this service is performed on the isthmus. The inference is that low-priced oils and the supervision given on the isthmus are set up as standards, whereas railroads in the United States have been following this practice of supervision for many years, and if a fair comparison were made with accurate statistics, considering character of service and comparative units of work performed, it would be demonstrated that the railroads in the United States are lubricating at a cost much less than is obtained on the isthmus."

NEW PUBLICATION

Corporate Promotions and Reorganizations. By Arthur S. Dewing. Harvard University Press, Cambridge, Mass. Cloth bound, 615 pages, $2.50.

This book, which is a study of the financial policy of certain individual corporations which at one time or another have found it necessary to undergo a reorganization of their capitalization, is a scholarly contribution to the literature of trusts and corporation finance. The major portion of the book is devoted to a detailed study of a selected group of industrial corporations, each of which has passed through the cycle of promotion, failure and reorganization. The consolidations discussed are: the United States Leather Company, the starch consolidations, the glucose combinations, the National Cordage Company, the Westinghouse Electric & Manufacturing Company, the National Salt Company, the United States Realty & Construction Company, the American Bicycle Company, the American Malting Company, the New England Cotton Yarn Company, the cotton duck consolidation, the asphalt consolidation, the United States Shipbuilding Company and the American Glue Company. The cases chosen, while not exhaustive, serve to illustrate best all phases of corporate history in a comparatively brief period. The book abounds in notes and tabulated data that give complete information on the smallest auxiliary points.

The chapter devoted to the analysis of the history of the Westinghouse Electric & Manufacturing Company is probably of greatest interest to the electric railway field. The author gives the best exposition of the financial successes and difficulties of the Westinghouse Company that has ever appeared. As Mr. Dewing states, the history of the Westinghouse Electric & Manufacturing Company is a record of marked achievement in the application of scientific knowledge to practical uses. To the mind of the author, both the strength and the weakness of the Westinghouse Company lie in the inventive genius of its founder. The company has always been strong from the side of technical achievement, but weak from the side of the administration of its finances and its control over the avenues of capital and investment. The main cause for the two reorganizations of the company was the fact that the owners failed to note that a business of large magnitude, even though its credit be excellent, must be fortified by considerable reserves in the form of fluid assets not affected by the ordinary fluctuations in the demand and supply of money. The author notes that the methods used to secure relief in each of the company's reorganizations were identical. In neither instance was the reorganization accomplished through the judicial loss of the property, or was there an exchange of entirely new securities for old, or a new funded debt created. The positive expedients were the same—the merchandise creditors and bankers funded their debt into stock, and new stock in suitable amounts was issued at par. In regard to the future, the author closes with words of optimism.

The last chapters of the book are devoted to a summary of the promotion of consolidations that have undergone reorganizations, of the conditions and causes leading to reorganization and of reorganization expedients. Mr. Dewing states that the link between the promotion of a corporation and its subsequent failure and reorganization often lies in the early management, and in cases where early interests have been willing to forego immediate profits and conserve the funds, the enterprises have been placed on a sound footing. The same problem of conservatism of management presents itself in the period immediately before reorganization in connection with the payment of unearned interest or unearned dividends. In summarizing the reorganization expedients discussed in the book, Mr. Dewing states that most reorganizations have sought to relieve accumulated and unmanageable floating debt brought about by the deflection of money from the needs of the business to the payment of interest and dividend charges. All plans of reorganization have sought to improve the company's position so that the amounts required for interest payments should be within the minimum earnings of the corporation, and the preferred stock dividend records no longer a hopeless burden upon the future credit of the reorganized company.

The *laissez-faire* point of view of the author throughout the book is worthy of notice. He states that he has been impressed in his study of corporate promotions and reorganizations by the powerlessness of mere aggregates of capital to hold monopoly and also by the tremendous importance of innate individual ability or its lack in determining the success or failure of any enterprise. With these observations in mind, the author hazards the belief that whatever trust problems exist will work out their own solution. Legislative regulation is liable to perpetuate the unfortunate corporation by furnishing an artificial prop to support natural weaknesses. It is on this point that other men may take issue with the conclusions of the author.

While unfortunate management and vigorous competition may have worked out the disintegration of some trusts, in the case of combinations having a wide monopoly of raw material or patent rights and possessed of enormous capital, these forces may work out too slowly to make a passive policy of dealing with them advisable.

Electric Railway Journal

Published by the McGraw Publishing Company, Inc.

Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY, AUGUST 15, 1914 No. 7

FINING RAILROAD TRESPASSERS IN ILLINOIS The move to arrest and fine all trespassers on Illinois railroad property, recently made by the Public Utilities Commission of Illinois with the consent of Governor Dunne, cannot be commended too highly. To this end municipal and railroad authorities have been instructed to arrest all trespassers. While railroads, both steam and electric, have taken every possible precaution to reduce the number of trespassers to a minimum, they have not been aided by the state or local authorities. Accordingly, this move is of great importance to them, and it is to be hoped that it is merely the beginning of a national campaign. When it is considered that more than one-half of the people killed by railroads in the United States are trespassers, it should be cause enough to make trespassing not only illegal but subject to fine. The fact that these trespassers illegally were on dangerous ground did not serve as sufficient notice to keep them from using railroad right-of-way as public thoroughfare. On the other hand, railway companies are being forced to take every precaution to protect their passengers, hence it seems right and proper that the public should be forced to protect itself in this matter.

DISCUSSIONS ON THE WAR One of the companies in a large city has given instructions to its trainmen to refrain from discussion of the war. The very good reason stated by the management is that as this is a nation with many elements of foreign birth or descent in its citizenship, disputes may arise easily from casual remarks and the final result might be an outbreak of some nature. The motive behind the order is the same that has led to the discouragement of public gatherings in a large city by adherents of one side or the other. If neutrality is to be preserved successfully, the responsibility for this safe policy will lie not only in the executive officials of the government but also in the rank and file of the population. It is plain that if the confidence which both factions in Europe now appear to have is succeeded, as is likely to be the case soon, by a realization that the cause of one is desperate, there may be an effort, both from Europe and from sympathizers in this country, to drag this nation into the conflict. Neutrality is easy to preserve under the present conditions, but it may be less easy if pressure should be directed against this country. It is hard to restrain trainmen from expressing their feelings, but in observing the strict neutrality which should prevail, it is desirable that the dangers of the contrary course be appreciated. Trainmen are in close contact with the public at all times and will be provoked or tempted to reply to sallies. Later, when bitterness succeeds the first sentiments of surprise and horror inspired by the war, it will be still harder to keep from talking. Whether or not companies issue strict orders to their men in this matter, they will improve their own position with the public by discouraging argument with passengers.

EXPORT TRADE DURING WAR The present European war should eventually redound appreciably to the benefit of American manufacturers. The countries now involved in war have in general been our smallest patrons of electrical apparatus, owing chiefly to the operation of protective tariffs. The exception to this is England, where American manufacturers have been compelled to meet the competition of German exports. On the other hand, Canada, Japan, Mexico, South America, South Africa, East Indies and China have all been good customers, and we still have access to their markets. If the English admiralty plans result in keeping the high seas clear for English shipping, our manufacturers will probably do a fairly large export trade with that country, for supplies from Germany will be held back by blockade. There are some latent possibilities in Italy also, provided the Italians succeed in maintaining their condition of neutrality in Europe. The export trade in strictly electrical goods from America has reached a height of more than $25,000,000 a year. During the last year or two a slight tendency toward a decline has been in evidence, but exporters have generally looked upon this as a sympathetic reduction caused by a general falling off in the volume of world trade. The present closing of the purchasing markets of Europe affects so small a percentage of our total export trade in electrical appliances that it can easily be omitted from calculations. On the other hand, in the opinions of those who have studied the subject, the electrical export trade of America, which last year reached a total of about $25,000,000 should greatly increase during the next twelve months.

PROBLEMS TO BE SOLVED Before the present opportunity for increasing our electrical export trade can be fully grasped, there are certain problems that must be more fully solved, such as that of packing goods for foreign shipment and that of establishing better credit relations abroad. The safe packing of goods has been a particularly persistent and annoying problem of American shippers in connection with South American trade, but this should not be a difficulty that would long baffle American ingenuity. Much emphasis also has always been placed upon the advantages enjoyed by our European competitors, especially in South America, by virtue of their longer credits. During the last few years, however, European and American manufacturers have been brought much closer together in the matter of credits. The Germans have displayed a tendency toward a retrenchment from a previous rather excessively liberal policy regarding credits, and American merchants have shown an appreciable relaxation from their former rigid cash policy. Our principal commercial agencies have established branches or chains of correspondents throughout South America, and some of our largest banks have developed their own foreign credit departments. It must be admitted that the average merchant has not yet been clearly educated up to using our existing South American credit system and European manufacturers still have the advantage of service by branches of important home banking institutions. Nevertheless, the progress that has already been made in South America in the face of competition, seems to us an auspicious sign of the complete development that should now take place in the face of the present restricted competitive market.

THE SPECIFIC VERSUS THE GENERAL

A most striking contrast exists between the majority report regarding the Crosser bill for the government ownership of electric railways in the District of Columbia, abstracted in the ELECTRIC RAILWAY JOURNAL of July 4, and the report recently submitted by the minority members of the District committee. Whereas the bulk of the majority report (thirty out of thirty-five pages, to be exact) was devoted to a general exploitation of economic theories regarding public ownership and only 2 in. to an unsupported conclusion of seven points concerning the District railways, the minority report confines itself specifically to the proposed bill, its faulty construction and the advantages claimed by its proponents. The majority report is at best an incomplete and unauthoritative discourse on the general principle of government ownership, while the minority report is a complete analysis of the proposal, good or bad, as it relates to the matter actually under consideration. In other words, it deals with the facts. This difference is worthy of note as being characteristic of two modes of thought—the loose and the analytical.

The first part of the minority report deals with several aspects of the faulty construction of the Crosser bill. The point covering the obligation of the city to take over the railways at an award to be made by the Public Service Commission, whether excessive or not, is particularly interesting in view of the fact that out of the total fifteen witnesses in favor of the bill only four discussed the question of cost. As pointed out, it is impossible at present to ascertain what a condemnation award would amount to, but the minority members are quite correct in their assertion that in the light of current decisions the supporters of the bill have no reason for expecting the award to be limited to a bare physical value, exclusive of going concern allowances. Moreover, it is pointed out that the street railways operating within the District of Columbia extend beyond the limits of the District into a territory over which the federal government has no jurisdiction. The commission is empowered to condemn the outlying lines, but no intelligent method has been suggested for so doing and no indication made of the cost that would result.

The loose construction of the entire bill is also exemplified by Section 9 and Section 10. The first of these provides for the operation of the condemned railways under rules not in conflict with existing acts of Congress. Whether the railways would thus become amenable to all existing laws pertaining to the District is a matter of conjecture, but the efficient electric railway manager would not desire even to admit the possibility of employees receiving thirty days' leave with pay annually and thirty days' sick leave annually, and that purchases over $25 in amount should be placed in federal government hands. Section 9 authorizes the appropriation of $50,000 out of the District funds for the expenses of the condemnation proceedings, an appropriation which is not to be reimbursed out of the sale of bonds and which, in the light of the $1,000,000 paid by the City of Holyoke, Mass., for condemnation proceedings to acquire its gas and electric plants, is palpably absurd. It does not require much discernment to see in this very section the entering wedge for a continual chopping into the District funds for money to run the railways under government ownership.

The second main division of the report is devoted to a general refutation of the local advantages of government ownership so nonchalantly asserted by the majority section of the committee. To use the latter's own words: "The experience of the British Isles with city operation of street car lines shows what may be reasonably expected to be the experience here." We had supposed that every schoolboy recognized the worthlessness of the device of analogy as a means of proof except in cases where absolute similarity of structure, education or environment could be shown. Why this fundamental principle of argumentation should be so slighted by representatives in our national halls of debate is certainly not comprehensible. As we have often stated in these columns, the political conditions and ideals in Great Britain and Germany do not obtain in this country, and with all the assumptions one may care to make regarding these countries, no valid argument may be derived in support of the trial of the proposition here.

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Washington claimed by the advocates of the bill. Neither in public nor in private operation can there be found any reason for asserting that municipal ownership in Washington would result in a great reduction of fares, or a large increase in wages to correspond to the San Francisco Municipal Railway wages. Even if the railways were bought at the absurdly low $25,000,000 valuation of the parent of the bill and the burden of taxes were dodged by shifting it to the other taxpayers of the District, the granting of the wage increase which has been dangled in the report would mean an annual deficit of more than $250,000, and fare reductions would make the financial disaster still greater. If the railways were bought at any price tending to equal the present market value of the securities, a deficit would be quite possible without either reduction in fares or increase in wages. In regard to improved service and extensions of lines, the minority report pertinently points out that no admissible testimony was offered at the hearing in regard to complaints along these lines. If these or other conditions, such as those of labor and publicity, are now unjust, as the minority members do not believe, then the Public Service Commission should be required to carry out the functions for which it was created.

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It would be impossible to leave the minority report without referring to the light it throws upon the state of public sentiment in Washington regarding the proposed bill. It may be recalled that one of the witnesses, as previously mentioned in the ELECTRIC RAILWAY JOURNAL, stated that the people of Washington were "overwhelmingly" in favor of the bill, but that during a four-hour session, even though assisted by a city directory, he could name only sixteen people who favored government ownership, four of these being the three public service commissioners and the corporation counsel. Just as entertaining as the above incident is the fact that after repeated invitations, public notices of meetings and prolonged meetings, only fifteen of the 350,000 citizens were interested enough to testify in favor of the bill, and of these fifteen only four were taxpayers, and these four represented a property valuation of only $23,197 out of the total of $380,000,000.

STEEL SHEATHING FOR CAR SIDING

A surprising diversity of opinion exists in regard to the most desirable thickness for the sheet steel that is now so generally used for the side sheathing between the sills and belt rails of electric railway cars. In the case of the semi-steel car, the sheathing on each side acts as a girder supported on the body bolsters to carry the weight of the car body without the aid of side or center sills. The girder has to be reinforced by the belt rail along its upper edge, as the inherent stiffness of such a member is a feature of importance. This may account for the fact that with cars of side-girder construction a thickness of side sheathing of 1/8 in. is widely used, although many cars of this type, notably those of the Chicago Railways and the Pittsburgh Railways, have a side-sheathing thickness of 3/32 in. However, in the case of all-steel cars, side sheathing of 1/8-in., 3/32-in., and 1/16-in. plate seems to be used indiscriminately.

The use of 1/8-in. plate for side sheathing undoubtedly originated from a belief that this was a minimum workable thickness, and that in city service safety against collisions with the poles or wheel hubs of vehicles demanded more resisting power than was supplied by very thin sheets of steel. However, that the use of even 1/16-in. side sheathing is permissible is demonstrated by the stepless cars of the New York Railways. These cars are now being operated upon Broadway in New York City, where the traffic is exceptionally congested, and notwithstanding the very low sides necessitated by the stepless design no difficulty on account of puncturing the 1/16-in. side sheathing has been experienced.

In these cars, of course, the side sheathing does not act as a girder in the commonly accepted meaning of the term. Instead, the entire car side acts as a truss, of which the belt rail is the compression member, and the side sill, which is composed of a 3-in. angle, acts as the tension member. Therefore the side sheathing, when it enters into the truss action of the side at all, is in tension throughout its entire width. No doubt the sheathing, in this case, acts as a gusset plate to hold the posts and belt rail square, but in general the difficulty of riveting such a thin sheet obviously limits its action except for short distances away from the stiffening members.

Certainly the successful operation of the New York cars upon one of the most congested thoroughfares in the country disposes of the argument, so generally heard in favor of 1/8-in. sheathing, that a thinner sheet will not afford the required protection against vehicles. As a corollary, the argument that strains need not be carried up to the letter board or plate also fails, and with it disappears the only logical reason for the popularity of the side-girder construction as opposed to one of all steel. However, even where the side-girder construction is retained there seems to be no longer any good cause for carrying 250 lb. of extra weight in two girder plates that are 1/8-in. thick when it has been so thoroughly demonstrated that 3/32-in. plates will satisfactorily serve the same purpose.

Single-Unit Power Plant and Substation at Alton, Ill.

The East St. Louis & Suburban Company Has Completed a Unique Addition to Its System Which Is Tied in with the Existing Steam Station and the Keokuk Hydroelectric Development

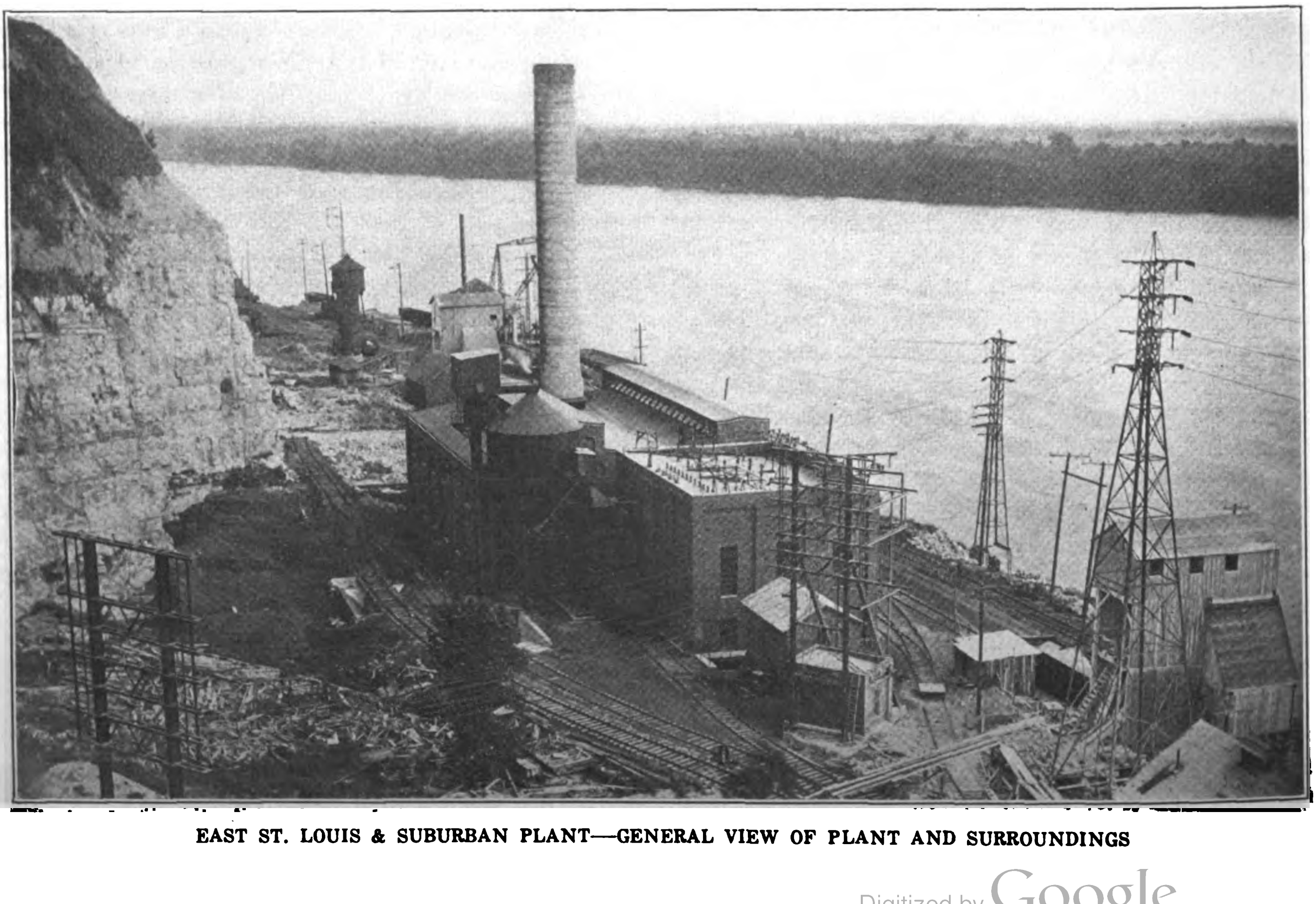
An addition to the generating system of the East St. Louis & Suburban Company, which is replete in unique features, has just been completed at Alton, Ill. Essentially, this installation includes a single-unit, 5000-kw steam generating plant supplying power to the railway, lighting and power transmission and distribution system, and a 6000-kw substation connected through a 66,000-volt a.c. transmission line with the hydroelectric plant at Keokuk, Ia. The power from the steam and the hydroelectric stations is transformed to 13,200 volts, and the lines connect with those from the Winstanley steam station of this company at East St. Louis, Ill. Power is supplied to 185 miles of city and interurban lines radiating from East St. Louis, Ill., as well as to lighting and power circuits in the territory served by the railway system. At Alton is also a terminal house from which transmission lines, carried on steel towers, lead to East St. Louis, a distance of 27 miles.

STEAM STATION ARRANGEMENT

A fireproof building on concrete foundations with red pressed-brick walls, and floors and roof of ferroinclave concrete construction, houses the steam station generating units. This building is divided into generator room and boiler room, each provided with a basement. In the engine room, 42 ft. x 112 ft. in size, is a 6250-kva 600-volt, twenty-five-cycle, General Electric generator, driven by a five-stage, horizontal Curtis turbine operating at 1500 r.p.m. The neutral of the generator is grounded. The generator terminals are connected to a three-phase, 3125-kva auto-transformer, which steps up the voltage to 13,200, and the high-tension terminals are connected, through a three-phase, 300-amp, 15,000-volt oil switch, to the 13,200-volt bus in the substation. The station is designed for an ultimate capacity of 10,000-kw and, with but slight changes, it can be arranged to house machinery of double this capacity. Practically two-thirds of the generating room is occupied by a synchronous condenser, two frequency changers, two synchronous converters, two motor-driven exciter sets, a steam-driven exciter, switchboards and control apparatus. An overhead, 30-ton, electric traveling crane serves the entire generating room.

MOTOR-DRIVEN VERTICAL PUMPS

An Alberger 8200-sq. ft. Spiroflo surface condenser, installed beneath the turbine, is connected to it by a 52-in. x 17-in. expansion joint. Circulating water is supplied to this unit through a syphon-type system, and is lifted from the Mississippi River by an 18-in. vertical centrifugal pump, driven by a 100-hp, 250-volt, d.c. variable-speed motor located on the engine-room floor. This pump has a capacity of 9000 gal. per minute against a total head of 16 ft. when operating at 395 r.p.m. Since the Mississippi River is free from sand bars and other obstructions at this point, it was possible to lay the 18-in. intake pipe, fitted with flexible joints, directly on the river bottom. To prevent large particles of foreign matter from entering the intake system, however, the end of this pipe was provided with a coarse screen, and in addition a twin strainer was placed inside the station. In order to provide for



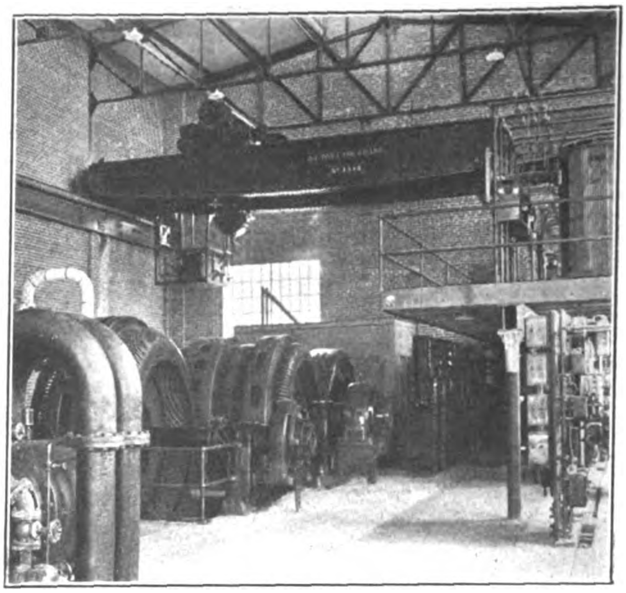
EAST ST. LOUIS & SUBURBAN PLANT—GENERAL VIEW OF PLANT AND SURROUNDINGS variations in the load on the turbine and in the stage and temperature of the river water, the motor driving the circulating water pump was chosen to permit a variation in speed from 350 r.p.m. to 750 r.p.m. A rotary dry-vacuum pump, 12 in. x 30 in. x 18 in. in size, handles the non-condensible vapor in the condenser, while a steam-turbine-driven, hot-well centrifugal pump removes the condensate from the condenser and lifts it to the overhead feed-water storage tank in the boiler room.

125-250-VOLT EXCITERS

As it was desired to use 250 volts d.c. for the motors driving the circulating pump, the coal-weighing hopper and the traveling crane, three-wire, 125-250-volt exciter units were selected. There are three 75-kw exciter sets, two driven by 220-volt, three-phase, twenty-five-cycle induction motors, and the third by a steam engine. Double exciter buses were installed so that a portion of the machines may be excited from one bus while the others receive their excitation from the second bus. The exciters were so connected also that they can supply power to the station lighting system in emergency. A storage battery used in the operation of the remote-control oil switches is also connected to automatically supply energy for switchboard lighting when the station voltage falls below a predetermined limit.

SYNCHRONOUS CONDENSER FOR POWER FACTOR CONTROL

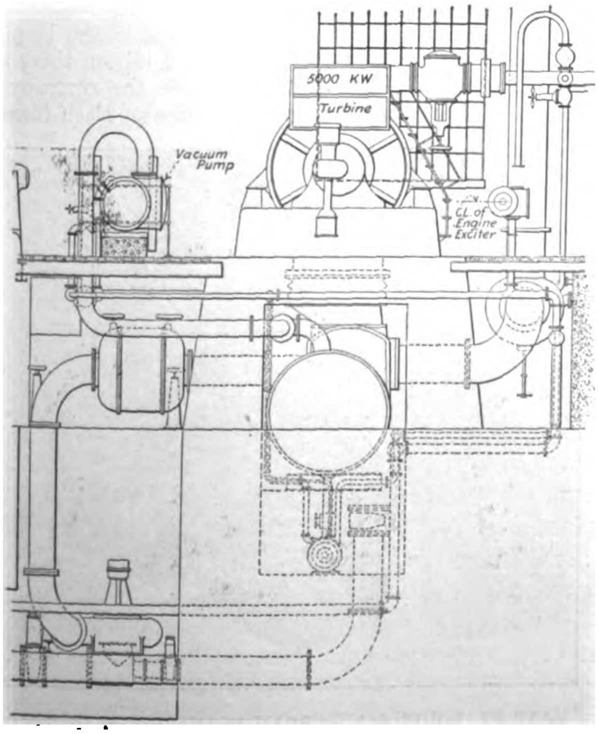
The substation equipment located in the power plant includes a 13,200-volt synchronous condenser connected to one section of the ring bus and designed to permit the maintenance of constant potential and high power factor on the railway end. There are also a frequency changer rated at 500 kw and another rated at 1000 kw, used to supply fifty-cycle power for motor service and light in Alton, and a 500-kw, 600-volt synchronous converter for railway lines in Alton. Another converter of the same capacity has been provided for.



EAST ST. LOUIS & SUBURBAN PLANT—FREQUENCY CHANGER END OF TURBINE ROOM

SWITCHBOARD ARRANGEMENT

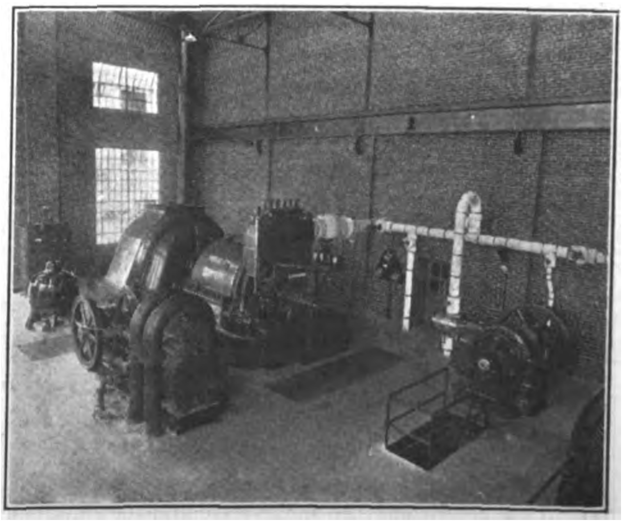
The twenty-five-cycle switchboard is divided into five sections, namely, one controlling the twenty-five-cycle, 13,200-volt equipment and the twenty-five-cycle 66,000-volt equipment; another the sixty-cycle, 2300-volt equipment; a third, the 600-volt d.c. railway unit, and a fourth for the arc lamp and the exciter sets. The fifth is a twenty-five-cycle, 220-volt panel for controlling the low-tension a.c. circuits to the various motor-driven auxiliaries.



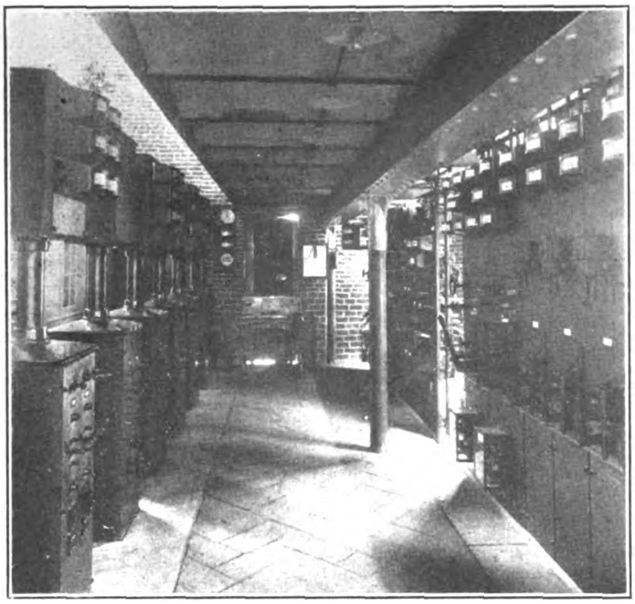
EAST ST. LOUIS & SUBURBAN PLANT—DETAILS OF TURBINE CONDENSING EQUIPMENT

Each panel is a separate pedestal separated from its neighbor approximately 4 ft. Seven pedestals with the synchronizing post, have been installed. One post at the end of the row of pedestals supports a swinging bracket carrying a synchroscope, a frequency indicator and two voltmeters. One of the voltmeters is so arranged that it can be connected to any section of the twenty-five-cycle buses, while the other can be plugged into any machine or into the outgoing lines.

Switchboards for the sixty-cycle a.c. and the d.c. railway feeders, the exciter and the synchronous condenser face the switchboard. A balcony over both switchboards carries the oil switches for the sixty-cycle, 2300-volt lighting and power feeders. This balcony also accommodates the transformer and switching equipment for the series arc and the incandescent lighting circuits.



EAST ST. LOUIS & SUBURBAN PLANT—TURBO-GENERATOR AND AUXILIARIES



EAST ST. LOUIS & SUBURBAN PLANT—SWITCHBOARD SECTION

NATURAL AND INDUCED DRAFT SYSTEMS

A battery of four 440-hp B. & W. boilers, equipped with superheaters, comprises the steam-generating equipment in the boiler room, which is 57 ft. x 96 ft. 6 in. in size. These boilers are designed to operate at 100 per cent overload, thus making the actual total rating 3520 hp. Steam is delivered to a single header at 175-lb. gage pressure with 100 deg. superheat. This header in turn serves all the steam units in the station. Each boiler is equipped with four chain-grate stokers, driven by 3-hp, 220-volt, three-phase, twenty-five-cycle individual motors. The battery is also served by two economizers, having 4018 sq. ft. of heating surface each, and so arranged that ordinarily the gases from two boilers pass through each economizer. The feed-water piping is so connected to the economizers that they are operated in parallel.

Under light loads a 12-ft. x 150-ft. concrete stack will serve the present boiler equipment, but for heavier loads and quick firing a supplementary induced draft fan, driven by a 12-in. x 30-in. Corliss engine, will be used also. This fan will deliver 1000 cu. ft. of air per minute when running at 100 r.p.m. Provision for quick firing was made also as a precaution against interruption in the power supply from the hydroelectric plant.

FEED-WATER SUPPLY AND MEASUREMENT

Boiler feed water is delivered by a gravity system from a storage tank above the boiler room, to a Hoppes exhaust-steam feed-water heater with 625 sq. ft. of heating surface. Ordinarily the water from this heater is pumped to the boilers by a 17-in. x 10-in. x 17-in. Worthington duplex pump of the outside packed type. In cases of light load or emergency, however, a 9-in. x 15-in. x 10-in. pump of the same type performs the work. This pump during ordinary operation is used only for boiler washing. The feed-piping system is arranged so that water may be fed either to the boilers direct or to the economizers.

All of the boiler feed water is weighed by Hammond water meters before entering the storage tank. A 4-in. meter, having a capacity of 75,000 lb. per hour, receives the condensate from the turbine, and a 3-in. meter weighs the make-up water. Under ordinary operating conditions the make-up water is supplied by the cooling water from the turbine bearings and the dry-vacuum pump jacket. Provision is made, however, so that water from the house piping system will be cut in automatically through this 3-in. meter, if the water in the storage tank falls below a predetermined level.

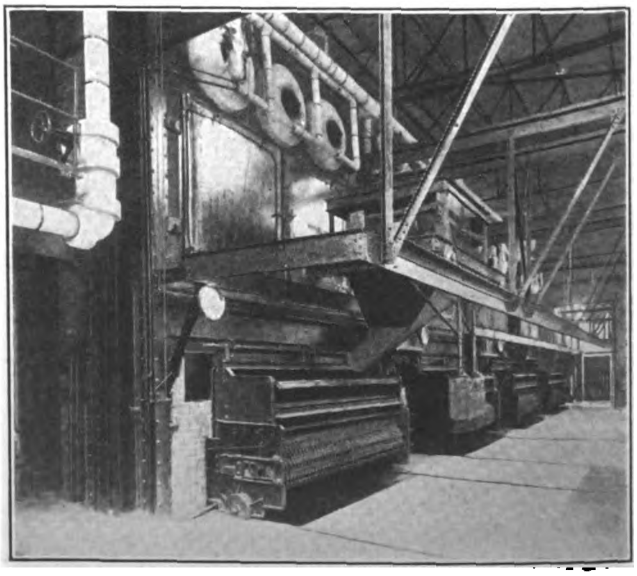
COAL SUPPLY AND MEASUREMENT

Although the East St. Louis & Suburban Railway transports large quantities of coal from the Illinois fields into East St. Louis, it was found more economical to deliver coal to this steam plant by a steam-road connection than to extend the company's own line to the station site for this purpose. Provision for receipt of coal include one track for loaded cars and another for empty ones. In installing these tracks a descending grade to the coal hoppers was provided so that loaded cars could be moved by hand. This same grade permits the "empties" to roll down to the end of the track whence they are removed by the switch engine. All coal is received in bottom-dump cars, which discharge into the track hopper. From this point it is picked up by a flight conveyor and carried to a motor-driven motor or, in case crushing is unnecessary, direct to the bucket elevator, in which it is elevated to a 300-ton steel, concrete-lined storage bunker located just outside the station at the end of the boiler room.

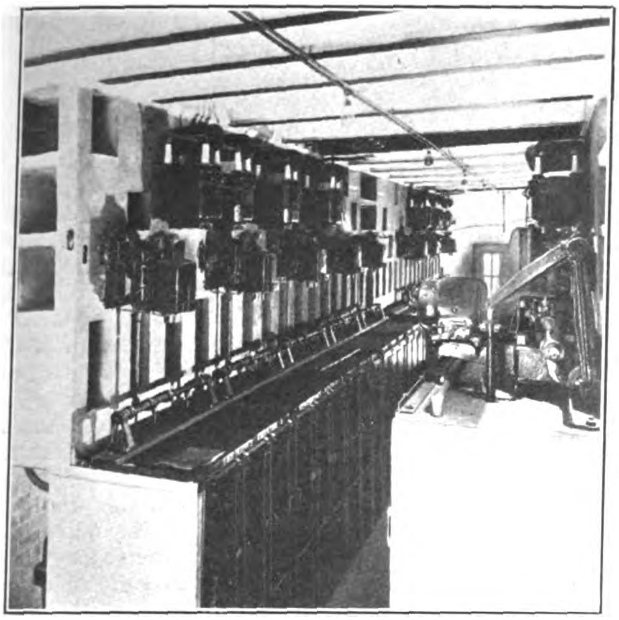
Coal from the bunker flows by gravity into a 2-ton traveling weigh hopper, which is driven by a 2-hp, 250-volt, 1250-r.p.m. d.c. motor, controlled by chains suspended within reach of a man on the boiler-room floor. This hopper is supported on an overhead track immediately in front of the boilers, and discharges coal into the stoker hoppers. Attached to this hopper is weighing apparatus which automatically records the amount of coal dumped into the stoker hoppers. Fine coal and ash from the chain-grate stokers are carried by a chain-drag conveyor and bucket elevator to separate hoppers supported on the same steel structure with the coal-storage bin. The fine-coal bin is so placed that this coal can be discharged into the coal-weighing hopper and again fed to the stokers. The ash hopper is placed above the track so that an empty coal car may be placed beneath it for loading.

DAILY BOILER TESTS

The combined facilities for weighing water and keeping coal and furnace records permit the keeping of continuous efficiency records. In addition there are other instruments installed to enable the company to keep close check on operating conditions. Each furnace



EAST ST. LOUIS & SUBURBAN PLANT—VIEW IN BOILER ROOM



EAST ST. LOUIS & SUBURBAN PLANT—REMOTE-CONTROLLED SWITCHES AND BUSBAR COMPARTMENTS

is furnished with an Ellison differential draft gage; a combination indicating recording and draft gage is so piped that it may serve any or all furnaces, and recording instruments have been installed to record the temperatures of water from the storage tank, the exhaust heater (giving the temperature of the water furnished to the economizer) and each economizer. Instruments also record the temperatures of the gases to and from each economizer, exhaust steam from the turbine, condensate from the condenser, and circulating water from the condenser. The chart for the exhaust steam thermometer record also contains those of temperature and vacuum. The temperature of the circulating water entering the condenser is determined by an indicating thermometer, since it is practically constant.

SUBSTATION WITH TWO SOURCES OF ENERGY

A substation of the same general construction has been erected at the west end of the steam station building. Incoming and outgoing 66,000-volt lines and outgoing 13,200-volt railway transmission lines terminate in this building. The outgoing 66,000-volt line is carried on steel towers of special design, furnished by the Archbold-Brady Company, to the company's substation in East St. Louis. This line is brought through the Alton substation so that all of the 66,000-volt a.c. power received from the Mississippi River Power Company can be measured. There are two 13,200-volt, twenty-five-cycle lines connecting this station with the East St. Louis substation at Lake Avenue. Provision has been made for two 13,200-volt, twenty-five-cycle lines to connect this station with local points in order to supply power to the city and interurban railway lines. But one of these has yet been installed. All of the a.c. transmission lines entering and leaving this substation pass through air-brake switches, the wires entering through bushings mounted on the roof.

The substation building is divided into three rooms; one each for transformers, 66,000-volt switches and 13,200-volt switches. Lightning arresters for incoming and outgoing 66,000-volt a.c. lines and outgoing 13,200-volt lines are installed on a balcony above the 13,200-volt switch room. Two three-phase, twenty-five-cycle, 3000-kva transformers; a three-phase, twenty-five-cycle, 3125-kva auto-transformers; two 13,200/220-125-volt auxiliary transformers, and potential and current transformers for the 66,000-volt metering equipment, are installed in the substation. In the 66,000-volt switch room an oil switch is connected between the incoming line and the bus. One 66,000-volt oil switch is connected between this bus and the 66,000-volt outgoing line to East St. Louis, and an oil switch is provided for each of the 3000-kva transformers.

All remote-control oil switches are installed in the 13,200-volt switch room. The view of this room, reproduced herewith, shows a narrow alleyway with concrete walls on either side. The ring bus is divided into four sections, two of which are carried on each side of the room, supported in concrete compartments. It has been possible by the use of this plan to economize in floor space. In width the room containing the 13,200-volt electrical apparatus is but 13 ft. from wall to wall with an alleyway down the center, 3 ft. 8 in. wide. In the concrete compartments the oil switches occupy the lower cells, while the switch solenoid operating mechanisms are mounted on the front walls of the compartments containing the buses. Cables connecting these switches with the machines and switchboards of the steam station are carried between the two buildings in underground clay conduits.

TERMINAL HOUSE ARRANGEMENT

The terminal house was provided to separate the high-voltage transmission apparatus from the low-voltage commercial and railway circuits. All of the local 2300-volt, sixty-cycle feeders, the 600-volt d.c. railway feeders, and the a.c. arc-lamp feeders which are carried in tile conduits from the steam station to the terminal house, are connected at this point to the outgoing steel-tower lines. The terminal house is 14 ft. square and is placed about 30 ft. from the substation building. It houses the lightning arresters for the feeders mentioned above. From the building the lines lead to a steel tower erected directly over it. From this point special steel towers support the line as it passes from the quarry, in which the plant is located, to connect with the city railway, lighting and power lines. These towers also serve to carry the local 13,200-volt line.

The addition to the generating system of the East St. Louis & Suburban Company described above was erected by the E. W. Clark & Company Management Corporation and will be operated by the East St. Louis Power Company. The construction work was superintended by K. B. Ward, assisted by G. W. McIver, electrical engineer, and H. H. Bailey, mechanical engineer.

Safety Movement in England

The Great Western Railway, England, has recently presented to each of its 80,000 employees a most interesting forty-eight-page pamphlet entitled "The Safety Movement." The introduction gives the railway accident statistics for the United Kingdom, showing what proportion was due to want of caution by the men themselves. The greater part of the book comprises many illustrations with appropriate text to show both safe and dangerous ways of working on locomotives, freight cars, passenger cars, in yards and shops, in baggage rooms, on track jobs, on hand cars, etc. Various safety devices such as goggles and respirators are also described. A detailed tabulation of one month's personal accidents in the various departments of the railway is given at the end with an earnest injunction to all to help in the "safety movement."

Minority Report on Crosser Bill

Abstract of Report Presented on Subject of Government Ownership of Railways in District of Columbia—Faults of Bill Outlined and Asserted Advantages Refuted

The complete minority report on the Crosser Bill, providing for government ownership of street railways in the District of Columbia, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, is now available. The report was signed S. E. Winslow, Worcester, Mass.; E. E. Reed, Manchester, N. H.; Samuel Wallin, Amsterdam, Pa.; Abraham L. Keister, Scottdale, Pa.; S. F. Prouty, Des Moines, Ia.; T. H. Calway, Jonesboro, Md., and Ben Johnson, Bardstown, Ky. An abstract of the report is published below.

Only two real points were made in support of the contention that municipal ownership is needed in the District of Columbia: That the citizens would be given universal transfers; that the companies are now overcapitalized, and in consequence the traveling public is being cheated out of proper rights which it would obtain under public ownership.

Universal transfers are urgently needed in the District. We believe the quickest and surest way to obtain universal transfers is for the Public Utilities Commission to press energetically a demonstration that the two companies can afford to provide this service. Other efforts to obtain universal transfers may be more spectacular and sensational, but will not be so constructive in result. Condemnation of railways and purchase by the District with the accompanying great expense are not needed to bring this about.

With all the references to overcapitalization, there were not presented to the committee any facts whatsoever to sustain the charge. This Congress has appropriated $100,000 for a physical valuation of these properties. The question of overvaluation, if any, can be intelligently dealt with when the report is made and not until then.

FAULTY STRUCTURE OF BILL

Section 2 provides that condemnation proceedings shall be instituted, and succeeding sections provide that a final award shall be made under one or another course and that the District shall then take over the lines at the amount of the award—whether it should appear to be excessively burdensome or otherwise. There are no data on the probable amount of the award other than the claim of a Washington street railway official that it would exceed $55,000,000, the fact that the market value of the outstanding securities is about $48,000,000, the belief of the corporation counsel that the award ought to be under $30,000,000, and the statement of the proposer of the bill that in his opinion the physical valuation of the properties was about $25,000,000. As a matter of fact the Public Utilities Commission has under way a physical valuation of the properties and finds itself after seven months unable to give the committee any idea whatsoever what the valuation of the properties would be even when regarded only from the standpoint of physical valuation.

The wisdom of condemnation proceedings by the Public Utilities Commission, as provided by Section 4, might properly be questioned, for two of the members openly testified that they were strongly in favor of public ownership of such public utilities and had advocated it for many years, which might naturally preclude their having the open minds of arbitrators. Moreover, none of the three would claim to have expert knowledge of street railway matters. The wisdom of selecting this board is furthermore open to question because of the impossibility of any three men devoting to this problem the exacting study and thought necessary, when they are already burdened with so many other duties which may not be slighted.

Section 5 provides for a possible court review of the award by the Public Service Commission. Without questioning the conclusions of the court, however, an appeal to it would naturally add greatly to the uncertainty of the amount of the award in view of recent court rulings that owners are entitled to a greater amount than the mere physical value of the properties and that the assets of a going concern should be paid for. No testimony was submitted by the supporters of the bill to show any reason for expecting the amount of the award to be limited to what are commonly known as physical values. The majority report virtually assumes that the so-called physical values will alone determine the award. Such an assumption is clearly contrary to present practice; court decisions are quite the reverse. The proposed bill either by design or otherwise absolutely omits all reference to the basis of determining value, which omission clearly indicates general carelessness and complete lack of business acumen on the part of the framers.

Funds for the payment of interest and the redemption of the bonds covered by Section 6 must accrue solely from the net earnings of the street railways, without which the bonds would immediately come into default, apparently. The form and other usual provisions of bonds are not mentioned in the bill. If issued strictly in accordance with the terms of the bill there would be grave doubt as to the responsibility of the District for the payment of interest charges and for the redemption of the bonds at maturity in the event of insufficient receipts from the earnings of the railways to cover such charges. In view of such uncertainty of interest and sinking-fund payments it is difficult to conceive that a market at par or better could be found for any such bonds. On the contrary, it is more than likely that if the bonds were sold at all they would have to be disposed of at a price or prices far below par. This transaction in itself would impose on the railways at the inception a deficit of no mean proportions.

Section 6 further provides that the commissioners must acquire all the lines within the District, but are merely empowered to purchase the parts of lines lying outside the District boundaries. The possible complications which may follow this must be apparent to everyone. The testimony of witnesses failed to bring forth any specific or intelligent suggestion either as to the acquisition of these outside lines in the event of dispute over their values or as to their operation pending purchase negotiations, and all this with no indication of the possible cost.

By the provision of Section 8 the determination of the amount to be paid into the sinking fund each year appears to be optional with the commissioners. There would be no safety, however, in any plan of making payments into the sinking fund except that of paying a definite, uniform and fixed amount each year. The market value of the outstanding securities on April 14, 1914, was approximately $48,000,000. If the commissioners were to purchase the lines at this price and were to sell the proposed bonds at par there would be an annual interest charge at 3.65 per cent on $48,000,000 of bonds, or $1,752,000. If the sinking fund were advantageously invested at 3 per cent interest, compounded semi-annually, the annual deposit to the credit of the sinking fund would be $1,166,533. Thus the annual charges on an issue of $48,000,000 of bonds would be $2,918,533. In 1912, however, the railways paid out a total of $2,266,094.51 for interest and dividends, an amount $652,439 short of an annual fixed charge of $2,918,533. In 1913 the companies paid out for interest and dividends an amount $368,299 short of such an annual fixed charge. The taxes paid by the companies in 1912 amounted to $206,078.85 and in 1913 to $318,063.69. Under municipal ownership these taxes would not have to be paid, and this sum could be applied to meeting annual fixed charges, yet even this would be insufficient to make up the shortage.

Section 9 provides for the operation of the lines by the commissioners of the District under rules not in conflict with any existing law of Congress. The point has been raised that this provision may be interpreted to apply to the operation of street railways all existing acts of Congress relating to the District of Columbia. This would apply the eight-hour law for all employees, would give all employees thirty days' annual leave with pay and thirty days' sick leave annually, would prohibit the insurance of any property, would place in the hands of a departmental committee of the federal government the purchase of all supplies of more than $25 in amount, and would restrict the operation of the railways in various other legal and commercial ways.

In regard to the appropriation of $50,000 for the expenses incident to the condemnation and taking over of the lines, as provided in Section 10, it may be said that not an estimate was submitted to the committee by anyone as to the probable expense of the proceedings. The Public Utilities Commission, not being a board of experts, would have to call to its assistance innumerable experts, such as accountants, engineers, real estate appraisers, etc., to give very complete and detailed reports on the great number of points involved. Then, in the almost certain event of an appeal to the courts from its award, the commission would be compelled to defend its award at very heavy expense for counsel, experts, court expenses, etc. Numerous other items of expense are also apparent.

United States Commissioner of Labor statistics are given on the ratio of these preliminary expenses in the acquisition of various municipal lighting plants. The four largest plants show a percentage of 1.66 to the total cost of the plant, which in this case would mean preliminary expenses of $500,000 to $800,000. This indicates that the proposed amount of $50,000 is in itself an absurdity and only further emphasizes the hit-or-miss character of the whole bill. Furthermore, this money is to be appropriated out of the District funds with no provision for reimbursing the District out of the sale of the bonds or otherwise, thus at the very outset establishing the practice of dipping into the District funds raised by taxation.

ALLEGED ADVANTAGES OF THE BILL

Seven advantages which would accrue to the District by the municipal ownership and operation of the street railways have been set forth by the supporters of the bill, the first being "a great reduction in fares." The rate of fare now paid by most passengers in the District is 4 1/6 cents, or 6 tickets for 25 cents. This is lower than in most large cities of the United States. The average fare paid by all revenue passengers is very close to 4 cents. In 1913 the Capital Traction Company carried 53,425,152 revenue passengers for $2,295,956.41 at an average fare paid of 4.03 cents. Such figures as are available for the other company indicate practically the same average fare. The only basis for a reduction of fares is the hope that an award by the courts would make it possible to buy the railways at an amount considerably lower than the market value of the outstanding securities on April 14, 1914—$47,798,102.

The wage increase proposed by the supporters of the bill would in itself make any reduction of fares impossible. The report of the majority of the committee contrasts the rate paid in Washington to motormen and conductors, an average of 23½ cents an hour, to that paid in San Francisco on the one street municipal line, 37½ cents per hour. Such an increase in wages would cost the District railways more than $1,500,000 a year. If the District can buy the railways for the lowest price suggested—$25,000,000, which is about half the market value of the outstanding securities—such an increase of wages would absolutely prevent any reduction in fares. The present earnings of the road are just sufficient to meet operating expenses, pay taxes of $318,063.69, and leave $2,550,234.94 available for interest and dividends. If the municipal railways paid $1,620,169 for fixed charges and granted a wage increase of $1,500,000 the combined sum would be $3,120,169, giving a shortage of $569,934.06. By not paying taxes this would be reduced to $251,871.06. On the basis of 1913 a reduction of 1 cent in fares would mean a decreased revenue of $1,075,000, and a reduction of half a cent in fares a decreased revenue of $537,000. The extreme unlikelihood of any reduction of fares is obvious from the fact that if the railways are bought at the present market value of the securities a deficit is quite possible without either reduction in fares or increase in wages, while if they are bought at the figure of $25,000,000, practically at half price, the wage increase suggested would make a deficit in itself, and fare reductions would simply make the financial disaster more complete.

The evidence submitted regarding municipal railways elsewhere gives no assurance of reduced fares. The San Francisco Municipal Railways operates through a very productive territory and charges 5-cent fares, with the provision of half fares for school children during certain hours, a practice quite common in the United States. The municipal railway in Monroe, La., charges 5-cent fares. Several cities in the newly developed western section of Canada have municipally owned street railways, the largest being Edmonton. Heavy annual deficits there have recently forced a return to 5-cent fares. Illustrations of lower fares in Great Britain and other European countries are worthless, for different conditions of length of ride, number of available cars, wages, etc., offer no intelligent basis for comparison.

The second advantage claimed is "an improvement in service." Not the slightest bit of evidence was presented to the committee to the effect that service in the District of Columbia is not equal to the best in other large cities, whether the companies are operated under private ownership in the United States or under private or public ownership in foreign countries. The evidence showed that the Public Utilities Commission has already issued more than 600 orders or suggestions of changes to one company and only two have been resisted by the company, both of which may yet be enforced by the courts if found reasonable. If the service is unsatisfactory, the remedy for its improvement is at hand in the Public Utilities Commission law passed for this very purpose.

"More rapid extension of lines" is given as the third advantage. No unprejudiced testimony was presented to the committee to show that the existing companies were not extending lines as readily as other private companies and much more readily than municipally owned foreign companies, or that they had refused any reasonable petitions on the part of the public for extensions. One witness protested against the refusal of the companies to extend lines in his section, but ultimately he admitted he was an executive officer of a real estate development company.

The fourth claimed advantage is "increase of traffic due to lower fares and improved service." It is purely a speculation that any more people would be riding if fares were slightly or even materially reduced—a theory not based on available facts, testimony or evidence.

"Improvement in conditions of labor" is given as the fifth advantage. The testimony indicated that labor conditions on the street railways in the District were on a parity with other labor conditions in the District. If the conditions are unjust, the Public Utilities Commission and Congress should exhaust all possible means for an improvement before resorting to the financial hazard of municipal ownership.

"Full publicity of cost and value," the sixth advantage, should be obtained by the Public Utilities Commission. If that commission has not sufficient power, an appeal to Congress for further authority would surely be granted. Authoritative evidence was presented in the hearings to the effect that municipally owned utilities are more likely to err in this matter than privately owned public utilities.

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PUBLIC OPINION IN THE DISTRICT

The report states that definite resolutions in favor of the Crosser bill were not submitted by any one of the score or more of citizens' organizations in the District. On the contrary, one presented resolutions against it and a number were reported as voting against going on record. Only fifteen witnesses appeared in behalf of the bill. The report contains a schedule showing the occupations of these witnesses, complaints against present operation, reasons for interest in bill, general arguments in favor of the bill, tax assessments, opinions concerning purchase regardless of cost and number of years in favor of municipal ownership. Of the fifteen witnesses, one complained against the present rate of fare, one against the number of cars running to the suburbs, two against crowds in rush hours and one against the refusal to build a suburban extension. The remainder of the witnesses either would not discuss this phase of the question or had no complaint to make. With one exception every witness expressed his firm belief in public ownership of public utilities as a general proposition, and a cross-examination as to the number of years they had been in favor of municipal ownership showed that the force behind the bill was almost all consistent and long-time advocates of municipal ownership.

The fifteen witnesses out of a total population of 350,000 represented a taxation assessment of $123,197 out of a total assessed valuation of $380,000,000 in the District. The above-mentioned tax assessment for the fifteen witnesses, however, was confined to four persons, the remaining eleven not being at all assessed. It is stated in general that efforts made by the committee to learn of any public demand for the Crosser bill were not successful other than in demonstrating that no public sentiment in favor of the bill existed.

MUNICIPAL OWNERSHIP IN GENERAL

In concluding, the minority report states that the evidence submitted has not been conclusive on the question of the success of municipal ownership of electric railways. Data from a 9-mile street railway in Monroe, La., were very scanty. A municipal line in New Orleans must be excluded from consideration, for it is merely a belt line for the transfer of freight from one terminal to another. As for the municipal line of San Francisco, when the annual redemption of bonds must be met, the net profits from operation would be inadequate to pay the costs of operation and all the other charges if the railway did not save $40,000 or more in taxes and services from other city departments. With this saving of $40,000, although at a like expense of other departments of the city, the lines may even then fail by a few thousands of dollars annually to meet all charges, on the basis of the present receipts and expenses. There appears to be no great inspiration for Washington in this example of municipal railways. James Dalrymple, general manager Glasgow Corporation Tramways, at one time expressed his opinion that municipal ownership of street railways should be successful in the United States, but after a visit to the United States and personal inquiry into American conditions he said: "What I have seen here, and I have studied the situation carefully, makes me realize that private ownership under proper conditions is far better for the citizens of American cities."

Ten Commandments of Safety

At the Lorain Steel Company's plant at Johnstown, Pa., the following ten commandments have been adopted for the guidance of the employees:

1. Thou shalt have no other thoughts than thy work.
2. Thou shalt take no unnecessary risks, nor try to show off, nor play practical jokes, for by thy carelessness thou mayest do injuries which will have effect unto the third and fourth generations to follow.
3. Thou shalt not swear, nor lose thy temper when things do not come just right.
4. Remember that thou art not the only one on the job and that other lives are just as important as thine own.
5. Honor thy job and thyself that thy days may be long in employment.
6. Thou shalt not clean machinery while it is in motion.
7. Thou shalt not watch thy neighbor's work, but attend to thine own.
8. Thou shalt not let the sleeves of thy shirt hang loose, nor the flaps of thy coat be unbuttoned, as they may get caught in the machinery.
9. Thou shalt not throw matches or greasy waste on the floor, nor scatter oil around the bearings, as a dirty worker is a clumsy worker, and a clumsy worker is a menace to his fellow workers.
10. Thou shalt not interfere with the switches, nor the dynamos, nor the cables, nor the engines, nor anything else thou art told is dangerous.

The Mayor of Portland, Ore., recently requested a committee composed of prominent men of Portland to investigate the general condition of the city and report to him with suggestions and recommendations to make Portland a safer city. B. F. Boynton, claim agent Portland Railway, Light & Power Company, was elected chairman.

Rolling Stock for Montreal Tunnel and Terminal

The Present Article Describes the Locomotives and Motor Cars for This 2400-Volt D.C. Electrification—The Locomotives Are Similar to the Butte Design but Are Geared for a Speed of 45 M.p.h..—The Motor Cars Are of Steel for Suburban High-Speed Service

BY W. C. LANCASTER, ELECTRICAL AND MECHANICAL ENGINEER MACKENZIE, MANN & COMPANY, LTD., MONTREAL

In the March 14 issue of the ELECTRIC RAILWAY JOURNAL the writer described the causes leading up to the choice of 2400 volts direct current for the electrification of the Canadian Northern Railroad at Montreal.

The electric rolling stock for the operation of the tunnel and terminal will consist of both electric locomotives for hauling the trains ordinarily operated by steam, and multiple unit cars to maintain a quick and frequent service between the main passenger terminal in the city and the country just west of Mount Royal, which, it is expected, will be rapidly built up and form one of the most attractive suburbs of Montreal.

LOCOMOTIVES

The 2400-volt d.c. locomotives are substantially the same in appearance and dimensions as those of the Butte, Anaconda & Pacific Railway, which were illustrated in the ELECTRIC RAILWAY JOURNAL for June 7, 1913, page 1010. As the schedule for the locomotive trains does not call for high speed, it was not thought necessary to resort to any of the special methods of connecting the motors to the driving axles, such as are used on the side-rod and gearless types. The motors will be nose-supported in the usual way and geared to the axle by means of twin gears.

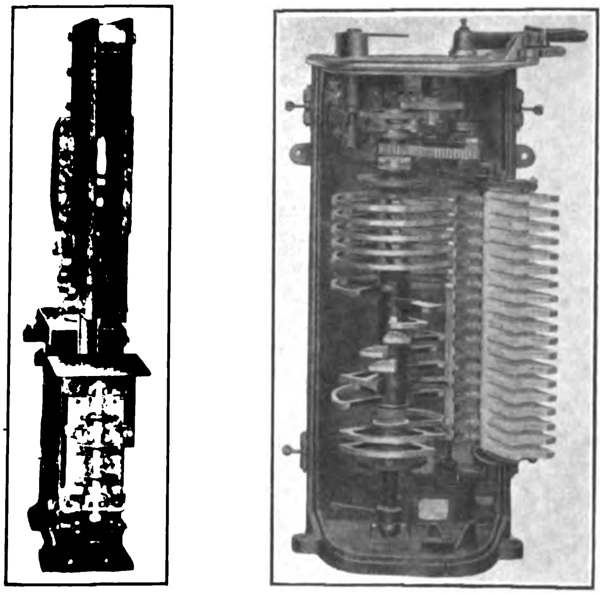
The locomotive has four axles with all the weight of the locomotive upon the eight driving wheels. The running gear consists of two four-wheel trucks, articulated together by a heavy hinge. The equalization of the trucks is accomplished by a semi-elliptic leaf spring over each journal box, connected through spring hangers to the frame and to the equalizer bars. The equivalent of a three-point suspension is thus obtained through the side equalization of one of the trucks and both side and cross equalization of the other truck.

The friction draft gear is mounted in the end frame casting of the truck. The cab, which is of the box type, is divided into three compartments, the center compartment for the apparatus and the two end compartments for the operator.. Each operator's compartment is supplied with controller, control switches, ammeter, air brake and pantograph control, air gages, 2400-volt cab heater, bell rope and control for the whistle and sanders, thus providing the locomotive with complete double-end control.

The motor equipment consists of four GE-229A commutating pole motors wound for 1200 volts and insulated for 2400 volts, two of these motors being permanently connected in series for operating on the 2400-volt trolley circuit. The one-hour rating of each motor is 315 hp at 1200 volts. The motors are designed for forced ventilation, which is obtained by means of a blower in the locomotive cab. Either pair of motors may be cut out, in case of emergency, by a ~~special~~ handle on the change-over switch. The locomotives are geared for a free running speed on tangent level track of approximately 45 m.p.h. and are operated as two-speed machines with ten points in series and nine points in series-parallel. The master controller used is of the non-automatic type and has two handles, one regulating the applied voltage at the motors and the other for controlling the direction of rotation of the motors. The rheostats which form the external motor resistance are placed near the roof of the cab and provided with ample natural ventilation.

The master controller and contactor energizing circuits are designed for 125 volts. Each contactor is easily accessible without any disturbance to adjacent contactors. A special electro-pneumatic change-over switch is used for making the transition between series and series-parallel connection of the pairs of motors.

The 125-volt current for operating the contactors and for lighting the cab and headlights is obtained from a motor-generator set, the motor of which has two 1200-volt windings and two 1200-volt commutators in series for operation on 2400 volts. This set is mounted in the center cab and also drives the blower for providing forced ventilation to the main motors.

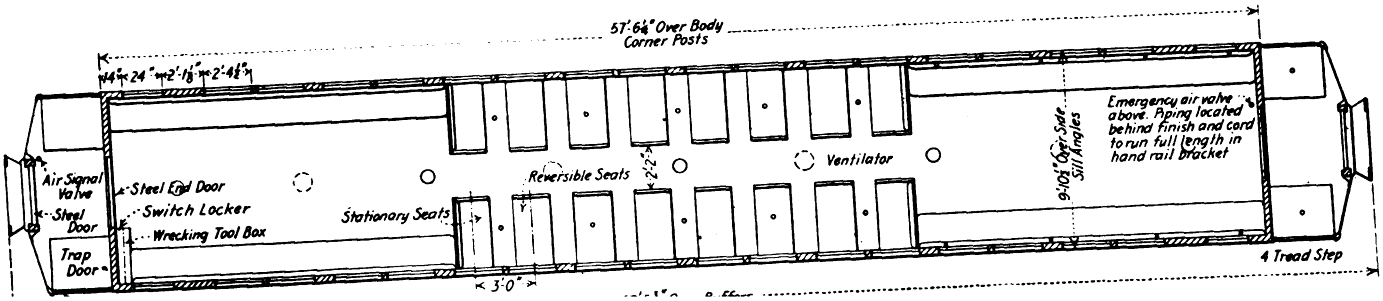


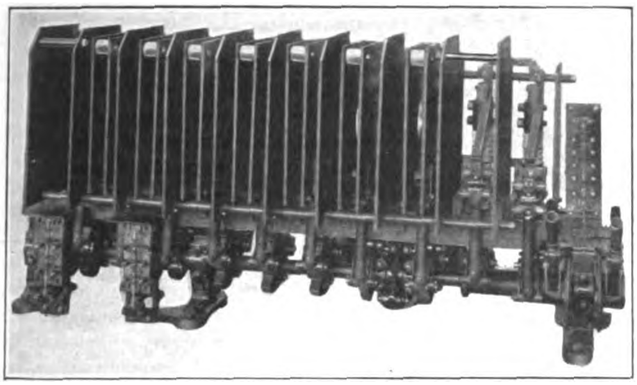
MONTREAL TERMINAL ELECTRIFICATION—CONTACTOR WITH INTERLOCK; MASTER CONTROLLER FOR LOCOMOTIVE

Fuses of the copper ribbon type placed in fuse boxes provide protection for each individual circuit as well as the main circuit from the trolley. These fuse boxes are all arranged to blow into a common chamber designed to take care of the arc. In addition to the fuse on the main circuit, a main switch is also provided. This is of the knife-blade type, being opened and closed by a handle placed in a position for easy operation in case of emergency or when it might be necessary to open the circuit while carrying current. This main switch blows into the chamber provided for the fuses, ~~and has a~~ powerful magnetic blowout.

The trolleys are of the Butte roller pantograph type, pneumatically operated and mounted on insulated bases. Two pantographs are used per locomotive. A hand pump is provided in case a locomotive has been standing for some time and has no air supply.

A Warner speedometer, similar to the type largely used on automobiles but especially designed for locomotives, is located in each operating cab. These will


57'-6¼" Over Body Corner Posts
14" 24" 2'-1⅛" 2'-4½"
Air Signal Valve
Steel Door
Trap Door
Steel End Door
Switch Locker
Wrecking Tool Box
Stationary Seats
Reversible Seats
2'-2"
3'-0"
Ventilator
9'-10½" Over Side Sill Angles
Emergency air valve above. Piping located behind finish and cord to run full length in hand rail bracket
4 Tread Step
Buffers

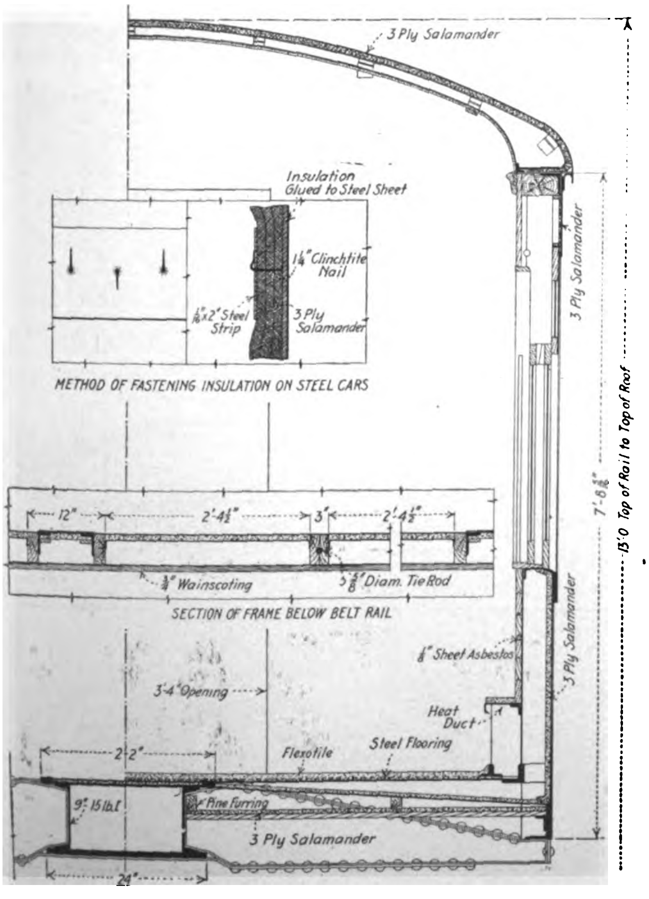


MONTREAL TERMINAL ELECTRIFICATION—ELECTRO-PNEUMATIC CHANGE-OVER SWITCH

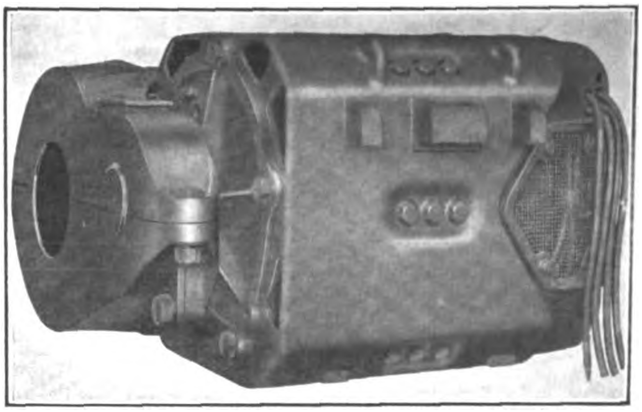
16¾ in. back to back and fitted with a top cover plate 26 in. x ¼ in. and a main bottom cover plate 24 in. x ⅜ in. The body and end sills are of structural steel shapes. Trap doors of Edwards all-steel construction are installed. The bolsters are built up of plates and angles. The Standard Coupler Company's buffers and Miner draft gear are used.

The flooring consists of a bottom layer of tongue and grooved spruce, on top of which is spread a layer of three-ply "Salamander." Between this and the main floor is an intermediate insulating floor formed of ⅛ in. steel plate, on top of which is also laid a layer of three-ply "Salamander." The main steel floor, on top of which is spread a layer of "Flexotile" composition flooring, consists of "Chanarch" steel.

As regards the side framing, the main side posts are formed of 3 in. x 2 in. x 5/16 in. rolled steel angles acting as a stiffener for the side sheeting and a suitable connection for the wooden side posts. At the belt rail the sheeting is further stiffened by a 4-in. x ½ in. bar extending the full length of the body. The corner posts are built up of 3-in. x 2-in. angles with 3/16-in. pressed steel cover plate extending around and over the side and end sheets. The side sheets are of 0.110-in. thick cold rolled steel plate.


3 Ply Salamander
Insulation Glued to Steel Sheet
1¼" Clinchtite Nail
1/16"x2" Steel Strip
3 Ply Salamander
METHOD OF FASTENING INSULATION ON STEEL CARS
3 Ply Salamander
12"
2'-4½"
3"
2'-4½"
¾" Wainscoting
⅝" Diam. Tie Rod
SECTION OF FRAME BELOW BELT RAIL
7'-6⅝"
13'0 Top of Rail to Top of Roof
⅛" Sheet Asbestos
3 Ply Salamander
3'-4" Opening
Heat Duct
2'-2"
Flexotile
Steel Flooring
9"-15 lb. [
Pine Furring
3 Ply Salamander
24"

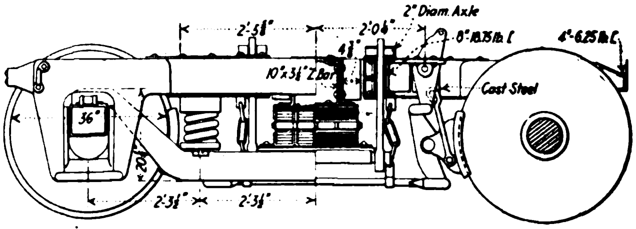
MONTREAL TERMINAL ELECTRIFICATION—CROSS-SECTIONS SHOWING FLOORING, HEAT INSULATION, ETC.



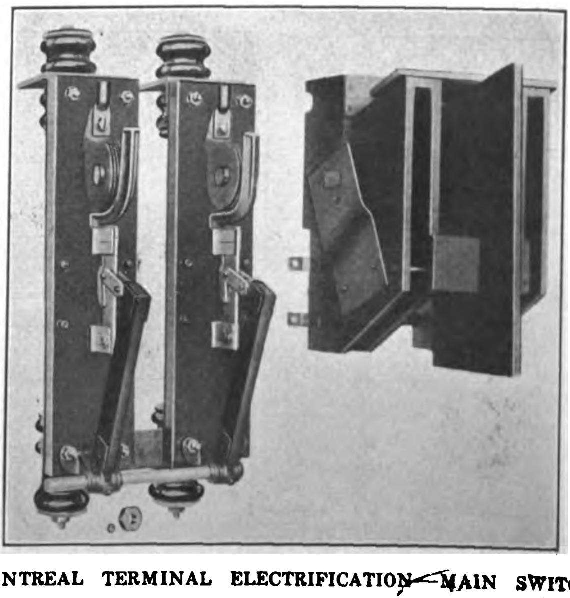
MONTREAL TERMINAL ELECTRIFICATION—VENTILATION SCREEN IN MOTOR

Particular attention has been given to the heat insulation. For the sides, roof and ends of the car this insulation consists of three-ply "Salamander." It is secured to the steel by means of glue and the Cleveland Tack Company's "Clinchtite" nails spot-welded to the sheet steel and provided with steel retaining bands. This method is similar to that used by the New York, Westchester & Boston Railway.

The trucks are of this railroad's plate frame construction built for a center plate capacity of 40,000 lb., and they are of the side equalized type. Case-hardening is applied for all hangers and rod jaws, for all pin ends of levers and where all holes occur in the same. The


2" Diam. Axle
2'-5⅛"
2'-0¼"
4⅛"
8"-10.75 lb. [
4"-6.25 lb. [
10"x3⅛" Z Bar
Cast Steel
36"
2'-3⅛"
2'-3⅛"

MONTREAL TERMINAL ELECTRIFICATION — TRUCK FOR MOTOR CARS



MONTREAL TERMINAL ELECTRIFICATION—MAIN SWITCH wheels are of rolled steel and are 36 in. in diameter. The journals are 5½ in. x 10 in. and of the American Electric Railway Association standard with McCord boxes.

The outside and inside finish and all fittings and other details are made to conform as nearly as possible with Canadian Northern standard practice.

The principal dimensions are given in the following table:

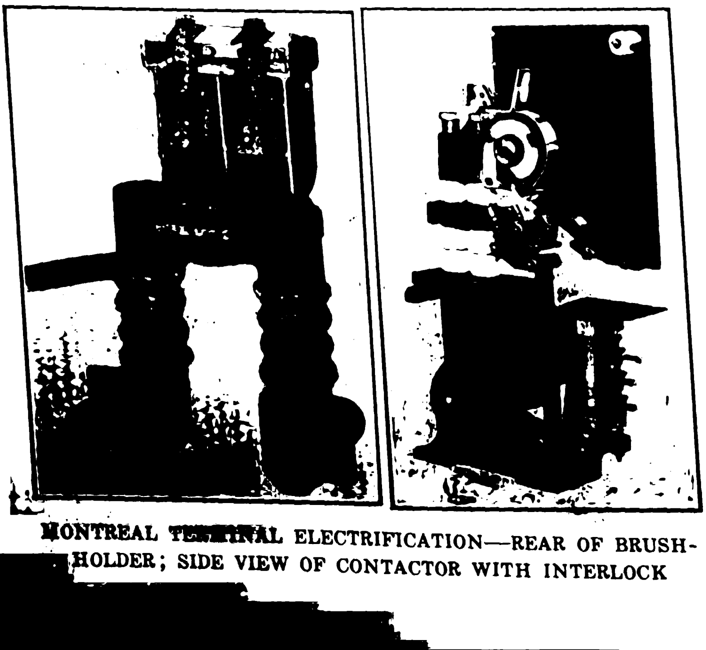
Length over buffers	67 ft.	5¾ in.
Length over body corner posts	57 ft.	6¼ in.
Truck centers	42 ft.	9 in.
Width over side sill angles	9 ft.	10½ in.
Width over eaves	10 ft.	2¾ in.
Height top of rail over roof	13 ft.	0 in.
Height top of rail to underside of side sill	3 ft.	7½ in.
Center to center of body side bearings	4 ft.	10 in.
Center to center deck sills	5 ft.	6 in.

The approximate weight of the car loaded and equipped is 160,000 lb.

The electric hot air system of car heating is used. One complete heater is placed underneath each car and receives its energy direct from the 2400-volt supply. The heater has a capacity of approximately 25 kw and is constructed for two heat combinations so as to provide for the changes in temperature conveniently and economically.

The complete heating equipment consists of the heating unit, blower and regulating mechanism, the controlling switch and thermostat of the regulating mechanism being arranged for operation from the 600-volt supply. Air is forced over the heating unit by means of the blower and distributed to the car through the air ducts along the sides of the car. The blower used for the circulation of the air is operated by a motor which is connected in series with the heating unit on the ground side. The capacity of the blower is approximately 1000 cu. ft. of air per minute.

The motor equipment consists of four fully ventilated GE-239A, 125-hp, 1200-volt commutating pole motors insulated for 2400 volts. Two of these motors are permanently connected in series for 2400-volt operation. Ventilation of the motor is accomplished by drawing air into the armature at the pinion end by means of the fan on the armature shaft. The air passes longitudinally through the whole interior of the motor and is expelled through an opening in the frame at the commutator end. This opening is protected by wire mesh. A back view of the brush-holder and support is also shown.



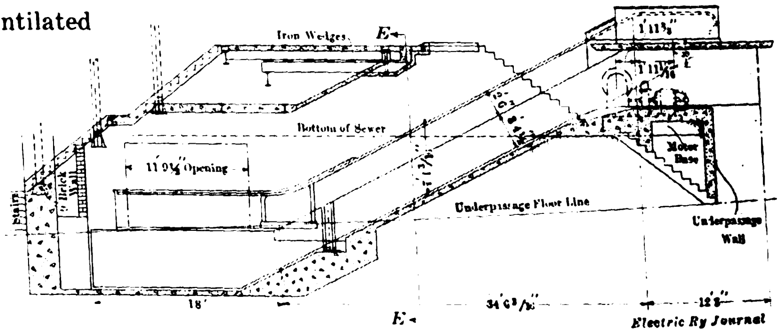
MONTREAL TERMINAL ELECTRIFICATION—REAR OF BRUSH-HOLDER; SIDE VIEW OF CONTACTOR WITH INTERLOCK

The control is of the non-automatic type for multiple-unit operation. The equipment includes a motor-generator set for furnishing 600-volt current for the control circuits, the air compressor and lighting circuits. This set consists of two 1200-volt motors, operating in series on 2400 volts, direct connected to a 600-volt generator. The master controller, contactors, switches, reverser and pantograph are of essentially the same construction and appearance as those already described for the locomotives. The controller will have five steps in series and four steps in parallel. It differs from the locomotive controller in having the usual motorman's operating handle instead of a lever. This handle is provided with means for cutting off power and applying air brakes in case the motorman removes his hand.

Copper ribbon fuses similar to those on the locomotive will be used and an aluminum cell lightning arrester is installed on each car.

Improvements at the Juniper Street Station in the Philadelphia Subway

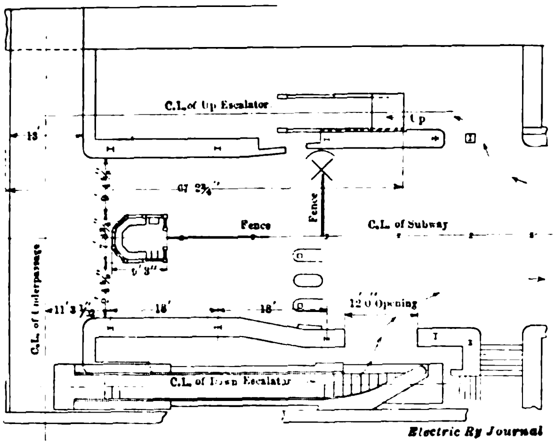
In the Market Street subway in Philadelphia there is a point near the business center where the east-bound surface cars in the subway make a loop under the elevated line cars, which are also in the subway, and return west. Passengers coming in from West Philadelphia transfer at this point if they desire to go farther east, say to the Delaware River ferries. Obviously a considerable part of the traffic terminates at this station, Juniper Street. This underground station has been laid out with a view to making its operation so convenient for passengers that there could be no possible cause for complaint on account of the necessity for using two levels. For this reason a down escalator has been installed between the two levels, in addition



PHILADELPHIA SUBWAY—CROSS-SECTION ESCALATOR WAY, JUNIPER STREET STATION

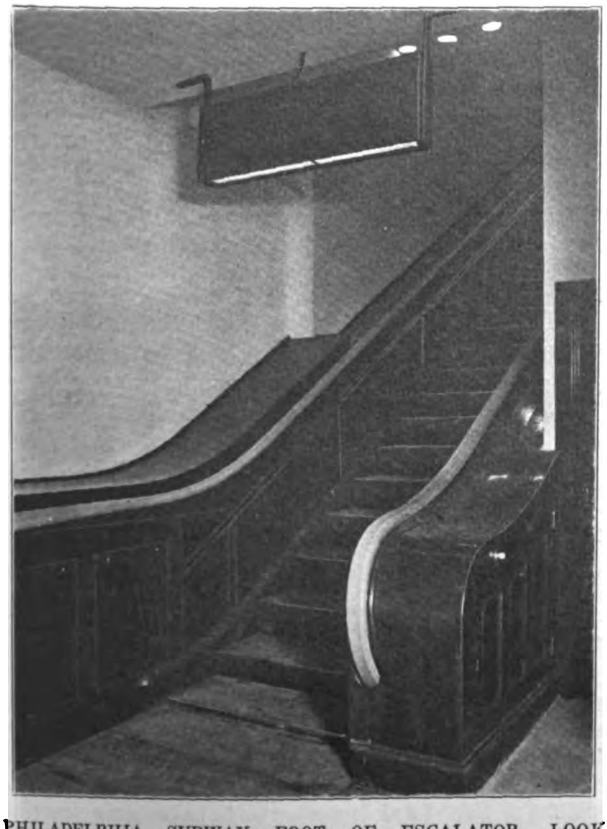
PHILADELPHIA SUBWAY—VIEW OF ENTRANCE TO DOWN ESCALATOR to the up escalator and conveniently placed staircases. The down escalator is very popular in spite of its comparative novelty, very few passengers using the stairway, which they could do with little extra effort.

The accompanying illustrations show some details of the station. One diagram is a plan of the lower level. Passengers entering the lower level direct from the street come in at the left in the figure, secure tickets at the booth shown and pass through the entrance to the large passage at the right which leads to the surface car loading platforms. Outgoing passengers from the lower level can pass out through the turnstile or to the upper level on the up escalator. Passengers from the upper level can reach the lower level either by way of the down escalator or by the stairs directly over it. A section showing the down escalator and staircase is given in a second diagram.

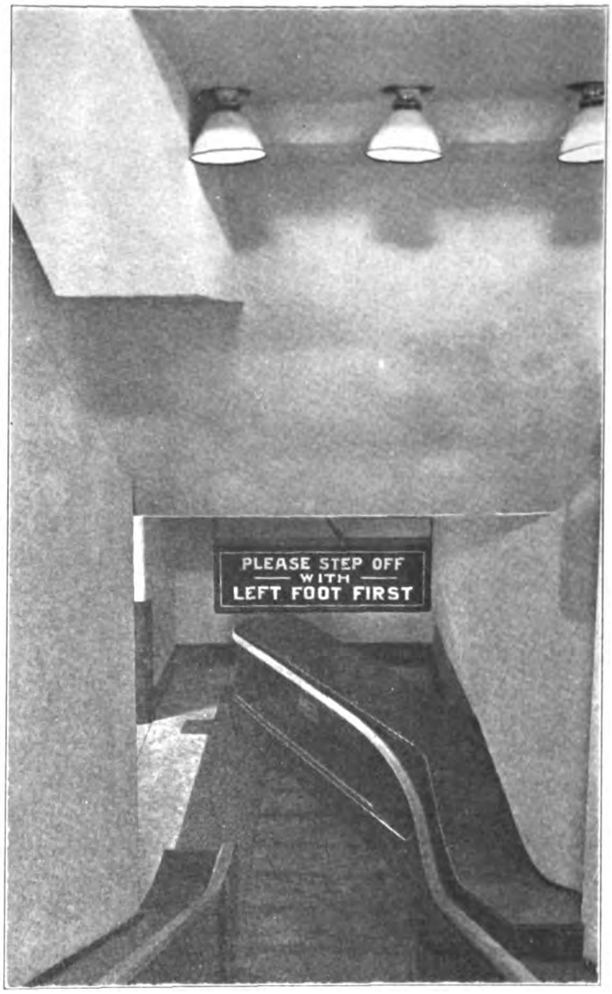


PHILADELPHIA SUBWAY—PLAN OF LOWER LEVEL, JUNIPER STREET STATION

The halftones show details of the down escalator, those from photographs taken at the foot having been chosen to illustrate particularly the method of lighting used. Unusually good light is desirable at this point to avoid confusion due to the novelty of the construction. The escalator way is brilliantly illuminated by lamps mounted in reflectors near the ceiling beams and through openings in the bottom of the illuminated box sign. An usher is located at the bottom of the escalator to assist passengers who may still not understand the method of getting off.



PHILADELPHIA SUBWAY—FOOT OF ESCALATOR, LOOKING UP



PHILADELPHIA SUBWAY—FOOT OF ESCALATOR, LOOKING DOWN, SHOWING ILLUMINATED SIGN

The Juniper Street station involved special structural problems due to the difficulty of underpinning the adjacent buildings. Cross beams much heavier than were needed for floor support were used for this purpose. Space limitations also prescribed a most economical arrangement of staircases, escalators and passageways. The result has been a layout which permits the handling of large crowds with little congestion.

The city of San Francisco is using the cement gun to finish the ornamental concrete poles which are being erected on Van Ness Avenue in San Francisco. The poles are for the double purpose of lighting and carrying trolley wires for the new municipal railway, and the coating is being applied after the poles are erected so that the finish will be free from the marks of handling, and the pole proper will seem to be monolithic with the base. After the surface has been sufficiently coated it is immediately trowelled to the desired lines, the aim being to secure a cement coating about 3/16 in. thick. The contract price for the finishing is $26 per pole.

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PUBLIC OPINION IN THE DISTRICT

The report states that definite resolutions in favor of the Crosser bill were not submitted by any one of the score or more of citizens' organizations in the District. On the contrary, one presented resolutions against it and a number were reported as voting against going on record. Only fifteen witnesses appeared in behalf of the bill. The report contains a schedule showing the occupations of these witnesses, complaints against present operation, reasons for interest in bill, general arguments in favor of the bill, tax assessments, opinions concerning purchase regardless of cost and number of years in favor of municipal ownership. Of the fifteen witnesses, one complained against the present rate of fare, one against the number of cars running to the suburbs, two against crowds in rush hours and one against the refusal to build a suburban extension. The remainder of the witnesses either would not discuss this phase of the question or had no complaint to make. With one exception every witness expressed his firm belief in public ownership of public utilities as a general proposition, and a cross-examination as to the number of years they had been in favor of municipal ownership showed that the force behind the bill was almost all consistent and long-time advocates of municipal ownership.

The fifteen witnesses out of a total population of 350,000 represented a taxation assessment of $123,197 out of a total assessed valuation of $380,000,000 in the District. The above-mentioned tax assessment for the fifteen witnesses, however, was confined to four persons, the remaining eleven not being at all assessed. It is stated in general that efforts made by the committee to learn of any public demand for the Crosser bill were not successful other than in demonstrating that no public sentiment in favor of the bill existed.

MUNICIPAL OWNERSHIP IN GENERAL

In concluding, the minority report states that the evidence submitted has not been conclusive on the question of the success of municipal ownership of electric railways. Data from a 9-mile street railway in Monroe, La., were very scanty. A municipal line in New Orleans must be excluded from consideration, for it is merely a belt line for the transfer of freight from one terminal to another. As for the municipal line of San Francisco, when the annual redemption of bonds must be met, the net profits from operation would be inadequate to pay the costs of operation and all the other charges if the railway did not save $40,000 or more in taxes and services from other city departments. With this saving of $40,000, although at a like expense of other departments of the city, the lines may even then fail by a few thousands of dollars annually to meet all charges, on the basis of the present receipts and expenses. There appears to be no great inspiration for Washington in this example of municipal railways. James Dalrymple, general manager Glasgow Corporation Tramways, at one time expressed his opinion that municipal ownership of street railways should be successful in the United States, but after a visit to the United States and personal inquiry into American conditions he said: "What I have seen here, and I have studied the situation carefully, makes me realize that private ownership under proper conditions is far better for the citizens of American cities."

Ten Commandments of Safety

At the Lorain Steel Company's plant at Johnstown, Pa., the following ten commandments have been adopted for the guidance of the employees:

1. Thou shalt have no other thoughts than thy work.
2. Thou shalt take no unnecessary risks, nor try to show off, nor play practical jokes, for by thy carelessness thou mayest do injuries which will have effect unto the third and fourth generations to follow.
3. Thou shalt not swear, nor lose thy temper when things do not come just right.
4. Remember that thou art not the only one on the job and that other lives are just as important as thine own.
5. Honor thy job and thyself that thy days may be long in employment.
6. Thou shalt not clean machinery while it is in motion.
7. Thou shalt not watch thy neighbor's work, but attend to thine own.
8. Thou shalt not let the sleeves of thy shirt hang loose, nor the flaps of thy coat be unbuttoned, as they may get caught in the machinery.
9. Thou shalt not throw matches or greasy waste on the floor, nor scatter oil around the bearings, as a dirty worker is a clumsy worker, and a clumsy worker is a menace to his fellow workers.
10. Thou shalt not interfere with the switches, nor the dynamos, nor the cables, nor the engines, nor anything else thou art told is dangerous.

The Mayor of Portland, Ore., recently requested a committee composed of prominent men of Portland to investigate the general condition of the city and report to him with suggestions and recommendations to make Portland a safer city. B. F. Boynton, claim agent Portland Railway, Light & Power Company, was elected chairman.

Rolling Stock for Montreal Tunnel and Terminal

The Present Article Describes the Locomotives and Motor Cars for This 2400-Volt D.C. Electrification—The Locomotives Are Similar to the Butte Design but Are Geared for a Speed of 45 M.p.h..—The Motor Cars Are of Steel for Suburban High-Speed Service

BY W. C. LANCASTER, ELECTRICAL AND MECHANICAL ENGINEER MACKENZIE, MANN & COMPANY, LTD., MONTREAL

In the March 14 issue of the ELECTRIC RAILWAY JOURNAL the writer described the causes leading up to the choice of 2400 volts direct current for the electrification of the Canadian Northern Railroad at Montreal.

The electric rolling stock for the operation of the tunnel and terminal will consist of both electric locomotives for hauling the trains ordinarily operated by steam, and multiple unit cars to maintain a quick and frequent service between the main passenger terminal in the city and the country just west of Mount Royal, which, it is expected, will be rapidly built up and form one of the most attractive suburbs of Montreal.

LOCOMOTIVES

The 2400-volt d.c. locomotives are substantially the same in appearance and dimensions as those of the Butte, Anaconda & Pacific Railway, which were illustrated in the ELECTRIC RAILWAY JOURNAL for June 7, 1913, page 1010. As the schedule for the locomotive trains does not call for high speed, it was not thought necessary to resort to any of the special methods of connecting the motors to the driving axles, such as are used on the side-rod and gearless types. The motors will be nose-supported in the usual way and geared to the axle by means of twin gears.

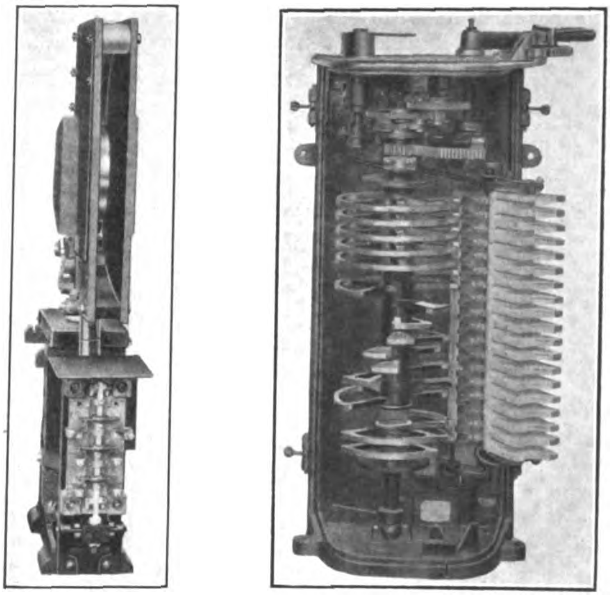
The locomotive has four axles with all the weight of the locomotive upon the eight driving wheels. The running gear consists of two four-wheel trucks, articulated together by a heavy hinge. The equalization of the trucks is accomplished by a semi-elliptic leaf spring over each journal box, connected through spring hangers to the frame and to the equalizer bars. The equivalent of a three-point suspension is thus obtained through the side equalization of one of the trucks and both side and cross equalization of the other truck.

The friction draft gear is mounted in the end frame casting of the truck. The cab, which is of the box type, is divided into three compartments, the center compartment for the apparatus and the two end compartments for the operator.. Each operator's compartment is supplied with controller, control switches, ammeter, air brake and pantograph control, air gages, 2400-volt cab heater, bell rope and control for the whistle and sanders, thus providing the locomotive with complete double-end control.

The motor equipment consists of four GE-229A commutating pole motors wound for 1200 volts and insulated for 2400 volts, two of these motors being permanently connected in series for operating on the 2400-volt trolley circuit. The one-hour rating of each motor is 315 hp at 1200 volts. The motors are designed for forced ventilation, which is obtained by means of a blower in the locomotive cab. Either pair of motors may be cut out, in case of emergency, by a special handle on the change-over switch. The locomotives are geared for a free running speed on tangent level track of approximately 45 m.p.h. and are operated as two-speed machines with ten points in series and nine points in series-parallel. The master controller used is of the non-automatic type and has two handles, one regulating the applied voltage at the motors and the other for controlling the direction of rotation of the motors. The rheostats which form the external motor resistance are placed near the roof of the cab and provided with ample natural ventilation.

The master controller and contactor energizing circuits are designed for 125 volts. Each contactor is easily accessible without any disturbance to adjacent contactors. A special electro-pneumatic change-over switch is used for making the transition between series and series-parallel connection of the pairs of motors.

The 125-volt current for operating the contactors and for lighting the cab and headlights is obtained from a motor-generator set, the motor of which has two 1200-volt windings and two 1200-volt commutators in series for operation on 2400 volts. This set is mounted in the center cab and also drives the blower for providing forced ventilation to the main motors.

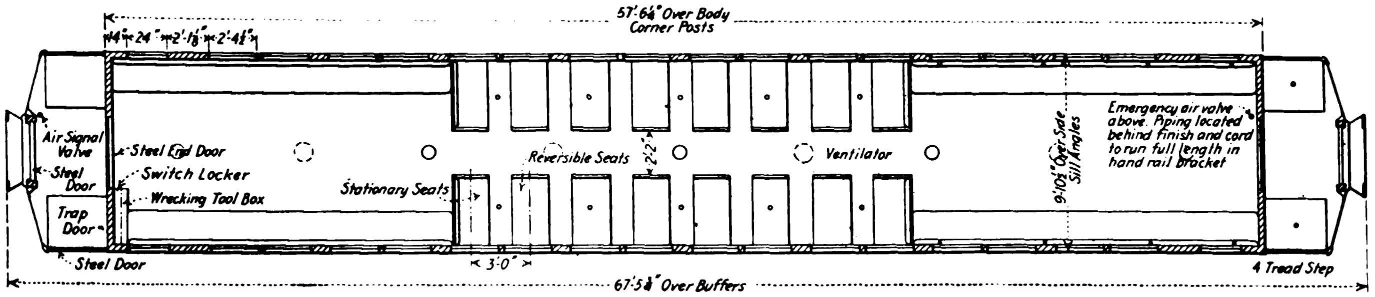


MONTREAL TERMINAL ELECTRIFICATION—CONTACTOR WITH INTERLOCK; MASTER CONTROLLER FOR LOCOMOTIVE

Fuses of the copper ribbon type placed in fuse boxes provide protection for each individual circuit as well as the main circuit from the trolley. These fuse boxes are all arranged to blow into a common chamber designed to take care of the arc. In addition to the fuse on the main circuit, a main switch is also provided. This is of the knife-blade type, being opened and closed by a handle placed in a position for easy operation in case of emergency or when it might be necessary to open the circuit while carrying current. This main switch blows into the chamber provided for the fuses, and has a powerful magnetic blowout.

The trolleys are of the Butte roller pantograph type, pneumatically operated and mounted on insulated bases. Two pantographs are used per locomotive. A hand pump is provided in case a locomotive has been standing for some time and has no air supply.

A Warner speedometer, similar to the type largely used on automobiles but especially designed for locomotives, is located in each operating cab. These will


57'-6¼" Over Body Corner Posts
14" 24" 2'-1⅛" 2'-4½"
Air Signal Valve
Steel End Door
Switch Locker
Wrecking Tool Box
Steel Door
Trap Door
Stationary Seats
Reversible Seats
2'-2"
Ventilator
9'-10½" Over Side Sill Angles
Emergency air valve above. Piping located behind finish and cord to run full length in hand rail bracket
3'-0"
67'-5¼" Over Buffers
4 Tread Step

MONTREAL TERMINAL ELECTRIFICATION—PLAN OF MOTOR CAR WITH SWING TYPE DOORS

be connected to the driving wheels of the locomotive by means of flexible shafts and gearing.

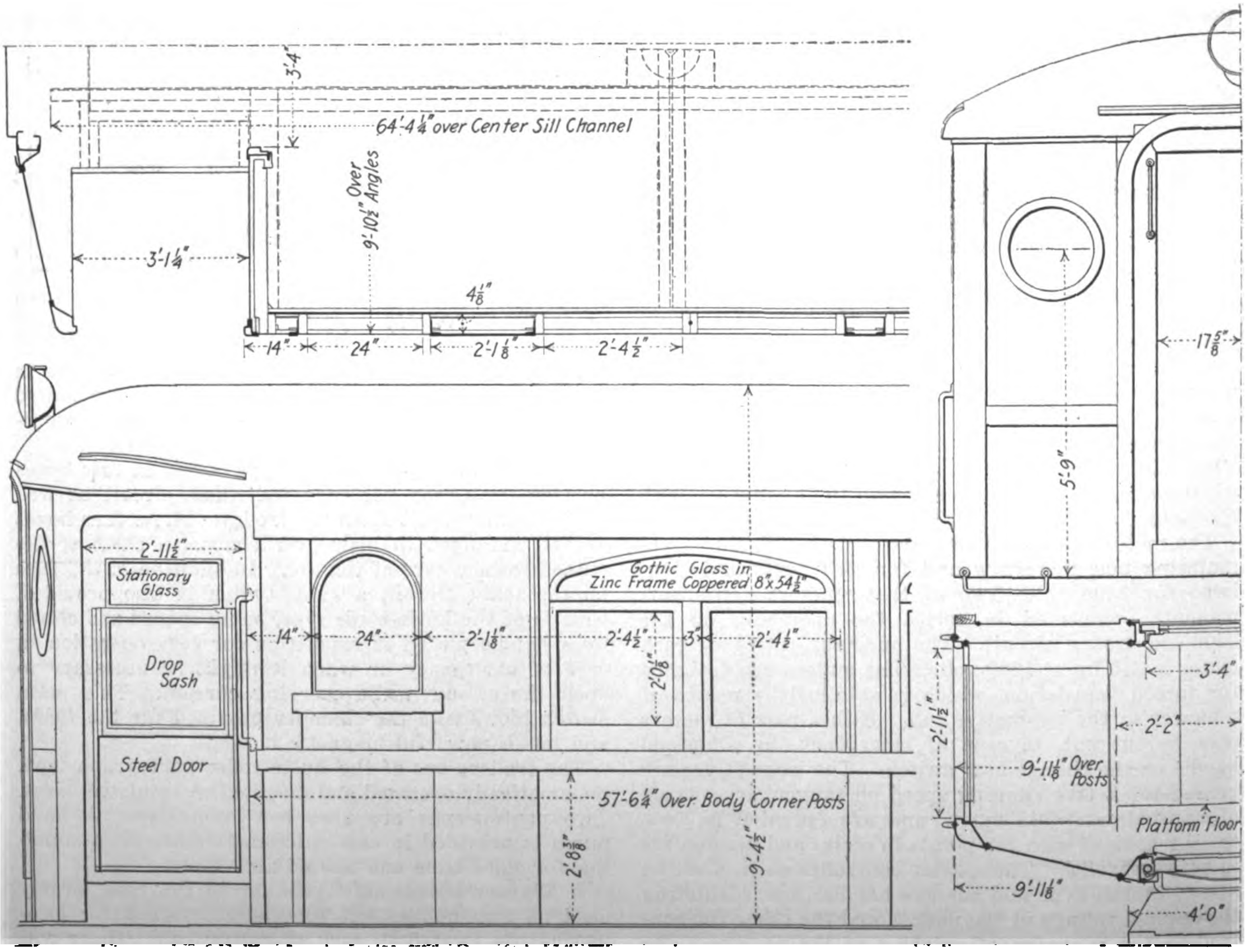
A combined straight and automatic air-brake equipment is provided on each locomotive. This equipment includes a 2400-volt motor-driven air compressor, the set consisting of two 1200-volt motors operating in series on 2400 volts and direct-connected to an air compressor having a displacement of 100 cu. ft. of free air per minute. The approximate total weight of each locomotive is 83 tons. Some of its principal dimensions and characteristics are given in the following table:

Length inside knuckles	37 ft. 4 in.
Length over cab	31 ft. 0 in.
Overall height, pantograph down	15 ft. 6 in.
Height over cab	12 ft. 10 in.
Over-all width	10 ft. 0 in.
Total wheelbase	26 ft. 0 in.
Rigid wheelbase	8 ft. 8 in.
Total weight, all on drivers	83 tons
Wheel diameter	46 in.
Tractive effort at 30 per cent tractive coefficient	49,800 lb.
Tractive effort at one-hour rating	20,300 lb.
Tractive effort at continuous rating	14,500 lb.

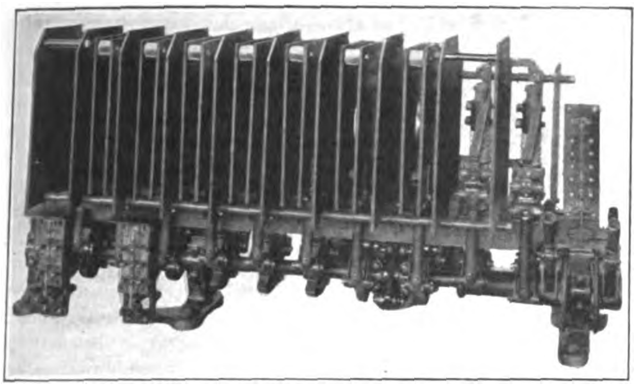
A floor plan of the cars, showing the arrangement of seats, doors and windows, is published. No sliding doors are used, as such doors tend to weaken the car just where most strength is required in case of collision. All the doors swing, so that the corners of the cars may be made as strong as is necessary.

Cross seats are used near the center of the car and longitudinal seats near the ends. This arrangement gives plenty of room near the doors where most of the crowding occurs when passengers are leaving or entering. It also tempts the passenger by means of the more comfortable cross seats to "move up to the center of the car." As shown in the side and end views of the car, presented herewith, the underframing is entirely of steel. The car body is also of steel except for window frames, wainscoting, side posts and part of the floor, which are of wood, and the headlining, which is of a heat-resisting, pressed-fiber board.

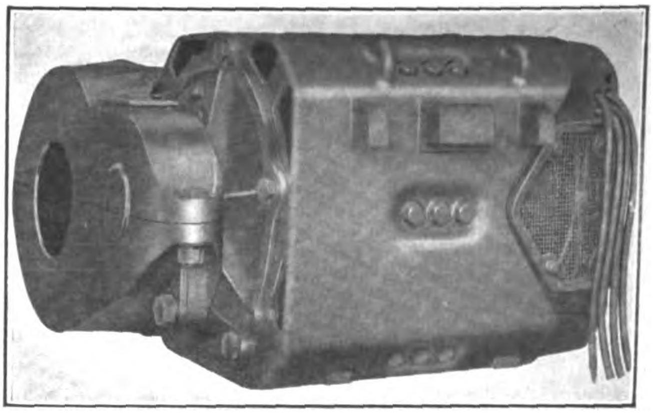
The underframing is of the center box girder construction, employing two 9-in. 15-lb. channels spaced


3'-4"
64'-4¼" over Center Sill Channel
9'-10½" Over Angles
3'-1¼"
4⅛"
14" 24" 2'-1⅛" 2'-4½"
17⅝"
5'-9"
2'-11½"
Stationary Glass
Drop Sash
Steel Door
Gothic Glass in Zinc Frame Coppered 8"x54½"
14" 24" 2'-1⅛"
2'-4½" 3" 2'-4½"
2'-0⅝"
2'-8⅜"
57'-6¼" Over Body Corner Posts
9'-4½"
3'-4"
2'-2"
2'-11½"
9'-11⅛" Over Posts
Platform Floor
9'-11⅛"
4'-0"

MONTREAL TERMINAL ELECTRIFICATION—ELEVATIONS AND PART PLANS OF MOTOR CAR



MONTREAL TERMINAL ELECTRIFICATION—ELECTRO-PNEUMATIC CHANGE-OVER SWITCH

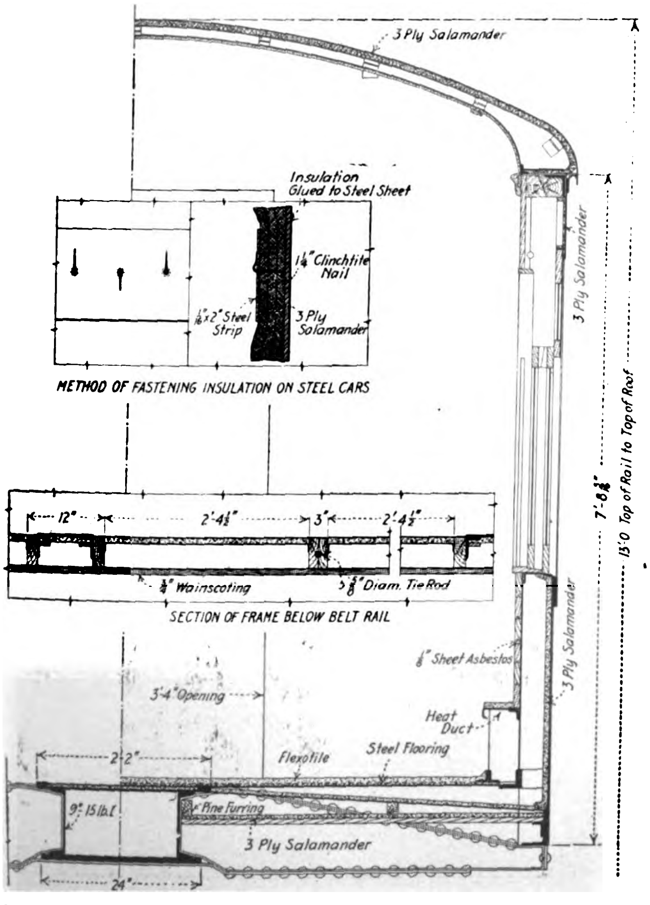


MONTREAL TERMINAL ELECTRIFICATION—VENTILATION SCREEN IN MOTOR

16¾ in. back to back and fitted with a top cover plate 26 in. x ¼ in. and a main bottom cover plate 24 in. x ⅜ in. The body and end sills are of structural steel shapes. Trap doors of Edwards all-steel construction are installed. The bolsters are built up of plates and angles. The Standard Coupler Company's buffers and Miner draft gear are used.

The flooring consists of a bottom layer of tongue and grooved spruce, on top of which is spread a layer of three-ply "Salamander." Between this and the main floor is an intermediate insulating floor formed of ⅛ in. steel plate, on top of which is also laid a layer of three-ply "Salamander." The main steel floor, on top of which is spread a layer of "Flexotile" composition flooring, consists of "Chanarch" steel.

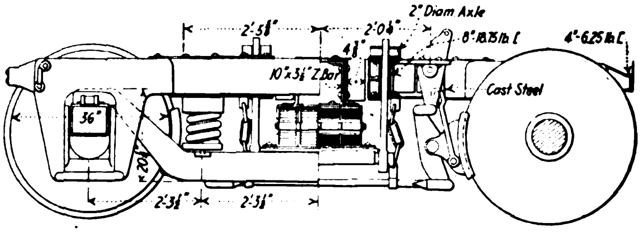
As regards the side framing, the main side posts are formed of 3 in. x 2 in. x 5/16 in. rolled steel angles acting as a stiffener for the side sheeting and a suitable connection for the wooden side posts. At the belt rail the sheeting is further stiffened by a 4-in. x ½ in. bar extending the full length of the body. The corner posts are built up of 3-in. x 2-in. angles with 3/16-in. pressed steel cover plate extending around and over the side and end sheets. The side sheets are of 0.110-in. thick cold rolled steel plate.


3 Ply Salamander
Insulation Glued to Steel Sheet
1¼" Clinchtite Nail
1/16"x2" Steel Strip
3 Ply Salamander
METHOD OF FASTENING INSULATION ON STEEL CARS
3 Ply Salamander
12"
2'-4½"
3"
2'-4½"
¾" Wainscoting
⅝" Diam. Tie Rod
SECTION OF FRAME BELOW BELT RAIL
7'-8⅜"
13'0 Top of Rail to Top of Roof
⅛" Sheet Asbestos
3 Ply Salamander
3'-4" Opening
Heat Duct
2'-2"
Flexotile
Steel Flooring
9" 15 lb. [
Pine Furring
3 Ply Salamander
24"

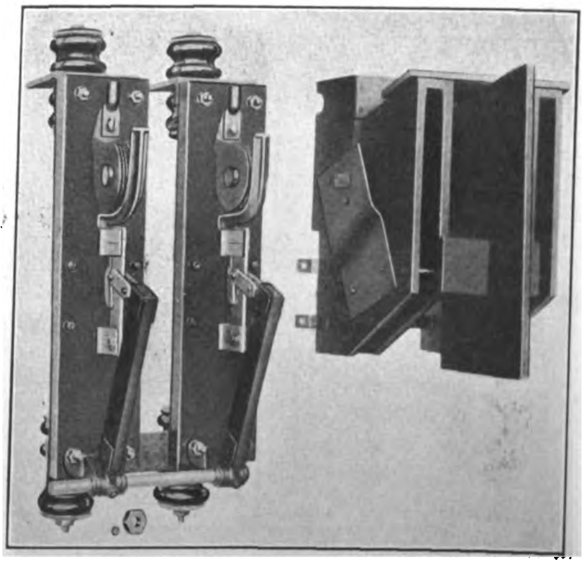
MONTREAL TERMINAL ELECTRIFICATION—CROSS-SECTIONS SHOWING FLOORING, HEAT INSULATION, ETC.

Particular attention has been given to the heat insulation. For the sides, roof and ends of the car this insulation consists of three-ply "Salamander." It is secured to the steel by means of glue and the Cleveland Tack Company's "Clinchtite" nails spot-welded to the sheet steel and provided with steel retaining bands. This method is similar to that used by the New York, Westchester & Boston Railway.

The trucks are of this railroad's plate frame construction built for a center plate capacity of 40,000 lb., and they are of the side equalized type. Case-hardening is applied for all hangers and rod jaws, for all pin ends of levers and where all holes occur in the same. The


2" Diam. Axle
2'-5⅛"
2'-0⅛"
4⅛"
8" 18.75 lb. [
4"-6.25 lb. [
10"x3½" Z Bar
Cast Steel
36"
20½"
2'-3⅛"
2'-3⅛"

MONTREAL TERMINAL ELECTRIFICATION — TRUCK FOR MOTOR CARS



MONTREAL TERMINAL ELECTRIFICATION—MAIN SWITCH wheels are of rolled steel and are 36 in. in diameter. The journals are 5½ in. x 10 in. and of the American Electric Railway Association standard with McCord boxes.

The outside and inside finish and all fittings and other details are made to conform as nearly as possible with Canadian Northern standard practice.

The principal dimensions are given in the following table:

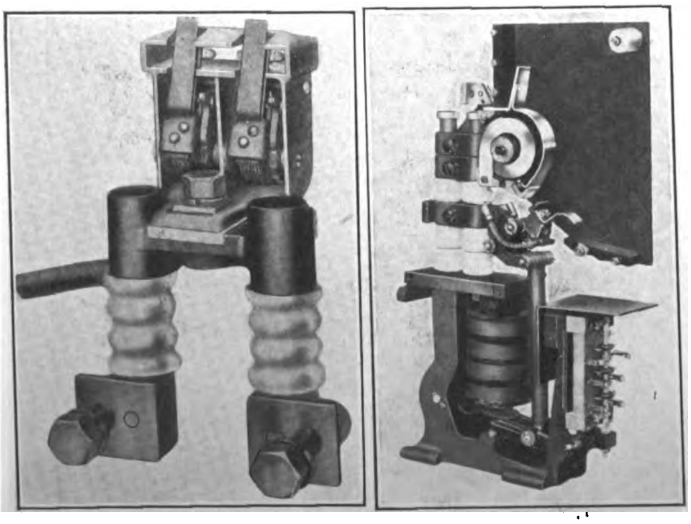
Length over buffers	67 ft.	5¾ in.
Length over body corner posts	57 ft.	6¼ in.
Truck centers	42 ft.	9 in.
Width over side sill angles	9 ft.	10½ in.
Width over eaves	10 ft.	2¾ in.
Height top of rail over roof	13 ft.	0 in.
Height top of rail to underside of side sill	3 ft.	7½ in.
Center to center of body side bearings	4 ft.	10 in.
Center to center deck sills	5 ft.	6 in.

The approximate weight of the car loaded and equipped is 160,000 lb.

The electric hot air system of car heating is used. One complete heater is placed underneath each car and receives its energy direct from the 2400-volt supply. The heater has a capacity of approximately 25 kw and is constructed for two heat combinations so as to provide for the changes in temperature conveniently and economically.

The complete heating equipment consists of the heating unit, blower and regulating mechanism, the controlling switch and thermostat of the regulating mechanism being arranged for operation from the 600-volt supply. Air is forced over the heating unit by means of the blower and distributed to the car through the air ducts along the sides of the car. The blower used for the circulation of the air is operated by a motor which is connected in series with the heating unit on the ground side. The capacity of the blower is approximately 1000 cu. ft. of air per minute.

The motor equipment consists of four fully ventilated GE-239A, 125-hp, 1200-volt commutating pole motors insulated for 2400 volts. Two of these motors are permanently connected in series for 2400-volt operation. Ventilation of the motor is accomplished by drawing air into the armature at the pinion end by means of the fan on the armature shaft. The air passes longitudinally through the whole interior of the motor and is expelled through an opening in the frame at the commutator end. This opening is protected by wire mesh. A back view of the brush-holder and support is also shown.



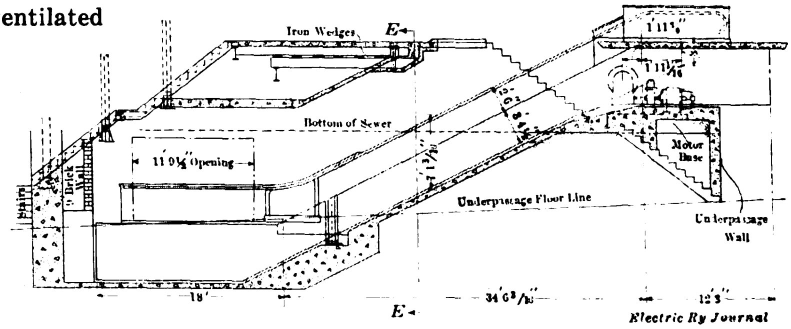
MONTREAL TERMINAL ELECTRIFICATION—REAR OF BRUSH-HOLDER; SIDE VIEW OF CONTACTOR WITH INTERLOCK

The control is of the non-automatic type for multiple-unit operation. The equipment includes a motor-generator set for furnishing 600-volt current for the control circuits, the air compressor and lighting circuits. This set consists of two 1200-volt motors, operating in series on 2400 volts, direct connected to a 600-volt generator. The master controller, contactors, switches, reverser and pantograph are of essentially the same construction and appearance as those already described for the locomotives. The controller will have five steps in series and four steps in parallel. It differs from the locomotive controller in having the usual motorman's operating handle instead of a lever. This handle is provided with means for cutting off power and applying air brakes in case the motorman removes his hand.

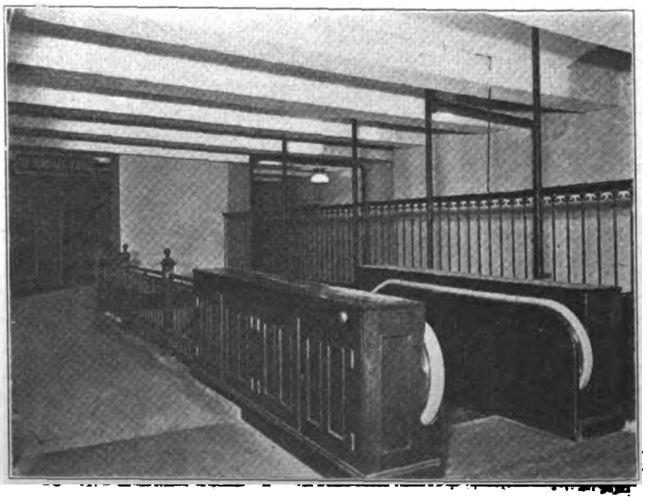
Copper ribbon fuses similar to those on the locomotive will be used and an aluminum cell lightning arrester is installed on each car.

Improvements at the Juniper Street Station in the Philadelphia Subway

In the Market Street subway in Philadelphia there is a point near the business center where the east-bound surface cars in the subway make a loop under the elevated line cars, which are also in the subway, and return west. Passengers coming in from West Philadelphia transfer at this point if they desire to go farther east, say to the Delaware River ferries. Obviously a considerable part of the traffic terminates at this station, Juniper Street. This underground station has been laid out with a view to making its operation so convenient for passengers that there could be no possible cause for complaint on account of the necessity for using two levels. For this reason a down escalator has been installed between the two levels, in addition

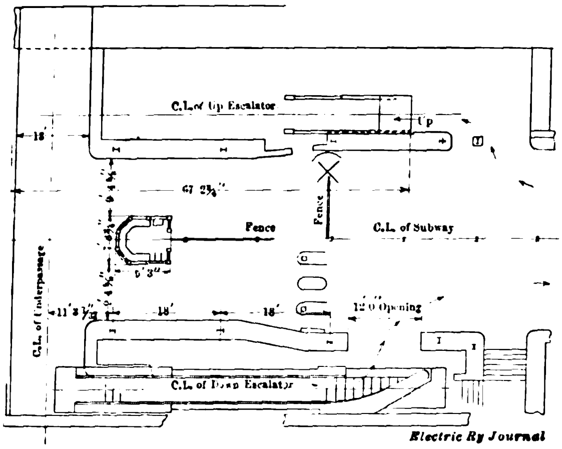


PHILADELPHIA SUBWAY—CROSS-SECTION ESCALATOR WAY, JUNIPER STREET STATION



PHILADELPHIA SUBWAY—VIEW OF ENTRANCE TO DOWN ESCALATOR to the up escalator and conveniently placed staircases. The down escalator is very popular in spite of its comparative novelty, very few passengers using the stairway, which they could do with little extra effort.

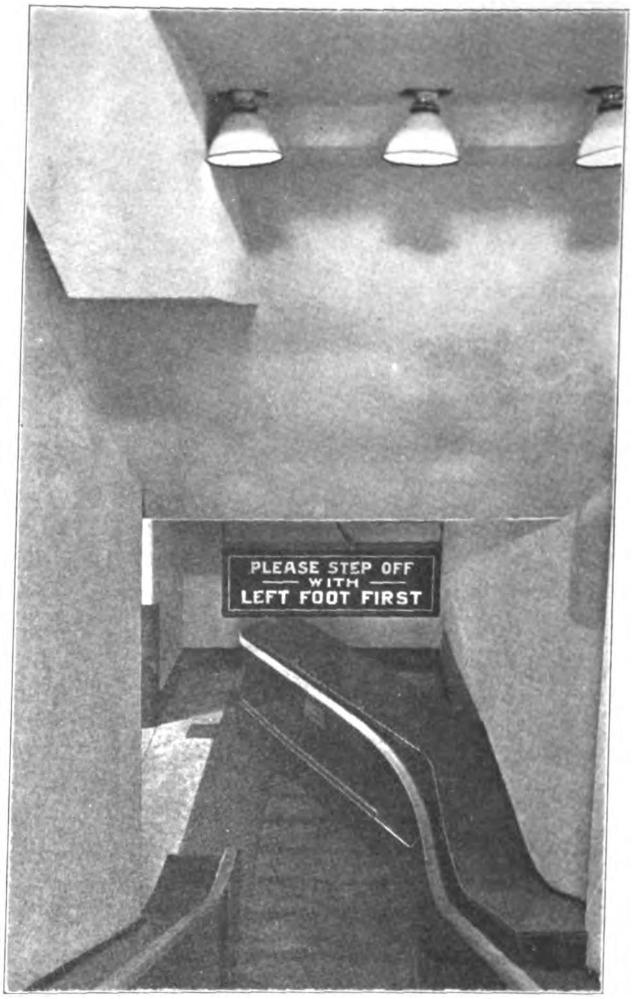
The accompanying illustrations show some details of the station. One diagram is a plan of the lower level. Passengers entering the lower level direct from the street come in at the left in the figure, secure tickets at the booth shown and pass through the entrance to the large passage at the right which leads to the surface car loading platforms. Outgoing passengers from the lower level can pass out through the turnstile or to the upper level on the up escalator. Passengers from the upper level can reach the lower level either by way of the down escalator or by the stairs directly over it. A section showing the down escalator and staircase is given in a second diagram.



PHILADELPHIA SUBWAY—PLAN OF LOWER LEVEL, JUNIPER STREET STATION

The halftones show details of the down escalator, those from photographs taken at the foot having been chosen to illustrate particularly the method of lighting used. Unusually good light is desirable at this point to avoid confusion due to the novelty of the construction. The escalator way is brilliantly illuminated by lamps mounted in reflectors near the ceiling beams and through openings in the bottom of the illuminated box sign. An usher is located at the bottom of the escalator to assist passengers who may still not understand the method of getting off.

PHILADELPHIA SUBWAY—FOOT OF ESCALATOR, LOOKING UP



PHILADELPHIA SUBWAY—FOOT OF ESCALATOR, LOOKING DOWN, SHOWING ILLUMINATED SIGN

The Juniper Street station involved special structural problems due to the difficulty of underpinning the adjacent buildings. Cross beams much heavier than were needed for floor support were used for this purpose. Space limitations also prescribed a most economical arrangement of staircases, escalators and passageways. The result has been a layout which permits the handling of large crowds with little congestion.

The city of San Francisco is using the cement gun to finish the ornamental concrete poles which are being erected on Van Ness Avenue in San Francisco. The poles are for the double purpose of lighting and carrying trolley wires for the new municipal railway, and the coating is being applied after the poles are erected so that the finish will be free from the marks of handling, and the pole proper will seem to be monolithic with the base. After the surface has been sufficiently coated it is immediately trowelled to the desired lines, the aim being to secure a cement coating about 3/16 in. thick. The contract price for the finishing is $26 per pole.

Proceedings of Pacific Claim Agents' Association Convention

At the opening session of the Pacific Claim Agents' Association convention in Spokane, Wash., on July 8-11, addresses were delivered by W. J. Hindley, Mayor of Spokane, and D. L. Huntington, president Washington Water Power Company, Spokane, Wash. Most of the addresses, papers and discussions making up the program were related to two general questions; namely, protection against fraudulent (personal injury) accident claims, and the "safety first" movement. After the annual address by J. H. Handlon, president of the association, papers were read by A. M. Lee, Harrison Allen, S. A. Bishop, J. H. Handlon, H. G. Winsor, Thomas G. Aston, B. F. Boynton, A. E. Beck, H. K. Relf, George Carson, T. M. Lyall, Ida P. Newell and T. J. Rupli. The papers by Messrs. Bishop, Handlon, Boynton, Allen and Carson were abstracted in the ELECTRIC RAILWAY JOURNAL of July 18 and that by Mr. Relf in the ELECTRIC RAILWAY JOURNAL of July 25. An abstract of the paper read by Mr. Winsor is published below.

The last day's session was opened with an address by Charles T. Banks, superintendent of efficiency of the Northern Pacific Railway, St. Paul, Minn., who outlined the safety measures and safety organization of his company. The final paper was the report of the association's standing committee on safety, composed of Messrs. Carson, Aston, Lee, Boynton, Beck and Winsor. This report was abstracted in the ELECTRIC RAILWAY JOURNAL of July 25. The convention had as invited guests Chairman Floyd L. Daggett and Clarence Parker, of the State Industrial Insurance Commission, both of whom addressed the convention and participated in the discussions.

Officers of the association for the ensuing year were elected as follows: President, A. M. Lee, Seattle, Wash.; first vice-president, Thomas G. Aston, Spokane, Wash.; second vice-president, H. K. Relf, Portland, Ore.; third vice-president, S. A. Bishop, Los Angeles, Cal., and secretary-treasurer, T. N. Henry, Seattle, Wash. The executive committee members were chosen as follows: H. G. Winsor, Tacoma, Wash.; Thomas A. Cole, Los Angeles, Cal.; A. E. Beck, Vancouver, B. C.; A. Molesworth, Portland, Ore.; L. Frank Gordon, Portland, Ore., and T. J. Rupli, Seattle, Wash.

PACIFIC CLAIM AGENTS' INDEX BUREAU

The annual meeting of the board of directors and the officers of the Pacific Claim Agents' Index Bureau was held in Spokane, Wash., July 11, the last day of the Pacific Claim Agents' Association convention. Since the beginning of 1912 this bureau has accumulated in its card index files more than 25,000 names of personal injury claimants and exposed more than 200 "repeaters." Officers were elected for this year as follows: President, George Carson, Seattle, Wash.; first vice-president, B. F. Boynton, Portland, Ore.; second vice-president, J. S. Mills, Oakland, Cal.; treasurer, H. G. Winsor, Tacoma, Wash., and secretary, T. N. Henry, Seattle, Wash. The board of directors is composed of Thomas G. Aston, Spokane, Wash.; L. Frank Gordon, Portland, Ore.; A. E. Beck, Vancouver, B. C.; Thomas A. Cole, Los Angeles, Cal.; H. K. Relf, Portland, Ore., and H. J. Handlon, San Francisco, Cal.

ACCIDENT COST OF TRAINMEN AND LENGTH OF SERVICE

Following is an abstract of the paper "Accident Cost of Trainmen and Length of Service," by H. G. Winsor, claim agent Tacoma Railway & Power Company, Tacoma, Wash.

In making an investigation of step and gate accidents during the latter part of 1913 it developed that a large percentage of such accidents could be traced to trainmen who had been in the service for a certain period. In presenting the data now it must be noted that no information has been sought outside of the properties represented by the writer, and it may be possible that the results shown may be materially changed regarding a company located in a different region and operating under different circumstances.

The properties which the writer represents consist of: first, the Puget Sound Electric Railway, an interurban line operating between Tacoma and Seattle, and between Tacoma and Puyallup, Wash., having a total trackage of 97.84 miles and operating seventy-six trains daily; second, the Tacoma Railway & Power Company, operating eighty-three regular cars over 64.86 miles of track and termed the "city lines"; and, third, the Pacific Traction Company, an urban line from Tacoma to the Lake District, operating six cars over 22.13 miles of track. As the physical conditions under which each of these companies operates are materially different, it has been thought advisable to present the figures of each company separately.

The Puget Sound Electric Railway employs sixty-six regular men in the passenger service. During the year 1913 the total car miles amounted to 1,390,095; the total number of passengers carried, 2,693,085, and the accident cost charged to trainmen, $0.0248 per car mile and $0.0128 per passenger carried. The percentages of medical, legal, miscellaneous and settlement costs for 1913, charged to trainmen according to their years in service, are shown in Table I.

TABLE I—SHOWING PERCENTAGES OF 1913 ACCIDENT COSTS FOR PUGET SOUND ELECTRIC RAILWAY TRAINMEN ACCORDING TO YEARS IN SERVICE.

Length of Service	Percentage Men in Service	Per Cent	Settlements	Medical	Legal	General
Less than six months...	10.6	8.5	$2,607	$284	$53	$17
Six months to one year.	30.3	28.6	8,689	947	89	56
One year to two years..	18.2	20.0	6,083	663	18	39
Two years to three years	9.1	14.3	4,345	474	160	28
Three years to five years	9.1	2.9	869	95	178	6
Five years and more....	22.7	25.7	7,820	853	125	50
	100.0	100.0	$30,413	$3,316	$623	$196

The Tacoma Railway & Power Company employs 294 platform men in regular service. These men operate cars over the city lines, which include a cable line of 1.58 miles. All cars are equipped with gates. During the year 1913 the total car miles amounted to 3,643,858; the passengers carried, 25,737,670, and the accident cost charged to trainmen, $0.0150 per car mile and $0.0021 per passenger carried. The percentages of medical, legal, miscellaneous and settlement costs for the trainmen of the Tacoma Railway & Power Company according to their years of service are presented in Table II.

TABLE II—SHOWING PERCENTAGES OF 1913 ACCIDENT COSTS FOR TACOMA RAILWAY & POWER COMPANY TRAINMEN ACCORDING TO YEARS IN SERVICE.

Length of Service	Percentage Men in Service	Per Cent	Settlements	Medical	Legal	General
Less than six months...	32.6	21.38	$10,634	$497	$461	$60
Six months to one year.	11.9	17.92	8,910	416	386	50
One to two years......	10.6	17.92	8,910	416	386	50
Two to three years.....	14.4	11.56	5,748	269	249	33
Three to five years.....	11.3	17.92	8,910	416	386	50
Five years and more...	19.2	13.30	6,611	309	286	38
	100.0	100.00	$49,723	$2,323	$2,154	$281

The Pacific Traction Company employs eighteen men in the regular service, operating five cars. Approximately 75 per cent of the 22 miles of track is laid on private right-of-way. The cars are equipped with doors and the greater part of the line is protected by block signals. The total mileage for the year 1913 was 505,881; the total number of passengers carried, 1,886,884, and the cost of accidents charged to trainmen, $0.0032 per car mile and $0.00086 per passenger carried. Table III gives the percentages of medical, legal, miscellaneous and settlement costs for the trainmen of the Pacific Traction Company according to their years of service.

TABLE III—SHOWING PERCENTAGES OF 1913 ACCIDENT COSTS FOR PACIFIC TRACTION COMPANY EMPLOYEES ACCORDING TO YEARS IN SERVICE.

Length of Service	Percentage Men in Service	Per Cent	Settlements	Medical	Legal	General
Less than six months...	5.6	7.1	$90	$3	$14	$8
Six months to one year.	5.6	7.1	90	3	14	8
One to two years......	22.2	28.7	360	13	59	30
Two to three years.....	11.1	...	...	...	...	...
Three to five years.....	11.1	...	...	...	...	...
Five years and over....	44.4	57.1	718	26	117	60
	100.0	100.0	$1,258	$45	$204	$106

In the investigation necessary to compile these figures, a careful observance of the cause of each accident was made. The personality and experience of trainmen who were responsible were also carefully considered, as well as the difference in physical conditions of the several lines. Another matter of considerable importance was the attitude of the public in different sections of the territory served.

Conditions which are present in Tacoma may be entirely different in some other locality. For this reason the writer has not thought it wise to report his conclusions as to what period of the average trainmen's service is the most efficient with respect to the elimination of accident cost. It may be said, however, that with the average trainmen there is a certain period of inexperience which adds greatly to a company's troubles. Yet after he has been in the service for a certain period, he is quite likely to assume responsibilities which belong to someone else and thus unnecessarily take chances which may ultimately result in serious accidents.

Safety Committee Meeting in Memphis

The first meeting of the July to December safety committee of the Memphis Street Railway Company was held July 11, the meeting being notable for the interest shown by the new members. Figures were read showing marked progress in the "safety first" work, and a paper entitled "Courtesy," was presented by A. D. McWhorter, master mechanic. This follows in abstract form:

The men who represent this company in its transportation department are selected with a view of establishing two important rules—caution and courtesy. Coming in direct personal contact with the public, the company's only customers, motormen and conductors are in a position to work for the permanent good or the incalculable harm of the company, and the reward for good or bad service is certain. The street car traveling public is composed of many peculiar individuals, and nobody knows better than the platform men how difficult it is to deal with that same public and keep its individual members in a contented frame of mind. It can be done, however, and, as a man can learn to handle the traveling public so can he learn to handle bigger men and bigger things. Sincerity, courtesy and, above all, common sense are the qualities necessary.

Getting along with the public is a great gift. The man with a small mind has a tendency to pick flaws, to argue, to find fault. Instead of dropping a misunderstanding he insists on "having it out." The man with the large mind rides over these little annoyances—the petty things over which the small man trips and stumbles. A conductor is not merely a collector of fares; he is the personal representative of the company. The student of human nature knows that tact is a great producer of success and that genius without tact is about as valuable as an expired transfer. It is not necessary to use a club of sarcasm or a battering ram of argument to gain a point with a passenger who may be full of friction, or at cross purposes with the world. It pays always to be patient with men and mules.

The person who is polite often finds himself imposed upon. He opens a door to let an old lady pass. He soon finds not only the old lady but everybody else takes advantage of the open door, never pausing to utter a word of thanks but absolutely blocking the door for the polite person himself. But he who conquers himself conquers the world. Courtesy is almost an absolute necessity for success in business and the men possesed of good manners, other things being equal, have reached fame or higher positions, when men more industrious as well as more scholarly, but wanting attractive manners, have remained in obscurity. Like virtue, politeness is its own reward. A pleasant manner helps to make the wheels of life run more smoothly and a little tact and a bit of kindness clear up many a difficulty, leveling many a rough way and shedding over the gray horizon of every-day life a ray of sunshine and joy.

The next speaker was E. W. Ford, general superintendent, who made a "chalk talk" on miles run per accident during the month of June, showing comparison with the same month of last year. The figures read by Mr. Ford showed the work in a healthy condition, showing a 30 per cent decrease in accidents over last year with a corresponding increase in number of miles run per accident.

Attorney Roane Warring spoke on the responsibility on the members of the safety committee, stating that the committee was now organized, the interest in the movement was increasing and each outgoing committee was showing a larger reduction in accidents than the previous committee. While the members should realize that they could help the other employees prevent accidents by reporting violations of rules, carelessness, unsafe operation, defective equipment, etc., they should be cautioned against looking on the safety movement as being for the purpose of spying on fellow workmen. It was for the mutual good of the employee and employer to help each other and prevent accidents. In conclusion Mr. Warring called particular attention to the humane side of the safety movement, saying that preventing accidents meant preventing untold sorrow, suffering, untold pain and loss of life which grow out of accidents. Attorney L. P. Miles also spoke.

District of Columbia Public Utilities Commission Report

The Public Utilities Commission of the District of Columbia has issued a report of its official proceedings for the ten months ended Dec. 31, 1913. The report contains information relative to electric railway accidents, inspections, equipment, extensions, pavement construction costs, service and track conditions. In addition to the foregoing there are presented tables showing the assets and liabilities of the companies within the district, the cost of road equipment and general expenditures, outstanding securities, operating revenues and expenses, analysis of passengers carried and miles of road and number of cars operated. In connection with each electric railway the commission also gives the results of its investigation concerning the outstanding stocks, bonds and debentures as of March 4, 1913. The information on these subjects, which was secured by means of answers to very detailed questions, is practically complete in regard to the companies' capitalization and ownership.

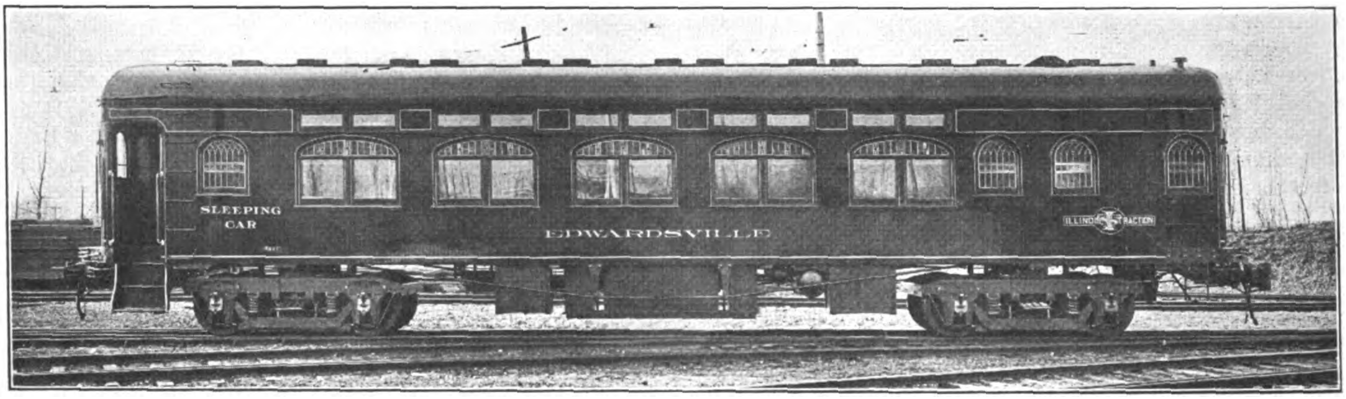
Illinois Traction System Special Service

Experience of Past Few Years Has Been Utilized in Devising Improvements in Details Making Electric Sleeper Service Very Attractive—Energy Consumption per Ton-Mile with Trail Cars Is Reasonable

The Illinois Traction System has operated sleeping cars for more than six years and observation parlor cars for nearly three years.

The original electric railway sleeping cars were built by the Holland Sleeping Car Company. These cars were inferior in their accommodation compared with later types of sleeping cars, but their use proved to the management that sleeping car service was a commercial possibility for an electric railway. After the Holland cars had been operated less than two years, four large sleeping cars incorporating many novelties in car-building, all designed to make sleeping-car service more comfortable and more safe were built especially for service between St. Louis, Springfield and Peoria.

H. E. Chubbuck, vice-president executive, and J. M. Bosenbury, superintendent of motive power, and equipment, Illinois Traction System, were the joint inventors of many of the novel features such as folding berths, safety deposit boxes for valuables, windows in upper berths, etc. The St. Louis Car Company has just completed another sleeper built according to the Illinois Traction standards. The new car is illustrated herewith. It is the fifth one of the new type to be built, and all five are now in active service. This type of car was described and illustrated on page 522 of the Electric Railway Journal for Sept. 30, 1911.



ILLINOIS TRACTION SYSTEM—NEW SLEEPING CAR

The sleeping cars, and in fact all of the freight and passenger cars of the Illinois Traction System, conform to the safety appliances and M.C.B. interchange requirements.

The sleeping cars are 57 ft. long over bumpers and 9 ft. 7 in. wide, and weigh 84,000 lb. The bodies are of heavy substantial Pullman-type construction with segmental arch roofs. They are mounted on steam-coach type four-wheel steel-frame trucks with quadruple elliptic bolster springs, and are provided with the M.C.B. contour, high-knuckle Sharon couplers, manufactured by the National Malleable Castings Company. These couplers are standard for all of the interurban equipment of the Illinois Traction System. There are twenty berths in each car, and the design of upper and lower berth is uniform. The cars are illuminated by seventy Mazda lamps, fed from a special panel governing a Gould storage battery of sixteen cells.

Sleeping-Car Service

Sleeping-car service is given between Peoria, Springfield and St. Louis. The distance from St. Louis north to Springfield is 100 miles, and from there to Peoria 75 miles.

The Illinois Traction System is the only road offering St. Louis, Springfield, Peoria sleeper service. The northbound train leaves St. Louis daily at 11:45 p. m., arrives at Springfield at 4:10 a. m. and Peoria at 7 a. m. The southbound train leaving Peoria 11:30 p. m., arrives at Springfield at 2:25 a. m. and St. Louis at 7:05 a. m. These trains are made up of a combination express, passenger motor car, a trailer coach and the sleeping cars. South of Springfield, the trains in both directions have two sleeping cars, namely, the through car between Peoria and St. Louis and the set-off Springfield car. The sleeping cars are ready for occupancy at 10 p. m., and passengers are allowed to remain in them until 8 a. m.

The combination motor-express cars which haul the sleeping-car trains were described in the Electric Railway Journal for Feb. 2, 1911, page 275. These cars are 52 ft. 6 in. long, 9 ft. 5⅜ in. wide, have underframing and body of heavy design and have four 140-hp motors. These motor cars satisfactorily haul the trailer coach and two or three sleeping cars at the average schedule speed of about 23 m.p.h., which includes time for cutting in and out extra cars at Springfield and making all station stops between 6 and 7 a. m. as the terminals are approached. The motor cars weigh about 100,000 lb. each. All sleeping car trains are equipped with Westinghouse A. M. V. air brakes with universal valves in place of triple valves.

Originally the sleeping-car trains were made up of a combination motor-passenger and baggage coach and two sleeping cars. The combination motor coach has seats for but twenty-four passengers, but these trains have developed coach traffic to such an extent that trailer coaches are now required. The baggage compartment of an ordinary motor passenger coach is not large enough to handle all of the baggage and express required for the sleeping-car trains. Considerable excess seating capacity also is desirable because of unexpected parties which use the trains for rides of 40 or 50 miles out of the terminals.

The sleeping car trains handle considerable theater traffic and serve as an "owl" train for the middle section of the road and as an early morning train for the other section near the arriving terminals.

A train crew for a four-car train is made up of a motorman, conductor, brakeman and two sleeping-car porters. The porters are paid $45 a month and perform duties similar to those of Pullman-car porters.

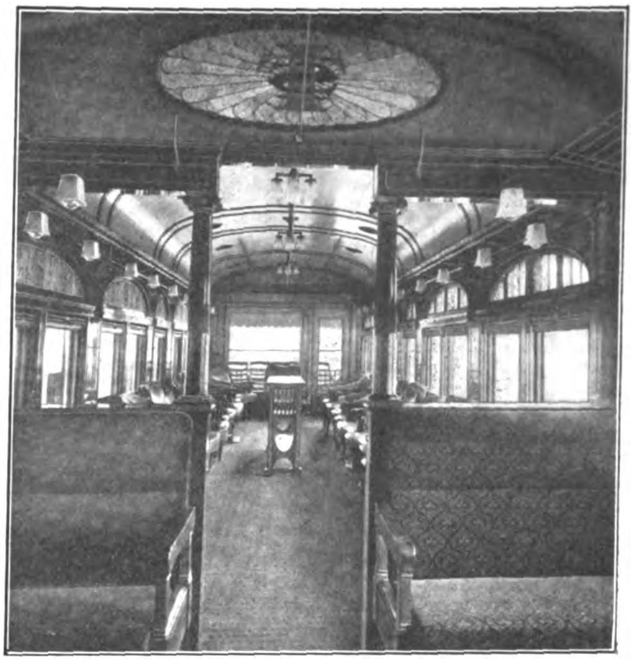
The sleeping-car trains have brought to this railway system traffic which it otherwise would not have had. Practically all of the passengers who now take the sleeping-car trains, both in the coaches and in the sleepers, would otherwise have taken steam trains had the Illinois Traction System not introduced the sleeping-car service. The business has gradually increased until now five sleeping cars are required, four of which are in operation daily and a fifth in reserve for overhauling and for special parties, to which latter use it is frequently put. One reason for the success of this service is that passengers can go to bed in the sleeper at one terminal and be at the other at 7 o'clock in the morning for an expenditure less than the cost of a hotel room in Springfield. The berth fare between Peoria and St. Louis is $1.50 for a lower and $1.25 for an upper.

The sleeping-car trains have net earnings of about $40,000 a year, and it is interesting to note that the earnings are practically the same for summer and winter. The gross earnings of a typical month were $5,679, the expenses $2,425 and the net profit $3,254. In these expenses are included the wages of motorman, conductor and porters, superintendence, power, maintenance of equipment, trackage, laundry, advertising, car cleaning, etc. The cost for laundry is about $15 per month per car, not including wear and tear.

PARLOR-OBSERVATION CARS

In 1911 the Illinois Traction System inaugurated an extensive parlor observation car service which has since been expanded, until now seven fine, large, heavy parlor cars are in use. The latest addition to this equipment is illustrated herewith. This car conforms to the earlier standard and was built by the St. Louis Car Company. The designs for this car, as well as those for the sleeping cars, were made and the construction supervised by Mr. Bosenbury. The parlor car weighs 80,000 lb.

Parlor cars are attached to limited trains, but not all limited trains have parlor cars. Those with the parlor cars attached make two round trips a day between Peoria and St. Louis, 175 miles each way, one round trip between Springfield and St. Louis, 100 miles each way, and two round trips between Springfield and Danville, 127 miles each way. The Danville-Springfield service connects with the Peoria-Springfield service, so that through service is given to and from St. Louis. The running time of a limited passenger motor car with trailer attached from St. Louis to Danville, 227 miles, is nine hours and fifteen minutes, and the running time between St. Louis and Peoria is six hours and forty-five minutes. Thus the schedule speeds of these trains are about 25 m.p.h., including all stops and dead time at junctions.



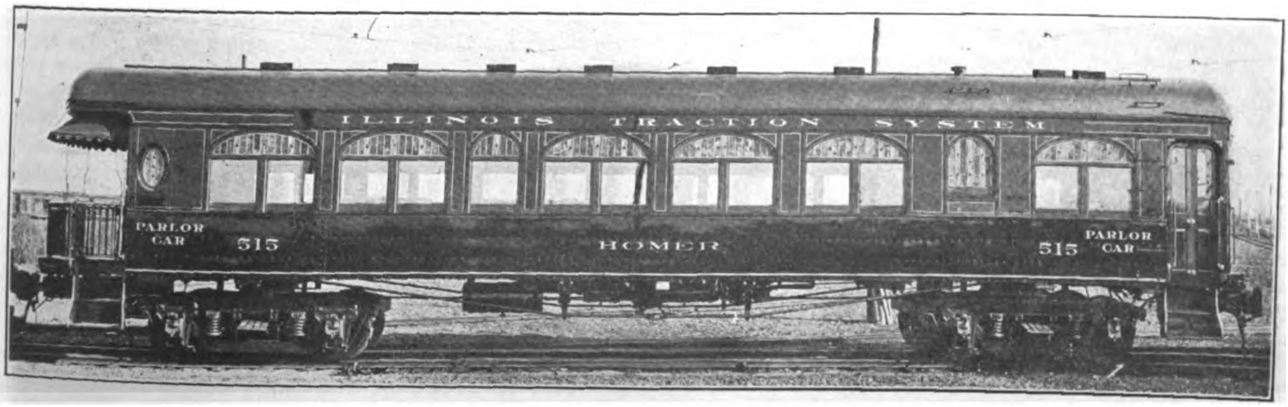
ILLINOIS TRACTION SYSTEM—INTERIOR OF PARLOR-OBSERVATION CAR

The parlor cars are added to the limited trains which regularly carry the most through business. In this way the normal electric railway load has better equipment, and inducements are offered which have resulted in building up traffic that formerly made the long runs on the trains of parallel steam railroads.

These parlor observation cars are 57 ft. long, 9 ft. 7⅛ in. wide, are mounted on standard steam-coach steel-frame four-wheel trucks with quadruple elliptic bolster springs, and are equipped with the Sharon type M.C.B. coupler. An interior view of the parlor car is shown. There are eight double seats, twenty-two mahogany chairs and six Pullman type camp stools.

The rates for seats in the parlor cars are approximately ½ cent per mile in addition to regular first-class fare. A minimum rate of 15 cents is observed. All station agents sell seat tickets and make reservations in advance for parlor car seats and sleeping-car berths.

The energy consumption of these limited trains with heavy observation parlor-car trailers, as compared with the same limited motor cars, shows that while the motor car alone consumes about 64 watt-hours per ton mile the same motor car, when hauling the parlor car as a trailer in the same run, consumes about 46 watt-hours per train ton mile.



ILLINOIS TRACTION SYSTEM—PARLOR-OBSERVATION TRAIL CAR

COMMUNICATIONS

Resistance to Car Motion

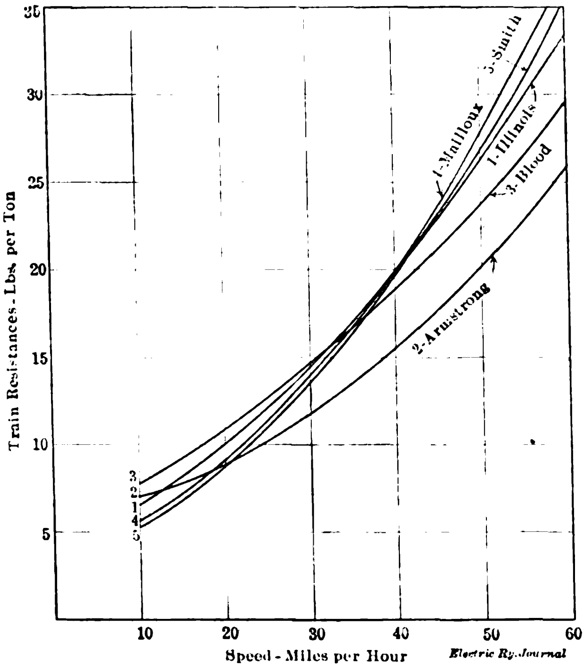
PURDUE UNIVERSITY
LAFAYETTE, IND., Aug. 5, 1914.

To the Editors:

I have read with interest the abstract of the University of Illinois Bulletin on train resistance, published in the issue of the ELECTRIC RAILWAY JOURNAL for June 20, and the comments by C. O. Mailloux and Louis Bell, in the issue for July 11. Railway engineers are again indebted to the University of Illinois Experiment Station for some valuable experimental work in train resistance measurement.

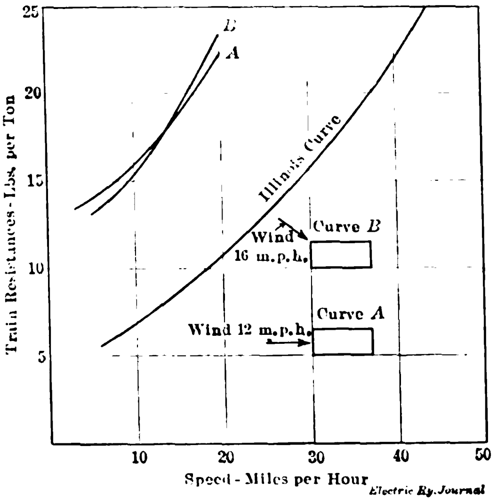
In the measurement of train resistance so many variable conditions are encountered that it is extremely difficult to secure consistent results. The variation in results obtained for a given speed with apparently similar car and track conditions are well illustrated by the illustration accompanying the abstract which shows the results for a typical individual test. I therefore agree with Mr. Mailloux, in his statement that the coefficients of the second and third terms of the Illinois formula indicate a degree of precision which is difficult of attainment in train-resistance measurements. The method used in making the resistance measurements has possibly as few objections as any in use, but any method involving the use of the difference of two quantities of which one at least cannot be measured with a great deal of precision is hardly ideal. I fear, however, that we shall have as much trouble in learning how to measure train resistance by direct measurement as we have had in deriving the "generalized rational formula" for train resistance that Mr. Mailloux so "devoutly" wishes for.

Presumably, the authors of the formula do not claim that it is applicable, except for car and track conditions similar to those of the tests upon which the formula is based. The abstract gives a comparison between the Illinois curve and the curves obtained by inserting the car constants of the Illinois test car in several other well-known formulas. In order to compare the Illinois formula with other formulas for other car weights and dimensions than those used in the test, I have calculated the train resistance of a 40-ton car with 100 sq. ft. of front end area (these figures representing approximately the proper values for cars used on several interurban railways in the Middle West), using the Illinois and four other well-known formulas. The results are shown in the first illustration and indicate that the Illinois formula compares with the others as favorably for the 40-ton car as it does for the 28-ton car.



TRAIN RESISTANCE—COMPARISON OF ILLINOIS WITH OTHER WELL-KNOWN FORMULAS

I have also been interested in comparing the results of the Illinois tests with those obtained in tests made under my direction at Purdue University during the past year and recorded in a thesis by H. B. Nussbaum, A. C. Davison, K. Wallace and F. B. Lubker. These tests had for their object the determination of the resistance of a small interurban car operating at low speed over track similar to that found in many small and medium-sized cities in the Middle West. Compared with the track of a high-grade interurban railway on private right-of-way this track would be ranked as below the average. The Purdue University test car used in making the tests weighs about 27 tons and has approximately the same dimensions as the Illinois car. A comparison of the results is therefore of some interest. Such a comparison is shown in the second figure. Because of the low speeds involved the "coasting method" of determining resistance was used in the Purdue tests. The runs were all made over a certain section of track, which had been carefully surveyed just previous to the tests. As in the Illinois tests, runs were made in both directions over the test section. Curve *A* is the average of 296 determinations of train resistance, and curve *B* is the average of 254 determinations, one half of the runs being made with the wind and the other half against it in each case. The rectangles and arrows in the corner of the figure represent the wind conditions. The two curves shown were selected because they represent sets of data taken under approximately similar conditions of weather. The air temperature for both curves was between 70 and 80 deg. F. and both sets of data were taken on fair days. The individual points on the curve sheets were as badly scattered as those shown in the curve sheet, marked "Typical Individual Test," of the Illinois report. Curves *A* and *B* were obtained by taking the arithmetical averages of the determinations with and against the wind. A method similar to the one outlined in the Illinois report was tried in calculating the results of a few of the tests, but as the speed and wind velocities were low, and as factors other than air resistance seemed to affect the curvature of the



TRAIN RESISTANCE—COMPARISON OF ILLINOIS AND PURDUE TESTS graphs, the method was discarded. While the curves *A* and *B* agree fairly well with each other, they show much higher values of train resistance than is shown by the Illinois curve. In presenting these curves of train resistance, it is not intended to disparage in any way the results of the Illinois tests; the idea being to bring out clearly the fact that even when car weights and dimensions are the same, greatly different values of train resistance may obtain. It will be noted that not only are the curves higher up on the sheet, but also that they show a greater curvature than the Illinois curve. Yet at the low speeds involved, the air resistance, to which the curvature of train resistance curves is usually attributed, cannot be an important factor.

The equations of curves *A* and *B* have not been worked out, but they would be of the general form of the McClaurin series, $r = A + BS + CS^2$. The constant terms and the coefficients of S^2 in the equations for the curves *A* and *B* would have much higher values than the similar terms in the Illinois equation. These differences may be attributed to condition and composition of wheel and rail surfaces; contour of wheel face; shape of rail head; elasticity and alignment of track; rigidity of truck frames; distribution of weight on truck frames; arrangement of trucks with respect to the car body; inequality of wheels on the same truck; condition and kind of gears; nature and composition of lubricants; and kind, condition and composition of bearing surfaces.

Any curvature in the graph of an equation of the form given above is due to the influence of the third term which involves the square of the speed. While it is the common assumption that this third term is chiefly concerned with air resistance, there seem to be very good grounds for believing that factors other than air resistance may also have some influence. Car vibrations and oscillations, truck nosing and truck frame skewing use up some of the tractive effort produced by the motors and, as these disturbances are greatly aggravated by poor track conditions and seem to increase at a greater rate than with the first power of the speed, it is easy to see how both the *B* and *C* coefficients may be increased over the values that would obtain for a properly designed car, operating over a first-class roadbed.

Dr. Bell states that the "difficulty of taking care of the air resistance lies in two matters, which have never been really well investigated; first, the actual effect of the shape of the front of the car, and second, the effect of this shape on the lateral drag at high speeds." I would add a third matter, namely, the actual effect of the shape of the rear end of the car. The rear end air resistance certainly is not negligible as compared with the front end air resistance, and it is quite possible that the shape of the rear end has some effect on the lateral drag. D. D. EWING,
Assistant Professor of Electrical Engineering.

"Proceed, Protected by Flag"

STEUBENVILLE, WELLSBURG & WEIRTON RAILWAY COMPANY
EAST LIVERPOOL, OHIO, Aug. 6, 1914.

To the Editors:

I have just read the editorial in the Aug. 1 issue of the ELECTRIC RAILWAY JOURNAL entitled "'Proceed, Protected by Flag'—A Fallacy?" I am strongly against any so called "proceed by flag" rule. A general rule of this nature, while it is very seldom if ever required by a regular scheduled train, is too apt to be seized upon by extra trains with the intention of forcing themselves over the road in the face of opposing regular scheduled trains. Consequently, it is sure to be a very dangerous method of operation.

In the case of block signal operation, I can see that certain instances could arise in the operation of regular scheduled trains whereby some rule should be provided to allow its scheduled operation; for instance, where the train is passing the piece of track over which the regular schedule gives it the right to travel and is approaching a regular scheduled meeting point but is stopped by the failure of a signal to operate, the dispatcher's telephone line being out of commission at the same time. In this case the opposing regular scheduled train would not be allowed to pass its meeting point until the one blocked by the inoperation of the signal had arrived. This is the only possible case to my mind that a rule should be worked out allowing such train to proceed and fulfil its regular rights, but in no wise should any rule allow an extra train of any nature to proceed beyond an inoperative block signal except under the provisions of rules 166 and 167.

W. R. W. GRIFFIN, General Manager.

BOSTON ELEVATED RAILWAY COMPANY
BOSTON, MASS., Aug. 8, 1914.

To the Editors:

With reference to the editorial entitled "'Proceed Protected by Flag'—A Fallacy?" in your issue of Aug. 1, my opinion is that a serious delay that is caused by a complete failure of the signal or dispatching system, and that lasts until such time as operation can be again restored to a safe basis, is preferable to a rule which offers opportunity for a serious catastrophe. If "safety first" means what it says we should not lay ourselves open, if it is possible to prevent it, to one of those harrowing collisions which, the moment they occur, shake the public confidence in the safety of block signals. Under certain local conditions, due to a sparsely settled territory and infrequent service, it may well be that some flagging rule should be devised in order not to tie up the system when telephone communication or signals fail, but it seems to me that only under such conditions is it justified. EDWARD DANA,
Assistant Superintendent of Surface Lines.

NEW YORK, Aug. 10, 1914.

To the Editors:

Your editorial in the Aug. 1 issue on "Proceed, Protected by Flag," is timely. It is my judgment that the rule is not good practice; this on the assumption that operation at high speed is comprehended.

The energies of modern electric railway operation are being directed toward providing greater safety of movement, as witness the development and use of automatic block signals for single track. Such a rule leaves an opening for the failure of the human factor under conditions where such a failure is most likely to occur.

L. H. PALMER.

A municipality in the United Kingdom has applied for sanction to borrow $109,500 with which to purchase twenty-five electric tramcars. The extensions which have been made in the various car routes and the increased traffic will require the utilization in the near future of fifty to seventy-five new cars. About half of these will be built in the company's shops, and the remainder will be purchased. These cars will be of the "double deck" type, inclosed both above and below. Interested American manufacturers may obtain the address of the manager of the tramways by writing to the United States Bureau of Foreign and Domestic Commerce and referring to No. 13,388.

Gergal & Santa Fe Three-Phase Railway —The First Spanish Heavy Electrification

The Gergal & Santa Fé Railway—a three-phase regenerative system which forms an electrified section of the South of Spain Railway is described in a recent article in the *Electric Railway and Tramway Journal*. This line serves an important part of the country situated between Linares and Almeria, and especially the mineral region near Almeria. In 1906 the iron ore traffic of this district became so heavy that the company found great difficulty in carrying on the steam service, especially between Gergal and Santa Fé, inasmuch as the line on this particular section has grades up to 2.8 per cent. The track is of 5-ft. 9-in. gage, which is usual in Spain, and is laid with 73½-lb. rails. This is the first heavy electrification in Spain.

The weights of the trains hauled are about 150 tons, empty, mounting toward Gergal, and 450 tons, loaded, descending toward Santa Fé. Electric locomotives are used solely for the ore traffic, while the less important passenger service is still carried on by steam locomotives. Electrification has raised the up-grade speed from 7 m.p.h. to 15½ m.p.h. and has enabled far heavier loads to be hauled. The time-table is so arranged that two trains run at the same time in each direction and cross each other near the middle of the line at Fuenta Santa. The layout of the line lent itself well to three-phase regeneration, as the descending trains are much heavier than the ascending ones.

POWER GENERATION AND DISTRIBUTION

Power is supplied from a steam station located at Santa Fé at one end of the present line, but midway of the complete Gergal-Almeria electrification. Current is generated at 6000 volts, twenty-five cycles by a 750-kw alternator. The contact line comprises two 8 mm (No. 0) copper wires, the rails serving as the third conductor. The suspension is usually of span type, either with poles or bridges. At stations and in the open the height of the contact wires above the rails is 18 ft. 2 in.; in tunnels, the height varies from 16 ft. 5 in. to 15 ft. 9 in. On open track the span wire is attached at each end to two Ambroin insulators. Galvanized iron clamps permit the span wire to be adjusted vertically to allow the height of the contact wire to be regulated, especially on curves.

Porcelain insulators are used in tunnels and at stations to economize space. The poles are usually 115 ft. apart on tangents and 72 to 92 ft. on curves. The trolley wires are fixed to the span wire by double ebonite and porcelain insulators, each of which has been tested at 10,000 volts, so that the suspension as a whole can withstand 40,000 volts. The line is protected against atmospheric discharges by Wurts lightning arresters. The rails were first bonded with metallic paste, but since then Carpentier-Riviére flexible bonds have been installed. The rails are cross-bonded every 328 ft.

ROLLING STOCK

In choosing the type of locomotives one of the factors which had to be considered was that the load per axle must not exceed 13 tons. The weight of the locomotive was fixed at 52 tons divided upon four driving axles. Each locomotive was built according to the normal twin-coupled design, namely, two axles and two motors per body. In case a half-locomotive is operated, the current collector of the half not in use is dismounted and placed on the other locomotive. The use of a second collector avoids interruptions of current and assures better acceleration. The electrical equipment of the locomotives was constructed by Brown Boveri & Company, and the mechanical equipment by the Ateliers Suisses pour la Construction des Wagons. The first five half-locomotives are of wood, constructed like Spanish box-type freight cars. The leading data of a half-locomotive follow:

Length outside buffers	24 ft. 5 in.
Length between axles	13 ft. 1 in.
Wheel diameter	47 in.
Weight of mechanical equipment	13 tons
Weight of electrical equipment	13 tons
Total weight	26 tons
Adhesion weight	26 tons
Hauled weight toward Gergal, without locomotive	75 tons
Hauled weight toward Santa Fé, without locomotive	225 tons
Weight of motor, including gearing	3 tons

The pole-changing connections of these three-phase, 220-hp (hour rating) motors permit speeds of 7.5 m.p.h. or 15.5 m.p.h., depending upon the use of twelve or six poles. The gear ratio is 1:4.5. At the lower speed the motors have a continuous rating of 160 hp each, and the tractive effort is 45 per cent greater. The contact voltage is stepped down by means of three-phase motor-ventilated transformers, and current is supplied to the motor terminals at 450 volts.

ASSOCIATION NEWS

COMMITTEE ON EDUCATION

The committee on education met at association headquarters on Aug. 12 and 13 to consider the preliminary report which had been prepared by the chairman. Martin Schreiber, engineer maintenance of way Public Service Railway; Prof. A. M. Buck, University of Illinois, and H. H. Norris, ELECTRIC RAILWAY JOURNAL, chairman, were in attendance. The committee reviewed the results of a questionnaire recently conducted to ascertain the present practice of the member companies in regard to apprentice and other employee training. The curriculums which had been prepared for certain correspondence courses were studied in detail and amended. The committee had arranged with a well-known correspondence school to outline several courses suitable for shop, line, power plant, track and other electric railway employees, working under the authority granted by the executive committee in making these preliminary negotiations. After revision the curriculums will be resubmitted to the correspondence school and if acceptable will be included in the committee's report.

The response to the efforts of the committee to interest educational institutions in sending representatives to the Atlantic City convention was considered and the importance of this matter was emphasized by Mr. Schreiber. While the committee agreed that the initiative should be taken by the educational institutions, as a matter of fact they have not done it, and the association has a duty in this direction.

MANUFACTURERS' ASSOCIATION

Secretary McConnaughy's latest circular to the prospective exhibitors at the Atlantic City convention relates to the supply of 110-volt d.c. power which is to be furnished free in reasonable quantities. All electrical connections are to be tested out on Friday, Oct. 9.

At a recent prosperity dinner given in San Francisco John A. Britton, vice-president and general manager Pacific Gas & Electric Company, showed wherein public service corporations have contributed to the welfare of the State. In all communities, he said, there are two main factors—transportation and lighting and industrial motor service—the success of which marks the success of the community and its people. Of primary importance is the matter of transportation.

Equipment and Its Maintenance

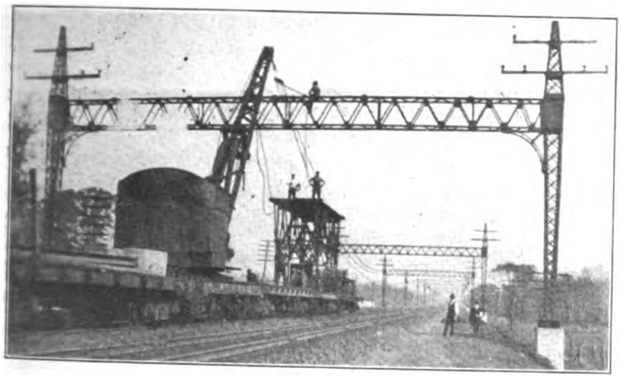
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

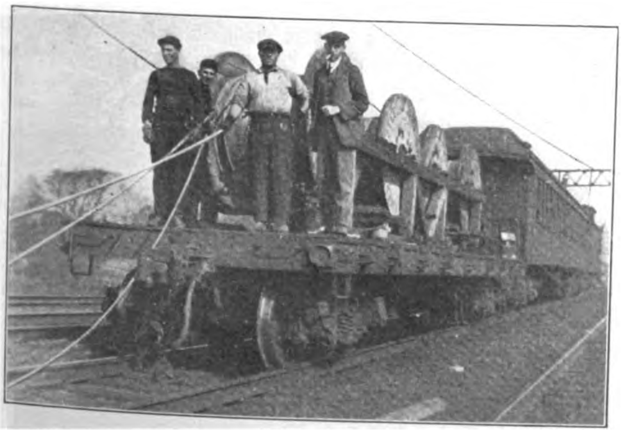
New Haven Railroad Construction Notes—Pulling ⅞-In. Messenger Cable

BY R. M. M. BURTNETT, FORMERLY INSPECTOR NEW HAVEN RAILROAD ELECTRIFICATION

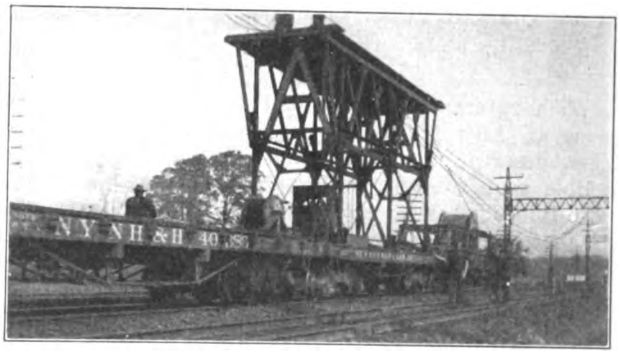
One of the most interesting jobs in the electrification of the New Haven Railroad was the pulling of the ⅞-in. steel messenger cable. These cables averaged about 1 mile in length and weighed about 5 tons. The train used for pulling them was composed of an engine, tool car, a derrick, a tower car and reel car. The reel car was loaded with four reels of ⅞-in. steel cables, as shown in one of the accompanying views. At the point from which the ⅞-in. steel cables were to be pulled the reel car and coach were cut off and anchored by chaining the reel car to the rails. Then the end of each cable was taken to the top of the tower car and connected to an iron plate which had eight holes in it, four for the ⅞-in. steel cable and four for the straps with which the cable was pulled. A ⅝-in. steel cable strap about 6 ft. long was attached to this plate; a second ⅝-in. steel cable strap that reached from the center of the boom of the derrick, provided with hooks on the ends to hook into the plate, held the cable which rested on the tower car while they were being pulled from the reel car to the bridge, and so on from bridge to bridge. After the cables had been attached to the plate the train would move until the tower car was under a bridge. The derrick was then raised and the load line was taken over the top of the bridge and hooked into the shorter ⅝-in. strap. Then the load line was taken up until the other strap was slack. Next the hooks were removed and the train went ahead, the cable being pulled with the load line of the derrick until it was clear of the bridge. Then the derrick was lowered until the plate and cable lay on top of the tower car. Following this the longer strap was hooked into place and the train was run ahead to the next bridge.



TRAIN WITH DERRICK AND TOWER CAR

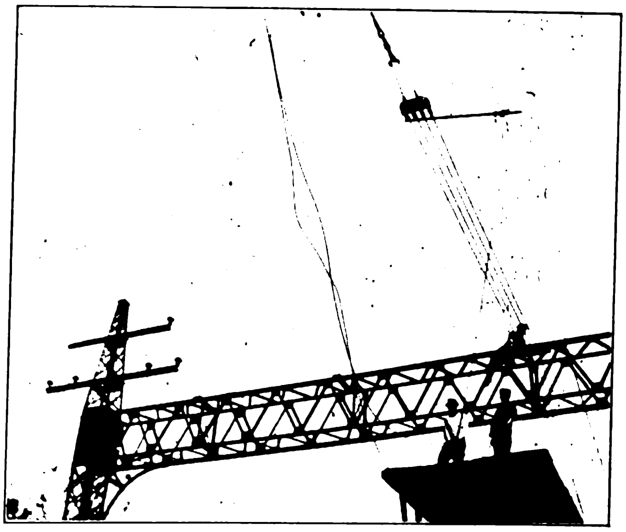


REEL CAR—THE TELEPHONE IS AT THE REAR OF THE CAR ON THE RIGHT



TOWER CAR IN OPERATION BETWEEN BRIDGES

When all the cable was out, sockets were put on and connected to the anchor bridge of the previous run of cable. The cables were then pulled up into the clear, one at a time, by the engine of the train. The movements of the train were controlled over a telephone line that had been distributed by the train from the anchored reel car as the run was made. If the cables were long enough they were dead-ended at the anchor



VIEW OF PLATE, SHOWING ALSO THE LIFTING OF FOUR CABLES OVER A BRIDGE

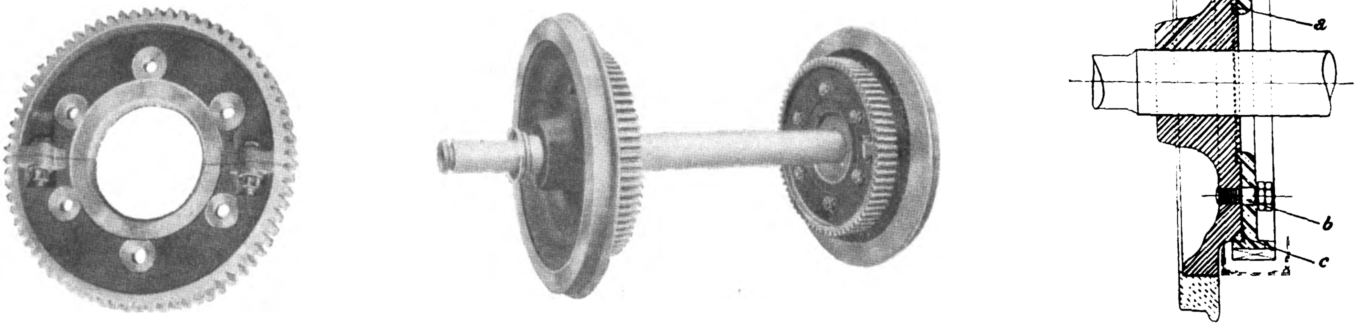
bridge at the other end of the run; otherwise they were dead-ended at the intermediate bridge which had previously been guyed to take the load. After the runs of cables between anchor bridges had been made the wires were separated and put in place over their respective tracks. In some cases we used the boom of the derrick to lift them into place; in other cases the work was done by the field force. Once the cables were in place they were sagged, after which the cables were ready to receive the I-beams, insulators and current-carrying wires.

It may be added that to facilitate the moving of the wires over the catenary bridges and to prevent them from shifting and so fouling other tracks, we installed on the top member of each bridge an iron roller, which was composed of four sections mounted on a wooden block and furnished with a common clamp to hold each wire in place.

Double-Gear Drive for Street Railway Motors

BY C. S. STEAD, A. M. I., MECH. E., ENGINEER TO THE M & G TRUCK & ENGINEERING COMPANY, LTD., LONDON, ENGLAND

With reference to Mr. Blackburn's article in your issue of July 4, relating to the double gear drive, a short description of the method employed to utilize the double gear for street cars operating on a track of 3 ft. 6-in. gage may be of interest. Owing to the amount of space taken up by the motor, it was impossible to fix an additional gear on the axle. It was therefore decided to attach the gears to the centers of the truck wheels. This was carried out in the manner shown in the accompanying drawing.



BIRMINGHAM DOUBLE GEARS AND DETAIL OF INSTALLATION

The wheel centers are of pressed mild steel carefully machined on the inner face to receive the cast-steel gears. The gears are secured in position by turned mild steel studs, *b*, in reamed holes. An annular projection, *a*, on the gear engaging with a corresponding groove in the wheel center preserves the concentricity. The studs are relieved of all driving stresses by two lugs, *c*, situated on the inner edge of the gear rim, which are an accurate fit in machined recesses located in the wheel center. This arrangement is the patented invention of Messrs. Baker and Dickinson of the Birmingham (England) City Tramways.

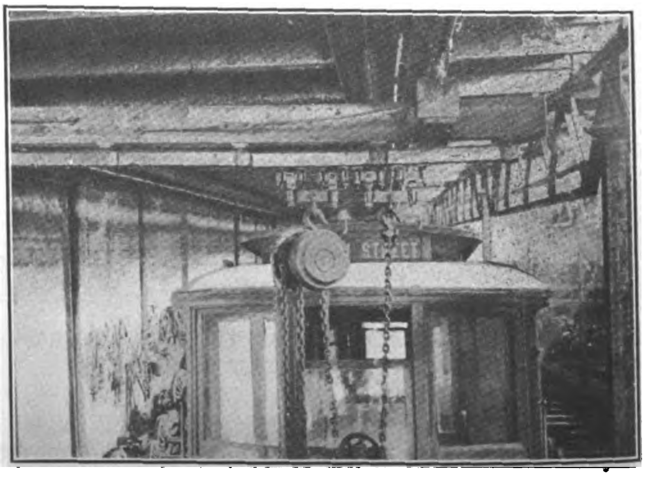
More than 180 car trucks (single and double truck) supplied to the Birmingham tramway system by the writer's firm, have been fitted with wheels upon which this type of double drive has been adopted, and the results obtained during the past two to three years have been exceedingly satisfactory. A distinct advantage obtained by the attachment of the gear to the road wheel center instead of keying the gear to the axle has been found in the freedom from broken axles.

Previous to the introduction of the double drive fractured axles, chiefly at the keyway, were a too frequent occurrence. This trouble is now entirely eliminated. At first sight it would appear as if much trouble would be experienced in obtaining correct alignment of the gears on axle, but by the use of suitable jigs and gages, during manufacture, strict accuracy has been maintained. The gears have seventy-one teeth, the pinions on the Dick-Kerr 19A motor have fifteen teeth.

A second view shows the gear wheel and a third view the wheels and axle with the gears in position.

A Home-Made Traveling Crane

At the Carew Street shops of the Springfield (Mass.) Street Railway effective use is made of two traveling cranes built by the company at a nominal cost. One of these cranes is illustrated in the accompanying halftone, its location being the carhouse storage section adjoining the local forge shop. The crane is built of a main wooden member 7-in. x 8-in. in section, with 7¼-in. x 7½-in. cross pieces near the ends, and a steel bar runway for block and tackle holders at the bottom. The capacity of the hoist is 4 tons, and the runway is 12 ft. long. The cross timbers are each 6 ft. long and are braced against the main member by ⅝-in. tie rods provided with turnbuckles. They are reinforced at the bottom by iron plates 1 in. thick and 6 in. wide. The hoist blocks are carried by hooks and eyes supported from the runway rollers by ½-in. x 2½-in. wrought-iron bars hung from 1¾-in. x ⅜-in. bars by ⅞-in. bolts, the upper bars being attached to the runners by ¾-in. bolts. The runway is attached to the main horizontal member by clamps 30 in. apart. The crane was built at a cost not exceeding $125, including all items relating to labor and material.



HOME-MADE CRANE OF 4-TON CAPACITY AT SHOPS OF SPRINGFIELD STREET RAILWAY

Changes In and Equipment For Car Wiring

BY R. H. PARSONS, ELECTRICAL FOREMAN

If one happens to glance under cars which were wired ten years ago and those which have been equipped within the last six or seven years, most striking differences will be observed. On looking now at the cars in service a decade or more with the original wiring one must wonder how they keep running. The wires and cables are hung around promiscuously in positions where they get the full benefit of the wheel wash or where they are rubbed by the gear cases, motor shells, wheels, etc. The resistors are hung by a couple of bolts down through the car floor, the controllers stand on the platforms with no protection for the cable leads which come in at the bottom and the circuit breakers hang loosely from the bonnet with all the woodwork around scorched from flashes. Further, the cables and wires usually are found to be composed mostly of poor wire, poor splices and screw connectors, while the beams and sills of the car underframe are frequently burned and charred because of short-circuited wires.

On a wet day it was not unusual for passengers to get a bad shock as soon as their feet touched the pavement because of leakage of current through the insulation of the old-time wires; nor was it a rare occurrence for the controller to blow up after seriously burning the motorman and causing panics among the passengers. In almost every one of these cases the controller would be found to have a good-sized hole burned in the cover. The connection board nearly always was found heavily carbonized and covered with many coats of shellac or paint while the wires would be found loose and full of screw connectors.

INTRODUCTION OF CONDUIT

The rules of the fire insurance companies, and still more the desire of progressive railways to avoid burnouts and failures led to the use of conduit and to giving more attention to the location of electrical apparatus for accessibility and safety. Junction boxes and other devices are now used to make watertight joints for the conduit, fire-resisting material is adopted wherever there is any danger from heat or flame, and more care is used in soldering connections. The conduit is grounded to prevent shocks to passengers, and generally the condition of the wiring and other electrical parts is no longer a secondary matter, as was formerly the case.

While it is important that cars fitted for multiple unit control should receive more attention because of the number and importance of the smaller wires, nevertheless if an ordinary car with K control is equipped with conduit completely, using care as to junction boxes, outlets, etc., the investment due to absence of failures and long life of the wiring will also be found to bring ample returns.

Below will be found a list of material, etc., necessary to equip a 45-ft. car with two K controllers and two motors. Although this amount will vary depending on location of apparatus, size of car and equipment, system of lighting, heaters and buzzers, the figures given will generally be found of use when equipping new cars.

WIRING EQUIPMENT FOR A 45-FT. DOUBLE-END CAR WITH TWO MOTORS

Item	Number or Quantity
Lamp receptacles—brass skirt type	17
Lamp receptacles—plain wall socket	2
Lamp receptacles—headlight socket	2
Main light switch	1
Three-way switch for headlights	1
Lamps	21
Connectors for motor leads	8
1-in. circular loom for motor lead connectors	4 ft.
Seven-conductor cable made up of—three No. 4 wires four No. 2 wires	52 ft.
Seven-conductor cable made up of—two No. 4 wires four No. 2 wires one No. 0 wire	52 ft.
No. 0 strand wire—trolley	125 ft.
No. 2 strand wire—motor lead taps	35 ft.
No. 4 strand wire—resistance taps	35 ft.
No. 12 strand wire—heaters	210 ft.
No. 14 strand wire—lighting, pump and buzzers	500 ft.
2-in. conduit—for main cables	50 ft.
1¼-in. conduit—for resistance wires	6 ft.
1- in. conduit—for motor leads	15 ft.
¾-in. conduit—for light, heater and compressor circuits	150 ft.
½-in. conduit—for light, heater and compressor circuits	30 ft.
Junction boxes—	
¾-in. x ¾-in. x ¾-in. T	19
¾-in. straight	1
¾-in. x ¾-in. L	2
¾-in. x ¾-in. x ½-in. T	2
1¼-in. straight	2
1-in. straight	2
Chase nipples, 1-in.	1
Chase nipples, ½-in	1
Floor flanges for ¾-in. pipe	16
Conduit insulating joints—½-in	2
Conduit T's—½-in	2
Conduit lock nuts—	
2-in.	20
1¼-in.	4
1-in.	8
¾-in.	8
½-in.	10
Conduit end bushings—	
2-in.	12
1¼-in.	2
1-in.	4
¾-in.	17
½-in.	6
Conduit couplings, right and left, ¾-in.	11
Conduit couplings, ½-in	4
Pipe straps—	
1-in.	25
¾-in.	25
½-in.	5
Lead washers for conduit—	
2-in.	12
1¼-in.	2
1-in.	4
¾-in.	4
Lag screws for heavy junction boxes, etc.—	
⅜-in. x 2¼-in	52
⅝-in. x 3¼-in	2
5/16-in. x 2-in	2
⅝-in. x 2½-in	2
⅝-in. x 1½-in	16
½-in. x 3-in	2
½-in. x 2-in	4
Bolts, machine—	
⅜-in. x 2-in	4
½-in. x 1½-in	2
½-in. x 3½-in	2
⅜-in. x 3-in	8
⅜-in. x 2½-in	4
½-in. x 2-in	2
Bolts, carriage—	
⅜-in. x 3½-in	26
⅜-in. x 3-in	2
⅜-in. x 2½-in	8
⅜-in. x 5½-in	8
⅜-in. x 2½-in	8
½-in. x 4½-in	12
⅝-in. x 6-in	1
Lock washers—	
⅜-in.	33
½-in.	18
⅝-in.	4
Flat washers—	
⅜-in.	32
½-in.	16
⅝-in.	6
⅞-in.	6
Screws—	
2-in. No. 14 flathead	8
1-in. No. 9 flathead	8
1-in. No. 10 right-hand	50
1¾-in. No. 12 right-hand	12
1½-in. No. 16 flathead	4
¾-in. No. 8 right-hand	40
1¼-in. No. 7 right-hand	24
1-in. No. 10 flathead	50
1½-in. No. 16 flathead	4
1½-in. No. 10 right-hand	12
⅜-in. No. 6 right-hand	40
Iron—	
½-in. x 2-in. flat	10 lb.
⅜-in. x 1½-in	37 lb.
¼-in. x 1¼-in	1 lb.
¼-in. x 2-in	2 lb.
¼-in. x 1-in	½ lb.
⅜-in. x 1½-in	12 lb.
3/16-in. x 1¼-in	1 lb.
⅛-in. x 1-in	1 lb.
¼-in. x 1½-in	6 lb.
¼-in. asbestos lumber	30 sq. ft.
Oak	38 ft.
Maple	6½ ft.
Ash	3½ ft.
Insulating paint	1 gallon
Solder	5 lb.
¾-in. friction tape	3½ lb.
2-in. friction tape	4 lb.
¾-in. rubber tape	3 lb.

The foregoing material includes all that is used for installing the electrical equipment, to wit, hanging the resistance fastening, all junction boxes, cleating all conduit boards for circuit-breakers and fuse boxes, motor lead brackets, light fixtures, switches, setting up controllers, grounding conduit, placing of heaters, etc.

In connection with the foregoing: As pipe straps and flat washers are ordered by the pound it will be useful to know how many of these make up a pound.

FLAT WASHERS PER POUND

Size	No.	Size	No.
3/16-in.	337	⅞-in.	6
¼-in.	132	1-in.	5
⅜-in.	97	1⅛-in.	5
½-in.	23	1¼-in.	3
⅝-in.	12	1½-in.	2
¾-in.	9		

PIPE STRAPS PER POUND

Size	No.	Size	No.
⅜-in.	33	1-in.	18
½-in.	25	1¼-in.	10
¾-in.	15	2-in.	7

In figuring the weights on a car it will be found useful to know what standard conduit and air pipe weighs per foot.

Conduit Size	Conduit Weight	Air Pipe Size	Air Pipe Weight
⅜-in.	8.4 oz.	⅛-in.	4 oz.
½-in.	14.0 oz.	¼-in.	5 oz.
¾-in.	17.2 oz.	⅜-in.	8 oz.
1-in.	26.4 oz.	½-in.	12 oz.
1¼-in.	34.4 oz.	¾-in.	16 oz.
2-in.	53.6 oz.	1-in.	24 oz.
2½-in.	84.8 oz.		

Insulated wire purchased on specifications best suited for car work weighs per foot as follows:

Size	Weight	Size	Weight
18-strand	0.8 oz.	2-strand	4.0 oz.
14-strand	1.6 oz.	No. 0 strand	7.2 oz.
12-strand	1.9 oz.	No. 4 flexible	4.0 oz.
10-strand	2.0 oz.	No. 2 flexible	5.6 oz.
4-strand	3.6 oz.		

The size of conduit which should be used for various sizes of wires is as follows:

No. of Wires	Size Wire	Size Conduit	No. of Wires	Size Wire	Size Conduit
1	0	¾ in.	1	10	⅜ in.
2	0	1¼ in.	2	10	½ in.
			3	10	¾ in.
			4	10	¾ in.
1	2	½ in.*	5	10	¾ in.
1	2	¾ in.	6	10	1 in.
2	2	1 in.*	1	12	⅜ in.
3	2	1¼ in.	2	12	½ in.
4	2	1¼ in.*	3	12	¾ in.
			4	12	¾ in.
1	4	½ in.	5	12	¾ in.
2	4	¾ in.*	6	12	1 in.
3	4	1 in.	7	12	1 in.
4	4	1¼ in.	8	12	1 in.
5	4	1¼ in.	9	12	1¼ in.
6	4	1¼ in.*	1	14	3 in.
1	6	⅜ in.	2	14	½ in.
2	6	¾ in.	¾	14	½ in.
3	6	1 in.	5	14	¾ in.
4	6	1 in.	6	14	¾ in.
5	6	1¼ in.	7	14	¾ in.
6	6	1¼ in.	8	14	1 in.
7	6	1¼ in.	9	14	1 in.
8	6	1¼ in.*	10	14	1 in.
			11	14	1 in.
			12	14	1 in.

This table is for wire insulated for car work, and is for the sizes mostly used in the equipment of cars.

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*Only on a short, straight, easy pull.

The greatest number of wires of different sizes which can be safely pulled into various sizes of conduit follow:

⅜-in. conduit—
- 1 No. 6 wire.
- 1 No. 10 wire.
- 1 No. 12 wire.
- 1 No. 14 wire.

½-in. conduit—
- 1 No. 2 wire.
- 1 No. 4 wire.
- 1 No. 6 wire.
- 2 No. 10 wires.
- 1 No. 10 and two No. 14 wires.
- 1 No. 10 and 2 No. 12 wires.
- 2 No. 12 wires.
- 4 No. 14 wires.

¾-in. conduit—
- 1 No. 2 and 2 No. 14 wires.
- 1 No. 2 and 1 No. 12 wires.*
- 2 No. 4 wires.*
- 1 No. 4 and 4 No. 14 wires.
- 1 No. 4 and 3 No. 12 wires.
- 1 No. 4 and 3 No. 10 wires.
- 2 No. 6 and 2 No. 14 wires.
- 2 No. 6 and 1 No. 12 wires.
- 2 No. 6 and 1 No. 10 wires.
- 1 No. 6 and 4 No. 14 wires.
- 1 No. 6 and 3 No. 12 wires.
- 1 No. 6 and 3 No. 10 wires.

1-in. conduit—
- 1 No. 0 and 1 No. 6 wires.
- 1 No. 0 and 4 No. 10 wires.
- 1 No. 0 and 4 No. 12 wires.
- 1 No. 0 and 5 No. 14 wires.
- 2 No. 2 and 2 No. 12 wires.*
- 1 No. 2 and 2 No. 4 wires.
- 1 No. 2 and 2 No. 6 wires.
- 1 No. 2 and 4 No. 10 wires.
- 1 No. 2 and 5 No. 12 wires.
- 3 No. 4 and 1 No. 6 wires.
- 3 No. 4 and 3 No. 14 wires.
- 3 No. 4 and 2 No. 10 wires.
- 3 No. 4 and 2 No. 12 wires.
- 4 No. 6 and 2 No. 14 wires.
- 4 No. 6 and 1 No. 12 wires.
- 4 No. 6 and 1 No. 10 wires.
- 8 No. 10 and 1 No. 14 wires.*
- 1 No. 14.
- 8 No. 12 and 1 No. 14 wires.

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*Only on a short, straight, easy pull.

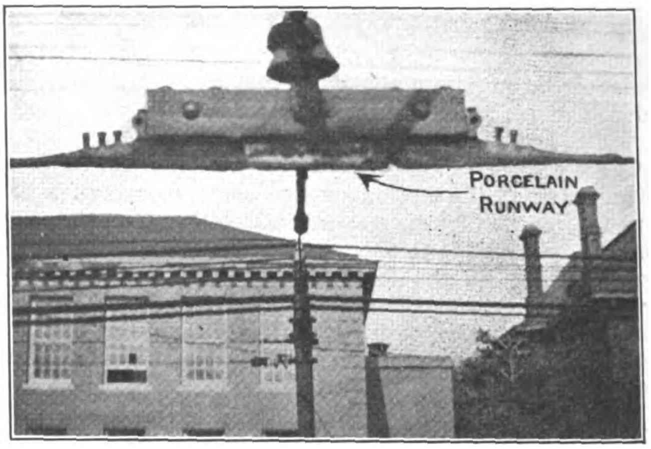
Report on Air in Paris Subways

In a recent issue of *The Engineer*, London, England, is a condensed report on some experiments as to the air in the Métropolitain and the Nord-Sud subways of Paris. The experiments were conducted by the Conseil Hygiene of Paris, and covered a period of two years. The report just issued shows that the air on the Métropolitain is much more vitiated than on the Nord-Sud. The principal cause of the trouble is attributed to the rails. On the Métropolitain the wear is very pronounced, especially owing to braking, in the stations; but on the Nord-Sud the rails are, apparently, of harder steel, and the braking has had little effect. On the former line the brake shoes are of cast iron; on the latter, they are faced with a tar-treated fabric, and, incidentally, the trains on the Nord-Sud stop much more smoothly and with less noise. The report refers to the fact that the floor of the coaches on the Métropolitain has longitudinal strips along the upper surface, so cannot be swept clean, but on the Nord-Sud the floors are covered with a conglomerate material forming a uniform and non-slipping surface, which can be cleaned with sawdust. It is therefore proposed that in these matters the Métropolitain should follow the example of the Nord-Sud, also that the ballast in and near the stations be covered by tiles, which can be swept, so as to reduce the dust.

Porcelain Runways on Section Insulators

BY JAMES SCOTT, SUPERINTENDENT OF OVERHEAD CLEVELAND RAILWAY

As the Cleveland Railway Company had been troubled by the burning and wearing away of the wooden runways on section insulators, it was decided to look around for a substitute. Several different materials were experimented with and finally a porcelain runway of the type shown in the accompanying illustration was adopted.



PORCELAIN RUNWAY IN CLEVELAND SECTION INSULATOR

We have, at present, twelve section insulators equipped with the porcelain runways. These runways have been in use for more than six months and they have yet to show defects. When the wooden runways on the insulators began to wear into "half moons," they caused the trolley to pound and break the wire. The permanent alignment of the porcelain runways overcomes this trouble.

Proposed French Monorail

A scheme for a suspended monorail railway has recently been submitted to the Minister of Public Works in France by M. Mähl, a French engineer. It is claimed that a speed of 150 m.p.h. may be attained with safety on this proposed railway. The track, either single or double, is to be carried 20 ft. to 25 ft. above the ground by catenary suspension. As planned, the trains will be composed of small sections freely articulated and will easily take curves of 1 km (3280 ft. 10 in.) radius and gradients of 1 in 20. Each train section will be suspended from two wheels about 1 m (39.37 in.) apart. There will be only one row of seats, placed longitudinally.

Electric Safety Brake

The Third Avenue Railway, New York, has recently equipped one of its storage battery cars with a new form of electric brake developed by the Electric Safety Brake Company, Philadelphia, Pa. This brake apparatus consists essentially of a pulling or braking cylinder for transmitting power to the truck levers and a controller for controlling the amount of current supplied to the cylinder. The cylinder is a reciprocating or sliding electric motor somewhat resembling an air-brake cylinder. This cylinder is 14 in. in diameter x 42 in. x 50 in. long, with a pulling movement of 12 in. The construction of the cylinder is very similar to that of a d.c. motor, in that it has suitable field magnets energized by separate field coils and a reciprocating or sliding armature with windings, commutator and brushes—imparting a reciprocating instead of a rotary motion. To the armature are attached rods which pass out through the cylinder heads, and attached to these rods is a crosshead to which the usual brake levers are attached.

The winding and arrangement of the cylinder is so proportioned that the movement or pull is smooth and constant throughout its entire length of travel. The amount or strength of the pull is governed by the amount of current supplied, and under normal conditions is from 0 to 1000 lb. for small single-truck cars, and 0 to 1500 lb. for the cylinders of larger truck cars with a maximum current of 75 to 90 amp.

In this type of brake the cylinders either push or pull, as may be most convenient. They are mounted underneath the car body, like an air-brake cylinder, and are connected to the truck levers by any suitable rigging. The cylinder levers are connected to the hand-brake staff and wheel in such a way that at every application of the brake or movement of the levers, the hand-brake staff is operated and all slack is taken up. Hence simply by latching the brake ratchet dog the brake is held applied indefinitely.

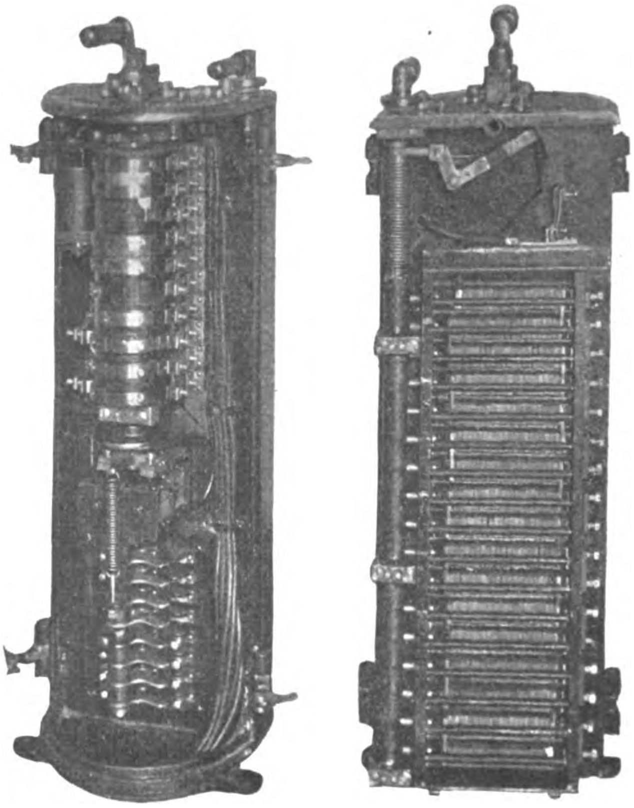
The controller is separate but can be made integral with the main controller. In installing, it is located beside the main controller in the space usually occupied by the air-brake valve and piping. It is connected with the main controller with an interlocking device which prevents the operation of both controllers at the same time. This arrangement prevents the use of power with brake applied or the application of the brake until the power is shut off in the main controller.

The controller consists of two separate parts, the first being the necessary connections, cut-outs, and apparatus for converting either of two motors to a generator to supply energy to operate the cylinder, and the arrangement for controlling this generated current; second, the necessary switches, connections and adjustable variable resistance for the control and application of trolley current for operating the cylinder in emergency, when the car is standing, or at any other time desired. An interlocking arrangement prevents the use of trolley and generated current at the same time.

As the controllers are mounted beside the main controller the only wiring necessary is the circuit for trolley current, one line being from the controller to the cylinder with short connections between the brake and car controllers by which the armature and field leads of two motors are brought into the brake cylinder. All of these wires carry current and are necessary for traction; necessarily any disarrangement would be noticed in propelling the cars and before the need for applying the brakes, thus making the apparatus safe against broken wires.

The apparatus for the control of the generated current consists of a connecting board with a cut-out switch, by means of which one motor is connected for generating use when the switch is thrown to the right, and the other motor connected when thrown to the left. Further, by placing the switch in the center both motors are cut out of the brake controller. From the connecting board and switch suitable connections are made to the fingers and contact points in the controller drum.

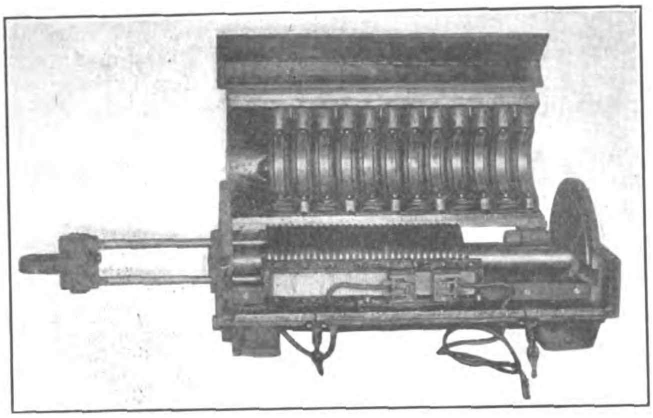
The operation is as follows: When the car controller is on the off position, the handle on the brake controller is thrown one notch to the right for car moving ahead, or one notch to the left for the reverse direction. In this position the armature connections to the motor that may be cut in to generate current for braking are broken and are reverse-connected to the field leads from the same motor. Connection is also made with the cylinder, the windings of which are connected in series with the armature, so that all current generated must flow through these windings and be used in the operation of the cylinder. In this position a contact is made which places a short-circuit across the field windings of the motor, thus preventing building up or generating in this position, although all other connections are complete for this purpose.


FRONT AND BACK OF CONTROLLER

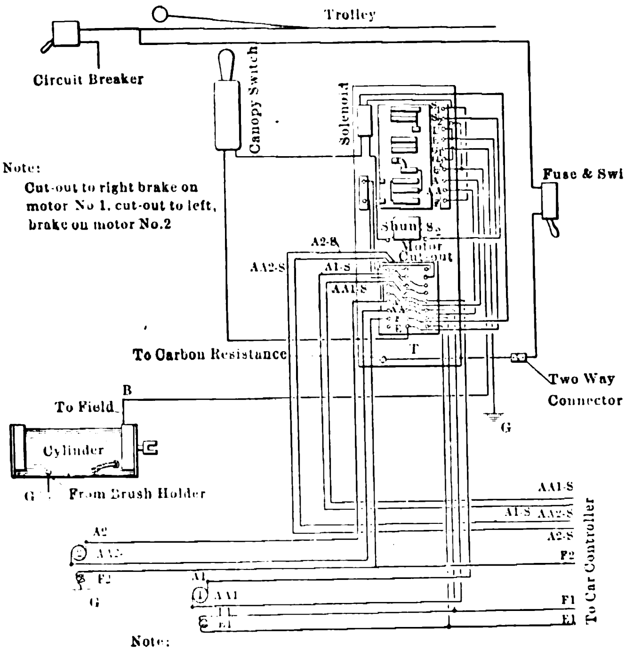
Further movement of the brake handle removes this short-circuit across the fields, which immediately receive current and energize very quickly, and the motor begins to generate current to apply the brake. Wired in series with the armature is a small solenoid set to operate at a low voltage. When the generated voltage reaches this predetermined amount, the solenoid acts to cut in a variable resistance circuit across the field windings. This resistance consists of a small number of clamped carbon blocks, operated by the movement of the controller handle. The movement of the handle causes more or less pressure on the blocks and consequently less of more resistance through them.

At the moment that the solenoid operates to cut in this resistance and current across the fields, the carbon blocks are clamped firmly together to insure little resistance. Hence much current that otherwise would flow through the fields flows through this circuit, with a consequent weakening of the field, and a retardation of the generating of additional voltage. Thus a high voltage is prevented, and the brake is very lightly applied. A further movement of the handle causes a decrease of the pressure on the carbons, and increased resistance in the short circuit. Therefore, more current flows through the fields and higher voltage current is generated to apply the brake to the desired strength.

It might appear that if the brake handle is moved too far, too much current would be generated and the brakes would therefore be applied so hard that skidding would ordinarily take place. This does not occur, however, because the slowing down of the wheels, and the consequent lessening of the speed of the motor armature, decreases the amount of current generated. Consequently, the pull of the brake cylinder would at once be reduced automatically to a point where the two forces would be equalized, and the proper braking of the car would be as rapid as wheel and rail conditions permit. A lesser movement of the handle results in generating a lower current and consequently lower pressure on the brakes. The return of the handle to the first notch again places the short-circuit across the fields, immediately stopping the generating of current and causing the immediate release of the brakes.



ELECTRIC SAFETY BRAKE CYLINDER OPEN



Note: Cut-out to right brake on motor No 1, cut-out to left, brake on motor No.2

Note: A1 s, AA1-s, A2-s, AA2-s are substituted for A1, AA1, A2, AA2 in main controller

Electric Ry. Journal

WIRING DIAGRAM FOR ELECTRIC BRAKE

The short-circuit across the fields prevents current from flowing through or flashing at the various contacts, when the brake handle is brought to the center, the generating connections are broken and the power connections made. The trolley or emergency switch consists of a large number of carbon blocks normally held together with but little pressure. The operation of the switch handle first closes the double switch to close the circuit. As there is little pressure on the carbons and great resistance, very little current flows through at this point. Additional movement of the handle increases the pressure on the carbons by an electric device until the desired pressure with the carbons is obtained to give the current resistance and the amount of current necessary to operate the cylinder.

Test of Oil-Treated Chrome-Vanadium Rolled-Steel Wheels

The Grand Trunk Railway has three lots of tenders, of twenty-five each, equipped respectively with unheat-treated carbon steel tired wheels, oil-treated carbon rolled steel wheels, and oil-treated chrome-vanadium rolled steel wheels, the last two types having been made by the Standard Steel Works Company. Of these three lots of tenders, that equipped with steel-tired wheels went into service between the latter part of January and the first part of March, 1913; that equipped with oil-treated carbon rolled steel wheels in August and September of last year; and that equipped with oil-treated vanadium rolled-steel wheels in November. Comparison is possible because it is stated that though the steel-tired wheels were in service longer than the others, they saw little service during the winter of 1913 and the real test of their merits came last winter.

Careful records were kept by the railroad of the performance of the wheels, particularly as regarded the amount of shelling, as this is stated to be a common defect on the Grand Trunk lines. From these it was found that only three pairs out of 100, or 3 per cent, of the oil-treated, chrome-vanadium, rolled-steel wheels had to be removed on account of shelling. Nine pairs, or 9 per cent, of the oil-treated, carbon, rolled-steel wheels and seventeen pairs, or 17 per cent, of the steel-tired wheels were removed for this cause. In other words, the oil-treated carbon-steel wheels shelled three times as much and the steel-tired wheels five and one-half times as much as the oil-treated, vanadium, rolled-steel wheels.

Further comparison showed that of the oil-treated vanadium wheels only 8 per cent had to be removed from all causes, such as sharp flanges. Of the oil-treated carbon steel wheels 22 per cent, and of the steel-tired wheels 52 per cent had to be removed; in the latter case, the larger number of removals was attributed to their longer service. As regards shelling, however, this circumstance did not affect the comparison with the other two makes. All the cases of shelled steel-tired wheels occurred during the past winter, while none shelled during the short period in which they were in service during the winter months of 1913.

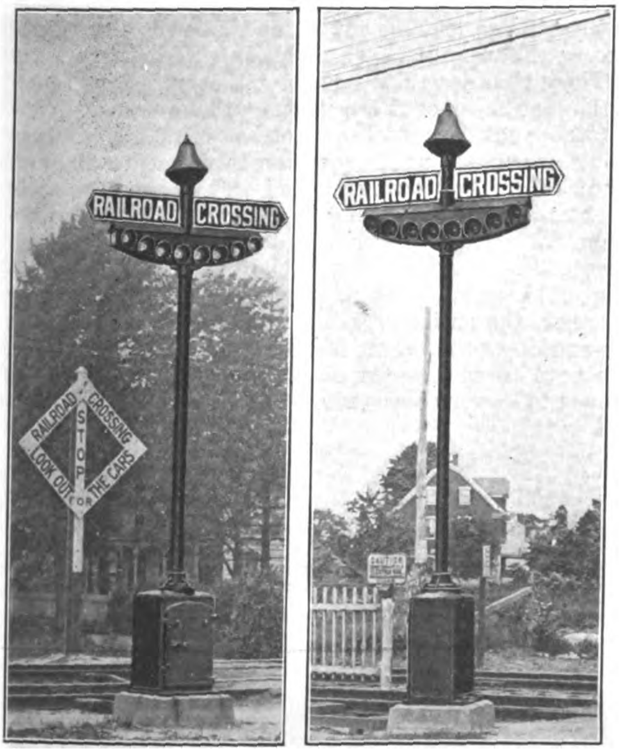
As regards wearing qualities, the oil-treated, chrome-vanadium, rolled-steel wheels showed 68 per cent more mileage per unit of wear than the oil-treated, carbon, rolled-steel wheels. The former averaged 14,500 miles per 1/32-in. tread wear, not including turning, as compared with 8600 miles, the record of the latter. Fair comparison as to mileage and wear without turning with the steel-tired wheels was impossible, owing to the greater length of service of the latter.

Physical and chemical tests of the oil-treated vanadium steel wheels showed a drop-test strength of one specimen wheel in a horizontal position of 1,254,000 ft.-lb. before cranking. The elastic limit ranged between 80,500 lb. and 103,200 lb., depending on location of the test piece in the rim and the elongation ranged between 10 per cent and 18 per cent. Hardness tests showed a practically uniform hardness of 302 Brinnell, and 48 scleroscope throughout the entire section, though a slightly higher degree of hardness was detected in the plate by the scleroscope. The chemical analysis showed carbon, 0.654 per cent; manganese, 0.63 per cent; chromium, 0.992 per cent; silicon, 0.30 per cent; vanadium, 0.16 per cent; phosphorus, 0.039 per cent, and sulphur, 0.047 per cent.

Automatic Flagmen on Long Island Railroad

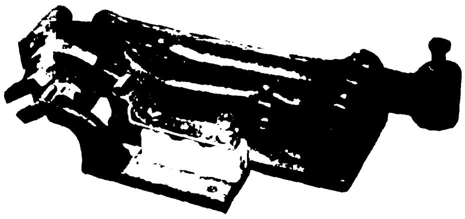
The Long Island Railroad, New York, has recently installed for the protection of two grade crossings the automatic flagmen made by the L. S. Brach Supply Company, New York. The indication consists of the combination of a bright swinging red light imitating that of a man swinging a red lantern and a loud sounding bell of the locomotive type. At Lynbrook, where two of these signals are located, the control is from track contacts, the installation being on the electrified division of the Long Beach branch. The energy for operation and control is taken from the railway's signal service feeder at 2200 volts a.c., and is reduced by transformer to 110 volts, at which potential the signals are operated. The two crossings protected are about 400 ft. apart.

Five track contacts are employed in each direction to start and stop the signal, three of them being starting contacts and two stopping, one at each crossing. The contact arrangement is such that if a train stops within the signal limits the bell will ring only for approximately thirty seconds to a minute. The signal starts as soon as the train is again in motion toward the crossing, and automatically cuts out as the train passes over the crossings. To secure this function, a relay and time element device are employed. These permit a train to come to a stop at a local station within the signal zone and stay there for a period of time without incurring the annoyance of continuous bell or signal operation. Hence the signal indicates only conditions of actual danger.



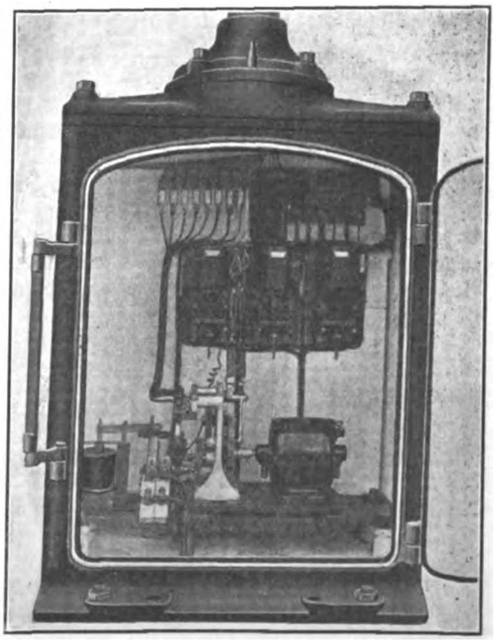
TWO LONG ISLAND CROSSINGS WITH AUTOMATIC FLAGMEN

The swinging red light effect is reproduced by eight stationary lamps located between red lenses, facing both sides of the highway. These lamps are in arc relation and are lighted successively backward and forward from a contact device. The effect of this backward and forward lighting gives the same effect as that of swinging a red lantern, a commonly understood danger warning. By means of concentrating lenses and shadow hoods, the lights are plainly visible in daytime from 1000 ft. to 1500 ft. from the signal under strong sunlight. This visible indication is more powerful and effective than an audible one, although the locomotive type of bell used has greater sound-carrying power than the vibrating type commonly employed.



TRACK CONTACT

Both the bell hammer and the contacts for the lamps are operated from an electric motor in order to avoid the heavy arcing of make-and-break contacts. No movable parts of the signal are exposed. The circuit wiring is such that should any lamp or several lamps go out, the indication will not be affected, because the light would be given by the other good lamps and the indication will skip only the burned-out lamps in its operation. The track circuit wiring is on the "normal danger" plan, so that should a line wire break a continuous danger indication will be given until it has been repaired. At the ends of the signal are two white lenses which indicate the operation to the train motorman. Should the signal fail it can be reported at the end of the trip and prompt repairs made.

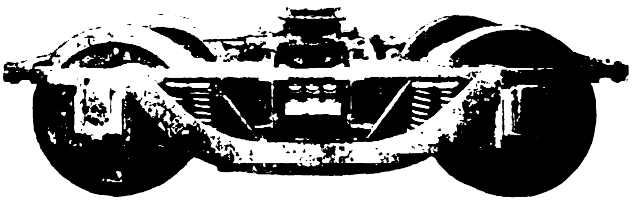


SIGNAL MECHANISM WITH MOTOR

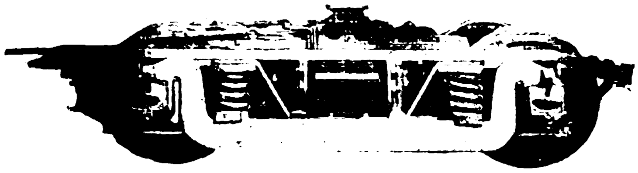
Similar installations of this signal have been in use for some time on the Public Service Railway of New Jersey, the Scranton & Binghamton Railroad and on several steam railroads, including the Central Railroad of New Jersey, Delaware, Lackawanna & Western and the Boston & Maine.

Heavy Service Trucks

The accompanying illustrations show two designs of electric motor trucks, recently built by the Baldwin Locomotive Works for heavy, high-speed service. The truck for the Ohio Electric Railway, designated by the builders as Class AA, is used in interurban passenger service requiring maximum speeds of 50 m.p.h. The track gage is standard, and the sharpest curves are of 45 ft. radius. This truck has a wheelbase of 84 in.; the wheels are of solid rolled steel 36 in. in diameter, mounted on steel axles having 5-in. x 9-in. journals. The transom gussets are of cast steel; they brace the frame and serve as supports for the brakeshoe hangers, and also transmit the greater part of the thrust from the side frames to the bolster when the motors are developing power. The chafing plates on the bolster are case hardened, while those on the gussets are of soft steel. The springs are arranged to insure easy riding qualities, the equalizing beam springs being of the twin coil pattern, while the bolster springs are full triple elliptic. The carrying capacity of this truck is 32,000 lb. on the center plate. The motors are inside hung, one being geared to each axle.



TRUCK FOR MAXIMUM SPEED OF 50 M.P.H.

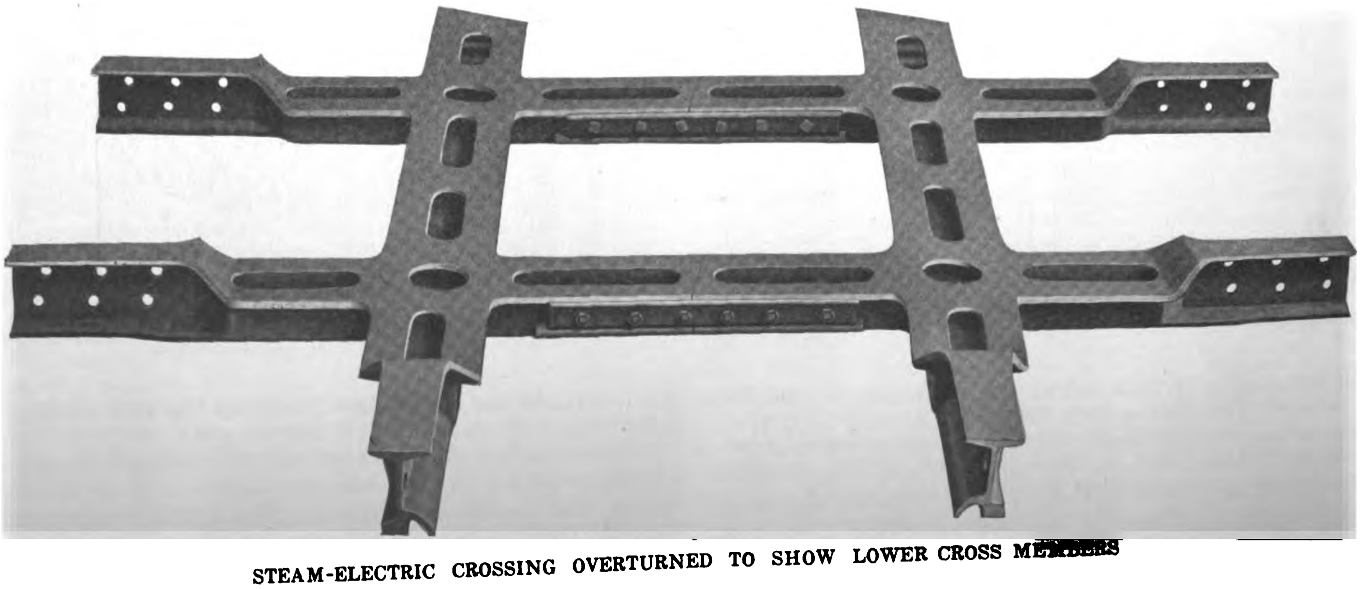


TRUCK FOR MAXIMUM SPEED OF 80 M.P.H.

The truck for the Michigan Railway Engineering Company is specially designed for high-speed service on the new air line shortly to be opened between Kalamazoo and Grand Rapids. The schedule requires an average speed of 50 m.p.h., so that the operating conditions, in this respect, are unusually severe. The track gage is standard, and the trucks are designed to traverse curves of 35 ft. radius. The wheels are of solid rolled steel, 37 in. in diameter, and the axles are of heat-treated steel, with 5½-in. x 10-in. journals. The bolster is a steel casting, equipped with the Bullock swing dampener, a device intended to check the free longitudinal swinging of the bolster in the frame of the truck. The bolster has a central rib, and has openings at each side near each end. A shoe is mounted in each opening and a coiled spring is placed between the central rib and the shoe, so that the latter is forced out against the chafing plate carried by the transom gusset. The shoes are of cast iron with chilled faces, while the gusset chafing plates are of mild steel. The truck frame is unusually strong, and is built as far as possible of commercial shapes so that repairs can be easily effected. The equalizing beam springs are of the double helical type, while the bolster springs are quadruple elliptic. This truck is designed for a center pin load of 50,000 lb., and as far as speed and carrying capacity are concerned it is undoubtedly one of the most notable thus far built for electric railway service.

A New Steam-Electric Crossing

The accompanying illustration shows the latest type of steam-electric crossing made by the St. Louis Steel Foundry Company in accordance with patents which were granted to this company early in July. In the past there have been many failures of solid manganese steel crossings caused by cracks in the bottom of the flangeways at the intersection. While some of these cracks resulted from poor foundry practice, a large part were due to the fact that the crossing was not designed with the proper beam strength across the intersection, some manufacturers leaving out all of the lower cross members in the crossing. These lower cross members are alternately subjected to tension and compression, owing to the movement of the train over the crossing. Without the addition of these bottom members, as here shown, the metal under the flangeway had to carry all this strain. As this metal was only about 1 in. thick and was practically lacking in the neutral motion of the beam, early rupture was sure to occur. The manufacturer of the present crossing believes that with the addition of these lower beam members to tie the crossing together, the entire crossing is made just as strong at the running surface. It is stated that this construction has been in service for about a year, and that it has proved to be very satisfactory.



STEAM-ELECTRIC CROSSING OVERTURNED TO SHOW LOWER CROSS MEMBERS

News of Electric Railways

Bill to Prevent Further Enforcement of Toledo Three-Cent Ordinance

A supplementary bill was filed in the United States District Court on Aug. 7 by the Toledo Railways & Light Company, Toledo, Ohio, asking that the city of Toledo be enjoined from the further enforcement of the Schreiber 3-cent-fare ordinance and that it be restrained from interfering with the withdrawal of cars from the streets on which franchises have already expired and the company be permitted to start them in such places as it may see fit. As Judge Killits is absent on a vacation, it is possible that Judge Clark, Cleveland, recently appointed to succeed Judge Day, will be asked to hear arguments on the supplementary bill. The original bill filed in the Federal Court asked for a receiver for the company, but the court has never been requested to fix a date for a hearing on this request. It has stood as a protection to the company in case any untoward steps were taken by the city.

It is probable that several weeks will elapse before steps are taken by the city in accord with the provisions of the municipal ownership ordinance which was passed by a vote of the electors recently. City Solicitor Thurstin said that the franchise committee should be present when this matter is taken up, in order that the members may take part in formulating plans, but two of the members will be out of the city for some time. Frank L. Mulholland of the Citizens' Franchise Association stated that nothing further can be done by the organization until the city solicitor's department indicates its course. The general understanding is that the city must enact some definite franchise ordinance as a security for the bonds that will be issued to take over the present street railway property or construct new property. The City Council must also take the usual action in providing for the issue of the $8,000,000 of bonds called for by the initiated ordinance. This bond question will then have to be submitted to a referendum vote. The voters apparently took only slight interest in the original ordinance, but when the bond issue comes before them it is expected that practically the full vote will be cast.

Regarding the possibility of disposing of the street railway bonds, various views are taken, but the following extract from a letter from C. E. Denison & Company, Boston, brokers, indicates how one previous bidder for Toledo securities views the proposal passed at the recent election:

"Is it true, as some of our Eastern financial papers write, that your city is proposing to go into the street railway business? We should like to know about this, as we have been recent bidders on your bonds, and in one instance the purchaser of a good sized amount. If you are going into the street railway business we shall probably discontinue bidding on Toledo bonds, as we do not believe in municipal ownership of street railways for United States cities, and we think that the city of San Francisco and the city of Seattle have seriously hurt their credit by going into the street railway business."

This letter was addressed to City Auditor McDonnall, who replied that he felt sure any Toledo bonds held by Denison & Company could be disposed of by his office.

There is still a great degree of uncertainty among those interested at Toledo as to whether a mere majority or a two-thirds vote is necessary in an election such as was held recently. City Solicitor Thurstin himself does not seem certain on this point. At best, he said, a long period will be required in which to take over the property from the present owner.

The following editorial from the Cleveland *Plain Dealer* is interesting in the light of the experience that Cleveland has had in the readjustment of the street railway business:

"Unfortunately for Toledo the approval by the voters on Tuesday of the ordinance providing for municipal ownership will not end the street car war in that city. The fight will be continued with increased bitterness, it is announced. Not only is there a strong element opposed to municipal ownership, but the construction of the ordinance is declared faulty. Claims made by attorneys, whose opinions are entitled to attention, are that the provisions of the ordinance are contradictory and its real meaning obscured.

"It is unfortunate that clearness did not mark the provisions of the ordinance when the city was making so serious an effort to put a troublesome problem out of the way. It is possible to write that sort of an ordinance so misunderstandings are reduced to the minimum. To make clear and definite the language is one step in reaching a solution. It is the foundation on which settlement must rest.

"Much constructive talent in Toledo appears to be arrayed against the settlement on the line of municipal ownership. It is a handicap when such a condition exists. Cleveland found a solution sufficiently troublesome and perplexing even when a great portion of the constructive talent of the city was aiding. A proposition for settlement along the lines of the Cleveland Tayler grant was rejected in Toledo. One wonders if it might have been successful had there been a figure and personality like Judge Tayler to take the leadership.

"Violent opposition to municipal ownership, with a large element of the business interests against the plan, and with legal questions already raised, may serve to hinder and delay the introduction of the policy and will make its adoption and operation exceedingly difficult. With each succeeding contest in other cities where settlement is sought, the far reaching importance of the Tayler plan in Cleveland is shown, and the sound judgment exercised in its adoption is emphasized."

Hearing on Washington Utilities

The committee on the District of Columbia of the House of Representatives held a hearing on Aug. 6 on a bill which directs the separation of the Washington Railway & Electric Company and the Potomac Electric Power Company, Washington, D. C. Those who appeared before the committee were Clarence P. King, president of the Washington Railway & Electric Company; W. F. Ham, vice-president; Capt. Charles Holm, New York, counsel for the company; Paul M. Lincoln, Pittsburgh, and A. K. Baylor, General Electric Company, New York. The Washington Railway & Electric Company owns a controlling interest in the Potomac Electric Power Company.

The principal feature of the hearing was the unexpected proposition advanced by Representative Prouty of Iowa, a member of the committee, that the two companies, instead of being forced by an act of Congress to separate, might be allowed to consolidate. The street railway officials, including Mr. King and Mr. Ham, said that in their opinion such an arrangement would be agreeable to the companies. Mr. Ham, in his statement to the committee, opposed the contention of the Public Utilities Commission of Washington that the Washington Railway & Electric Company has not maintained a proper depreciation account. Mr. Ham said in part: "The facts are that our annual report for the year ending June 30, 1912, to the Interstate Commerce Commission, shows a charge for depreciation of equipment amounting to $93,934. Furthermore, there appeared as a reserve in the report the sum of $550,251, which included a depreciation reserve of $516,290." He presented figures from an auditing company, which said that the railway company is making ample charges for maintenance and a proper provision for depreciation.

The railway officials protested against the separation of the two companies. Representative Prouty's suggestion altered the course of the inquiry, and it is stated that further hearings are likely to be held, with that suggestion in view.

In a letter sent to the company on Oct. 15, 1913, the utilities commission declared that dividends should not be declared without "the creation and maintenance of a sound depreciation account." Mr. Ham informed the committee that since 1902 the dividends paid by the company have averaged only 2.8 per cent. They have been larger of recent years. Mr. Ham questioned the expert knowledge of the commission to prescribe what should be a proper depreciation account for a railway company.

Referring specifically to Representative Prouty's suggestion of a consolidation of the two companies, Mr. Ham expressed the opinion that the time is not far distant when the advantages will be realized of consolidating all the railway companies and the power companies of the District of Columbia. He said this would settle "the transfer problem" once and for all, and would give the companies a sound financial basis, with the prospect of going forward to meet the demands of future growth in the Capital.

A recent attempt to consolidate the railway companies and the power company failed because of public opinion, led by the commissioners of the District of Columbia.

New York Rapid Transit Work to Continue Uninterruptedly

In view of inquiries with respect to the continuation of rapid transit work on account of the present financial situation in this country, Chairman Edward E. McCall of the Public Service Commission for the First District during the week made the following statement:

"The commission will continue to rush the completion of the dual system with all expedition. With so many parts of the system nearing completion or under contract, it is vital that the remaining portions should be constructed at the earliest moment. For example, it is essential that not a moment's time shall be lost on such connections as the Grand Central diagonal station, William Street, Nassau Street and Willoughby Street, Brooklyn. There are now engaged on our work upwards of 11,000 men. I am assured that we will suffer no inconvenience on account of lack of labor. The statements of the financial officers of the city show that while care need be exercised, the rapid transit work may continue to completion. The present crisis shows the wisdom of the dual contracts in so far as complete arrangements were entered into at that time with respect to financial matters."

During the week ended Aug. 8 the commission announced that at its meeting on Aug. 21 it will order advertising for bids for the construction of routes Nos. 43 and 26, the diagonal station at Forty-second Street, connecting the Lexington Avenue subway with the existing subway at the Grand Central Station, bids to be opened Sept. 11, 1914. This is one of the most important contracts yet to be let under the dual system agreements. The contract has now been sent to the Interborough Rapid Transit Company, the operating company, for its criticisms and suggestions, and will be returned by that company within a few days, when it will be put in permanent form by the commission. All contractors submitting bids for this work will be required to deposit a certified check of $75,000 with their bids. The successful contractor will be required to give a bond to the city in the sum of $500,000, and make a deposit, either in cash or securities, of $250,000 to protect the Interborough company. In addition a percentage of all monthly payments will be withheld by the commission until the completion of the work. The entire work must be completed within twenty-eight months from the signing of the contract. The commission's engineers state that the construction of this connection will present many new engineering features, and that it will be one of the most difficult engineering problems in the dual system.

The city has just opened for service the new rapid transit station underneath the gigantic municipal building, in which the heads of most of the city departments and their staffs are located. The station is part of the Centre Street loop line operated by the Brooklyn Rapid Transit System, and is one of the most elaborate of its kind in the world.

The Kansas City Terminal Building Problem

The board of control of the street railway of Kansas City has taken over a part of the duties assigned to it under the new franchise to the Kansas City Railways, but as far as the operating of the system is concerned the company is still the Metropolitan Street Railway, working under the general direction of the federal court and the receivers. P. J. Kealy represents the company and Robert P. Woods represents the city on the board of control, which is also acting under the receivers.

One of the present duties of the board is the selection of a site for the interurban station to be built in accordance with franchise terms. The five interurban lines which will use the station have been unable to agree on a site. The board will hold a public meeting soon and will then make a recommendation to the City Council. The Council, however, may locate the station irrespective of such recommendation. Representatives of four of the five lines have mentioned their preferences for the district within which they wish the station located, and all urge that the site be near the shopping center so that transfers can be avoided.

The Missouri & Kansas Interurban Railway, or the Strang Line, and the Kansas City, Lawrence & Topeka, or the Hocker Line, favor some site between Sixth and Twelfth, Wyandotte and Oak Streets. The Strang Line has its city office at Seventh and Walnut Streets. The Kansas City, Clay County & St. Joseph Railway, which has a ticket office at Thirteenth and Walnut Streets, suggests some location between Eighth and Fifteenth, Oak and Baltimore Streets. The Leavenworth Line suggests one of three sites: (1) Fourteenth and Fifteenth, Main and Baltimore; (2) Thirteenth and Fourteenth, Grand and McGee; (3) Tenth and Wyandotte. The fifth railway, the Bonner Springs line, has not expressed a preference. The Strang, Hocker and Bonner Springs lines enter the business district from the south, the Leavenworth line from the west and the St. Joseph line from the north. In most cases the preferences are for sites that will take the cars through the business district.

Agreement Between New Haven and Federal Department of Justice

The department of justice of the United States and the directors of the New York, New Haven & Hartford Railroad again have reached an agreement on methods for segregating the properties which go to make up the system, and the civil action recently begun by Attorney-General McReynolds has been ended. Instead of standing an action in court the directors have decided to meet the attorney-general half way and return to practically the original arrangement between the government and the road in compliance with the Sherman law. It is said that the entire agreement will be embodied in a decree which will be accepted both by the government and by the railroad officials, and submitted to the United States District Court for approval and record. It is stated that the criminal prosecution of the directors of the company will not be affected by the settlement of the civil action.

At the close of a meeting on Aug. 11 President James H. Hustis, of the New Haven Company, said that an agreement with Mr. McReynolds had been ratified by the directors which was in full accord with the vote of stockholders on April 21, authorizing a settlement with the government. An exception to the first arrangement, he said, was in regard to the disposition of the Boston & Maine stock owned by the New Haven. Mr. Hustis has resigned as a director of the New Haven, as on Aug. 15 he became head of the Boston & Maine. Chairman Elliott has been elected president of the New Haven to succeed him. The resignation of John L. Billard as a director was accepted.

Providence Tunnel Opened

The Rhode Island Company, Providence, R. I., has opened the tunnel from North Main to Thayer Street and discontinued the counterweight system on College Hill. The saving in running time from Swan Point, Butler Avenue, Rumford and Phillipsdale is five minutes, and the Elmgrove Avenue residents gain three minutes over the old schedule. This is due to the elimination of the delays on College Street, the cars now running express from Thayer Street to North Main—a distance of 2165 ft. from portal to portal. Another departure is in sending the west-bound tunnel cars through Exchange Place instead of Market Square and Westminster Street. This adds thirty cars to the ninety-eight previously run during the thirty-five-minute period ending at 6.20 p. m. The time interval is less than seventeen seconds. As traffic increases it is thought that it will be necessary to divert some of the East Side cars through North Main Street to Market Square. This, however, is not contemplated at present, the disposition being to test the new routing thoroughly before taking up the question of relieving the pressure on the northerly tracks in Exchange Place. A third change is the removal of many cars from Westminster Street, the principal retail thoroughfare.

The Los Angeles & San Diego Beach Electrification

Alexander Gordon, of the California Railroad Commission, held hearings recently on a petition to allow an issue of $825,000 in bonds for electrifying the Los Angeles & San Diego Beach Railroad. Raymond B. Talbot, vice-president and general manager of the company, told of the financial affairs of the company and explained the amounts given in the petition as estimates to cover various parts of the work, purchasing of land and erection of new buildings. He said it has been planned to replace the present light rails and erect a power house, a carhouse and machine shop at Pacific Beach. The cost of improvements at Pacific Beach would be about $80,000. The substation at Arctic and Ash Streets, San Diego, will cost about $22,000. The total cost of new equipment will be about $131,000. Mr. Talbot explained that the company, if given permission to issue the bonds, would increase its service materially and fund the present floating debt. A new terminal building to cost about $4,000 will be erected in La Jolla and the company will purchase at least sixteen new passenger cars and seventeen passenger trailers at a cost of about $125,000. The total amount the company expects to expend is $723,198, divided as follows: plant investment, $371,612; new equipment, $131,000; refunding indebtedness, $180,585; interest first year, $40,000.

The Courts and the Toledo Election

The special bench of the Court of Appeals, to which the case against the election for municipal ownership in Toledo, Ohio, was taken after it had been decided in favor of the plaintiff in common pleas court, rendered its decision on July 30, sustaining the decision of the lower court. The question was decided on the grounds that the court did not have jurisdiction and that the petition did not state the cause of action, grounds contained in a demurrer filed by City Solicitor Thurstin in both courts. The decision did not take into account the merits of the case, nor was the efficiency of the proposed municipal ownership ordinance taken into consideration. Judge Winch raised the question twice during the hearing, but the defense contended that it could be taken up on appeal, if the case is carried to the Supreme Court. In making its decision, it is understood that the court did not consider this point at all.

As noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, page 272, the ordinance carried by a plurality of 1100 at the election on Aug. 4. It merely expresses the will of the people who voted and does not carry with it authority to issue bonds. Even now there is doubt as to whether a majority or a two-thirds vote was necessary and the matter may reach the Supreme Court.

Finding for Company in Springfield Arbitration

The arbitration board which has been considering the problem of discipline for improper handling of fares on the Springfield (Mass.) Street Railway has issued a report sustaining the officials of the company in their contention that upon existing evidence three conductors against whom charges had been brought should be discharged from the service. The board found that one other conductor, while somewhat careless and irresponsible in handling fares, should be reinstated without pay for time lost. The board consisted of Gleason L. Archer, dean of the Suffolk Law School, Boston; Henry E. Reynolds, assistant general manager of the Bay State Street Railway, Boston, and M. J. Hennessey of the Amalgamated Association. In a general survey of the situation, Messrs. Archer and Reynolds stated that C. V. Wood, vice-president of the company, acted in good faith and did not desire innocent men to be reported by the inspectors, and that Mr. Wood and R. W. Reynolds, general manager of the Springfield Street Railway, were fully justified on the evidence in discharging the men named. The evidence was presented by eight inspectors. The board found that the evidence had not been discredited. In a brief dissenting report, Mr. Hennessey contended that the evidence was insufficient to warrant the men being found guilty of misconduct, but recommended that the entire award be accepted by the union. This was unanimously done at a meeting subsequent to the announcement of the decision.

Illinois Traction System Issues Newspaper Supplement

The publicity department of the Illinois Traction System has issued a twenty-four page supplement to various daily and weekly newspapers in which it reviews the history of the company and notes the growth and development of the many utility properties controlled by the McKinley syndicate. The many cities and towns through which the lines of the Illinois Traction System and the Chicago, Ottawa & Peoria Railway pass are described and many illustrations are included. The St. Louis terminals and the St. Louis Electric Bridge Company receive much attention, while the new terminal stations and office buildings of the company at Champaign and Peoria are described and carefully illustrated. The freight and express and the sleeping car and parlor car services also receive attention, as do the Decatur shops and storehouses, the block signal system, the many parks and recreation centers and the holiday trips that can be taken on both the Illinois Traction System and the Chicago, Ottawa & Peoria lines. In fact, the supplement reviews the entire work of the company. The supplement was used as an insert in about sixty daily and weekly papers in Illinois on Aug. 6.

Franchise Surrendered for Indeterminate Permits

The Indiana & Michigan Electric Company has surrendered franchises from South Bend, Mishawaka, Elkhart and Town River to the Public Service Commission and will take indeterminate permits therefor. An order of the Indiana Public Service Commission, issued recently, allowed the company permission to issue $150,000 in capital stock to pay debts arising from extensions and betterments of service. The same order rescinded a previous order of the commission which authorized the company to issue $500,000 of bonds. The authorized capital of the company is $3,500,000, and approximately $3,300,000 had been issued before the order of the commission.

Campaign for Hydro-Electric Railways in Ontario

The first meeting in the campaign for hydro-electric radial railways in York and Ontario Counties in Canada was held in Agincourt on Aug. 5 with more than 500 persons present. Reeve J. G. Corbell, Scarboro, was in the chair. He explained that the object of the campaign was to educate the electorate as to the advantages of the proposed new hydro-electric radial railway from Toronto to Port Perry, in order that they could vote intelligently on the by-laws to be submitted by the various municipalities on Sept. 21 to guarantee the bonds for the new line. Sir Adam Beck said that the new road would open many new districts now without any means of transportation and give direct and speedy connection with the city. He expressed himself as confident that a right-of-way could be secured in Toronto giving direct access to the center of the city. He estimated the cost at about $40,000 per mile.

Memorandum by Massachusetts Commission Upon Reduced Rates for Charitable Purposes

The Massachusetts Public Service Commission has issued a memorandum defining the general limitation of free or reduced rate service by steam railroads and street railways for charitable objects. Under Sec. 18, Chap. 784, Acts of 1913, common carriers are prohibited from furnishing free transportation with various exceptions, among which are charitable purposes. The board gave a public hearing to the various companies upon the subject and has reached the conclusion that it would not be consistent with the public interest to permit common carriers to grant free or reduced rate service to any and all kinds of religious and educational institutions. The memorandum says:

"Rather should the operation of this exception to the general prohibition be limited to needy classes, such as the inmates of hospitals, of homes for the aged, of orphans' homes, day nurseries, mothers' outings and other similar undertakings supported by benevolent and charitable societies and intended for the relief of suffering or to furnish opportunities for health to needy children and women and others unable from their own resources to provide the requisite opportunities. Trips for school children, perhaps to visit the

State House, Sunday-school picnics, outings of athletic associations and clubs, and other similar purposes, which are mainly for pleasure and are not intended primarily to relieve any real suffering or need, are not, in the judgment of the commission, charitable purposes to which the carriers ought to contribute by granting free or reduced rate service not available to the general public."

Boston Men in Belligerent Zone

In the last issue of this paper mention was made of a number of electric railway men stranded in Europe. It has since been learned that the plans of several Boston men have been upset by the war. John W. Corning, electrical engineer of the Boston Elevated Railway, is in England. E. W. Holst, superintendent of equipment of the Bay State Street Railway, has returned from Norway. Eliot Wadsworth, of Stone & Webster, was on the *Kronprinzessin Cecilie*, which put back into Bar Harbor. C. S. Sergeant, vice-president of the Boston Elevated Railway, was planning to go abroad this Summer, but has been forced to abandon the idea. His family is now in England.

A special cable to the New York *World* said that the withdrawal of thousands of men from every field of labor has seriously altered transportation in Paris. The underground railway was said to be running only on certain lines, and then only on a much reduced service. The work of the conductors, ticket punchers and other employees called to the front is being done by their wives and sons.

Air Brake Order Asked in Windsor.—The City Council of Windsor, Ont., has applied to the Ontario Railway & Municipal Board for an order to compel the Sandwich, Windsor & Amherstburg Railway to install air brakes on its cars and to provide the necessary equipment for keeping the tracks clear of snow during the winter.

Automobile as Adjunct in Seattle.—If common user rights cannot be obtained soon on the tracks of the Seattle, Renton & Southern Railway on Fourth Avenue, Seattle, Wash., the City Council will consider the operation of a municipal motor bus service connecting Division "A" of the municipal electric railway with the Highland Park & Lake Burien Line, Division "C."

Interstate Commerce Commission Hearing Suspended.—The Interstate Commerce Commission is having at the present time as much of a recess as is possible, for no hearings are scheduled to require the presence of any commissioners during August. Secretary McGinty is visiting the valuation offices of the commission, his first itinerary calling for a trip as far as Kansas City and Chattanooga.

Part of Clover Leaf to Be Electrified.—It is announced that the Clover Leaf Railroad may construct an electric railway from Crawfordsville, Ind., to Cayuga, Ind., where connection will be made with the present tracks of the company, and that the motor car service which extends eastward from Marion, Ind., will be continued west to Cayuga and into Illinois, with the branch from Cayuga to Crawfordsville.

Municipal Ownership Agitation in Alexandria.—The City Commissioners of Alexandria, La., signified their intention of calling an election recently on the question of granting a franchise to the Southern Traction & Power Company on Sixteenth Street from Levin to Marye, and out Marye to the city limits, and on Magnolia and Thirteenth Streets. The advisability of the city endeavoring to take over the property of the company under the provisions of a bill passed recently by the Legislature is being agitated.

Illinois Traction Not to Buy "Black Bridge."—T. W. Gregory, assistant treasurer of the East St. Louis & Suburban Railway, East St. Louis, Ill., has denied that the Illinois Traction System has purchased the "Black Bridge" line of the former company which runs between the Stock Yard district in East St. Louis and Madison, Ill. The Illinois Traction System recently erected a new freight depot at the East St. Louis terminus of the Black Bridge line and is operating express cars to this depot instead of the one at Collinsville and St. Clair Avenues. The Illinois Traction System has trackage arrangements with the East St. Louis & Suburban Railway.

Wage Agreement in Ottawa.—As a result of conferences held recently between the officers of the Ottawa (Ont.) Electric Railway and representatives of the employees, the award of the board of conciliation made in June, 1912, is to be continued for two years from July 1, except that the first and second year men will receive an increase of 1¼ cents an hour and those in the third year of service and upwards a 2-cent increase. This makes the rates as follows: first year, 23 cents; second year, 24 cents; third year and thereafter, 27 cents. Sunday work will be paid for at 2 cents an hour extra over the rates just stated. Increases in wages have been granted in the company's other departments. The rules and conditions of work which have been in force for the last two years remain unchanged.

Through Trolley Trip, Boston to New York.—A trolley trip under the auspices of the Bay State Street Railway will be run between Boston and New York during the week commencing Aug. 16. A through car, said to be the first to cover the entire distance, will leave Post-office Square, Boston, with a party of street railway officials and newspaper men at 8 a. m. on Aug. 17, stopping at New London, Conn., for the night. The car is due at 123d Street, New York, at 6.45 p. m. Tuesday and the distance to be traversed is 282 miles. On Wednesday the return trip will be started with several New York newspaper men as guests. The through service is made possible by the recent completion of a connecting link between Saybrook and New Haven, Conn., and the run is planned to furnish data upon which tourist travel may later be founded.

New Jersey Ferry Fare Case.—The New Jersey & Hudson River Railway & Ferry Company, Edgewater, N. J., as owner of the stocks and bonds of the Riverside-Fort Lee Ferry Company, recently brought suit in the United States District Court against the ferry company, the city of New York and the Board of Chosen Freeholders of Bergen County, N. J., asking that the resolution passed by the freeholders, reducing the fares on the ferry from the foot of West 129th Street, New York, to Edgewater, N. J., from 5 cents to 3 cents for an adult and from 4 cents to 2 cents for children, be declared illegal. The complaint alleged that the reduction would cause a loss to the company of $100,000 annually. Judge Meyer granted an injunction temporarily authorizing the company to continue to collect not less than 5 cents for an adult and 4 cents for a child.

Legislative Expense of the Boston Elevated Railway.—The Boston Elevated Railway has issued the following statement in connection with the filing of its legislative expenses: "The Boston Elevated Railway was interested in upwards of 300 matters acted upon by the Legislature of 1914. The company was not a petitioner for any legislation this year and was represented by counsel and officers of the company only on matters originating on the petitions of others. On some of the matters there were many hearings, the company having been represented at as many as nine hearings upon each of several matters. The statement of legislative expenses for 1914 filed by the company with the secretary of the commonwealth, shows that $7,500 was paid to Gaston, Snow & Saltonstall, and $931.35 to E. P. Saltonstall for legal services, and $659.37 to Edgecomb & Neylan for stenographic reports.

Security Holdings of James Campbell Estate.—According to an inventory of the personal property of the late James Campbell recently filed for probate in St. Louis, Mo., the par value of the securities owned by Mr. Campbell amounts to $16,896,805. It is estimated that the market value of these stocks and bonds is $6,821,237, or $10,065,568 below the par value. The value of the real estate owned by Mr. Campbell is placed at $3,500,000, so that the value of his estate is slightly more than $10,000,000. The stocks in which Mr. Campbell was most heavily interested were 'Frisco common, first preferred and second preferred, Rock Island preferred and Missouri, Kansas & Texas common. In addition to these securities there were included in the list of sixty-eight companies whose securities were held by Mr. Campbell the following: Utah Securities Corporation, par value $4,184,000; St. Louis Transit Company, par value $2,100; North American Company, par value $3,294,500; United Railways Company of St. Louis, par value $118,100; Kirby Lumber Company, par value $90,400; Wagner Electric Company, par value $94,500; Midland Securities Company, par value $50,000, and American Light & Traction Company, par value $43,500.

Financial and Corporate

Holdings of Public Utility Securities

The closing of American stock exchanges has, in its broadest aspect, had no adverse effect on the market for public utilities securities. The prime reason for this is that only a relatively small number of such securities is listed. This, however, has never detracted from their marketability. The bulk of the public utility transactions are through investment houses that specialize in this class of bonds and stocks, selling large quantities of them "over the counter" to the investors. The records of purchases and sales, however, have not been published or even collated.

Certain exact statistics, however, indicate how investors have been turning from other classes of securities to those of public utilities. The report of the Comptroller of the Currency of the United States for the fiscal year ended June 30, 1913, which was referred to in the ELECTRIC RAILWAY JOURNAL at the time of its publication in the spring of this year, presents some illuminating figures concerning the bond holdings of the 26,000 banks of this country. In this fiscal year, as compared to the preceding, bank investments in United States bonds declined 0.2 per cent; in State, county and municipal bonds, 0.9 per cent, and in railroad bonds, 2.1 per cent. On the other hand, the banks' holdings of bonds of public utilities increased 2.1 per cent. The decrease in the banks' investments in steam railroad bonds was $101,400,000 in value, while the increase in public utility bonds held was $118,800,000 in value. This represented an increase of nearly 20 per cent in bank holdings of such bonds.

The largest banking holders of public utility securities are loan and trust companies, with holdings of $334,300,000. National banks come next with $197,400,000; mutual saving banks have about half as much, and state banks hold $52,900,000, or a total of $721,400,000. If United States, state, county and municipal bonds, which form a necessary part of the investments of national and savings banks, are eliminated from the calculation, the holdings of public utility bonds become nearly 22 per cent of the remainder, or more than half as much as the percentage of railroad bonds. The latest available statistics show that the total value of railroad securities in the United States is a little more than $20,000,000,000, while the aggregate value of the operating gas, electric light and traction companies' securities is about $7,500,000,000. From the above statistics it appears that less than one-tenth of the public utility securities are held by the banks, and that the other nine-tenths are in the hands of companies and individuals.

The present popularity of public utility securities bids well to be enhanced during the European war period. Gas and electric consumption and electric railway transportation will continue, which means larger earnings, increased profits and greater stability for the corporations. The general attitude among investment houses regarding the present status of public security issues is shown by the following quotation from the weekly review of Williams, Dunbar & Coleman, New York: "Peculiarly exempt from the various adverse influences now on the financial horizon are public utility securities. Irrespective of the depression in the railroad or industrial stocks and bonds, American public service securities will not be affected. There may be some sentimental reaction in prices, but the attraction for permanent investment will not be impaired."

In accordance with the plan of the Cities Service Company, New York, as noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, to issue a weekly letter to stockholders informing them of the trend of events following the recent deferring of the company's cash dividend, the directors on Aug. 10 issued a statement reading in part as follows: "Many of our stockholders who were not in close touch with the financial condition at the time of the dividend postponement are only now awakening to the severity of the disturbance and may be led to believe that the situation is growing worse instead of better. We believe, however, that the situation is improving daily, and much credit is due to the administration for its prompt supply of emergency currency. Our managers generally report that business continues to be good, but that some difficulty is being experienced in making collections from large customers."

ANNUAL REPORTS

Montreal Tramways

The statement of income, profit and loss of the Montreal (Que.) Tramways for the fiscal year ended June 30, 1914, follows:

Gross earnings	$7,142,804
Operating expenses	4,206,115
Net earnings	$2,936,689
Deduct:	
City percentage on earnings	$527,383
Interest on bonds and loans	787,769
Interest on debenture stock	800,000
Taxes	84,700
Total	$2,199,852
Net income	$736,837
Dividends	242,056
Surplus	$494,781
Less:	
Balance of discount on bonds sold	$82,237
Transferred to contingent renewal account	275,000
Total	$357,237
Transferred to general surplus	$137,544

The gross earnings of the company increased during the year $388,577, or 5.75 per cent; the operating expenses, $173,450, or 4.3 per cent, and the net earnings $215,127, or 7.9 per cent. The ratio of operating expenses to earnings was 58.89 per cent, as compared to 59.71 per cent during the preceding year.

During the year the sum of $417,125 was charged to the contingent renewal account as representing expenditures made for special renewals. An amount of $289,706 was expended on the maintenance of the company's properties, plant and equipment. This amount, taken with the $417,125 noted above, made a total of $1,246,831, or 17.46 per cent of the gross earnings, expended during the year on the upkeep of the company's properties. There was spent on capital account for additional rolling stock, extensions and improvements the sum of $2,711,572. Underlying bonds of the company to the amount of $313,893 were redeemed and cancelled. The amount of the underlying bonds redeemed to date is $838,607.

The report states that large additions were made to the rolling stock of the company during the year, which necessitated extensions of the power requirements. The company also completed a large portion of the rebuilding of its track. The number of revenue passengers carried during the year amounted to 168,472,952. The total number of transfers was 58,120,066, making the number of total passengers carried 226,593,018. The car earnings per revenue passenger were 4.11 cents and the car earnings per passenger total carried, 3.05 cents.

Alabama Traction, Light & Power Company, Ltd.

The Alabama Traction, Light & Power Company, Ltd., New York, which controls the Anniston Electric & Gas Company, Anniston, Ala., the Huntsville Railway, Light & Power Company, Huntsville, Ala., and the Horne Alabama Railway, Power & Manufacturing Company, has issued its first annual report covering the entire period from the organization of the company to Dec. 31, 1913. According to the consolidated balance sheet presented in the report, the property assets of the company as of Dec. 31, 1913, amounted to $27,109,864; investments in other companies, $962,519; bond discount and expenses, $1,783,322, and current and working assets, $463,019, making with a few other small miscellaneous items a total of $30,429,269. Capital liabilities of the company included the following: preferred stock outstanding, $1,000,000; common stock outstanding, $16,975,000, and first mortgage bonds outstanding, $10,902,000. The bonded indebtedness of subsidiary companies not owned by the Alabama Traction, Light & Power Company, Ltd., amounted to $327,800. The current and accrued liabilities totaled $1,129,896; the reserve for accidents and damages, $913, and the surplus, $93,133.

The activities of the company during the period covered by the report were directed principally to construction work on the hydroelectric plant of Lock No. 12 on the Coosa River. A steam plant with a capacity of 15,000 hp was built at Gadsden. It has been operated in conjunction with the company's 2000-hp hydroelectric plant at Jackson Shoals. At present the company has in operation 160 miles of 110,000-volt transmission lines, delivering current through three substations to a distributing system 116 miles in length.

The report does not present any income statement for the holding company or for any of the subsidiaries. It is stated, however, that the earnings at present assured are sufficient to carry the fixed charges on the entire system, including the burden of certain unproductive investments which the company feels it necessary to purchase in order to be in a position adequately to meet future requirements.

Chicago & Interurban Traction Company, Chicago, Ill.—Owing to a misprint, the revenue from transportation of the Chicago & Interurban Traction Company for the year ended Feb. 28 was stated in the ELECTRIC RAILWAY JOURNAL of Aug. 8 as being $209,811 instead of $290,811.

Monterey Railway, Light & Power Company, Monterey, Mexico.—Directors of the Monterey Railway, Light & Power Company have announced that owing to the continuance of the unsettled conditions in Mexico which led to the delay in the payment of the interest on the first mortgage debenture stock due Feb. 1, as noted in the ELECTRIC RAILWAY JOURNAL of March 21, they are compelled to postpone the payment of interest on the first mortgage debenture stock due on Aug. 2, until it is possible to transfer the money on more reasonable terms.

New York, New Haven & Hartford Railroad, New Haven, Conn.—On July 31 the resignation of John L. Billard as a director of the New York, New Haven & Hartford Railroad was announced. This leaves twenty-two directors in the board. As it is desired to reduce the number to nineteen or less, no successor will be elected.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The California Railroad Commission has authorized the Oakland, Antioch & Eastern Railway to issue $900,000 of three-year promissory notes, bearing interest at the rate of 6 per cent per annum and redeemable at the option of the railway on any interest date at face value and accrued interest on not less than thirty days' notice. The application for these notes was mentioned in the ELECTRIC RAILWAY JOURNAL of Aug. 1. The company is further authorized to issue $330,000 face value of first mortgage 5 per cent bonds and pledge these bonds, together with others heretofore authorized by the commission, as security for the payment of the notes at the ratio of two to one. The notes will be convertible at the holder's option before maturity on the basis of 80 per cent of the par value of the bonds with accrued interest for the par value of the notes with accrued interest. The notes must be sold for not less than 96, provided, however, that the company may pay a commission for their sale of not to exceed 4 per cent. The company will be required to make up by stock assessment during the next three years the discount at which the notes are sold below par. The proceeds are to be used only to pay off floating indebtedness.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company is offering the unsubscribed balance of its first preferred stock, amounting to $12,500,000, to the public and is urging its customers to take the new stock. In view of requests from several stockholders the company decided to issue a special circular to its customers dealing with the merits of the stock issue. While the price of the stock to the customers is the same as to the general public, the company points out the advantages to the customers being stockholders in the company supplying them with service. Previous references to this preferred stock financing of the company were made in the ELECTRIC RAILWAY JOURNAL of July 11 and July 25.

The Consolidated Railways, Light & Power Company, Wilmington, N. C.—The Consolidated Railways, Light & Power Company has presented a petition to the City Council for a franchise to change its existing lines. This company is the lessor of the Tidewater Power Company, which recently opposed the granting of a franchise to the Wilmington & Carolina Beach Railway. The City Council on July 29 granted this latter company the right to build and operate an electric road, and adopted a resolution calling for a special election on Oct. 7 to ratify or reject this grant. The proposed city lines of the new company will be about 11 miles in length, and the suburban lines from the city to Wilmington Beach and Carolina Beach will be more than 13 miles. The estimated cost of the lines and the power plant is $750,000.

Toronto (Ont.) Railway.—Seventy-one 4½ per cent currency bonds of $100 each and 322 sterling bonds of £100 of the Toronto Railway, issued under the first mortgage dated Sept. 1, 1892, have been drawn for redemption at par and interest on Aug. 31. Payment will be made at the Canadian Bank of Commerce, Toronto.

United Railroads of San Francisco, San Francisco, Cal.—The California Railroad Commission on July 30 issued a supplementary order authorizing the United Railroads of San Francisco to issue $378,000 of car trust certificates. The original order, which was noted in the ELECTRIC RAILWAY JOURNAL of June 6, provided that the certificates might be paid off in ten years, but the new order enables the railway to pay them off in a shorter time if so desired.

Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.—The foreclosure sale of the Warren, Brookfield & Spencer Street Railway which, as noted in the ELECTRIC RAILWAY JOURNAL of July 25, was set for Aug. 6, has again been adjourned to Sept. 10 on account of the absence of bidders.

Dividends Declared

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1¾ per cent, preferred.

Connecticut Valley Street Railway, Greenfield, Mass., three-quarters of 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE.					
1m., June, '14	$71,595	*$41,215	$30,380	$17,567	$12,813
1 " " '13	60,780	*28,913	31,867	17,198	14,669
12 " " '14	782,952	*365,001	417,591	208,791	209,160
12 " " '13	735,690	*334,820	400,870	204,868	196,002
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., June, '14	$91,477	*$58,834	$33,043	$28,190	$4,853
1 " " '13	101,635	*60,466	41,169	23,204	17,965
12 " " '14	1,162,036	*707,128	454,908	320,791	134,117
12 " " '13	1,161,121	*694,249	466,872	281,103	185,769
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.					
1m., June, '14	$249,684	*$169,951	$79,733	$42,362	$37,371
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE.					
1m., June, '14	$217,868	*$119,646	$98,222	$63,599	$34,623
1 " " '13	200,339	*108,044	92,295	57,979	34,316
12 " " '14	2,447,406	*1,409,955	1,037,451	753,305	284,146
12 " " '13	2,213,749	*1,225,551	988,198	675,299	312,899
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.					
1m., June, '14	$225,180	*$140,968	$84,212	$55,435	$28,777
1 " " '13	207,251	*128,060	79,191	48,037	31,154
12 " " '14	2,732,541	*1,707,886	1,024,655	619,123	405,532
12 " " '13	2,572,598	*1,434,535	1,138,063	584,432	553,631
GRAND RAPIDS (MICH.) RAILWAY					
1m., June, '14	$109,413	*$70,651	$38,762	$13,361	$25,401
1 " " '13	112,045	*64,856	47,189	15,308	31,881
12 " " '14	1,297,010	*837,793	459,217	157,880	301,337
12 " " '13	1,270,291	*739,127	531,164	177,441	353,723
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO.					
1m., June, '14	$127,203	*$76,702	$50,501	$35,470	$15,031
1 " " '13	129,354	*75,863	53,491	35,315	18,176
6 " " '14	658,106	*431,646	226,461	211,721	14,740
6 " " '13	633,699	*410,092	223,608	210,286	13,322
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE					
1m., June, '14	$62,002	*$40,257	$21,745	$15,579	$6,166
1 " " '13	63,459	*38,020	25,439	14,859	10,580
12 " " '14	677,723	*458,174	219,549	184,834	34,715
12 " " '13	650,004	*401,232	248,772	174,134	74,638
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO					
1m., June, '14	$317,780	*$199,525	$118,255	$51,020	$67,235
1 " " '13	291,518	*178,355	113,163	45,214	67,949
12 " " '14	1,721,701	*1,059,635	662,066	301,835	360,231
12 " " '13	1,497,238	*928,458	568,779	270,723	298,056
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.					
1m., June, '14	$248,874	$150,011	$98,863	$57,575	$41,288
1 " " '13	248,793	155,340	93,454	58,387	35,067
12 " " '14	3,093,848	1,883,165	1,210,682	704,458	506,224
12 " " '13	2,844,333	1,757,594	1,086,739	632,501	454,238

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*Includes taxes.

Traffic and Transportation

Fare Order of Pennsylvania Commission

In the case of the complaint for a rate of fare over the Lehigh Valley Transit Company's line from Coopersburg to Allentown, Pa., lower than the rate now in effect, the Public Service Commission of Pennsylvania has ordered that the number and extent of the fare zones between Coopersburg and Allentown remain the same as heretofore; that the single return ticket for 25 cents issued at the office of the company at Coopersburg and Allentown continue in effect in the same manner and form as heretofore; that a commutation ticket book containing twenty-five round-trip tickets, good for the calendar month for which it is purchased, be issued as follows: (a) Good between Coopersburg and Allentown, with full transfer privileges in Allentown, for $4.50, thus making it at the rate of 18 cents a round trip. (b) Good between Centre Valley and Allentown, with full transfer privileges in Allentown, for $3.75, being at the rate of 15 cents a round trip.

Coopersburg is a small town located 9 miles from Allentown on the line of the Lehigh Valley Transit Company that extends from the latter place to Philadelphia. The regular rate of fare from Coopersburg to Allentown is 15 cents, but a return ticket can be purchased at the office of the company at Coopersburg or Allentown for 25 cents, thus making the fare each way 12½ cents, or a trifle less than 1.4 cents per mile. These return tickets have no time limit specified on them. The purchaser has the privilege, if he chooses to take advantage of it, of buying one or any number of these tickets at any given time, and is not obliged to call daily at the ticket office to pay his fare for transportation. Moreover, the ticket may be bought by one party and used by another, the ticket being accepted by the carrier from anyone that presents it. The regular one-way fare of 15 cents which must be paid on the car, and the daily return ticket which can be obtained only at the company's office at either end of the trip, are the only rates of fare established by the company between Coopersburg and Allentown.

The commission in its opinion says:

"The complainant avers that respondent issues a monthly commutation fare from other points on its lines about the same distance from Allentown at a much lower rate, and therefore contends that he is discriminated against, and petitions that he be granted the lower commutation rate accorded to the citizens of the aforesaid towns and places located on other divisions of the company's system. While respondent admitted that there are certain towns and places on other branches of its system, located about the same distance from Allentown as Coopersburg that have a lower rate of fare, it also established the fact in the testimony offered that there are other towns and localities on the Coopersburg line situated about the same distance from Philadelphia, Norristown and other centers of population as Coopersburg is from Allentown that have a higher rate of fare than the people of Coopersburg.

"From the various facts and administrative features educed at the hearing, it appeared quite conclusively that existing local conditions are always a factor which must be considered in the work of arranging a correct schedule of rates on the different lines of a transportation plant. The size of the cars operated on a line, the frequency of the service furnished, the density of the population of the adjacent territory, the grades and general alignment of the roadbed, the annual outlay required for repairs and upkeep on the different branch lines, all figure more or less in the rate problem, and must be considered up to a certain point in their proportionate bearing upon the matter.

"Since the hearing held in this proceeding, the company with a view of meeting the wishes of the complainant in part, and of maintaining thereby a spirit of harmony and co-operation with its patrons, has written to the commission that it is willing 'to issue commutation tickets for travel between Coopersburg and Allentown at the rate of 25 cents for a round trip, and between Centre Valley and Allentown at the rate of 16 cents for a round trip, such tickets, in each case, to be bound into books containing twenty-five round trips and to be good for use only on local cars and during the calendar months within which the same were issued, but only when presented by the purchasers in person, accompanied by the book themselves.'

"This proposed change in the rate of fare has been submitted to the complainant by the commission for comment. In his answer to the foregoing readjustment of rates, the complainant contends that the charge of discrimination preferred in the complaint is not removed and asks for a still further reduction in the rates. He requests that he be permitted to purchase for $2.70 'a monthly book containing twenty-five round-trip tickets with full transfer privileges in Allentown,' and for $3 'a book containing twenty-seven round-trip tickets with transfer privileges between Allentown and Coopersburg, good for at least one calendar month,' and that he be permitted to ride between Allentown and Centre Valley on either of two commutation books containing twenty-five and twenty-seven round-trip tickets respectively, which can be obtained at the rate of 10 cents for one round trip.

"It therefore appears that the proposed rates are not satisfactory to the complainant, and the company as intimated in its letter submitting the proposed reduction does not feel warranted to offer any further concessions in the matter. The commission accordingly has made a careful examination of the various local conditions affecting the point at issue, and also of the general principles that must be recognized in the problem of rate making when the transportation service of a general electric railway system is purely local on some lines and interurban and less frequent on other divisions."

After a full consideration of all the different phases and factors involved in the matter, the commission issued an order directing the fare changes previously noted.

Examination of Southern Indiana Employees

Examinations of all the employees of the Insull lines at New Albany in southern Indiana are conducted at regular intervals by James Harmon, safety agent of the company, in connection with the "safety first" work, in order to make sure that trainmen are familiar with the operating rules and other regulations. Ordinarily forty questions are prepared, numbered and typewritten on foolscap paper, with space between the questions for the answers of the men who are examined. A correct and sufficient answer is marked 2½ per cent, the total if the employee has made a perfect record, giving 100 per cent.

Practically all of the questions have a direct bearing on "safety first." A high rating in the examination tells in favor of advancement, while low ratings bring the men who made them into line for special coaching, suspension or dismissal. The sets of questions vary; ordinarily there are special sets for conductors, motormen and trackmen, for city employees and employees of the interurban lines, etc.

Among the examination papers recently turned in by the trainmen of the Louisville & Southern Indiana Traction Company and the employees of the street railway systems of New Albany and Jeffersonville, Ind., across the river from Louisville, was one by J. M. Sams, a motorman on the interurban line, who came through with a perfect score. Some of the questions and answers in Mr. Sams' paper are as follows:

Q—What forms of reading are allowed on duty?

A—Train orders, rule book and instructions, only.

Q—What is a station?

A—A place where trains stop to let off and take on passengers.

Q—What is a dwarf signal?

A—A low, fixed signal with a semaphore arm.

Q—What is a violent signal?

A—Any signal waved violently on or by the track.

Q—What should a motorman do when blowing the whistle is forbidden by law?

A—Ring his gong.

Q—What places should train approach under control?

A—All tongue switches, curves, crossings and special work.

Q—What should be done with a disorderly person?

A—Ask him first to behave himself and be quiet; then, if he will not behave, ask him to get off of car and if necessary put him off.

Q—Should switches be set for opposing train if you were to hold main track?

A—Yes, to save time; but when a switch has been opened for another train and is then left, the switch must be locked.

Q—What should be the speed of a car going over the switch points and frogs on the Big Four Bridge?

A—Four m. p. h.

T. P. Coleman, of the city service, was rated at ninety-seven. All of the answers on Mr. Coleman's paper were perfect except two. These were each marked off 1½ and were as follows:

Q—How should you pass cars at tongue switches?

A—If possible cars should not pass at tongue switches as a switch might split.

Q—How should motormen and conductors look out for passengers?

A—With all possible care.

Some of the other questions and answers from this same paper were as follows:

Q—When should bulletin boards be examined?

A—At all times.

Q—How can you popularize the service in your conduct towards the public?

A—By being polite to all.

Q—What should you do when there is evidence that your car is on fire?

A—Get the passengers off, pull down the trolley and try to put out the fire.

Q—When is conversation forbidden on duty?

A—At all times except when it is necessary to give information.

Q—How should conductors compel passengers to conduct themselves?

A—Like gentlemen or ladies.

Q—How should you report accidents to employees?

A—In no way at all.

Q—What do you use before ejecting a passenger?

A—Everything possible to keep from having to eject him must be done first.

Q—What should motormen and conductors do before assuming charge of their cars?

A—See that everything is as it should be.

A Motorman on Scientific Coasting

About three years ago W. M. Casey, now superintendent of transportation of the Denver (Col.) Tramway, contributed to the *Tramway Bulletin*, published by the company, an article dealing with the economical use of current. Mr. Casey intimated that he thought the motormen were using current until unnecessarily close to their stops. It seems now that a number of the motormen did not at that time agree with Mr. Casey in regard to the economies which he thought might be worked by stricter attention to the ideas he advanced. One of the motormen who disagreed with Mr. Casey in this matter has contributed to the July number of *Tramway Bulletin* his experience after having followed Mr. Casey's advice. The pertinent suggestions made by this motorman in regard to proper coasting methods follow:

"Scientific coasting does not consist solely in keeping the recording clock running the greatest number of minutes per trip, or hours per day, week or month. Scientific coasting is the art of coasting all of the time that you don't actually need to use current to propel your car. For example, A and B are operating cars—each is approaching a street crossing about one block distant; a car, having the right-of-way, is approaching from the opposite direction. A throws off his current and coasts until his car has crossed the street, and proceeds, not having been required to set his brake at all. B keeps current in his motors until near street crossing, makes a heavy application of air, and brings car to a full stop—being compelled, of course, to wait for go-ahead bells. A has saved the power required to propel his car for nearly a block, also the power necessary to replace the air used in making the stop, and the wear on the brakeshoes and wheels. He has also saved his conductor the time and trouble of turning his attention to the car stops and bell-cord.

"The same principle applies to all 'bell,' passenger and regular stops and slow-downs for curves, etc. Coast up to all vehicles or other obstructions on the track, whether moving or not—all current thus saved is clear gain. In my opinion, trying to make a coasting record on an upgrade, where no stop or slow-down is required, is poor economy, as the excess amount of current required to bring car back to speed will offset that saved while coasting.

"The best and most scientific coasting is done by making a good, long coast where a stop or slow speed is called for. The motorman nearly always hears the conductor's bell ring. Beat him to it. Get your current off, and save that much. It is only a little, but means a few ticks on the clock and a considerable saving when practiced on the entire system.

"Get a few ticks on the clock on every stop. I don't care how late or heavily loaded a car may be, it is not only possible but thoroughly practicable to get a few ticks on the clock at almost every stop. Keep your car on time. You lose more coasting getting out of the 'soup' than you do in keeping out. For economy of current get as long a coast as is practicable with the proper handling of a car every time a stop or slow-down is required. Current thus saved is clear gain.

"After all else is said, scientific coasting consists entirely in making an honest effort, being always on the job, and paying strict attention to the task at hand."

Transfer System in Newark

An effective plan of acquainting the public of changes in service rules in public utility operations is illustrated in the method adopted by the Public Service Railway, Newark, N. J., in making known its new general transfer system which went into effect on Aug. 1. Somewhat radical departures from former arrangements such as might easily lead to general confusion and differences among passengers not fully informed were evidenced in the change.

A day or two preceding the installation of the new system, and immediately thereafter, announcements were made in local dailies setting forth just what the various changes embodied. From one general color of transfer for each respective line a change was made to six standard colors, each relating to a particular direction of travel or second transfer, this latter being an added feature of the new system. Further arrangements for these transfers was also perfected in the establishment of zones. All these changes were carefully described in the company's announcement. On the day of the inauguration of the new transfer system only one complaint was registered. The transfer changes were made in connection with the general rerouting of the city lines of the company, as recently sanctioned by the Board of Public Utility Commissioners. The new transfers really extend such privileges, but eliminate the former possibilities of persons "looping" on a single fare. The company intends to continue during August its campaign of educating the public in the improved system along the lines noted.

Cincinnati Fare Case Will Be Appealed to United States Supreme Court

City Solicitor Schoenle of Cincinnati has filed with the United States District Court a petition for appeal to the United States Supreme Court from the decision of the lower court in the injunction case of the Cincinnati & Hamilton Traction Company and the Ohio Traction Company against the city of Cincinnati to prevent the enforcement of an ordinance requiring a 5-cent fare between Cincinnati and Hartwell.

The decision of the District Court was in favor of the companies and the findings were as follows:

That the Cincinnati & Hamilton Traction Company as owner and the Ohio Traction Company as lessee have a perpetual right to maintain and operate a street railway over Erkenbrecher Avenue from the entrance of the Zoological Garden to the Carthage pike, except as to the east 241 ft. of Erkenbrecher Avenue, over which the plaintiffs have the present right to maintain and operate a street railway.

That the plaintiffs have a perpetual right to maintain and operate a street railway over Carthage Pike, from

Ludlow or Erkenbrecher Avenue to the northern terminus of said pike, at or near the Carthage Fair Grounds, by virtue of the grant from the County Commissioners under date of March 23, 1889.

That the plaintiffs have the right at least until Aug. 7, 1919, to operate over Main Street and Lockland Avenue in the former village of Carthage, from the northern terminus of Carthage Pike, to the north corporation line of said former village, by virtue of the ordinance of the village of Carthage, passed on Aug. 7, 1894.

That the plaintiffs have the right to maintain and operate a street railway over Wayne, Rural and De Camp Avenues, in the former village of the Hartwell, at least until Sept. 16, 1921, by virtue of the ordinance of the village of Hartwell, dated Sept. 16, 1896, and May 14, 1900, respectively.

That the plaintiffs have the right to maintain and operate a street railway on the Springfield Pike, from De Camp Avenue to the north corporation line of the city of Cincinnati in the district formerly known at Hartwell, until at least March 14, 1925, by virtue of the grant from the company owning said pike, dated March 19, 1895; and the grant of the Board of County Commissioners of Hamilton County, Ohio, dated March 14, 1900, for a period of twenty-five years.

Illinois Traction System Accident Circular

The Illinois Traction System, Peoria, Ill., has mailed an accident circular over the signature of C. F. Handshy, assistant general manager, to each agent, foreman, head of department and subhead. This circular, which has been posted on all bulletin boards, reads in part as follows:

"The year ended June 30, 1914, shows that there were fewer accidents and personal injuries than during the previous year. This is certainly very gratifying, yet we feel quite well satisfied that the number of accidents can be reduced still further by each employee making it his business to watch not only himself but others in an endeavor to keep down accidents. Employees on trains should watch all passengers, cautioning them, when necessary, as to any possible danger to themselves and the likelihood of accidents or personal injury to others. The number of accidents to persons boarding or leaving cars at railroad crossings has been reduced, but the number is still alarming, and trainmen should give their particular attention to this class of accidents."

Suburban Fare Suit in Cincinnati.—Suit is to be filed by Assistant City Solicitor Constant Southworth of Cincinnati to enjoin the Interurban Railway & Terminal Company from charging more than a 5-cent fare from Cincinnati to Kennedy Heights.

Serving the I. C. C. Order.—The order of the Interstate Commerce Commission in the 5 per cent case, reference to which was made in last week's issue of the ELECTRIC RAILWAY JOURNAL, directs that a copy shall be served upon the carriers directly concerned in the case and also upon a number of agents, including A. L. Neereamer, chairman of the Central Electric Traffic Association.

Interchange with Traction Line.—The Chicago, Ottawa & Peoria Railway, Ottawa, Ill., has begun the construction of a connection with the Chicago, Burlington & Quincy Railroad at Ottawa, Ill. The steam road objected to interchanging traffic with the electric railway, but lost the case before the Public Utilities Commission of Illinois. Traffic rates governing the interchange are now being compiled.

Parking Cars in Indianapolis Streets.—The Indianapolis Traction & Terminal Company, Indianapolis, Ind., has received an extension of the time in which to obey an order made more than a month ago to discontinue parking its cars in the downtown streets of that city. J. Harry Johnson, chief of the Indianapolis fire department, declared that the parking of cars in the streets was a menace to the efficiency of the fire department.

Cincinnati Street Railway Men Enjoy Three-Day Outing.—The annual outing of the street railway men at Cincinnati was concluded on the evening of Aug. 9, having continued for three days. It was held at Chester Park, near the city. The wives and families of the men were present much of the time. A vote of thanks was tendered to General Manager I. M. Martin of the Cincinnati Traction Company and Assistant General Manager J. M. Martin for their co-operation in making the affair a success.

Trespassers on Illinois Railroad to Be Arrested.—With the consent of Governor Dunne the Illinois Public Utility Commission will instruct municipal and railroad authorities to arrest all trespassers on railroad right-of-way. It is believed that people will cease to take such dangerous cut-offs when they realize that they will be fined. A general campaign also will be conducted to educate the public on the danger of grade crossings and to teach them to heed the railroad danger and warning signs. An inspection of all grade crossings in Illinois is now being made, and all dangerous crossings will be ordered protected by the commission and such changes suggested as may be deemed necessary in the cases of crossings already protected.

"Why We Need the Nickels."—The Brooklyn (N. Y.) Rapid Transit System has reprinted in pamphlet form the continued story "Why We Need the Nickels," which appeared as paid advertisements in the Brooklyn newspapers recently. The introductory note printed in the pamphlet follows: "The Brooklyn Rapid Transit System, feeling that a better understanding of some of its problems is necessary to the establishment of that measure of co-operation which the company desires to maintain with its patrons, has issued from time to time chaptered advertisements explaining 'Why We Need the Nickels.' In order that some of our friends may read this story as a whole, we reprint these advertisements and hope that they may be of more than passing interest to all who give attention to the great problem of urban transportation." Some of the advertisements have been reprinted in the ELECTRIC RAILWAY JOURNAL.

Waiting Stations in Manila, P. I.—The *Cable News-American* of June 27 contained the following editorial commenting on the offer of C. N. Duffy, vice-president of the Manila Electric Railroad & Light Company, Manila, P. I., to erect waiting stations for the convenience of the public at the five important junction points in the city: "In another column is published certain correspondence explaining in detail the proposition of the Manila Electric Railroad & Light Company to erect at its own expense waiting stations at five different points in the city, provided the land for the stations owned by the city or the insular government be granted rent free. The company agrees to maintain and provide for the lighting and cleaning of the same. This is good news. The public will appreciate it. When the necessary permission is received, Mr. Duffy promises to commence the construction work at once and estimates that it will be finished within thirty days. The conditions are fair and should receive the immediate attention of the municipal board. The company proposes that the five waiting stations shall be of the same type, dimensions and construction as the one now in service on Calle Taft, opposite the Philippine Hospital."

Regulating Traffic on Fifth Avenue, New York.—Seeking to facilitate traffic movement on Fifth Avenue, the New York City Police Department has recently been experimenting in the half mile between Fortieth and Fiftieth Streets. The problem for all the tests was to move the heavy traffic, principally automobile, simultaneously over this interval in the busy afternoon hours. At each intersection a traffic policeman took orders from a signal flag mounted on a pole in the center of the avenue at Forty-fourth Street. In the first tests arbitrary intervals were chosen—50 sec. for crosstown traffic, succeeded by a period of 2 min. and 10 sec. for Fifth Avenue traffic. Later a change was made by choosing the policeman at Forty-second Street, the principal crosstown thoroughfare in the district, as the key to the system. This officer adjusted the two rectangular movements according to his own judgment, communicating his decisions to the main signalman at Forty-fourth Street, who relayed the signals. Left-hand turns were not allowed during the tests. Though it is stated that the systems tested had aided traffic, the Police Department will carry them further before a decision is made. It has also been suggested that safety zones be established at each street intersection and that all traffic, unless it is going straight, move around these centers counter-clockwise, branching to the right at the desired points. In practice, of course, this system would also be subject to some regulation.

Personal Mention

Mr. George W. Quackenbush has resigned as traffic manager of the Illinois Traction System, Peoria, Ill., effective on Oct. 1.

Mr. James H. Hustis has resigned as president and as a director of the New York, New Haven & Hartford Railroad and will hereafter devote himself to the interests of the Boston & Maine Railroad, of which he is president.

Mr. Howard Elliott, chairman of the board of the New York, New Haven & Hartford Railroad, has been elected president of the company to succeed Mr. James H. Hustis, who continues as president of the Boston & Maine Railroad.

Mr. E. J. Chamberlin, president of the Grand Trunk Railway and the Grand Trunk Pacific Railway, has also been elected president of the Montreal & Southern Counties Railway, Montreal, Que., succeeding the late W. Wainwright.

Mr. Frank Scott, treasurer of the Grand Trunk Railway, and heretofore treasurer of the Montreal & Southern Counties Railway, has been elected vice-president and treasurer of the Montreal & Southern Counties Railway, Montreal, Que.

Mr. Harper Boyd has been appointed superintendent of the Tarentum, Brackenridge & Butler Street Railway, Tarentum, Pa., to succeed Mr. F. C. Hornstein, who has become superintendent of the Lebanon & Ephrata Traction Company, Lebanon, Pa.

Mr. W. M. Hitt has resigned as electrical engineer with the Public Service Commission of Washington to accept a position with Mr. Henry I. Lea, consulting gas engineer of Chicago, who is at present valuing the property of the Seattle Lighting Company.

Mr. Harry G. D. Nutting has resigned as assistant to the president of the Wisconsin Public Service Company, Wisconsin Railway, Light & Power Company, and the Evanston (Ill.) Railway to engage in business for himself as a public utility expert, with offices in Milwaukee, Wis.

Mr. C. C. Trees, who has been auditor and assistant secretary of the Indiana Railways & Light Company, Kokomo, Ind., for the last eight years, has been appointed to the position of examiner of accounts in the valuation department of the Interstate Commerce Commission with headquarters in Chicago.

Mr. J. N. Graham has been appointed to succeed Mr. L. W. Jacques as master mechanic of the Rockford & Interurban Company, Rockford, Ill. Mr. Graham was assistant to the master mechanic of the company for the last three years. Previous to that he was in the employ of the Fort Wayne & Northern Indiana Traction Company at Fort Wayne, Ind.

Mr. Clarke M. Rosecrantz, counsel for The Milwaukee Electric Railway & Light Company and other public service corporations in Wisconsin, has retired from the firm of Van Dyke, Rosecrantz, Shaw & Van Dyke, and will leave Milwaukee to become, on Sept. 1, a partner in the firm of Sullivan & Cromwell, New York, general counsel for the North American Company. Mr. Rosecrantz was formerly employed by Sullivan & Cromwell and since he left eighteen years ago he has been counsel for many public service companies in the West.

Mr. R. L. Rand has been elected vice-president of the Richmond Light & Railroad Company, New Brighton, Staten Island, N. Y., to succeed Mr. H. F. Hazelrigg. Mr. Rand was formerly connected with the Alabama Traction, Light & Power Company, which controls among other companies the Huntsville Railway, Light & Power Company, the Horne Alabama Railway, Power & Manufacturing Company, the Alabama Power Company, the Anniston Gas & Electric Company and the Muscle Shoals Hydroelectric Power Company. He has been engaged in public utility work for more than twenty-five years.

Mr. C. S. Banghart, whose appointment as general manager of the Binghamton (N. Y.) Railway was announced in the ELECTRIC RAILWAY JOURNAL of Aug. 1, was tendered a dinner by the members of the Deportation Club of New York at the Seabourn Hotel, Coney Island, on the evening of Aug. 7. Among those present in addition to Mr. Banghart were W. O. Wood, president of the New York & Queens County Railway, with which Mr. Banghart was connected, and Messrs. W. R. Kerschner, George Robinson, E. R. Mason, Ross Hays, William Wampler, J. H. Denton, Charles Ellicott, Harry Ransom and Edward Smith.

Mr. H. S. Curry, who has been appointed chief dispatcher of the Illinois Traction System, with headquarters at Staunton, Ill., was born in Vinton County, Ohio, on May 30, 1882. Mr. Curry has been in railway work for the last ten years. He started as a conductor for the Springfield (Ohio) Railway. He worked for several city companies previous to 1908, at which time he entered the service of the Dayton & Troy Electric Railway at Tippecanoe City, Ohio. Mr. Curry served this company successively as motorman, dispatcher and timekeeper, resigning on June 1, 1912, to become connected with the Illinois Traction System as train dispatcher.

Mr. F. C. Hornstein, superintendent of the Tarentum, Brackenridge & Butler Street Railway, Tarentum, Pa., has resigned to accept the superintendency of the Lebanon & Ephrata Traction Company, Lebanon, Pa. About six miles of that road are to be constructed to complete the 30-mile run, and Mr. Hornstein will have charge of the construction and will assume the superintendency of the road when it is put into operation. Mr. Hornstein was formerly with the Westinghouse Electric & Manufacturing Company and built the overhead construction of the Tarentum, Brackenridge & Butler Street Railway. When the line was completed he was made superintendent of the company.

Mr. W. W. Waterson, who has been appointed superintendent of the Peoria Division of the St. Louis, Springfield & Peoria Railroad, included in the Illinois Traction System, with headquarters at Mackinaw Junction, Ill., became connected with the McKinley interests at Fort Wayne, Ind., on what was known as the Fort Wayne & Southwestern Traction Company and was employed there in the train service from 1902 until October, 1904. When the Indiana property was disposed of by the McKinley interests Mr. Waterson went to Springfield, Ill., as a trainman with the Illinois Traction System. This was in November, 1904. After being employed a short time in the train service he was promoted to be train dispatcher. He has been connected with the Illinois Traction System continuously since that time and has served in turn as train dispatcher, terminal superintendent, train master, assistant superintendent and superintendent.

Mr. F. R. Edmonston, who has been appointed superintendent of transportation of the Illinois Traction System, Peoria, Ill., having jurisdiction over all lines west and north of Decatur, and south of Springfield, with headquarters in Springfield, was born in Galloway County, Mo., on Dec. 2, 1878. Mr. Edmonston was connected with the Chicago & Alton Railroad at various places on the Kansas City Division, as student-operator and agent from April, 1894, to September, 1896. He was with the Wabash Railroad at various places on the Kansas City Division as telegraph operator, agent, trainmaster's clerk and train dispatcher, from September, 1896, to September, 1907. Mr. Edmonston next entered the service of the Missouri, Kansas & Texas Railroad at New Franklin and Moberly, Mo., serving as train dispatcher and chief train dispatcher from September, 1907, to March, 1913. He was appointed division superintendent of the Illinois Traction Company, Northern Division, on March 10, 1913, and served in that capacity until Aug. 1, 1914, when he was appointed superintendent of transportation with jurisdiction as noted previously.

Mr. John E. Vaughn, general cashier for the Shore Line Electric Railway since July 7, 1913, with headquarters at the general office of the Plant lines in Norwich, Conn., has been appointed purchasing agent of the Shore Line Electric Railway and the Norwich & Westerly Traction Company, both of which are included in the Plant system. Mr. Vaughn was born in Warwick, R. I., on April 25, 1872. He attended the grammar school in Central Village, the high school at Danielson, and was a student at Peddie Institute, Heightstown, N. J., for two years. He entered the service of the dry goods house of the Hartwell-Richards Company in Providence, and worked his way through Brown University. Having completed his studies, Mr. Vaughn went to Boston and passed two more years in the dry goods business. He had overworked his eyes, however, during his studies and was forced to retire from active work for a year. In 1903 he was appointed a conductor on the Worcester & Connecticut Eastern Railway and in May, 1904, was made a clerk on the office of the company. On Jan. 1, 1905, Mr. Vaughn was made cashier and chief clerk of the Consolidated Railway, the successor company. He rendered various services in Webster, Mass., during his term as cashier. He then returned to Dayville and in 1907 went to Norwich and had charge of the office of the Shore Line Electric Railway there for more than six years.

Mr. G. Gordon Gale has been appointed manager of the Hull (Que.) Electric Company. Prior to 1907 he was assistant engineer of the Canadian Rubber Company's electrical plant. From 1907 to November, 1908, Mr. Gale was superintendent of power of the Hull Electric Company and from November, 1908, to 1909 was acting superintendent of the company. From 1909 to June, 1914, Mr. Gale was general superintendent of the Hull Electric Company. He is a graduate of McGill University and an associate member of the Institute of Electrical Engineers, and of the Canadian Society of Civil Engineers. The company of which Mr. Gale has just been appointed manager controls and operates 27.5 miles of electric railway connecting Ottawa, Hull and Aylmer, and furnishes power for lighting. It also owns and controls Queen's Park, Hull. The position of general manager is a new one with the company.

G. Gordon Gale

OBITUARY

Henry C. Wood, associated with the construction of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., died at his home in Wheaton on Aug. 8. He was a member of the law firm of Wood & Lounsbury, Chicago. Mr. Wood was born in Philadelphia on Oct. 3, 1863, and was graduated from the Columbia Law School in 1886. For two years he practiced law in St. Paul, and in 1888 was appointed United States district attorney at Duluth. In 1892 he went to Chicago and was connected with a number of interurban properties in the Central West during the last ten years.

John R. Bowman, division passenger agent of the Southern Traction Company and the Texas Traction Company, Dallas, Tex., and former private secretary to Governor T. M. Campbell of Texas, is dead. Mr. Bowman was born at Plano, Tex., on April 17, 1876. He was graduated from Southwestern University at Georgetown in 1897. He received his law degree at the University of Texas and studied at Vanderbilt University. He moved to Amarillo and began the practice of law. He was elected to the State Legislature, serving a part of two terms, resigning to become private secretary to Governor Campbell. He became connected with the railways previously mentioned about two years ago.

Henry L. Oestreich, the senior assistant division engineer of the Public Service Commission for the First District of New York, in charge of the Fourth Avenue Subway, died on Aug. 13 in Atlantic City from septic poisoning. Mr. Oestreich was born in New York and was graduated from New York University. He had always been associated in subway building. When the old Rapid Transit Commission began the construction of the original subway in 1900, Mr. Oestreich was assistant engineer to the commission, and had charge of that section from Astor Place to Eighteenth Street. During the next three years he supervised the construction of the sub-surface structures between Fourteenth Street and the Battery, and the Center and Delancey Street subways.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Lehigh-Buffalo Terminal Railway, Buffalo, N. Y.**—Incorporated in New York to build an electric or steam railway in Buffalo. Capital stock, $50,000. Directors: John A. Middleton and Thomas M. Jarvis of New York, and Lyman D. Smith, Brooklyn.

***Ohio River Electric Railway & Power Company, Pomeroy, Ohio.**—Incorporated in Ohio presumably as the successor to the company now operating in Pomeroy. Capital stock, $10,000. Incorporators: I. L. Oppenheimer, J. W. Wolfe, D. W. Hennesey, George Wanger and W. R. Plantez.

FRANCHISES

***Opelika, Ala.**—W. L. Carmack, Opelika, has received a thirty-year franchise from the Council to build an electric railway in Opelika. This is part of a plan to build an electric line between Opelika and Auburn. A company will soon be organized to construct this line, for which right-of-way has been secured.

Los Angeles, Cal.—The Los Angeles Railway has received an extension of time of six months on its franchises from the Council in which to complete its tracks on South Main Street between Slauson Avenue and Manchester Avenue in Los Angeles.

Pomona, Cal.—The Pacific Electric Railway has received a franchise to cross North Garey Avenue and Fulton Road in Pomona. This is part of a plan to build a short cut for the San Bernardino line between Lordsburg and North Pomona.

San Francisco, Cal.—The Daniel O'Day Company has received a franchise from the Council to build an electric railway on the north side of Mariposa Street from the east line of York Street, to connect with the main line of the Ocean Shore Railroad, and to lay a temporary spur track on the west line of Hampshire Street from a connection of the temporary track on Mariposa Street in San Francisco.

Wilmington, Del.—The Wilmington City Railway has received a franchise from the Council to extend its lines to Concord Heights in Wilmington.

***Clearwater, Fla.**—Charles H. Evans, H. A. Murphy and James H. Murphy have received a franchise from the Council to build an electric railway and other public utilities in Clearwater.

Neodesha, Kan.—The Independence, Neodesha & Topeka Traction Company has received a franchise from the Council in Neodesha. This 17-mile line will connect Independence, Neodesha, Altoona and Topeka. T. J. Booth, Independence, president. [E. R. J., July 4, '14.]

Hopkinsville, Ky.—The franchise providing for the construction of an electric railway in Christian County was sold to R. E. Cooper, said to be representing Eastern capitalists who will build the electric line in Hopkinsville. A companion franchise, relating to the city, will be sold on Aug. 22.

Pittsfield, Mass—The Berkshire Street Railway will ask the Council for track locations near the new railroad station in Pittsfield.

Buffalo, N. Y.—The International Railway has asked the Public Service Commission for permission to extend its tracks through Tracy Street to connect the Grant and Elmwood lines in Buffalo.

Ithaca, N. Y.—The Ithaca Traction Company has received the Mitchell Street-College Avenue franchise from the Council in Ithaca, with the stipulation that a double-track be laid in Eddy Street and a ten-minute schedule in either direction maintained.

Schenectady, N. Y.—The Schenectady Railway will ask the Council for franchises to extend its lines in Schenectady to South Schenectady and to the Grand Boulevard. The company will also ask the Board of Trustees in Rotterdam for a franchise.

Wilmington, N. C.—The Tidewater Power Company has asked the Council for a franchise to build several additional crosstown lines in Wilmington.

Wilmington, N. C.—The Wilmington-Carolina Beach Railway has asked the Council for a franchise in Wilmington. This is part of a plan to build an electric line to connect Wilmington and Carolina beaches. Joseph L. Loughlin, secretary. [E. R. J., Aug. 8, '14.]

Wilmington, N. C.—The Wilmington & Fort Fisher Railway has asked the Council for a franchise in Wilmington. This is part of a plan to build an electric line from Wilmington to Fort Fisher Sea Beach, a distance of 18 miles. Lawrence Kure, Wilmington, secretary. [E. R. J., Aug. 8, '14.]

Dartmouth, N. S.—The Dartmouth & Cow Bay Electric Railway has received an extension of time on its franchise from the Nova Scotia Legislature to build this projected railway from Dartmouth to Cow Bay Beach, Halifax County, N. S.

Portland, Ore.—The Portland & Oregon City Railway will accept the franchise for an interurban line on the East Side, to connect up with a line now being built from Oregon City to Portland. The franchise as fixed by the City Council will be advertised for twenty days, after which it will be set up for final passage by the Council. Sixty days after passage, it will go into effect, and the company can begin actual construction and will be given a year's time to complete the work of building the line.

Dallas, Tex.—The Dallas Northwestern Traction Company has asked the Council for an extension of time of six months on its franchise in which to build its line in Dallas. This 50-mile line will connect Dallas, Wichita Falls and Denton. E. P. Turner, Dallas, president. [E. R. J., Feb. 21, '14.]

Danville, Va.—The Danville Traction & Light Company has received a franchise from the Council for an extension of its lines through the eastern section of Danville.

Seattle, Wash.—Councilman Erickson has asked the City Council for a franchise for an extension of the municipal railway into Ballard. The ordinance also instructs the public utilities department to prepare for immediate extension. The extension as proposed will begin at the western terminus of Division "A" and extend in a northwest direction across the recently voted bridge at Fifteenth Avenue Northwest, into Ballard. Provision is made for the construction of the extension by the issuance of public utility bonds. The ordinance was referred to the city utilities committee, which will prepare a definite routing for the proposed railway and work out details of its cost of construction and maintenance.

TRACK AND ROADWAY

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The extension of the Boyles line 1½ miles from Boyles to Tarrant City has been placed in operation.

Edmonton (Alta.) Interurban Railway.—A by-law has been passed authorizing the expenditure of $168,000 by the City Council on electric railway extensions in Edmonton. Plans are being considered to build a line from Edmonton to Fort Saskatchewan, Alta.

Nelson (B. C.) Street Railway.—Plans are being considered to improve and extend this company's lines in Nelson.

British Columbia Electric Railway, Ltd., Vancouver, B. C.—This company has awarded a contract to the Westminster Iron Works to build an ornamental arched entrance to Central Park. The cost is estimated to be about $4,000.

Visalia Electric Railway, Exeter, Cal.—Work has been begun by this company on a 3-mile extension from Woodlake to the base of the foothills in Tulare County.

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company on the extension of the line from Arlington to Corona.

***Niland, Cal.**—Preliminary arrangements are being made to build an electric railway between Niland, Blythe and Seeley. A. L. Faas, Arthur E. Hull, P. A. Raab, G. Ghiglieri and John D. Reavis are interested.

San Francisco (Cal.) Municipal Railway.—The new municipal line in San Francisco from Market Street down Van Ness Avenue to the grounds of the Panama-Pacific International Exposition has been placed in operation.

Norwalk & New Canaan Street Railway, Norwalk, Conn.—This company has awarded a contract to the Conkling & McGrath Company, New York, to build this line between Norwalk and New Canaan. M. W. Conkling, New York, president. [E. R. J., June 27, '14.]

New Smyrna, Fla.—Preliminary arrangements are being made to build an electric railway between New Smyrna, Lake Helen and the St. Johns River. Eventually it will extend on through to the west coast of Tampa. S. E. Carmichael, Lake Helen, is interested. [E. R. J., June 6, '14.]

Lee County Central Electric Railway, Lee Center, Ill.—This company, which purchased the property of the Northern Illinois Electric Railway, operating a 12-mile line between Amboy and Middlebury, plans to extend the line to connect Amboy, Lee Center, Rochelle, DeKalb, Princeton and Dixon. Officers: H. W. Hillison, Franklin Grove, president; William S. Frost, Jr., Franklin Grove, vice-president; S. L. Shaw, Lee Center, secretary; Andrew Aschenbrenner, Amboy, treasurer; C. A. King, general manager and superintendent, and E. S. Virgil, Lee Center, engineer. [E. R. J., July 25, '14.]

Evansville, Chrisney & Eastern Railway, Evansville, Ind.—The bonds of this railway have been disposed of and plans are being made to begin construction within the next two months on the line between Booneville and Chrisney. Eventually it is intended to extend this line to Tell City and Cannelton, Ind. J. P. Chrisney, Chrisney, president. [E. R. J., April 11, '14.]

Evansville & Indianapolis Light, Power & Electric Railway, Evansville, Ind.—Surveys have been completed between Indianapolis and Washington, 80 miles, and surveys are now under way from Washington to Petersburg, 30 miles. This line will connect Evansville and Indianapolis, via Oakland City, Petersburg, Washington, Bloomfield, Worthington and Spencer. Arthur C. Stone, Evansville, president. [E. R. J., Dec. 6, '13.]

Evansville & New Harmony Traction Company, Evansville, Ind.—At a meeting of the officers of this company held at Cynthiana the business men of the town agreed to raise $30,000 to help finance the railway. It is now decided that this line will pass through Cynthiana. [E. R. J., Aug. 1, '14.]

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—An agreement was entered into recently between French Quinn, receiver for the Fort Wayne & Springfield Railway, and the Fort Wayne & Northern Indiana Traction Company for the latter to build from Rudisill to McKinnie Avenue in Decatur. The track is to be used by the Fort Wayne & Springfield Railway in Decatur.

***Jeffersonville, Ind.**—Large shipments of cable are being received at New Albany, Ind., preparatory to constructing a high tension line across the Ohio River, to connect the power plant of the Louisville Gas & Electric Company with New Albany and Jeffersonville. It is proposed to lay the cable across the Pennsylvania bridge at Fourteenth Street.

Richmond & Hamilton Traction Company, Richmond, Ind.—Interest in this railway, which was recently incorporated, is increasing, and petitions have been filed signed by the property owners of two townships, one including the city of Richmond, with the county commissioners of Wayne County, asking that special elections be called to vote on the question of subsidies. Eugene Purtelle, promoter. [E. R. J., Aug. 1, '14.]

Sioux City (Ia.) Service Company.—About 1½ miles of track are being relaid in paved streets in Sioux City.

Quebec Extension Railway, Presque Isle, Maine.—Surveys have been completed and plans are being made to begin construction in 1915 by this company for its 100-mile line between Washburn and Quebec. It will extend across the northern part of Maine to connect the existing lines at Quebec and New Brunswick, and across New Brunswick to the Quebec border. [E. R. J., Jan. 31, '14.]

Transcona, Man.—Bids are to be called at once for the construction of the electric line from Winnipeg to Transcona, to be built by J. H. Kern, Moose Jaw. The line is to be completed by December, according to a change effected in the agreement with the Transcona Council. [E. R. J., June 20, '14.]

Winnipeg (Man.) Electric Railway.—The Manitoba Public Utilities Commission has directed this company to prepare plans for the immediate laying of a second track through the St. James subway. The Winnipeg Board of Works has approved of plans for the laying of a second track on Notre Dame Avenue west, to provide a new loop with the Notre Dame, Keewatin Avenue and Logan Avenue lines in Winnipeg. The company has prepared new plans to build a second track on Sargent Avenue and is asking the City Council to approve them.

Grosse Isle Railway, Detroit, Mich.—This company, which was organized several years ago to build a 10-mile electric railway around Grosse Isle, has abandoned the plan to build a railway as it was thought that the transportation upon the island could be taken care of much better in another way. [E. R. J., Aug. 1, '14.]

Michigan Railway, Jackson, Mich.—This company has practically completed its 50-mile line between Grand Rapids and Kalamazoo. H. H. Crowell, 939 Michigan Trust Building, Grand Rapids, president.

United Railways, St. Louis, Mo.—This company has been requested by the Missouri Public Service Commission to extend its Fourth Street line by way of Grand Avenue to the new viaduct entrance to Carondelet Park in St. Louis.

***Bozeman, Mont.**—A new electric railway 150 miles long to cross the Gallatin Valley west from Bozeman and thence to follow Elk Creek over to the Madison Valley, and the Madison Valley south to Yellowstone at the west entrance of the Yellowstone Park is the project now being considered by Eugene W. Dawes, Bozeman, Charles L. Loomis, Kansas City, and associates.

Portsmouth (N. H.) Electric Railway.—The Boston & Maine Railroad, which owns the Portsmouth Electric Railway, is making extensive improvements on this line.

Albuquerque (N. M.) Interurban Railway.—No definite plans have yet been decided upon by this company to begin construction on this line to connect Albuquerque, Jemez Springs, Santa Anna, Almeda, Los Linas and Belen. E. J. Hall, Albuquerque, is interested. [E. R. J., June 21, '13.]

Jersey Central Traction Company, Keyport, N. J.—This company is now engaged in relaying 1½ miles of track in Keyport.

New York Municipal Railway Corporation, Brooklyn, N. Y.—The Public Service Commission has approved a supplementary contract between this company and the George W. McNulty Company, Inc., for the reconstruction of the Sea Beach line. The company is considering plans to extend the Jamaica Avenue elevated line and will soon award contracts for the construction of the branch.

South Flatbush Railroad, Brooklyn, N. Y.—This company, which was incorporated in January, 1909, to build a railroad in the extreme southern part of Flatbush, which never secured a franchise for the route, or issued any stock, was formally dissolved recently, when Supreme Court Justice Van Siclen signed the dissolution order. The proposed route of this line was from Brighton Beach elevated, to West Thirty-fourth Street, to Avenue Q and Flatbush Avenue. The extension of the existing lines so as to serve the territory where the new line was to be operated, caused the abandonment of the project.

Frontier Electric Railway, Niagara Falls, N. Y.—The right-of-way, property and holdings of this company were deeded recently to the International Railway, Buffalo. James S. Simmons, Niagara Falls, president. [E. R. J., Aug. 8, '14]

***Port Jervis, N. Y.**—Plans are being perfected to build an electric line from Port Jervis through Milford, Pa., to the Delaware Water Gap. Plans are being contemplated to purchase the Delaware Valley Railroad and enter East Stroudsburg over that line. The project is said to be backed by Philadelphia capital.

Schenectady (N. Y.) Railway.—Two extensions will be built at once by this company. The South Schenectady extension will extend from the end of the present line in Broadway to the tracks of the West Shore Railroad in South Schenectady. The Grand Boulevard line will be double-track and will extend from the present terminus in Nott Street to the intersection of the Boulevard, and thence to Van Antwerp Road.

Chardon, Jefferson & Meadville Interurban Railroad, Cleveland, Ohio.—Surveys have been completed from Chardon to Jefferson, 30 miles, and are now under way between Jefferson and Linesville, Pa., 18 miles. Grading has been begun. This line will connect with the Cleveland & Eastern Traction Company at Chardon, with the Pittsburgh & Ohio Valley Railway at Jefferson for Ashtabula and the extension to Linesville, Pa., will connect with the Northwestern Pacific Railroad for Conneat Lake, Meadville, Cambridge Springs and Erie. The maximum grade of this line will be 5 per cent. 80-lb. rails will be used and one 100-ft. steel bridge will be built. F. A. Pease, Cleveland, engineer. [E. R. J., June 20, '14.]

Cleveland, Alliance & Mahoning Valley Railroad, Cleveland, Ohio.—The link between Newton Falls and Leavittsburg will be completed by this company within a few months. This will serve as a connection between the group of towns, including Canton, Akron and Alliance, and the group further north, comprised of Warren, Niles, Youngstown and several other important places. Some time ago the line was completed to Newton Falls and it is now in operation from Alliance through Ravenna to this point. When the entire line is completed it will be about 80 miles long. C. R. Morley is president of the company; J. M. Blatt, vice-president, and W. H. Heil, secretary and treasurer, with offices in the Prospect Building, Cleveland. [E. R. J., March 28, '14.]

Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.—Right-of-way has been obtained by this company for an extension from the present terminus of the railway just south of the city limits of Monroe. It is thought the company eventually will extend its tracks to Monroe.

Interstate Electric Company, Tulsa, Okla.—Application for a charter will soon be made by this company to build a network of interurban electric railways covering the State of Oklahoma. The first line will be from Tulsa to Muskogee and the next one from Tulsa west to Orumright, Cushing and Guthrie. This line will branch at Cushing and go from there to Stillwater, Perry and Enid. C. B. Hale is interested. [E. R. J., July 11, '14.]

***Blenheim, Ont.**—An organization has been formed with Mayor Little, Blenheim, as president, to consider plans to build a hydro-radial railway from St. Thomas to Amherstburg.

Fort William (Ont.) Electric Railway.—It is proposed to build a double track line on Victoria Avenue, as far west as Franklin Street, and a single track from Franklin Street south to Walsh Street in Fort William.

London & Port Stanley Railway, London, Ont.—This railway, the electrification of which the ratepayers authorized last January, is being reconstructed rapidly and will be placed in operation very shortly. The Pere Marquette Railroad has the rehabilitation contract.

Dunnville, Wellanport & Beamsville Electric Railway, Wellanport, Ont.—A resolution has been passed by the Clinton Township Council, asking the Hydro-Electric Power Commission of Ontario to take over this uncompleted line, and incorporate it with a general system of lines to be built under the commission's auspices.

Harrisburg & Mechanicsburg Electric Railway, Harrisburg, Pa.—This company has obtained permission from the Pennsylvania Public Service Commission to apply to the City Council for an extension of its tracks in Harrisburg.

Pittsburgh (Pa.) Railways.—This company is asked to consider plans to build an extension from Avalon to downtown Pittsburgh. The plan is to extend the Avon and Emaworth lines to connect with the West View Park line.

Pottstown & Phoenixville Railway, Pottsville, Pa.—Surveys will be made at once by this company for an extension from Stowe to Reading.

Regina (Sask.) Municipal Railway.—The City Council of Regina has authorized the purchase of one single track, three-part Y with crossover, at a cost of $3,129, which is required for this railway intersection at the north end of the Broad Street subway in Regina.

Wheeling (W. Va.) Traction Company.—Plans are being considered by this company to build a steel and concrete bridge across the Ohio River at Tiltonsville connecting the West Virginia side above Warwood with Tiltonville, Rayland and Yorkville on the Ohio side. It is understood that ground on both sides of the river is now being leased for the purpose.

SHOPS AND BUILDINGS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—The contract for the construction of this company's new building at First Avenue and Twenty-first Street in Birmingham has been awarded to the Realty Construction Company. The Herndon-Mettrick Engineering Company had previously been awarded the concrete contract. The structure will be four stories in height, as nearly fireproof as possible and is estimated to cost about $75,000.

Calgary (Alta.) Municipal Railway.—A proposition is under consideration in Calgary for the erection of a public utilities building, in which would be combined offices, recreation rooms for the employees of the Calgary Municipal Railway and other departments, and a public waiting room.

Pacific Electric Railway, Los Angeles, Cal.—This company has awarded a contract to the Alta Planing Mill Company, Los Angels, to build a new passenger station in El Segundo. The structure will be 58 ft. x 38 ft. and of mission style of architecture. It will have a long platform for loading freight.

Peoples' Traction Company, Galesburg, Ill.—The present passenger station for this company and the Rock Island Southern Interurban Railway will be vacated. It is reported that the new depot will be in the Galesburg National Bank Building in Galesburg.

Brooklyn (N. Y.) Rapid Transit Company.—This company has opened its new station under the Municipal Building for the trains running through the Centre Street Loop in Brooklyn.

Wheeling (W. Va.) Traction Company.—Contracts have been awarded by this company to build a new carhouse at McMechen, for the Moundsville division of this railway. The structure will be of steel, concrete and brick construction.

POWER HOUSES AND SUBSTATIONS

Birmingham-Tuscaloosa Railway & Utilities Company, Birmingham, Ala.—It is stated that this company has closed a contract with the Alabama Power Company to secure its water power for the operation of the electric railway in Tuscaloosa. This company plans to have its line to Tuscaloosa completed by October.

Pacific Electric Railway, Los Angeles, Cal.—This company's power house at Watts was partly destroyed by fire on July 30.

Jersey Central Traction Company, Keyport, N. J.—During the next few weeks this company plans to install at its power house in Keyport 1000-hp Sterling boilers lately purchased from the Babcock & Wheeler Company.

Public Service Railway, Newark, N. J.—This company has awarded a contract to Linde & Griffith, Newark, to build its new power plant at Point-no-Point. The plant will be erected on the banks of the Passaic River, north of Lincoln highway. Contracts have been let to build concrete foundations for a turbine-room, 95 ft. x 160 ft.; a boiler house, 124 ft. x 168 ft.; an outside coal bunker, 48 ft. x 56 ft., and a detached switch house, 70 ft. x 105 ft. The main building will be 160 ft. x 264 ft.

Wheeling (W. Va.) Traction Company.—Plans are being made to build a new power plant and generator station on the site of the present power house on Water Street, near Forty-first in Wheeling. The walls are to be built of brick and reinforced concrete. The building is being constructed about the present structure, and when completed the old walls will be razed.

Manufactures and Supplies

ROLLING STOCK

Empire United Railways, Syracuse, N. Y., which was reported in the Electric Railway Journal of Aug. 1 to be in the market for twelve interurban cars, has awarded the contract for these cars to the St. Louis Car Company.

Calgary (Alta.) Municipal Railway has received from the Preston Car & Coach Company a street sprinkler of 5000 gal. capacity with adjustable sprinkler heads at all four corners and a direct connected centrifugal pump so arranged that it can be used for fire fighting.

Los Angeles & San Diego Beach Railway, San Diego, Cal., will purchase sixteen new motor cars and a similar number of trail cars if the application which it has pending before the Railroad Commission of California for permission to issue bonds to electrify its line is granted.

Pacific Electric Railway, Los Angeles, Cal., is reported to be considering the purchase of forty-four all-steel interurban cars for the new line extending for 59 miles between Los Angeles and San Bernardino. This new line, of which a brief description was published in the Electric Railway Journal for July 25, page 163, is now being operated with rebuilt cars intended only for temporary use.

New Orleans Railway & Light Company, New Orleans, La., has specified the following equipment for the fifty closed motor cars which it ordered recently from the Southern Car Company for delivery in October, November and December:

Seating capacity	55
Weight (car body only),	16,000 lb.
Bolster centers, length	23 ft. 5¼ in.
Length of body	34 ft. 8 in.
Over vestibule	47 ft. 8 in.
Width over all	8 ft. 7 in.
Height, rail to top trolley board	11 ft. 3⅝ in.
Body	Metal
Interior trim,	Wood and metal
Headlining	Agasote
Roof, type	Arch
Underframe	Metal
Bumpers,	Hedley anti-climber
Car trimmings	Bronze
Conduits and junction boxes	Sheroduct
Curtain material	Pantasote
Destination signs	Keystone
Hand brakes	Dayton handle
Headlights	Crouse-Hinds
Motors	G.-E. inside hung
Registers	International
Sash fixtures	Edwards
Seats, style,	H. & K. No. 300 A
Seating material,	Cherry slats
Step treads,	American abrasive
Trolley catchers or retrievers	Earle
Trolley base	G. E.
Trucks, type	Brill 39-E
Ventilators	Railway Utility

TRADE NOTES

Pathé Frères, New York, N. Y., the French moving picture firm, announces that Arthur Roussel and L. P. Bonvillain, its ranking vice-presidents in America, are Frenchmen and that Mr. Bonvillain, together with other employees, is about to sail to join his regiment in France. Mr. Roussel is ill in New York and has not been told about conditions abroad. The immense factory of the company near Paris has been requisitioned by the government as a barrack for soldiers.

Union Switch & Signal Company, Swissvale, Pa., has received a contract from the Indianapolis Railway & Lighting Company, a 600-volt interurban line, for the installation of a.c. automatic block signals between Pit and Junction, 7.2 miles in Indiana. There will be eight model No. 13 electric light signals installed on the TDB system which will permit two trains to follow each other between turnouts but will prevent opposing movements. Vane relays will be used on the line circuits and galvanometer relays on track circuits.

Railway Utility Company, Chicago, Ill., reports orders for its thermostat control to be used on the 228 cars recently ordered by the Chicago Surface Lines, 100 cars ordered by the Pittsburgh Railways and twenty-five cars ordered by the Third Avenue Railway, New York. Utility ventilators have also been ordered for the vestibules of the 228 cars ordered by the Chicago Surface Lines and for fifty cars ordered by the New Orleans Railway & Light Company, and the twenty-five cars ordered by the Third Avenue Railway, New York.

William R. Garton, New York, N. Y., sales engineer, has been appointed as exclusive general sales agent in the United States and Canada for the Zink adjustor and Zink radius, or circle bar brake connection. The Zink adjustor takes the place of all turn buckles used in connection with brakes. It can be adjusted readily and remains in fixed position until readjusted. It is in use on some of the largest properties. The radius or circle bar connection avoids the binding of brake bars and rods on double trucks when the truck is on a curve or standing at an angle.

General Electric Company, Schenectady, N. Y., has received the order for motors on the 100 additional steel cars to be purchased by the New York Municipal Railway Corporation under recent authorization by the Public Service Commission of the First District of New York. This order of 200 motors is a duplicate of the order that was placed for the first lot of cars for operation in new subways in New York City, covering 140 hp equipments of the GE-248 type without control equipment. The General Electric Company has also received an order for one 3000-kw rotary converter from the Transit Development Company for use on the Brooklyn Rapid Transit System. This includes the necessary transformers and switchboards for the converter, which will be a duplicate of the three machines recently ordered by the Brooklyn Rapid Transit System from the General Electric Company.

O. de G. Vanderbilt, Jr., president of the Weir Frog Company, Cincinnati, Ohio, is one of those manufacturers whom President Wilson has interviewed on the state of business in this country. In this interview, which occurred on Aug. 5, the President expressed himself as realizing very keenly the extremely bad conditions in the railway supply business, due to the very stringent economy which the railroads of the country have been forced to put into effect on account of the uncertainty as to future legislation affecting them and because of reduced earnings. He feels also that certain basic legislation is necessary before the business interests of the country can be put on a sound basis. As soon as this is in force it will be the attitude of the administration to remove all uncertainty as to future legislation and the position of the administration toward business. As regards the present situation in Europe, the President, according to Mr. Vanderbilt, feels that this country is in an admirable position to withstand the influences which will be brought about by the conflict abroad.

Harry G. D. Nutting has opened an office as a public utility expert and engineer in the First National Bank Building, Milwaukee, Wis. Mr. Nutting's services will be available for valuations, rates, audits, etc., for electric railway, electric light and other public services. After he was graduated from the College of Engineering, University of Illinois, Mr. Nutting did extensive experimental work for Fairbanks-Morse & Company. Later he was engineer for the Wisconsin Railroad Commission, manager of a municipal plant, district superintendent in charge of operation of eighteen towns in Illinois, and electrical engineer for the Government Arsenal at Rock Island. Mr. Nutting has retired from the position of assistant to the president of the Wisconsin Public Service Company, Wisconsin Railway, Light & Power Company and Evanston (Ill.) Railway to establish his own business. He has been retained by these companies as consulting expert. He is also consulting expert for the Berlin (Wis.) Public Service Company in connection with its rate case now pending before the Wisconsin Commission. He has been a contributor to technical literature and read a paper "An Accounting System for a Small Public Utility" at the January, 1914, convention of the Wisconsin Electrical Association. He is also chairman of the committee on extensions and commercial service rules of the association, and the author of a unique formula for determining the advisability of making extensions of distribution systems.

Walter D. Uptegraff, who has recently been elected president of the Union Switch & Signal Company, is, in point of service, one of the oldest men connected with the Westinghouse interests. He was fourteen years old when he became assistant to Howard Sprague, who was secretary of the Westinghouse Air Brake Company. This was in 1880. He quickly attracted the attention of George Westinghouse, the late inventor, who made the young man his private secretary. As Mr. Westinghouse's activities expanded, the responsibilities and duties of Mr. Uptegraff grew in proportion, and in 1896 Mr. Westinghouse showed his confidence in his secretary's ability by giving him his power of attorney to act for him in financial matters. In this capacity Mr. Uptegraff took an active part in the industrial affairs of the Westinghouse interests and was named by the late inventor as one of the three men to act as executor to his estate, the others being H. H. Westinghouse, his brother, and Charles A. Terry, a personal friend and business associate. Mr. Uptegraff, soon after the death of Mr. Westinghouse, was elected vice-president of the Union Switch & Signal Company and the Westinghouse Machine Company. Of both these concerns he had already been a director for some time. Besides his connection with the Switch & Signal Company as president, and the Westinghouse Machine Company as vice-president, he is a director in the Westinghouse Air Brake Company, president of the Pittsburgh Wall Paper Company, New Brighton, Pa., and president of the Defiance Paper Company, Niagara Falls, N. Y.

Sidney G. Johnson, who has been elected a vice-president and director of the General Railway Signal Company, Rochester, N. Y., with headquarters in New York, was born in Eccles, Lancashire, England, in 1874, and entered Harrowgate boarding school when he was about nine years old. At the age of twelve he came to America and went to Swissvale where his father, Henry Johnson, was works manager of the Union Switch & Signal Company. After about a year he went to Rahway, N. J., where the Johnson Railroad Signal Company had been established, and during vacations he worked in the shops and drawing office to acquire a knowledge of the business. He attended a New York preparatory school and for two years after leaving school he worked in the construction gang of the Johnson Signal Company, without pay, in order to learn the business, and then went into the construction forces of the Union Switch & Signal Company for a year. He was then about twenty years old. In 1896 the Standard Railway Signal Company was organized and Mr. Johnson's father was made president. Mr. Johnson was made signal engineer and had charge of the locking and dog sheets, making estimates, etc. When the company moved to Troy, Mr. Johnson went with it, but after the Trojan Car Coupler Company's interests took hold Mr. Johnson's father left the Standard and Mr. Johnson followed him after a few months, and went to the Union Switch & Signal Company in 1899 in the New York office. Shortly thereafter he was made engineer of construction for the Eastern district. Afterwards he was for two years at Swissvale as signal engineer in charge of the estimating department, and then went back to New York and had charge of installing the signal system for the Interborough Rapid Transit Company, New York, and all the other large installations put in at that time. When the Interborough job was finished he was made Eastern manager in charge of sales and construction. About four years ago he was made general sales manager and early in the present year was elected vice-president in charge of sales and engineering with offices in New York.

ADVERTISING LITERATURE

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a twenty-eight page pamphlet "Ball Bearings in Machine Tools."

Chicago Pneumatic Tool Company, Chicago, Ill., has issued a sixteen-page booklet in which the company's Class A. O. Giant fuel oil engines are described and illustrated.

Canton Foundry & Machine Company, Canton, Ohio, has issued "Portable Floor Crane and Hoists," a well-printed and attractive booklet so arranged as to be quite explicit in regard to the company's products.

Ohio Brass Company, Mansfield, Ohio, has issued a folding mailing card illustrating the application of the National railroad trolley guard. The company says that more than 100,000 ft. of the guard is in service protecting grade crossings on many prominent roads.

Dielectric Manufacturing Company, St. Louis, Mo., has published "Data on Dependable Insulation," a forty-eight-page booklet. The information in regard to the goodly number of corelated subjects referred to in the publication is made readily available by a very helpful subject index.

Titanium Alloy Manufacturing Company, Niagara Falls, N. Y., has issued Bulletin No. 7 of the series covering comparative tests of standard open-hearth rails and titanium treated open-hearth rails. This bulletin contains microphotographs, sulphur prints and etched sections of rails of both types which characterized previous issues of the bulletin, new tests on three samples of each type being included.

National Tube Company, Pittsburgh, Pa., has reprinted as "National Bulletin No. 10-C" a paper by Dr. William H. Walker on the relative corrosion of iron and steel pipe as found in service. This paper is an abstract of one read before the New England Water Works Association on Dec. 13, 1911. Dr. Walker concludes after an investigation into the relative life of service pipes that on the average there is no difference in the corrosion of iron and steel pipe. The abstract of the paper is accompanied by two discussions on the subject.

Western Electric Company, Chicago, Ill., has issued a very attractive brochure on the use of the telephone for train dispatching. A brief historical account of the telephone development in train operation is given, together with an outline of the reasons why the telephone has been so largely introduced in railroad work. Numerous illustrations are provided to show methods of using telephone selector equipments and details of different types of apparatus which are used, and a number of letters from operating men regarding the use of the telephone in railroad service are reproduced.

S. K. F. Ball Bearing Company, New York, N. Y., has published a catalog "S.K.F. Ball Bearings as Applied to Electric Motors." Applications of this well-known ball bearing have been made to a great variety of motive apparatus, and electric railway men will be particularly interested in the installations made for the Third Avenue Railway, New York. The publication explains the principles of construction of this bearing and contains a number of interesting sectional drawings showing how the bearings may be mounted in alternators, rotary converters, motors and other apparatus used by electric railways.

The Ronald Press Company, New York, N. Y., has issued a 42-page catalog classifying and briefly describing 100 of the best books on accounting, banking, finance, salesmanship, valuations and other general business topics. In selecting them no endeavor has been made to give all business books on any subject or even all the best books, but to give under each heading the names of books generally accepted in business circles as the most reliable, authoritative and generally useful. The pamphlet should be invaluable to electric railway officials who desire to have readily available a carefully compiled list of general business books.

Ray D. Lillibridge, Inc., New York, N. Y., has designed and written for the Titan Storage Battery Company, Newark, N. J., a thirty-two-page booklet dealing with Titan storage batteries for electric vehicles, both trucks and pleasure cars, and for use with self-cranking systems on gasoline automobiles. The chapter headings follow: "The Titan Storage Battery Company: Its Organization and Purposes," "Storage Battery Parts," "Elementary Theory of the Storage Battery," "Titan Pasted Type Plates," "Storage Battery Measurements," "Titan Ignition and Lighting Batteries," "Titan Starting and Lighting Batteries" and "Titan Vehicle Batteries."

Spencer Trask & Company, New York, N. Y., have issued a forty-four-page pamphlet entitled "Knowledge of Investment," written by Charles Lee Scovil. As the author states, the selection of sound investments is largely a matter of education. The pamphlet discusses in a simple manner some of the intricate problems in connection with the buying and transfer of stocks and bonds. It is divided into four chapters, the first of which discusses such points as security of principle, excessive rates of interest, misleading statements, distribution of securities, and mortgages and deeds of trust. The second chapter takes up the difference between coupon and registered bonds, the proper procedure to be followed when bonds are lost and questions in connection with the redemption, payment and delivery of bonds. The last two chapters are devoted to a short analysis of the management of corporations, the rights of stockholders, the institution of a surplus reserve, the value of preferred stocks and the question of diversification of investments. The chief value of this pamphlet lies in its extremely practical discussion of investment points that are too often left unexplained in the standard books on corporation finance.

NEW PUBLICATION

Where and Why Public Ownership Has Failed. By Yves Guyot, editor-in-chief of the *Journal des Economistes*, president of the Sociéte d'Economie Politique of Paris, former vice-president of the Municipal Council of Paris, deputy to the French Parliament and Minister of Public Works, etc. Published by The Macmillan Company, New York. 5½ in. x 8 in. Bound in cloth, 459 pages, $1.50 net.

The question of what State ownership and operation has generally accomplished in the world receives in this volume the most exhaustive treatment that has ever been given to the subject. M. Guyot, statesman, traveler, editor and economist, is able to speak with special authority on the subject because of his former ministerial position in France, which is surpassed by few countries in its activities along government ownership lines. The comprehensive character of the volume is shown by the following topics, which represent only a few of those covered: Municipal activity of the United Kingdom, United States, Germany, Russia, France, Austria-Hungary, Italy, Denmark, Switzerland, the Netherlands, Belgium, Sweden; State operation of railways; State and municipal bookkeeping and finance; private versus public initiative; housing of the working classes; government monopolies; State insurance; State and municipal employment, and graft and corruption.

M. Guyot's evident familiarity with conditions, together with the extremely complete data which he quotes and explains, makes his treatise extraordinarily valuable to the student of government ownership. The chief difficulty in preparing the book seems to have been to make a coherent arrangement of the material, but the author has attained a fair success in this respect. Specific examples and statistics gathered from every available source are brought to bear upon every theoretical argument usually relied upon by the advocates of State ownership, and the result is an uncompromising and effective attack against this principle.

While space will not permit a full review of M. Guyot's book, it may be interesting to note a few of its conclusions. The author firmly believes that when political or administrative bodies, whether states or municipalities, operate, they are regulating themselves. This to his mind is sufficient reason for the suppression of all public trading operations, because it is necessary that there be a distinct separation between the forces of operation and regulation. Industrial operation is inherently adapted to private enterprise, but the only corresponding function of State and municipality is industrial control. Mr. Guyot's treatment of the labor question is particularly comprehensive and the tenor of his remarks can be judged from the following final statement: "The suppression of the political and electoral rights of all employees of states and municipalities is an indispensable consequence of the development of public operation."

In general the author asserts that the propaganda of public ownership has established more firmly than ever before the truth of the following industrial laws: (1) Neither states nor municipalities should attempt tasks especially adapted to individual effort. (2) In the case of utilities in which public interest is general, as railways, water, gas and electric companies, and tramways, there must be a physically and morally responsible body, accountable to the public on the one hand and to the service on the other hand, and protected by contract against the vacillations of public opinion and the extortionate demands of interested groups, whether employees, consumers or patrons. (3) For individuals the watchword should be action; for local and state governments, control.

Electric Railway Journal

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Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

Vol. XLIV NEW YORK, SATURDAY, AUGUST 22, 1914 No. 8

"FOR THE GOOD OF THE SERVICE"

The finding of the Springfield, Mass., arbitration board, to which reference is made in our news columns last week, is of more than local significance. It places the seal of approval upon the methods of secret inspection utilized by the company, affirms the good faith of the latter's officials in discharging several conductors for irregularities in handling fares, and closes a controversy between the company and the local union which more than once threatened to involve the community in a strike. The proceedings of the board had been under way for many weeks, and vigorous attempts were made at the hearings to discredit the observations of the inspectors assigned to the unpleasant task of running down leaks in the fares collected, but the company's position was upheld, the guilty parties have been discharged from the service and at a meeting of the union immediately following the award, the decision was unanimously accepted. It is cause for congratulation that in this case the arbitration plan worked out satisfactorily, although it is difficult to conceive of any other result after the charges were proved.

SIGNAL LIGHTS AND LINE VOLTAGE

During the investigation of a recent wreck the point was brought out that, with those types of signal which obtain current for their lights from the trolley line, it was possible for the signals to become dimmed and even to go out when the voltage was reduced by the operation of several cars in the block. The possibility of these conditions is, of course, obvious enough, but this is, so far as we know, the first time that it has been suggested as contributory to a wreck. The lamps for such signals are necessarily subject to the same limitations as are those used for the illumination of car interiors, and the problem of maintaining a reasonably constant light in electric railway cars regardless of fluctuations of line voltage has never been satisfactorily solved. Certainly there is no room in a signal installation for a motor-generator or storage-battery outfit at each mast, to make the voltage of the signal lights independent of that impressed upon the line. Apparently the only practical solution of the difficulty would be the use of separate power wires for signal lights that are located far from substations or at other points where abnormal drafts of current are to be expected. It should not be overlooked, however, that there is absolutely no excuse for a collision due to the temporary dimming or obscuring of a signal light. One of the cardinal rules of signal operation is that a lack of indication must be regarded as a stop signal, and the motorman who runs by a signal in which no light is shown is clearly guilty of disregard of duty.

ECONOMIES OF THE SMALL WHEEL

The success of the experiment carried out by the United Railroads of San Francisco, in which standard motors were replaced by those of the so-called "baby" type developed by P. N. Jones of the Pittsburgh Railways two years ago, is a very gratifying demonstration of real economy. The reduction in power consumption effected by the change, which, according to the report published in the ELECTRIC RAILWAY JOURNAL for Aug. 8, will be introduced on 123 cars, was found to amount to about 0.5 kw-hr. per car-mile. This, at a rate of say 1 cent per kilowatt-hour, would equal about $150 per car per year in ordinary city service, a saving in excess of that prophesied in a recommendation of the scheme which was published in these columns just two years ago. The actual reduction in weight was 6220 lb., and this, on the frequently-quoted basis of 5 cents per pound per year, would amount to $310. As the total cost of the new motors and rebuilt small-wheel trucks was $1,682, the return on the investment would be 9 per cent when taken on the first basis and 18 per cent when taken on the second, and as the step heights of the car were reduced by the use of the small wheel to 12½ in. and 10 in. respectively, there is an indirect gain by the change in addition to that which may be expressed in dollars. That the use of the small wheel and the small motor will even pay for the cost of the change on old cars is a most emphatic argument in favor of their universal adoption for new equipment, and it is to be hoped that the action of the United Railroads will help to overcome the unaccountable slowness with which this important new development is being taken up by the electric railways of the country.

TRADE AND INVESTMENT

The point that undoubtedly stands out more than any other in the review of American export conditions published elsewhere in this issue is that trade follows investment. The two great competitors of the United States in South America are England and Germany, in the furtherance of whose trade one of the chief factors has been the enormous investments of capital, especially in railways and mines. The prominence of a few large English and German branch banks, which have lent active assistance to schemes of trade promotion and handling of credits, has also been an asset that must not be underestimated. At present the moment is propitious for the United States to institute moves along these lines. The home absorption of European capital has left most outside countries stranded without sufficient funds to follow out improvements begun and contemplated. It is true that the administration looks upon the American flotation of loans to European belligerents as a breach of that fine, unwavering neutrality we should exhibit, but our governing officials would certainly find cause for gratification if American capital sought South American or other neutral borrowers in order to strengthen our export trade. If branch banks could stir up American capitalists to the opportunities for investment in South American government bonds and private loans, they would well merit institution, to say nothing of the benefit that would accrue from the resulting closer touch with the fluctuating financial and credit conditions of South America. The National City Bank of New York has already taken the initial step along this line under the new currency act permitting the establishment of foreign branches by federal reserve banks. The imitation of this act by a few other large banks, and the placing of the branches in charge of men who not only speak the native language but also have an intimate knowledge of South American conditions and practices, should place our trade on much more than the incidental and occasional basis that has heretofore characterized it.

REGULATION FROM WITHIN

There is food for thought in the suggestion of President Frederic A. Delano of the "Monon" Railroad, and recently appointed by President Wilson a member of the Federal Reserve Board, that the railroads should form a "board of ethics" to keep an eye upon the doings of the railroad companies, exercising over them very much the same sort of espionage and regulation that a clearing-house committee has over the banks within its jurisdiction.

It is easy to find fault with this plan; easy to point out that such a committee would be regarded by the public as merely a whitewashing institution; that it would have no authority to coerce railroad managements; and in general to regard the whole idea as visionary and impracticable, not to say presumptuous, in view of the fact that we are already oversupplied with regulatory bodies instituted by the public and in which the public has more confidence than it would have in a committee of railroad men. Nevertheless the plan has very substantial merits which grow upon the imagination the more they are considered; and the idea is one that would work out as well in respect to electric roads as to steam lines. In fact, so far as its practicability is concerned, it would probably be easier to apply under the aegis of the American Electric Railway Association than under a general movement on the part of the steam roads.

But whether the situation in either industry is such that Mr. Delano's plan will ever be put into effect, it is highly suggestive as to what railroad men can do to better their positions before the public and in the eyes of governmental agencies. This becomes evident as soon as the plan is applied, by way of example, to some very familiar situations in the railroad world. But before doing this let us see how the scheme would work.

The committee on ethics would be constituted, by common consent, of railroad presidents who have established a reputation for ability as executives and for a high sense of their responsibilities to the public as well as to their stockholders. They would not wait until a railroad management was at the bar of a court, a commission or of public opinion; but if the action or prospective action of a railroad management was such as to threaten it eventually with censure and thus to bring down in some degree upon all railroads public or official condemnation, the committee on ethics would look into such a situation, it would make its representations to the management concerned, stating that the action of the road was disapproved by the committee and recommend that the offending management withdraw from the objectionable position or line of action that it had adopted or was contemplating. If objectionable acts or policies were persisted in, the committee on ethics would then be obligated to state to the public that the consensus of railroad opinion, as represented by the committee, disapproved of and disclaimed any responsibility for the acts of the offending road. This is a species of ostracism and disapproval that hardly any road would care to risk.

The weakness of the plan is not that this would be an ineffective remedy against railroad wrongdoing, but that it would be so harsh and destructive that doubts at once arise as to whether a committee could be found that would take such a position. If not, of course, the whole scheme falls to the ground; but it is to be assumed that if the plan were ever adopted at all, it would be adopted in good faith, and that the men who composed a committee such as that under discussion could not be frightened or influenced.

Broadly speaking, the great merit of some such plan as the one suggested by Mr. Delano is that it would work reformation from within; it would anticipate and prevent acts which have brought all railways into public discredit. If it had been in effect for the past few years it would have prevented, in large part, the difficulties through which the New Haven is now going; it would have made impossible some of the acts that have brought the Rock Island into bankruptcy and disgrace, and it would have prevented such humiliation as the Chicago, Milwaukee & St. Paul recently suffered when called to time by the Interstate Commerce Commission for some of that road's bookkeeping methods.

Another outstanding merit of the plan from the railroads' point of view is that it would prevent the many from being punished for the sins of the few. The main difficulty in the way of railroads getting a square deal at the present time is that the general public thinks that all railroad managements are as bad, or almost as bad, as the worst of which the public knows. A sincere, straightforward and effective movement on the part of railroad men themselves to clean house, to cast out evildoers, and among the railroads themselves to put the stamp of disapproval on practices which the general public condemns, would eventually do vastly more to improve the reputation of the railroads than any amount of coercion from without. The fact that a court corrects a railroad wrong does not improve the reputation of the road concerned or of the industry of which it is a part. But if the same correction was fearlessly applied by the roads themselves, beneficial effect upon public opinion would be immediate and more effective for reestablishing the reputation of the railroads than anything else that has yet been proposed.

THE WAR AND THE ELECTRIC RAILWAYS

Thoughtful electric railway men cannot fail to speculate at this time upon the ways in which the frightful slaughter now in progress in Europe is going, sooner and later, to affect their business. They realize instinctively that wholesale destruction must result in hardship to every citizen in the world, so closely knit together are all lines of industry in the fabric of financial credit. The results of the comparatively insignificant Balkan war showed this conclusively. In fact, the industries and people of a single civilized country like ours respond promptly to any success or disaster experienced by any other. Hence, in endeavoring to analyze the possible effects of the war on electric railways, we need to consider mainly what are to be the effects upon our people. In a recent issue of the *Journal of Commerce and Commercial Bulletin,* Prof. E. R. A. Seligman divides these effects into two kinds, immediate and ultimate. The immediate effect upon our industries will be to stimulate them. Business will be good, but prices high and work plentiful. Living expenses will be high, but wages will undoubtedly compensate for this. The ultimate results, according to Professor Seligman, are very difficult to predict. There must come sooner or later a shortage of capital with correspondingly high interest rates and a hampering of industry. To an unknown extent this will tend to neutralize in this country the stimulating effect already mentioned.

Turning now to the electric railway industry, we may attempt to analyze the effect on it of the war according to the principles derived by Professor Seligman, and considering the matter from the standpoints of gross income, operating expenses and the obtaining of new capital for extensions. From what has been said, it would appear that the operating ratio will not be greatly affected. If there should be an increase in industrial activity, the gross income of the railways should reflect this condition, but it would be counterbalanced probably to a considerable extent by increased operating expenses. But it is in connection with the obtaining of new capital for extensions that the electric railway companies will be most greatly affected. The capital requirements of the warring nations, both during the conflict and after its close, will demand cash, which can be secured most easily by a return of the American securities there held. This condition will glut the investment market to such an extent that only those new securities which are most attractive as regards yield can be floated here to advantage.

EFFECT OF WAR ON IMPORTS

While the war in Europe should ultimately result in great benefit to American manufacturers, especially if it is of long duration, some of our industries already have been forced to suspend business and others must soon follow, owing to their inability to obtain the refined materials necessary in their work. For instance, in the timber preservation industry, which has become an important factor in the railway and paving world, 70 per cent of the supply of creosote oils has become discontinued. Practically 80 per cent of the ferromanganese used in the manufacture of manganese steel is imported from England, where it is merely refined, being imported there from mines in Asia Minor. While there is a considerable supply in this country, the price has advanced so that it is almost prohibitive. On the other hand, most of the American ferro-manganese is owned by manufacturers of manganese steel products. According to Franklin K. Lane, Secretary of the Interior, the United States has great stores of manganese which has been largely untouched because it is of somewhat inferior quality. He thinks that to bring this home supply into use means merely the adoption of methods of purification which are known but which hitherto have not been exploited. In the end, therefore, the United States will be able to continue the manufacture of manganese steel without regard to foreign wars or sources of material.

Other important industries affected include the paint manufacturers, who obtain a large quantity of their pigments as well as colors from Europe. Manufacturers of batteries and carbon brushes also will feel the far-reaching effect of this almost world-wide struggle. Undoubtedly, in the end good will come of it. Where there is necessity there usually is an inventor, and American ingenuity is world-famed.

The creosote industry is a salient example of dependence on Europe, where there is little need for it. Although a sufficient quantity of coke-oven and gas-works tar is produced in this country to yield, if distilled, more creosote than present requirements demand, up to this time it has not been looked upon as a profitable manufacturing venture. With our disappearing timber resources American consumers have learned that they must avail themselves of preservatives. Moreover, this demand, along with the interruption of the supply, should be sufficient incentive to the manufacturers already engaged in producing American creosote oil to enlarge their plants. It is possible that the European situation may clear in a short time, but what has already taken place indicates a long struggle for supremacy, which will have a permanent effect on each of the belligerent countries' industrial relations with the rest of the world while tending to make the United States a "self-contained" country.

Manhattan Bridge Three-Cent Line

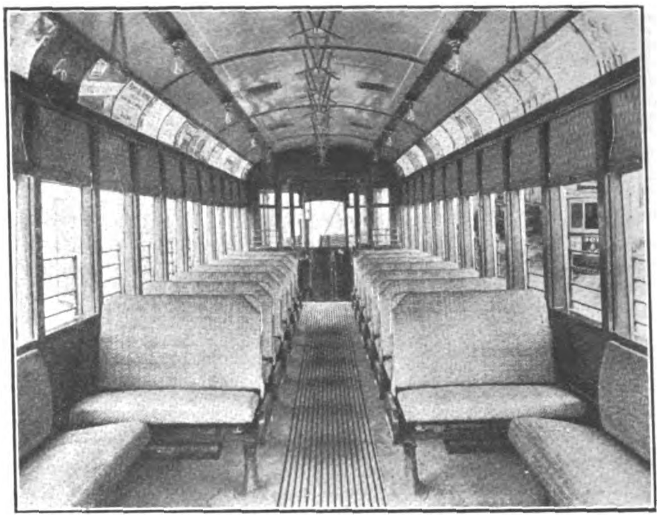
A Description Is Given of the Operation of the Manhattan Bridge Line, with Particular Reference to the Rolling Stock and Carhouse

The Manhattan Bridge Three-Cent Line is the corporate name of the railway which operates over the Manhattan Bridge between the Bowery, New York and Fulton Street, Brooklyn. This company began operation on Sept. 4, 1912, and a brief description of the conditions under which the service was begun was published in the ELECTRIC RAILWAY JOURNAL for Sept. 27, 1912, page 381.

The Manhattan Bridge line now comprises 2 miles of route or 4 miles of single track, exclusive of the tracks in the carhouse. On the Manhattan Bridge the cars are operated over tracks belonging to the city of New York, and on the Flatbush Avenue extension of the bridge into Brooklyn they are operated over the company's tracks jointly with the cars of the Brooklyn & North River Railroad, a corporation formed by the other traction companies of New York and Brooklyn to operate over the bridge and give transfers to the interconnecting lines for a 5-cent fare. The actual amount of non-carhouse track owned by the Manhattan Bridge Three-Cent Line is only 0.88 mile, and this includes four crossings and three crossovers of manganese insert work furnished by the Lorain and the New York Switch & Crossing companies. At present the company is seeking a franchise in Brooklyn to extend the present terminus at Fulton Street about ½ mile via Ashland Place to the Flatbush Avenue terminal of the Long Island Railroad. In the Borough of Manhattan the company is also seeking rights for an extension from the Bowery through Canal Street for about 0.8 mile to the Hudson River in order to give service across town and bring passengers to important ferries and steamship piers.

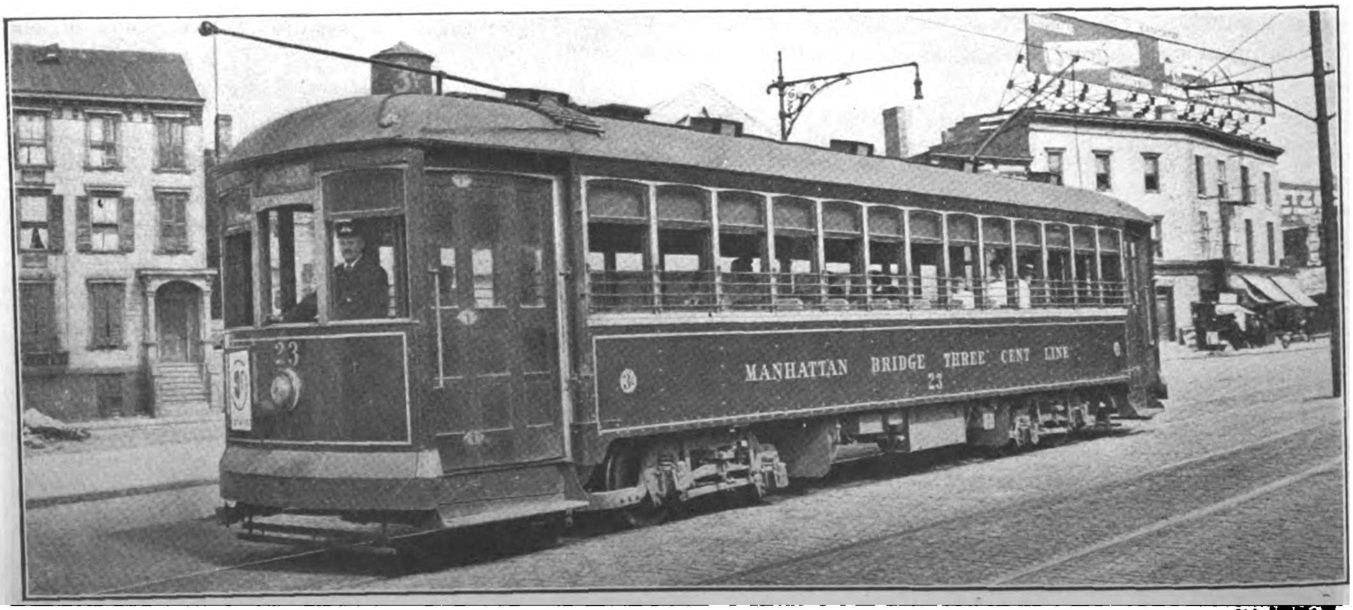
EARNINGS AND SERVICE

The Manhattan Line operates under a twenty-five-year franchise, paying $4,000 a year to the city out of gross receipts. In February, 1914, the company began to pay its first dividends at the rate of 6 per cent a year. At the present time 14,500 passengers a day are carried, practically all of whom pay fare with tickets purchased at the rate of two for 5 cents. In fact, not more than $8 to $9 a day is received in straight 3-cent fares. During the morning and evening rush hours cars are operated on a two-minute headway; between 10 a.m. and 4 p.m. on a four-minute headway, while the owl schedule calls for the operation of one car on a thirty-minute service from 12 midnight to 5 a.m.

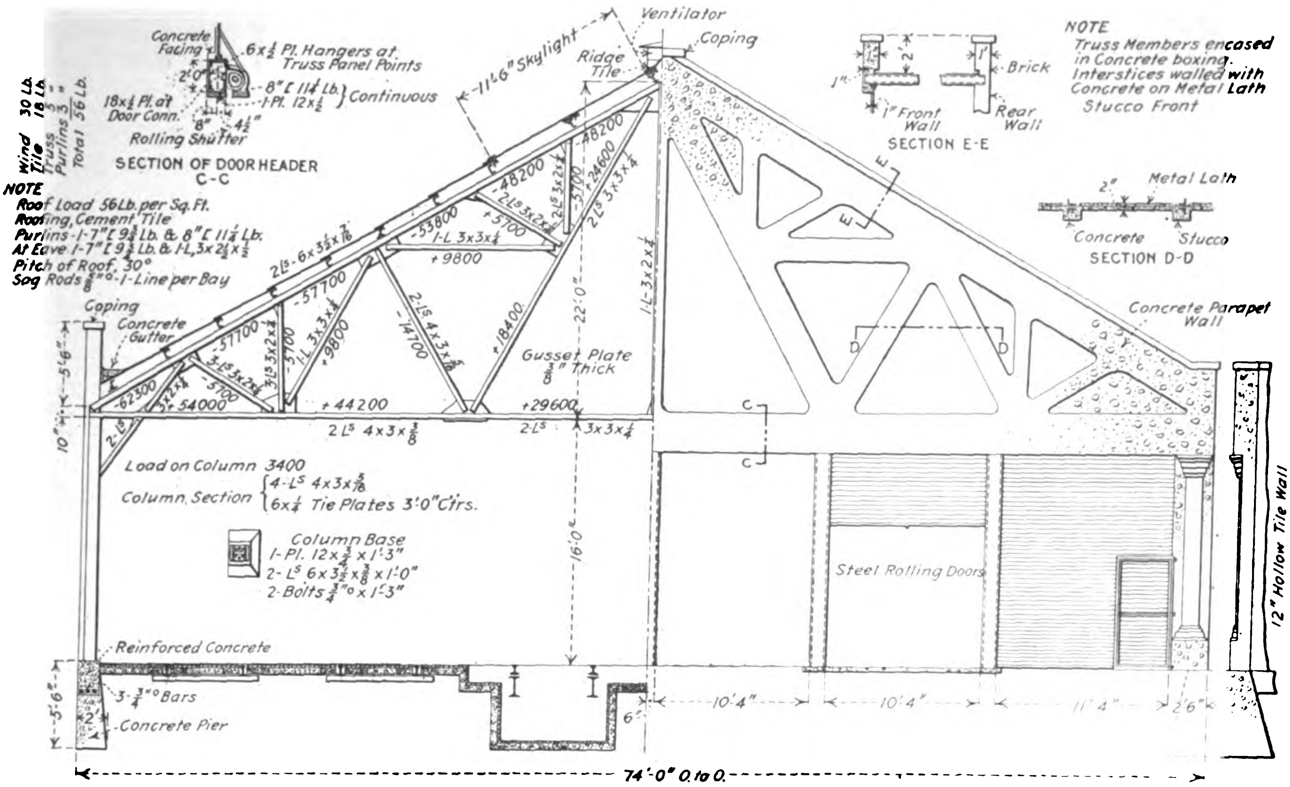


MANHATTAN BRIDGE LINE—INTERIOR OF STANDARD ARCH-ROOF CAR WITH CROSS SEATS

In addition to its practical freedom from maintaining a way department the company has no power station. Energy is purchased from the Edison Electric Illuminating Company, of Brooklyn, at the rate of 1 cent per kw-hr. Should the company use more than 100,000 kw-hr. per month the rate will be reduced to 0.7 cent per kw-hr. The line is fed from the Jay Street substation of the Edison Company, in which the railway has installed one 750-kw General Electric 3300-volt,



MANHATTAN BRIDGE LINE—TYPICAL ARCH-ROOF CAR; CARS WHICH ARE NOW ON ORDER DIFFER CHIEFLY IN THAT THEY HAVE FOLDING STEPS

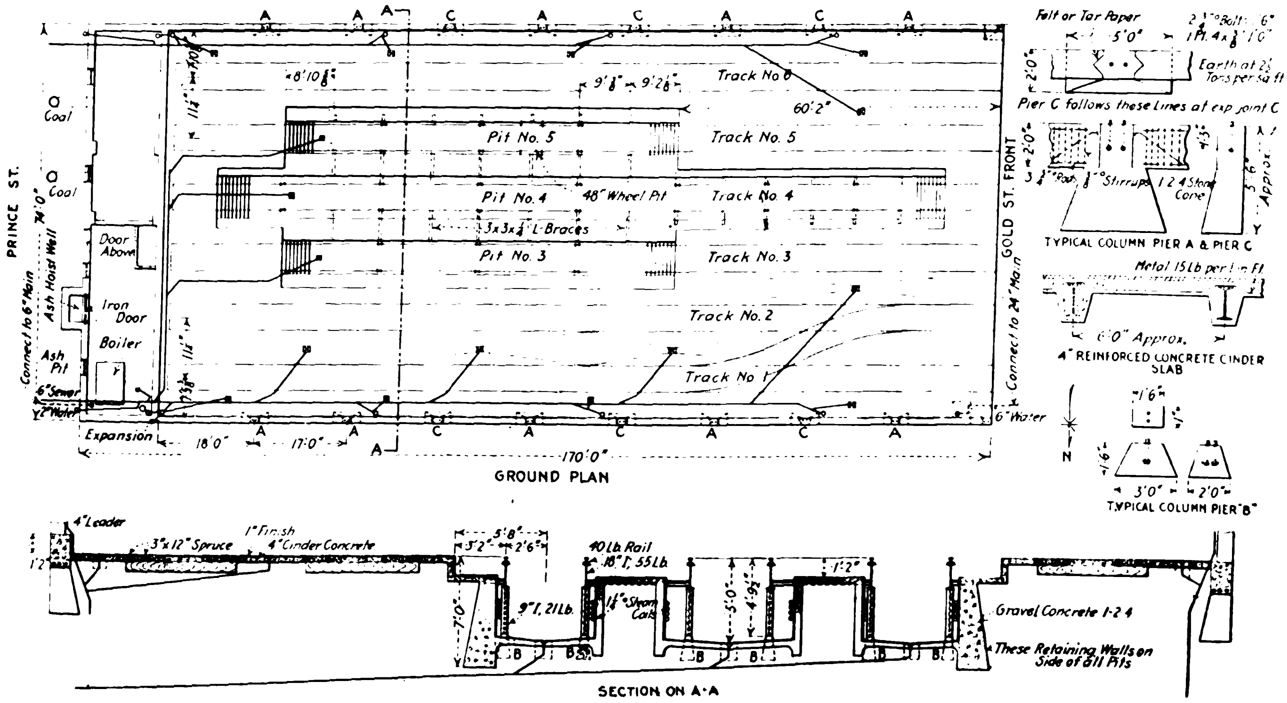

Concrete Facing
6x½ Pl. Hangers at Truss Panel Points
8"[11¼ Lb.
1-Pl. 12x½
Continuous
18x½ Pl. at Door Conn.
Rolling Shutter
SECTION OF DOOR HEADER C-C
Wind 30 Lb.
Tile 18 Lb.
Purlins 3 "
Truss 5 "
Total 56 Lb.
NOTE
Roof Load 56 Lb. per Sq. Ft.
Roofing, Cement Tile
Purlins 1-7"[9¾ Lb. & 8"[11¼ Lb.
At Eave 1-7"[9¾ Lb. & 1-L 3x2½x⅜
Pitch of Roof 30°
Sag Rods ⅝"ᵒ 1-Line per Bay
Coping
Concrete Gutter
11'6" Skylight
Ridge Tile
Ventilator
Coping
Gusset Plate ⅜" Thick
Load on Column 3400
Column Section 4-Ls 4x3x5/16, 6x¼ Tie Plates 3'0" Ctrs.
Column Base
1-Pl. 12x¾ x 1'3"
2-Ls 6x3½x⅜ x 1'0"
2-Bolts ¾"ᵒ x 1'3"
Reinforced Concrete
3-¾"ᵒ Bars
Concrete Pier
74'-0" O. to O.
Steel Rolling Doors
NOTE
Truss Members encased in Concrete boxing.
Interstices walled with Concrete on Metal Lath
Stucco Front
Front Wall
Brick
Rear Wall
SECTION E-E
Metal Lath
Concrete
Stucco
SECTION D-D
Concrete Parapet Wall
12" Hollow Tile Wall
10'4"
10'4"
11'4"
2'6"
22'0"
16'0"

MANHATTAN BRIDGE LINE—CROSS-SECTION AND ELEVATION OF CARHOUSE, SHOWING THE CHARACTER OF THE FLOOR, PIT AND ROOF CONSTRUCTION WITH SECTIONS OF SPECIAL DETAILS

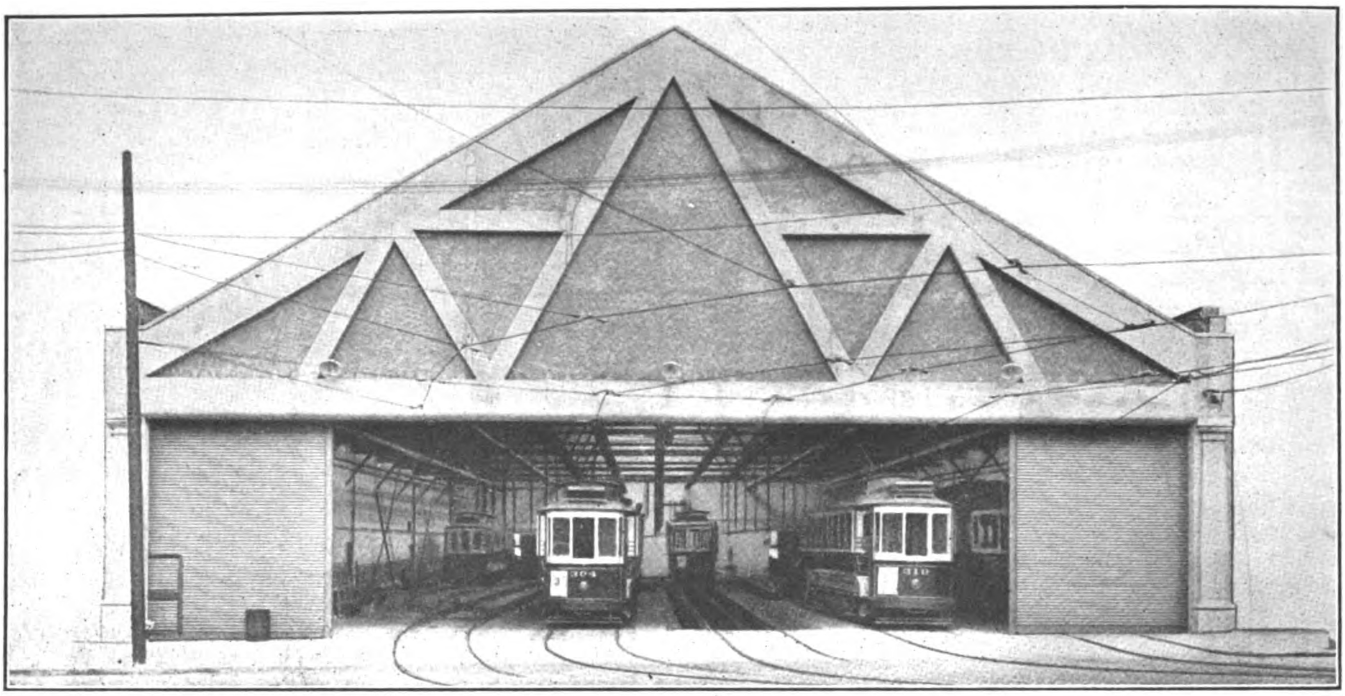
sixty-cycle, three-phase rotary converter, transformers, switchboard and other appurtenances.

ROLLING STOCK

The first rolling stock consisted of thirteen longitudinal seat, monitor roof cars, which were originally in the service of the Third Avenue Railway, New York. In August, 1913, however, the company purchased from the Cincinnati Car Company six arch-roof cross-seat cars of modern design, and six like cars were recently ordered from the Southern Car Company. In capacity six of the new cars correspond to eight of the monitor type, so that during the evening rush hours it will be necessary to operate only twelve cars instead of fourteen for the same number of passengers. It is intended gradually to eliminate the original longitudinal seat cars in favor of the new rolling stock which is equipped with the most modern devices for comfort and safety. Illustrations are presented of the first lot of arch-roof cars, from which the lot now under order will differ in


PRINCE ST.
GOLD ST. FRONT
Coal
Coal
Door Above
Iron Door
Boiler
Ash Pit
Ash Hoist Well
Connect to 6" Main
Connect to 24" Main
6" Sewer
6" Water
Expansion
Track No. 6
Pit No. 5
Track No. 5
Pit No. 4
48" Wheel Pit
Track No. 4
3x3x¼ L Braces
Pit No. 3
Track No. 3
Track No. 2
Track No. 1
60'2"
170'0"
74'0"
18'0"
17'0"
GROUND PLAN
Felt or Tar Paper
Earth at 2½ Tons per sq. ft.
Pier C follows these Lines at exp. joint C
TYPICAL COLUMN PIER A & PIER C
Metal 15 Lb. per Lin. Ft.
6'0" Approx.
4" REINFORCED CONCRETE CINDER SLAB
TYPICAL COLUMN PIER "B"
4" Leader
3"x12" Spruce
1" Finish
4" Cinder Concrete
40 Lb. Rail
18"[55 Lb.
9"[21 Lb.
Gravel Concrete 1-2-4
These Retaining Walls on Side of all Pits
SECTION ON A-A

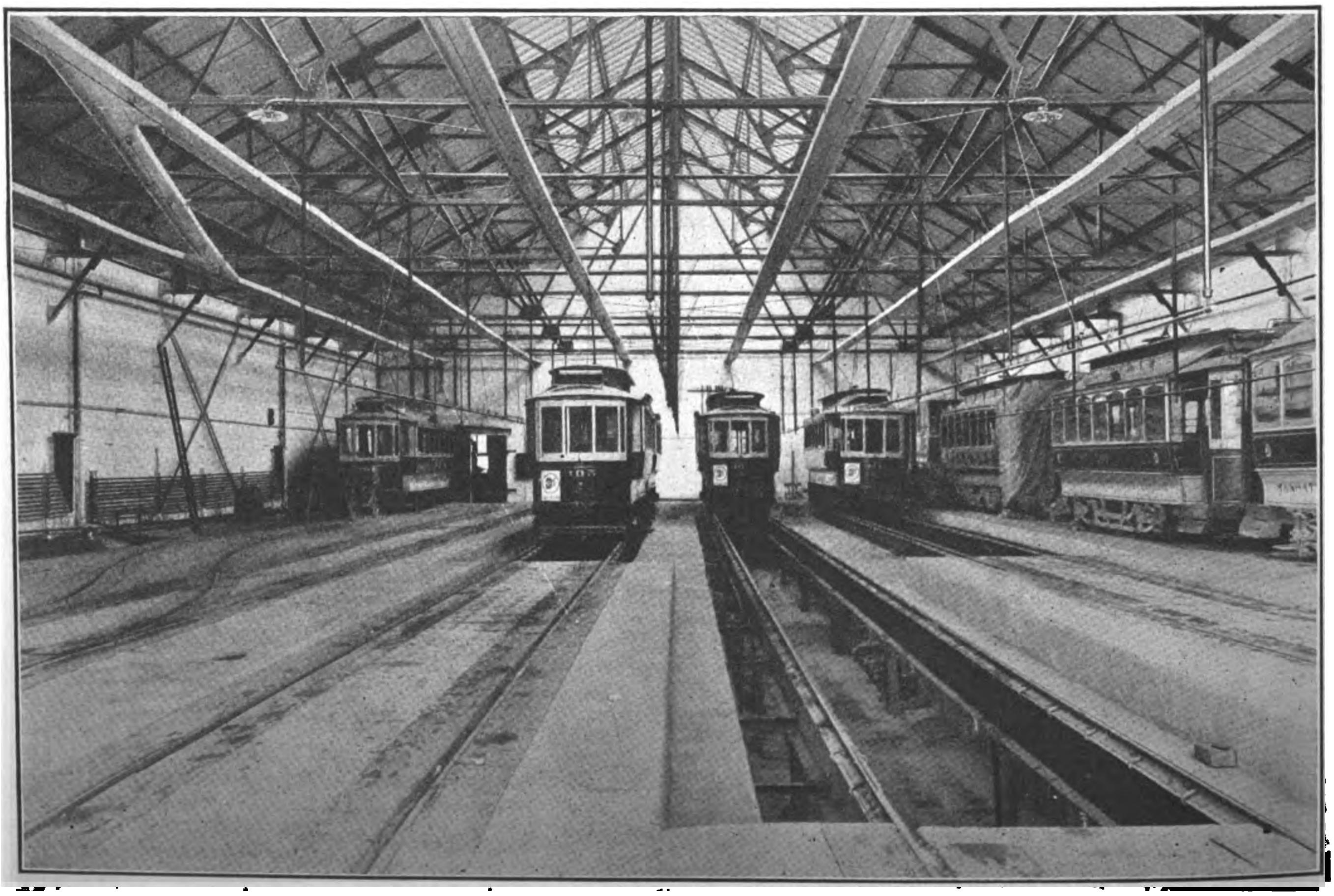
MANHATTAN BRIDGE LINE—GENERAL PLAN, SHOWING LENGTH AND LOCATION OF PITS, CROSS-SECTION OF FLOORS, PIT CONSTRUCTION AND MISCELLANEOUS DETAILS



MANHATTAN BRIDGE LINE—FRONT AND OPERATING END OF CARHOUSE, SHOWING THE STUCCO FRONT

a few particulars. The most important change is that folding steps in connection with four-leaf instead of three-leaf doors will be provided. These cars will be built with a steel underframe and composite body, with interior trim of cherry and with a headlining of Nevasplit. The principal data on the new cars follow:

Seating capacity, forty-eight passengers; weight of car body alone, 16,500 lb.; length over the vestibules, 43 ft. 6½ in.; length of the body, 33 ft. 3 in.; bolster centers, 21 ft.; width over the sills, 8 ft., and height from rail to trolley base, 11 ft. 1¾ in. The trucks will be of Baldwin 54-18 ML-2 design with Symington journal boxes and two Westinghouse 323-A-2 inside-hung motors. The Westinghouse air brakes will be supplemented by "Giant" hand brakes. Other equipment on these cars will consist of Gold heaters, Crouse-Hinds headlights, Lord trolley bases, H.B. wheelguards, Railway Utility ventilators and HL-F control. The wheels for these cars are to be Standard steel drivers and Ramapo special chilled-iron ponies. The longitudinal



MANHATTAN BRIDGE LINE—INTERIOR VIEW OF CARHOUSE, SHOWING LIGHTING, SPRINKLER SYSTEM AND PITS seat cars are equipped with Ramapo 2¼-in. chilled-iron driving wheels which are being changed from ¾-in. to ⅝-in. flanges in order to eliminate chipped flanges.

The remaining rolling stock of the company comprises one Brill sweeper, which served to keep the entire line open during the severe snowstorms last winter.

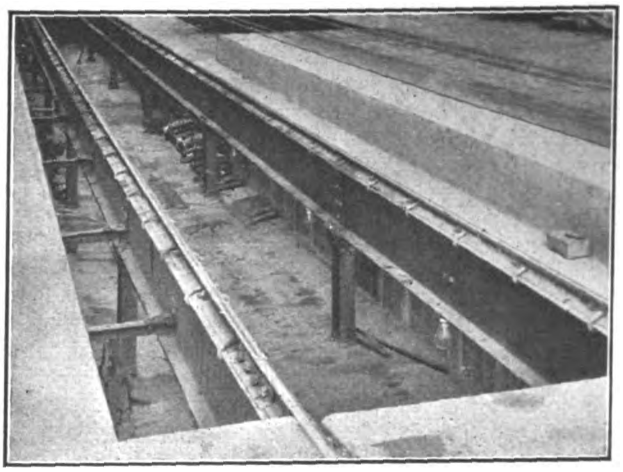
CARHOUSE AND SHOPS

On the east side of Gold Street and 100 ft. north of the intersection of the Flatbush Avenue extension with Myrtle Avenue, the company erected the handsome tile and stucco front carhouse shown in the accompanying illustrations. This structure houses all of the rolling stock and also has a brick-partitioned room at the rear for shop purposes. As shown in the accompanying plan, the entire building is 170 ft. deep x 74 ft. wide, thus permitting the installation of six tracks. Three tracks have pits, one for heavy overhauling and two for inspection.

The piers, pit walls and pit floors and the carhouse floors are of concrete as indicated on the drawings, but the shop floor over the boiler-room is of reinforced concrete. The longitudinal walls are of 12-in. x 12-in. x 12-in. terra cotta blocks built in panels between steel columns and set on reinforced concrete girders. The rear wall, like the shop partition, is of 12-in. brick. These walls are furnished with piers to support the tank installed for the sprinkler system. The roof tiling is of "Bonanza" expanded metal interlocking cement type made by the American Cement Tile Company. This tile is so installed that the whole roof can be taken off, leaving merely the steel framework. A central wired glass skylight, 11 ft. 6 in. wide on each side, extends for the complete length of the car storage section. The effective natural lighting thus obtained is demonstrated by the clear views of the interior.

The neat front of the building has been secured by stuccoing the front girder as illustrated. The stucco finish was made up of one part of Portland cement, two parts of stone and four parts of Peekskill gravel. It was applied only to the panels, the truss outlines being faced with a smooth finish of one part cement and one part fine sand. This front is carried on two ornamental columns which have a molded cap and base.

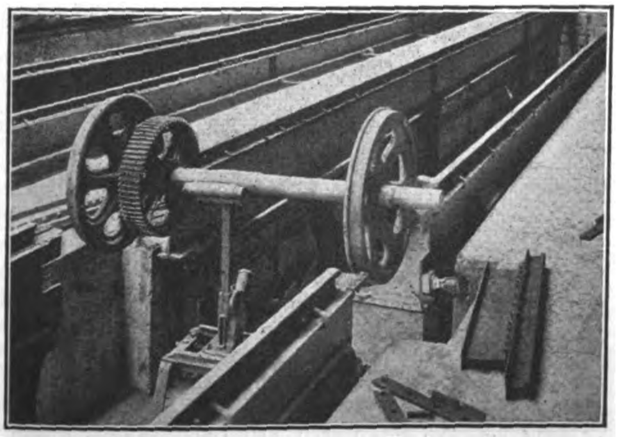
The illustrations of the inspection and overhauling pits show interesting variations from common practice. The main floor of the carhouse is flush with three storage tracks which are bounded by 3-in. x 12-in. spruce timbers on each side of the rails to take up vibrations that would otherwise break the concrete. At the inspection and overhauling tracks, however, the floor, including the devil strips, is dropped 14 in. perpendicularly for the convenience of men working alongside of the cars. At the overhauling tracks the pit walls are set back 14 in. from the pit columns so that a man can stand erect between the columns and the wall to handle any repairs or changes at the sides of the trucks and bodies. All pit tracks are hook-clipped to 18-in. I-beams.



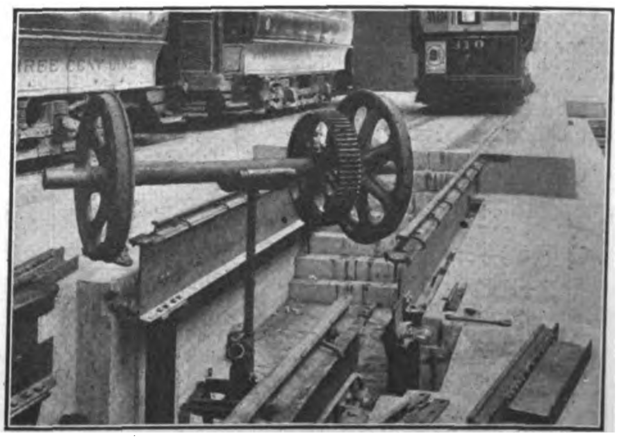
MANHATTAN BRIDGE LINE—OVERHAULING PIT WITH DEPRESSED FLOORS AND STANDING ROOM BETWEEN PIT COLUMNS AND WALLS

Some of the illustrations show the interesting form of wheel pit which was improvised at one of the inspection pits after the carhouse had been in service for some time. The pit was made by constructing an alcove in each wall and by cutting the rails and their I-beam supports, the removable section being reinforced later by smaller intermediate I-beams as indicated. To replace an axle set the car is jacked up, the rails are removed and then the set is lowered to the top of a 10-ton Barrett armature lift, the wheels and axle then being swung around to any convenient angle. A pony set was recently removed and replaced in this way in twenty-nine minutes. The total cost of making the wheel pit was $138.

The carhouse and its contents are protected against fire by Niagara ceiling and aisle sprinklers, furnished by Evans, Almirall & Company. The sprinkler system is connected to an indicator which gives an alarm whenever the water in the tank has reached either the high or the low levels. Hose lines are also installed for fire protection as well as for car washing. The track entrances of the building are supplied with five Wilson steel rolling doors, while approved type Underwriter's fused fire doors are used elsewhere. The fireproof construction of the building, backed by the sprinkler sys-



MANHATTAN BRIDGE LINE—WHEEL PIT AND JACK IN INSPECTION PIT



MANHATTAN BRIDGE LINE—WHEEL PIT, SHOWING REMOVABLE RAIL AND OTHER DETAILS tem, enabled the company to insure the building for only $0.114 and the contents for only $0.336 per $1,000.

The building, including the pits, is steam-heated from a Richardson & Boynton boiler, on the direct system. During the coldest days of the recent severe winter 4 lb. steam pressure was enough to maintain a temperature of 70 deg. Fahr. with closed doors. The boiler is installed in the shop basement, which contains the storage for coal and sand. The latter are delivered from the sidewalk on Prince Street by way of one swinging chute. The sand drier is of the Electric Service Supplies Company's type, with a capacity of 3½ tons for twelve hours.

The carhouse is lighted by means of twelve incandescent clusters hung from the roof trusses, each cluster having five 40-watt lamps with a 20-in. steel reflector. In addition, brackets on each longitudinal wall carry one 40-watt lamp protected by wire guards. There are four similar lamps on the rear wall of the carhouse. The inspection and overhauling pits contain thirteen 25-watt wire-guarded lamps, which are fastened to the bottom flange of the I-beams in staggered relation. Tungsten lamps are also used in the shop. The front of the carhouse is supplied with three five-lamp clusters.

The shop and storeroom located behind the car storage comprises a small smithy, a drill press and a grinder, but the company plans to install a lathe with a 12-ft. bed and 4-ft. swing for simple work. Its wheelwork is done by the Ramapo Iron Works.

The cost of the carhouse, including the steel rolling doors, sprinkler system and other fixed equipment, was $40,000. The building was erected under the supervision of J. M. Johnson, general superintendent, who also had charge of all other construction work in connection with this property.

The Cost of Supplies in Railway Units

S. H. Bennett, auditor Hagerstown (Md.) & Frederick Railway, recently prepared for the information of all employees a schedule which shows the value of a large number of items in terms of the cost of carrying passengers or tons of coal per mile. The list not only relates to supplies in all departments, but also to the equivalents of missed fares, freight losses, personal injury claims, service loss of damaged cars, derailments, broken wires, etc. This instructive schedule and the introduction to it follow:

WHAT IT COSTS!

Did you ever stop to think what carelessness, indifference and neglect cost this company? Do you know that when you lose or throw away a half-used broom, this company has to carry ten passengers 1 mile, or 11.6 tons of coal (inter-line freight) a similar distance, just to get even again, by reason of your act? The table below will tell you what some other items cost this company, figured on the basis of service necessary to offset. Read this carefully.

		Passengers Carried 1 Mile	Tons of Coal Moved 1 Mile
4	Railroad spikes lost or mislaid	2.5	3
1	Spiking hammer handle	6.5	8
¼	Lb. switch rubber	12.5	14.4
1	Dry cell	9	10
1	Trolley rope	20	23.1
1	Trolley feed ear	7.5	9
1	Curve suspension	12.5	14.4
6	Sheets sand paper	1.5	1.6
20	Nuts, ¼ in.	5	5.8
1	Trolley catcher	250	288
1	Car window catch	8	9
6	Lock washers	1.5	1.6
1	Trolley wheel	45	52.2
4	Trolley wheel washers	2	2.3
10	Cotter pins	2.5	3
1	Trolley pole	62.5	72
1	Ball tape	6	6.4
1	Gem lamp	7.5	9
1	lb. waste	4	4.6
1	Tungsten lamp	16	18.4
1	Headlight globe	5	5.8
2	Fuse plugs	3	3.2
1	Pony glass insulator	1.5	1.6
1	Transmission insulator	5	5.8
1	Rail bond	17.5	21
2	Lag bolts, 4 in. x ⅝ in	2	2.3
1	Glass 23 in. x 34 in	26	32
1	Pair Rubber gloves	150	174
1	Fuse—5 amp	8	9.2
1	File, 14 in.	15	17.4
1	Leather register cord	84.5	98
1	Cap badge	30	34.8
1	Air hose gasket	2	2.3
1	Journal box spring	7.5	9
1	Hack saw blade	4	4.6
2	Lbs. nails, 20 d	2.5	3
1	Cash fare missed, 5 cents	2.5	3
1	Cash fare missed, 10 cents	5	5.9
1	Cash fare missed, 25 cents	12.5	14.4
1	Lantern	37.5	43.2
1	Broom—new	20	23.1
1	Broom—half used	10	11.6
2	Postal cards	1	1
1	Stamp—2 cents	1	1
1	Ticket punch	87.5	100
3	Sheets carbon paper	4	4.6
20	Waybills (blank)	3	3.5
20	Conductor's manifests (blank)	3	3.5
30	Conductor's envelopes (blank)	2	2.3
1	Shovel	37.5	43.2
1	Pick	25	29
1	Iron bracket—11 ft	100	115.2
	Overhead line down (simple break)	130	150
	Broken car wheel (cast)	1100	1270
	Switch iron lost	12.5	14.4
	Loss of freight ($5 claim)	250	288
	Loss of freight ($10 claim)	500	576
	Personal injury ($15 claim)	750	864
	Personal injury ($25 claim)	1250	1440
	Personal injury ($50 claim)	2500	2880
	Personal injury ($100 claim)	5000	5760
16	In. of 4/0 trolley	8	9.2
1	Lead pencil	2.5	3
4	Pens	2	2.3
	Labor wasted, 1 hour at 15 cents	7.5	9
	Labor wasted, 1 hour at 20 cents	10	11.6
	Labor wasted, 1 hour at 25 cents	12.5	14.4
1	Oz. rubber bands	7.5	9
1	Phone call (toll), 15 cents	7.5	9
1	Phone call (toll), 30 cents	15	18
1	Armature burned out	2000	2312
	*Derailment—replaced by crew—		
	Time, two men, one-half hour each	8	9
	Time, two men, 1 hour each	16	18
	*Derailment—line car used—		
	Time, four men, one-half hour each	52	60
	Passenger car damaged—		
	Loss of revenue, one day	1500	1728
	Loss of revenue, two days	3000	3456
	Loss of revenue, three days	4500	5184

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*Damage to car not included.

Production of Pig Iron

The production of all kinds of pig iron in the United States in the first half of 1914, according to the Bureau of Statistics of the American Iron and Steel Institute, amounted to 12,536,094 gross tons, against 14,477,550 tons in the last half of 1913, a decrease of 1,941,456 tons, or more than 13.4 per cent. In the first half of 1913 the output was 16,488,602 tons. Comparing the output in the first half of 1914 with the output in the first half of 1913 shows a decrease of 3,952,508 tons, or more than 23.9 per cent.

The following table gives the production of pig iron in the United States in half-yearly periods for the last ten years:

Years, Gross Tons	First Half	Second Half	Total
1905	11,163,175	11,829,205	22,992,380
1906	12,582,250	12,724,941	25,307,191
1907	13,478,044	12,303,317	25,781,361
1908	6,918,004	9,018,014	15,936,018
1909	11,022,346	14,773,125	25,795,471
1910	14,978,738	12,324,829	27,303,567
1911	11,666,996	11,982,551	23,649,547
1912	14,072,274	15,654,663	29,726,937
1913	16,488,602	14,477,550	30,966,152
1914	12,536,094	....	....

As shown above the maximum production of pig iron in any two half-yearly periods was reached in the twelve months from July 1, 1912, to June 30, 1913, when the output amounted to 32,143,265 tons. The next largest output was in the twelve months of 1913, when 30,966,152 tons were made. The output in the first six months of 1914 was the smallest in any half year since the last half of 1911.

Saving Power on the New York, Westchester & Boston Railway

A Description Is Given of the Methods That Have Reduced the Average Power Consumption of the Cars on This Suburban Line by Nearly 50 Per Cent Through the Use of Recording Watt-Meters and the Establishment of Competitive Records for Motormen

The astonishing economies that become possible through consistent attention to the matter of power consumption by motormen are seldom realized, and as an example of this may be cited the results of a campaign along this line which has been made by the New York, Westchester & Boston Railway. These results show that the power cost on an electric railway may be practically cut in half. As indicated in the accompanying diagram, the power consumption on this road has been reduced approximately from 8 kw-hr. per car mile to 4.5 kw-hr. per car mile. It should be said also that continued instruction of the motormen is expected to result, eventually, in still greater reductions in the amount of power consumed, because the railway officials believe that the best possible results have by no means been accomplished.

On the New York, Westchester & Boston Railway the service is of a typical suburban character. Trains are run at frequent intervals from New York to White Plains and to New Rochelle. On the White Plains line, which is 19.56 miles long, the local trains make twenty-two stops, and the schedule calls for a running time of forty-seven minutes. This gives a schedule speed of 25 m.p.h., with 1.12 stops per mile.

Approximately half of the total number of trains on the White Plains line are run as expresses between Harlem River Station in New York City and Mount Vernon—a distance of 10.33 miles. Over this run three stops are made, and after Mount Vernon is reached the trains continue on to White Plains as locals, making a total of eleven stops over the 19.56 miles of route, the running time being thirty-seven minutes. This gives a schedule speed of 31.7 m.p.h., with 0.56 stop per mile.

Half of the total number of trains on the New Rochelle line also run as expresses over the 10 miles between the Harlem River and Mount Vernon, making three stops as in the case of the White Plains expresses, and the other half of the trains run as locals all the way to New Rochelle. The distance is 12.23 miles and the local trains make eighteen stops, the running time being thirty-four minutes. This gives a schedule speed of 21.6 m.p.h., with 1.47 stops per mile. The express trains on the New Rochelle line make four local stops in addition to the three express stops over the first ten miles of the run, and this makes a total of seven stops in the distance of 12.23 miles, which is covered in twenty-four minutes. The schedule speed for the New Rochelle expresses is therefore 34.6 m.p.h., with 0.57 stop per mile.

In practically all cases the motormen alternate between express trains and local trains, taking an express run one way and returning on a local. These service requirements are not far from the limit of the capacity of the equipment, as the cars are provided with an automatic over-speed control that limits the speed to 56 m.p.h. In fact, the time-card calls for a schedule speed that is close to the absolute upper limit set by the number of stops per mile as generally accepted in engineering practice.

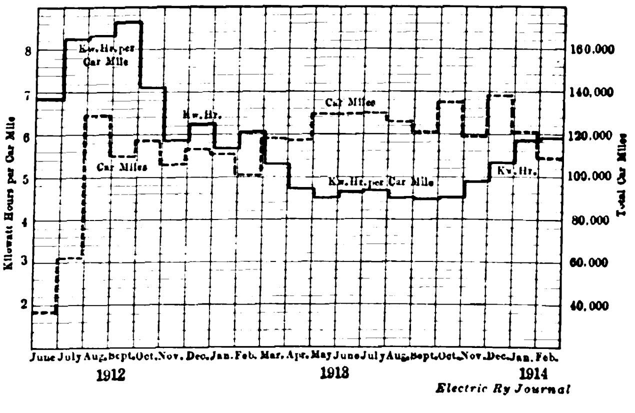
The following table shows comparative figures of theoretical maximum and actual speeds based upon an acceleration of 1.2 m.p.h.p.s. and deceleration during braking of 1.6 m.p.h.p.s., the free running speed being 56 m.p.h.

	Stops per mile		
	0.56	1.12	1.47
Theoretical maximum schedule speed	35 m.p.h.	26 m.p.h.	23 m.p.h
Actual schedule speed:			
New Rochelle expresses	34.6 m.p.h.		
White Plains expresses	31.7 m.p.h.		
New Rochelle locals			21.6 m.p.h.
White Plains locals		25 m.p.h.	

The cars used on this line are 72 ft. long and are equipped with two motors each of 175-hp hourly rating. These are designed to give an acceleration of 1.2 m.p.h.p.s. on level track, and as previously mentioned the running speed is limited to 56 m.p.h. At the present time the road is operating practically without delays of any kind. The cars, completely equipped, weigh about 120,000 lb. and the estimated average passenger load brings the total weight of the car up to about 65 tons under ordinary circumstances.

Record of Reduction in Power Consumption

As shown by the accompanying diagram, the average power consumption increased from about 7 kw-hr. per car mile in June, 1912, to about 8 kw-hr. in July. This increase was caused by the opening of the line to White Plains which occurred in July, 1912. As this line requires all trains to make eight stops in the last 9 miles of the route, the distance operated under local-service conditions was proportionately increased. The effect, therefore, of the express run over the New York end of the line was decreased, raising the average power consumption per car mile. In September, 1912, an increase in power consumption also took place, as shown by the diagram. This was due to the fact that the schedule speed on the New Rochelle division was increased materially with a consequent increase in consumption of power.



WESTCHESTER POWER—UNIT POWER CONSUMPTION SINCE BEGINNING OF OPERATION

During these months no particular attempt was made to reduce power consumption by the motorman, but in October, 1912, a traveling instructor for motormen was employed and the results of this became apparent through the reduction of power consumption to about

7 kw-hr. per car mile during October and to 6 kw-hr. per car mile in November.

In December, 1912, however, a competitive system was introduced by which the power consumption records of all motormen were kept in detail and publicly posted each month, the motormen being held accountable for failure to keep their records close to the minimum consumption. This scheme was placed in active operation in January, 1913, and the results are shown in the diagram by the gradual decrease during the months preceding November, 1913, to a power consumption of about 4.5 kw-hr. per car mile. Based on the weight of approximately 65 tons for a loaded car this is equivalent to 69 watt-hours per ton-mile, the average schedule speed for all classes of service on both divisions being 26.4 m.p.h. with 0.93 stop per mile.

It will be seen that from November, 1913, until February, 1914, a considerable increase in power consumption took place. This is due in part to the fact that the figures as shown include the current used by the lamps, electric heaters and all auxiliary apparatus for the cars. During the month of March of this year the matter was agitated actively, with the result that the power consumption was reduced to an average of 5.35 kw-hr. per car mile for the month, notwithstanding the fact that the cold weather necessitated a liberal use of the car heaters. This consumption, it may be said, is 10 per cent less than that of the preceding month, and now that attention to the matter has been revived it is expected that the records of 1913 will be easily surpassed.

METHOD OF COMPILING MOTORMEN'S RECORDS

The power consumption records are obtained by recording watt-hour meters carried on each car. These watt-hour meters are read by the motorman at the beginning and end of each trip, and the readings are entered in a blank form which is turned in to the chief dispatcher at the end of each day. The form provides spaces for the car numbers, the train numbers, the points between which each of the motormen's runs was made, the reading of the watt-meter at the start and at the finish of each run, the time of starting and of arrival of each train and for the power used during the terminal switching at the end of each run.

As motormen have lay-overs lasting from twenty to thirty minutes after each round trip and the cars are sent back at once, the men generally change cars after each round trip, and, to avoid the possibility of motormen turning in incorrect readings of the watt-meter, the car inspector at the terminal also reads the watt-meter on every car as soon as it arrives and also reads it again when the car is ready to leave for its return trip. At the end of each day the inspectors send their reports to the chief dispatcher, who checks their readings against those of the motormen. Discrepancies between the two sets of readings now seldom occur, but when they are found the motorman involved is promptly advised.

The necessity for taking readings at the end of each trip and at the beginning of the next is due to the fact that while the car is lying in the terminal or being moved around a certain amount of power is consumed by the auxiliaries, by the lights and heaters, and by the switching of the car itself. These terminal power consumptions run from 2 kw-hr. to 4 kw-hr. at each layover, and the power thus used is charged against the inspector and not against the motorman.

The use of watt-meters for establishing power consumption records has been found to be most satisfactory in every respect. The trains on the line are subject at times to delays on account of a drawbridge on the tracks of the New Haven Railroad over which the Westchester cars have to run to reach the Harlem River terminal, and on this account southbound trains are sometimes late at Harlem River through no fault of the motorman. In such cases the fact that the train is late entering the terminal does not affect the motorman's record. No special provision is made for delayed trains, and adherence to schedule is considered of more importance than low power consumption. However, the presence of the watt-meters places a premium upon gradual acceleration and braking, so that the motormen display no tendency to rack the equipment by too rapid starts and stops. As the power used by the car heaters is included in the watt-meter reading it has been found that motormen even take particular care to avoid running the heaters unnecessarily, and in this way a considerable amount of power is saved during the winter season. In fact it is not unusual for motormen to cut out heaters during a trip when the car is heavily loaded and in consequence becomes warmer than necessary, although the adjustment of heaters is ordinarily regulated at the terminals under orders from the chief dispatcher.

The watt-meters are tested about three times a year. At these times the meter is removed from the car and tested on a bench by connecting it across a known resistance through which a certain current is passed. The meter is then replaced, generally on the same car from which it was taken, as a test occupies but a few minutes. The record is entered on a special form which provides space for the meter number, for the number of the car from which it was removed, for the car to which it was applied, for the date of the test and for the percentage of error. In general the error is found to run about 1 per cent above or below the exact figures and in such cases no adjustment is made, although the work of adjustment is a very easy matter. In view of the fact that motormen seldom use any one car for more than one round trip the slight errors in the different meters are averaged up among the various motormen.

METHOD OF REDUCING POWER CONSUMPTION

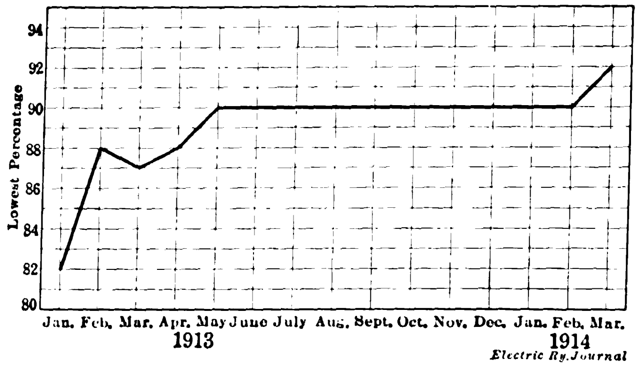
At the present time the operating methods of all motormen are being given special attention. It is customary for the men whose records are poor to be coached by the chief dispatcher, who rides with them and indicates the shutting-off points that are best, under normal conditions, for securing the maximum amount of coasting distance without dropping behind the schedule. No necessity exists for teaching the motormen not to apply power while the brakes are dragging, as the cars are all equipped with an air-brake-and-control interlock which automatically prevents this. The method of making a stop is standardized, as the permanent instructions call for one sufficiently heavy reduction in the train pipe pressure at a predetermined point in advance of a station, the brakes then being graduated off as required to make the stop at the exact point desired. In addition, there are certain places where a motorman can gain thirty or forty seconds on the schedule, and these are pointed out by the chief dispatcher when he is coaching backward motormen. Such places are found between stations where the run can be made in, say, two minutes and thirty seconds, although the time-card naturally has to allow a full three minutes for it. They provide an opportunity for accelerating slowly in case the train is on time, or else for making up time without excessive use of power in case the train happens to be late.

In addition to covering these matters the chief dispatcher, when he rides with motormen, makes a general point of seeing that the trains are not held unduly at the station stops. In fact, it has been found that the rapidity with which bell signals are transmitted makes an important difference in the power consumption. This fact was discovered when some of the conductors were changed around on different runs so that they worked with new motormen. Since their efforts toward reducing the time spent at station stops can affect materially the motormen's records the conductors' names have been included recently with the motormen's names on the competitive list, the same motorman and conductor generally staying together on any given run during the greater part of each month.

The competitive lists show the names of all motormen and the conductors running with them in order of merit, the positions of the men being determined on a percentage basis. These lists until recently have been posted daily in addition to the final monthly reports, as the records for each day can be made up in the chief dispatcher's office by one man in from three to four hours, and can be posted by noon of the day after the records are made. The preparation of the lists includes the work of checking the inspector's reports of meter readings with those turned in by the motormen, together with the calculations involved by reducing the total number of kw-hr. used by each motorman to a basis of kw-hr. per car mile.

However, at the present time these daily lists have been discontinued and the records are now posted to show only the whole month's performance. In this connection it may be said that the bills for power purchased on the New York, Westchester & Boston Railway are based upon the readings obtained from the wattmeters on the cars, the chief dispatcher including, with his records of power used for propelling cars, that used by the inspectors and by the motormen at terminals. He enters all figures in a book, which includes a record of the heaters ordered on or off from the dispatcher's office and remarks as to delays or special conditions.

As an indication of the steady improvement that has followed the efforts of all concerned, the diagram below is shown. This indicates that since the competitive system was introduced in January, 1912, the low men on the list have improved to such an extent that, while the first month of operation under the competitive system indicated a difference of 18 per cent between the lowest man and the highest, the record last month showed a difference of but 8 per cent. This difference between the lowest man and the highest occurred on the New Rochelle branch, while on the White Plains branch the difference was but 7 per cent. The average efficiency of all men during the month of March, 1914, was 95 per cent on the White Plains branch and 97 per cent on the New Rochelle branch, three men being tied for 100 per cent efficiency on the latter line.



WESTCHESTER POWER—DIAGRAM SHOWING IMPROVEMENT OF LOW-RECORD MEN

As before mentioned, the power registered by the watt-meter includes that used by all of the auxiliaries, and these have been found to consume power approximately as follows:

Heaters	23 kw
Main motors in starting	670 kw
Main motors at 40 m.p.h.	192 kw
Transformer	3.5 kw
Air compressor	8.0 kw
Transformer blower	3.0 kw
Motor-generator set	.05 kw

In general the heaters, which are arranged in two groups, take about 15 kw during the winter months, the full consumption of 23 kw applying only to exceptionally cold days. In the summer, of course, no current is used for this purpose. The power used by the transformer is a constant loss, winter and summer, while the air compressor is in use about one-third of the time. The power used by the blower and the motor-generator is constant. In addition to these items there are forty-two 23-watt Mazda lamps which are used at night and also during a short period in each trip while the car is passing through a mile-long tunnel on the route.

Statistics of Steam Railroads

The Interstate Commerce Commission recently issued an abstract of the statistics of steam railroads in the United States for the year ended June 30, 1913, based upon compilations for the twenty-sixth annual statistical report made from the annual returns of carriers having operating revenues over $100,000 and also of railroads owning property operated under lease or other agreement by those carriers. On June 30, 1913, the roads represented 244,418 miles of line, including 11,163 miles used under trackage rights. The aggregate mileage of railroad tracks was 369,580 miles. There were 63,378 locomotives in service, an increase of 2102 over the previous year. The total number of cars was 2,445,508, an increase of 76,566. The total number of employees was 1,815,239, an increase of 115,298, and the total amount of wages and salaries paid during the year was $1,373,830,589.

The par value of the amount of railroad capital outstanding June 30, 1913, was $19,796,125,712, including $8,610,611,327 of stock and $11,185,366,426 of funded debt. The amount of dividends declared during the year was $368,606,327, being equivalent to 6.38 per cent on the dividend-paying stock. The average rate of dividends paid on all stocks outstanding was 4.28 per cent. The investment in road and equipment increased from $15,874,579,926 on June 30, 1912, to $16,351,639,266 on June 30, 1913, or $477,059,640.

The number of passengers carried during the year was 1,033,679,680, corresponding to 994,372,283 for the previous year. The passenger mileage was 34,575,872,980, an increase of 1,536,762,172 over 1912. The average receipt per passenger per mile was 2.008 cents and per ton per mile 0.729 cent. The average operating revenue per train mile was $2.4538 and the average operating expense per train mile $1.7037. The operating ratio was 69.44 per cent. The operating revenues for the year ended June 30, 1913, were $3,125,135,798 and the operating expenses $2,169,968,924, comparing with $2,826,958,366 and $1,959,094,658 in 1912 respectively. The operating revenues per mile of line (including lines operated under trackage rights) averaged $12,873 and the operating expenses $8,939 for the year.

According to information received in Jeffersonville, Ind., from Chester P. Wilson, president of the Interstate Public Service Company, which owns the southern Indiana electric railways and the utilities of New Albany and Jeffersonville, Ind., a pulmotor for the use of the public has been ordered. It will be installed in the Jeffersonville offices of the United Gas & Electric Company and be sent out promptly in response to emergency calls.

Export Trade to South America

Opportunities Offered to American Electric Manufacturers as Result of European War—Transportation Conditions in Individual South American Countries—Interviews with Manufacturers, Shippers and Government Officials Urge Systematic Study to Meet South American Conditions

According to a statement made to a representative of the ELECTRIC RAILWAY JOURNAL by the Acting Secretary of the Department of Commerce, South America is a growing market for electrical machinery and supplies and one in which the United States should have a greater share of business. That this country will be called upon to furnish it more electrical materials will be the natural result of the war now in progress in Europe; but the permanence of this business depends upon a change in certain factors that have worked much to the disadvantage of American manufacturers and exporters. Heretofore, the countries of South America have looked to Europe for capital to develop their natural resources and to utilize their water power in the development of electrical energy. This source of capital is now largely or completely cut off, and the result will be a curtailment of expenditures and the postponement of new enterprises until more auspicious times. The United States will profit, no doubt, through their necessity of getting supplies, but it should be borne in mind that purchases by South American countries will be limited to urgent needs.

The chief factor against the sale of American equipment and supplies is the fact that the source of capital for South American enterprises and the nationality of the engineers have largely determined where they shall be purchased. A project with German financial backing, carried out under the supervision of German engineers, is practically certain to use German materials, as far as they are available at competitive prices. In fact, in recent years it has become a practice for banks furnishing the money for such enterprises to stipulate the use of materials from the country in which the banks are located. Investment of United States capital in South America is small as compared with the amounts invested there by England, Germany and France. Hence, manufacturers of electrical machinery and supplies in this country have been at a great disadvantage. Conditions in the electrical field are similar to those obtaining in the railway field.

The one country that seems to have been most successful in combining the efforts of bankers and manufacturers toward the increase of business and export trade is Germany. Back of the greatest electrical concern in Germany is a group of banks that furthers the interests of the combine in foreign countries by furnishing money for the development of various enterprises. The net result is that the money furnished by these banks is spent largely in the purchase of goods from the manufacturing companies with which they are allied.

It must be borne in mind, however, that the financial resources of the great European nations are being rapidly exhausted by war. It is fair to assume that it will be many years before they recover from its effects. In the meantime they will have great industrial problems to solve at home, and investments in far off South America will be far less attractive to their citizens than they have been in the past.

The time seems ripe, therefore: First, for a more liberal investment of United States capital in South American development; second, for a very considerable business in ordinary electrical supplies and in the equipment necessary for the completion of projects already begun, and, third, for demonstrating to the people of South America the satisfactory character of American electrical apparatus. In common with other American-made goods, apparatus of this kind has been misrepresented by foreign competitors and we ought to make the most of our opportunity to demonstrate their excellence. To take the fullest advantage of the present situation prompt and vigorous action on the part of our manufacturers is needed.

POINTS FOR AMERICAN EXPORTERS

According to a study of the South American export trade just made by Otto Wilson for the United States Bureau of Foreign and Domestic Commerce, poor packing, poor marking, failure to send goods as ordered, an insistence on cash with order or at least cash with documents, and the sending of catalogs and correspondence in English instead of Spanish or Portuguese are charges made against American exporters. Considerable improvement in these matters has been noted in the last few years, however, indicating that Americans are paying closer attention to South American requirements. It is important to remember that the ordinary credit terms of ninety days are usually insisted on even by houses that do not need the credit, for they regard a refusal of the usual terms granted by Europeans as a reflection on their integrity. Besides printing catalogs in native language, American exporters should be careful to use metric weights and measures instead of English and American standards.

As Mr. Wilson points out, numerous opportunities exist in South America for the extension of electric light and electric railway trade. For example, the number of electrical enterprises in Argentina in 1910 was fifty-six, with 2402 employees. One of the most noticeable features of Buenos Aires is its extensive street railway service, in which German and American electrical apparatus is used.

The character of goods demanded in Bolivia may be judged from the following quotation from the report of an American diplomatic official: "Bolivia needs electrical goods and supplies for railway construction, and when Bolivia has real opportunities to become acquainted with what the United States can supply sales will not be lacking. Nearly every city of size in Bolivia has an electric light plant, but the supplies therefor have been procured chiefly in Germany and France. American manufacturers could probably overcome this competition if they could meet the prices of the competitors, because American goods in this line are generally regarded as of superior quality."

The American manufacturers have become more and more interested in Brazilian markets in late years and in 1912 the United States passed Germany, the chief competitor, in the importation of electrical machinery to Brazil. In electrical work, especially railways, electric light and power systems, etc., American products compete as a rule on equal terms with those from Europe and have become very prominent. The mountainous nature of the country to the south makes possible the wide use of hydroelectric power. The market for waterwheels, turbines, electric motors, cables and everything connected with the generating and transmitting of power, says Mr. Wilson, is sure to be steady and growing.

As for Chile, it may be expected that hydroelectric machinery will be in constant demand in view of the mountainous nature of the country and the numerous rivers. Germany has a long lead in supplying electrical machinery, especially for electrical enterprises, but there is no reason why a great part of this trade should not come to the United States with the advantage of shipping distances this country will enjoy at the completion of the Panama Canal.

Mr. Wilson states that a demand is expected for electrical supplies in Peru. In Montevideo, the capital of Uruguay, there are two systems of electric tramways, besides a line of horse cars. One of the electric tramways is British and the other German, the former carrying about 40,000,000 passengers a year. There are few electric railways in Peru, and these mostly run out from Lima. In import trade to Peru the United States occupies a very favorable position. The trade conditions and tramway development in other countries are also mentioned.

INTERVIEW WITH MR. OUDIN

M. A. Oudin, manager of the foreign department of the General Electric Company, and member of the National Foreign Trade Council, in an interview with a representative of the ELECTRIC RAILWAY JOURNAL, declared that the opportunity before American manufacturers as a result of the curtailment of European production is one that concerns all industries. He was glad to give his ideas because he regards it as a patriotic duty to do all that can be done to remove the obstacles which have hampered the growth of export business. The problem is larger than the interest of a single company or of a single industry. The electrical business should share in the stimulation which our exports are bound to experience in the immediate future. The question which most concerns electrical manufacturers is how this trade may be acquired on a profitable and permanent basis.

Mr. Oudin pointed out, however, that while the stoppage of European supplies of all kinds is a factor favorable to a great extension of American trade, there are two adverse factors having an important bearing upon the magnitude of the trade that may be obtained. The first is the financial disturbance which has existed throughout the world for over a year; this economic depression, particularly in South America, has been made much worse by the war in Europe. The second adverse factor, which is of a temporary character, is the dislocation of transportation facilities which now exists.

The two important markets for our goods in South America, namely Brazil and Argentina, have been passing through a financial crisis of the first order. The inability on the part of the former country to obtain the loan which was needed so greatly has accentuated an already difficult situation. This loan was almost closed when the war broke out. The withholding of European funds for the further development of public and private enterprises in both countries will cause a cessation of engineering and other work there. It should also be remembered, Mr. Oudin added, that the purchasing power of South American countries particularly has been greatly lessened by the partial closing of European markets to their products. This undoubtful lessening of exports from South America with the result mentioned will be offset more or less by an increase in prices. For the reasons given above, at least reasonable caution should be exercised in the extension of credits.

Interruption of the shipping facilities in this country would have a most serious effect upon home affairs if prolonged, and a continuation of this situation would go a long way toward nullifying the favorable opportunities for furthering our export trade. But already the situation is much improved. Mr. Oudin expressed pleasure that so far as it has the power Congress has relieved the situation by passing a law admitting under certain conditions foreign vessels to American registry and removing the regulations heretofore applying to our merchant marine which made the employment of ships in our foreign trade an unprofitable venture.

The essential elements in the exploitation of manufactures abroad, Mr. Oudin declared, are representation, price and quality. If the small manufacturer cannot afford to have his own office abroad he must have recourse either to agents as a medium through which his goods may be sold or to commission houses or brokers in his own country. Another method by which the small manufacturer can acquire a market is through association with other manufacturers of allied lines. What we need most abroad is American business houses. Until our small manufacturer can sell his goods through such concerns established abroad, his business is bound to be more or less intermittent, for it is obvious that he cannot depend upon the permanency of an agency arrangement with a European firm, nor can he secure the highest effectiveness from an arrangement with a native concern.

As to prices, the prices of American manufacturers are higher ordinarily than those of European competitors. This is due to the higher costs of labor which prevail in this country. The influence of the war will operate in the direction of overcoming that handicap because it will have a tendency to increase labor costs in Europe. As to quality, American goods in general are superior to those of European countries, especially of Germany, but they are not always sufficiently superior to overcome the differences in cost. In many lines American engineering is recognized as superior to European engineering, but this advantage is not regarded as sufficiently great in some countries to overcome differences in cost; particularly is this true in countries whose financial resources are limited and where the people are more concerned about low first cost than about future maintenance and operating expenses.

Already two factors have been mentioned prominently as bound to influence our foreign trade favorably. One is the increase in our merchant marine, and the other the establishment of American banks abroad. Mr. Oudin believes that it is easy to overestimate the influence of these activities in creating new business. The establishment of American banks abroad will have certain advantages which must affect our foreign trade favorably, but is not likely to have as great an influence upon it as the other factors which have been mentioned. If American banks established abroad could have branches in different parts of the country there is no doubt that such banks would assist to a very large extent in securing more reliable information as to the financial standing of prospective purchasers than it is possible to get under the present banking conditions. The great potential influence cited by Mr. Oudin in connection with our foreign business in the establishment of banks in foreign countries is that thereby American capital will be encouraged to seek investment abroad. If American banks abroad could arouse American investors to the opportunities for investment in these foreign countries, both in issues of government bonds and the loans of private enterprises, their usefulness because of this consideration alone would be established beyond any question.

INTERVIEW WITH VICE-CONSUL OF BRAZIL

The vice-consul for Brazil at New York, who is thoroughly familiar with business and political conditions in Brazil and has gained the American viewpoint by residence here of more than twenty years, said to a representative of the ELECTRIC RAILWAY JOURNAL that the United States had for some time gradually been becoming a factor in the commerce and trade of Brazil and that the war in Europe would work greatly to the advantage of Americans if they were judicious in the use of the opportunity now presented to them. In the past Brazilian projects had been financed very largely in England and Germany, but this did not indicate any prejudice on the part of native Brazilians or the government. As an instance of this he referred to the joint English and American traction promotion in Sao Paulo and Rio de Janeiro. While practically all the large public utility projects had been floated abroad, the small ones were being taken care of by the local Brazilian capital and were officered by natives, many of whom had been educated in the United States.

The vice-consul said that the machinery in use in the industries of Brazil was largely English and German, but this was mostly a matter of expediency, those engaged in promoting any given work giving preference to the machinery made in their home country. For instance, practically all mining machinery was of English manufacture, the mine promoters and engineers engaged in Brazil being English. That there was absolutely no prejudice against American machinery was attested by the fact that much American machinery was in use in Brazil although few Americans were engaged in industry there. On the whole, American machinery in use in Brazil had been found very satisfactory compared with that from Europe. For some time past most of the electrical students from Brazil had studied in the United States, and this in itself would likely result in advantage to the American manufacturers on account of the familiarity of such men with American machines and American manufacturers when they entered active work.

Transportation between the United States and Brazil was inferior in many ways to that between Brazil and the European countries. This has naturally told in favor of Europe. This gentleman was enthusiastic in regard to the possibilities for America in developing coal trade with Brazil. He said that in this trade America would have to contend with the already well established English market, but felt that Americans could profit by turning their attention to such trade.

The vice-consul said a great deal of discretion would have to be used by Americans seeking business in Brazil. With the European market unsettled Brazilians would naturally turn toward America, but the American who showed any disposition toward being avaricious or exacted extortionate prices could not hope to keep the Brazilian trade after the settlement of the European conflict. He said that the Brazilians feel that the stoppage of commerce to Europe means an excess of American manufactures and that the excuse could not be advanced that increased demand from other sources had caused a natural increase in prices. The present unsettled conditions in the United States would seem to indicate that prices could be made to Brazilian ports low enough to compensate for the high freight and the insurance. On the other hand, those Americans who dealt with Brazilians judiciously would probably find a permanent market for their wares in Brazil irrespective of the outcome of the war. It would be advisable for Americans who hope to do business in Brazil to arrange to extend to their Brazilian customers the same credit terms that have been accorded Brazil in the past by European firms. Americans should try to anticipate the Brazilian need and cater to the Brazilian taste. The vice-consul gave the value of the imports of machinery into Brazil in 1911 as $28,660,000 and in 1912 as $36,292,000. He said that in 1913 Brazil imported from the United States $3,000,000 of electrical supplies, $1,074,000 of iron goods, $800,000 worth of coal, $167,000 of zinc and approximately $700,000 of lubricating oils. The value of the imports of rails in 1913 was approximately $1,500,000, while that of locomotives for 1913 was $1,600,000.

INTERVIEW WITH MR. TRIPP

Guy E. Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Company, returned from Europe on the steamship *Celtic* on Aug. 15. When war was declared by Germany on France Mr. Tripp was in Paris. Foreigners were ordered to leave the country and he went to London. Although his voyage was taken for business and pleasure combined, it was interrupted in France, and for that reason he did not have much opportunity of observing commercial conditions abroad. He thinks that it is impossible to form any conclusive opinion at this time as to the effect of the war on ultimate commercial conditions in Europe. Both the French and the Austrian subsidiary Westinghouse factories have been closed. It was necessary to do this because the operatives left to go to war. The plant in Italy is still in operation. The plant at Manchester, England, is operating on full time. Up to the time that Mr. Tripp left England comparatively few of the men at the Manchester plant had left to go to war.

The export business of the Westinghouse company to South America, Japan and China is handled from this country, and Mr. Tripp mentioned the opportunity presented to American manufacturers to meet the needs of consumers in those countries. In order that trading relations may be developed the principal necessity is to establish banking facilities and, following the practice of German manufacturers, to give buyers longer time for payment. The German manufacturers have been borrowers at low rates and were satisfied with small margins of profit. There is no reason, Mr. Tripp believes, why this country should not follow the practices to which South American buyers have been accustomed.

Mr. Tripp believes that as a result of the present situation this country should become a creditor nation instead of remaining a debtor nation. By the development of a larger export business it can get a steadier load for factories and reduce the overhead cost. The great bugbear which confronts manufacturers in this country is the fluctuation in the volume of business. When the business is stretched over a larger area the fluctuation in volume is likely to be less.

INTERVIEW WITH SENOR NAON

In an interview Señor Ramulo S. Naon, Argentine Ambassador to the United States and one of the recent A-B-C mediators in the Mexican trouble, expressed to a representative of the ELECTRIC RAILWAY JOURNAL the hope that American manufacturers would respond promptly to the commercial needs of his country. As evidence of her desire to trade with us he cited the emergency foreign exchange system which his government had established. He warned American manufacturers, however, that South American trade customs must be studied if headway is to be made. It is almost useless to expect any inquiries from pamphlets delivered by mail. Traveling salesmen equipped with letters of introduction and other credentials and familiar with the South American ways and manners, are necessary if goods are to be sold.

Engineers and engineering contractors should also realize that bids are generally delivered in person by a representative and not by mail, as is customary in the United States. In advertising for bids on construction work the interval of time given before opening proposals is often as long as six months, so as to enable representatives of foreign firms to forward specifications and other data to the home office and allow adequate time for the preparation of careful estimates.

Extensive commercial relations depend on good banking facilities, a fact that has been readily appreciated by the Argentine Senate and Chamber of Deputies. On Aug. 11 a law was passed empowering the executive to receive and deposit in the Argentine legations sealed gold from commercial and banking houses. The treasury department upon receipt of telegraphic advice from a legation will then issue a bond in favor of the Caja de Conversion for the amount of gold deposited. Against the delivery of this bond through the Banco de la Nacion Argentina, the Caja de Conversion will deliver to the same bank the equivalent in paper pesos, to be credited to the proper person. The Argentine government, Señor Naon said, has thus made foreign exchange easy. It is for Americans to supply the ships. They can enter the South American trade in force assured that they will be most cordially received by the nations to the south.

INTERVIEW WITH W. E. PEARSON

W. E. Pearson, of the Pearson Engineering Corporation, New York, believes that there is an excellent market for American goods in South America, if the manufacturers in this country will pay attention to the requirements of South American buyers. The Pearson Engineering Corporation is interested in a number of South American properties, as it is the purchasing agent of the Brazilian Traction Light & Power Company, which owns the Rio de Janeiro Tramway, Light & Power Company, the Sao Paulo Tramway, Light & Power Company, and the Sao Paulo Electric Company. Of these properties, that at Rio de Janeiro is the largest, the tramway department operating about 270 miles of track, 342 passenger cars and 202 freight cars. The car mileage made last year was 24,830,760 and the passengers carried 195,783,634. This same company had a lighting load last year of 683,937 incandescent lamps, 10,821 arc lamps and 63,539 hp of motors. The company also controls the gas business in Rio de Janeiro, and the telephone business there and in several neighboring cities. The Sao Paulo tramway company has 141 miles of track, 386 passenger cars and 84 freight cars, and the gross receipts from its light and power business were more than $5,000,000. The Sao Paulo Electric Company supplies power to the Tramway, Light & Power Company. Dr. Pearson, president of the Brazilian Traction, Light & Power Company, is also interested in the Bahia Tramway Company in Brazil. This system is now operated from London and its purchases are not conducted by the Pearson Engineering Corporation.

Mr. Pearson said that since the period of hostilities had begun in Europe there had been a large increase in freight rates from New York to Brazilian ports, namely, from about $8 a ton to about $21 a ton for electrical materials. This increase has been practically uniform on all of the fifteen or sixteen transportation lines between New York and South America, all of which, except one, are owned by foreign interests. He believed this was to be temporary only. Continuing he said:

"One question which the manufacturers in this country will have to take up in developing the sale of electric apparatus in South America is that of credits. Most South American purchasers have received long credits from Europe, especially from Germany. These credits are usually cared for by financial institutions, working in conjunction with the manufacturers, so that the latter receive their pay promptly. The usual terms of payment are sixty and ninety days, but these are often extended, one case, for example, being a gas plant in one of the cities of Brazil costing about $1,000,000, for which payment was not demanded for three years. These long credits are necessary owing to the recent development of the country, and are asked especially by purchasers in smaller towns. This is a matter in which the bankers in this country can render great assistance to American manufacturers.

"Another important matter is that of good packing for all shipments on account of the many times a package has to be trans-shipped. The large American manufacturers of electrical apparatus, like the General Electric, Westinghouse and Western Electric, understand the necessity of this, and their shipments rarely are received in bad condition. It would seem as if they had learned how to pack lamps, for instance, by trying different ways and then throwing the packages out of the window until one kind of packing has been devised which would stand such treatment. But most American manufacturers have not yet learned how to pack their goods for South American delivery. Thus, in a shipment of glass which we received some time ago from an American manufacturer, 99 per cent of the glass was broken. We could get no redress from either the shipper or the shipping company. I know of only one manufacturer of gas stoves that can pack these goods so that they will be delivered in Brazil in good condition.

"Most of the electric apparatus used by our properties in Rio de Janeiro and Sao Paulo comes from the United States. We buy practically everything in America except repair parts for apparatus originally built in Europe. The cars are built locally, because Brazilian wood withstands the climate better, but all the car trimmings and other metal parts, such as trucks and steel underframes, come from the United States. Of our coal we buy about 75 per cent in England, the rest in the United States. The English coal is not better, but England can offer lower freight rates, because the steamers get the return freight.

"Outside of Rio de Janeiro and Sao Paulo the principal electric railway properties in Brazil are at Bahia, Campinas and Santos. These originally were installed by German capitalists and necessarily buy most of their repair material in Europe. In the smaller cities in Brazil which have street railways, mules are used in many cases."

INTERVIEW WITH MR. CHILSON OF THE J. G. WHITE ENGINEERING CORPORATION

According to E. N. Chilson, purchasing agent The J. G. White Engineering Corporation, New York, 75 per cent of South American imports in transportation materials, power house apparatus, coffee machinery and agricultural machinery is either manufactured by Europe or sold by Europe. The countries mostly concerned in this are Argentina, Brazil, Chile and Venezuela. The credits of the South American consumers or dealers have been so long established in Europe that it is only natural that they should buy there what goods they need.

The usual credit given is ninety days' draft through European markets. This gives the purchaser an opportunity to place an order and have it delivered to him for consumption before actual payment. On the other hand, the American method provides for spot cash or a three days' sight draft, thereby making the purchaser assume all of the risks. If we are to establish trade with South America on a firm basis, however, we must bring about an amicable credit adjustment so that South Americans can come direct to our markets, get good shipments and start actual disposition of goods before payment is made.

A Brazilian paper dealer recently endeavored to buy 10,000 tons of paper through New York brokers. He had formerly paid German exporters by a ninety days' draft, but New York brokers refused to sell except on a confirmed bankers' credit or a gold basis. If some of the American paper companies had had agents here in Rio de Janeiro to look up the customer's credit, it should have been possible to make a satisfactory adjustment instead of losing this customer's trade.

It has been suggested that a sufficient trade balance be established in New York to allow the South Americans to purchase all goods needed. In Mr. Chilson's belief, were this condition once established, Europe would not be able to take trade back after the war. It is the prevailing opinion here that if the war continued from twelve to eighteen months, industrial and agricultural pursuits in Germany, England, France and Russia will be so demoralized that it will take an equal or longer time for these countries to recuperate. Hence, American manufacturers will probably have a period of about three years in which to place themselves on a firm basis with South American consumers. The countries engaged in South American trade were ranked before the war in regard to the volume of trade as follows: (1) England, (2) Germany, (3) France, (4) Belgium and (5) United States. If American manufacturers make the proper use of their opportunities America should secure a firm position much higher in the list.

In regard to proper transportation facilities, Mr. Chilson said that the Brazilian government has a government-owned steamship line, the Lloyd Brazileiro, of 100 vessels, and with the trade balances coming our way, the line will no doubt be placed in the American trade. Ineed, Ambassador Edwin V. Morgan has already cabled from Rio de Janeiro that the Minister of Finance of Brazil is arranging to dispatch to the United States five vessels of this line with consignments of coffee from Santos and Rio de Janeiro and rubber from Para, and these vessels are to bring back cargoes of prime necessities.

American manufacturers, however, must take a long-sighted view of the present situation and not endeavor to make abnormal profits by boosting prices. South American manufacturers would feel that they were being fleeced on account of the almost compulsory trading with this country, and after the war they would turn back instantly to their former producers. The rail market, for instance, has been quiet for the last two or three years. Orders from South American trade could be easily handled by American steel manufacturers and would only serve to make up for part of the present depression in trade here. South American consumers are well aware of this fact, and any attempt to run up the price through a falsification of the facts of present demand and supply would only result in irretrievably losing the South American market when the present war restrictions on European products are removed.

INTERVIEW WITH MR. SCOTT OF W. R. GRACE & COMPANY

A. L. Scott, assistant manager W. R. Grace & Company, New York, in an interview with a representative of the ELECTRIC RAILWAY JOURNAL, declared that the increase in freight rates that has been evidenced since the beginning of hostilities in Europe had averaged 50 per cent, although some advances have ranged as high as 100 per cent or more. His own company has not yet put any increase into effect, although it expects to make soon an increase of from 15 to 20 per cent. Mr. Scott did not believe that American manufacturers would be so short-sighted as unnecessarily to increase prices to South American purchasers, and he was inclined to believe that such an assertion made by some was due to a lack of understanding concerning the effect of the increased freight rates caused by the war. The extra war rate has necessitated increased freight rates, which have caused seemingly greater increases in the prices of goods carried. For example, a freight rate of $10 per ton increased according to the average figure of 50 per cent, would amount to $15, or 12 cents a cubic foot. This might cover an article which may be worth only 50 cents a cubic foot, causing an increase of nearly 25 per cent in the quoted price of the article.

W. R. Grace & Company is one of the firms known as banking and shipping lines. According to Mr. Scott, this means that the company in transmitting its shipping to western South American ports has become familiar with the credit conditions of the best-known merchants in these localities. The company is desirous to be of service to shippers by means of any information that is at hand or obtainable as to the responsibility of prospective clients and by taking care of the banking transactions between the shippers and the buyers. Mr. Scott believed, however, that efficacious as this method may be, the up-to-date manufacturer is not relieved from the responsibility of taking active steps himself for the development of trade in the field.

The problem is not so serious for the extensively organized companies, for these can afford to have traveling salesmen, and also local representatives in the South American countries who can act as bureaus for getting information concerning South American buyers and also serve to place American products before the eyes of these buyers. For the smaller companies who cannot afford a traveling agent or a representative, it would be highly desirable to establish a combined representative for five or six companies of allied character. American banks can also participate in commerce with South America by establishing branch banks, as the National City Bank of New York has done. The credit that would usually have to be given to South American purchasers will not be less than ninety days, and on contracts up to large amounts the time may extend as long as two years.

A vital point for American manufacturers to realize is that American goods need to be only seriously exploited in South America, under the proper knowledge and appreciation of South American conditions, in order to have a substantial and lasting export trade from America with these companies built up. It is not difficult to show the inhabitants of the West Coast the superiority of American goods at the same price. While the temperament of the South American may lead him to consider the first cost more than the question of maintenance and operating life, the only thing needed in order to rectify this is to educate him in regard to approved American ideas on such subjects. In order to do this it is necessary that catalogs and prospectuses should be written by men who have a knowledge of conditions in South America and men who are able to tell their story to their prospective buyers in the latters' native language.

INTERVIEW WITH MR. FLINT

Charles R. Flint, of Flint & Company, New York, has stated to a representative of the ELECTRIC RAILWAY JOURNAL that he believed that the placing of foreign ships under American registry during war times, which is forbidden by the terms of the Declaration of London, can undoubtedly be overcome by some means and that the danger of seizure by the British of former German liners flying our flag and vice versa can be obviated. In Mr. Flint's opinion, there is now a remarkable opportunity to enlarge the merchant marine of the United States and give to American manufacturers the opportunity to send their products to neutral markets under the American flag. His idea is that conditions under which American corporations can buy and run foreign-built vessels should be relieved from embarrassing restrictions. In order to bring this about American corporations should have the right to compensate foreign shipbuilders in bonds and other obligations of American corporations and should not be compelled to pay cash in order to effect American ownership. There should not be any reason why purchase should not be made of ships of any age, nor should there be any uncomfortable restrictions as to the character of the crews which might be employed.

According to Mr. Flint, the outcome of the present opportunity depends entirely upon the industry with which American manufacturers take advantage of the opening afforded them. The financial depression that has been existing in certain South American countries, notably Brazil and Argentina, will undoubtedly prove slightly embarrassing to the immediate institution of increased trade relations between these countries and the United States, but this condition cannot be at all permanent. While the present administration has taken a position against the making of loans by American capitalists to belligerent buyers, as exemplified by the recent turning down of the proposed French loan, it is Mr. Flint's opinion that the administration officials of the country would be gratified to see our export trade increase as a result of loans to neutral countries.

Electric Construction Locomotives

In connection with the construction of the 3-mile Mt. Royal tunnel of the Canadian Northern Railway at Montreal, six small storage-battery locomotives are being used to haul 175 tunnel dirt cars. The storage batteries are carried on trail cars, there being two batteries for each locomotive. These locomotives were originally operated by gasoline. It was hoped that the carbon monoxide in the exhaust could be changed to dioxide by passing over lime, but this was only partly successful. The fumes finally became so objectionable that 110-volt electric motors were substituted for the engines, the locomotive gearing being left practically without change, and the trail car with a sixty-cell storage battery being added to each locomotive to supply the current.

Recently, since the hauls have become longer and a larger tunnel cross-section has been available so that a trolley wire could be used, these same locomotives have undergone still another change. A trolley pole and another 110-volt motor have been added, the two motors operating in series and being supplied with 220-volt power from the trolley wire.

In addition to these six gasoline-storage-battery-trolley locomotives there are one 6-ton and two 10-ton 250-volt General Electric trolley locomotives, and two 7-ton trolley locomotives built in the job machine shop.

First Valuation Regulations

The Interstate Commerce Commission recently promulgated the first regulations to govern the valuation of the physical properties of railroads subject to the Interstate Commerce Act. The commission orders that every common carrier shall in each year, beginning with the year 1914, take an inventory of all extensions and improvements or other changes in physical property and report to the commission. The regulations follow:

1. Intent.—In order that the Interstate Commerce Commission may investigate, ascertain, report, and record the value of property of every common carrier, subject to the provisions of the act to regulate commerce, as such property may be extended, improved, or changed, after June 30, 1914, it is essential that certain records shall be prepared and kept by the carriers in their offices, and that certain reports shall be filed with the Interstate Commerce Commission. It is the intent of these regulations to prescribe a uniform method of recording and reporting the investment in extensions, improvements, or other changes, including retirements of physical property.

2. Records to be kept by common carriers, authorities.—Each extension and improvement or other change in the property of a common carrier shall be covered by an authority setting forth clearly and explicitly the general character and location, quantities, and amounts involved in the extension and improvement or other changes. These authorities shall be issued by executive or other responsible officers of carriers in numerical order and separately for owners and states, territories, and the District of Columbia.

3. Detailed records of cost.—The records of common carriers, covering investment in extensions, improvements, or other changes, including retirements, in the physical property shall be kept by jobs, and separately by owners and states, territories, and the District of Columbia in such complete detail as to units and quantities of the material and labor entering therein so as to show a unit of analysis of their cost.

4. Reports of completed work.—Reports of authorized jobs which have been completed shall be made within six months after the completion thereof upon special forms which will be later prescribed by the commission. Such reports shall be summarized, showing distribution by primary accounts, in accordance with the commission's classifications. Reports and summaries shall be made by jobs, and separately by owners and states, territories, and the District of Columbia. The completion reports for such jobs as extend over two or more fiscal years shall be made in full detail for the entire period covered by the work, and the amounts expended in each fiscal year shall be stated in summary form.

5. Reports of uncompleted work.—Reports of authorized jobs which have not been completed by June 30 of each year shall be made in summary form only, showing the cost thereof to said June 30, and distributed by accounts, in accordance with the commission's classifications. Separate summaries shall be made by owners, states, territories, and the District of Columbia, and filed with the commission not later than six months after said June 30.

6. Reports of extensions.—Reports of extensions shall be accompanied by such maps, profiles, plans, or diagrams as are required by the commission's specifications applicable to such extensions.

7. Reports of improvements or other changes.—Reports of improvements or other changes, including retirements, shall be accompanied by such maps, profiles, plans, or diagrams as may be necessary to show their general character.

COMMUNICATIONS

Three-Wire System and Electrolysis Mitigation

ELGIN, ILL., Aug. 12, 1914.

To the Editors:

The articles on electrolysis mitigation which have appeared in recent issues of the ELECTRIC RAILWAY JOURNAL have not contained any reference to the three-wire system and its possibilities in the reduction of the cause of electrolysis. The Brisbane Tramways Company, of Brisbane, Queensland, Australia, has had a plan of this kind in operation for some two years, and, under the local conditions, it has given good results and has kept the drop in potential in our rail return to 3½ volts per mile, as required by the regulations. Complaints of electrolysis of water pipes were formerly very frequent but, since the adoption of this system, there have been no such complaints.

In applying the three-wire principle, we do not have one overhead wire of a double track road positive and the other negative. Instead, our system is divided into several sections, in some of which the trolley wire is positive while in others it is negative. The positive and negative sections are separated by pairs of ordinary trolley-wire section insulators placed several feet apart with, therefore, a short insulated section of trolley wire between. This insulated section is sufficiently short to allow a car to secure current from either side by reversing the trolley pole and it is grounded through a set of five series, 110-volt lamps which will light up if one or other of the section insulators breaks down. This plan for breaking the line up into sections is used because it is unlikely that both section insulators will break down at the same time, and the indicating lamps give a positive notification of trouble.

The positive and negative sections are arranged so that, as nearly as possible, the two sides will carry equal loads. The switchboard is so constructed that sections can be fed either from the positive or the negative busbars by means of interlocked switches. At times of light load the three-wire principle is not used.

A successful method of applying the negative booster principle to the return feeders when the drop in the rail return is excessive has been used with good results in Brisbane. When a number of generators are operating in parallel they are forced to produce the same voltage and the equalizer connection maintains the proper subdivision of load among them. With our system of negative boosting the negative terminal of one generator is disconnected from the negative busbar and is connected directly to certain outgoing return feeders. When carrying its proportion of the total load it will automatically run at 25 to 50 volts higher than the other generators, depending upon the drop in the return feeders and will automatically regulate the voltage at the points of connection to the track with the load drawn. As many points can be connected to this high-voltage generator as its capacity will allow. On the other hand, if the load demand at the negative feeding point is not sufficient to take up the full-load output of the generator the latter can be connected in parallel with the other generators through an equalizing connection having considerable resistance, the value of the resistance being determined by the proportion of load which is to be diverted from the high voltage feeders. I believe that this plan is original with our company.

Positive and negative feeders are carried on the same poles and there has been no trouble in providing the necessary insulation. For convenience of the linemen the negative feeder is painted red. The linemen do not experience any difficulty in handling the feeders, as it is impossible for them to receive more than 550 volts except by touching positive and negative feeders at the same time. We use standard 550-volt generators in the power plant, and they are connected by pairs in series, with the neutral connection going to the rails. We have about 35 miles street length, most of which is double track, and we operate from 100 to 140 cars.

While I realize that the three-wire system has been proposed in the past and that it has been found undesirable under most conditions, I have no doubt that there are places where the principle can be utilized along lines somewhat similar to those here described. The use of parallel positive and negative trolley wires is not desirable, but the division into alternate positive and negative sections has been found, by us at least, to be entirely practicable.

J. S. BADGER,
Manager Brisbane Tramways Company.

Kansas City Franchise

NEW YORK, Aug. 15, 1914.

To the Editors:

In Mr. Kealy's reply to my communication published in your issue of July 18 relating to the new Kansas City street railway franchise, he states that I was "engaged to come to Kansas City during the campaign preceding the election by the local newspapers opposing the franchise." He refers to the Kansas City *Star*. This statement is unimportant, though untrue.

Referring to the forfeiture clause Mr. Kealy says that it was taken from the terminal franchise, and that in my book on "Municipal Franchises" I referred to the terminal franchise as a "most comprehensive and carefully drawn document." The provisions that make this recent forfeiture clause a joke are not in the terminal franchise at all. Moreover, Mr. Kealy's quotation from my book is a misquotation. Instead of using the language he attributes to me, I referred to the terminal franchise as "one of the most comprehensive and elaborate terminal franchises on record in this country." The ridiculous thing about this new forfeiture clause is not its assurance that the company shall have a fair deal when it unwittingly violates some requirement of the ordinance, but its assurance that after the company has wilfully violated the ordinance and has persistently and wantonly refused to make good its delinquency, even after a decree of court, the ensuing forfeiture shall merely put the property into the hands of city trustees, who will have to carry the entire burden of operation with the obligation still to pay the company, in addition to the full return on the full capital value, three-quarters of the company's share in the surplus profits, although the only reason for giving the company any share in surplus profits at any time is to enlist its zeal in efficiently carrying out the purposes of the franchise.

Mr. Kealy refers to my statement in regard to the provision for personal injury claims as "a very curious error, to say the least." I was fully aware of the fact that the provision making personal injury claims a special operating expense subordinate to return upon capital was devised for the alleged purpose of taking care of old tort claims antedating the receivership, but as I read the ordinance it seems clear that all future personal injury claims are included under this provision. In quoting the clause Mr. Kealy conveniently omits the comma which appears in the original after the word "property" and also cuts his quotation short before he gets to the end of the sentence. What the ordinance says is this:

"3. All liabilities for personal injuries and damages to property, including claims due the city up to the time of the adoption of this contract, whether same accrued before, during or after the receivership, shall be paid as a special operating expense, subordinate only to the payments provided for in paragraphs 1 and 2 of this section, and prior to any participation by the city or company in net income."

If this language means what Mr. Kealy says it does, we shall have to exercise unusual caution in the interpretation of this ordinance, following the old adage: "Take a Dutchman as he means, not as he says."

Mr. Kealy argues at some length that there is no chance for the inflation of capital, but he misses entirely the point of my criticism. I will try to make it clear. The ordinance provides that in replacing portions of the property as they are worn out, the additional cost of the new parts over and above the depreciated value of the old parts as set down in the Inventory-Appraisal, shall be added to capital account. Assuming that the entire physical property goes into the Inventory-Appraisal at an average of 79 per cent of cost new, is it not perfectly clear that when this property has been gradually replaced, although the property as a whole will not be increased in value, still the recognized capital value or purchase price will have been increased to the extent of this 21 per cent? The amortization of intangibles provided for in the ordinance extends only to the intangibles already in the valuation, not to those that are to be put in by the renewal process.

In a recent address before the Commonwealth Club of California, Mr. Arnold referred at some length to the intangibles in the capital value recognized under the Chicago ordinances. According to his estimate, the capitalization at the end of the twenty-year franchise period in 1927 will be about $204,000,000, while the real value of the property will be only $140,000,000 or $150,000,000. He explained that $11,000,000 of junk value was included in the original appraisal as the price of peace, and that in the subsequent rehabilitation of the system the intangible value was so increased as to make the purchase price to-day about one-third higher than the real value of the property. "The mistake we made when we passed that franchise was in not providing some sort of an amortization fund for the purpose of gradually retiring that intangible value," says Mr. Arnold.

The amortization provision of the Kansas City franchise takes care only of the original intangible value in the $30,000,000 valuation, which is figured at $7,500,000. The 21 per cent inflation of capital that I am talking about is the additional intangible value which will be put into the capital by the process I have described, much as it is now being done in Chicago.

Mr. Kealy is entirely wrong when he refers to me as alleging that the city was not in a position to effect a favorable settlement. What I really said was very different, namely, that "the city was not in a position where it was necessary to settle on unfavorable terms."

This Kansas City ordinance is so long and so complex that it would require a great deal of valuable space to prove any one of a hundred points as to its meaning which might be asserted in a few lines. But the main point of the Kansas City episode, as I see it, is that it represents a successful attempt by a company, in a resettlement of its own seeking, to induce the city to make good past losses as well as to assume future risks. I agree in principle that the city should assume future risks and thereby change the public utility investment from a speculative to a non-speculative basis, but I cannot agree that this undertaking for the future should be weighted down with the losses of the past.

The overvaluation in the Kansas City case is found in the overvaluation of the existing franchise. The company went into a receivership and predicted all sorts of calamities to itself and to the city if it were not relieved of the existing franchise, and yet this very franchise was appraised by various engineers as being worth from $10,000,000 to $13,000,000, and the company actually got an allowance of $7,500,000 for it in addition to the boost of the guaranteed return from 5 per cent to 6 per cent. It seems curious that the payment of tort claims accruing under a franchise with a future net earning power, over and above a fair return upon the value of the physical property, of $13,000,000, should be treated as alms.

I may be a "soldier of fortune," as Mr. Kealy dubs me, but I am quite scrupulous not to allow myself to be misquoted with impunity in support of a big franchise deal which I do not approve.

DELOS F. WILCOX.

Technical Schools and Electric Railways

PUBLIC SERVICE RAILWAY COMPANY,
NEWARK, N. J., Aug. 17, 1914.

To the Editors:

It seems to me that the general criticism of the inadequacy of the technical schools to meet present-day conditions may be largely justified. Our technical schools have not advanced at the same rate as the special industry. The personnel of the college faculty could do a great deal to keep abreast of the industry by more closely identifying itself with practical work and the deliberations of the various national engineering organizations.

College professors should make a particular effort to engage in actual or consulting engineering work outside of their regular duties. Faculties should encourage outside employment, and members whose services were so sought should be recognized.

Again, take the question of membership in the engineering societies. Speaking of the American Electric Railway Association as one of which I have some personal knowledge, this association represents approximately 80 per cent of the electric railway business in the United States and about $2,500,000,000 of capital. The "Engineering Manual," issued last year for the first time by the allied engineering association, is an example of the great work that is being accomplished. As one indication of the value of this work it may be pointed out that the 7-in. standard rail that was decided upon by last year's convention at Atlantic City has already been adopted by four representative electric railway properties in the United States and Canada.

In looking over the membership list I find fewer than twenty representatives of college faculties. Certainly there are a number of leading colleges that purport to teach something about electric railroading with its various ramifications. How colleges can expect to keep in pace with modern practice without being firmly entrenched with technical organizations that are helping to mold the destiny of the industry I leave for others to answer. Many successful engineers who are locally spending all of their time in electric railroading believe it essential to take active part in the deliberations of the association in order to keep in touch with the best modern practice. The graduate, sooner or later, must compete with these men. Is the graduate prepared if his tutor has not at least laid a foundation for him? Will the college receive words of praise for not turning out such men as the industry requires?

I, for one, am of the firm opinion that colleges, at least as far as the technical association is concerned should encourage the members of the faculties to get outside the college halls. Professors who broaden them selves in this manner should be encouraged and substantially rewarded. Then there would be some competitive instruction introduced in the college, and efficiency will never become dormant where competition exists. The final results would be better for the teacher and better for the graduate and bring greater popularity to the technical schools.

MARTIN SCHREIBER, Engineer Maintenance of Way.

WORCESTER POLYTECHNIC INSTITUTE
WORCESTER, MASS., Aug. 20, 1914.

To the Editors:

I read with interest in a recent issue your editorial under the heading "The Convention and Technical Education." There can certainly be no better way for the college professor to keep in touch with the rapid development in the electric railway field, with the expenditure of a minimum amount of time, than regularly to attend the conventions of the American Electric Railway Association, and this is especially true in the case of the teacher who does not combine his educational work with professional connections which regularly keep him in touch with practical work. In my own case, the habit of regular attendance at the railway conventions was formed long before I attempted any teaching, but in connection with my duties at Worcester Polytechnic Institute I have fully realized the benefits obtained from such attendance, both in the way of keeping closely in touch with current practice and in meeting the men who are responsible for its development.

ALBERT S. RICHEY,
Professor of Electric Railway Engineering.

Los Angeles as an Interurban Center

PACIFIC ELECTRIC RAILWAY COMPANY
LOS ANGELES, CAL., Aug. 11, 1914.

To the Editors:

In connection with the discussion in your paper on the subject of which city runs the largest number of interurban cars or trains per day, the question having been brought up by Mr. Ankeny in the issue of the ELECTRIC RAILWAY JOURNAL of July 25, 1914, I inclose statement showing, by divisions, the number of interurban trains and cars operated by this company in and out of the city of Los Angeles:

NUMBER OF INTERURBAN TRAINS AND CARS OPERATED INTO AND OUT OF LOS ANGELES DAILY

	Trains	Cars
Northern Division	807	1,098
Southern Division	424	598
Western Division	395	566
Totals	1,626	2,262

J. MCMILLAN, General Manager.

Electrolysis Studies in Springfield, Mass.

For the past few months the United States Bureau of Standards has been conducting tests to determine the present condition of the underground pipes and cable sheaths and of the return system of the local electric railway. A preliminary report was recently made to the Public Service Associates, an organization of representatives of public utility company and city officials, at the instigation of which the study has been made. A more formal report giving experimental data and definite recommendations will follow soon. In the final report will be discussed also the question of the cost of delivering power to the cars under the present distribution system, the effect upon such costs of making certain changes in the distribution system and the advantages to the railway company in making the proposed changes.

The Bureau of Standards believes that when the full details of the proposed plan are examined it will be found to the advantage of the railway company, as well as to the owners of underground utilities, to carry out the changes which will be recommended. While the Bureau found that some deterioration of underground pipe is going on the danger from electrolysis of such structures in Springfield cannot be considered as acute or alarming. At the present time there seems to be too much negative copper in certain districts and a better distribution of the return current could probably be secured by a rearrangement of the negative copper. In these districts it is the opinion of the officials of the Bureau that satisfactory electrolysis conditions could undoubtedly be secured with considerably less total copper than is now already installed and at the same time the energy losses in transmission could be very greatly reduced.

Dr. E. B. Rosa, acting director of the Bureau of Standards, expressed his appreciation of the courtesies extended by all of the local interests and of the hearty co-operation received from all of the utility companies participating in the investigation.

ASSOCIATION NEWS

MEETING OF THE COMMITTEE ON STANDARDS

At the meeting of the committee on standards which was held in New York on Aug. 6 and 7, and which was reported briefly in a recent issue, action was taken upon the recommendations of four of the standing committees of the American Electric Railway Engineering Association. The first of these submitted for the consideration of the committee by Chairman H. H. Adams were contained in the report of the committee on power distribution. In this report a specification for rubber-insulated wire and cable for power distribution purposes was recommended for adoption as a standard, Chairman G. W. Palmer, of the committee on power distribution, presenting a brief outline of the work of the committee on this subject for the past year and stating that the points of difference between the proposed specification and that of the underwriters' association had been overcome. During the discussion which followed it was brought out that the Association of Railway Electrical Engineers had a substantially similar specification except that only one grade of cable was covered, the less expensive grade for which provision had been made in the proposed specification not having been included, and that the same thing applied to the practice of the New York Central Railroad. It was finally decided to adopt the recommendation of the committee as the standard, including the two grades of insulation as proposed.

The specification for round and grooved high-conductivity trolley wire was then taken under consideration, the committee on power distribution recommending that the present specification covering No. 00 round, hard-drawn copper trolley wire be expanded to cover No. 000 and No. 0000 round and grooved trolley wire. After the reading of the proposed specification it was moved for adoption as a standard and the motion was carried.

A number of other recommendations of the committee on power distribution were then approved, including a request for further time to investigate the subject of reinforced-concrete poles and to prepare a specification for sundry line materials. The suggestion to discontinue investigation of the influence of large short-circuit currents on multiphase cables and the dynamic force exerted between conductors during the time that short-circuits existed was approved owing to the fact that a representative of one of the member companies was giving the subject thorough study, with the expectation of presenting his conclusions in the form of a report. A minor correction was made in the specifications for high-voltage, three-conductor, paper-insulated, lead-covered cable as recommended by the power distribution committee.

REVISED SPECIFICATION FOR GALVANIZING

The revision of the present standard specification for galvanizing iron and steel so that it would include sherardized materials was then approved, as was a recommendation that the standard copper wire tables be revised by correcting the values of the resistance to provide for the physical changes in the wire due to the assumed temperature changes. Minor changes were approved in the standard stranding cable and in the wire and cable terminology. Changes were also approved in the present recommended specification for 600-volt d.c. overhead trolley construction, these including the installation of span wire on tangents, the suggested sags for trolley wire, formulas for dressing trolley wire at curves, and the location of lightning arresters; but a suggested change regarding the method of grounding lightning arresters was referred back to the committee on power distribution for further consideration.

The clearances for overhead structures which were submitted at the last convention by the committee on heavy electric traction were presented to the committee on standards for adoption as a recommendation of the association, it being stated that the American Railway Engineering Association had already adopted similar clearances as standard. The recommendation of the committee was adopted.

The committee on way matters then submitted drawings covering four types of foundation for use in paved streets for adoption as recommended designs, each of these designs being intended for use only after consideration of the sub-soils and other conditions obtaining. These drawings were discussed at length and referred back to the committee on way matters for further consideration.

The session on Friday was devoted largely to a consideration of the recommendations of the committee on equipment, presented by F. W. Phillips, chairman.

NEW DESIGN OF JOURNAL BRASS

Among the new subjects brought to the attention of the committee on equipment during the past year was that of the necessity for a new design of journal brass for high-speed heavy electric traction. The committee on equipment recommended that the matter of developing a new standard journal brass to replace the present M.C.B. standard in high-speed service should be referred to the ensuing committee on equipment for consideration jointly with the Master Car Builders' Association, and this recommendation was concurred in by the committee on standards.

In the matter of wires and cables for car equipment, the recommendation of the committee on car equipment to postpone consideration was approved, but the suggestion was made that the general subject should be referred to the ensuing committee with special reference to fire protection, and that a specification for car wiring should be prepared, giving consideration to the specifications on wires and cables for power distribution which had already been adopted.

Several minor changes in the present specifications for solid wrought carbon steel wheels for electric railway service which were recommended by the committee on car equipment were approved by the committee on standards, placing the specifications in form for adoption as a standard of the association. Proposed new specifications for air-brake hose were then discussed at length. The recommendation that the study of the subject of lightning protection should be continued was also approved by the committee on standards.

Mr. Schreiber, as a member of the committee on the "Engineering Manual," then made a report on this subject, speaking about the probable necessity for culling out miscellaneous practices in the near future to provide room for the large amount of material that would soon have to be included among the standards and recommendations of the association. After a discussion of this matter the meeting adjourned.

INDIVIDUAL MEMBERSHIP

Secretary E. B. Burritt wishes to call attention to the following fundamental matter regarding individual membership in the American Association. To be eligible for individual membership an applicant must be an employee of an operating company which is a member of the American Association or an employee of a member of the Manufacturerers' Association. This announcement is made to avoid possible disappointment at Atlantic City. The rule does not apply, of course, to individuals, like college teachers, outside the immediate railway business whose employers are not eligible to membership in either association.

MANUFACTURERS' ASSOCIATION

Mr. McConnaughy's latest circular emphasizes the necessity for prompt shipment of goods in order to allow for all freight delays, possible bad weather conditions in Atlantic City previous to the convention and the further fact that all goods must be delivered on the Pier before Saturday, Oct. 10, to be set up, as no work will be allowed on Monday. All night and Sunday work, also Saturday afternoon, should be avoided, as this will cost double time. Manufacturers should arrange to have their men on the ground a day or two earlier so that all electrical and other mechanical work can be completed without overcharge and everyone may be given a chance to rest up Sunday. With this circular letter are enclosed order blanks for drinking water.

The Pier has been put in unusually fine shape for the convention, which is now only seven weeks off.

New members secured by the Association during the past week are S. Abrahams & Company, Philadelphia, Pa., and the Detroit Graphite Company, Detroit, Mich.

Some Safety Rules in St. Louis

The Union Electric Light & Power Company, of St. Louis, has promulgated additional safety rules, some of which follow:

Railings are to be erected where, on the company's properties, preventive measures are necessary to keep pedestrians from stepping on railroad tracks.

Picket doors are to be installed at stations so that solid wood doors may be left open in warm weather without possible danger to public.

Switchboard guards are to be erected wherever such construction is of advantage from the standpoint of safety.

Walkways on crane and other apparatus are to be equipped with railings wherever needed.

Pole ladders are to be equipped with chain at the top so that ladder rests firmly against pole to lessen danger from the ladder turning when it is subjected to weight.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

The Return Circuit—General Considerations

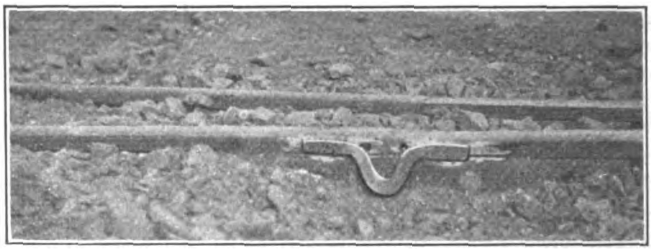
BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY, PUBLIC SERVICE RAILWAY, NEWARK, N. J.

The fundamental principle in bonding is to secure a rail which is electrically a continuous conductor from the power house to the end of the line. The great importance of properly designing the return circuit is now arousing more interest every day among operators of street railway properties, and is being generally recognized, not only from the standpoint of saving in energy consumption, but also from that of minimizing electrolytic action.

REQUIREMENTS OF A GOOD BOND

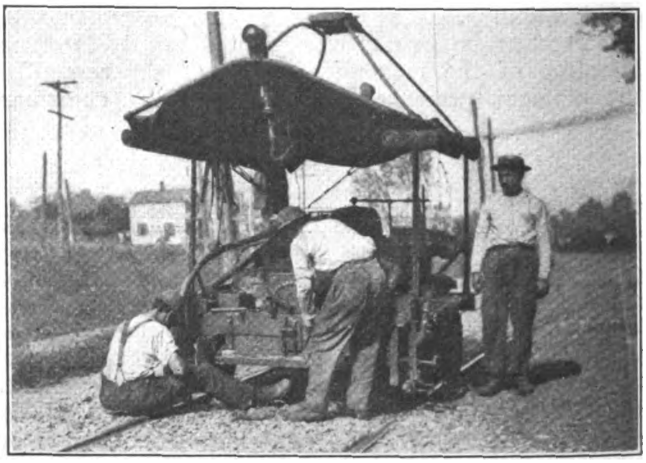
Poor bonding has been generally emphasized as the most important defect in the return circuit. Of course, other elements such as an increase in the temperature, higher percentage of carbon or manganese in the steel, etc., tend to increase the resistance of this circuit, but the principal resistance factor is offered by the joints. A satisfactory bond must fulfil at least three conditions, namely, mechanical strength, electrical contact for conductivity, protection from injury or theft.

Here it might be well to show why mechanical bonds installed in connection with bolted joints do not retain their efficiency as a conductor indefinitely. It may seem an easy matter to secure a perfect return circuit, but practically the reverse is true. The trouble is not so much in bonding a joint properly in the beginning as it is to maintain the same for any great length of time. The only way to maintain a mechanical joint properly is to go over it at frequent intervals, tighten up the bolts and keep the ties tamped up well under the joints. It will at once be realized that this would not be practicable in the case of track laid in city streets and inclosed in an expensive type of paving; and as a result, any mechanical bond is bound to suffer more or less. The cost of properly maintaining such a joint, and consequently the bond, under these conditions would be prohibitive, and would very soon amount to more than the saving in power which would result from the better bonding across the joint. The Public Service Railway has very largely solved the problem of maintaining the rail bond by making extensive use of an electrically-brazed bond. The apparatus used for the installation of this bond as illustrated on this page is that of the Electric Railway Improvement Company, Cleveland, Ohio. The three or four men required for its operation can install from eight to fifteen bonds per hour, depending upon traffic conditions, power, etc., the entire expense including cost of bond being only about 50 cents per bond. Of course, where plates and paving must be removed and replaced, the total cost per joint will be much more than this figure. The second illustration shows a portable grinder in use for polishing the surface of rail to which the bond is to be applied, while a third view shows a complete bond installation. This grinder is of the Electric Railway Improvement Company's type, but our company has also purchased a somewhat similar portable grinder from the Pneumatic Tool Company.



RETURN CIRCUITS—BRAZED BOND AS INSTALLED ON PUBLIC SERVICE RAILWAY

RETURN CIRCUITS—GRINDER FOR BRAZED BONDS



RETURN CIRCUITS—CAR FOR APPLYING BRAZED BONDS

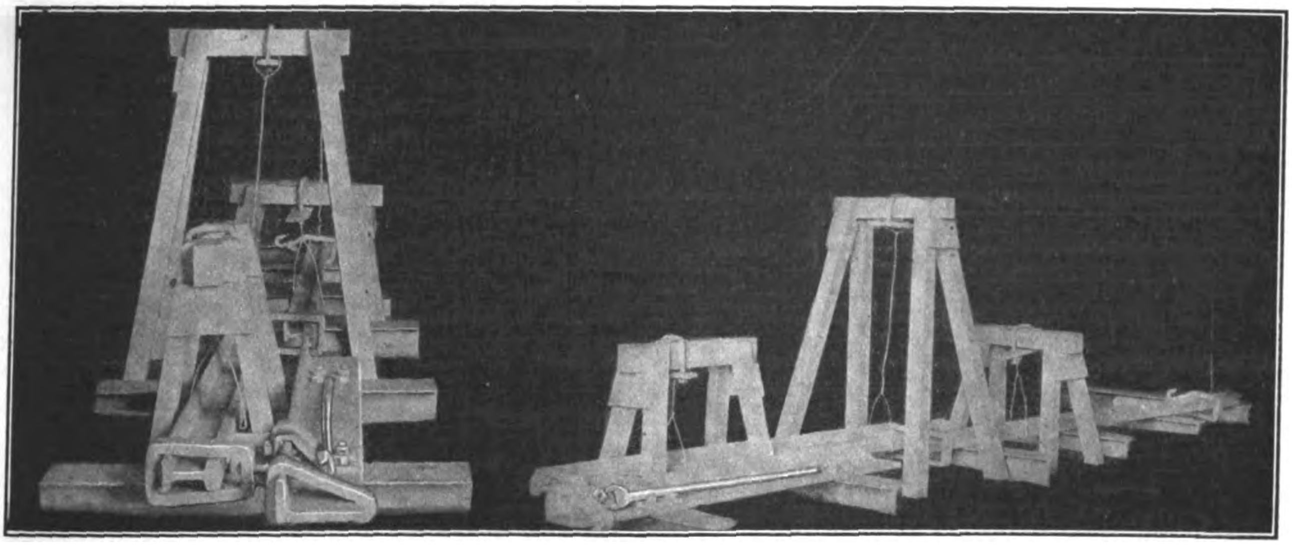
THEORY OF MECHANICAL JOINT FAILURE

In view of the statement that it is not practicable properly to maintain a mechanical joint indefinitely in paved streets, an explanation of the generally accepted theory of the plate joint and why it cannot be kept tight indefinitely without constant attention, with the possible exception of track carrying the lightest kind of traffic, may prove interesting. Outlined as briefly as possible, the solidity and permanence of a joint depend upon the thorough, continuous and tight contact of the two plates against the rail ends. In any form of rolled steel the two sections are never uniform, and consequently, in the case of rails, the two abutting ends are not of the same section, the variations sometimes being as much as 1/16 in. This is also true of the plates themselves. Yet even if it is assumed that sections of both the plates and rails are exactly the same, rolled steel surfaces are not perfectly smooth but consist of very small elevations and depressions; consequently instead of having a continuous contact between the rails and plates, only an intermittent or point contact is obtained. Under car loading only, the plates would have to resist the vertical and lateral movements, but in addition to these movements there is also the bodily or longitudinal movement of the rails themselves, due largely to temperature changes. There is also a wave motion in the rail itself as the wheel loads pass over it. These movements act on the small irregular surfaces like a file. While such movements are only ¼-in. to ⅜-in. (even in severe changes of temperature), yet the point contacts are so small compared with the extent of the rail movement that the action is the same as that of a file. Hence no matter how tightly the plates may have been adjusted originally, they quickly work loose and the ends of the rails soon begin to hammer and pound under the wheel loads. In addition to these causes, the nuts are continually being jarred loose by vibration. The nuts also work loose due to stretching of the bolts themselves, since with the nut-lock now in general use, a very slight loosening or stretching of the bolt immediately destroys its usefulness.

The only permanent solution of the joint and bond problem lies in the adoption of some form of welded joint to make a practically continuous rail. The Public Service Railway has adopted the Lorain electric joint as standard on all new construction and reconstruction work. Where five years or more additional life can be obtained from the old rail by welding this is done, and much rail has thus been saved from the scrap heap. During recent years this welding has been applied even to several miles of T-rail in both open and closed track, expansion joints being placed approximately every 1000 ft. with very gratifying results on joint maintenance and power return. Up to the end of 1913 approximately 60,000 electrically welded joints had been installed. The fact that such large railway companies as those in St. Paul and Minneapolis, Cleveland, Chicago, Philadelphia, Brooklyn, Pittsburgh and Buffalo, as well as our own, have reduced the use of bolted joints in city streets to a practicable minimum is the strongest evidence of the modern tendency to get farther away from the joint maintenance problem by the adoption of some type of welded joint or a combination of weld and riveted joint. Were it not for the high cost of welding a comparatively few joints at any one isolated location, many other smaller companies now using plate joints would at once abandon them for some form of welded joint.

Determining the Proper Length of Wrench for Track Bolts

BY P. NEY WILSON, ROADMASTER CONNECTICUT COMPANY



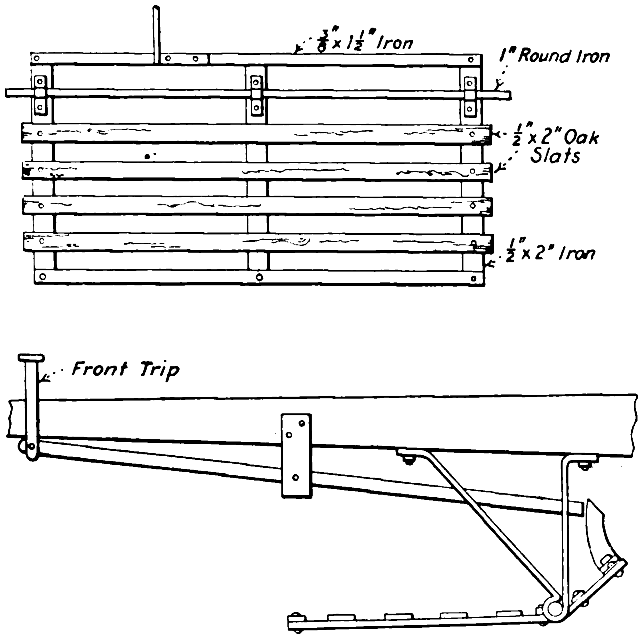
VIEWS OF CONNECTICUT COMPANY'S MACHINE FOR DETERMINING PROPER LENGTH OF WRENCH FOR SETTING UP TRACK BOLTS—WRENCH AND NUT OF BOLT UNDER TEST ARE IN FOREGROUND

In investigating the proper length of wrench to use in setting up track bolts the maintenance of way department of the Connecticut Company has devised a novel apparatus for this purpose. In taking the problem to the department a wide difference of opinion was shown. The experience of other electric railways as well as manufacturing concerns was then solicited without satisfactory results. No conclusion based upon actual existing conditions seemed to be available. We felt that some of the factors entering into the problem were assumed, and the device as shown herewith was the result of much study on the subject. Tests on this machine eliminate friction of the nut when it turns on a Harvey grip thread as well as when the nut sets against the joint plate. The actual stress on the track bolt as manifested by the lateral movement of the beams, is registered on a spring scale which is attached to a hook welded to a shackle iron on the second beam. The fulcrum points are knife-blade edges made from a short section of 7-in. T-rail, the head being cut off and the web sharpened to an edge. They are bolted securely to the base of 7-in. T-rails placed at right angles under the beams and imbedded in concrete. Both beams are made of low T-rails, ratio 1 to 10, slotted at fulcrum points and at the shackles. Accurate results can be obtained by having a track man set up the bolts as he would in the track, using wrenches of different lengths, and measuring the bolts before and after to determine whether or not this elastic limit has been exceeded. The scale in each test will show the stress on the bolts. A spring scale may also be attached to the upper end of the track wrench, showing the pounds pull on the wrench. This machine was made at a nominal cost and with it very interesting results can be obtained without resorting to any assumed factors. With reference to the wires shown in the views the following may be added: The wires attached to the two wooden horses, including the vertical wire at the end of the second beam, suspend the beams in such a way that they are free to move at the slightest pressure.

A Good Home-Made Fender

BY J. N. GRAHAM, SHOP FOREMAN ROCKFORD & INTERURBAN RAILWAY, ROCKFORD, ILL.

The accompanying diagram shows a good home-made fender which has been in use for the past few years on the Rockford & Interurban Railway's city cars. The frame of the fender is made of three pieces of ½-in. x 2-in. iron 30 in. long, bent to an angle of 45 deg. 6 in. from one end. The rest of the frame comprises two pieces of ⅜-in. x ½-in. iron 6 ft. long. The five pieces are put together with ⅜-in. rivets. The fender is hung on a piece of 1-in. round iron 6 ft. 6 in. long by means of three clips which are riveted in the angle of the 1½-in. x 2-in. frame at the sides and center. This 1-in. round bar is held up by two brackets made from ⅜-in. x 1½-in. iron which are bolted to the bottoms of the vestibule knees. The frame of the fender is covered with ½-in. x 2-in. oak strips 6 ft. 4 in. long which are bolted to the sides and center pieces with ¼-in. x 1¼-in. stove bolts. The trip is made of a piece of ½-in. x 1-in. iron bent to a right angle on the end that supports the fender, a piece of ⅜-in. x 1½-in. iron bent as shown in the sketch being riveted to the top piece of the fender frame which rests against the trip. A very slight pressure on the trip with the foot will drop the fender. A damaged fender is very easily repaired, as the irons are seldom broken.



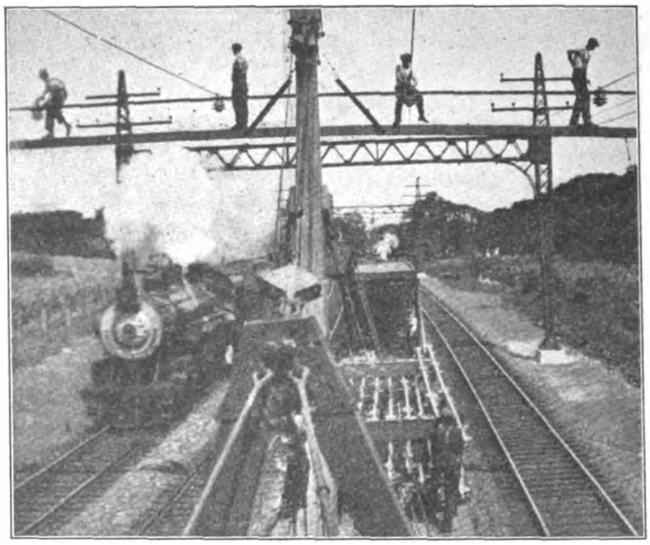
FENDER MADE AT THE SHOPS OF THE ROCKFORD & INTERURBAN RAILWAY

A trial trip was recently made on the newly electrified London & South Western Railway in London, England. The trip was made between Wimbledon and East Putney with one of the new electric trains to be used on this railway. The new coaches will each carry about 200 passengers.

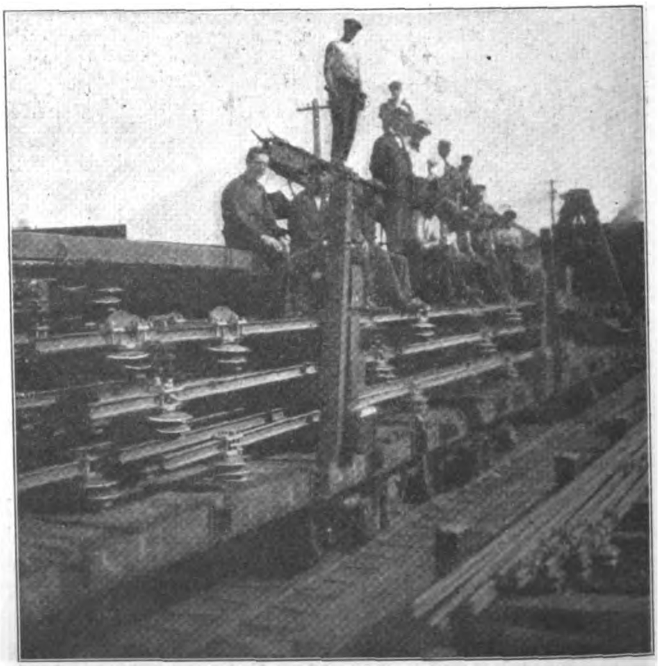
New Haven Railroad Construction Notes—Putting Up I-Beams

BY A FORMER INSPECTOR

In putting up the intermediate transverse I-beams for the electrification of the New Haven Railroad we used a train which was composed of an engine, derrick, tool car and coach, and two to four flat cars to carry the I-beams themselves. These I-beams and their insulators, etc., were assembled in the storehouse preliminary to their erection, those for four-track construction having four main-line insulators spaced to correspond with the track spacing. As shown in a view of one of the flat cars, the I-beams were placed on racks which could be added or taken off as fast as the beams were loaded or unloaded. These I-beams were erected with the help of a cradle about 40 ft. long and supplied with racks to hold two members. The load line of the derrick was attached to a steel strap in the middle of this cradle. After the cradle was loaded, the derrick lifted



INSTALLING I-BEAMS, SHOWING CRADLE AND DERRICK; ALSO PASSING TRAIN UNDER THE CRADLE WHILE MEN ARE WORKING



COMPLETE LOAD OF I-BEAMS WITH INSULATORS ATTACHED READY FOR INSTALLATION the cradle, the I-beams and the four erectors up to the ⅞-in. steel messenger. The men put the clamps in the ⅞-in. messenger and then the end men dropped a plumb line which was sighted to a mark previously made on the outside rails at the location intended for the I-beam. After the first I-beam had been attached to the ⅞-in. messenger the cradle was lowered so that the cradle and racks were clear of the beam. Then the train moved ahead to the next location where a second I-beam was installed in the same way as the first one. As the upper view shows, this method of installation blocked only one track.

Results of a Brush Test for Interpole Motors at Montreal

BY KEITH MACLEOD, MONTREAL TRAMWAYS

The brush test hereinafter described was made on two of the newer types of motors recently purchased by the Montreal Tramways. These motors are of the fully ventilated, interpole type with slotted commutators, all features which did not belong to the motors formerly in use on this road. As the commutation was so different, it was thought advisable to make tests to find a suitable brush for these motors when operated under Montreal conditions.

The test was begun early in the winter of 1913 and continued till the middle of June, 1914, two sets of measurements being taken to determine whether the rate of wear increased in proportion to service or not. As all the motors were new, with uniform spring tension and commutators, it was expected that reliable results could be obtained in a shorter time than is usual with old motors. On the first type of motor, "A," we tried five types of brushes (which we can call 1, 2, 3, 4 and 5), but two of these (1 and 2) proved so unsatisfactory that they were removed after a few weeks. On the other motor, "B," brushes 2, 3, 4 and 5 were used throughout the entire testing period.

To obtain the same conditions for each type of brush they were distributed among the motors so that two or more types appeared on each car. Cars were inspected at the regular intervals and no special attention was given to the brushes except to see that none of those on test had been removed. No attempt was made to discover the effect of variation in spring tension on the wear. With motor "A" the minimum allowable tension was 8 lb. per spring, or 10.5 lb. per sq. in., the high pressure being necessitated by the tendency of this motor to flash over when running at high speed over rough track. The 5 lb. per spring (5.3 lb. per sq. in.) used in motor "B" is the manufacturer's standard and was adhered to as closely as possible.

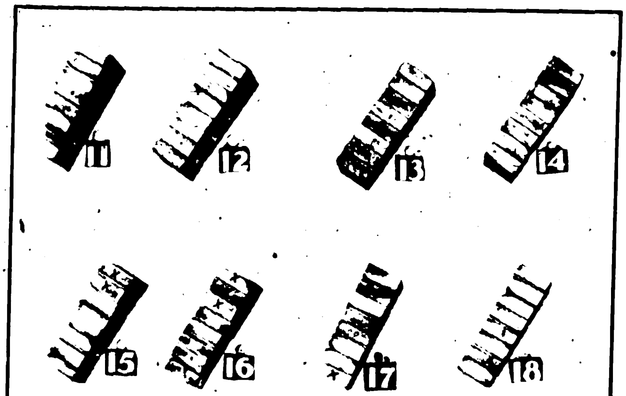
SUMMARY OF MONTREAL BRUSH TEST ON NEW INTERPOLE MOTORS, 1913-1914

					First Period		Second Period		Entire Test				
Type Brush	Type Motor	Number Brushes Tested	Number Brushes Broken or Worn Out	Number Brushes Chipped	Average Mileage	Average Wear per 1000 Miles, In.	Average Mileage	Average Wear per 1000 Miles In.	Average Mileage	Average Wear per 1000 Miles, In.	Estimated Life of Brush, Miles	Cost per Motor per 1000 Miles, Cents	Remarks
1	A	32											Bad chipping and side wear test discontinued.
2	A	8	8										Test discontinued.
2	B	32	3	30	13,170	0.0104	7,620	0.0077	20,790	0.0094	120,000	0.38	Brush unsatisfactory, too much chipping.
3	A	48	6	20	*16,510	0.0198	**8,080	0.0210	21,700	0.0194	45,000	1.98	Considerable chipping, brushes otherwise very good.
3	B	16	0	15	11,780	0.0094	7,960	0.0074	19,740	0.0085	132,000	0.75	Some motors had 0.040 in. mica: more brushes chipped in these than in motors with 0.025 in. mica.
4	A	16	0	9	7,530	0.0205	8,250	0.0173	15,780	0.0185	47,000	2.1	Brushes very good.
4	B	16	0	6***	12,250	0.0096	7,480	0.0102	19,730	0.0098	115,000	1.04	Brushes very good.
5	A	16	0	7	14,640	0.0236	7,920	0.0255	22,560	0.0243	36,000	0.96	Brushes very good.
5	B	16	0	2***	14,080	0.0078	7,780	0.0074	21,860	0.0077	146,000	0.24	Brushes very good.

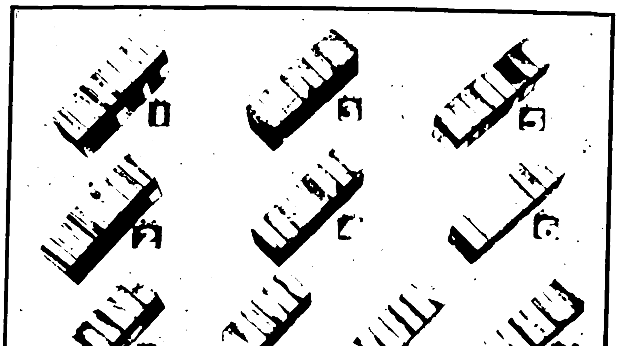
Average cost, all brushes—Motor "A" 1.68 cents per 1000 miles.
Average cost, all brushes—Motor "B" 0.60 cents per 1000 miles.

*48 Brushes.
**32 Brushes.
***Very slightly.

The accompanying table and halftones show the principal results. Brushes marked with black crosses are those replacing brushes which were worn out or broken before the completion of the test. It will be seen that the main trouble encountered was bad chipping at the edges of the brushes. Practically all cars are equipped for single-end operation and there are loops at the ends of most runs, so that the brushes wear all one way and develop very sharp edges. Fortunately the most eco-



BRUSHES OF MOTOR "A"—GROUPS 11 AND 12 (NO. 4); GROUPS 13 AND 14 (NO. 5); GROUPS 15, 16, 17 AND 18 (NO. 3)



BRUSHES OF MOTOR "B"—GROUPS 1 AND 2 (NO. 4); GROUPS 3 AND 4 (NO. 3); GROUPS 5 AND 6 (NO. 5); GROUPS 7, 8, 9 AND 10 (NO. 2) nomical brush (No. 5) was remarkably free from chipping, but it was found that it could be prevented in all types by an occasional beveling of the edges. This trouble is one that has appeared with the introduction of slotted commutators, as formerly we did not have it to any extent.

Another condition that developed was the hammer wear on top of the brush, particularly in motor "A." Appearances indicate that on motors with slightly eccentric commutators or other causes of hammer movement, deep wear and breakage on the tops of brushes would result before they had attained their full life. This applies about equally to each type of brush.

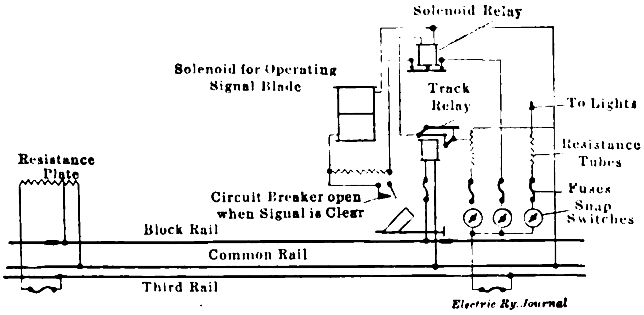
The effect on the commutators was practically the same with all brushes, the wear being entirely negligible as compared with the probable life of the motor. The surfaces were perfect except in two or three motors where the mica had not been thoroughly removed.

The selection of the most suitable brush was made on a basis of cost per 1000 miles. There is no remarkable difference in life of the various brushes as applied to the same type of motor, but a large difference between the two types of motors, evidently due to the different spring tensions, was observed. On this account the decision was largely a question of the relative costs of the three types which give satisfactory service, and as the most satisfactory was also the cheapest, selection was easy.

It was decided some time ago to undercut the mica of all our armatures, and a similar test is now in progress to find the best brush for the non-interpole motors with slotted commutators.

Solenoid Signals of Interborough Rapid Transit Company

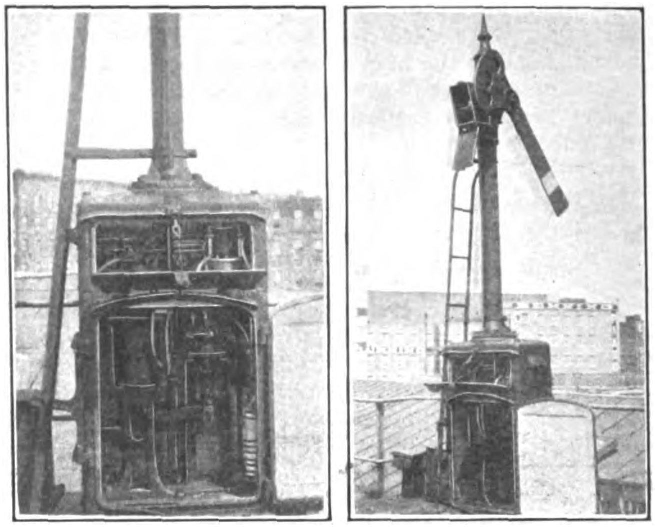
An ingenious modification of the standard semaphore type of signal has been in use for some time on the Manhattan Elevated division of the Interborough Rapid Transit Company in New York City. In this device the operating mechanism for the semaphore blade is replaced by a solenoid which is normally energized from a resistance tap from the third-rail feeder, the signal being held in clear position against the attraction of gravity while power is on. A track circuit is made up by insulating a section of one of the running rails, and this is also supplied with current at reduced voltage from the third-rail, a d.c. track relay completing the circuit at the opposite end of the block from the point of feeding.



Electric Ry. Journal

SOLENOID SIGNALS—DIAGRAM OF CIRCUITS

The track relay, when energized, holds closed another relay which controls the circuit to the solenoid. When the presence of the wheels of a train within the block short-circuits the track relay, the solenoid relay is deenergized and breaks the main solenoid circuit, permitting the counter weight of the semaphore blade to fall and raise the blade to stop position. In this position of the blade a circuit breaker, directly connected to it, is closed, and when the train leaves the block, permitting both relays to pick up, the main solenoid is subjected to full third-rail voltage. As the blade clears, however, the circuit breaker opens and puts the current through a resistance in parallel with it so that, normally, only a small flow of current exists, this being enough to hold the blade clear, although not enough to put it in motion.


SOLENOID SIGNALS—VIEWS SHOWING INTERIOR OF MECHANISM CASE AND CIRCUIT BREAKER ON BLADE

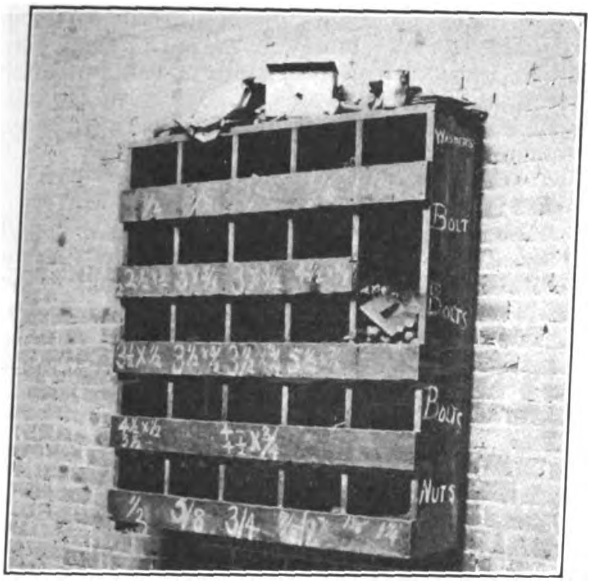
These signals, which are very inexpensive to install and to maintain wherever propulsion current is as plentiful as it is on the Manhattan Elevated Railway, are installed at all bad curves on the line, an accompanying photograph of a typical installation showing the severe conditions. All operations are, of course, for double track, protection being required for following movements only. The signals are home-made in so far as erection and construction of the solenoids go, but standard semaphore blades, masts, casings and relays are used.

SOLENOID SIGNALS—VIEW OF TYPICAL INSTALLATION AT SHARP CURVE ON ELEVATED RAILWAY

Two Handy Boxes for Supplies

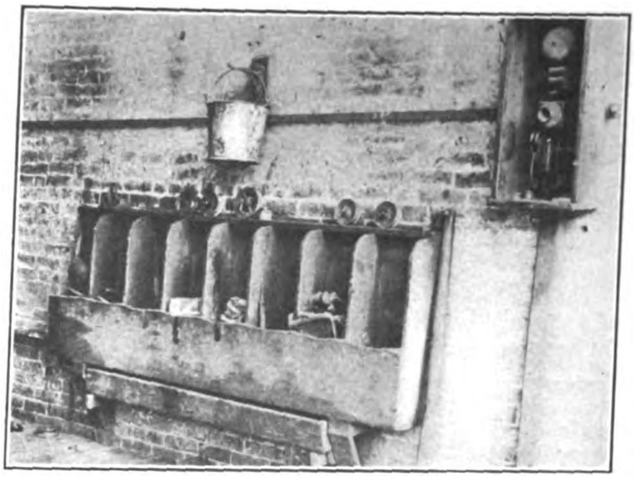
The two accompanying halftones illustrate two convenient receptacles for supplies used by the operating department of the Springfield (Mass.) Street Railway at the Carew Street carhouse.

The first view shows a bolt and nut storage box of twenty-four compartments, located on the wall of the inspection division of the carhouse. The standard bin size is 8 in. x 8 in. x 9 in., the front strips being about 4 in. high, and the box practically 4 ft. square and 9 in. wide over all.



HANDY BOLT AND NUT BOX, SPRINGFIELD, MASS.

The second illustration is a view of a handy box 6 ft. 9 in. long and 3 ft. 8 in. high, divided into eight compartments 9¼ in. wide and 28 in. high, with partitions 6 in. deep, the box being mounted against the wall of the carhouse within a few steps of the street, so that replacements of trolley wheels, controller parts, contactor fingers, terminal blocks and other fittings can be made quickly without withdrawing a car from service. A drawer 4 ft. 8 in. long, 3½ in. deep and 5½ in. wide at the bottom carries the smaller repair parts, the bins holding journal box covers, brasses, light truck parts and trolley wheels. The partitions are ⅞ in. thick, and the planking at the bottom of the bins is 12 in. high, to prevent stock from dropping out on the floor and rolling into the pits. A shelf 2½ in. wide at the top is also found a convenience.



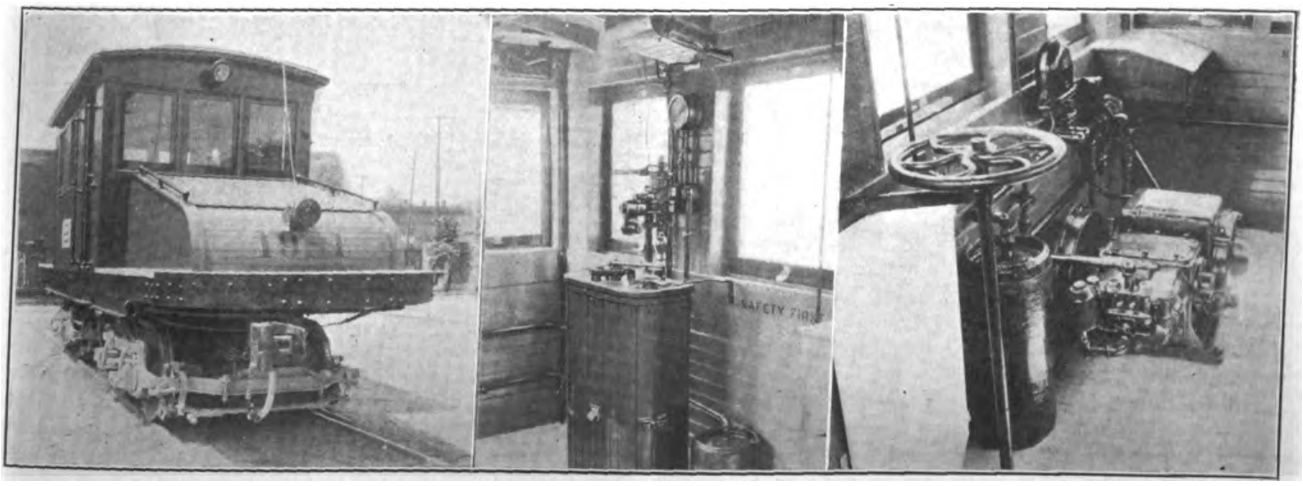
CONVENIENT SUPPLY BOX, SPRINGFIELD, MASS.

Although both of these boxes are of rough construction, their location close to the track has saved a great deal of time in light maintenance work.

Detroit Switching Locomotive

The Detroit United Railway has recently completed the sloping cab type switching locomotive for double-end operation shown in the accompanying illustrations. This locomotive, which is used for handling cars at power houses "A" and "B," is 31 ft. 1½ in. long, 8 ft. 6¾ in. wide over all, 12 ft. long over the body, 6 ft. 7¼ in. clear inside width and 11 ft. 10 in. high from the head of the rails to the top of the trolley board. The locomotive is mounted on two Brill 27-F trucks, spaced 14 ft. centers, with 4-ft. wheelbase and 33-in. diameter cast wheels. The operating equipment comprises four Westinghouse 56 motors geared 14:68, K-14 controller, with resistors under the locomotive, Westinghouse quick-acting automatic air brakes, Peacock hand brakes and Tomlinson M. C. B. drawbars. The weight of the locomotive complete is 42,000 lb.

The underframe has 7-in.—9¾-in. channel outside sills and 7-in. 72-lb. grooved girder rails for center sills. The subsills are also 7-in. 72-lb. grooved girder rails. The sloping ends of the cab are provided with trap doors. The front compartment contains the air tanks, while the rear compartment can be used for tools, etc., in case the locomotive is ever put to any other service.

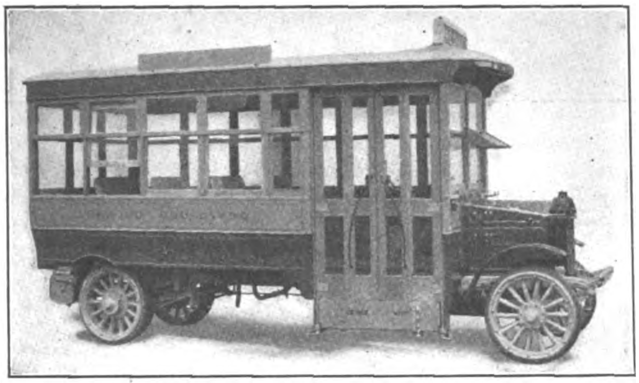


END-VIEW AND TWO INTERIORS OF DETROIT SWITCHING LOCOMOTIVE SHOWING DISPOSITION OF CONTROLLER, AIR-BRAKE, CIRCUIT BREAKER, HAND BRAKE AND COMPRESSOR MECHANISM

Entrance and exit are provided by a solid wooden door on each side, an angle-iron step and grab handles being provided for each door. The illustrations of the interior show how the braking and control equipment is distributed. It may also be added that the slogan "Safety First" is stenciled both inside and outside the locomotive as a constant reminder to the operators and yardmen to exercise caution.

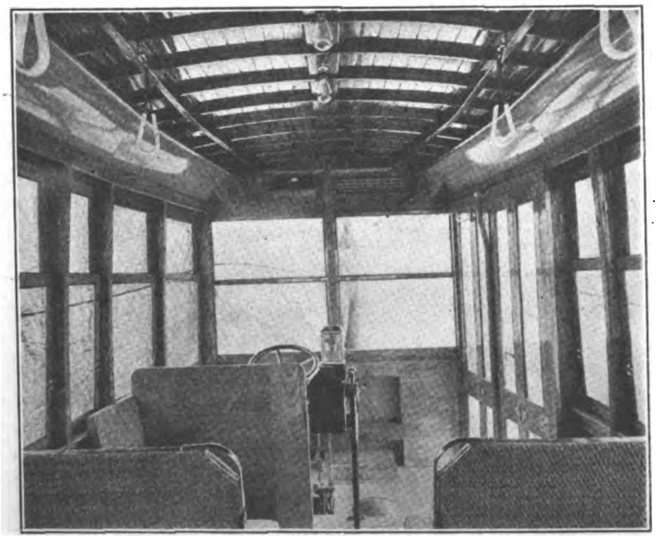
Near-Side Buses in Birmingham

The usefulness of the motor bus for the development of suburban territory is exemplified by the purchase of four motor buses by the Birmingham Realty Company, Birmingham, Ala. These buses were built by The J. G. Brill Company.



VIEW OF NEAR-SIDE BUS WITH FOLDING DOORS CLOSED AND STEP RAISED

The buses are now in service on a regular schedule between the downtown section of Birmingham and a high-class residential realty development known as the "Norwood Property," located 3¼ miles from the center of the city. A condition very favorable for the operation of buses is that the entire route is over asphalted streets. The vehicles have been in service since the third week of July and have proved a popular solution of the problem of carrying people to and from this section.



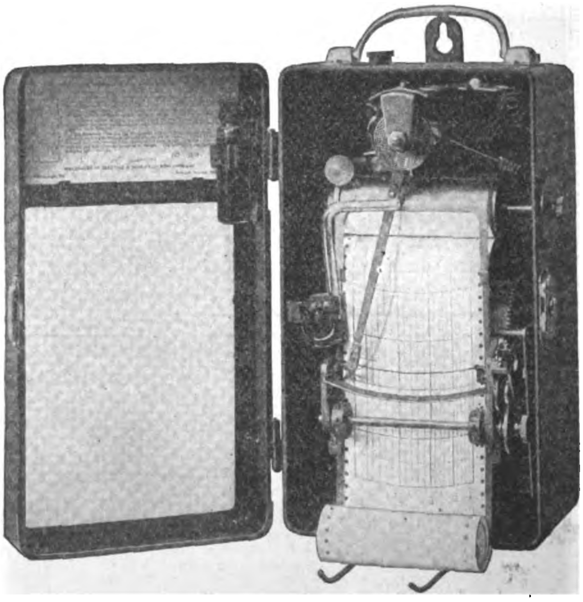
INTERIOR OF BUS AT ENTRANCE

The buses are 15 ft. 6 in. over the body, 6 ft. 11¾ in. over the sills and 7 ft. 4½ in. over all. The body is constructed of wood with plain arch roof and composite underframe. The interior trim is of clear ash with exposed carlines. A two-ton Pierce-Arrow chassis is used. The bus steps are of the folding type, arranged to operate in connection with double-leaf glazed folding doors on the near-side car principle. A vertical stanchion separates colored from white passengers. The height from the roadway to the first step is 14¼ in., from the step to the platform 10 in. and from the platform to the bus floor, 10 in. The conductor collects fares with the aid of a Dayton fare box. The seats are of Brill cane style with pressed steel frames. Perry ventilators are used on all buses. Heaters connected with the exhaust from the engine will maintain satisfactory temperature during the winter months. The lamps are lighted from a storage battery. Standing room conditions have been provided for not only in furnishing seats with corner grab handles, but in supplying Rico sanitary straps. The buses have push buttons as in standard prepayment cars.

Graphic Meters

The graphic meter has a wide field of usefulness, especially for locating leaks and theft of current, determining most economical hours for operating generators of various sizes and checking up the distribution of load between units. The Westinghouse type U graphic meters of the style shown are intended primarily for purposes where graphic meters that are easily operated, light in weight, comparatively low in price and reasonably accurate are required. The continuous records of the type U meters, covering a week's time on a single chart, make it possible for central stations to secure at a reasonable cost a number of records much desired, but not previously obtained because of the expense. The extended uses to which graphic meters of this class have been put have brought out points of improvement that have lately been made in the above-mentioned meter.

The meter consists of a solenoid and core acting directly on an arm that carries the recording pen, and a continuous strip of paper moved uniformly by a high-grade clock mechanism. To overcome the slight friction of the pen on the paper, the solenoid is made very powerful in action. This action is controlled by a heavy spring, which also minimizes inaccuracies due to slight errors in leveling. An oil dash-pot is provided to damp the action of the meter's fluctuating current or voltage. On circuits not subject to excessive fluctuations, the oil can be left out of the dash-pot.

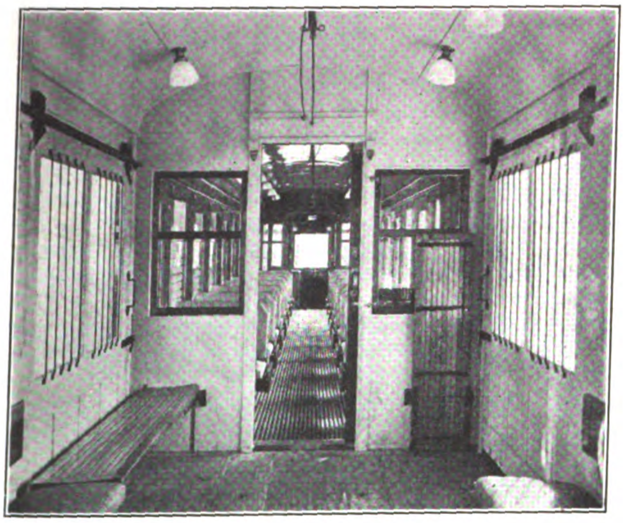


GRAPHIC METER WITH COVER OPEN

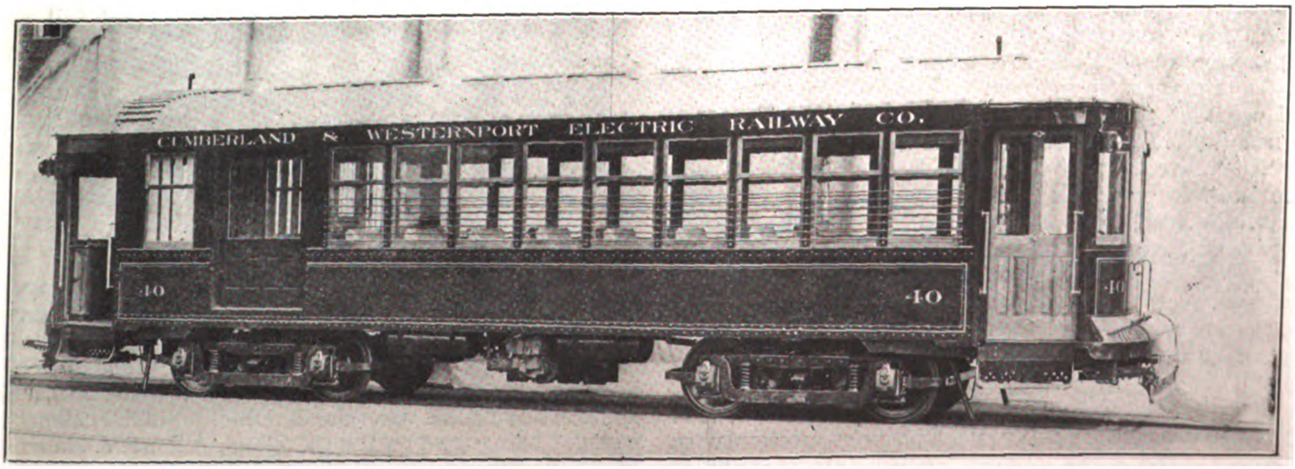
A glass ink reservoir, a new feature, which will hold a supply sufficient for three weeks or more of ordinary use, is mounted in such a way that a wick, one end of which is in the reservoir and the other in the V-shaped pen, will feed the ink into the pen as used. The ink is furnished in liquid form and is specially prepared to give good results with the pen and paper supplied. A small clip inside the meter case serves to hold the ink phial, so that the ink is always on hand when wanted.

The record paper for these meters is of stock specially selected for satisfactory records and is accurately ruled. The hours are stamped on one margin, and an accurate drive is assured by perforations in the paper in which pins on the driving mechanism engage. The paper is 3¼ in. wide, 2½ in. being occupied by the calibrated part of the scale, which has well spaced legible divisions throughout 2¼ in. in its width.

Combination Cars for Maryland


INTERIOR OF CUMBERLAND CAR AT PARTITION

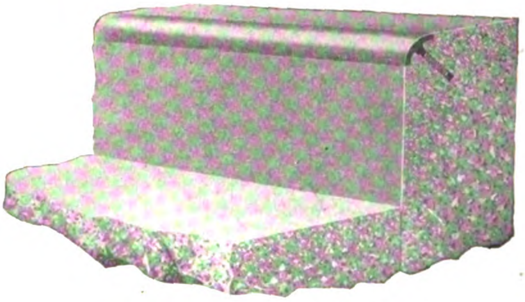
The Cumberland (Md.) & Westernport Electric Railway has lately received from The J. G. Brill Company two arch-roof cars built for combination passenger and express service. These cars are 43 ft. 3 in. long over the vestibules, 34 ft. 3 in. over the body, 8 ft. 5 in. wide over the sills and 11 ft. 11⅝ in. from the rails to the trolley base. The constructional materials are steel underframe, composition wood and metal body, with agasote headlining and bronze interior trim. The main passenger compartment is fitted with Hale & Kilburn cross seats for thirty-six passengers. The seating in the baggage-smoking compartment is somewhat unusual inasmuch as rattan seats are used along the sides in addition to removable slat benches alongside the door. It will be noted also that the upper part of the doors of this compartment is glazed with clear glass, grilling being used to prevent breakage, and that the partition between the two compartments is also of clear glass. The lamps are equipped with inverted bowl shades. The bodies are mounted on 27 M.C.B-2 X trucks with hammered steel axles and Carnegie steel wheels. The motor equipment is of the GE 201-G type. Both Peacock hand and Westinghouse A.M.M. automatic air brakes are employed.

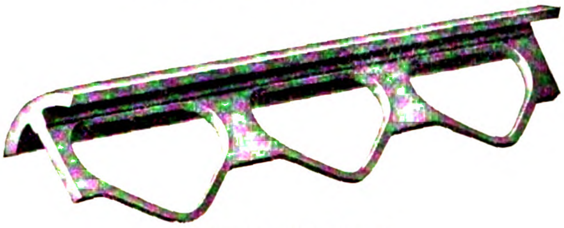


COMBINATION PASSENGER AND BAGGAGE CAR FOR THE CUMBERLAND & WESTERNPORT RAILWAY

Protection of Pit Steps and Columns Against Chipping

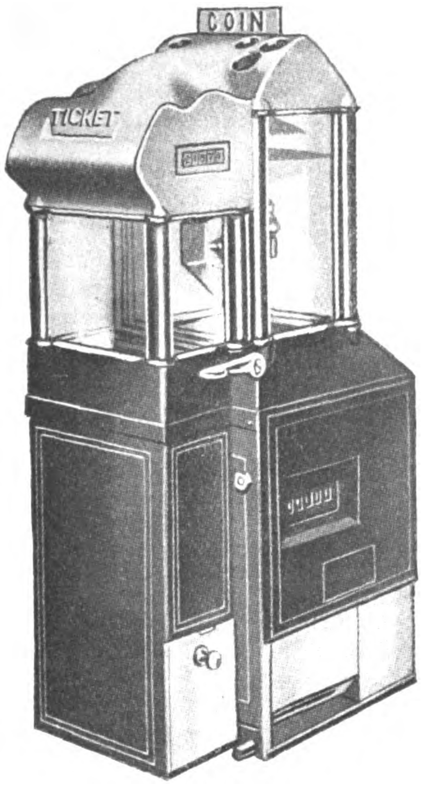
The Trussed Concrete Steel Company, Youngstown, Ohio, has recently brought out a form of reinforcement called a curb bar which is designed specifically to protect the edges of concrete steps and columns against chipping or other breakage. In the case of electric railway structures, the new form should prove especially useful for pit steps on which brakeshoes and other heavy parts are liable to fall and do damage. The curb bar is made from a special steel section which is punched and expanded by powerful machinery. The form of the plate is such as to give a neat edge, while the anchorage is integral therewith. The bars are of open hearth steel and are galvanized after forming.


EDGE REINFORCEMENT AT STEP


REINFORCING MEMBER

Ticket and Cash Counting Fare Box

An illustrated description in the Electric Railway Journal for March 14 set forth recent developments in recording fare boxes as perfected by the Johnson Fare Box Company, Chicago and New York. This article described in particular the addition of a receptacle for tickets, which includes a cancelling device operated by a small motor. The accompanying illustration shows the most recent improvement to this combination coin and ticket box. A ticket counter has been added so that, as now sold, the combined box will receive and count coins and will receive, cancel and count tickets.



FARE BOX WITH TICKET AND CASH COUNTING MECHANISM

The tickets used are octagonal in shape with dimensions of 1⅜ in. for the shortest diameter and 1½ in. for the longest diameter. They are prepared in strips of the desired length and the strips are scored so that the tickets will separate easily and correctly. It is stated that the cost of these tickets is no greater than for any other tickets. When a passenger inserts even the smallest part of a ticket in the slot, the cancelling rolls engage with the ticket and pull it inward, passing it rapidly between two sets of rolls which cancel it and drop it into an inspection box below. As the ticket is passing through the rolls it operates a unique counting device which gives an accurate registration of each ticket passing through, whether singly or in strips. This ticket cancelling and counting device with its examination box and ticket receptacle below has a capacity for handling more than 1000 tickets before it requires emptying. However, boxes in use never become filled because it is the practice at the end of each trip to remove the tickets from the box and insert them in the trip report envelopes.

The ticket counting and cancelling device is so designed that it will fully cancel and individually count all tickets even though they may be inserted in strips; also the inking rollers are arranged so that a double cancellation is plainly indicated. Some of these boxes have been in actual service since December, 1913. It has been found that the motors give no trouble and so far have required no attention. The felt rollers which carry the ink are especially hard and should last for several years. These rollers require inking at intervals of not less than ninety days.

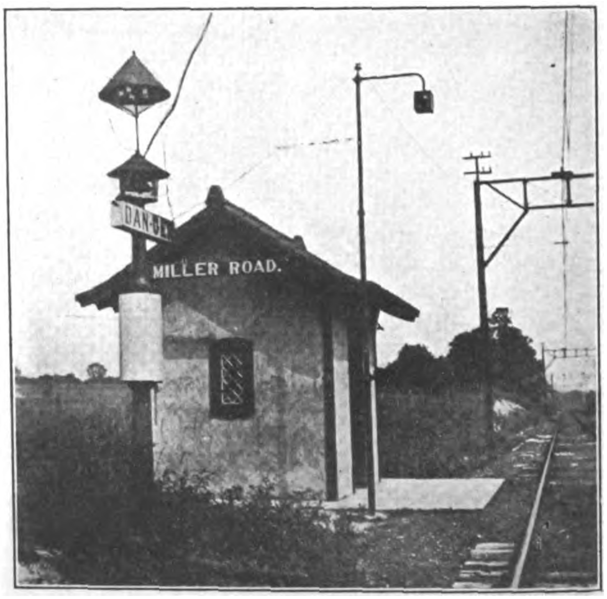
The fare collection methods which are recommended by the Johnson Fare Box Company, in connection with the use of its latest devices, contemplate the use of "clock" registers in the cars and combination ticket and cash counting boxes on the platforms. As fares are received, whether they are tickets or cash, they pass into the inspection receptacles and are then counted and the cash and tickets are available for the conductor, the cash for making change and the tickets for turning in with the trip report. This plan exhibits to the interior of the car the instantaneous count of all fare passengers and insures a prompt count of both tickets and cash as they pass through the fare box. It is thought that this box with its ticket cancelling and counting attachment will be of particular interest to those roads which collect 70 or 80 per cent of their receipts in the form of tickets.

The company has recently moved into a new plant in Chicago, the capacity of which is 2000 boxes every ninety days. The company is now at work on an order of 1000 boxes. The equipment used for the manufacture of the boxes includes a large number of special machines. The boxes are in unit parts so that the parts are interchangeable. The movement of the mechanism in the boxes is effected in all cases by gear transmission, and a great many unique dies, jigs, presses and tools have been evolved to assure uniformity in manufactured parts.

Road Crossing Stop Signals

The Northern Ohio Traction & Light Company, Akron, Ohio, has recently installed a number of road crossing stop signals for the convenience of its passengers. It is expected that these signals will serve to promote safety, aid the motorman in making efficient stops and prove a great convenience to patrons. The signals comprise a small rectangular lantern housing made of ingot iron fitted with two 5⅜-in. green semaphore lenses and wired for three 250-volt lamps. The size of the lens insures a clear indication to the trainmen, and the low drop across the lamp terminals insures a long life.

These signals are mounted on steel poles with mast arms projecting so that the lights are clearly visible to the motormen. As the train approaches the road crossing a prospective passenger closes the lamp circuit through a manually operated self-opening switch, which is released upon receiving a signal from the approaching car. This equipment was furnished by the Nichols-Lintern Company, Cleveland, Ohio. Similar signals are also being used on the Cleveland, Alliance & Mahoning Valley Railroad, and signals of this type are being tested by the Northwestern Pennsylvania Traction Company, Meadville, Pa.



ROAD CROSSING STOP SIGNAL

News of Electric Railways

Court to Pass on Toledo Three-Cent Fare Injunction in September

The application for an injunction to restrain the city of Toledo, Ohio, from enforcing the Schreiber 3-cent ordinance was heard by Judge John M. Killits of the United States District Court on Aug. 14. The Toledo Railways & Light Company filed the application a few days prior to this as supplementary to the petition for a receiver which has been pending in that court for some months.

The court will pass upon the application on Sept. 8. Unless it can be shown by that time that it is possible for the company to operate its cars for 3 cents, without impairment of its securities, the injunction will be granted by the court.

A ruling was made to the effect that the company may cease the operation of its cars at any time, voluntarily, or the city may force the suspension of operation, since all franchises have expired. The court said this would work a hardship upon the citizens, and result in great damage to the business of the city.

When City Solicitor Thurstin objected to the burden being placed on the city of showing the reasonableness and validity of the Schreiber ordinance, the court said that the testimony of Accountant Carl Nau, Cleveland, submitted in the previous hearing of the case last March, unless refuted by the city, is enough to show that 3-cent fare will not pay in Toledo. Judge Killits said in part:

"The only reason why an injunction was not then issued was that the ordinance itself pointed out that it is the duty of the city solicitor to enforce it. By the attitude of the city, the court was led to believe that as soon as the papers could be prepared suit would be filed in common pleas court to ask the court to pass on this question. That burden has been upon the city ever since March 27. At the bottom of all this controversy is the question whether the Schreiber ordinance is reasonable, and it is difficult to conceive that in all this time no court has been asked to pass on this question.

"In this particular case, the court puts the burden on the city of showing that its own ordinance is illegal because the very construction of the ordinance requires that the city solicitor go into court to enforce the ordinance just as soon as the company refuses to obey it. Is it possible that the city intends to occupy the position of dog in the manger forever? If the ordinance is unreasonable the company cannot be held to its terms by the mere fact that it continues to operate. We must have transportation. Then for the city to say that if the company continues to furnish that transportation it thereby accepts terms which may be unreasonable is unconscionable.

"If the city attempts to enforce the ordinance by means of the police, or by inciting the public to be judge and jury and enforce the ordinance itself, without an effort being made in court to test its validity, a federal question is involved and this court has the right to inquire into it. The morals of this community are being impaired by the general understanding that passengers may beat the company out of fares merely by showing 3 cents.

"On Sept. 8 I expect the city to be prepared to meet not only the facts alleged in the supplementary petition, but also the testimony of Carl Nau, which tends to show that the Schreiber ordinance is inoperative because it is unreasonable. Mr. Nau's testimony, if unrefuted, is sufficient to show that 3-cent fare, because of the mileage and the number of unproductive miles of street railway in Toledo, will not give a return, regardless of bonds. The city ought not to have the idea that there is any sacredness about 3-cent fare, and should be prepared at this minute to show that it is reasonable."

Pending the decision of the court the company will continue to operate cars as in the past, accepting the old rate of fare from those who are willing to pay, but refusing 3 cents at all times.

City Solicitor Thurstin said on Aug. 17 that his department had begun to prepare the matter to be presented to Judge Killits. The company offered to open its books to the city, but Mr. Thurstin said that the city would probably not employ an expert to examine the accounts since the Schreiber ordinance became effective. Council does not meet until Aug. 24 and authority for this step could be secured only at that time.

The city will be required to refute the testimony of Carl Nau, who made the examination referred to by Judge Killits. Mr. Nau testified in a former hearing in regard to the rate of fare that would be necessary to meet the requirements. This, at the time, seemed to satisfy the court that the fare was too low, unless it could be refuted by the testimony of other witnesses. No attempt has ever been made at such refutation.

Results of Boston "Safety First" Campaign

In conjunction with the Boston Chamber of Commerce, the Boston (Mass.) Elevated Railway conducted a "safety first" campaign covering part of June and the whole of July, 1914. The features of this campaign were described in this journal at the time of its occurrence, and figures are now available showing the results of the work on the Boston Elevated system and in the streets of the city as a whole.

In the course of the campaign 200,000 "safety first" circulars were distributed to pupils of the public schools of Boston and five adjoining municipalities; 7500 circulars were sent to the teachers of these schools; two exhibition cars with illuminated signs were operated; 55,000 dasher signs, divided into six different sets, were displayed during July; 45,000 clerestory signs elaborating upon the dasher signs were shown in the interiors of cars during the same period and 2700 signs were displayed upon the company's premises. On the cars and premises of the company, 150,000 gummed labels were shown; 3000 placards illustrating automobile and team accidents were distributed among garages and stables in the Boston metropolitan district, and 10,000 placards were distributed to the owners and drivers of vehicles. Six thousand large placards were distributed to the stores throughout the city and suburbs; 100,000 circulars setting forth "safety first" rules were placed with mercantile and industrial establishments, and various other signs and letters were sent out. Fourteen illuminated "safety first" signs were installed at various terminals and stations, and slides calling attention to the campaign were displayed at various moving picture theaters.

Upon solicitation of the Boston Chamber of Commerce and the Boston Elevated Railway, the New York, New Haven & Hartford Railroad installed a large illuminated sign at the main entrance to the South Station in Boston, which handles the largest passenger traffic of any steam railroad terminal in the world. The newspapers of the city of Boston and surrounding towns and cities were liberal in the prominence which they gave to the campaign. Pictures of the exhibition cars and cartoons based upon the slogan "safety first" were shown. Many individual advertisers adopted the slogan for store-window displays. An attempt to secure the interest of employees was made by the exhibition of charts at all rating stations, showing the daily number of accidents in each of six important classes, as compared with the same period in 1913.

On July 1 a printed bulletin was sent to all employees by the Bureaus of Operation and Maintenance announcing the campaign, and on July 16 a bulletin was posted in the carhouses showing the results for the first half of the month. At the end of the month a printed bulletin was sent out to all employees, giving the results of the entire month's campaign and adopting the slogan, "Safety first, last and always."

The following statement shows some of the principal percentage accident decreases over 1913 as figured on the Boston Elevated Railway: Car and vehicle, 22.5; car and person, 15.7; collision of cars, 19.4; alighting, 28.3; boarding, 27.6; derailments, 14.9; total reduction from 1913, 25.3; car accidents, 20.6; passenger accidents, 28.

Figures compiled by the company show that in spite of an increase of passengers carried of 2.9 per cent over July, 1913, there was a decrease of 25.3 per cent in all classes of accidents during the period of the campaign. Forty-three per cent more passengers were carried per passenger accident than in July, 1913, and the car-miles per passenger accident increased 25.8 per cent. In July, 1913, there were eleven clear days, fifteen partly cloudy and five cloudy, compared with eight clear, thirteen partly cloudy and ten cloudy in July, 1914. The total precipitation in the former month was 2.69 in. and in the latter, 2.64 in., and the mean barometer was 29.92 in. and 29.98 in. The company ran 236 more trips in July, 1914, than in July, 1913. The accident figures on the rapid transit lines show little change compared with the previous year's period.

Following are statistics obtained from the Boston Police Department in regard to the number of street accidents during July, 1913, as compared with the same period during the year 1914:

FIRST WEEK	1913	1914
Fatal	9	2
Serious	10	14
Minor	44	27
Total	63	43

SECOND WEEK	1913	1914
Fatal	17	5
Serious	14	19
Minor	30	29
Total	61	53

THIRD WEEK	1913	1914
Fatal	1	6
Serious	11	9
Minor	42	37
Total	54	52

FOURTH WEEK	1913	1914
Fatal	3	5
Serious	18	3
Minor	43	39
Total	64	47

The total accidents of each kind indicate a reduction of 40 per cent in fatal accidents during July, 1914, as compared with July, 1913; a reduction of 11 per cent in serious accidents, and a reduction of 17 per cent in minor accidents. The average of all accidents shows a reduction of 19 per cent for July, 1914, as compared with the same period for last year.

Des Moines Franchise Negotiations

In referring to the franchise negotiations in Des Moines, Ia., Emil G. Schmidt, president of the Des Moines City Railway, is quoted as follows:

"We would rather reach a solution through the City Council than submit the matter to the voters. I have told the City Council that I would negotiate on the basis of the Denver franchise or on a franchise that will make it possible for the city to enforce good service and fix an established fare. The reduced fare in the latter proposition amounts to the same thing as the payment of a fixed sum to the city, as is done in Denver. If the city will not negotiate further, it will be necessary to draw up a new draft and submit it to the voters. If this is done, the franchise would provide for service and fares but not for capitalization."

The City Council on Aug. 13 rejected the franchise presented by Mr. Schmidt, by moving to substitute the first franchise offered by the company, amended, however, as to the amount of capitalization. The motion stipulates that the capitalization shall not be more than $4,762,500 and also that six fares for a quarter be allowed from the time of acceptance of the franchise by the company. Mr. Schmidt is quoted as follows:

"We will not accept any such franchise and will take the matter direct to the people. The company will take steps immediately to have the special election to see how the people stand on this question. That a franchise calling for such a low capitalization and for reduced fares is not acceptable to the company I repeat at this time. We have made every concession but the one which means that we cannot operate at a profit and have reached the point where there is no hope of settling the matter through the City Council."

The capitalization named in the franchise as originally drawn was $5,400,000.

Subway Construction and Equipment Contracts

Edward E. McCall, chairman, and Travis H. Whitney, secretary of the Public Service Commission for the First District, have executed on behalf of the city of New York the contract for the construction of Section 1-A of Route Nos. 4 and 38 of the Seventh Avenue Subway in Manhattan. The contract was awarded to the Rapid Transit Subway Construction Company, the lowest bidder, for $474,244. Section 1 of this subway covers the connection of the new Seventh Avenue Subway with the existing subway at the Battery. The chairman and the secretary have also executed the contract for station finish for certain stations in the Fourth Avenue Subway, Brooklyn, on the extension now being constructed between Forty-third and Eighty-sixth Streets. This contract was recently awarded to the Station Construction Company, Inc., for $251,133. There are six stations on the extension, namely, local stations at Forty-fifth Street, Fifty-third Street, Bay Ridge Avenue and Seventy-ninth Street, and express stations at Fifty-ninth Street and Eighty-sixth Street. The chairman and the secretary have in addition executed a contract recently awarded to the Indianapolis Switch & Frog Company for the supply of certain special work for the Fourth Avenue Subway in Brooklyn.

Future Transportation Needs of Los Angeles

The *Evening Herald*, of Los Angeles, Cal., has been publishing a series of articles by "men who have done things in Los Angeles" in which they give their ideas as to what should be done to insure the future of the city. In the issue of that paper for Aug. 11 Paul Shoup, president of the Pacific Electric Railway, discussed transportation in part as follows:

"More than any other great city in the world, growth in greatness of Los Angeles will be measured by the safety, swiftness and comfort of its urban and interurban transportation systems. To maintain one great central business section for a population of 1,000,000 or perhaps 2,000,000 people, with that population so distributed that each family may have its own vine and fig tree, involves a problem in transportation. The rule is fairly well established that suburban communities may become a part of the daily business life of a city if not further removed than one hour from the center. The army of commuters dwindles rapidly after the hour post is passed. This time element is of greater importance than the fare or the distance; indeed, distance cuts little figure save as it affects the expense and time elements.

"It is essential that the city should maintain a policy that will keep open to the very heart of its business section ways for the suburban and interurban electric railways. Any policy of interference with their service is but one of putting up hurdles for the stranger seeking our gates to jump over; and other gates are open. Lines of travel must be provided that will furnish such easy access to the city's center that one may have a home 35 or 40 miles away and yet be a part of the city's daily business life. But if it is to be done these lines must eventually be free from grade crossings and on rights-of-way devoted to no other purpose. Then Pomona and Santa Ana may both come well within the hour limit. First of all the city must be willing and able to grant such rights as will assure to investors the stability and safety of their investments; and second, its citizens must be willing to pay such rates of fare as will yield a reasonable return upon the investment—what you would want and expect if it were your bank account that was being converted into rails and rights-of-way.

"The Pacific Electric Railway does not at present on all classes of travel, commutation, single and round trip, earn a great deal more than 1 cent a mile. The round trip to the beaches, for example, yields only from 1 cent to 1½ cents a mile, and the individual commutation rates are much below 1 cent a mile where traffic is dense. And if further large investments are to be made to help make this greater city, the rate question, one of sore perplexity to many railways, needs to have the careful and fair consideration of the public; bricks cannot be made without straw, nor railroads operated without adequate revenues.

"The transportation systems of the future will have as its base our present lines, supplemented with subways to the west and elevated roads to the east and south, over which electric trains will be operated without 'let or hindrance' to the city's center, making of Los Angeles County, for a radius of 40 miles around, one great city. How fast transportation development will come upon us will be determined not only by the need but as well by the measure of public confidence and co-operation granted. It would be idle to claim that railways still have any open sesames to treasure houses. The railways must prove their case in advance and the public must stand by them; for the public is most interested after all in their welfare, since without success there cannot be good service, and good service is the making of our southern California."

The Toronto Purchase Deal

The proposed purchase of the property of the Toronto Railway and the Toronto Electric Light Company by the city is regarded as being off. Mayor Hocken would not admit on Aug. 14 that the financial situation was the controlling factor, but on all sides it is agreed that it would be highly inadvisable to perfect the sale in the present state of the money market, particularly as the city has experienced difficulty in obtaining funds to finance work it now has in hand. When asked if the railway and light purchase was off, the Mayor said: "I do not know. I am consulting financial authorities to see what can be done."

The Mayor announced that the Board of Control would further consider West Toronto's transportation problem at a full meeting about Aug. 20. It is likely that the submission of both a motor bus by-law and one for the extension of the Toronto Civic Car Lines will be recommended.

R. C. Harris, commissioner of works of Toronto, has reported to the Board of Control that a transfer system between the Civic Railway and the suburban lines is not feasible.

Kansas City Board of Control Opens Office

The board of control of the Kansas City (Mo.) Railways is established in a suite of offices in the building at Fifteenth Street and Grand Avenue and is arranging for the approval of the specifications and details of construction of the Prospect Avenue extension. It is also investigating the type of car which will be built, details of construction, and power house and distribution questions. A. L. Good, civil engineer, and R. L. Weber, electrical engineer, have been added to the staff. Two engineers will be selected soon to assist the board in gathering data and studying problems of car schedules and service.

Three of the interurban lines definitely favor the site proposed at Eleventh and McGee Streets for the interurban station. Public hearings were to start on Aug. 18, at which interested persons are to be heard in arguments for the various proposed sites.

Low Water Interferes with Operation of Ohio Road.—The Sandusky River has recently been at its lowest stage in years and, owing to a lack of water, the immense hydroelectric power plant south of Fremont, Ohio, which generates power for the Lake Shore Electric Railway, has been unable to operate.

Service Resumed in Goldsboro.—The Goldsboro (N. C.) Street Railway has re-established service on part of its present system. New track will be laid on the section not now in operation and two more cars put in service. The road suspended operation some time ago. In 1913 the property was sold under foreclosure and the receiver discharged.

Inspection of Eastern Properties.—D. F. Fennell, secretary to J. E. Gibson, general superintendent of the Metropolitan Street Railway, Kansas City, Mo., is at present making a tour of some of the principal cities of the Northeast to observe operating conditions and railway practices. He expects to visit Chicago, Milwaukee, Buffalo, Cleveland, Detroit and Toronto.

Municipal Railway Bond Issue Upheld.—The Supreme Court of the State of Washington has handed down a decision upholding the validity of the $35,000 issue of bonds voted recently in Tacoma for municipal railway purposes. The plan is for the city to equip a short line to the section known as the "Tide Flats," over which the Tacoma Railway & Power Company has agreed to operate under conditions summarized previously in the ELECTRIC RAILWAY JOURNAL.

New Jamaica-New York Service.—The management of the Brooklyn (N. Y.) Rapid Transit Company has announced that it expects to have express trains running in a little more than a year over the elevated tracks on Jamaica Avenue and the third tracks of the Kings County elevated line on Fulton Street, Brooklyn, between Park Row, Manhattan, and Grand Street, Jamaica, in thirty-five minutes and for a 5-cent fare. The distance from Manhattan to Jamaica over this route is more than 12 miles. The third tracking of the Kings County elevated line is now under way on the section between Nostrand Avenue and Sackman Street, and the entire work between the East New York loop and the Brooklyn bridge will be done in a year.

Proposed West Side Service in Cleveland.—City Engineer Hoffman has proposed a plan to give the west side of Cleveland, Ohio, rapid transit service, similar to that proposed for the Heights by way of Kingsbury Run. For the purpose of avoiding street and railroad crossings and keeping the cost of construction within bounds, the Cuyahoga Valley and Walworth Run will be utilized. A point near West Sixty-fifth Street could be reached in this way and then the road would follow Clark Avenue to its junction with Lorain Avenue. It could then be continued as far west as desirable. Mr. Hoffman thinks that this should be a part of the Cleveland Railway system. The matter has been referred to Director of Public Service T. L. Sidlo and Street Railway Commissioner Peter Witt.

Strike on Northampton Street Railway.—Sixty-five conductors, motormen, carhouse employees and trackmen of the Northampton (Mass.) Street Railway went on strike on Aug. 18. The disagreement between the men and the company is understood to have arisen from differences in interpretation of the finding of the board of arbitration which recently investigated wage conditions on the road. The men claim that the finding of the board reduced wages by about $3,600 and that the arbitration agreement did not permit a finding for a wage reduction. According to the company's interpretation, the finding of the board awarded compensation to the men on the basis of actual platform time. Present wage schedules run from 23 to 28 cents an hour compared with 21 to 26 cents under the former arrangement. The men desire to be paid for ten hours' work on the basis of nine hours' platform time.

Dorchester Tunnel Bids Opened.—The Boston Transit Commission has opened bids for the construction of the section of the Dorchester subway located in Dewey Square and Summer Street, Boston, and having a length of about 800 ft. The section includes the Dewey Square station, and associated with it are connections with the South Station elevated platforms and provision for quick access to the South Terminal Station of the New York Central and the New Haven systems. The portion of the subway covered by the bids is one of the most important in the city from the standpoint of traffic arrangements. The subway station at Dewey Square will include a lobby 125 ft. long and about 75 ft. wide. Trains now run in the Cambridge subway between Harvard Square and Park Street, Boston, will provide rapid transit to the South Station from Cambridge, Arlington, Watertown, Newton, Waverly and other western suburbs by the extension of the present Boston section of the Cambridge subway under Winter and Summer Streets to Dewey Square. Bids made public by the commission ranged from $673,780 to $749,860. The contract will be awarded later.

Strike in Vincennes.—The Vincennes (Ind.) Traction Company has suspended operations as a result of a strike of a number of its employees and the alleged hostile attitude of members of some twenty-five union labor organizations in that city. S. S. Bush, the managing director of the system, is a Louisville (Ky.) man and returned to Louisville during the latter part of the week ended Aug. 15 after having spent several days in Vincennes. Mr. Bush said that the only question at issue was recognition of the union, in which something less than a score of the fifty trainmen in the company's employ have enrolled. No attempt will be made to operate cars until the company can be assured of sufficient police protection. Meanwhile about thirty of the company's employees, who have refused to join the union, are reporting daily and are on full pay, prepared to take out the cars when conditions warrant the resumption of service. The company has 9 miles of track in Vincennes, which is a city of about 25,000. According to Mr. Bush, most of the employees of the company signed a statement previous to the strike in which they expressed satisfaction with conditions of work and pay.

Financial and Corporate

Recent Financial Tendency

The resumption of international trade relations on a moderate scale on Aug. 19, with the foreign exchange market at rates more nearly approaching normal, was generally looked upon as an augury for good in the near future. War risks which commanded from 30 to 50 per cent ten days ago were quoted on Aug. 19 at 3 to 5 per cent in addition to the general insurance rate of one-fifth of 1 per cent on cargoes. On Aug. 19 sterling exchange was quoted from 4.96 to 4.98, while sixty to ninety-day bills were quoted at 4.88¾, and represented actual transactions.

There has been considerable agitation for the reopening of the stock exchanges, the Boston *News Bureau* saying that such reopening cannot be delayed much longer. The governors of the New York Stock Exchange are said not to have discussed the question of reopening. The committee of governors positively refuses to disclose the volume or character of the daily dealings for cash in securities through the medium of the Clearing House, but it is reported that since the system was inaugurated the daily transactions on several occasions have reached 15,000 shares. In connection with the agitation for reopening the New York Association of Partners of Stock Exchange Firms sent a notice to members on Aug. 19 reviewing present conditions briefly and suggesting that members notify customers that they will accept orders to be executed "at the market" only in moderate amount and for adequate reasons, the association recommending strongly that all orders should have fixed limits; that buying orders should be executed only for those who previously have supplied ample margin, or whose purchases are made for cash, and that stop loss orders be eliminated as far as possible. It was felt that by co-operating along these lines the opening of the exchange would be facilitated and that such a course would render the initial transactions free from violent and erratic fluctuations.

Trading in securities for cash was resumed on the Chicago Stock Exchange on Aug. 14 under a plan similar to that adopted in New York on Aug. 12. In addition members of the Chicago exchange received permission to execute buying and selling orders in their own offices, at prices not below the closing quotation of July 30. The bond market in Chicago is reported at a standstill. Bond houses are said to have recalled all their salesmen. The Montreal exchange has announced that three days' notice will be given before trading is resumed there. The Boston Curb Exchange is open daily from 10 a. m. to 12 m. for the settlement of outstanding contracts, but members have been warned not to trade in stocks or bonds listed on the Boston or other exchanges.

The conference between treasury officials and representative bankers and business men to the number of 150 at Washington on Aug. 14 is regarded as having a stabilizing effect. Views were generally interchanged with the object in mind of guiding the treasury in upholding the credit of the country and in devising means to restore normal conditions in the export trade. The opinion prevailed that there would be no escape from a war tax if the war should continue for any length of time. In connection with the issue of emergency currency it is pointed out that National bank notes hoid a peculiar place in the country's circulation. Unlike either the gold and silver certificates, which are secured dollar for dollar by metal, or the United States legal tender notes, which are secured by a substantial gold reserve fund, they have behind them for the most part, only the credit of the Government in the shape of its bonds. The metal security behind the other notes has a stable value, but how the security behind the national bank notes is liable to impairment was demonstrated in the decline in the price of Government bonds last year. The danger indicated here is from any project which resulted in pyramiding obligations upon a base that is liable to depreciation under adverse circumstances.

On Aug. 18 President Wilson signed the amendment to the Panama Canal act under which foreign-built ships may be admitted to American registry for overseas trade. The measure becomes effective at once. It was reported about the same time that the British Government had informed this Government that it would not interpose any objection to the transfer of German vessels to American registry if assurances and evidence were furnished that the sales of these vessels to Americans were bona fide and not merely for the period of the war between Great Britain and Germany.

The Boston *News Bureau* has prepared the following interesting comparison of the leading traction securities, giving the closing prices of July 30, the 1914 high and the high and low for 1913:

	Close July 30	1914 High	1913 High	1913 Low
American Railways............	37	39½	49½	37
Boston Elevated..............	93	101¼	114¼	82
Brooklyn Rapid Transit........	79	94¼	92¾	83¾
Chicago Railways part. ctf. "1"...	88½B	99¾	102	88
Chicago Railways part. ctf "2"...	29B	35⅞	33¼	18
Interborough-Metropolitan com...	11	16⅜	19⅝	12⅜
Interborough-Metropolitan pfd...	52	65⅜	65⅜	45
Manhattan	128¼	133	132⅝	127
Massachusetts Electric com......	9¼	14	19⅜	10½
Massachusetts Electric pfd......	57½	66½	79	63
North American Co............	64⅛	79¾	81½	60
Philadelphia Rapid Transit......	12½	20⅛	28½	18
Third Avenue	33	45¾	43⅜	27⅞
Twin City	94⅞	108½	109	101⅛
United Rys. Investment com.....	6B	23¾	35½	16
United Rys. Investment pfd.....	22	49¼	63½	30

Dominion Power & Transmission Company, Ltd.

According to the annual report of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., Canada, the gross earnings of the company for the year ended Dec. 31, 1913, amounted to $2,737,806. The operating expenses totaled $1,455,993, leaving a net income of $1,281,813. After the transfer of $141,116 to the maintenance and renewal accounts and the payment of bond interest and general interest of $378,172, there were left surplus earnings of $762,525. The combination of this sum with the profit and loss balance for 1912 of $1,005,715, together with the declaration of dividends of $362,378 and the transferal to the reserve account of $450,000, left a profit and loss balance for the year of $955,861.

The report of the company lays particular stress upon what it considers to be a feature of conservatism in accounting: namely, the installation of a reserve for taking care of maintenance and depreciation. Prior to 1913 it was the practice to charge to operating expenses all sums spent on necessary renewals and maintenance, the amount so spent in 1910 being $210,753; in 1911, $224,935, and in 1912, $282,443. In 1913 the board of directors began charging off a substantial percentage of the gross earnings each year, the charge for that year being $442,677. Of this amount $337,269 was actually expended, the balance remaining to the credit of the maintenance and renewal account as a special reserve. This provision was made in addition to the sinking fund for bonds.

Cape Breton Electric Company, Sydney, N. S., Canada.—The gross earnings of the Cape Breton Electric Company for the year ended June 30, 1914, were $373,647, as compared to $373,788 for the year ended June 30, 1913. The net earnings for the present year amounted to $166,308, as compared to $173,045 for the year previous. The interest charges increased during the year from $55,931 to $60,973, sinking and improvement funds decreased from $14,380 to $14,280, and the surplus decreased from $102,734 to $91,055.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—The resale of the Chicago & Milwaukee Electric Railroad, ordered by the United States Circuit Court of Appeals, was postponed for six months on Aug. 17 by Federal Judge Geiger, on motion of Master in Chancery Charles Morrison. The financial condition caused by the European war is given as the reason for the postponement of this sale.

Cities Service Company, New York, N. Y.—The directors of the Cities Service Company adjourned until Aug. 10 the meeting planned to be held on Aug. 7. At the later date they decided to refer to the executive committee the course to be pursued in regard to dividends, the executive committee being instructed to be prepared to make recommendations at the next directors' meeting, shortly to be held.

Columbus, Delaware & Marion Electric Railroad, Columbus, Ohio.—Suit for $591,146 has been filed in Common Pleas Court against the Columbus, Delaware & Marion Electric

Railroad by the Troy Trust Company. The trust company claims that it is the holder of a mortgage for $500,000 of the Columbus, Marion & Bucyrus Railway, said to be insolvent, and that the Columbus, Delaware & Marion Railroad guaranteed payment.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.—The Fonda, Johnstown & Gloversville Railroad has deferred the annual dividend on its common stock. Last year the company paid 2 per cent. President J. L. Hees, in a letter to stockholders, says: "The board of directors has not felt justified because of recent events, affecting general financial conditions, in approving the payment at the present time of a dividend on the common stock. Operations for the year ended June 30 show practically the same surplus available for the dividend as in the previous year, but it has been considered advisable to conserve the company's cash resources."

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—The Public Utilities Commission of Ohio has authorized the Hocking-Sunday Creek Traction Company to issue $300,000 of first and refunding mortgage twenty-four-year 6 per cent bonds and to execute a promissory note payable in five years or less from the date thereof to the amount of $100,000. The proceeds of the bonds are to be used as follows: $156,200 to be offered in exchange for the present outstanding bonds of the company, and $143,800 to be deposited as collateral, guaranteeing the payment of the principal and interest of the promissory note. The money secured by the delivery of the promissory note is to be used for the completion of the proposed line of interurban railway into Athens, including the equipment of this line with new and modern coaches. The application of the company for permission to issue these securities was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1.

Keokuk (Ia.) Electric Company.—The directors of the Keokuk Electric Company have declared a dividend of 2 per cent on the $615,000 of common stock, payable on Aug. 15 along with the regular quarterly dividend of 1½ per cent on the $215,000 of 6 per cent cumulative preferred stock. Prior dividends paid in 1914 on the common stock were 2 per cent on Feb. 16 and 1¾ per cent on May 15.

Modesto & Empire Traction Company, Modesto, Cal.—The California Railroad Commission has authorized the Modesto & Empire Traction Company, successor to the Modesto Interurban Railway, to issue 144 shares of capital stock, par value $100. This stock is to be issued to various persons in return for property, cash advanced and other obligations. This line connects Modesto and Empire.

Ocean Shore Railroad, San Francisco, Cal.—According to a decision recently handed down by the Railroad Commission of California, the original cost of the operative property of the Ocean Shore Railroad as of June 30, 1912, was $5,373,668. The total original cost of all properties, according to the engineering department investigation, amounted to $5,656,509, approximately three-quarters of which was made up of three items—land, grading and overhead expenses. The company in its appraisal stated the reproduction value of the operative property to be $6,124,679, but the engineering department in its valuation found this value to be $4,812,084. The company placed the present value of its operative property at $5,807,221, or equal to 94.8 per cent of the reproduction value. The engineering department's valuation showed the present value to be $4,627,319, or 96 per cent of the reproduction value. The total cost of the non-operative property of the company, as ascertained by the engineering department, was $507,890.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.—A suit was recently filed in the Court of Common Pleas of Allegheny County by the Traction Materials Company, New York, asking the court to direct the sale of the Pittsburgh, McKeesport & Westmoreland Railway free and clear of all liens and incumbrances. James B. Secrist is receiver of the company.

Republic Railway & Light Company, New York, N. Y.—The gross earnings of the controlled companies of the Republic Railway & Light Company for the year ended June 30, 1914, were $3,093,848, as compared to $2,844,334 in 1913. The net earnings after the payment of taxes amounted to $1,210,682 for the fiscal year and $1,086,739 for the previous year. During the present year interest and preferred dividend payments amounted to $704,458 and $311,709, as compared to $632,501 and $311,919 respectively during the previous year. The surplus as of June 30, 1914, was $194,515, as compared to a surplus as of June 30, 1913, of $142,319. It is announced that the company will hereafter issue a consolidated statement of earnings for the subsidiary companies, as well as for the parent company.

Riverside Traction Company, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has refused the application of the Riverside Traction Company for approval of an issue of $132,000 of 5 per cent mortgage bonds, but has approved of the issuance of $51,000 of these bonds. The money is to be used for a new power plant at Burlington.

San Diego Consolidated Gas & Electric Company, San Diego, Cal.—The California Railroad Commission has issued a supplemental order authorizing the San Diego Consolidated Gas & Electric Company to apply the proceeds from the sale of $23,000 of bonds against construction expenditures incurred in the period beginning May 31 and ending Nov. 1, 1914.

San Diego (Cal.) Electric Railway.—A special general meeting of the stockholders of the San Diego Electric Railway has been called for Sept. 30. The purpose of the meeting is to consider a proposition to increase the authorized bonded indebtedness of the company to $10,000,000 by refunding its present outstanding bonded indebtedness and creating an original bonded indebtedness of $10,000,000, and to secure the same and interest thereon by the execution of a deed of trust and mortgage upon its corporate properties. The details of the company's present bonded indebtedness and its application to the California Railroad Commission for permission to create this bonded indebtedness of $10,000,000 was noted in the ELECTRIC RAILWAY JOURNAL of July 11.

Seattle (Wash.) Municipal Railway.—During July, Division "A" of the Seattle Municipal Railway operated at a loss of $1,904, while Division "C" made a profit of $371. Counting the earnings and expenses of both lines the net loss was $1,528. The power bill for Division "A" approximated $670, and the interest on bonded indebtedness $1,125. The power bill of Division "C" amounted to $570. The passenger revenue from Division "A" was $1,482, and the revenue from the same source from Division "C" was $2,065. The freight revenue from Division "C" was $107 and the miscellaneous revenue amounted to $3.38, making a total of $2,176 for Division "C."

Underground Electric Railways, Ltd., London, England.—The London Stock Exchange has admitted for quotation a further issue of $179,000 of 6 per cent income bonds of $100 each of the Underground Electric Railways. The directors of the London Underground Electric Railways have issued a statement to the effect that with the court's sanction the company has become a share and securities holding company. The regular receipts of the company for the first six months of the current year remaining after paying or providing for all expenses would justify the distribution of approximately £60,000 by way of interim dividends on the shares according to their respective rights. The board has decided, however, to defer the payment of dividends until the next annual meeting. The directors of the London General Omnibus Company, which is controlled by the Underground Electric Railways, have declared a dividend of 8 per cent free of income tax on the ordinary shares for the half year ended June 30. Owing to the acquisition of the assets of the General Omnibus Company, the dividend is on capital of £1,600,480, as compared to £1,150,480 last year. An interim dividend on the ordinary shares of the London & Suburban Traction Company, another controlled corporation, has been declared at the rate of 1 per cent per annum for the six months ended June 30. This is the first dividend on the ordinary shares of this company, which was formed in November, 1912.

United Railroads, San Francisco, Cal.—The date set for the hearing in connection with the inquiry into the finances of the United Railroads by the Railroad Commission of California has been postponed until Aug. 24.

United Railways Investment Company, San Francisco, Cal.—The United Railways Investment Company has paid Series "L" of $200,000 of its issue of 6 per cent serial notes, together with interest now due. With this payment there is left $1,100,000 of the original issue. The notes were put out to acquire $3,500,000 of first preferred stock of the United Railroads of San Francisco and are secured by deposit of that stock and by $1,500,000 additional, previously acquired.

Washington-Oregon Corporation, Vancouver, Wash.—A committee composed of Thomas Pitcairn, James D. Windsor, Jr., and Lawrence J. Morris is requesting the deposit of the first and consolidated mortgage twenty-five-year gold 6's of the Washington-Oregon Corporation, dated 1911, due April, 1916, the interest on which was due April 1 and is in default. The interest for July 1 on the $350,000 of Twin City Light & Traction Company first mortgage twenty-five-year gold 6's of 1909, due 1935, also remains unpaid. These bonds are secured on properties formerly owned by the Chehalis Electric & Traction Company and the Centralia Electric & Traction Company. There are also outstanding and possibly in default $65,000 of Lewis County Water Company first 6's of 1909, due 1929, and $40,000 of Centralia Water Company first 6's of 1906, due 1926. The Washington-Oregon Corporation was incorporated in Washington in 1910 and has outstanding $1,266,100 of common stock and $286,400 of preferred stock, the total authorized capital stock being $5,000,000. It has acquired the ownership or control of various local public utilities, including the Vancouver (Wash.) Traction Company, the Twin City Light & Traction Company, Chehalis, Wash., and the Haines Electric Traction Company. The company operates an electric line between Vancouver and Sifton (Vancouver Division) and Centralia and Chehalis (Twin City Division). The appointment of a receiver for the company was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8.

Dividends Declared

Rochester Railway & Light Company, Rochester, N. Y., 1¼ per cent, quarterly, preferred.

Washington Railway & Electric Company, Washington, D. C., 1¾ per cent, quarterly, common; 1¼ per cent, quarterly, preferred.

Southern Pacific Company, 1½ per cent, quarterly.

Keokuk (Iowa) Electric Company, 1½ per cent, quarterly, preferred; 2 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AURORA, ELGIN & CHICAGO RAILWAY, WHEATON, ILL.					
1m., June, '14	$186,771	$116,766	$70,004	$34,778	$35,226
1 " " '13	184,786	103,309	81,477	32,957	48,520
12 " " '14	2,037,790	1,312,219	725,572	413,387	312,185
12 " " '13	1,955,723	1,164,856	790,867	388,245	402,622
CLEVELAND, PAINESVILLE & EASTERN RAILWAY, WILLOUGHBY, OHIO					
1m., June, '14	$42,596	$21,461	$21,135	$11,075	$10,060
1 " " '13	40,989	21,732	19,257	10,396	8,861
6 " " '14	196,293	107,729	88,564	65,933	22,631
6 " " '13	188,540	106,596	81,944	62,545	19,399
CLEVELAND, SOUTHWESTERN & COLUMBUS, CLEVELAND, OHIO					
1m., June, '14	$110,026	$65,211	$44,815	$32,437	$12,378
1 " " '13	111,601	63,763	47,838	31,743	16,095
6 " " '14	596,846	370,510	226,336	193,208	33,128
6 " " '13	575,157	357,334	217,823	187,647	30,176
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., June, '14	$1,154,432	*$662,080	$492,352	$332,875	$159,477
1 " " '13	1,107,326	*644,867	462,459	302,855	159,604
12 " " '14	14,571,468	*8,345,445	6,226,023	4,018,689	2,207,334
12 " " '13	13,654,375	*7,828,553	5,825,822	3,725,623	2,100,199
DETROIT (MICH.) UNITED RAILWAY					
1m., June, '14	$1,088,855	$775,983	$312,872	$178,994	$133,878
1 " " '13	1,186,156	772,174	413,982	179,245	234,737
6 " " '14	6,065,139	4,200,211	1,864,928	1,079,370	785,577
6 " " '13	6,394,670	4,214,029	2,180,641	1,076,108	1,104,533
PHILADELPHIA (PA.) RAPID TRANSIT CO.					
1m., July, '14	$1,951,266	$1,137,702	$813,564	$809,365	$4,199
1 " " '13	1,996,612	1,192,531	804,081	797,690	6,391

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*Includes taxes.

Traffic and Transportation

Compliance with Service Recommendations in Albany

Seymour Van Santvoord, chairman of the Public Service Commission of the Second District of New York has directed a letter to the United Traction Company, Albany, N. Y., relative to the charges made to the commission against the management of the company, and the recommendations by the commission's electrical expert, Mr. Van Santvoord says:

"With a view to facilitating as far as possible the accomplishment of certain hoped-for improvements in the service of your company in Albany, an interview was had with James F. Hamilton, general manager of the company, a few days ago, in the course of which he was advised of the views of the commission in reference to certain of the recommendations contained in our Mr. Barnes's report under date of June 10, 1914. In confirmation of such oral statement I beg now to advise you that the commission has finally passed upon and decided certain of said recommendations."

The recommendations by Mr. Barnes and decision thereon follow:

1. That it put in proper operating condition the 13.26 miles of track classified in track table as in fair condition. Recommendation adopted with the understanding that the company has given assurance that as soon as the street paving is commenced, it will reconstruct its track on Central Avenue, along Broadway and South Pearl Street.

4. That it provide additional means to prevent a car from running into the river when the draw of the Greenbush bridge is open. Approved and the company is to submit to the commission for its approval such additional safeguards as may be proposed, with the exception that they shall be installed not later than Oct. 1 next.

9. That it comply with the detailed suggestion on page 263 in reference to church hour service. Approved on the understanding that the company is already making a proper compliance and that still further improvements in methods of operation in this respect shall be made.

10. That it furnish a reasonable service during what is known as the theater hours, especially the travel from the theater, and in accordance with the suggestion for this service. Approved, on understanding that the company is already providing additional car service for the accommodation of theatergoers in returning to their homes, and is making a study of the case with a view of such additional service as may be proper.

11. That the company immediately modify its rules in reference to transfers so that a second transfer will be issued to persons on Pine Hills cars to points on the West Albany line, by Quail instead of Lark Street, and on Arbor Hill-Kenwood line to points on the Delaware Avenue line. Approved on the understanding that the company is engaged in the preparation of a coupon transfer arrangement under which passengers will be enabled to ride to destination by the most direct route for one fare. This should be put into effect by Sept. 1.

14. That it rearrange its passenger stops on the basis of rapid transit with the least possible inconvenience to passengers. Approved, with the understanding that compliance by the company shall be made in all cases except where it would be in conflict with city ordinances or franchise requirements; and that it should be operative not later than Nov. 1 next.

17. That it equip all its cars in Albany city with conspicuous route and destination signs illuminated at night. Approved on the company's compliance in the case of all closed cars, regular and extra, to be completed not later than July 1, 1915.

21. That it cause the steps on six of the open cars which are 21 in. or more in height to be lowered, or these cars be withdrawn from the service. Approved, compliance therewith by the company to be made not later than May 1, 1915.

22. That it construct new transformer station, replacing the present North Albany station as near as practical to the center of gravity of the feeder system. Approved, the commission understanding that the company has already made substantial progress in the construction of the proposed new transformer station. The commission expects

that such station shall be sufficiently completed and a portion of its equipment, with a capacity of not less than 1200 kw, shall be installed and put in operation not later than Dec. 15, 1914; the complete installation and rearrangement of the feeder system to be completed by July 1, 1915.

23. That it construct an additional high tension and transmission line between Mechanicville and Watervliet, a distance of 12½ miles. Approved, the commission understanding that the company has already performed a substantial part of the work in constructing the proposed additional high tension line; the commission expects this line shall be completed and put in operation by Sept. 1, 1914.

25. That before Aug. 1, 1914, it notify this commission what it proposes to do before Nov. 1, 1914, in increasing the amount and responsibility of its power supply providing a reasonable "stand-by service."

Compliance with recommendations Nos. 22 and 23 is considered as practically a compliance with recommendation No. 25, except that portion of the latter which refers to "stand-by" service; with the contemplated improvement in the reliability and amount of power supply and the improved methods of utilizing such supply, the matter of the "stand-by" service may be held in abeyance.

After stating the recommendations and the approval of those enumerated, Chairman Van Santvoord concludes:

"The adoption of the above mentioned recommendations is to be considered only as representing the views of the commission upon the particular subjects involved, consideration of and final action upon the remaining recommendations in the report first above mentioned to be made and determined hereafter."

The report of Mr. Barnes and his recommendations in regard to service in Albany were referred to in the ELECTRIC RAILWAY JOURNAL of June 27, page 1478.

Boston-New York Through Trolley Trip

Twenty-five newspaper men left Boston at 8.15 a. m. on Aug. 17 on a special car of the Bay State Street Railway as the company's guests on a through trip to New York, according to the plan outlined in the ELECTRIC RAILWAY JOURNAL of Aug. 15, page 318. Robert S. Goff, vice-president, and E. W. Holst, superintendent of equipment of the Bay State Street Railway, were on hand to speed the party on its journey of 267 miles. The car was in charge of Ralph M. Sparks, general passenger agent of the company. Photographs of the interior and exterior of the car and a cut of the route traversed were presented to each representative of the press soon after starting. The car was tastefully fitted up with wicker chairs in place of the usual cross-seats, as on the New England Street Railway Club convention trip of last fall. In the advertising racks were maps of the route drawn to scale and showing the schedule for the complete round trip. It was planned to pick up various local newspaper men at important cities en route, and the schedule called for a night's lay-over at New London, Conn., going and coming. The New London Business Men's Association entertained the party during these stops and the program included a dinner, automobile rides about the city and boat trips to Fort Griswold. Crews were changed at the boundaries of each system traversed.

The route was from Post-office Square, Boston, through Mattapan, Brockton, and Taunton to Providence, R. I., and Danielson, Conn., over the Boston Elevated Railway, the Bay State Street Railway and Rhode Island Company and thence to New Haven, Conn., via the Shore Line Electric Railway. From New Haven to Stamford the car traversed the lines of the Connecticut Company; from Stamford to New Rochelle, the New York & Stamford Railway handled the car and the final lap of the journey from New Rochelle to New York was over the lines of the New York, Westchester & Boston Railway. The Boston press representatives returned from New York on the 1 a. m. train on Aug. 19. The return trip by trolley followed the same route as the going journey, New York newspaper men being the guests.

To facilitate travel over this route by vacation tourists, the Bay State Street Railway has prepared two folders describing the trip from each starting point, with fares, running times and local leaving times in tabular form, and containing maps of Boston, New York and the intermediate territory, with running commentary upon the principal features of interest en route. The company sells through tickets to points en route, the fare from Boston to New York being $3.75. Tickets may also be purchased at Providence, Norwich, New London, New Haven and New York. In addition to the general information in the folders, data bearing upon hotels en route are included.

The schedule between Boston and New York on Aug. 17-18, follows:

Leave Boston (Post-office Square)	8:00 a.m.
Arrive Brockton	9:50 a.m.
Leave Brockton	9:50 a.m.
Arrive Providence	12:15 p.m.
Leave Providence	12:30 p.m.
Arrive Norwich	4:30 p.m.
Leave Norwich	4:45 p.m.
Arrive New London	5:45 p.m.

Leave New London August 18	8:15 a.m.
Arrive New Haven	11:33 a.m.
Leave New Haven	11:45 a.m.
Arrive Bridgeport	1:45 p.m
Leave Bridgeport	2:00 p.m.
Arrive Stamford	4:25 p.m.
Leave Stamford	4:30 p.m.
Arrive 133d Street, New York	6:45 p.m.

The schedule between New York and Boston on Aug. 19-20, follows:

Leave New York (133d Street)	8:30 a.m.
Arrive Stamford	10:45 a.m.
Leave Stamford	11:00 a.m.
Arrive Bridgeport	1:25 p.m.
Leave Bridgeport	1:30 p.m.
Arrive New Haven	3:30 p.m
Leave New Haven	3:45 p.m.
Arrive New London	7:00 p.m.

Leave New London Aug. 20	8:15 a.m.
Arrive Norwich	9:15 a m.
Leave Norwich	9:15 a.m.
Arrive Providence	1:15 p.m.
Leave Providence	1:30 p.m.
Arrive Brockton	4:00 p.m.
Leave Brockton	4:00 p.m.
Arrive Boston (Post-office Square)	5:50 p.m.

Front-End Collectors in San Francisco

The rush-hour traffic problems in San Francisco are aggravated by the fact that at the close of business hours, when a very large number of passengers desire to board cars at the same time and place, the travel centers chiefly on two or three trunk lines. With no subway or elevated roads, the only relief is to run the cars very close together. This reduces the problem largely to a question of speed in loading, and with pay-as-you-enter cars considerable time is lost on account of congestion at the rear end.

This condition has been very materially improved by the adoption of the practice followed by the Metropolitan Street Railway, Kansas City, Mo., for some time of stationing a man at each important street intersection, who collects fares and allows passengers to enter at the motorman's gate. The same number of passengers can thus get into the car by the front way more quickly than they could by the rear entrance even if the latter were not crowded. The "station conductor" stands beside the track where the forward ends of the cars come to a stop. He makes change and collects fares as the car approaches, issues transfers if desired, and assists passengers to step aboard. The motorman gets his "go ahead" signal from the "station conductor," as the latter can see the rear steps better than the conductor.

The extra men are required at only a few points in the heart of the business district and are on duty for only about an hour in the evening, but this expedient very materially relieves the crowding of the rear platform and allows the cars to make much better time along this part of the line. The results under this system in Kansas City were reviewed in the ELECTRIC RAILWAY JOURNAL of Feb. 14, 1914, page 383.

Hearing on Missouri Fare Case Postponed.—The Public Service Commission of Missouri has postponed until Sept. 25 the hearing on the question of reduced rates on the Kansas City, Clay County & St. Joseph Railway.

Joint Grain Rates.—The Northern Electric Railway, Chico, Cal., has completed arrangements with the Southern Pacific

Financial and Corporate

Recent Financial Tendency

The resumption of international trade relations on a moderate scale on Aug. 19, with the foreign exchange market at rates more nearly approaching normal, was generally looked upon as an augury for good in the near future. War risks which commanded from 30 to 50 per cent ten days ago were quoted on Aug. 19 at 3 to 5 per cent in addition to the general insurance rate of one-fifth of 1 per cent on cargoes. On Aug. 19 sterling exchange was quoted from 4.96 to 4.98, while sixty to ninety-day bills were quoted at 4.88¾, and represented actual transactions.

There has been considerable agitation for the reopening of the stock exchanges, the Boston *News Bureau* saying that such reopening cannot be delayed much longer. The governors of the New York Stock Exchange are said not to have discussed the question of reopening. The committee of governors positively refuses to disclose the volume or character of the daily dealings for cash in securities through the medium of the Clearing House, but it is reported that since the system was inaugurated the daily transactions on several occasions have reached 15,000 shares. In connection with the agitation for reopening the New York Association of Partners of Stock Exchange Firms sent a notice to members on Aug. 19 reviewing present conditions briefly and suggesting that members notify customers that they will accept orders to be executed "at the market" only in moderate amount and for adequate reasons, the association recommending strongly that all orders should have fixed limits; that buying orders should be executed only for those who previously have supplied ample margin, or whose purchases are made for cash, and that stop loss orders be eliminated as far as possible. It was felt that by co-operating along these lines the opening of the exchange would be facilitated and that such a course would render the initial transactions free from violent and erratic fluctuations.

Trading in securities for cash was resumed on the Chicago Stock Exchange on Aug. 14 under a plan similar to that adopted in New York on Aug. 12. In addition members of the Chicago exchange received permission to execute buying and selling orders in their own offices, at prices not below the closing quotation of July 30. The bond market in Chicago is reported at a standstill. Bond houses are said to have recalled all their salesmen. The Montreal exchange has announced that three days' notice will be given before trading is resumed there. The Boston Curb Exchange is open daily from 10 a. m. to 12 m. for the settlement of outstanding contracts, but members have been warned not to trade in stocks or bonds listed on the Boston or other exchanges.

The conference between treasury officials and representative bankers and business men to the number of 150 at Washington on Aug. 14 is regarded as having a stabilizing effect. Views were generally interchanged with the object in mind of guiding the treasury in upholding the credit of the country and in devising means to restore normal conditions in the export trade. The opinion prevailed that there would be no escape from a war tax if the war should continue for any length of time. In connection with the issue of emergency currency it is pointed out that National bank notes hold a peculiar place in the country's circulation. Unlike either the gold and silver certificates, which are secured dollar for dollar by metal, or the United States legal tender notes, which are secured by a substantial gold reserve fund, they have behind them for the most part, only the credit of the Government in the shape of its bonds. The metal security behind the other notes has a stable value, but how the security behind the national bank notes is liable to impairment was demonstrated in the decline in the price of Government bonds last year. The danger indicated here is from any project which resulted in pyramiding obligations upon a base that is liable to depreciation under adverse circumstances.

On Aug. 18 President Wilson signed the amendment to the Panama Canal act under which foreign-built ships may be admitted to American registry for overseas trade. The measure becomes effective at once. It was reported about the same time that the British Government had informed this Government that it would not interpose any objection to the transfer of German vessels to American registry if assurances and evidence were furnished that the sales of these vessels to Americans were bona fide and not merely for the period of the war between Great Britain and Germany.

The Boston *News Bureau* has prepared the following interesting comparison of the leading traction securities, giving the closing prices of July 30, the 1914 high and the high and low for 1913:

	Close July 30	1914 High	1913 High	1913 Low
American Railways.............	37	39½	49½	37
Boston Elevated...............	93	101¼	114¼	82
Brooklyn Rapid Transit........	79	94¼	92¾	83¾
Chicago Railways part. ctf. "1"...	88½B	99¾	102	88
Chicago Railways part. ctf "2"...	29B	35⅞	33¼	18
Interborough-Metropolitan com...	11	16⅜	19⅝	12⅜
Interborough-Metropolitan pfd...	52	65⅜	65⅜	45
Manhattan	128¼	133	132⅝	127
Massachusetts Electric com......	9¼	14	19⅜	10½
Massachusetts Electric pfd.......	57½	66½	79	63
North American Co............	64⅛	79¾	81½	60
Philadelphia Rapid Transit......	12½	20¼	28½	18
Third Avenue	33	45¾	43⅜	27⅞
Twin City	94⅞	108½	109	101⅛
United Rys. Investment com.....	6B	23¾	35½	16
United Rys. Investment pfd.....	22	49¼	63½	30

Dominion Power & Transmission Company, Ltd.

According to the annual report of the Dominion Power & Transmission Company, Ltd., Hamilton, Ont., Canada, the gross earnings of the company for the year ended Dec. 31, 1913, amounted to $2,737,806. The operating expenses totaled $1,455,993, leaving a net income of $1,281,813. After the transfer of $141,116 to the maintenance and renewal accounts and the payment of bond interest and general interest of $378,172, there were left surplus earnings of $762,525. The combination of this sum with the profit and loss balance for 1912 of $1,005,715, together with the declaration of dividends of $362,378 and the transferal to the reserve account of $450,000, left a profit and loss balance for the year of $955,861.

The report of the company lays particular stress upon what it considers to be a feature of conservatism in accounting: namely, the installation of a reserve for taking care of maintenance and depreciation. Prior to 1913 it was the practice to charge to operating expenses all sums spent on necessary renewals and maintenance, the amount so spent in 1910 being $210,753; in 1911, $224,935, and in 1912, $282,443. In 1913 the board of directors began charging off a substantial percentage of the gross earnings each year, the charge for that year being $442,677. Of this amount $337,269 was actually expended, the balance remaining to the credit of the maintenance and renewal account as a special reserve. This provision was made in addition to the sinking fund for bonds.

Cape Breton Electric Company, Sydney, N. S., Canada.—The gross earnings of the Cape Breton Electric Company for the year ended June 30, 1914, were $373,647, as compared to $373,788 for the year ended June 30, 1913. The net earnings for the present year amounted to $166,308, as compared to $173,045 for the year previous. The interest charges increased during the year from $55,931 to $60,973, sinking and improvement funds decreased from $14,380 to $14,280, and the surplus decreased from $102,734 to $91,055.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—The resale of the Chicago & Milwaukee Electric Railroad, ordered by the United States Circuit Court of Appeals, was postponed for six months on Aug. 17 by Federal Judge Geiger, on motion of Master in Chancery Charles Morrison. The financial condition caused by the European war is given as the reason for the postponement of this sale.

Cities Service Company, New York, N. Y.—The directors of the Cities Service Company adjourned until Aug. 10 the meeting planned to be held on Aug. 7. At the later date they decided to refer to the executive committee the course to be pursued in regard to dividends, the executive committee being instructed to be prepared to make recommendations at the next directors' meeting, shortly to be held.

Columbus, Delaware & Marion Electric Railroad, Columbus, Ohio.—Suit for $591,146 has been filed in Common Pleas Court against the Columbus, Delaware & Marion Electric

Railroad by the Troy Trust Company. The trust company claims that it is the holder of a mortgage for $500,000 of the Columbus, Marion & Bucyrus Railway, said to be insolvent, and that the Columbus, Delaware & Marion Railroad guaranteed payment.

Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.—The Fonda, Johnstown & Gloversville Railroad has deferred the annual dividend on its common stock. Last year the company paid 2 per cent. President J. L. Hees, in a letter to stockholders, says: "The board of directors has not felt justified because of recent events, affecting general financial conditions, in approving the payment at the present time of a dividend on the common stock. Operations for the year ended June 30 show practically the same surplus available for the dividend as in the previous year, but it has been considered advisable to conserve the company's cash resources."

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—The Public Utilities Commission of Ohio has authorized the Hocking-Sunday Creek Traction Company to issue $300,000 of first and refunding mortgage twenty-four-year 6 per cent bonds and to execute a promissory note payable in five years or less from the date thereof to the amount of $100,000. The proceeds of the bonds are to be used as follows: $156,200 to be offered in exchange for the present outstanding bonds of the company, and $143,800 to be deposited as collateral, guaranteeing the payment of the principal and interest of the promissory note. The money secured by the delivery of the promissory note is to be used for the completion of the proposed line of interurban railway into Athens, including the equipment of this line with new and modern coaches. The application of the company for permission to issue these securities was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 1.

Keokuk (Ia.) Electric Company.—The directors of the Keokuk Electric Company have declared a dividend of 2 per cent on the $615,000 of common stock, payable on Aug. 15 along with the regular quarterly dividend of 1½ per cent on the $215,000 of 6 per cent cumulative preferred stock. Prior dividends paid in 1914 on the common stock were 2 per cent on Feb. 16 and 1¾ per cent on May 15.

Modesto & Empire Traction Company, Modesto, Cal.—The California Railroad Commission has authorized the Modesto & Empire Traction Company, successor to the Modesto Interurban Railway, to issue 144 shares of capital stock, par value $100. This stock is to be issued to various persons in return for property, cash advanced and other obligations. This line connects Modesto and Empire.

Ocean Shore Railroad, San Francisco, Cal.—According to a decision recently handed down by the Railroad Commission of California, the original cost of the operative property of the Ocean Shore Railroad as of June 30, 1912, was $5,373,668. The total original cost of all properties, according to the engineering department investigation, amounted to $5,656,509, approximately three-quarters of which was made up of three items—land, grading and overhead expenses. The company in its appraisal stated the reproduction value of the operative property to be $6,124,679, but the engineering department in its valuation found this value to be $4,812,084. The company placed the present value of its operative property at $5,807,221, or equal to 94.8 per cent of the reproduction value. The engineering department's valuation showed the present value to be $4,627,319, or 96 per cent of the reproduction value. The total cost of the non-operative property of the company, as ascertained by the engineering department, was $507,890.

Pittsburgh, McKeesport & Westmoreland Railway, McKeesport, Pa.—A suit was recently filed in the Court of Common Pleas of Allegheny County by the Traction Materials Company, New York, asking the court to direct the sale of the Pittsburgh, McKeesport & Westmoreland Railway free and clear of all liens and incumbrances. James B. Secrist is receiver of the company.

Republic Railway & Light Company, New York, N. Y.—The gross earnings of the controlled companies of the Republic Railway & Light Company for the year ended June 30, 1914, were $3,093,848, as compared to $2,844,334 in 1913. The net earnings after the payment of taxes amounted to $1,210,682 for the fiscal year and $1,086,739 for the previous year. During the present year interest and preferred dividend payments amounted to $704,458 and $311,709, as compared to $632,501 and $311,919 respectively during the previous year. The surplus as of June 30, 1914, was $194,515, as compared to a surplus as of June 30, 1913, of $142,319. It is announced that the company will hereafter issue a consolidated statement of earnings for the subsidiary companies, as well as for the parent company.

Riverside Traction Company, Newark, N. J.—The Board of Public Utility Commissioners of New Jersey has refused the application of the Riverside Traction Company for approval of an issue of $132,000 of 5 per cent mortgage bonds, but has approved of the issuance of $51,000 of these bonds. The money is to be used for a new power plant at Burlington.

San Diego Consolidated Gas & Electric Company, San Diego, Cal.—The California Railroad Commission has issued a supplemental order authorizing the San Diego Consolidated Gas & Electric Company to apply the proceeds from the sale of $23,000 of bonds against construction expenditures incurred in the period beginning May 31 and ending Nov. 1, 1914.

San Diego (Cal.) Electric Railway.—A special general meeting of the stockholders of the San Diego Electric Railway has been called for Sept. 30. The purpose of the meeting is to consider a proposition to increase the authorized bonded indebtedness of the company to $10,000,000 by refunding its present outstanding bonded indebtedness and creating an original bonded indebtedness of $10,000,000, and to secure the same and interest thereon by the execution of a deed of trust and mortgage upon its corporate properties. The details of the company's present bonded indebtedness and its application to the California Railroad Commission for permission to create this bonded indebtedness of $10,000,000 was noted in the ELECTRIC RAILWAY JOURNAL of July 11.

Seattle (Wash.) Municipal Railway.—During July, Division "A" of the Seattle Municipal Railway operated at a loss of $1,904, while Division "C" made a profit of $371. Counting the earnings and expenses of both lines the net loss was $1,528. The power bill for Division "A" approximated $670, and the interest on bonded indebtedness $1,125. The power bill of Division "C" amounted to $570. The passenger revenue from Division "A" was $1,482, and the revenue from the same source from Division "C" was $2,065. The freight revenue from Division "C" was $107 and the miscellaneous revenue amounted to $3.38, making a total of $2,176 for Division "C."

Underground Electric Railways, Ltd., London, England.—The London Stock Exchange has admitted for quotation a further issue of $179,000 of 6 per cent income bonds of $100 each of the Underground Electric Railways. The directors of the London Underground Electric Railways have issued a statement to the effect that with the court's sanction the company has become a share and securities holding company. The regular receipts of the company for the first six months of the current year remaining after paying or providing for all expenses would justify the distribution of approximately £60,000 by way of interim dividends on the shares according to their respective rights. The board has decided, however, to defer the payment of dividends until the next annual meeting. The directors of the London General Omnibus Company, which is controlled by the Underground Electric Railways, have declared a dividend of 8 per cent free of income tax on the ordinary shares for the half year ended June 30. Owing to the acquisition of the assets of the General Omnibus Company, the dividend is on capital of £1,600,480, as compared to £1,150,480 last year. An interim dividend on the ordinary shares of the London & Suburban Traction Company, another controlled corporation, has been declared at the rate of 1 per cent per annum for the six months ended June 30. This is the first dividend on the ordinary shares of this company, which was formed in November, 1912.

United Railroads, San Francisco, Cal.—The date set for the hearing in connection with the inquiry into the finances of the United Railroads by the Railroad Commission of California has been postponed until Aug. 24.

United Railways Investment Company, San Francisco, Cal.—The United Railways Investment Company has paid Series "L" of $200,000 of its issue of 6 per cent serial notes, together with interest now due. With this payment there is left $1,100,000 of the original issue. The notes were put out to acquire $3,500,000 of first preferred stock of the United Railroads of San Francisco and are secured by deposit of that stock and by $1,500,000 additional, previously acquired.

Washington-Oregon Corporation, Vancouver, Wash.—A committee composed of Thomas Pitcairn, James D. Windsor, Jr., and Lawrence J. Morris is requesting the deposit of the first and consolidated mortgage twenty-five-year gold 6's of the Washington-Oregon Corporation, dated 1911, due April, 1916, the interest on which was due April 1 and is in default. The interest for July 1 on the $350,000 of Twin City Light & Traction Company first mortgage twenty-five-year gold 6's of 1909, due 1935, also remains unpaid. These bonds are secured on properties formerly owned by the Chehalis Electric & Traction Company and the Centralia Electric & Traction Company. There are also outstanding and possibly in default $65,000 of Lewis County Water Company first 6's of 1909, due 1929, and $40,000 of Centralia Water Company first 6's of 1906, due 1926. The Washington-Oregon Corporation was incorporated in Washington in 1910 and has outstanding $1,266,100 of common stock and $286,400 of preferred stock, the total authorized capital stock being $5,000,000. It has acquired the ownership or control of various local public utilities, including the Vancouver (Wash.) Traction Company, the Twin City Light & Traction Company, Chehalis, Wash., and the Haines Electric Traction Company. The company operates an electric line between Vancouver and Sifton (Vancouver Division) and Centralia and Chehalis (Twin City Division). The appointment of a receiver for the company was noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8.

Dividends Declared

Rochester Railway & Light Company, Rochester, N. Y., 1¼ per cent, quarterly, preferred.

Washington Railway & Electric Company, Washington, D. C., 1¾ per cent, quarterly, common; 1¼ per cent, quarterly, preferred.

Southern Pacific Company, 1½ per cent, quarterly.

Keokuk (Iowa) Electric Company, 1½ per cent, quarterly, preferred; 2 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AURORA, ELGIN & CHICAGO RAILWAY, WHEATON, ILL.					
1m., June, '14	$186,771	$116,766	$70,004	$34,778	$35,226
1 " " '13	184,786	103,309	81,477	32,957	48,520
12 " " '14	2,037,790	1,312,219	725,572	413,387	312,185
12 " " '13	1,955,723	1,164,856	790,867	388,245	402,622
CLEVELAND, PAINESVILLE & EASTERN RAILWAY, WILLOUGHBY, OHIO					
1m., June, '14	$42,596	$21,461	$21,135	$11,075	$10,060
1 " " '13	40,989	21,732	19,257	10,396	8,861
6 " " '14	196,293	107,729	88,564	65,933	22,631
6 " " '13	188,540	106,596	81,944	62,545	19,399
CLEVELAND, SOUTHWESTERN & COLUMBUS, CLEVELAND, OHIO					
1m., June, '14	$110,026	$65,211	$44,815	$32,437	$12,378
1 " " '13	111,601	63,763	47,838	31,743	16,095
6 " " '14	596,846	370,510	226,336	193,208	33,128
6 " " '13	575,157	357,334	217,823	187,647	30,176
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., June, '14	$1,154,432	*$662,080	$492,352	$332,875	$159,477
1 " " '13	1,107,326	*644,867	462,459	302,855	159,604
12 " " '14	14,571,468	*8,345,445	6,226,023	4,018,689	2,207,334
12 " " '13	13,654,375	*7,828,553	5,825,822	3,725,623	2,100,199
DETROIT (MICH.) UNITED RAILWAY					
1m., June, '14	$1,088,855	$775,983	$312,872	$178,994	$133,878
1 " " '13	1,186,156	772,174	413,982	179,245	234,737
6 " " '14	6,065,139	4,200,211	1,864,928	1,079,370	785,577
6 " " '13	6,394,670	4,214,029	2,180,641	1,076,108	1,104,533
PHILADELPHIA (PA.) RAPID TRANSIT CO.					
1m., July, '14	$1,951,266	$1,137,702	$813,564	$809,365	$4,199
1 " " '13	1,996,612	1,192,531	804,081	797,690	6,391

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*Includes taxes.

Traffic and Transportation

Compliance with Service Recommendations in Albany

Seymour Van Santvoord, chairman of the Public Service Commission of the Second District of New York has directed a letter to the United Traction Company, Albany, N. Y., relative to the charges made to the commission against the management of the company, and the recommendations by the commission's electrical expert, Mr. Van Santvoord says:

"With a view to facilitating as far as possible the accomplishment of certain hoped-for improvements in the service of your company in Albany, an interview was had with James F. Hamilton, general manager of the company, a few days ago, in the course of which he was advised of the views of the commission in reference to certain of the recommendations contained in our Mr. Barnes's report under date of June 10, 1914. In confirmation of such oral statement I beg now to advise you that the commission has finally passed upon and decided certain of said recommendations."

The recommendations by Mr. Barnes and decision thereon follow:

1. That it put in proper operating condition the 13.26 miles of track classified in track table as in fair condition. Recommendation adopted with the understanding that the company has given assurance that as soon as the street paving is commenced, it will reconstruct its track on Central Avenue, along Broadway and South Pearl Street.

4. That it provide additional means to prevent a car from running into the river when the draw of the Greenbush bridge is open. Approved and the company is to submit to the commission for its approval such additional safeguards as may be proposed, with the exception that they shall be installed not later than Oct. 1 next.

9. That it comply with the detailed suggestion on page 263 in reference to church hour service. Approved on the understanding that the company is already making a proper compliance and that still further improvements in methods of operation in this respect shall be made.

10. That it furnish a reasonable service during what is known as the theater hours, especially the travel from the theater, and in accordance with the suggestion for this service. Approved, on understanding that the company is already providing additional car service for the accommodation of theatergoers in returning to their homes, and is making a study of the case with a view of such additional service as may be proper.

11. That the company immediately modify its rules in reference to transfers so that a second transfer will be issued to persons on Pine Hills cars to points on the West Albany line, by Quail instead of Lark Street, and on Arbor Hill-Kenwood line to points on the Delaware Avenue line. Approved on the understanding that the company is engaged in the preparation of a coupon transfer arrangement under which passengers will be enabled to ride to destination by the most direct route for one fare. This should be put into effect by Sept. 1.

14. That it rearrange its passenger stops on the basis of rapid transit with the least possible inconvenience to passengers. Approved, with the understanding that compliance by the company shall be made in all cases except where it would be in conflict with city ordinances or franchise requirements; and that it should be operative not later than Nov. 1 next.

17. That it equip all its cars in Albany city with conspicuous route and destination signs illuminated at night. Approved on the company's compliance in the case of all closed cars, regular and extra, to be completed not later than July 1, 1915.

21. That it cause the steps on six of the open cars which are 21 in. or more in height to be lowered, or these cars be withdrawn from the service. Approved, compliance therewith by the company to be made not later than May 1, 1915.

22. That it construct new transformer station, replacing the present North Albany station as near as practical to the center of gravity of the feeder system. Approved, the commission understanding that the company has already made substantial progress in the construction of the proposed new transformer station. The commission expects

that such station shall be sufficiently completed and a portion of its equipment, with a capacity of not less than 1200 kw, shall be installed and put in operation not later than Dec. 15, 1914; the complete installation and rearrangement of the feeder system to be completed by July 1, 1915.

23. That it construct an additional high tension and transmission line between Mechanicville and Watervliet, a distance of 12½ miles. Approved, the commission understanding that the company has already performed a substantial part of the work in constructing the proposed additional high tension line; the commission expects this line shall be completed and put in operation by Sept. 1, 1914.

25. That before Aug. 1, 1914, it notify this commission what it proposes to do before Nov. 1, 1914, in increasing the amount and responsibility of its power supply providing a reasonable "stand-by service."

Compliance with recommendations Nos. 22 and 23 is considered as practically a compliance with recommendation No. 25, except that portion of the latter which refers to "stand-by" service; with the contemplated improvement in the reliability and amount of power supply and the improved methods of utilizing such supply, the matter of the "stand-by" service may be held in abeyance.

After stating the recommendations and the approval of those enumerated, Chairman Van Santvoord concludes:

"The adoption of the above mentioned recommendations is to be considered only as representing the views of the commission upon the particular subjects involved, consideration of and final action upon the remaining recommendations in the report first above mentioned to be made and determined hereafter."

The report of Mr. Barnes and his recommendations in regard to service in Albany were referred to in the ELECTRIC RAILWAY JOURNAL of June 27, page 1478.

Boston-New York Through Trolley Trip

Twenty-five newspaper men left Boston at 8.15 a. m. on Aug. 17 on a special car of the Bay State Street Railway as the company's guests on a through trip to New York, according to the plan outlined in the ELECTRIC RAILWAY JOURNAL of Aug. 15, page 318. Robert S. Goff, vice-president, and E. W. Holst, superintendent of equipment of the Bay State Street Railway, were on hand to speed the party on its journey of 267 miles. The car was in charge of Ralph M. Sparks, general passenger agent of the company. Photographs of the interior and exterior of the car and a cut of the route traversed were presented to each representative of the press soon after starting. The car was tastefully fitted up with wicker chairs in place of the usual cross-seats, as on the New England Street Railway Club convention trip of last fall. In the advertising racks were maps of the route drawn to scale and showing the schedule for the complete round trip. It was planned to pick up various local newspaper men at important cities en route, and the schedule called for a night's lay-over at New London, Conn., going and coming. The New London Business Men's Association entertained the party during these stops and the program included a dinner, automobile rides about the city and boat trips to Fort Griswold. Crews were changed at the boundaries of each system traversed.

The route was from Post-office Square, Boston, through Mattapan, Brockton, and Taunton to Providence, R. I., and Danielson, Conn., over the Boston Elevated Railway, the Bay State Street Railway and Rhode Island Company and thence to New Haven, Conn., via the Shore Line Electric Railway. From New Haven to Stamford the car traversed the lines of the Connecticut Company; from Stamford to New Rochelle, the New York & Stamford Railway handled the car and the final lap of the journey from New Rochelle to New York was over the lines of the New York, Westchester & Boston Railway. The Boston press representatives returned from New York on the 1 a. m. train on Aug. 19. The return trip by trolley followed the same route as the going journey, New York newspaper men being the guests.

To facilitate travel over this route by vacation tourists, the Bay State Street Railway has prepared two folders describing the trip from each starting point, with fares, running times and local leaving times in tabular form, and containing maps of Boston, New York and the intermediate territory, with running commentary upon the principal features of interest en route. The company sells through tickets to points en route, the fare from Boston to New York being $3.75. Tickets may also be purchased at Providence, Norwich, New London, New Haven and New York. In addition to the general information in the folders, data bearing upon hotels en route are included.

The schedule between Boston and New York on Aug. 17-18, follows:

Leave Boston (Post-office Square)	8:00 a.m.
Arrive Brockton	9:50 a.m.
Leave Brockton	9:50 a.m.
Arrive Providence	12:15 p.m.
Leave Providence	12:30 p.m.
Arrive Norwich	4:30 p.m.
Leave Norwich	4:45 p.m
Arrive New London	5:45 p.m.

Leave New London August 18	8:15 a.m.
Arrive New Haven	11:33 a.m.
Leave New Haven	11:45 a.m.
Arrive Bridgeport	1:45 p.m
Leave Bridgeport	2:00 p.m.
Arrive Stamford	4:25 p.m.
Leave Stamford	4:30 p.m.
Arrive 133d Street, New York	6:45 p.m.

The schedule between New York and Boston on Aug. 19-20, follows:

Leave New York (133d Street)	8:30 a.m.
Arrive Stamford	10:45 a.m.
Leave Stamford	11:00 a.m.
Arrive Bridgeport	1:25 p.m.
Leave Bridgeport	1:30 p.m.
Arrive New Haven	3:30 p.m
Leave New Haven	3:45 p.m.
Arrive New London	7:00 p.m.

Leave New London Aug. 20	8:15 a.m.
Arrive Norwich	9:15 a m.
Leave Norwich	9:15 a.m.
Arrive Providence	1:15 p.m.
Leave Providence	1:30 p.m.
Arrive Brockton	4:00 p.m.
Leave Brockton	4:00 p.m.
Arrive Boston (Post-office Square)	5:50 p.m.

Front-End Collectors in San Francisco

The rush-hour traffic problems in San Francisco are aggravated by the fact that at the close of business hours, when a very large number of passengers desire to board cars at the same time and place, the travel centers chiefly on two or three trunk lines. With no subway or elevated roads, the only relief is to run the cars very close together. This reduces the problem largely to a question of speed in loading, and with pay-as-you-enter cars considerable time is lost on account of congestion at the rear end.

This condition has been very materially improved by the adoption of the practice followed by the Metropolitan Street Railway, Kansas City, Mo., for some time of stationing a man at each important street intersection, who collects fares and allows passengers to enter at the motorman's gate. The same number of passengers can thus get into the car by the front way more quickly than they could by the rear entrance even if the latter were not crowded. The "station conductor" stands beside the track where the forward ends of the cars come to a stop. He makes change and collects fares as the car approaches, issues transfers if desired, and assists passengers to step aboard. The motorman gets his "go ahead" signal from the "station conductor," as the latter can see the rear steps better than the conductor.

The extra men are required at only a few points in the heart of the business district and are on duty for only about an hour in the evening, but this expedient very materially relieves the crowding of the rear platform and allows the cars to make much better time along this part of the line. The results under this system in Kansas City were reviewed in the ELECTRIC RAILWAY JOURNAL of Feb. 14, 1914, page 383.

Hearing on Missouri Fare Case Postponed.—The Public Service Commission of Missouri has postponed until Sept. 25 the hearing on the question of reduced rates on the Kansas City, Clay County & St. Joseph Railway.

Joint Grain Rates.—The Northern Electric Railway, Chico, Cal., has completed arrangements with the Southern Pacific

Company for through rates on grain on all points on the lines to Port Costa. These rates are the same as those applying to Port Costa via the Southern Pacific lines.

Arbitration Fails at Pittsburg, Kan.—Conferences between the strikers' committee and the officials of the Joplin & Pittsburg Railway, arranged by committees of the Pittsburg trade council and the chamber of commerce, have failed to bring about a settlement of the strike of the employees which has been in progress for some time.

Near-Side Stop in New York.—Mayor Mitchel of New York has signed the ordinance which provides that street cars shall stop at the near side of the street. It is announced that the street cleaning department will co-operate in helping to make near-side operation a success by keeping street intersections clean. The ordinance will go into effect on Sept. 1.

Old Transfers Tendered on Ohio Roads.—On July 22 the Northern Ohio Traction & Light Company, Akron, Ohio, put in use a new style of transfer in the cities and towns in which it operates local lines. It is stated that on that day an astonishing number of old transfers were tendered for fare. The passengers are said to have accepted the situation with a grin when the facts were explained to them and the new transfers were displayed.

Record Illinois Traction Excursion Traffic.—The Illinois Traction System, Peoria, Ill., brought more than 2500 people into Peoria on a recent Sunday from Springfield, Decatur, Bloomington, Lincoln and intermediate cities and towns. A special rate of $1 was made, which included a trip up the Illinois River to Chillicothe on the steamer *David Swaim.* Thirty cars were required to carry the excursionists, who arrived in Peoria about noon and left at 8 p. m. Fifteen trains were dispatched in an hour and a half.

Opportunities for Young Electrical Men.—"The Young Man and the Electrical Industry" is the title of an illustrated story written by James H. Collins for the *Scientific American,* and reprinted and issued by the Westinghouse Electric & Manufacturing Company. The story contains a great deal of information regarding the Westinghouse organization and exemplifies the different lines in which a young man may direct his activities, especially in the works of this company. The company announces that it will supply a copy to anyone interested in the development of young men.

Accidents on Cleveland Suburban Lines.—Two serious accidents occurred recently on electric railways running out of Cleveland. The first was on the Cleveland, Painesville & Ashtabula road, on Aug. 9, when a limited and a local car collided head-on 2 miles east of Painesville. Seven persons, including one of the motormen and one of the conductors, were injured. The other accident occurred on the Northern Ohio Traction & Light Company's line, near Bedford, on Aug. 11. This was a head-on collision of a passenger and a baggage car. Eleven persons were injured seriously and several others slightly.

Movies for Bay State Employees.—The Bay State Street Railway is perfecting a series of moving picture exhibits to show to its motormen and conductors in connection with the company's "safety first" work. This demonstration exhibit is in charge of Harold W. Irwin, who is at the head of the instruction department of the company. One idea is to teach the motormen proper control of a car and to impress upon them the necessity of keeping brakes in proper condition. One series of pictures shows a "green" motorman driving a car down a steep grade. Another set of pictures shows the proper method for resuscitating a "shocked" man. Still another series of pictures shows the work of using the lifting jack which the state laws require every car to carry. It shows a victim under the car and the crew and passengers using the jack to lift the car so that he can be taken out. Replacing a derailed car on the tracks is illustrated by another set.

Increase in Fare in Barre.—The Barre & Montpelier Traction & Power Company, Montpelier, Vt., announced recently that it intended to put a 6-cent fare in operation in Barre on Aug. 12. Legal proceedings have already been begun on the part of Montpelier to test the franchise right of the company to charge a fare in excess of 5 cents within the city limits of Montpelier. Under a 6-cent rate for each city, or a 12-cent rate for a through ticket, the company divided the zones as follows: A Montpelier full fare passenger could ride on one fare as far as No. 1 switch, and a Barre passenger, bound for Montpelier, could ride as far as Intercity Park for 6 cents. Berlin passengers could ride in either direction for the 6-cent fare. It was announced that workmen's tickets would be sold in Barre at the rate of fifty rides for $1.75, an increase from 2½ to 3½ cents. It was intended to make the rate for school children eighty rides for $2. Reduced rate tickets, it was announced, would not be good on Sunday or holidays or in either direction for a part of through fare between Montpelier and Barre.

Increase in Wages in Memphis.—The Memphis (Tenn.) Street Railway has announced an increase in the wages of all motormen and conductors of 1 cent an hour, the increase applying to all such employees who have served more than six months. Men who have been with the company for six months will hereafter receive 18 cents an hour. One-year men will receive 21 cents; second year men 21 cents; third year men 22 cents; fourth year men 23 cents; fifth year men 24 cents; sixth year men 25 cents, and men whose service has extended to seven years or over will be paid 26 cents an hour. This increased scale does not affect the semi-annual bonus of 1 cent an hour for each hour's service which has been paid to conductors and motormen who during the six preceding months have not had an accident for which they were personally responsible. Announcement has also been made to all employees of the company of an allotment of stock in the American Cities Company, which controls the Memphis Street Railway and several other companies in the South. The stock is offered to employees at $63.50 per share, and subscriptions are voluntary.

Increase in Wages in Baltimore.—Motormen and conductors of the United Railways & Electric Company, Baltimore, Md., as well as other employees, have been informed of an increase in pay, which became effective on Aug. 11. The increase will total $200,000 a year, and it was said that the total of increases since 1912 has added $600,000 to the annual payroll. This is the third increase in wages since 1912. The schedule, providing for an increase of 2 cents an hour to each class of platform men is as follows: Class No. 1 will comprise men who have been in the service less than one year. They will be paid 22 cents an hour. Class No. 2 will comprise men who have been continuously in the service more than one year and less than two. They will be paid 23 cents an hour. Class No. 3 will comprise men who have been continuously in the service more than two years and less than three. They will be paid 24 cents an hour. Class No. 4 will comprise men who have been continuously in the service more than three years and less than five. They will be paid 25 cents an hour. Class No. 5 will comprise men who have been continuously in the service more than five years. They will be paid 26 cents an hour.

Chicago Turns to Electric Lines to Reduce Cost of Living.—In connection with the investigations now being carried on by the municipal, state and federal authorities to determine the cause for the unprecedented advance in the price of foodstuffs, the Chicago Municipal Markets Commission is planning an ordinance to effect relief. Among other things, this ordinance will provide for municipal stores in the poorer districts at which food will be sold at cost. It is also intended that the ordinance shall take up the question of transportation, and to this end the commission wants the assistance of the interurban electric railways. This is merely one of the results of the commission's investigation of the Chicago municipal market situation. An abstract of the commission's report in this connection was published in the ELECTRIC RAILWAY JOURNAL of May 2. As stated in that report, there are ten interurban roads which carry passengers and freight to the city limits, but are not permitted by ordinance to carry freight into the city. As a result of this it is necessary to handle farm products three or four times before they reach the consumer. It is now proposed that these lines be permitted by ordinance to haul freight in the city between 7 p. m. and 5 a. m. The operation of freight cars would not interfere with street railway traffic then, and it is believed that such a service would work materially to the advantage of consumers.

Personal Mention

Mr. William M. Coleman has been appointed general counsel of the Republic Railway & Light Company and the Central States Electric Corporation, New York, N. Y.

Mr. Ray Oswald, Delaware, Ohio, has been appointed assistant treasurer of the Columbus, Delaware & Marion Railway, Columbus, Ohio.

Mr. James W. Caldwell, Troy, N. Y., has been elected treasurer of the Columbus, Delaware & Marion Railway, Columbus, Ohio, to succeed Mr. Charles Gallinger.

Mr. C. V. Peel, formerly secretary of the Austin (Tex.) Electric Railway, now the Austin Street Railway, has been appointed chief clerk of the Carlisle Indian School at Carlisle, Pa. In 1910 Mr. Peel entered the service of the Indian Bureau at Washington as a clerk.

Mr. Frederic C. Howe, who was associated with the late Tom L. Johnson in his work in Cleveland and was president of a special commission from the United States which reported on municipal ownership in Great Britain, has been nominated by President Wilson for appointment as commissioner of immigration at Ellis Island, New York.

Mr. John L. Livers, general manager of the Charlottesville & Albermarle Railway, Charlottesville, Va., has also been elected president of the Goldsboro (N. C.) Street Railway and is in charge of the rehabilitation of the company's property, the operation of which was suspended for a time. New interests have taken over the Goldsboro property and the receiver has been discharged.

Mr. W. L. Henry, of Dorchester County, Maryland, has been appointed a member of the Maryland Public Service Commission, succeeding Mr. Philip D. Laird, former chairman of the board, who resigned. The new commissioner, who is a Democrat, will take office at once and will serve about eighteen months to complete Chairman Laird's unexpired term. Mr. Henry is a resident of Cambridge and is fifty years of age. Commissioner Alberg G. Towers has been designated as chairman of the commission.

OBITUARY

Maj. Joseph Pangborn, of the Baltimore & Ohio Railroad, is dead. Major Pangborn was a veteran of the Civil War and a journalist. He entered railroad work in 1880 and continued in active service until recently. He was well known as the author of "The World's Railway," in the preparation of which he spent seven years and traveled around the world in search of material.

Thomas A. Griffin, chairman of the board of directors of the Griffin Wheel Company, died on the steamer *Korea* en route from Yokohama, Japan, to Honolulu, Hawaiian Islands, on Aug. 12. He was completing a trip around the world, having started from New York on Jan. 13, 1914. Mr. Griffin was born in Rochester, N. Y., on Aug. 28, 1852, and has been in the car wheel manufacturing business continuously since 1868. In 1875 he went from Rochester, N. Y., to Detroit, Mich., where he engaged in car wheel manufacturing with his father, the late Thomas F. Griffin. In 1880 he came to Chicago and organized the Griffin & Wells Foundry Company. In 1886 this latter company was merged into the Griffin Wheel & Foundry Company, which later was changed to the Griffin Wheel Company. From the original single plant in Chicago this company has grown until now there are three Chicago foundries, as well as plants in Boston, Detroit, St. Paul, Denver, Kansas City, Tacoma and Los Angeles. Mr. Griffin, though he occupied the position of chairman of the board of directors of the Griffin Wheel Company, had not been active in its management for some years. He was a member of the Chicago Club, Chicago Athletic Association and South Shore Country Club, of Chicago; the Metropolitan Club, Racquet and Tennis Club and The Lambs, of New York; the Minnesota Club, of St. Paul; Maryland Club, of Baltimore; Denver Club, of Denver, and British Iron and Steel Institute. Two children survive him, George Francis Griffin, Chicago, now a vice-president of the company, and Mrs. Carl P. Dennett, Boston, Mass.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Monongahela Southern Traction Company, Brownsville, Pa.**—Chartered in Pennsylvania to construct an electric railway from California, Pa., to Brownsville, Pa. Capital stock, $108,000. Directors: C. L. Snowden, president, Brownsville; J. P. McKelvey, Pittsburgh; C. S. Story and F. B. Snowden, Brownsville; Linn V. Phillips, Uniontown.

***Salt Lake Light & Traction Company, Salt Lake City, Utah.**—Incorporated in Utah with a capital stock of $1,000,000. Incorporators: O. J. Salisbury, S. A. Whitney, C. W. Johnson, A. H. Parsons and J. B. Salisbury.

FRANCHISES

Clovis, Cal.—The Board of Trustees has authorized the offering of another street railway franchise through the town at public sale on Sept. 8.

Dixon, Cal.—The Sacramento Valley Electric Railway has received permission to enter Dixon on the southern limits under a one-year franchise granted by the city trustees.

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the Council for a line from Sunset Boulevard on Maubert Avenue, almost to the Vermont Avenue entrance of Griffith Park, in Los Angeles.

Hillsboro, Ill.—The Southern Illinois Light & Power Company has received from the Village Board a renewal of the interurban franchise through Hillsboro.

Lafayette, Ind.—The Tippecanoe County Board of Commissioners has granted the Lafayette & Northwestern Traction Company the right to construct a line through the county. The company has also received franchises in Jasper, White and Newton Counties. (E. R. J., Aug. 1, '14.)

Hopkinsville, Ky.—A franchise, amended in some minor particulars at the suggestion of the Eastern capitalists who promise to build an electric railway in Hopkinsville, has been granted by the City Council and must now receive the consent of the mayor. [E. R. J., July 25, '14.]

Franklin, Mass.—The Dedham & Medway Street Railway has received a franchise from the Council on Main Street and Lincoln Street, in Franklin. [E. R. J., Aug. 8, '14.]

Springfield, Mass.—The Springfield Street Railway has asked the Council for a franchise for a change of location of its tracks on Main Street in Springfield.

Paterson, N. J.—The Public Service Railway, Newark, has applied for permission to construct a street railway in Broadway west of Mulberry Street, Paterson.

Buffalo, N. Y.—The International Railway has received permission from the Public Service Commission to extend its line through Tracy Street to connect the Grant and Elmwood lines in Buffalo.

Wilmington, N. C.—The Wilmington & Carolina Beach Railway, which plans to build an electric railway from Wrightsville to Carolina and Wilmington beaches, has received a franchise over certain streets in Wilmington, subject to the approval of the people at an election to be held Oct. 7. (E. R. J., Aug. 15, '14.)

Wilmington, N. C.—The Tidewater Power Company has asked the Council for a franchise to extend its lines in Wilmington.

Dayton, Ohio.—The Dayton Street Railway will ask the Council for a franchise for a relocation of its tracks on several streets in Dayton.

Milwaukee, Ore.—The amended franchise for right to construct an electric railway in Milwaukee, applied for by L. H. Campbell, will come up for consideration at a special meeting of the Council to be held this month. A twenty-five-year franchise is asked for. Work on the line must start within sixty days after the date of acceptance of franchise, and the lines must be in operation within eighteen months after the ordinance goes into effect. The company is required to pay the city of Milwaukee $200 annually. [E. R. J., May 16, '14.]

Danville, Va.—The Danville Traction & Power Company has received a franchise from the Council to extend its lines in the eastern section of Danville.

Everett, Wash.—The Everett Railway, Light & Water Company, a subsidiary of the Stone & Webster Corporation, will ask the Council for a franchise shortly to extend its line down Maple Street to First and west on First to the corner of Cedar Street.

***Seattle, Wash.**—A. P. Gillies, 444 Henry Building, Seattle, has applied to the Council for a franchise to run tunnels a total distance of 3 miles under city streets and to construct a doubletrack electric line to operate from Elliott Avenue and Virginia Street to Lake Union. Mr. Gillies represents the Bridle Belt Railroad & Navigation Company.

Snohomish, Wash.—An ordinance has been introduced in the Council granting a franchise to the Everett Railway, Light & Water Company to build a line from the Northern Pacific right-of-way to Cedar Street.

TRACK AND ROADWAY

Little Rock & Hot Springs Electric Railway, Little Rock, Ark.—The City Council has extended the time for beginning the construction of this company's line until Aug. 15, 1915, and the time for the completion until Aug. 15, 1918. The Arkansas Interurban Construction Company has the contract to build the line.

Benicia Land & Terminal Company, Benicia, Cal.—Engineers for the Benicia Land & Terminal Company have begun the surveying necessary before the company can make application for franchises for the proposed electric railway between Benicia and Vallejo. [E. R. J., July 18, '14.]

Montecito Railroad, Los Angeles, Cal.—The Railroad Commission of California has rendered a decision authorizing the Montecito Railroad to issue 50,000 shares of capital stock of the par value of $1 each. The proceeds from the sale of this stock are to be used by the company to build a street railroad 2.4 miles in length in Los Angeles.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—Finishing touches are being put by the San Francisco-Oakland Terminal Railways upon the first unit of street railway extension and improvement undertaken by it in Richmond since the reorganization. Double-tracking on the main parts of the system, putting in heavier rails, repaving along its lines and other work are features of the corporation's activity in that city.

Waycross Street & Suburban Railway, Waycross, Ga.—It is understood that this company has completed plans for an extension from its carhouse on Johnson Avenue to Hebardville.

Galesburg Railway & Light Company, Galesburg, Ill.—This company is laying 6-in. 73-lb. rails on all streets where new pavements are ordered by the local board of improvements.

Waterloo, Cedar Falls & Northern Railroad, Waterloo, Ia.—This company has just completed laying the rails in its new 60-mile extension between Waterloo and Cedar Rapids, Ia. The work of ballasting is following closely the track laying outfit, being approximately 5 miles behind it. This will put the new line in operation six weeks ahead of the scheduled time. The electrical equipment has been planned so that this new 60-mile extension will be operated at 1200 volts. In all of the principal cities touched extensive freight and passenger facilities have been provided, and arrangements have been made with the Chicago & Northwestern Railroad for using its freight terminals at Cedar Rapids.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—Plans are being made to begin work soon on the extension from Bonner Springs to Lawrence, via the Union Pacific Railroad right-of-way.

Kentucky Central Electric Railway, Frankfort, Ky.—This company has decided to abandon the project to build the electric line to connect Louisville and Buffalo with a branch to Lincoln Farm and Glasgow. J. M. Richerson, Glasgow, president. [E. R. J., June 29, '12.]

Louisville & Interurban Railroad, Louisville, Ky.—Reports are current that a hotel is to be built at Fern Grove, Ind., on the Ohio River, several miles above Louisville. This would involve extension of the Prospect line of the Louisville & Interurban Company for a distance of about 5 miles, to a point on the river opposite the resort.

New Orleans Railway & Light Company, New Orleans, La.—An extension of the Claiborne Street line on St. Claude Avenue is proposed by the New Orleans Railway & Light Company.

Thibodaux, La.—Plans are under way for the organization of a company to be known as the Louisiana Railway, Light & Power Company, which proposes to construct a 56-mile electric railway from Lockport to Donaldsville, La. According to Walter Ohlmeyer, Plattenville, La., one of the promoters, the line will serve a densely-populated rural section and run through a level country. The promoters are now arranging with parties to finance the line. It is also the intention to sell light and power to the towns along the route. [E. R. J., Aug. 1, '14.]

Springfield (Mass.) Street Railway.—This company is asked to consider plans for an extension from Chestnut Street and Carew Street in Springfield, extending easterly through Carew Street to St. James Avenue, and St. James Boulevard, and thence to Page Boulevard to connect with the present electric railway on Page Boulevard.

Miller's River Street Railway, Miller's Falls, Mass.—No definite plans have yet been made when work will be begun on the construction of this line between Orange and Miller's Falls. D. P. Abercrombie, secretary. [E. R. J., Feb. 21, '14.]

St. Paul (Minn.) City Railway.—Work has been begun by this company on its Dale Street crosstown line in St. Paul.

Mississippi Electric Railway, Columbus, Miss.—Preliminary arrangements are being made by this company to build an electric railway from Memphis, Tenn., to Columbus, Miss., and eventually extend it into Alabama through Pickens County, with Aliceville as the terminus. Headquarters: Columbus, F. W. Crisby, Columbus, is interested. [E. R. J., March 28, '14.]

Meridian Light & Railway Company, Meridian, Miss.—This company has begun construction of an extension on Twenty-fourth Avenue to a point beyond Poplar Springs, 3½ miles from the center of the city.

***Kansas City, Mo.**—R. A. Long and associates are reported to be considering plans for the construction of an interurban railway between Kansas City, Lees Summit, Pleasant Hill and Harrisonville.

Missouri & Kansas City Interurban Railway, Kansas City, Mo.—The proposal to extend the lines of this company from Olathe to Ottawa has been revived.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—An extension of the Prospect Avenue line from Prospect Avenue and Market Street to Third Street and Highland Avenue in St. Joseph is being considered by this company.

Lincoln (Neb.) Traction Company.—Plans are being made by this company to extend its line in Lincoln to Thirty-third Street.

Wilmington-Carolina Beach Railway, Wilmington, N. C.—The City Council has approved a petition and franchise authorizing the Wilmington-Carolina Beach Railway to occupy about 10 miles of streets with tracks and also to generate and sell electricity for light, heat and power. The franchises will be submitted to a vote of the people on Oct. 7. C. C. Chadbourn, Wilmington, president. [E. R. J., Aug. 15, '14.]

Columbus (Ohio) Railway, Light & Power Company.—This company on Aug. 11 filed its acceptance of the ordinance permitting a relocation of its track from Hosack Street to Barthman Avenue. The track will be relaid by the company in order to allow the interurban cars to take the grade at the Parsons Avenue viaduct with greater ease. The company has received permission to construct a double-track line on Park Street to be used for rerouting purposes while High Street is being improved.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—This company has received permission from the Public Utilities Commission to issue $300,000 of bonds to run twenty years and draw 6 per cent interest. The sum of $156,200 of the bonds is to be used in refunding present bonded indebtedness of the company and the remainder, $143,800, is to be used to construct a line from Athens to Chauncey, 5 miles.

Bristol (Tenn.) Traction Company.—This company has completed the conversion of the Holston Valley Railroad from steam to electric motive power, and has put it in operation as part of its electric system. The Holston Valley line is 11 miles long.

Bristol (Tenn.) Traction Company.—The extension to Big Creek has been placed in operation by this company.

Dallas, Tex.—A preliminary survey will be begun shortly by the Fred A. Jones Company, Dallas, for a proposed electric interurban railway from Dallas to Wichita Falls, about 100 miles. William Doran, Dallas, one of the promoters, states that the company has only taken up preliminary work on the projected line and it will not know whether the plan will be feasible until the engineer's report is made. [E. R. J., July 4, '14.]

Houston (Tex.) Electric Railway.—The 4-mile extension to Sunset Heights and Independence Heights has been placed in operation by this company.

***Palestine, Tex.**—W. H. Brashier, Corpus Christi, has made a formal proposition to the business league for the construction of a street railway in Palestine. Mr. Brashier proposes to advance $25,000 if the citizens will put up $40,000 and bond the company for the remainder, having the capital stock at $125,000.

SHOPS AND BUILDINGS

British Columbia Electric Railway, Vancouver, B. C.—This company has placed a contract with E. P. Harris & Company for the installation of an elevator in the carhouse at Fourteenth Avenue and Main Street, Vancouver.

New Paltz, Highland & Poughkeepsie Traction Company, New Paltz, N. Y.—Charles H. Higgins, New York, is preparing plans and specifications for a carhouse and offices of frame and sheet metal construction for the New Paltz, Highland & Poughkeepsie Traction Company at New Paltz.

Toledo, Bowling Green & Southern Traction Company, Toledo, Ohio.—This company has secured a permit to build an addition to its freight house on St. Clair Street, Toledo, to cost $12,000. The building will be of brick and provision will be made for the company's local offices.

Seattle (Wash.) Municipal Street Railway.—Bids are now being received by the Board of Public Works for the construction of a one-story carhouse for the Seattle Municipal Street Railway on the Lake Burien & Highland Park line. The carhouse will have corrugated iron roof and corrugated iron doors.

POWER HOUSES AND SUBSTATIONS

Riverside (N. J.) Traction Company.—This company has received permission from the Public Utility Commissioners to issue $51,000 of 5 per cent mortgage bonds for the erection of a new power plant at Burlington.

Knoxville Railway & Light Company, Knoxville, Tenn.—This company is spending about $300,000 for improvements in connection with underground wiring. A contract for the erection of transformer stations has been let to L. C. Powers, Knoxville.

Monongahela Valley Traction Company, Fairmount, W. Va.—This company is said to have awarded contracts for equipment for its power plant to be erected at Hutchinson, at a cost of about $300,000. The company's plant at Jayenne will be abandoned owing to acid in the waters of the West Fork River.

Fayette Traction Company, Fayetteville, W. Va.—Preparations are being made by this company for the construction of a power plant and other details in connection with the completion of its proposed electric railway between Fayette and Fayetteville, for which $50,000 in bonds were recently authorized. [E. R. J., May 2, '14.]

Manufactures and Supplies

ROLLING STOCK

Union Street Railway, New Bedford, Mass., is considering the purchase of two new cars.

Springfield (Ohio) Railway has ordered ten passenger cars from The J. G. Brill Company.

Richmond Light & Railroad Company, New York, N. Y., is in the market for thirty-two double-truck passenger cars.

Boston (Mass.) Elevated Railway is expecting to purchase thirty-seven center-entrance vestibules for the purpose of constructing articulated cars out of its closed cars.

Rio de Janeiro (Brazil) Tramways is not at present considering the purchase of new rolling stock, as reported in an item in the ELECTRIC RAILWAY JOURNAL of Aug. 1.

New York Municipal Railway, Brooklyn, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, 1914, as having been authorized to order 100 additional steel cars, has placed this order with the American Car & Foundry Company.

Aubany Southern Railroad, Rensselaer, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, as having been authorized to purchase one express car, has placed this order with the American Car & Foundry Company.

Illinois Traction System, Peoria, Ill., is constructing at its shops at Decatur, Ill., four large express cars to be used in hauling Adams express over the lines. These cars will be placed on the heavy runs so as to relieve the front end of the passenger cars where, as a general rule, the express is usually handled.

Springfield (Mass.) Street Railway, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8 as having ordered ten city prepayment passenger cars from the Wason Manufacturing Company, has reported additional details for this equipment. The cars will be 43 ft. 4 in. over all with a 30-ft. body and 6-ft. platforms. Seating arrangements will be provided for forty-eight instead of thirty-six passengers, as with the cars now in service. There will be sixteen rattan side seats accommodating two passengers each, and four longitudinal end seating four passengers each. Straps will be provided only at the ends. The new cars will have arched ceilings, painted ivory white. The lighting system provides for a row of five 56-watt tungsten lamps in the center of the ceiling, with Holophane shades. One of these high-power lamps will be placed on each platform. The cars will be equipped with folding doors and steps. The Worcester (Mass.) Consolidated Street Railway, which recently ordered ten cars from the Osgood Bradley Car Company, has specified cars of a similar type.

TRADE NOTES

Poole Engineering & Machine Company, Baltimore, Md., has reorganized its engineering, foundry and machine business, with S. Proctor Brady as president.

Canadian General Electric Company, Ltd., Toronto, Ont., has appointed H. C. Cox, of Toronto, as a director of the company in place of his brother, the late E. W. Cox.

Automatic Ventilator Company, New York, N. Y., has received an order to equip with ventilators the fifty cars which were recently ordered by the Rhode Island Company from the Laconia Car Company.

C. W. Rhoades has been appointed manager of sales of the Daniels Safety Device Company, Chicago, Ill., manufacturer of the Bulldog self-locking nut. Mr. Rhoades was until recently assistant sales manager in the railway department of Valentine & Company, Chicago, Ill.

Heywood Brothers & Wakefield Company, Wakefield, Mass., announces the termination of the strike with its employees. The strike was declared off by the American Federation of Labor and the same working terms which had previously existed before the strike have been accepted.

Terry Steam Turbine Company, Hartford, Conn., has appointed Fidanque Brothers & Sons of New York and Panama, with main office at 15 Whitehall Street, New York, as its representatives for the Republic of Panama and the Canal Zone. The former company has moved its Cleveland office, in charge of L. G. Finlay, from 710 New England Building to 503 Union Building.

A. L. Whipple, New York, N. Y., recently with the A. L. Whipple Company, has taken the exclusive agency for railroads and electric railways for Oakite. This is the name of a cleansing compound, which has been manufactured for the past six years by the Oakley Chemical Company, New York, for general purposes, but not heretofore offered especially to the railway trade. The material is intended for use in cleaning cars at terminals, and can be used on car bodies without injury to the paint or varnish, for cleaning rattan seats or metal parts, washing floors, etc. In a stronger solution it can be used for cleaning paint pails and varnish cups and in the "potash" tank of the armature room. The interruption to the supply of potash from abroad owing to the war makes this use of especial interest. Oakite is a compound of salts and has an alkaline reaction. The manufacturers direct special attention to the fact that this product replaces lye and potash without any detrimental effect whatsoever and without any danger. As it contains no grease or oil, there is no soap film remaining on cleaned surfaces, and as it is not an alkali or acid, there is no crawling after revarnishing and nothing left in pits or pores to eat through plating lacquer or metal, and no fumes to injure the eyes and lungs where it has been used in preparatory cleaning. The manufacturers have prepared special directions for the use of this cleanser for its various purposes.

Westinghouse Air Brake Company, Pittsburgh, Pa., some time ago offered the sum of $2000 in prizes, as announced in several advertisements published in various technical papers at the time. The company stated that it would pay this sum of money for the six best stories submitted, under certain conditions, dealing with the experience and practical knowledge of railroad employees regarding any striking performance of the air brake manufactured by this company. The history of braking railroad trains is full and complete in dramatic but unwritten narrative, and the company believes that by offering this incentive a vast amount of this material will be brought to light. The conditions stated that the story must be written either from the practical experience or the personal observation of the writer, or from information obtained first hand from railroad men who actually knew the facts related. The contest closed Aug. 1, 1914, and the committee of judges composed of the following men is now engaged in judging the entries: W. E. Symons, consulting mechanical engineer, Chicago; Willard Smith, Editor *Railway Review*, Chicago; and R. V. Wright, Managing Editor of the *Railway Age Gazette*, New York City. A great deal of interest was displayed in the contest, and the large number of stories that were submitted means that several weeks will elapse before the judges will be able to announce the winners of the prizes.

ADVERTISING LITERATURE

Western Electric Company, New York, N. Y., has recently issued two catalogs, one on magneto telephones, switchboards and supplies, another on telephone cords.

American Electrical Works, Phillipsdale, R. I., has issued a price list of its copper, weather proof, galvanized iron, magnet and other kinds of wire, cables and lamp cord.

H. A. Strauss Data-Card Service, Chicago, Ill., has issued, among its recent additional specimen engineering data cards, a card giving various unit operating data of a typical modern size d. c. electric locomotive for interurban operation.

Schutte & Koerting Company, Philadelphia, Pa., has issued Catalog 5, Section AB, which describes and illustrated its multi-jet condenser. The only moving part required for the operation of this condenser is a centrifugal pump which supplies the water to the condenser by a pressure of 9 lb.

St. Louis Steel Foundry Company, St. Louis, Mo., has just issued a new catalog of solid manganese steel track work for steam and electric roads. In a foreword it is stated that this company specializes in solid cast manganese steel track work, and that the work illustrated in the catalog is all machine-ground to templet and dimension, and is absolutely interchangeable. Among other things the catalog illustrates and describes the Steedman patent undercut tongue switch, grooved girder solid manganese crossings of various angles and designs, this company's new method of stiffening the intersecting flangeway bearing in solid manganese crossings and its method of reinforcing and protecting plain end and joint ends of solid manganese special work. Various types of solid manganese inserts and commercial castings are also illustrated and described.

American Rolling Mill Company, Middletown, Ohio, has issued a catalog entitled "Defeating Rust," which describes the various uses of its Armco iron, which in the electric railway industry includes bridge flooring, cattle guards, coal chutes, corrugated culverts, electrical transformer tanks, fence posts, hot water heaters and pipes, metal cars, metal window frames, smokestacks, skylights, terne plates, third rails, ventilators and wire fencing. The catalog outlines the special attention given by the chemical laboratory of this manufacturer towards securing a pure iron as possible in order that it may have a maximum rust resisting power. The catalog also contains a large number of testimonial letters from users of this iron and shows illustrations of culverts installed by steam and electric railways. Another catalog entitled "Iron Roofs that Resist Rust" describes various kinds of iron roofing and siding materials manufactured by this company. A third catalog has also been recently issued and is entitled "A Journey to Armco Farm."

Prest-O-Lite Company, Inc., Indianapolis, Ind., has issued two folders on the subject of oxy-acetylene welding. One folder describes the special features of the Prest-O-Lite welding. This welding outfit is light and portable. The use of acetylene dissolved in large cylinders eliminates the waste of gas, characteristic of the acetylene generator. With accurate regulating devices perfect steadiness of the flame is insured. Explosion from fire is prevented by the melting of safety plugs in both ends of the cylinder which allows the acetylene to escape and burn harmlessly at the openings. The outfit requires no generator to charge or clean out, and has no other details which require attention. The second folder describes the advantages of this process in welding and cutting apparatus in electric railways, shops, yards and tracks. Rail bonding by this process is discussed with the aid of illustrations. The special advantages claimed by the use of this method are economy due to rapidity of work, small gang and low cost of tools and supplies, non-interference with traffic, and low cost and portability of the apparatus used in bonding. Other illustrations show the making of repairs in various parts of car equipment, such as a broken gear tooth, main shaft bolt cutter, keyway in armature shaft, motor nose, cracked gear case and motor compressor case. Views also show the outfit used as a cutter of sections of iron and steel for the scrap yard.

NEW PUBLICATION

The Railway Library. Compiled and edited by Slason Thompson, director of Bureau of Railway News and Statistics. R. R. Donnelley & Sons Company, Chicago. Cloth, 5½ x 8¼ in., 269 pages, illustrated, 50 cents.

This volume, which is the fifth annual issue of The Railway Library, follows previous custom in bringing together the most noteworthy papers presented during 1913 on a wide variety of railroad subjects. In general the topics are devoted to the wider aspects of railroad work, such as rates, wages, capitalization and government ownership. Some of the articles of most interest to electric railway men are as follows: "Certain Considerations in Rate Making," by Balthasar S. Meyer; "Apportionment of Expenses to Suburban Traffic of the Southern Pacific Company," by T. W. Durbrow; "The State and the Railways," by "The Spectator"; "Government Ownership of Railways," by Samuel O. Dunn; "Workmen's Compensation," by Frank B. White; "Valuation of Railroads," by Charles A. Prouty, and "Government Regulation of Railways," by William H. Herrin. Several of these papers have previously been abstracted in the ELECTRIC RAILWAY JOURNAL. The last 132 pages of the book are devoted to statistics of American railways for the year ended Dec. 30, 1913. There are also presented a chapter giving statistics of principal foreign railways and a table of contents for the previous four issues of The Railway Library.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY, AUGUST 29, 1914 No. 9

WHAT DID IT COST?

Last week we published a brief note regarding an attempt of the auditor of an electric road in Maryland to impress upon employees of the company the value of the small supplies which they handle in every-day work. Instead of the usual financial valuation he ingeniously used other units selected to bring the matter closer home. The notion that a lantern is the equivalent to the transportation of a passenger 37½ miles involves a stimulating transformation of ideas. It is extremely difficult for one individual to feel a sense of responsibility for the property of another, even if the other is his own employer, but this is more from thoughtlessness than intent. There is hope of economy, therefore, in every device designed to call attention to the facts. While this is true in regard to material things, it is even more so in connection with the use of time. An employee who would not deliberately throw new fuse plugs at the frogs in the pond near the car-house might unwittingly waste an equivalent value in time in "visiting" or "soldiering." He would not do this if he could "see" the time in the form of a tangible equivalent.

FUTILITY OF HEAVY SIDE SHEATHING

The communication by C. J. McPherson, published elsewhere in this issue, is a most valuable contribution to the many and varied arguments which seem, unfortunately, to be necessary in the process of evolution through which electric railway cars are now passing and during which it is to be hoped that the old-style, house-on-a-flat-car design will be replaced by the all-steel, side-truss type of construction. The basis upon which our contributor's conclusions rest is original but simple, an analysis having been made of stresses and weights (which need only to be considered comparatively) involved by a single standard type of car-side framing which is variously assumed to be constructed with and without sheathing and with and without a top plate. The results, as submitted, indicate forcibly that heavy side sheathing has only a questionable supporting value. With the introduction of a top plate, or where the whole side of the car is designed to act as a truss, the author shows the use of side sheathing to be quite as unnecessary as are facts in a war bulletin. The sheathing may be actually removed complete without an appreciable loss in strength. With the side-girder type of design, where the strains from the load extend only between the belt rail and sill, he shows that when the side sheet is removed there is an addition of only 38 per cent to the stress as against a reduction of 22 per cent in the beam weight. Following out Mr. McPherson's idea it may be calculated that if the strength is maintained by adding metal to the belt rail and sill, and if 1/16-in. sheathing is used as a gusset plate only, the beam weight will actually be reduced some 2 lb. per running foot. This illuminating exposition is something for designers to think over seriously.

SAVING UNDER GOVERNMENT OWNERSHIP

Considerable attention has been directed toward articles recently published by the *Saturday Evening Post* on the subject of government ownership of steam railroads. Drawing from a wide source of anti-railroad publicists, ex-Governor Stubbs of Kentucky started the program by producing a scarecrow that was calculated to frighten the most ardent believer in the private operation of public utilities. In a subsequent article, however, Edward P. Ripley, president of the Atchison, Topeka & Santa Fé Railway, easily disposed of most of the statements made by Mr. Stubbs. Since contributing this general refutation, Mr. Ripley has taken up more in detail the question of the savings that would result from government ownership of railways on account of the use of government credit. Being in doubt as to the accuracy of a statement by Clifford Thorne that the government would save $400,000,000 by financing the railroads on a 3 per cent basis, Mr. Ripley wrote to Sir George Paish, editor of the London *Statist*, who is well known all over the world as an authority on financial matters. In reply this expert stated that one could not possibly calculate a greater profit from immediate ownership than about $60,000,000 per annum on the common stock. Moreover, there could be no immediate saving of interest from government purchase as regards the funded debt, although a barely possible refunding at the maturity of the existing bonds might save $70,000,000 per annum. That such a saving as this is incomparably small when placed against the inevitable extravagance, waste and loss which results from government ownership, is a fact upon which we do not need here to dwell. The chief point to be noticed is the difference between the computations of amateur railway economists and those of a man thoroughly understanding railway finance. American newspapers have in recent years been surfeited with figures and articles written by government ownership advocates with a maximum of assurance and a minimum of information. A few pertinent facts from the real authorities in the field are often sufficient to overthrow the innumerable statements bandied about by such writers.

THE HYBRID STEEL-UNDERFRAME CAR

A recent statement on steel passenger cars in service on the steam railroads of the United States includes figures to show that, at the present time, there are in use approximately half as many cars with steel underframes as there are of all-steel construction. The steel-underframe cars are classed, by indirection, as steel cars, although wherein this assumption is warranted is by no means clear. Certainly the steel underframe, as a step in the evolution of the all-steel car, has served its purpose in full by this time, and it is obvious that it should diminish in comparative numbers on both the steam and electric railways at a rapidly accelerating rate.

This belief is supported by the figures given for past years by the steam railroads. In 1908 the all-steel passenger cars in service constituted 48 per cent of the combined number of steel and steel-underframe cars. In 1913 the number of all-steel cars had increased enough to change the ratio to 68 per cent and 32 per cent. On the basis of annual production the all-steel cars constructed during the year 1909 numbered 53.5 per cent, the steel-underframe cars constituting 46.5 per cent. For the year 1912 the corresponding figures were approximately 77 per cent and 23 per cent. The estimated figures for 1914 are 87 per cent for all-steel and 13 per cent for steel underframes, even though the latter figure includes the old wooden cars that were reconstructed with steel sills. Unfortunately, similar statistics are not available for the electric railway industry, but judging in general by the reports of the newly built cars the steel underframe is losing much less ground on electric railways than it is on the steam lines.

By steel underframe is meant, of course, a construction wherein no steel extends above the floor line. The so-called "side-girder design," now generally termed semi-steel, in which the side sheathing is made of steel plate that extends as high as the window sills is not, therefore, included, the obvious reason being that it escapes the inherently defective principle of carrying load on shallow beams which is involved by the true steel-underframe construction. This limitation of depth of beam is, of course, the most serious handicap that can be imposed upon any structure that carries weight, and it is no credit to the electric railway industry that the deleterious influence of this class of car design is not being grasped more promptly than is indicated by recent records.

That, of all the steps in the evolution from wood to steel as a material for car construction, the steel-underframe design for street railway cars should remain, even in its present moribund condition, is an absurdity. Foregoing all of the advantages of the girder or truss design that the use of steel makes possible, it retains only the feature of greater collision strength over wood, and in city service this advantage is worth just about as much as an umbrella for a school of fish. On the other hand, the steel underframe perpetuates the necessity for car repairmen working with steel, this being the most frequently quoted objection to the all-steel car, which may be purely psychological but is none the less difficult to overcome. At best, it is a hybrid construction with which the electric railways can well afford to dispense.

THE COMPETITION OF THE AUTOMOBILE

Our English tramway brethren have long been concerned at the inroads of the motor bus. American electric railway operators have not had to contend with this self-propelled vehicle but in many cities have had to face the competition of the private automobile. We realize that this competition is usually considered slight. But we do not know of any city except Denver where a serious attempt has been made to learn its actual extent. Of course, if only the owner rode to business the influence of the automobile on the trolley receipts would be small. But in a city of moderate size where the owner in a spirit of generosity and hospitality invites his next-door neighbor to take a seat in his car and extends this invitation as well to his other friends until the car is full, the total effect of a large number of cars is considerable. This truth is brought out with startling clearness by the traffic figures presented in this issue by Roger W. Toll, chief engineer Denver Tramways. The investigation conducted under Mr. Toll's supervision showed that on a typical weekday, passenger automobiles alone carried 8.2 per cent of all the traffic going by certain points in the business district. Furthermore, motorcycles and bicycles carried 6.4 per cent, horse-drawn vehicles, 1.3 per cent, and pedestrians constituted 29.2 per cent. This leaves 54.9 per cent to the street railway.

This figure is a lower proportion of the total travel than one would expect in most cities of greater size or even in those of equal size. In the large Eastern cities, for example, the bicycle and motorcycle are practically unknown for business uses; furthermore, in large cities the distance from the residential to the business district is too great for walking by so large a percentage as that found in Denver. But even if the influence of the passenger automobile alone is considered, Mr. Toll finds that its business in possible 5-cent fares is equivalent to $437,372.20 a year —a very tidy sum to add to the gross earnings of any company.

It is likely that prosperous Denver, with its wide, level streets and non-congested residential districts, has more than the usual number of automobiles. Still the time is not far away when many other cities may have the same or an even greater percentage of automobile traffic. When machines can be bought for only $440 each, the only factors that seem capable of impeding their extension to a point that would seriously impair street railway earnings are garage rentals, street spacing for safe travel and the rising price of fuel.

The inroads of the automobile are really more serious to the interurban electric railway than to the city railway. Much interurban travel is half business and half social, because so many people combine shopping and pleasure when they go, say once a week, from the country to the local metropolis. Many trips of this character are now made by automobile, with two or three neighbors as guests. Farmers who raise garden truck are also tempted to use the automobile when it can be used to convey their produce as well as themselves. From this angle it is clear that the interurbans can be hurt appreciably if they do not make it clear to prospective patrons that the cost of automobile trips is greater, while the speed, safety and convenience of such machines are less, than with the modern interurban car.

IMPENDING COMMERCIAL WARFARE

The present colossal struggle in Europe has naturally dislocated every phase of commercial life in the warring countries, but America cannot afford to accept the present situation with simply a vociferous welcome of increased commercial activities heretofore restricted by foreign competition. To be sure, the people of the United States as a whole have no desire to make capital out of the misfortunes of other peoples, but there may be a few effervescent spirits who will do well to look upon the present commercial opportunity as a chance for performing a real world service instead of merely conquering foreign markets.

At present the German overseas trade is virtually obliterated; the home of Belgian manufacturers is bathed in blood; English electric railway exports are comparatively small—all of which conditions make an unprecedented opening for us in the trade of South America and the Far East. Appreciation of the European catastrophe that has made this possible can be shown only through taking advantage of the present opportunity without unseemly precipitation and through endeavoring to afford South American countries as good, if not better, service than they have formerly received from our competitors.

To attain the above result, we must realize fully the difficulties confronting us, as pointed out in interviews with W. J. Clark and G. H. Charls, published elsewhere in this issue. It must be remembered that the cessation of European exports also means the cutting off of the great European customers for South American imports, and that the resulting South American trade restriction must be helped by our bankers and capitalists. South American sales requirements and conditions must also be studied and exactly met. Furthermore, it may be wise to note that English electrical manufacturers are hailing the opportunity for securing German trade in South America, and that some competition from this source will persist even in the face of danger. If these problems are properly solved by our manufacturers, there will come a boom to this country that will probably be permanent, but at the same time our friendly relations as a nation with all the European countries will be conserved. The ultimate result will probably be a more even division in the world's trade than has heretofore existed.

PERMANENT TRACK A FALLACY

Several articles and communications in recent issues of this paper have drawn attention to the lack of appreciation on the part of some companies of the importance of first-class maintenance of track. It appears that many street railway managers take the term "permanent track construction" literally and, failing to take the "stitch in time," find that the term is not only a fallacy but that the so-called permanent type of track construction lasts but little longer than its predecessor. If managers and engineers expect to profit by the increased life obtainable from the permanent types of track construction they must give constant attention to its maintenance.

Probably before any other defects which develop under traffic are in evidence, inequalities and inaccuracies in track construction will show themselves. After these have been corrected, the points subject to severest wear under traffic present themselves. Usually these occur in track special work or at the joints. In either case they generally take the form of cupping, and grinding or welding should immediately be prescribed. If this is done promptly, the defect will not be reflected in the substructure where the cost of repair is many times that of merely removing the cups on the surface at the proper time. Following the cupping at joints, many complications arise which ultimately destroy the entire structure, making a complete renewal necessary. In other words, the price of neglectful maintenance is high cost of operation. This is reflected not only in the future maintenance of the tracks but in the maintenance and in practically every phase of car operation.

No track structure is permanent, and it is foolish for anyone to consider that its maintenance may be forgotten even for the shortest period of time. The secret of true economy in the subject we are considering is unceasing vigilance followed by prompt repairs. When this vigilance is present but is accompanied by inefficient repair methods, or the repairs are made by incompetent men, the life of the structure is increased but the maximum is not obtained. The track is an engineering structure, and engineering intelligence must be put into it. As a rule the work of maintenance in the power station and in the repair shops is so concentrated that the engineer or master mechanic in charge can personally supervise the more difficult repairs. With the track department the case is entirely different—the work covers a wide area and much of the supervision must be left to the section foreman, who in most instances is nothing more than a first-class laborer.

If the same amount of intelligence and money was expended in maintaining a track structure in proportion to its cost as is expended in maintaining rolling stock and power station equipment, we firmly believe that the cost of track maintenance would be much lower than it is to-day, and undoubtedly the life of the structure would be greatly increased. Simply because a failure in either the power station or cars stops income is no economic reason for slighting the most expensive portion of the composite structure.

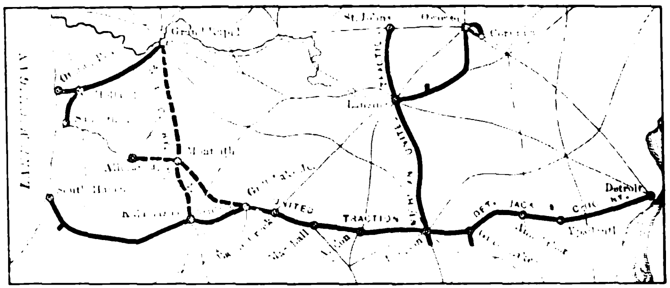
Third-Rail 2400-Volt Construction on the New Michigan & Chicago Railway

This High-Speed Line Connecting Kalamazoo and Grand Rapids Will Be the First Electric Railway in the World to Use a 2400-Volt Third-Rail—The Line Will Be Placed in Operation Next Autumn

Another long stride in the advance of direct-current voltages for third-rail operation will be taken when the new Michigan & Chicago Railway's 2400-volt line is completed. When ready for operation this line will include 91 miles of single track in southern Michigan, connecting Kalamazoo and Grand Rapids, and also Allegan and Battle Creek. That portion of the line between Kalamazoo and Grand Rapids, 49 miles in length, is being newly constructed throughout. The line between Allegan and Battle Creek, 42 miles long, is an old steam road purchased from the Michigan Central Railroad and it is now being electrified for 2400-volt, third-rail operation.

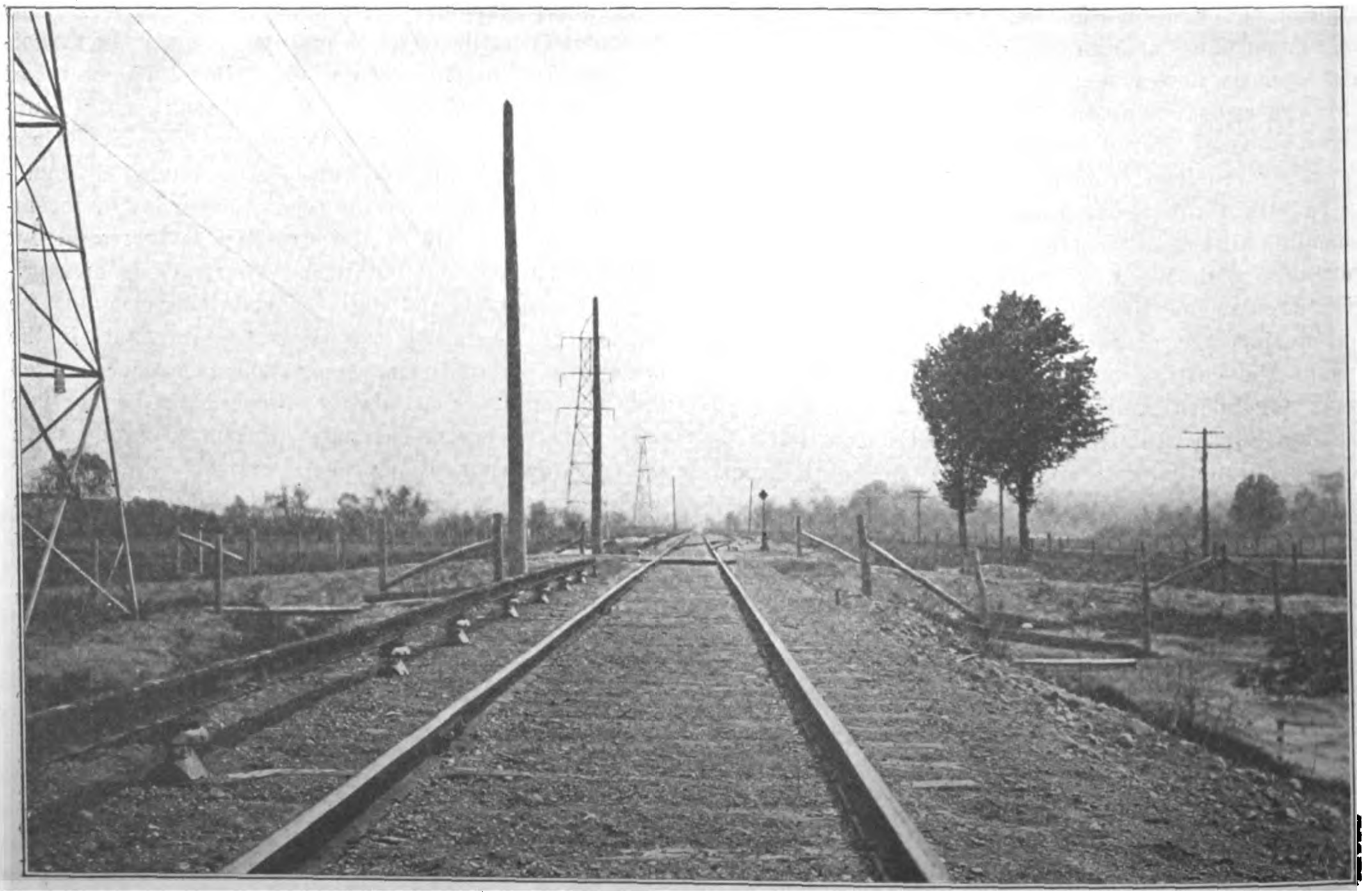
Standards adopted for the construction of this new line provide for high speed with 3 deg. maximum curves and 1 per cent maximum grades. All track, including main line and sidings, is being laid with 80-lb. A. S. C. E. rail on 6-in. x 8-in. x 8-ft. cedar ties, spaced twenty to a 33-ft. rail. Every sixth tie is 10 ft. long, the additional length being provided to furnish support for the third-rail. All sidings are being made double end with No. 12 turnouts having 90-ft. leads, and each siding provides 600 ft. of track in the clear. Both side tracks and main tracks are laid on from 6 to 8 in. of gravel ballast distributed in sufficient quantities to provide a liberal shoulder. Track bonding includes compressed terminal cross-bonds and exposed, Type J, Ohio Brass bonds at all joints.

In order to adhere to the track and roadway standards the grading quantities per mile averaged approximately 20,000 cu. yd., making the total for the new 49-mile line amount to about 1,000,000 yd. The subgrade standards provided for a 100-ft. private right-of-way, and a 16-ft. roadbed in cuts and fills with ample provision for drainage in the former. All waterways under the subgrade are provided with permanent structures. Where reinforced concrete pipe would not supply a sufficiently large opening, reinforced concrete, flat-top arches were constructed. In a few instances the spans were too long for this design and at these points through girders with ballast decks were installed.



Electric Ry Journal

MICHIGAN & CHICAGO RAILWAY—MAP OF THE SYSTEM



MICHIGAN & CHICAGO RAILWAY—VIEW SHOWING THIRD-RAIL AND TRACK CONSTRUCTION

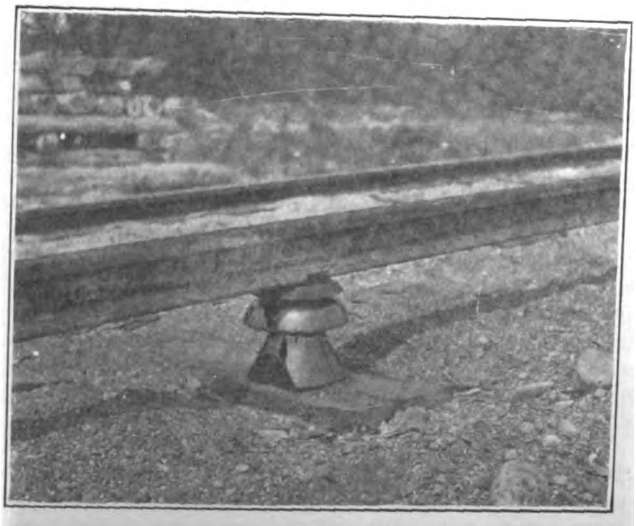
At the present time two bridges are under construction, one over the Kalamazoo River at Kalamazoo, and the other over the Grand River at Grand Rapids. Both of these are important structures, as they provide direct entrance to the north and south terminals of the new line. The bridge at Grand Rapids is a permanent one that rests on concrete piers and abutments. The one at Kalamazoo is a timber trestle with one set of through girders. A temporary structure was provided at the latter point in order to permit a more thorough study of the waterway requirements before a permanent bridge is provided.

2400-VOLT, THIRD-RAIL DETAILS

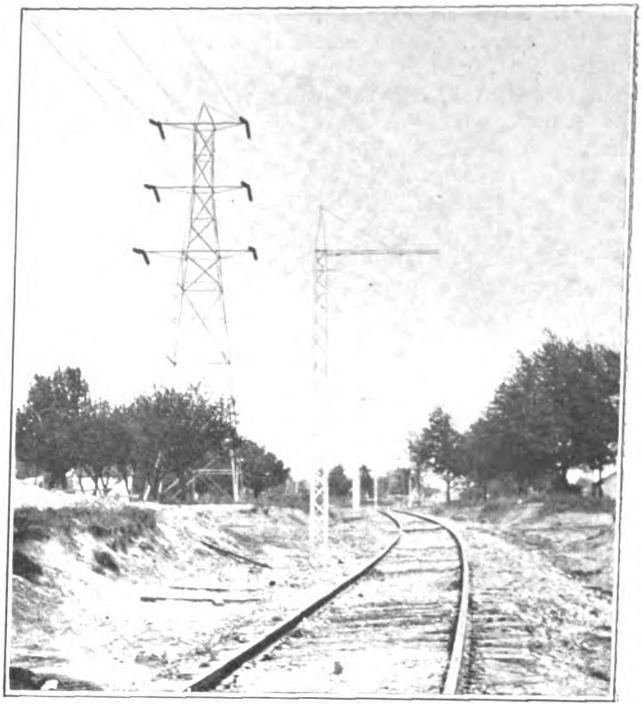
Undoubtedly the most interesting part of the construction of this new line is found in the manner of supporting and insulating the 2400-volt third-rail. Practically all of the third-rail is now in place, and tests are now being conducted to determine the best method of providing an insulated guard for it. As shown in the accompanying illustration the third-rail is installed on special insulators, which are 8½ in. high and are provided with a single petticoat 9⅓ in. in diameter. After the long ties have been accurately adzed to insure a uniform third-rail surface, a small rectangular casting is fastened to the tie with a lag screw. A pocket in the base of the third-rail insulator fits snugly over this base casting. A similar pocket in the top of the insulator takes a malleable iron saddle casting provided with lugs which exactly span the third-rail base. Both the insulator and the third-rail are held in position by their own weight, and the rail is permitted to move freely in accordance with the effects of expansion and contraction.

Prior to adopting the third-rail clearance a careful study was made of a number of Eastern steam-road electrifications that use third-rails in order to determine what clearance would be ample for all classes of equipment. As a result of this study the third-rail was placed at a horizontal distance of 32 in. from the adjacent track rail and 8½ in. above the track-rail surface. This clearance is believed to be ample for any steam-road equipment on tangent track, but at turnouts it was found necessary to depress the third-rail approximately to the same elevation as that of the track rail to insure clearance as a car passes over the switch points into the lead curve. All third-rails are stub-ended at crossings, and poles are set each side to support an overhead contact wire.

Through the cities and villages where the line leaves the 100-ft. private right-of-way, or where it is necessary to provide team tracks and station facilities, the propulsion current is carried on overhead trolley wires. At these locations galvanized structural poles with mast-arms are provided. The poles are 35 ft. long and are set with 18 in. of concrete at the bottom of the hole and 18 in. at the top. The sections of overhead trolley which are carried on the mast-arm construction are dead-ended by connecting the trolley ends to a pair of structural-steel galvanized poles, one set each side of the track. A view of this class of construction is shown in one of the illustrations.



MICHIGAN & CHICAGO RAILWAY—VIEW OF THIRD-RAIL CONSTRUCTION



MICHIGAN & CHICAGO RAILWAY—VIEW SHOWING OVERHEAD TROLLEY CONSTRUCTION THROUGH CITIES

As the third-rail clearance was unusually wide the use of a specially designed third-rail shoe was required to provide for operation through public streets. Accordingly, the shoe was arranged to operate with a pneumatic folding mechanism under the control of the motorman. Since practically the entire line is on private right-of-way, even well into the cities of Kalamazoo, Battle Creek and Grand Rapids, these third-rail shoes need be in the folded position only during the short intervals when a car is operating over the streets at these terminals.

SUPPLY OF ENERGY

According to present plans the whole line will be fed from Kalamazoo, Battle Creek and Grand Rapids at 2400 volts d.c., and no additional feeder other than the 80-lb., A. S. C. E., low-carbon third-rail will be employed. In case energy supplied from these three points is insufficient, 42,000-volt and 70,000-volt a.c. transmission lines that are already installed on steel towers along the private right-of-way may be tapped to supply energy to a substation at some intermediate point. This transmission line forms a part of the network of lighting and power lines of the Commonwealth Power & Light Company, owned and operated by the same holding company as the one which owns the new railway line.

PRESENT STATUS OF WORK

The work completed up to June 1 includes all the track and roadway except that portion in the immediate vicinity of the cities of Kalamazoo and Grand

Rapids. All third-rail is now installed but is awaiting the selection and installation of the protecting guard. Entrance to Kalamazoo and to Grand Rapids is arranged for, but the work was delayed both by the franchise negotiations and the construction of the two bridges mentioned.

The electrification of the steam road between Allegan and Battle Creek has been started. Third-rail ties are being placed and the overhead construction through the cities and villages is well under way. Three new telephone circuits will be provided on both divisions of the line. One will be used for train dispatching, one for commercial purposes and the third for power dispatching. These lines are being constructed on separate wooden poles. The overhead transmission power line is complete, but will not be put in service until the railway is ready for operation.

When the Michigan & Chicago Railway is completed it will form a part of the Michigan Railway Company's system, which is operated by the officers of the Michigan United Traction Company. This system includes the Michigan United Traction Company that operates a 1200-600-volt d.c. overhead and third-rail line; the Grand Rapids, Holland & Chicago Railway, a 1200-600-volt overhead line; the Saginaw-Flint Railway, a 1200-600-volt overhead and third-rail line, and the new Michigan & Chicago Railway, which will be a 2400-1200-volt third-rail line. In total length this system comprises approximately 470 miles of single track, practically all of which will be operated at 1200 volts on private right-of-way, excepting the Michigan & Chicago Railway, which will start at 1200 volts and later be raised to 2400 volts.

Responsibility for Pavement Repair Along Car Tracks in Chicago

In an article by P. E. Green, consulting engineer of Chicago, printed in the *Engineering Record*, the question of pavement deterioration along street railway tracks in Chicago is discussed. An abstract follows:

One of the most perplexing problems in modern city pavement is the maintenance of a first-class pavement along street railway tracks. In practically all cities this trouble is encountered. The city of Chicago has lately won an exceedingly important case in litigation on this point. The decision means hundreds of thousands of dollars to the city and to various contractors. It will undoubtedly be appealed and hence will not be finally decided for two or three years.

In order that the following discussion may be clear, the "brow pavement" is defined as that part of the paving area within a couple of feet and outside of the street railway tracks. The "quarter point" or "quarter" is the point midway between the outer rail and the curb.

Lincoln Avenue, where this question arose, is one of the principal secondary business streets of the North Side of Chicago. It is a diagonal street and accommodates a heavy traffic, both vehicular and street railway. It is paved with creosoted-wood blocks on a sand bed 1 in. in thickness and a 6-in. concrete foundation. The pavement was constructed in three sections—the first mile in 1907, the second mile in 1908 and the third mile in 1909. The space between the rails and tracks is paved with granite block for the first two miles and with wood block in the third. The creosoted-wood block pavement is laid in rows of approximately 45 deg. to within 4 in. of the rail. Most of the brow has a single longitudinal block laid parallel with the rail. On the west side of the first mile, however, the diagonal rows extend to the edge of the rail.

The railway construction is what is known as "Type 3," as adopted by the Board of Supervising Engineers, Chicago Traction. This type of track consists of a lower course of 8 in. of crushed stone upon which the ties and rails are laid. The ties and bases of the rails are covered and surrounded by 8 in. of concrete. On the top of the concrete is spread the sand bed, and the pavement is laid on this. In the first mile mentioned, in addition to this crushed stone, crushed cobbles were placed in the bottom of the track trench and the whole was thoroughly rolled with an Iroquois 10-ton roller. Particular attention is called to this type of construction, as its ability to stand up under the traffic was a question of the problem discussed in the following paragraphs. The rails themselves were of the 129-lb. Chicago section.

In longitudinal profile the street is exceedingly flat, there being only about 3 ft. difference in elevation in 3 miles. The roadway of Lincoln Avenue is 42 ft. wide from curb to curb. Since the railway right-of-way is 16 ft. wide, the pavement is approximately 13 ft. wide on each side of the railway right-of-way.

TRAFFIC CENSUS

Traffic is heavier in the first mile, especially as regards the railway traffic, than in the second or third mile. This is because Lincoln Avenue is known as a through-route street, and at the end of the first mile some of the cars turn off the avenue. A census of the traffic taken between the hours of 7.30 a. m. and 10 p. m. is given in the table.

CENSUS OF TRAFFIC BETWEEN 7.30 A. M. AND 10 P. M.

First mile	Street cars 1041,	Vehicular traffic 1500
Second mile	Street cars 746,	Vehicular traffic 1814
Third mile	Street cars 457,	Vehicular traffic 1010

For the past four or five years the street cars have been practically all of the large pay-as-you-enter type, weighing when loaded about 80,000 lb. Previous to that time cars of all sizes and types were used, with the heaviest weighing about 50,000 lb. loaded.

EXTENT OF DAMAGE

Within the past three years the condition of the brow in the first and second miles, and especially the first mile, has become very bad. The pavement for a distance of from 6 in. to 4 ft. from the rail has been broken down and dips below the tops of the rails. Between the rails the granite blocks have also dropped down to a considerable extent, though not as badly as on the outside. In general appearance it would seem as if the entire right-of-way had been dropped from 1 to 2 in., with the resultant disintegration of the pavement. At intervals humps or blisters were in evidence on the pavement, generally in the vicinity of the gutters. These humps were from 3 to 20 ft. in length and rose above the general surface of the pavement from 2 to 6 in. Adjoining such humps the surface of the pavement was invariably broken down and depressed.

After much correspondence between the proper city authorities and the contractor for the original work in the fall of 1911 and early part of 1912, the contracting company, one of the largest and most responsible in the city of Chicago, and a company which has had an irreproachable reputation, refused to make further repairs. It stated that the railway construction was not strong enough to withstand the heavy cars now in use and that they were not contemplated at the time the pavement was built.

If the pavement had not been repaired at once it would certainly have been destroyed from curb to curb within a few months. An agreement was therefore made between the city and the contractor that the contractor should make the repairs at once and that the actual cost of the repairs should be deposited in escrow awaiting the final decision of the courts.

Repairs of the pavement were begun immediately, and a thorough investigation of the causes of the trouble was made. Since the concrete was exposed on the outside of the rails for the purpose of making repairs, very accurate measurements were taken at frequent intervals to observe the actual contour of the foundation, and minute investigation was made as to the condition of the concrete immediately adjoining the track—in other words, along the brow. This concrete was almost always found to be in excellent condition as regards the material. It was sound and unbroken except that for about 20 per cent of the longitudinal distance and immediately adjoining the bottom of the rail it had become shattered. The same condition as to concrete was found between rails, though it was noted that only over ties was the concrete usually disturbed.

The testimony of all the witnesses was universally to the effect that the concrete foundation was in excellent condition. The street railway company testified that in very few cases had they found broken concrete. In the spring of 1913 they had repaired the pavement between their rails and had shimmed their track whenever necessary. These shims consisted of iron plates from 1/32 in. to ½ in. thick, but by far the greater number used were of the smaller size, and only in very few cases were the ½-in. shims employed. Where these were used there had been cuts made in the pavement by the public-utility companies.

It was also brought out in the case by testimony of city employees and by the contractor that the concrete when originally laid had been surfaced to three stakes set across the half roadway between the track and the curb, one stake being set at the end of the ties, one at the quarter point and one at the gutter. No allegation was made by the city that the material or the thickness of the foundation was defective in any way. It was very clearly demonstrated, however, that the concrete midway between the brow and the gutter was almost universally from ¼ in. to 1 in. higher than the concrete at the rails. In other words, either the track had gone down or the concrete had not been carefully laid to grade. It had also been clearly shown that the concrete was in excellent condition, that it was not at any time broken or shattered except for a distance of 2 in. or 3 in. adjoining the rail in about 20 per cent of the length of the street.

In the investigation of the foundation, three large openings were made in the pavement entirely through the concrete to the subgrade and the thickness was very carefully measured. These holes, which were taken at distances apart of about 2000 ft. on alternate sides of the street, exposed the contour both of the top and bottom concrete. They showed, first, that the concrete was sound and unbroken; second, that at its thickest point, which was the high point of the surface, the concrete was fully 7 in. thick; third, that the bottom of the concrete foundation was below the theoretical bottom as shown in the original ordinance and plans, while the top was above the theoretical line established as the top of the foundation. Both the theoretical top and bottom were established for these points by assuming the present top of rail elevations to be at original grade.

THEORY OF CAUSE OF TROUBLE

From this investigation it was concluded that the railway tracks did not settle appreciably. After six years' use under heavy traffic the only work necessary to put the track in first-class line and grade was an occasional shim 1/16 in. thick. No decided depressions of the track were found. It is inconceivable that the track could settle uniformly from 1 to 2 in. without breaking the concrete around the ties and back of the rails and without badly distorting both line and grade.

It is undeniable that at present the surface of the concrete midway between the quarter and the brow (half way between stakes as set) is from ¼ in. to 1 in. above the concrete abutting the rails. Yet the concrete is sound and unbroken. When this condition exists any water getting between the blocks and the foundation cannot drain away through the sand bed to the sewer inlets in the gutter. Traffic pounding the blocks and street cars pounding the rails—all act as the plunger of a pump and the sand is forced up through the joints to the surface of the pavement and then blown away. In a short time the blocks of the brow pavement drop, and then the wheeled traffic pushing and pounding on the distorted blocks, tilted toward the rails, gradually forces the sand back toward the curb, forming the large blisters previously described. Some of these blisters when opened showed a depth of 6 in. of sand at their high point.

WHY HIGH FOUNDATIONS?

It may be asked why the concrete foundations should be high between the stakes. It was believed that the concrete spreaders on a street having such a flat profile and section kept the concrete high at the point in question. The cross-section was so flat at this point of the curve and the instructions were that there must not be any depressions in the base. Consequently the men instinctively went to the other extreme and made it slightly higher. During construction it passed unnoticed, for as soon as the concrete set the sand bed was roughly spread on it to protect it from street traffic using the railway right-of-way.

THE REMEDY

The remedy is plain. Drainage must be perfect. If it is, there will be little trouble with any modern brow pavement, provided the street railway has a foundation at all adequate for its purposes. A dip in the foundation toward the rails of ¼ in. to 1 in. in 3 ft. may seem a small thing to many engineers, but if no water is held in the sand bed there will be no hydraulic action caused by the traffic. It is not a question of whether or not a sand cushion or a mortar bed is placed under the blocks. A mortar bed under constant pounding will pulverize and the same action take place. It is the old question of perfect drainage. Water is the great enemy of all street pavements. The more nearly the actual drainage conforms to the theoretical requirements, the more perfect the wearing surface will be and will remain under the heaviest traffic.

Typhoons and Philippine Transmission Lines

From June to October of each year the Philippine Islands are subject to typhoons which occasionally interrupt electric service by blowing débris against transmission lines and poles. These whirlwinds are usually very violent and occur without warning, uprooting trees, demolishing houses, sucking up large quantities of water, and sometimes even swamping ships. Because of their vertical, gyratory movement, however, they are not as destructive to transmission lines as equivalent horizontal gusts or gales of wind would be, except when they drop entrained débris on the lines or trail loose branches of trees through the conductors. The Manila Electric Railroad & Light Company reports that these disturbances do little damage to its trolley wires unless loose branches are flying through the air. Ordinarily the typhoons cause about the same interference with operation as would a fairly bad snow and sleet storm in the States.

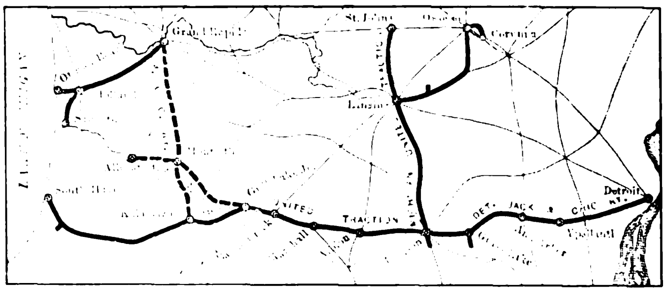
Third-Rail 2400-Volt Construction on the New Michigan & Chicago Railway

This High-Speed Line Connecting Kalamazoo and Grand Rapids Will Be the First Electric Railway in the World to Use a 2400-Volt Third-Rail—The Line Will Be Placed in Operation Next Autumn

Another long stride in the advance of direct-current voltages for third-rail operation will be taken when the new Michigan & Chicago Railway's 2400-volt line is completed. When ready for operation this line will include 91 miles of single track in southern Michigan, connecting Kalamazoo and Grand Rapids, and also Allegan and Battle Creek. That portion of the line between Kalamazoo and Grand Rapids, 49 miles in length, is being newly constructed throughout. The line between Allegan and Battle Creek, 42 miles long, is an old steam road purchased from the Michigan Central Railroad and it is now being electrified for 2400-volt, third-rail operation.

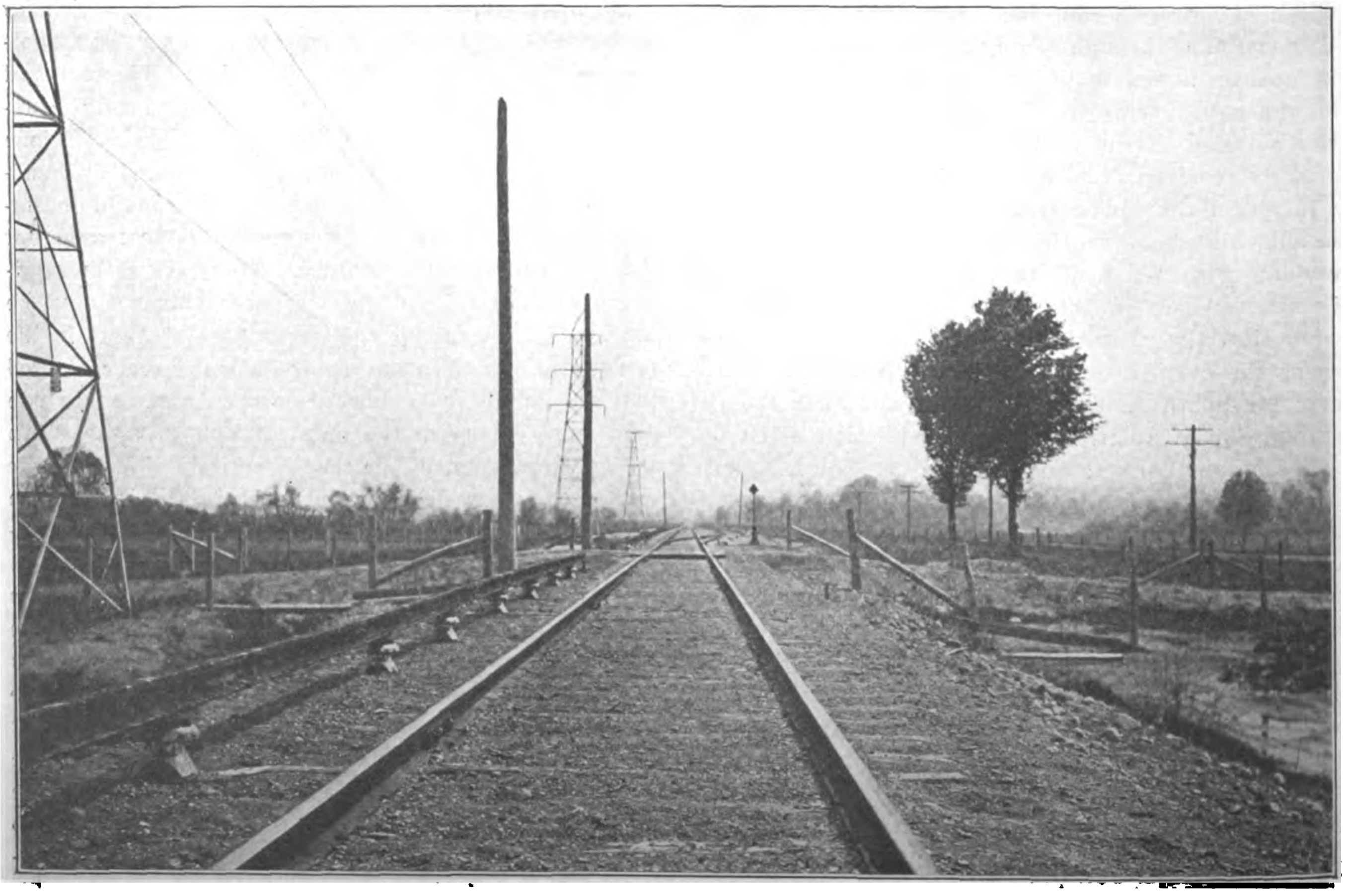
Standards adopted for the construction of this new line provide for high speed with 3 deg. maximum curves and 1 per cent maximum grades. All track, including main line and sidings, is being laid with 80-lb. A. S. C. E. rail on 6-in. x 8-in. x 8-ft. cedar ties, spaced twenty to a 33-ft. rail. Every sixth tie is 10 ft. long, the additional length being provided to furnish support for the third-rail. All sidings are being made double end with No. 12 turnouts having 90-ft. leads, and each siding provides 600 ft. of track in the clear. Both side tracks and main tracks are laid on from 6 to 8 in. of gravel ballast distributed in sufficient quantities to provide a liberal shoulder. Track bonding includes compressed terminal cross-bonds and exposed, Type J, Ohio Brass bonds at all joints.

In order to adhere to the track and roadway standards the grading quantities per mile averaged approximately 20,000 cu. yd., making the total for the new 49-mile line amount to about 1,000,000 yd. The subgrade standards provided for a 100-ft. private right-of-way, and a 16-ft. roadbed in cuts and fills with ample provision for drainage in the former. All waterways under the subgrade are provided with permanent structures. Where reinforced concrete pipe would not supply a sufficiently large opening, reinforced concrete, flat-top arches were constructed. In a few instances the spans were too long for this design and at these points through girders with ballast decks were installed.



Electric Ry Journal

MICHIGAN & CHICAGO RAILWAY—MAP OF THE SYSTEM



MICHIGAN & CHICAGO RAILWAY—VIEW SHOWING THIRD-RAIL AND TRACK CONSTRUCTION

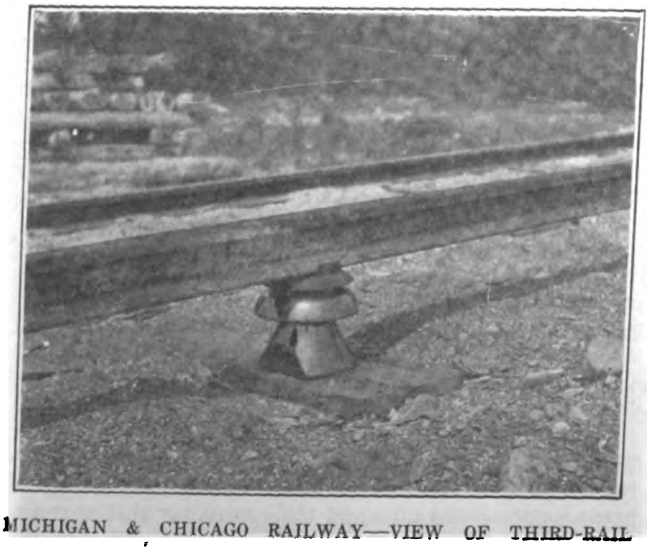
At the present time two bridges are under construction, one over the Kalamazoo River at Kalamazoo, and the other over the Grand River at Grand Rapids. Both of these are important structures, as they provide direct entrance to the north and south terminals of the new line. The bridge at Grand Rapids is a permanent one that rests on concrete piers and abutments. The one at Kalamazoo is a timber trestle with one set of through girders. A temporary structure was provided at the latter point in order to permit a more thorough study of the waterway requirements before a permanent bridge is provided.

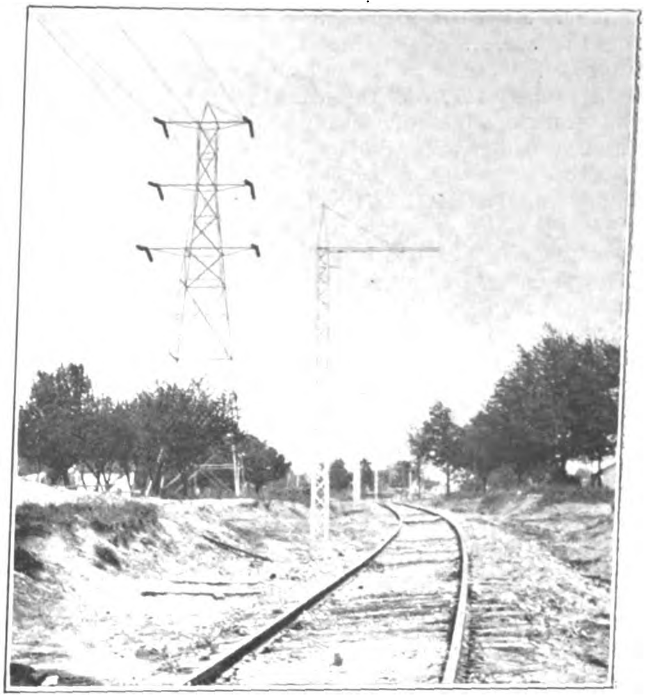
2400-VOLT, THIRD-RAIL DETAILS

Undoubtedly the most interesting part of the construction of this new line is found in the manner of supporting and insulating the 2400-volt third-rail. Practically all of the third-rail is now in place, and tests are now being conducted to determine the best method of providing an insulated guard for it. As shown in the accompanying illustration the third-rail is installed on special insulators, which are 8½ in. high and are provided with a single petticoat 9⅓ in. in diameter. After the long ties have been accurately adzed to insure a uniform third-rail surface, a small rectangular casting is fastened to the tie with a lag screw. A pocket in the base of the third-rail insulator fits snugly over this base casting. A similar pocket in the top of the insulator takes a malleable iron saddle casting provided with lugs which exactly span the third-rail base. Both the insulator and the third-rail are held in position by their own weight, and the rail is permitted to move freely in accordance with the effects of expansion and contraction.

Prior to adopting the third-rail clearance a careful study was made of a number of Eastern steam-road electrifications that use third-rails in order to determine what clearance would be ample for all classes of equipment. As a result of this study the third-rail was placed at a horizontal distance of 32 in. from the adjacent track rail and 8½ in. above the track-rail surface. This clearance is believed to be ample for any steam-road equipment on tangent track, but at turnouts it was found necessary to depress the third-rail approximately to the same elevation as that of the track rail to insure clearance as a car passes over the switch points into the lead curve. All third-rails are stub-ended at crossings, and poles are set each side to support an overhead contact wire.

Through the cities and villages where the line leaves the 100-ft. private right-of-way, or where it is necessary to provide team tracks and station facilities, the propulsion current is carried on overhead trolley wires. At these locations galvanized structural poles with mast-arms are provided. The poles are 35 ft. long and are set with 18 in. of concrete at the bottom of the hole and 18 in. at the top. The sections of overhead trolley which are carried on the mast-arm construction are dead-ended by connecting the trolley ends to a pair of structural-steel galvanized poles, one set each side of the track. A view of this class of construction is shown in one of the illustrations.


MICHIGAN & CHICAGO RAILWAY—VIEW OF THIRD-RAIL CONSTRUCTION


MICHIGAN & CHICAGO RAILWAY—VIEW SHOWING OVERHEAD TROLLEY CONSTRUCTION THROUGH CITIES

As the third-rail clearance was unusually wide the use of a specially designed third-rail shoe was required to provide for operation through public streets. Accordingly, the shoe was arranged to operate with a pneumatic folding mechanism under the control of the motorman. Since practically the entire line is on private right-of-way, even well into the cities of Kalamazoo, Battle Creek and Grand Rapids, these third-rail shoes need be in the folded position only during the short intervals when a car is operating over the streets at these terminals.

SUPPLY OF ENERGY

According to present plans the whole line will be fed from Kalamazoo, Battle Creek and Grand Rapids at 2400 volts d.c., and no additional feeder other than the 80-lb., A. S. C. E., low-carbon third-rail will be employed. In case energy supplied from these three points is insufficient, 42,000-volt and 70,000-volt a.c. transmission lines that are already installed on steel towers along the private right-of-way may be tapped to supply energy to a substation at some intermediate point. This transmission line forms a part of the network of lighting and power lines of the Commonwealth Power & Light Company, owned and operated by the same holding company as the one which owns the new railway line.

PRESENT STATUS OF WORK

The work completed up to June 1 includes all the track and roadway except that portion in the immediate vicinity of the cities of Kalamazoo and Grand

Rapids. All third-rail is now installed but is awaiting the selection and installation of the protecting guard. Entrance to Kalamazoo and to Grand Rapids is arranged for, but the work was delayed both by the franchise negotiations and the construction of the two bridges mentioned.

The electrification of the steam road between Allegan and Battle Creek has been started. Third-rail ties are being placed and the overhead construction through the cities and villages is well under way. Three new telephone circuits will be provided on both divisions of the line. One will be used for train dispatching, one for commercial purposes and the third for power dispatching. These lines are being constructed on separate wooden poles. The overhead transmission power line is complete, but will not be put in service until the railway is ready for operation.

When the Michigan & Chicago Railway is completed it will form a part of the Michigan Railway Company's system, which is operated by the officers of the Michigan United Traction Company. This system includes the Michigan United Traction Company that operates a 1200-600-volt d.c. overhead and third-rail line; the Grand Rapids, Holland & Chicago Railway, a 1200-600-volt overhead line; the Saginaw-Flint Railway, a 1200-600-volt overhead and third-rail line, and the new Michigan & Chicago Railway, which will be a 2400-1200-volt third-rail line. In total length this system comprises approximately 470 miles of single track, practically all of which will be operated at 1200 volts on private right-of-way, excepting the Michigan & Chicago Railway, which will start at 1200 volts and later be raised to 2400 volts.

Responsibility for Pavement Repair Along Car Tracks in Chicago

In an article by P. E. Green, consulting engineer of Chicago, printed in the *Engineering Record*, the question of pavement deterioration along street railway tracks in Chicago is discussed. An abstract follows:

One of the most perplexing problems in modern city pavement is the maintenance of a first-class pavement along street railway tracks. In practically all cities this trouble is encountered. The city of Chicago has lately won an exceedingly important case in litigation on this point. The decision means hundreds of thousands of dollars to the city and to various contractors. It will undoubtedly be appealed and hence will not be finally decided for two or three years.

In order that the following discussion may be clear, the "brow pavement" is defined as that part of the paving area within a couple of feet and outside of the street railway tracks. The "quarter point" or "quarter" is the point midway between the outer rail and the curb.

Lincoln Avenue, where this question arose, is one of the principal secondary business streets of the North Side of Chicago. It is a diagonal street and accommodates a heavy traffic, both vehicular and street railway. It is paved with creosoted-wood blocks on a sand bed 1 in. in thickness and a 6-in. concrete foundation. The pavement was constructed in three sections—the first mile in 1907, the second mile in 1908 and the third mile in 1909. The space between the rails and tracks is paved with granite block for the first two miles and with wood block in the third. The creosoted-wood block pavement is laid in rows of approximately 45 deg. to within 4 in. of the rail. Most of the brow has a single longitudinal block laid parallel with the rail. On the west side of the first mile, however, the diagonal rows extend to the edge of the rail.

The railway construction is what is known as "Type 3," as adopted by the Board of Supervising Engineers, Chicago Traction. This type of track consists of a lower course of 8 in. of crushed stone upon which the ties and rails are laid. The ties and bases of the rails are covered and surrounded by 8 in. of concrete. On the top of the concrete is spread the sand bed, and the pavement is laid on this. In the first mile mentioned, in addition to this crushed stone, crushed cobbles were placed in the bottom of the track trench and the whole was thoroughly rolled with an Iroquois 10-ton roller. Particular attention is called to this type of construction, as its ability to stand up under the traffic was a question of the problem discussed in the following paragraphs. The rails themselves were of the 129-lb. Chicago section.

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Within the past three years the condition of the brow in the first and second miles, and especially the first mile, has become very bad. The pavement for a distance of from 6 in. to 4 ft. from the rail has been broken down and dips below the tops of the rails. Between the rails the granite blocks have also dropped down to a considerable extent, though not as badly as on the outside. In general appearance it would seem as if the entire right-of-way had been dropped from 1 to 2 in., with the resultant disintegration of the pavement. At intervals humps or blisters were in evidence on the pavement, generally in the vicinity of the gutters. These humps were from 3 to 20 ft. in length and rose above the general surface of the pavement from 2 to 6 in. Adjoining such humps the surface of the pavement was invariably broken down and depressed.

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Repairs of the pavement were begun immediately, and a thorough investigation of the causes of the trouble was made. Since the concrete was exposed on the outside of the rails for the purpose of making repairs, very accurate measurements were taken at frequent intervals to observe the actual contour of the foundation, and minute investigation was made as to the condition of the concrete immediately adjoining the track—in other words, along the brow. This concrete was almost always found to be in excellent condition as regards the material. It was sound and unbroken except that for about 20 per cent of the longitudinal distance and immediately adjoining the bottom of the rail it had become shattered. The same condition as to concrete was found between rails, though it was noted that only over ties was the concrete usually disturbed.

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Traffic Investigation in Denver

Counts of All Vehicular Traffic Made by Forty-four Men on the Thirty-six Streets Entering the Business District of Denver Showed that 53 Per Cent of All Travelers Used the Street Cars—If Automobilists Used the Car Service the Annual Gross Revenues of the Railway Would Increase Nearly $440,000

BY ROGER W. TOLL, CHIEF ENGINEER DENVER TRAMWAYS

Most traction companies are interested in knowing how the people of their city travel, and what proportion of the travel is carried by the street cars. Thus, the number of passengers carried by automobiles is often conjectured, but usually there are very few data upon which to base an estimate upon this and similar questions. To determine this information in the case of Denver, a traffic investigation was recently conducted under the direction of John A. Beeler, vice-president and general manager of the Denver Tramway Company. The following synopsis of the methods used in making the investigation and the results obtained are presented:

BOUNDARIES OF ASSUMED BUSINESS DISTRICT

The business district, as assumed for the purposes of this investigation, is bounded by the lines shown on the map on the opposite page.

East side of Broadway from Colfax Avenue to Twentieth Avenue.

Northwest side of Welton Street from Twentieth Avenue to Twentieth Street.

Southwest side of Twentieth Street from Welton Street to the Platte River.

Center line of the Platte River from Twentieth Street to Cherry Creek.

Center line of Cherry Creek from the Platte River to West Colfax Avenue.

South side of West Colfax Avenue from Cherry Creek to Broadway.

The area included within this business district is 0.87 sq. mile. The total area of the city and county of Denver is 58.75 sq. miles. The area of the business district, here assumed, is slightly less than 1½ per cent of the area of the entire city. The district includes not only the retail business district but the greater part of the wholesale district and a portion of the railroad yards.

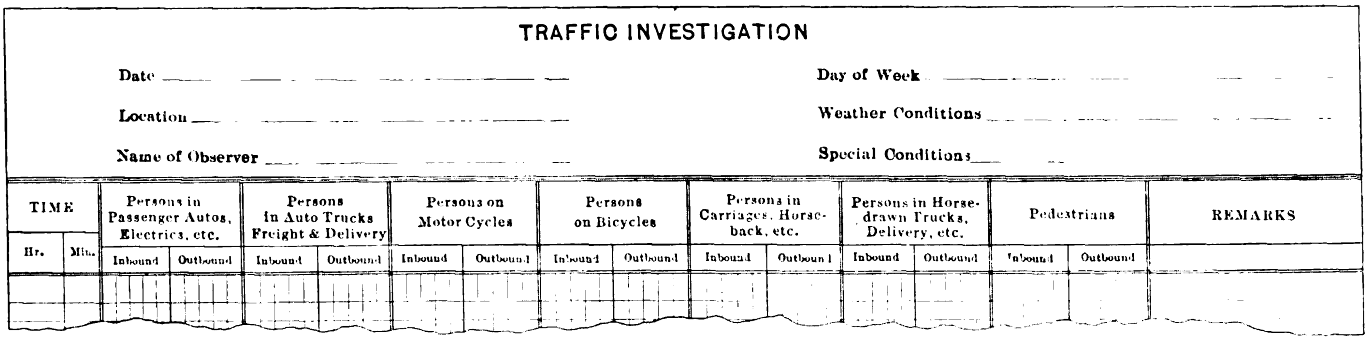
CLASSIFICATION OF TRAFFIC AND OBSERVATIONS

All street traffic, exclusive of street car passengers, was grouped in accordance with the following classification:

A—Persons in passenger automobiles.
B—Persons in freight automobiles.
C—Persons on motorcycles.
D—Persons on bicycles.
E—Persons in horse-drawn passenger vehicles.
F—Persons in horse-drawn freight vehicles.
G—Pedestrians.

The accompanying blank shows the form used by the observers on this work.

There are thirty-six public thoroughfares entering this business district. At a few locations the travel was so light that one observer recorded the travel on two streets. At five locations the travel was so heavy that two observers were required, one to record pedestrians and the other to record vehicle traffic. The observations were taken by forty-four men, most of whom were trainmen. Half of the men were on duty from 6 a. m. until 3 p. m.; they were then relieved by the other half, who were on duty from 3 p. m. until midnight. The observations were therefore continuous from 6 a. m. until midnight, a period of eighteen hours. The observations covered a period of two days, as the number of available men was insufficient to cover all locations in one day. These days were Monday, May 4, and Tuesday, May 5.



TRAFFIC INVESTIGATION

Date
Day of Week
Location
Weather Conditions
Name of Observer
Special Conditions

TIME		Persons in Passenger Autos, Electrics, etc.		Persons in Auto Trucks Freight & Delivery		Persons on Motor Cycles		Persons on Bicycles		Persons in Carriages, Horseback, etc.		Persons in Horse-drawn Trucks, Delivery, etc.		Pedestrians		REMARKS
Hr.	Min.	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	

Electric Ry. Journal

DENVER TRAFFIC STUDY—FORM OF RECORD USED BY THE DENVER TRAMWAY'S OBSERVERS

In order to see if the traffic conditions were similar during the two days named, the traffic at two locations was observed by the same men on both days. One of these two locations showed a decrease of travel, while the other showed an increase. It was concluded that no great error was involved by combining the records of two days so as to represent a typical day. Tuesday, May 5, was therefore assumed as the typical day. The weather conditions for the days on which observations were taken were good and may be considered as typical for that time of year.

As stated above, the number of vehicles entering and leaving the business district was recorded, as well as the number of persons in the vehicles. The totals of the vehicle count are shown below, together with the average number of persons carried by each class of vehicle.

Class of Traffic	Inbound Trips	Outbound Trips	Total Trips	Per Cent of Total Vehicles	Average Persons per Vehicle
Passenger automobiles...	8,489	8,723	17,212	26.0	1.79
Freight automobiles.....	1,355	1,275	2,630	4.0	1.42
Motorcycles	1,730	1,722	3,452	5.2	1.14
Bicycles	9,325	9,342	18,667	28.2	1.01
Horse-drawn passenger vehicles	1,787	1,672	3,459	5.2	1.36
Horse-drawn freight vehicles	10,447	10,300	20,747	31.4	1.22
Total vehicles.......	33,133	33,034	66,167	100.0	1.47

The number of vehicles entering and leaving the business district should be practically equal for any one day. The foregoing figures afford an indication of the percentage of error of this investigation.

The most numerous vehicles entering and leaving the business district are the horse-drawn freight vehicles, including delivery wagons of all sorts. This class constitutes 31 per cent of the total number of vehicles. It is surprising to find the bicycles next in number, being 28 per cent of the total, and even exceeding passenger automobiles, which constitute 26 per cent of the total.

Horse-drawn passenger vehicles constitute 5 per cent and motorcycles 5 per cent and freight automobiles 4 per cent of the total. The number of passing bicycles was more than five times the number of passing motorcycles, and the number of passing passenger automobiles was more than six times the number of passing freight automobiles.

Thirteen per cent of the 10,000 daily trips made by automobiles in and out of the district are for freight purposes. Of the total number of automobiles in use in the city, probably about the same percentage are freight autos. Of the horse-drawn vehicle trips, 86 per cent were for freight purposes. Of the total vehicle trips, 35 per cent were for freight purposes. The horse-drawn vehicle trips are in excess of the automobile trips, being 37 per cent of the total number of vehicles, as compared with 30 per cent for the automobiles.

The State law that went into effect in 1913 requires the registration, at the beginning of each year, of all automobiles and motorcycles. The records of the registrations in Denver County are as follows:

Total for 1913	
Individual licenses	4,793
Dealer licenses	175
Total automobiles	4,968
Motorcycles	1,013
Issued Jan. 1 to May 5, 1914.	
Individual licenses	4,630
Dealer licenses	169
Total automobiles	4,799
Motorcycles	927

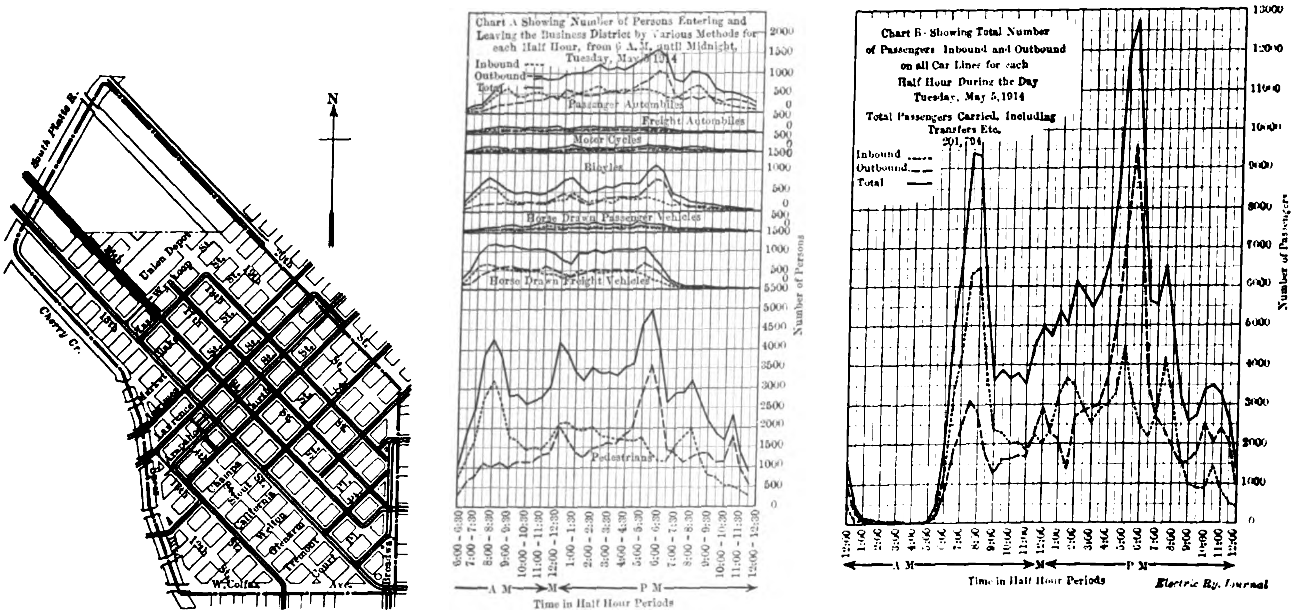
The figures for May 5 represent the number of licenses issued at the time of this traffic investigation. The number of licenses that will have been issued by Dec. 31 of this year will exceed the number issued during 1913. No reliable data are available as to the number of automobiles in use during years prior to 1913.

From the foregoing data it is assumed that about 5000 automobiles and 1000 motorcycles are now in use in Denver. If 13 per cent of the automobiles are in freight service, there are about 650 freight autos and 4350 passenger autos in use in the city.

The number of automobiles and motorcycles entering and leaving the business district is shown below, together with the number of round trips per machine, based upon the estimated number of machines in use:

	In-bound	Out-bound	Average Number of Round Trips	Estimated Number in Use	Number of Round Trips per Machine
Passenger automobiles	8,489	8,723	....	....	..
Freight automobiles	1,355	1,275	....	....	..
Total automobiles	9,844	9,998	9,921	5,000	2.0
Motorcycles	1,730	1,722	1,726	1,000	1.7

A certain percentage of the registered automobiles are not in daily use, and a certain percentage of those in use do not reach the business district, so that the actual number of round trips per machine in city use is doubtless more than that here shown. It is also true that some of the automobiles used in the business district are owned and registered in the counties adjoining Denver and are therefore not included in the estimated number of automobiles owned in Denver.



DENVER TRAFFIC STUDY—THE BUSINESS DISTRICT OF DENVER AND THE TWO TRAFFIC CHARTS MADE TO SHOW THE TRAVEL ON ONE BUSINESS DAY

Number of Persons Inbound and Outbound

The combined records of the observations taken at the thirty-six thoroughfares give the total number of persons, entering and leaving the business district daily, as 194,456. The following tabulation shows the total results for each class of traffic, inbound and outbound, together with the percentage that each class of traffic bears to the total traffic. This tabulation includes all classes of traffic with the exception of passengers carried on the electric cars:

Number of Persons Entering and Leaving the Business District Daily by Various Methods, Other than Street Car

Class of Traffic	Inbound	Outbound	Total	Per Cent
Persons in passenger automobiles	15,540	15,264	30,804	15.9
Persons in freight automobiles..	1,938	1,797	3,735	1.9
Persons on motor cycles........	1,967	1,956	3,923	2.0
Persons on bicycles.............	9,348	9,602	18,950	9.7
Persons in horse-drawn passenger vehicles	2,430	2,280	4,710	2.4
Persons in horse-drawn freight vehicles	12,733	12,611	25,344	13.5
Pedestrians	56,251	50,739	106,990	55.0
Total	100,207	94,249	194,456	100.0

It will be noted that the number of persons inbound is 100,207, while the number outbound is 94,249. The difference of nearly 6000 is seen to be due principally to the pedestrian class, as the number of pedestrians inbound is about 5500 greater than the number of pedestrians outbound. This would indicate that more people walk to business than walk home. There is a similar excess of about 300 in the number of persons carried to the business district in passenger autos.

The inbound and outbound records for other classes of traffic are fairly consistent. The excess of 250 in outbound bicycles is probably due in part to those reaching the business district before 6 a. m., for the charts indicate that bicycle riders are early risers.

The accompanying chart "A" shows graphically the number of persons entering and leaving the business district during each half-hour of the day by each class of transportation. These curves show the peaks due to inbound traffic in the morning, outbound traffic in the late afternoon and traffic in both directions during the middle of the day and also the evening.

Car Traffic

To have made this investigation complete it would have been interesting to have ascertained the number of passengers on each car as it entered and left the business district throughout the day. It is impracticable to get an accurate count of this nature, particularly during the rush hours. The best statistics that are available for comparison with street traffic are the figures of total passengers carried in the city, regardless of the business district.

While this comparison is the best available, it is on a somewhat different basis, since a certain proportion of the passengers carried on cars do not enter the business district. There are a number of factories, shops, industries and minor centers of trade that are not included in the business district. Persons going to these locations may or may not pass through the business district. The car data therefore include all of that class of traffic in the entire city, while the street traffic data are confined to the business district. The passengers carried by interurban lines outside of the city are excluded from the totals.

The percentage of passengers carried by the lines passing through the central loop and the lines passing at various distances from the central loop was found to be as follows:

Passengers carried by lines passing through the central loop	45.5 per cent
Passengers carried by lines passing adjacent to the central loop	17.5 per cent
Passengers carried by lines passing one block from the central loop	30.2 per cent
Passengers carried by lines passing two or three blocks from the central loop....................	6.8 per cent
Total	100.0 per cent

Chart "B" shows graphically the number of persons riding on the cars during each half-hour of the day. The data for this chart were obtained from the records of the fare registers. These records give the number of passengers carried on each car-trip, inbound and outbound, together with the time of the car at each end of the line. The time that each car crossed the boundary of the business district was then computed and the car-trips were then grouped in half-hour periods. By this method the chart represents the number of passengers carried on cars entering and leaving the business district during each half hour, and the chart is therefore on the same time basis as the other traffic charts. As previously stated, that car traffic includes all passengers carried in the entire city, though a certain proportion of these passengers do not cross the boundaries of the business district.

Six of the thirty-one lines are crosstown lines and no data are available as to the inbound and outbound passengers on these lines, since a single trip across town includes both classes of passengers. The total number of passengers carried by these crosstown lines during each half-hour was divided into inbound and outbound in the same proportion that was found to exist between the inbound and outbound passengers carried on the other lines during the same half-hour of the day.

An examination of the chart showing car passengers leads to the following conclusions:

The morning load was heavy from 6.30 to 9 o'clock, and reached its peak from 7.30 to 8, during which half hour, 9400 passengers were carried, inbound and outbound.

The afternoon load was heavy from 4 o'clock to 6.30, and reached its peak from 5.30 to 6, during which half hour 12,800 passengers were carried, inbound and outbound. The time of these peaks is known to vary with the season of the year, but the chart may be considered typical for a week-day during the month of May.

The outbound traffic shows a small peak from 12 o'clock to 12.30 p. m., and the inbound traffic shows a small peak from 1.30 to 2 p. m. This is caused principally by the lunch hour.

The inbound traffic shows a small peak from 7.30 to 8 p. m. and the outbound traffic shows small peaks from 10 to 10.30 p. m. and 11 to 11.30 p. m. These are principally due to evening entertainments in the business district.

It is to be noted that a peak in the inbound traffic is usually accompanied by a smaller peak in the outbound traffic, and vice versa. This is probably due to two causes: First, the people working outside of the business district move in the opposite direction to those working in the business district; second, transfers issued from an inbound car are generally used on an outbound car, so it is to be expected that both directions of traffic will show peaks at about the same time, due to the large percentage of transfers issued.

General travel is heavier in the afternoon than in the morning, indicating a prevalence of afternoon shopping. The travel during the evening peak is about double the travel at any other time of the day except during the morning peak, and more than double the average travel during the day.

The following is a comparison of the inbound and outbound passengers carried during the day:

Inbound	99,345
Outbound	102,449
Total	201,794

The excess of outbound over inbound is 3104, which is in accordance with the previous statement that many people walk to business and ride home on the cars.

Total Traffic

The total daily inbound and outbound traffic is as follows:

Street traffic, inbound............................	100,207	
Car traffic, inbound............................	99,345	
Total inbound		199,552
Street traffic, outbound	94,249	
Car traffic, outbound	102,449	196,698
Total, inbound and outbound............................		396,250

The number of passengers carried on cars during the "owl" period, from midnight to 6 a. m. and during the remaining eighteen hours, from 6 a. m. to midnight, is as follows:

Passengers carried from midnight to 6 a. m.	2,004	1 per cent
Passengers carried from 6 a. m. to midnight	199,790	99 per cent
Total passengers carried	201,794	100 per cent

If this same percentage holds true on other classes of street traffic, then the data obtained by this investigation, which are based on the eighteen hours, from 6 a. m. to midnight, represent about 99 per cent of the total street traffic for a twenty-four hour day.

Combining the number of passengers carried by the cars in the entire city with the street traffic in and out of the business district, we have the following totals and percentages:

Method of Transportation	Number of Persons	Per Cent
Street cars	201,794	50.9
Passenger automobiles	30,804	7.8
Freight automobiles	3,735	0.9
Motorcycles	3,923	1.0
Bicycles	18,950	4.8
Horse-drawn passenger vehicles	4,710	1.2
Horse-drawn freight vehicles	25,344	6.4
Pedestrians	106,990	27.0
Total	396,250	100.0

Eliminating the persons traveling in freight vehicles, the totals and percentages are as follows:

Method of Transportation	Number of Persons	Per Cent
Street cars	201,794	54.9
Passenger automobiles	30,804	8.2
Motorcycles	3,923	1.2
Bicycles	18,950	5.2
Horse-drawn passenger vehicles	4,710	1.3
Pedestrians	106,990	29.2
Total	367,171	100.0

It is interesting to note that the number of passengers carried by street cars is about 53 per cent of the above total.

The receipts per passenger carried for the year 1913 averaged 3.89 cents, since the total number of passengers carried includes those riding on transfers, half fares and miscellaneous tickets. If the 30,804 persons going in and out of the business district by passenger automobiles were all carried on the street cars the revenue would be 30,804×$0.0389, or $1,198.28 a day, or $437,372.20 per year, assuming that the automobile passengers average the same throughout the entire year as for the typical week day on which these data were based.

On the estimate, previously stated, that there are 4350 passenger autos in use in the city, the 30,804 passengers carried by these autos are equivalent to an average of 7.1 passenger-trips per auto per day. The loss of revenue per auto is therefore about 7.1 × 3.89, or 27.6 cents a day, or $100.74 a year, assuming the same average daily number of passengers for the entire year.

TRAVEL COMPARED WITH POPULATION

For the purposes of this investigation, the population of Denver is assumed in round figures at 200,000. The total number of persons riding on cars and going in and out of the business district daily is shown as 396,250. This is equivalent to approximately one trip, in and out, per person per day. In an average household of four or five persons, one person would go to the business district daily and the other members of the household would go occasionally, averaging perhaps two persons per household going to the business district per day. For the entire city, about 100,000 persons would go to the business district per day. This would result in a minimum of 200,000 trips, in and out, per day. The difference between this figure and the figure of 396,250 given above is probably due to trips out and back at noon time, as shown by the accompanying curves, and to the numerous trips, in and out, of a certain portion of the population. The total result is not far from what would be expected.

The number of passenger automobiles in use, estimated at 4350, is equivalent to an average of one automobile for every forty-six persons. Assuming an average of from four to five persons per household, this is equivalent to an average of one automobile to about ten households.

Commonwealth Edison Company Acquires South Chicago Power House Site

The Commonwealth Edison Company, Chicago, Ill., announces the recording of the deeds covering the purchase of about 24 acres of land in South Chicago, on the east side of the Calumet River near the intersection of the Lake Shore and Pennsylvania Railroad tracks entering Chicago. While it is probable that nothing will be built on the site at present, ultimately it will contain a large generating plant, supplementing the output of the present three large, modern steam-turbine generating plants and smaller stations of an older type. The proposed new station will be located on the Calumet River, the commercial highway for water-borne commerce in the southern part of Chicago. The new site is strategically located with respect to railroad transportation and water for condensing purposes.

It has been assumed that the proposed generating plant would be conveniently located in case the steam railroads in that part of Chicago desired to equip their passenger service for electrical operation. However, Samuel Insull, president of the Commonwealth Edison Company, is quoted as saying that his company has no contract with steam railroad companies to supply electrical energy for the operation of trains and that the location of the new plant has nothing to do with the suggested electrification of the railroads. It is simply a part of the general engineering plans of the company to establish generating stations in advantageous locations in different sections of the city. Of course, the plant will be there for railroads and others to avail themselves of its resources if desired.

English Tramway Employees at War

According to *Electrical Engineering*, a very large number of the employees of electric supply tramway and manufacturing companies of Great Britain are now serving in the army and navy and territorials. In many cases arrangements are being made to continue the full pay of the men in the case of married employees and half-pay in the case of single employees. In other instances the difference between the army pay and ordinary wages is being paid, and in still others the company has guaranteed to look after the wives and families of the men. The tramway undertakings are supplying the largest number of men, probably because so many army reservists find employment in this direction. The names of some of the electric railways, with the number of men sent, follow:

London County Council Tramways, 700 men, and an additional 400 men are liable to be called upon as national reservists.

Glasgow Corporation Tramways, 604 men, including many members of the engineering staff.

Birmingham Corporation Tramways, 340 men.

Manchester Corporation Tramways, 346 men.

Metropolitan Electric Tramways, 233 men.

London United Tramways, 150 men.

Liverpool Corporation Tramways, 400 men.

South Metropolitan Electric Tramways and Lighting Company, 33 men.

Cardiff Lighting and Tramways Department, 59 men.

The European War and Export Trade

Statistics of German and British Export Trade in Electrical Apparatus to Different Countries—Opinions of British Technical Papers on Trade Conditions — South American Business Discussed by Prominent Authorities

BRITISH AND GERMAN EXPORT TRADE

STATISTICS SHOW THE AMOUNT AND DESTINATION OF THE ELECTRICAL EXPORTS

Owing to the suspension of most European mail service, the only foreign technical papers now available are those of England. The general tone of the English technical press is one of optimism. While admitting that the present outlook is too serious to be illumined by more than hope, much satisfaction is found in the steadfast way in which the financial institutions of London and the people affected have met the situation without the precipitation of a panic.

Electrical Engineering in its issue of Aug. 13 presents a digest of a German official return showing under classified headings Germany's chief customers for its export trade. The total exports of Germany to all countries for 1913 were of a value of £14,500,000, and the total weight was 133,855 (metric) tons. If all of the German exports going to Austria, Russia and France, the large Continental countries now involved in the war, is deducted from the total a figure of £12,300,000 is obtained, which represents approximately the trade opened to other countries. English electrical exports to Germany, Austria, Russia, France and Belgium during 1913 were only £511,440, the present loss of which English exporters aim to more than counterbalance by participating in the £12,300,000 of trade now lost to Germany.

TABLE I.—SHOWING VOLUME OF GERMAN TRADE IN POUNDS STERLING FOR ELECTRICAL EXPORTS TO ALL COUNTRIES DURING 1913.

Generators, motors, transformers and choking coils:		
Machines, etc., up to 25 kg. in weight	£ 144,350	
Machines, etc, from 25 to 100 kg. in weight	361,000	
Machines, etc., from 100 to 500 kg. in weight	721,000	
Machines, etc., over 500 kg. in weight	1,599,850	
		£2,826,200
Separate armatures and commutators		393,750
Accumulators and parts		286,850
Cable		1,963,400
Arc lamps and mercury vapor lamps		143,000
Arc lamp carbons		491,300
Spare cases and globes, etc., for arc and mercury vapor lamps		21,600
Projectors and reflectors		97,950
Metal filament lamps		2,251,900
Carbon filament and Nernst lamps		167,650
Telegraphic apparatus		48,200
Telephonic apparatus (excluding wireless)		431,800
Electrical fuses, cut-outs, bells, signaling apparatus, etc.		186,700
Apparatus for wireless telegraphy and telephony		82,100
Electrical devices for lighting, power, etc		3,702,350
Electro-medical and dental apparatus		228,200
Electrical measuring instruments, electricity meters and parts		1,211,500
Primary batteries and parts		154,150
Electrical heating and cooking apparatus and parts		83,750
Asbestos, mica and micanite insulators		56,300
Insulating tubes of paper, etc		163,300

Table I, presented herewith, indicates the volume of German export trade in pounds sterling in various electrical and allied commodities for 1913. It will be noted the chief line of German trade has been electrical devices for lighting, power, etc., amounting in value to £3,702,350. Following this is the trade in heavy electrical machinery, including generators, dynamos, transformers and choking coils, valued at £2,826,200; metal filament lamps, £2,251,900; cable, £1,963,400, and electrical measuring instruments, £1,211,500.

Table II shows how the German trade in generators, motors and transformers, in electrical devices for lighting, power, etc., and in electrical measuring instruments, is divided among the world customers of Germany. These items are selected as being those in the classification most closely allied to the electric railway industry. As indicated in the table, Russia ranks first in volume of trade on a ton basis, but Belgium, Austria-Hungary, Great Britain, Argentina, Italy, Spain, France and Japan are not far behind. The heavy export trade by Germany is along the line of generators, motors, transformers, etc., the total volume being 37,279 (metric) tons, while electric light and power devices follow with 21,553 (metric) tons and electrical measuring instruments with 3321 (metric) tons.

TABLE II.—SHOWING DIVISION ON METRIC-TON BASIS OF THREE MAIN LINES OF GERMAN ELECTRICAL EXPORTS TO WORLD COUNTRIES IN 1913.

	Generators, Motors, Transformers and Choking Coils	Electrical Devices for Lighting, Power, etc.	Electrical Measuring Instruments, Electricity Meters and Parts
Russia	3,667	2,924	570
Belgium	3,048	1,465	129
Austria-Hungary	2,107	1,992	353
Great Britain	2,314	1,441	275
Argentina	1,984	1,520	279
Italy	2,148	1,205	375
Spain	3,090	..	249
France	1,859	1,121	184
Japan	2,610	..	91
Holland	1,921	..	91
Brazil	1,777	..	34
Norway	1,552	..	43
British South Africa	1,004	273	14
Switzerland	828	..	106
Chile	822	..	47
Roumania	812	..	26
Sweden	585	..	125
Mexico	567	..	..
Denmark	414	..	134
India	547	..	..
Finland	395	..	46
Dutch Indies	362	..	..
Portugal	305	..	..
China	266	..	20
Australia	129	122	21
Uruguay	158	..	..
Peru	124	..	..
United States	..	..	17
Total weight in metric tons	37,279	21,553	3,321

ENGLISH EXPORT TRADE

The Electrical Review of Aug. 15 devotes considerable space to an analysis of present export trade conditions in England. It is stated that during the present year exports of British electrical goods has been in excess of £500,000 a month, toward which amount European countries contributed only £88,000 worth of purchases. This figure includes countries not directly engaged in war, and in any case it is not greatly in excess of English electrical trade with India alone. Less than 20 per cent of British overseas trade is concerned with Europe and obviously a much smaller proportion with Germany, Austria-Hungary and Russia, the countries which may be regarded as absolutely sealed by the war. The balance of English export trade represents trade with countries far removed from the war, the best customers being India, Japan, Australia, Canada and the South American republics. The distribution of English export trade to all customers is shown by Table III.

Germany has heretofore made a preponderating contribution of English electrical imports. In recent months England received on the average about £275,000 of electrical imports. Of this German imports accounted for £156,000 and Austro-Hungarian for £1,800. France and Belgium contributed between £25,000 and

TABLE III.—SHOWING PRINCIPAL FOREIGN AND COLONIAL ELECTRICAL MARKETS OF GREAT BRITAIN AND AVERAGE MONTHLY VALUES OF ELECTRICAL EXPORTS.

*Europe	£88,000
India	78,000
Australia	74,000
British South African Colonies	45,000
Argentina	45,000
Japan	38,000
Canada	36,000
China and Federated Malay States	27,000
New Zealand	23,000
Brazil	23,000
Remaining Countries of Africa	21,000
Remaining Countries of South America	10.000

*Russia, Germany, Austria-Hungary and Balkan nations, £18,000

£30,000 worth of electrical imports per month. All these competitors in the home market will be seriously affected by the war, but the trade of the United States, which in June exported nearly £60,000 of electrical goods to England, should not be so greatly damaged.

GENERAL ENGLISH TRADE OUTLOOK

MANUFACTURERS EXPECT WAR ULTIMATELY TO RENDER COUNTRY LESS INDUSTRIALLY DEPENDENT UPON CONTINENT

According to *The Electrician* of Aug. 7, the outlook for the electrical trade should become brighter as the first operations of the war are concluded. It is realized that those firms that are now and have been for many years trading in electrical plant, apparatus and materials from the Continent and particularly Central Europe, will have no alternative but to close their doors. Indeed, English inter-trade with the Continent in electrical material, both raw and finished, is said to have already completely ceased. As a result, the minds of British manufacturers have turned toward those outlets of trade which the distant parts of the Empire and other unaffected countries offer. *The Electrician* of Aug. 14 is particularly optimistic in regard to the future of British electrical trade. From inquiries made of the principal electrical manufacturing firms and supply houses, it appears that there has been no unwonted falling-off of trade. It is feared that a few companies will for a period be undermanned, but this is not looked upon as a permanently serious factor. The paper concludes: "The contracting element need feel no uneasiness that there will be any dearth of supplies nor have any doubts that the financial situation will generally favor the continuance of trading. Everything seems to justify the fixing up of a notice in the window of every electrical concern in England —'Business as usual.'"

The general opinion of *The Engineer* is that English manufacturers "must face the difficulties of a temporarily collapsed trade, strong in the conviction that when the war is over their position will be far stronger than it has ever been."

The Electrical Review, in its issue of Aug. 7, states that Canada and the United States may find their financial salvation by reason of the present situation, and the belief is expressed that the future holds such an activity in trade, in metals, in stocks and bonds, as few can remember. The next issue of the paper characterizes as unpatriotic the action of some firms (scarcely any electrical) in issuing circulars broadcast to their clients to the effect that in the future they must have cash with their orders. It is stated with emphasis that no departure should be made from the usual practice with regard to credit accounts unless circumstances arise which render such a move absolutely unavoidable, a contingency at present not anticipated. In concluding, comment is made as follows: "One of the unexpected disclosures effected by the outbreak of the war is the extent to which reliance has been placed by British manufacturers upon supplies of raw material from Germany, as evidenced by the number who have had to close their works for want of it. We trust that the outcome will be the transference of the bulk of this trade to British purchasers of raw material. We believe that the cut-throat competition with which our manufacturers have suffered in the past will be removed, the exploitation of the British dominions and colonies will cease and the large amount of foreign trade will be deferred from the Continent to British workshops."

SOUTH AMERICAN TRADE CONDITIONS

W. J. CLARK EXPLAINS REASONS FOR EUROPEAN INDUSTRIAL SUPREMACY IN SOUTH AMERICA AND FOR POSSIBLE SUCCESS OF UNITED STATES THERE

W. J. Clark, manager of the traction department of the General Electric Company, takes an optimistic view of the ultimate effect of the war upon industrial conditions in this country, but he feels that it will take time to adapt our financial machinery to the new conditions. European financiers have made a diligent study of foreign business for such a long time that Americans cannot expect to learn the art of dealing with South American countries, especially, in a few months. In his opinion a vital feature in the European industrial achievements abroad has been the attention given to the financial standing of individual foreign customers. The status of each as a creditor is carefully studied and suitable terms are made for him. Credits up to two years are sometimes allowed with a reasonable interest rate which can be discounted at home, making a profitable transaction for seller as well as purchaser. Belgium, which has been so far the center of conflict in the present war, has played an important part in the financing of foreign undertakings. It has been to a considerable extent a clearing house for them due to favorable laws, to the supposedly neutral character of the country and to the excellent Belgium consular service. Corporations in other countries invested through Belgium corporations somewhat as though they were holding companies. The capital placed thus outside of Belgium in public utilities of various kinds is at least $1,000,000,000. There are also vast sums invested directly by French, German and other financiers. In South America the public utilities, with the exception of the Pearson, Grace and minor interests, are financed in Europe principally, directly or indirectly, from Germany. To offset the conditions outlined, Mr. Clark believes that, aside from the temporary and possibly permanent conditions produced by the present war, the principal advantages possessed by American manufacturers lie in the quality of their products and the ability of their selling forces. That our manufacturers are beginning to appreciate their opportunity is shown by the activity of the United States Steel Corporation and a few other enterprising organizations.

The General Electric Company does much of its South American business through its London office, opened fourteen years or more ago, largely to handle foreign business. A very large business is done here because London is the natural center for South American trading. The company also controls the South American General Electric Company with headquarters at Buenos Aires and it has regular office headquarters at Rio de Janeiro. In addition a large business is handled by W. R. Grace & Company in the West and Southwest, and by Amsinck & Company in the North.

In discussing the probable effects of the war upon financial and industrial conditions Mr. Clark stated that he expects some small immediate benefits and larger ultimate ones. At first there should be an increase in the demand for small supplies for which the purchaser can pay directly. The present plants must be kept up and supplies will be required at once. Ultimately foreign projects will have to be partially, and possibly largely, financed from America. Europe up to this time has largely financed all foreign undertakings, but America must shoulder part of the burden because European money will be needed at home. As foreign ownership influences trade to a large extent it follows that, as fast as American money is invested abroad, American trade will follow it. South America has little money of its own, hence must depend upon the outside world for capital. The conditions for investment, moreover, are favorable and they are constantly becoming less so in this country, at least so far as public utilities are concerned.

In Mr. Clark's opinion the close of the war will be followed by an influx of very desirable immigrants who will flee from the burdens which inevitably follow a great war. South America will share in this benefit as it did fifty years ago when some of the present prosperous Irish and other families settled there, particularly in the River Plate country. The reaction of the war will probably also be seen in the increased costs of manufacturing in Europe, both in labor and supplies, through high taxes and shortages, due to destruction and non-production. These will act as a protection to American industries, enabling them to offset the results of tariff reductions.

INSTRUCTIONS TO COMMERCIAL TRAVELERS IN SOUTH AMERICA

E. F. COLYER EMPHASIZES NEED OF KNOWLEDGE OF NATIVE LANGUAGE, OF PERSONAL CONTACT WITH CUSTOMER AND OF PROPER SEASONAL TRAVELING

E. F. Colyer, in charge of the Latin-American section of the foreign department of the General Electric Company, has had much experience in Central America and South America. In discussing export trade matters with a representative of the ELECTRIC RAILWAY JOURNAL, he said that no commercial traveler who went to either Central America or South America could do much if he did not know the language spoken in the country visited. In all countries except Brazil, where Portuguese is spoken, and British, French and Dutch Guiana, it is necessary to talk Spanish. Although some of the plants are owned by English or Americans, the miscellaneous trade, except in the large cities, is principally in the hands of native firms. With these a foreigner, who had to talk through an interpreter, could make very little progress, Mr. Colyer believes. This, of course, applies to travelers who are trying to make actual sales. If a representative of an American manufacturer goes to the country merely in order to get information concerning the outlook for his goods, it is not so imperative that he speak the language. It will be found that many of the plants and stores in Central American countries have connections with commission houses in New York and New Orleans.

In offering goods to residents of the Central and South American countries it is most desirable, Mr. Colyer stated, to have letters of introduction in order that a friendly relation may be established before actual business is attempted. As the banks of this country do not often have correspondents there, they are not likely to be of much assistance to commercial travelers. If it is possible to get a letter of introduction to a resident banker or to establish a business connection with him that is an advantage. In all cases the first man to be seen is the American consul. These men are always glad to assist anyone who is on a business trip, and frequently they are able to give much information that is of value. Correspondence between a company and a possible consumer is, of course, a step toward a personal introduction that will be found to be a help.

Mr. Colyer emphasized the fact that much of the business with the greater part of Central and South America is likely to be small in amount and that some time is required to develop the market. He figures the traveling expense of a salesman in Central or South American countries at about $5,000 a year. If a salesman were to attempt to cover the entire field he would find the territory so large that he might easily become discouraged. Business is not transacted in accordance with the practices that prevail here. Often a salesman will not receive a single order until he has been on the ground for weeks.

Mr. Colyer said that with the possible exception of Guatemala, which is more nearly a market for European countries, the Central American countries patronize mainly the manufacturers of this country. Between the commission and jobbing houses and local representatives of American firms, Central America is now well covered by American manufacturers.

In regard to the time of the year when trips should be made by representatives of manufacturers, Mr. Colyer said that it varied with the section visited, but that it was desirable to avoid the rainy season. Clothes suitable for the tropics should be taken, with a light overcoat for the altitudes. On account of the condition of the rivers in Colombia, it is possible to get into the interior of that country readily during only two seasons of the year.

The question of granting credit, Mr. Colyer believes, is not radically different in Central and South America from other countries. A good deal of misinformation has been published about the general necessity of very long credits, which are not the invariable rule. In some lines extended credits must be given, while in others it would be poor business policy. The practice in different markets and in different lines varies widely.

GOVERNMENT MOVES TO SECURE FOREIGN TRADE

AMERICAN AGENTS TO WORK WITH MANUFACTURERS IN STUDYING TRADE CONDITIONS IN SOUTH AMERICA AND THE FAR EAST

An appropriation of $50,000 for promoting the commerce in Central and South America, which for the first time is now available to the Bureau of Foreign and Domestic Commerce for the current fiscal year, is to be used promptly to reinforce the existing service for the development of Latin-American trade, according to the latest *Daily Consular and Trade Report.* Much work has already been done in this field in the line of reports covering current branches of commerce, but now a number of new phases of the trade will be intensively studied by special government agents. Agents will begin field investigations as soon as they can reach their several districts in Central and South America.

The appropriation for commercial attachés of the Bureau of Foreign and Domestic Commerce is also now available and the appointees of this class of trade promotion, those of the government for Rio de Janeiro, Buenos Aires, Santiago and Lima, will be promptly dispatched to their posts as soon as selected.

B. Joachim, special commercial representative of the Department of Commerce, who is about to conduct an investigation in South America in furtherance of American export trade, says that the existing war represents the greatest opportunity American manufacturers and exporters have ever had to capture South American markets. Mr. Joachim can for a time be reached through the New York City branch of the Bureau of Foreign and Domestic Commerce. Ralph M. Odell, another commercial agent, sails from San Francisco for Corea on Aug. 29. Mr. Odell is to spend two years investigating Oriental markets in the interests of American exporters. He will devote much of his time to the study of the markets of India as a source for American exports and will also look into the trade conditions and requirements in China and the Straits Settlements.

POINTS REQUIRING CAUTION IN INSTITUTING SOUTH AMERICAN TRADE

G. H. CHARLS MAKES PLEA FOR PROPER CONSIDERATION OF SOUTH AMERICAN TRADE REQUIREMENTS

In an interview with G. H. Charls, assistant secretary and sales manager American Rolling Mills Company, it was stated to a representative of the ELECTRIC RAILWAY JOURNAL that the chief words in connection with the possibilities of increasing United States trade with South America are "utmost caution." American manufacturers thoroughly familiar with the conditions that have prevailed during the past year in all South American countries and even the most representative South American merchants are proceeding cautiously because of the financial readjustment which is occurring there.

South America has relied upon foreign capital to finance practically all of its big undertakings. With the beginning of the Balkan war a money tightness became prevalent. Land speculation drove the price of many properties to twice their real value. Money borrowed from Europe paid for these lands. To-day many owners of fine camps and plantations find themselves in the position of being able to earn just sufficient profit to pay the interest on their loans. Misfortunes in crops have embarrassed these owners seriously. The present war has made it impossible for South American countries to float their loans abroad, and unless the bankers and capitalists of the United States go to their relief dull times will continue to prevail.

Too many, in Mr. Charls's opinion, are aroused to action by the fact that England, Germany and France, who formerly controlled the lion's share of South American business, are now at war. American manufacturers must keep in mind that these same countries consumed a proportional amount of the exported products of all South American nations. These conditions will not tend to lighten the financial situation which was so serious before the European war began. The merchants of Brazil, Argentina and Chile are not accepting orders without full information on the financial standing of their customers, and it will be well for United States manufacturers to follow their example.

According to Mr. Charls, two very important steps must be taken by North Americans to secure a permanent, profitable business relation with the nations south of us. The first is to secure proper shipping facilities. Some important and successful efforts to accomplish this task are now in progress, but all need the hearty support of every manufacturer interested in this field. The second is an awakening of United States bankers and capitalists to the splendid opportunities for profitable investment offered them in South America.

Mr. Charls expressed his regret that one of the large enterprising American railway firms operating in Argentina and Brazil was forced a year ago to appeal to English and French capitalists. The European capitalists, in cases of this kind, require that European products be purchased. Many of the largest systems of railways, rubber plantations, nitrate fields, public utilities, mines, etc., are financed by Europeans on the above basis. Therefore, notwithstanding the recognized superiority of United States products, American manufacturers lose the order. The chairman of one of the largest railway systems in Brazil, whose headquarters are in London, said: "If we intended purchasing $100,000 of material we would dislike very much for $1 of this business to be purchased in the United States if it could be produced in Europe." Too much emphasis cannot be laid on the danger of this impediment to the success of the manufacturers of the United States endeavoring to secure a successful foothold in South America.

Mr. Charls stated that American firms may either improve or endanger their future relations with South American countries by their actions and methods of doing business at this time. In order to gain their confidence manufacturers in this country must send them just what they order to the last detail, do business with them as they are accustomed to doing it, and devote every effort to please and win their respect. This can be accomplished only in one way, said Mr. Charls. Send experienced, tactful representatives speaking fluently the language of the country they visit, to study conditions, to make acquaintances, and, most important, to ascertain the exact requirements of the trade. Then these requirements should be filled without one hint of substitution. By this procedure due caution will be observed, and financial risks minimized on immediate business.

CITIES IN SOUTH AMERICA

The following table gives the names of the cities in South America with a population of 50,000 or more, according to the latest available census reports.

TABLE SHOWING POPULATION OF LARGEST CITIES IN SOUTH AMERICA

Buenos Aires	Argentina	1,331,000
Rio de Janeiro	Brazil	1,000,000
Santiago	Chile	400,000
Sao Paulo	Brazil	400,000
Bahia	Brazil	350,000
Montevideo	Uruguay	252,000
Pernambuco (Recife)	Brazil	150,000
Bogota	Columbia	150,000
Belem (Para)	Brazil	150,000
Rosario	Argentina	150,000
Valparaiso	Chile	150,000
Lima	Peru	140,000
Porto Alegre	Brazil	100,000
La Plata	Argentina	80,000
Quito	Ecuador	80,000
La Paz	Bolivia	80,000
Guayaquil	Ecuador	75,000
Caracas	Venezuela	72,000
Cordoba	Argentina	59,000
Ouro Preto	Brazil	60,000
Tucuman	Argentina	55,000
Georgetown	British Guiana	53,000
Concepcion	Chile	51,000
Mendoza	Argentina	51,000
Medellin	Colombia	50,000
Manaos	Brazil	50,000
Fortaleza	Brazil	50,000

The city treasury of Newark, N. J., has received from the Public Service Railway $173,976.99, which represents 5 per cent of the gross earnings from passenger traffic in the city during the year ending April 31. The company was obliged to pay this as practically a franchise tax in accordance with an old ordinance authorizing a change from horse-car to electricity. The amount is about $5,000 less than that paid the city for a similar purpose last year. Various reasons are assigned for the decrease, one of which is the falling off of traffic during the two big storms of the winter.

Statistics of Electric Railways for 1913

Following its previous practice the ELECTRIC RAILWAY JOURNAL publishes herewith a compilation of statistics of electric railway companies based on the returns given in the *McGraw Electric Railway Manual.* The statistics are compiled from the 1914 edition of the *McGraw Electric Railway Manual* and therefore represent the condition of the industry at the end of the year 1913. As in previous similar compilations the miles of track, the number of cars and the authorized and outstanding capital stock and funded debt are given. The same division as to States and groups of States that has been shown in earlier tables has been

STATE	NUMBER OF RY. COMPANIES	MILES OF TRACK	CARS	CAPITAL STOCK		FUNDED DEBT		TOTAL STOCKS AND BONDS	
				AUTHORIZED	OUTSTANDING	AUTHORIZED	OUTSTANDING	AUTHORIZED	OUTSTANDING
NEW ENGLAND STATES:									
Connecticut	12	1,463.62	3,096	$62,653,100	$61,530,100	$79,506,000	$57,951,000	$142,159,100	$119,481,100
Maine	15	551.99	822	11,622,400	11,408,000	26,690,800	15,204,050	38,313,200	26,612,050
Massachusetts	46	3,495.75	9,786	102,546,050	99,416,950	118,879,000	85,128,700	221,425,050	184,545,650
New Hampshire	14	303.80	444	4,382,800	3,017,000	3,887,000	3,532,000	8,269,800	6,549,000
Rhode Island	12	460.42	1,335	36,819,300	31,593,900	17,328,500	15,553,500	54,147,800	47,147,400
Vermont	10	103.75	145	3,020,000	2,735,800	2,775,000	2,625,000	5,795,000	5,360,800
Total	109	6,379.33	15,628	$221,043,650	$209,701,750	$249,066,300	$179,994,250	$470,109,950	$389,696,000
EASTERN STATES:									
Delaware	6	97.00	210	$11,120,000	$9,180,000	$37,524,000	$6,088,000	$48,644,000	$15,268,000
Dist. of Columbia	7	420.66	1,376	35,000,000	31,878,300	36,990,000	27,722,850	71,990,000	59,601,150
Maryland	12	709.60	2,194	51,450,000	29,249,950	100,955,000	76,318,400	152,405,000	105,568,350
New Jersey	46	1,414.67	3,074	99,609,990	89,335,290	119,242,800	97,373,400	218,852,790	186,708,690
New York	134	5,001.06	17,785	602,548,800	497,498,590	1,378,246,300	703,268,500	1,980,795,100	1,200,767,090
Pennsylvania	237	5,015.53	10,236	362,397,150	336,145,300	440,457,050	257,793,850	802,854,200	593,939,150
Virginia	15	452.47	888	31,665,000	26,647,400	52,060,300	27,766,300	83,725,300	54,413,700
West Virginia	21	444.42	586	22,610,000	17,474,900	71,596,800	18,275,800	94,206,800	35,750,700
Total	478	13,555.41	36,349	$1,216,400,940	$1,037,409,730	$2,237,072,250	$1,214,607,100	$3,453,473,190	$2,252,016,830
CENTRAL STATES:									
Illinois	75	3,597.62	8,623	$207,556,300	$156,805,950	$365,885,073	$264,818,948	$573,441,373	$421,624,898
Indiana	46	2,210.40	2,068	121,815,000	104,587,800	161,232,500	89,323,700	283,047,500	193,911,500
Iowa	24	820.68	1,655	53,380,000	39,922,870	88,016,000	41,389,600	141,396,000	81,312,470
Kentucky	10	525.78	1,123	26,139,750	24,597,050	46,364,000	21,850,800	72,503,750	46,447,850
Michigan	25	1,542.83	2,954	45,890,000	43,410,800	132,814,000	82,597,000	178,704,000	126,007,800
Minnesota	12	626.07	1,164	63,825,000	42,641,000	35,740,000	24,360,000	99,565,000	67,001,000
Missouri	22	1,227.97	2,884	133,898,800	88,788,080	161,352,100	108,571,100	295,250,900	197,359,180
Ohio	86	4,154.04	6,565	259,583,000	209,245,500	275,160,800	137,574,100	534,743,800	346,819,600
Wisconsin	22	751.34	1,060	67,687,000	35,382,000	201,225,000	46,776,400	268,912,000	82,158,400
Total	322	15,456.73	28,096	$979,774,850	$745,381,050	$1,467,789,473	$817,261,648	$2,447,564,323	$1,562,642,698
SOUTHERN STATES:									
Alabama	14	368.08	691	$51,852,000	$30,662,000	$82,725,000	$37,760,000	$134,577,000	$68,422,000
Arkansas	10	123.49	284	26,325,000	13,277,000	29,531,000	11,656,000	55,856,000	24,933,000
Florida	7	162.71	287	6,594,000	5,529,600	11,500,000	4,990,000	18,094,000	10,519,600
Georgia	14	464.23	785	51,664,600	50,866,400	88,790,000	26,239,000	140,454,600	77,105,400
Louisiana	8	289.49	751	54,062,400	31,630,000	96,589,000	34,020,000	150,651,400	65,650,000
Mississippi	11	117.50	187	12,000,000	7,512,670	16,444,400	8,174,000	28,444,400	15,686,670
North Carolina	12	267.51	311	42,450,000	23,733,900	25,925,000	13,310,600	68,375,000	37,044,500
South Carolina	7	112.03	192	16,500,000	13,044,600	16,100,000	8,318,000	32,500,000	21,362,600
Tennessee	12	425.92	930	21,400,000	21,148,000	73,460,000	32,492,000	94,860,000	53,640,000
Total	95	2,330.96	4,418	$282,848,000	$197,404,170	$441,064,400	$176,959,600	$722,912,400	$374,363,770
WESTERN STATES:									
Arizona	5	57.50	46	$4,165,000	$3,773,200	$1,314,800	$1,314,800	$5,479,800	$5,088,000
California	43	2,794.42	5,625	379,763,100	352,130,150	423,991,000	235,143,500	803,754,100	587,273,650
Colorado	16	449.00	769	49,305,000	25,865,900	72,218,000	33,807,000	121,523,000	59,672,900
Idaho	3	102.50	65	30,750,000	30,492,400	5,750,000	1,457,000	36,500,000	31,949,400
Kansas	16	321.09	419	11,450,000	7,458,975	13,885,000	7,553,600	25,335,000	15,012,575
Montana	7	118.86	172	4,045,000	3,280,000	2,500,000	1,951,000	6,545,000	5,231,000
Nebraska	6	246.12	537	22,820,000	12,377,000	16,500,000	11,564,000	39,320,000	23,941,000
Nevada	2	10.30	12	2,000,000	1,000,000	1,000,000	135,000	3,000,000	1,135,000
New Mexico	2	10.50	11	550,000	410,000	160,000	160,000	710,000	570,000
North Dakota	4	25.50	72	500,000	461,000	314,600	314,600	814,600	775,600
Oklahoma	13	247.04	325	22,850,000	10,394,400	26,830,000	8,159,000	49,680,000	18,553,400
Oregon	7	557.95	1,325	51,610,000	40,648,800	157,900,000	54,690,000	209,510,000	95,338,800
South Dakota	3	25.00	35	1,900,000	587,000	500,000	50,000	2,400,000	637,000
Texas	31	921.19	1,380	59,565,000	45,702,000	54,056,000	31,308,000	113,621,000	77,010,000
Utah	5	274.25	376	12,400,000	7,614,700	16,000,000	5,272,000	28,400,000	12,886,700
Washington	18	1,098.31	2,033	105,525,000	68,885,300	92,310,000	32,212,000	197,835,000	101,097,300
Wyoming	2	22.00	28	875,000	875,000	420,000	420,000	1,295,000	1,295,000
Total	183	7,281.53	13,230	$760,073,000	$611,955,825	$885,649,400	$425,511,500	$1,645,722,500	$1,037,467,325
All States	1187	45,003.96	97,721	$3,460,140,440	$2,801,852,525	$5,280,641,823	$2,814,334,098	$5,739,782,363	$5.616 186,625

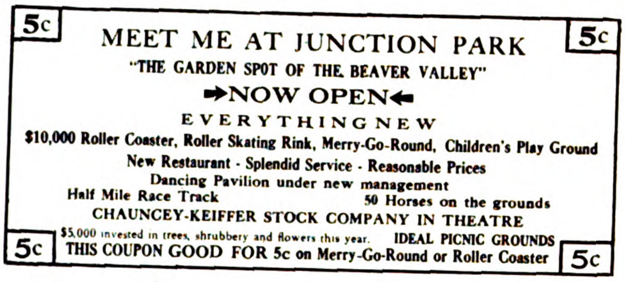
followed in this case. As the returns for the small companies were included in the 1914 edition of the *McGraw Electric Railway Manual* the compilation is based more nearly on actual figures from the companies and to a smaller degree on estimates than has been the case for several years past. The returns are mainly taken by companies as no systematic attempt has been made to segregate capitalization applicable only to the electric railway in cases where companies operate two or more classes of utilities.

Making A Park Pay

BY W. H. BOYCE, SUPERINTENDENT THE BEAVER VALLEY TRACTION COMPANY, NEW BRIGHTON, PA.

Junction Park until 1913 had been an amusement park on the lines of our company, the Beaver Valley Traction Company. During 1913 we made a contract with the Beaver County Agricultural Association, which had recently been organized, whereby we furnished the grounds and constructed a race track in Junction Park, giving the association a ten-year lease on the grounds. The association in turn built a grandstand with a seating capacity of 3000 and constructed stables, poultry-house, cattle pens and other buildings necessary for the conduct of a county fair.

Although the year 1914 saw the first fair held in Beaver County since 1902 and we experienced such bad weather during the first days of the fair that but two days of racing were possible, the fair was very well attended. The association had about 7000 paid admissions on Thursday, 8500 on Friday and 14,500 on Saturday.



5c MEET ME AT JUNCTION PARK 5c

"THE GARDEN SPOT OF THE BEAVER VALLEY"

➔NOW OPEN⬅

EVERYTHING NEW

$10,000 Roller Coaster, Roller Skating Rink, Merry-Go-Round, Children's Play Ground

New Restaurant - Splendid Service - Reasonable Prices

Dancing Pavilion under new management

Half Mile Race Track 50 Horses on the grounds

CHAUNCEY-KEIFFER STOCK COMPANY IN THEATRE

$5,000 invested in trees, shrubbery and flowers this year. IDEAL PICNIC GROUNDS

5c THIS COUPON GOOD FOR 5c on Merry-Go-Round or Roller Coaster 5c

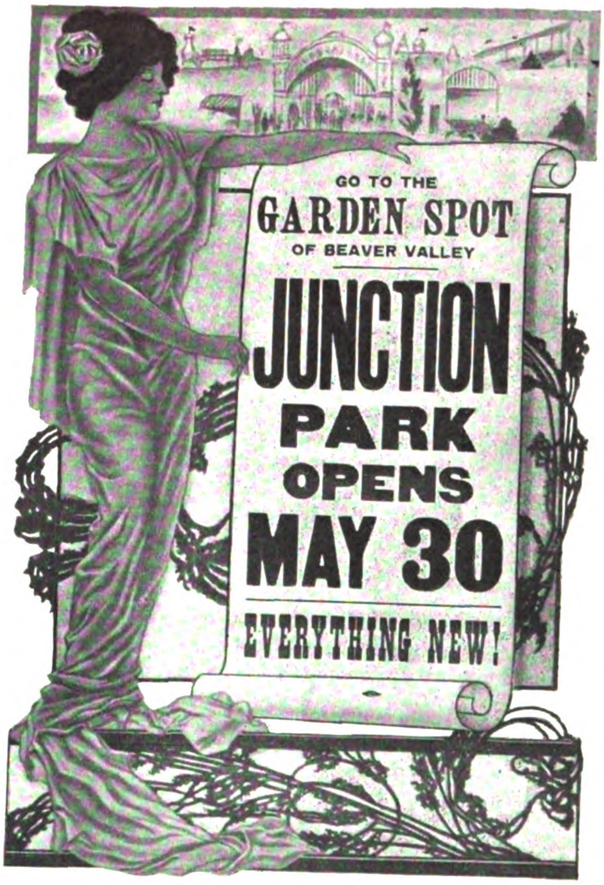
DODGER WITH IMITATION OF BANK NOTE ON BACK

In rearranging the grounds and constructing the race track we expended approximately $11,000. From our fair week revenue, as compared with the same week in previous years, after deducting all extra operating expenses, such as trainmen's wages, policemen's wages and extra coal consumed, we found that we had earned $1,800, or a little more than 16 per cent on our investment. We also have the promise of a very good fair at Junction Park this September.

In addition to the crowd that the race track brings to the fair, we sought extra business this year by advertising and by employing a park solicitor for a month before Decoration Day. As a result we booked about forty picnics where heretofore we did not exceed more than eight to ten picnics during the season because most of the organizations throughout the Beaver Valley had previously gone to out-of-town resorts. This year we could offer the use of a very fine half-mile track for motorcycle, automobile, bicycle and miscellaneous athletic races. This improvement and others, like the planting of many large shade trees, was a strong inducement in attracting these organizations to us.

Beside the picnics we have had field meets and professional automobile races with such drivers as Eddie Hearne and Louis Disbrow. Altogether, the installation of the race track has proved to be a very profitable investment. Junction Park is located just across the street from our office, shop, carhouse and power station and is about ten minutes run from the Pittsburgh & Lake Erie station (New York Central Lines) at Beaver and five minutes from the Pennsylvania station at New Brighton, so that it is a very desirable spot for a fair ground.

Display window cards announcing the opening of the park were placed in most of the store windows throughout Beaver Valley and in our cars. One form of novelty advertising was the distribution of a pen contained in an envelope, with the appropriate wording to "take a pointer" as to Junction Park; another was imitation money with lettering on one side, as reproduced; and a third was a box of safety matches with picnic and safety advertising. In addition to this, one-sheet posters of the form illustrated were placed in store windows and similar eight-sheet posters were used on billboards.



TYPICAL POSTER ADVERTISING JUNCTION PARK

When our traffic representative was about to close up with a picnic committee which was apparently lagging and undecided, he would send them a pair of 10-cent glasses, secured at a 5 and 10-cent store, with a letter stating that he hoped these glasses would aid them to see their way clear to attend Junction Park.

Provision has been made for the electrification of the Montreal (Que.) Harbor Railways. The cost is estimated at $282,674, with $300,000 for equipment. This year the actual trackage of the electrification will be extended to Pointe aux Trembles. The ultimate terminus of the railway system is Bout de l'Ile, which it is expected will be reached next year. On the south shore 8 miles of electric railway track will be laid.

crease in the demand for small supplies for which the purchaser can pay directly. The present plants must be kept up and supplies will be required at once. Ultimately foreign projects will have to be partially, and possibly largely, financed from America. Europe up to this time has largely financed all foreign undertakings, but America must shoulder part of the burden because European money will be needed at home. As foreign ownership influences trade to a large extent it follows that, as fast as American money is invested abroad, American trade will follow it. South America has little money of its own, hence must depend upon the outside world for capital. The conditions for investment, moreover, are favorable and they are constantly becoming less so in this country, at least so far as public utilities are concerned.

In Mr. Clark's opinion the close of the war will be followed by an influx of very desirable immigrants who will flee from the burdens which inevitably follow a great war. South America will share in this benefit as it did fifty years ago when some of the present prosperous Irish and other families settled there, particularly in the River Plate country. The reaction of the war will probably also be seen in the increased costs of manufacturing in Europe, both in labor and supplies, through high taxes and shortages, due to destruction and non-production. These will act as a protection to American industries, enabling them to offset the results of tariff reductions.

INSTRUCTIONS TO COMMERCIAL TRAVELERS IN SOUTH AMERICA

E. F. COLYER EMPHASIZES NEED OF KNOWLEDGE OF NATIVE LANGUAGE, OF PERSONAL CONTACT WITH CUSTOMER AND OF PROPER SEASONAL TRAVELING

E. F. Colyer, in charge of the Latin-American section of the foreign department of the General Electric Company, has had much experience in Central America and South America. In discussing export trade matters with a representative of the ELECTRIC RAILWAY JOURNAL, he said that no commercial traveler who went to either Central America or South America could do much if he did not know the language spoken in the country visited. In all countries except Brazil, where Portuguese is spoken, and British, French and Dutch Guiana, it is necessary to talk Spanish. Although some of the plants are owned by English or Americans, the miscellaneous trade, except in the large cities, is principally in the hands of native firms. With these a foreigner, who had to talk through an interpreter, could make very little progress, Mr. Colyer believes. This, of course, applies to travelers who are trying to make actual sales. If a representative of an American manufacturer goes to the country merely in order to get information concerning the outlook for his goods, it is not so imperative that he speak the language. It will be found that many of the plants and stores in Central American countries have connections with commission houses in New York and New Orleans.

In offering goods to residents of the Central and South American countries it is most desirable, Mr. Colyer stated, to have letters of introduction in order that a friendly relation may be established before actual business is attempted. As the banks of this country do not often have correspondents there, they are not likely to be of much assistance to commercial travelers. If it is possible to get a letter of introduction to a resident banker or to establish a business connection with him that is an advantage. In all cases the first man to be seen is the American consul. These men are always glad to assist anyone who is on a business trip, and frequently they are able to give much information that is of value. Correspondence between a company and a possible consumer is, of course, a step toward a personal introduction that will be found to be a help.

Mr. Colyer emphasized the fact that much of the business with the greater part of Central and South America is likely to be small in amount and that some time is required to develop the market. He figures the traveling expense of a salesman in Central or South American countries at about $5,000 a year. If a salesman were to attempt to cover the entire field he would find the territory so large that he might easily become discouraged. Business is not transacted in accordance with the practices that prevail here. Often a salesman will not receive a single order until he has been on the ground for weeks.

Mr. Colyer said that with the possible exception of Guatemala, which is more nearly a market for European countries, the Central American countries patronize mainly the manufacturers of this country. Between the commission and jobbing houses and local representatives of American firms, Central America is now well covered by American manufacturers.

In regard to the time of the year when trips should be made by representatives of manufacturers, Mr. Colyer said that it varied with the section visited, but that it was desirable to avoid the rainy season. Clothes suitable for the tropics should be taken, with a light overcoat for the altitudes. On account of the condition of the rivers in Colombia, it is possible to get into the interior of that country readily during only two seasons of the year.

The question of granting credit, Mr. Colyer believes, is not radically different in Central and South America from other countries. A good deal of misinformation has been published about the general necessity of very long credits, which are not the invariable rule. In some lines extended credits must be given, while in others it would be poor business policy. The practice in different markets and in different lines varies widely.

GOVERNMENT MOVES TO SECURE FOREIGN TRADE

AMERICAN AGENTS TO WORK WITH MANUFACTURERS IN STUDYING TRADE CONDITIONS IN SOUTH AMERICA AND THE FAR EAST

An appropriation of $50,000 for promoting the commerce in Central and South America, which for the first time is now available to the Bureau of Foreign and Domestic Commerce for the current fiscal year, is to be used promptly to reinforce the existing service for the development of Latin-American trade, according to the latest *Daily Consular and Trade Report.* Much work has already been done in this field in the line of reports covering current branches of commerce, but now a number of new phases of the trade will be intensively studied by special government agents. Agents will begin field investigations as soon as they can reach their several districts in Central and South America.

The appropriation for commercial attachés of the Bureau of Foreign and Domestic Commerce is also now available and the appointees of this class of trade promotion, those of the government for Rio de Janeiro, Buenos Aires, Santiago and Lima, will be promptly dispatched to their posts as soon as selected.

B. Joachim, special commercial representative of the Department of Commerce, who is about to conduct an investigation in South America in furtherance of American export trade, says that the existing war represents the greatest opportunity American manufacturers and exporters have ever had to capture South American markets. Mr. Joachim can for a time be reached through the New York City branch of the Bureau of Foreign and Domestic Commerce. Ralph M. Odell, another commercial agent, sails from San Francisco for Corea on Aug. 29. Mr. Odell is to spend two years investigating Oriental markets in the interests of American exporters. He will devote much of his time to the study of the markets of India as a source for American exports and will also look into the trade conditions and requirements in China and the Straits Settlements.

POINTS REQUIRING CAUTION IN INSTITUTING SOUTH AMERICAN TRADE

G. H. CHARLS MAKES PLEA FOR PROPER CONSIDERATION OF SOUTH AMERICAN TRADE REQUIREMENTS

In an interview with G. H. Charls, assistant secretary and sales manager American Rolling Mills Company, it was stated to a representative of the ELECTRIC RAILWAY JOURNAL that the chief words in connection with the possibilities of increasing United States trade with South America are "utmost caution." American manufacturers thoroughly familiar with the conditions that have prevailed during the past year in all South American countries and even the most representative South American merchants are proceeding cautiously because of the financial readjustment which is occurring there.

South America has relied upon foreign capital to finance practically all of its big undertakings. With the beginning of the Balkan war a money tightness became prevalent. Land speculation drove the price of many properties to twice their real value. Money borrowed from Europe paid for these lands. To-day many owners of fine camps and plantations find themselves in the position of being able to earn just sufficient profit to pay the interest on their loans. Misfortunes in crops have embarrassed these owners seriously. The present war has made it impossible for South American countries to float their loans abroad, and unless the bankers and capitalists of the United States go to their relief dull times will continue to prevail.

Too many, in Mr. Charls's opinion, are aroused to action by the fact that England, Germany and France, who formerly controlled the lion's share of South American business, are now at war. American manufacturers must keep in mind that these same countries consumed a proportional amount of the exported products of all South American nations. These conditions will not tend to lighten the financial situation which was so serious before the European war began. The merchants of Brazil, Argentina and Chile are not accepting orders without full information on the financial standing of their customers, and it will be well for United States manufacturers to follow their example.

According to Mr. Charls, two very important steps must be taken by North Americans to secure a permanent, profitable business relation with the nations south of us. The first is to secure proper shipping facilities. Some important and successful efforts to accomplish this task are now in progress, but all need the hearty support of every manufacturer interested in this field. The second is an awakening of United States bankers and capitalists to the splendid opportunities for profitable investment offered them in South America.

Mr. Charls expressed his regret that one of the large enterprising American railway firms operating in Argentina and Brazil was forced a year ago to appeal to English and French capitalists. The European capitalists, in cases of this kind, require that European products be purchased. Many of the largest systems of railways, rubber plantations, nitrate fields, public utilities, mines, etc., are financed by Europeans on the above basis. Therefore, notwithstanding the recognized superiority of United States products, American manufacturers lose the order. The chairman of one of the largest railway systems in Brazil, whose headquarters are in London, said: "If we intended purchasing $100,000 of material we would dislike very much for $1 of this business to be purchased in the United States if it could be produced in Europe." Too much emphasis cannot be laid on the danger of this impediment to the success of the manufacturers of the United States endeavoring to secure a successful foothold in South America.

Mr. Charls stated that American firms may either improve or endanger their future relations with South American countries by their actions and methods of doing business at this time. In order to gain their confidence manufacturers in this country must send them just what they order to the last detail, do business with them as they are accustomed to doing it, and devote every effort to please and win their respect. This can be accomplished only in one way, said Mr. Charls. Send experienced, tactful representatives speaking fluently the language of the country they visit, to study conditions, to make acquaintances, and, most important, to ascertain the exact requirements of the trade. Then these requirements should be filled without one hint of substitution. By this procedure due caution will be observed, and financial risks minimized on immediate business.

CITIES IN SOUTH AMERICA

The following table gives the names of the cities in South America with a population of 50,000 or more, according to the latest available census reports.

TABLE SHOWING POPULATION OF LARGEST CITIES IN SOUTH AMERICA

Buenos Aires	Argentina	1,331,000
Rio de Janeiro	Brazil	1,000,000
Santiago	Chile	400,000
Sao Paulo	Brazil	400,000
Bahia	Brazil	350,000
Montevideo	Uruguay	252,000
Pernambuco (Recife)	Brazil	150,000
Bogota	Columbia	150,000
Belem (Para)	Brazil	150,000
Rosario	Argentina	150,000
Valparaiso	Chile	150,000
Lima	Peru	140,000
Porto Alegre	Brazil	100,000
La Plata	Argentina	80,000
Quito	Ecuador	80,000
La Paz	Bolivia	80,000
Guayaquil	Ecuador	75,000
Caracas	Venezuela	72,000
Cordoba	Argentina	59,000
Ouro Preto	Brazil	60,000
Tucuman	Argentina	55,000
Georgetown	British Guiana	53,000
Concepcion	Chile	51,000
Mendoza	Argentina	51,000
Medellin	Colombia	50,000
Manaos	Brazil	50,000
Fortaleza	Brazil	50,000

The city treasury of Newark, N. J., has received from the Public Service Railway $173,976.99, which represents 5 per cent of the gross earnings from passenger traffic in the city during the year ending April 31. The company was obliged to pay this as practically a franchise tax in accordance with an old ordinance authorizing a change from horse-car to electricity. The amount is about $5,000 less than that paid the city for a similar purpose last year. Various reasons are assigned for the decrease, one of which is the falling off of traffic during the two big storms of the winter.

Statistics of Electric Railways for 1913

Following its previous practice the ELECTRIC RAILWAY JOURNAL publishes herewith a compilation of statistics of electric railway companies based on the returns given in the *McGraw Electric Railway Manual.* The statistics are compiled from the 1914 edition of the *McGraw Electric Railway Manual* and therefore represent the condition of the industry at the end of the year 1913. As in previous similar compilations the miles of track, the number of cars and the authorized and outstanding capital stock and funded debt are given. The same division as to States and groups of States that has been shown in earlier tables has been

STATE	NUMBER OF RY. COMPANIES	MILES OF TRACK	CARS	CAPITAL STOCK		FUNDED DEBT		TOTAL STOCKS AND BONDS	
				AUTHORIZED	OUTSTANDING	AUTHORIZED	OUTSTANDING	AUTHORIZED	OUTSTANDING
NEW ENGLAND STATES:									
Connecticut......	12	1,463.62	3,096	$62,653,100	$61,530,100	$79,506,000	$57,951,000	$142,159,100	$119,481,100
Maine...........	15	551.99	822	11,622,400	11,408,000	26,690,800	15,204,050	38,313,200	26,612,050
Massachusetts....	46	3,495.75	9,786	102,546,050	99,416,950	118,879,000	85,128,700	221,425,050	184,545,650
New Hampshire...	14	303.80	444	4,382,800	3,017,000	3,887,000	3,532,000	8,269,800	6,549,000
Rhode Island.....	12	460.42	1,335	36,819,300	31,593,900	17,328,500	15,553,500	54,147,800	47,147,400
Vermont.........	10	103.75	145	3,020,000	2,735,800	2,775,000	2,625,000	5,795,000	5,360,800
Total.........	109	6,379.33	15,628	$221,043,650	$209,701,750	$249,066,300	$179,994,250	$470,109,950	$389,696,000
EASTERN STATES:									
Delaware........	6	97.00	210	$11,120,000	$9,180,000	$37,524,000	$6,088,000	$48,644,000	$15,268,000
Dist. of Columbia...	7	420.66	1,376	35,000,000	31,878,300	36,990,000	27,722,850	71,990,000	59,601,150
Maryland........	12	709.60	2,194	51,450,000	29,249,950	100,955,000	76,318,400	152,405,000	105,568,350
New Jersey.......	46	1,414.67	3,074	99,609,990	89,335,290	119,242,800	97,373,400	218,852,790	186,708,690
New York........	134	5,001.06	17,785	602,548,800	497,498,590	1,378,246,300	703,268,500	1,980,795,100	1,200,767,090
Pennsylvania.....	237	5,015.53	10,236	362,397,150	336,145,300	440,457,050	257,793,850	802,854,200	593,939,150
Virginia..........	15	452.47	888	31,665,000	26,647,400	52,060,300	27,766,300	83,725,300	54,413,700
West Virginia.....	21	444.42	586	22,610,000	17,474,900	71,596,800	18,275,800	94,206,800	35,750,700
Total..........	478	13,555.41	36,349	$1,216,400,940	$1,037,409,730	$2,237,072,250	$1,214,607,100	$3,453,473,190	$2,252,016,830
CENTRAL STATES:									
Illinois...........	75	3,597.62	8,623	$207,556,300	$156,805,950	$365,885,073	$264,818,948	$573,441,373	$421,624,898
Indiana..........	46	2,210.40	2,068	121,815,000	104,587,800	161,232,500	89,323,700	283,047,500	193,911,500
Iowa............	24	820.68	1,655	53,380,000	39,922,870	88,016,000	41,389,600	141,396,000	81,312,470
Kentucky........	10	525.78	1,123	26,139,750	24,597,050	46,364,000	21,850,800	72,503,750	46,447,850
Michigan.........	25	1,542.83	2,954	45,890,000	43,410,800	132,814,000	82,597,000	178,704,000	126,007,800
Minnesota........	12	626.07	1,164	63,825,000	42,641,000	35,740,000	24,360,000	99,565,000	67,001,000
Missouri..........	22	1,227.97	2,884	133,898,800	88,788,080	161,352,100	108,571,100	295,250,900	197,359,180
Ohio............	86	4,154.04	6,565	259,583,000	209,245,500	275,160,800	137,574,100	534,743,800	346,819,600
Wisconsin........	22	751.34	1,060	67,687,000	35,382,000	201,225,000	46,776,400	268,912,000	82,158,400
Total..........	322	15,456.73	28,096	$979,774,850	$745,381,050	$1,467,789,473	$817,261,648	$2,447,564,323	$1,562,642,698
SOUTHERN STATES:									
Alabama.........	14	368.08	691	$51,852,000	$30,662,000	$82,725,000	$37,760,000	$134,577,000	$68,422,000
Arkansas.........	10	123.49	284	26,325,000	13,277,000	29,531,000	11,656,000	55,856,000	24,933,000
Florida..........	7	162.71	287	6,594,000	5,529,600	11,500,000	4,990,000	18,094,000	10,519,600
Georgia..........	14	464.23	785	51,664,600	50,866,400	88,790,000	26,239,000	140,454,600	77,105,400
Louisiana........	8	289.49	751	54,062,400	31,630,000	96,589,000	34,020,000	150,651,400	65,650,000
Mississippi.......	11	117.50	187	12,000,000	7,512,670	16,444,400	8,174,000	28,444,400	15,686,670
North Carolina....	12	267.51	311	42,450,000	23,733,900	25,925,000	13,310,600	68,375,000	37,044,500
South Carolina....	7	112.03	192	16,500,000	13,044,600	16,100,000	8,318,000	32,500,000	21,362,600
Tennessee........	12	425.92	930	21,400,000	21,148,000	73,460,000	32,492,000	94,860,000	53,640,000
Total..........	95	2,330.96	4,418	$282,848,000	$197,404,170	$441,064,400	$176,959,600	$722,912,400	$374,363,770
WESTERN STATES:									
Arizona..........	5	57.50	46	$4,165,000	$3,773,200	$1,314,800	$1,314,800	$5,479,800	$5,088,000
California........	43	2,794.42	5,625	379,763,100	352,130,150	423,991,000	235,143,500	803,754,100	587,273,650
Colorado.........	16	449.00	769	49,305,000	25,865,900	72,218,000	33,807,000	121,523,000	59,672,900
Idaho............	3	102.50	65	30,750,000	30,492,400	5,750,000	1,457,000	36,500,000	31,949,400
Kansas..........	16	321.09	419	11,450,000	7,458,975	13,885,000	7,553,600	25,335,000	15,012,575
Montana	7	118.86	172	4,045,000	3,280,000	2,500,000	1,951,000	6,545,000	5,231,000
Nebraska	6	246.12	537	22,820,000	12,377,000	16,500,000	11,564,000	39,320,000	23,941,000
Nevada..........	2	10.30	12	2,000,000	1,000,000	1,000,000	135,000	3,000,000	1,135,000
New Mexico......	2	10.50	11	550,000	410,000	160,000	160,000	710,000	570,000
North Dakota.....	4	25.50	72	500,000	461,000	314,600	314,600	814,600	775,600
Oklahoma........	13	247.04	325	22,850,000	10,394,400	26,830,000	8,159,000	49,680,000	18,553,400
Oregon	7	557.95	1,325	51,610,000	40,648,800	157,900,000	54,690,000	209,510,000	95,338,800
South Dakota	3	25.00	35	1,900,000	587,000	500,000	50,000	2,400,000	637,000
Texas...........	31	921.19	1,380	59,565,000	45,702,000	54,056,000	31,308,000	113,621,000	77,010,000
Utah...........	5	274.25	376	12,400,000	7,614,700	16,000,000	5,272,000	28,400,000	12,886,700
Washington......	18	1,098.31	2,033	105,525,000	68,885,300	92,310,000	32,212,000	197,835,000	101,097,300
Wyoming	2	22.00	28	875,000	875,000	420,000	420,000	1,295,000	1,295,000
Total..........	183	7,281.53	13,230	$760,073,000	$611,955,825	$885,649,400	$425,511,500	$1,645,722,500	$1,037,467,325
All States......	1187	45,003.96	97,721	$3,460,140,440	$2,801,852,525	$5,280,641,823	$2,814,334,098	$5,739,782,363	$5,616 186,625

followed in this case. As the returns for the small companies were included in the 1914 edition of the *McGraw Electric Railway Manual* the compilation is based more nearly on actual figures from the companies and to a smaller degree on estimates than has been the case for several years past. The returns are mainly taken by companies as no systematic attempt has been made to segregate capitalization applicable only to the electric railway in cases where companies operate two or more classes of utilities.

Making A Park Pay

BY W. H. BOYCE, SUPERINTENDENT THE BEAVER VALLEY TRACTION COMPANY, NEW BRIGHTON, PA.

Junction Park until 1913 had been an amusement park on the lines of our company, the Beaver Valley Traction Company. During 1913 we made a contract with the Beaver County Agricultural Association, which had recently been organized, whereby we furnished the grounds and constructed a race track in Junction Park, giving the association a ten-year lease on the grounds. The association in turn built a grandstand with a seating capacity of 3000 and constructed stables, poultry-house, cattle pens and other buildings necessary for the conduct of a county fair.

Although the year 1914 saw the first fair held in Beaver County since 1902 and we experienced such bad weather during the first days of the fair that but two days of racing were possible, the fair was very well attended. The association had about 7000 paid admissions on Thursday, 8500 on Friday and 14,500 on Saturday.

5c MEET ME AT JUNCTION PARK 5c

"THE GARDEN SPOT OF THE BEAVER VALLEY"

➡NOW OPEN⬅

EVERYTHING NEW

$10,000 Roller Coaster, Roller Skating Rink, Merry-Go-Round, Children's Play Ground

New Restaurant - Splendid Service - Reasonable Prices

Dancing Pavilion under new management

Half Mile Race Track 50 Horses on the grounds

CHAUNCEY-KEIFFER STOCK COMPANY IN THEATRE

$5,000 invested in trees, shrubbery and flowers this year. IDEAL PICNIC GROUNDS

5c THIS COUPON GOOD FOR 5c on Merry-Go-Round or Roller Coaster 5c

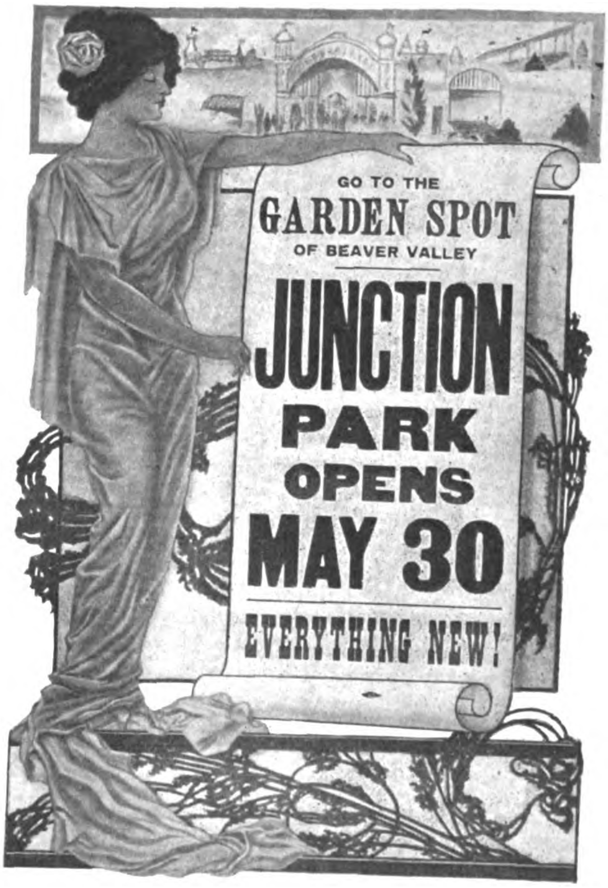
DODGER WITH IMITATION OF BANK NOTE ON BACK

In rearranging the grounds and constructing the race track we expended approximately $11,000. From our fair week revenue, as compared with the same week in previous years, after deducting all extra operating expenses, such as trainmen's wages, policemen's wages and extra coal consumed, we found that we had earned $1,800, or a little more than 16 per cent on our investment. We also have the promise of a very good fair at Junction Park this September.

In addition to the crowd that the race track brings to the fair, we sought extra business this year by advertising and by employing a park solicitor for a month before Decoration Day. As a result we booked about forty picnics where heretofore we did not exceed more than eight to ten picnics during the season because most of the organizations throughout the Beaver Valley had previously gone to out-of-town resorts. This year we could offer the use of a very fine half-mile track for motorcycle, automobile, bicycle and miscellaneous athletic races. This improvement and others, like the planting of many large shade trees, was a strong inducement in attracting these organizations to us.

Beside the picnics we have had field meets and professional automobile races with such drivers as Eddie Hearne and Louis Disbrow. Altogether, the installation of the race track has proved to be a very profitable investment. Junction Park is located just across the street from our office, shop, carhouse and power station and is about ten minutes run from the Pittsburgh & Lake Erie station (New York Central Lines) at Beaver and five minutes from the Pennsylvania station at New Brighton, so that it is a very desirable spot for a fair ground.

Display window cards announcing the opening of the park were placed in most of the store windows throughout Beaver Valley and in our cars. One form of novelty advertising was the distribution of a pen contained in an envelope, with the appropriate wording to "take a pointer" as to Junction Park; another was imitation money with lettering on one side, as reproduced; and a third was a box of safety matches with picnic and safety advertising. In addition to this, one-sheet posters of the form illustrated were placed in store windows and similar eight-sheet posters were used on billboards.



TYPICAL POSTER ADVERTISING JUNCTION PARK

When our traffic representative was about to close up with a picnic committee which was apparently lagging and undecided, he would send them a pair of 10-cent glasses, secured at a 5 and 10-cent store, with a letter stating that he hoped these glasses would aid them to see their way clear to attend Junction Park.

Provision has been made for the electrification of the Montreal (Que.) Harbor Railways. The cost is estimated at $282,674, with $300,000 for equipment. This year the actual trackage of the electrification will be extended to Pointe aux Trembles. The ultimate terminus of the railway system is Bout de l'Ile, which it is expected will be reached next year. On the south shore 8 miles of electric railway track will be laid.

COMMUNICATIONS

Futility of Heavy Plates for Side Sheathing

PHILADELPHIA, PA., Aug. 19, 1914.

To the Editors:

Referring to your editorial on steel sheathing for car siding in the ELECTRIC RAILWAY JOURNAL of Aug. 15, I append some computations showing the strength and weights of various car sides, as shown in the accompanying cut, which may be of interest to your readers.

Assumed constructions of car siding

Case *A*. The girder siding here consists of a belt rail 3½-in. x ⅝-in. bar, the side sheet of 30-in. x ⅛-in plate and a side sill of 4-in. x 4-in. x ⅜-in. angle. This section is similar to that used in a great many instances, the belt rail being made ⅝ in. thick to facilitate shop work, it being easier to maintain a section of this weight in alignment than with a lighter section. The size of the bottom angle in girders of this kind is determined by the amount of material to be suspended from it and by the construction of the bolsters and other cross members of the car.

Case *B*. The second case is computed on the same section as before except that in determining the center of gravity and the moment of inertia, the side sheet is neglected entirely. For the sake of comparison the belt rail and side sill are made the same as in the first case.

Case *C*. The third case considers a car using the steel construction similar to that in the two foregoing cases with the addition of a side plate or top plate, consisting in this case of an angle. This top plate angle is 3½-in. x 2½-in. x ¼-in. angle with a 3½-in. leg vertical. The belt rail consists of a 3-in. x ¼-in. bar, the side sheet of a 30-in. x ⅛-in. plate and side sill of 4-in. x 4-in. x 5/16-in. angle. The total depth of the girder is 93 in., as shown, which is possibly slightly in excess of the depth of the girder for the average city car but is about correct for cars used in interurban service.

Case *D*. In the fourth case the same girder is considered as in the third case, with the exception that the side sheet is omitted from the computation.

Moments of inertia and section moduli

Case *A*. This computation, using a side plate, gives a total moment of inertia of 1208.9 and a fairly well balanced section, the section modulus at the top being 74.58 and the section modulus at the bottom 87.67.

Case *B*. In the second case, disregarding the side sheet, we get a total moment of inertia of 919.8 and a section modulus at the top and bottom respectively of 53.7 and 71.4.

Case *C*. In this case, using a top plate, we get a total moment of inertia of 8682, the section modulus at the top and bottom respectively of 129.6 and 334. This section takes into consideration the side sheet.

Case *D*. In the fourth case, by disregarding the side sheet, we get a total moment of inertia of 7444 and a section modulus at top and bottom respectively of 126.2 and 219. It is interesting to note in this section that the neutral axis lies above the belt rail, making the belt rail a tension member and allowing the use of a light belt rail, which has been figured.

Stresses and weights

In computing the stresses in the various types, I have assumed arbitrarily an unbalanced moment of 800,000 lb.-in. This is about the average figure for city cars with prepayment platforms. The stresses in the beam as computed in the first case are 10,700 lb. in compression and 9100 lb. in tension, while the stress as computed in the second case, neglecting the side sheet, runs 14,800 lb. in compression and 11,200 lb. in tension.

With the beam as computed in Cases *C* and *D* we find in Case *C* a stress of 6150 lb. compression and 2390 lb. tension, and as figured in Case *D*, again neglecting the side sheet, we get a stress of 6330 lb. compression and 3650 lb. in tension.

It will be noticed that the increase in stress due to the omission of the side sheet is very much less in Cases *C* and *D* than in Cases *A* and *B*.

The weights of the girders are as follows:

In Case *A*, 30.84 lb. per lineal foot.
In Case *B*, 24.04 lb. per lineal foot.
In Case *C*, 30.1 lb. per lineal foot.
In Case *D*, 22.88 lb. per lineal foot.

In Cases *B* and *D*, in computing the weight, a 1/16-in. sheathing was added for weight but was not considered in computing the strength.

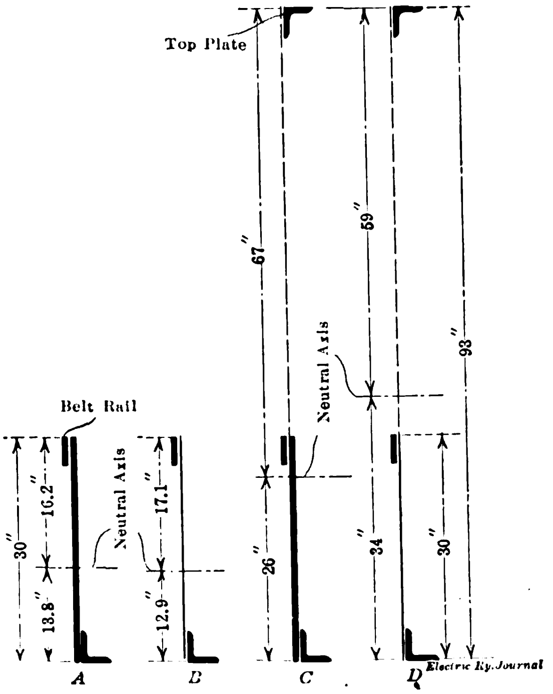


DIAGRAM SHOWING CONSTRUCTION OF FOUR HYPOTHETICAL CASES

The maximum stress for each of these cases is as follows:

Case *A*, 10,700 lb. compression.
Case *B*, 14,800 lb. compression.
Case *C*, 6,150 lb. compression.
Case *D*, 6,330 lb. compression.

Discussion

In making these computations it has been assumed that the posts were applied in the car in such a manner as to prevent buckling of the web due to shear. This is easily accomplished in the average electric car where the post spacing runs from 2 ft. 6 in. to 2 ft. 8 in. centers. Of course, where a girder of the kind considered in Cases *C* and *D* is used, the posts should be of steel, preferably with tee section on account of the great strength for weight and its adaptability to the construction in riveting. In Cases *A* and *B* where the stress in the girder runs high, the shear in the web may be taken care of by angles on each side of the posts where a wooden post is used.

As for the steel sheet, it is hardly necessary to consider it in beam action as it has been considered in Cases *A* and *C* because the sections of the belt rail and sill can easily be made in the average electric car so that the sheet need not be considered at all. Therefore it may be readily seen that where the heavier sheathing is used, sufficient strength is not gained to offset the increase in weight.

A comparison of Cases *A* and *D* gives a good example of what can be accomplished by the use of a top plate, the total difference in weight being approximately 8 lb. per lineal foot, or 480 lb. weight in a car 30 ft. long over the corner posts. Of course, there will be a slight increase in this weight from this figure due to the fact that in any construction of this kind, the posts must be fastened thoroughly at the side sill, belt rail and top plate by means of gussets or otherwise to prevent any loosening of the joints and to develop the full strength of the posts. These connections have not been considered in this calculation, but their weight will be a very small factor in the total and will hardly decrease the total saving in weight by the use of a top plate and 1/16-in. sheathing.

It should be noted that by eliminating the sheathing in computing the strength of the girders it becomes possible to make the side sheet of very light material and in short sections running only between posts or in panels of say two posts each. Then in case of any damage to the side of the car by wagon tongues or accidents of any kind, the sheathing may be easily removed and replaced without disturbing the girder or getting the car out of alignment.

The computations upon which these comparisons were made were accurate in the main but were not carefully carried out to the right of the decimal point. However, I think the comparison thoroughly demonstrates the point brought out in your editorial. Indeed, I believe within the next few years that you will see the light side sheathing come to its own, as I have been told there are electric cars running in England on which aluminum side sheets have been used for effecting reduction in weight. CHARLES J. MCPHERSON.

[The calculations by which the above results were determined accompanied Mr. McPherson's communication. Unfortunately lack of space prohibits their publication, but they are available for anyone who wishes to ascertain in detail how the writer arrived at his conclusions.—EDS.]

CHICAGO, Aug. 21, 1914.

To the Editors:

I have read with interest your editorial of Aug. 15 on the subject of steel car design. Your thoughts regarding the stresses taken by the side sheathing when it acts in a girder are correct, but you state that in the New York cars these sheets take only tensile stresses. This is true of all plate girder designs, the size of plate being selected for its tensile value rather than its value in compression. The compression is taken care of in the top flange as well as in the stiffeners at the girder panel points. I think this same reasoning will apply to the side girder design of car.

Also, fundamentally, that portion of the car body above the sash rail is not properly designed to receive body stresses. In other words, the posts and letterboard form rectangles, like panels of a Pratt truss in which there are no diagonals or tension members. Of course, it is possible to increase the post section and the connections between the posts and the side girder and between the posts and the letterboard to transmit these stresses around the sash opening, but this would require an uneconomical use of metal and, consequently would increase the weight without increasing strength. Hence, I believe that the side-girder design, with the minimum economical thickness of side sheathing and with as light a structure above the sash rail as is consistent with economical maintenance, will provide a car body structure of minimum weight. STUDENT.

[It would be interesting if our correspondent would calculate the stresses due to horizontal shear in the side posts of a car with seven panels between truck centers, neglecting the overhang to simplify the problem and using the admittedly high moment of 800,000 in.-lb. and a 93-in. truss-side construction as assumed in Mr. McPherson's communication published above The weight of gusset plates and posts required to make the top plate effective would then cease to be a matter of personal opinion.—EDS.]

Association News

Secretary Burritt has recently spent some days at Atlantic City arranging the details of meeting rooms for the several associations. An announcement of these details will be given out soon.

The Chicago train committee has arranged with the Pennsylvania Railroad for a first-class, all-steel train to leave Chicago at 5 p. m. Saturday, Oct. 10, arriving at Atlantic City at 4 p. m. Sunday, Oct. 11. Applications for reservations should be sent to E. K. Bixby, Pennsylvania Lines, Chicago, Ill.

The following members have been secured to the Manufacturers' Association in the last week: Mark Mfg. Company, Chicago, Ill.; Hubbard & Company, Pittsburgh, Pa., and Nungesser Carbon & Battery Company, Cleveland, Ohio.

The joint committee held its final meeting for the year in New York on Aug. 26. Those in attendance were W. J. Harvie, chairman, with Allen & Peck; A. S. Richey, professor of electric railway engineering, Worcester Polytechnic Institute; C. L. Henry, president Indianapolis & Cincinnati Traction Company; W. S. Twining, with Ford, Bacon & Davis; Farley Osgood, assistant general manager Public Service Electric Company; P. H. Thomas, consulting engineer; F. B. H. Paine, consulting engineer; W. T. Oviatt, general superintendent Narragansett Lighting Company; Thomas Sproule, assistant engineer Philadelphia Electric Company, and F. H. Bethell, vice-president New York Telephone Company.

The committee considered suggestions which had been received from various members, and the report as originally prepared will be revised and submitted to the company members of the association.

Engineering Teachers at the Westinghouse Works

The fourth in the series of special summer courses for teachers in engineering schools which has been given at the works of the Westinghouse Electric & Manufacturing Company at East Pittsburgh has just closed. Representatives from Stevens Institute, South Dakota State College, Purdue University, Bliss Electrical School, Swarthmore College, Case School, Montana State College, University of Illinois, Virginia Polytechnic Institute, Virginia Military Institute, University of Nebraska, Colorado College, Yale University, Syracuse University, Georgia Institute of Technology and the Ohio State University were in attendance. The teachers were assigned to various departments, including work in the shops and on the test floor, and to investigation in the engineering department. In addition to the actual engineering work there are regular conferences, inspections of different departments of the factory and excursions to outside plants. The course affords an opportunity for teachers to get together to compare notes and become acquainted with some of the recent developments in manufacturing practice.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

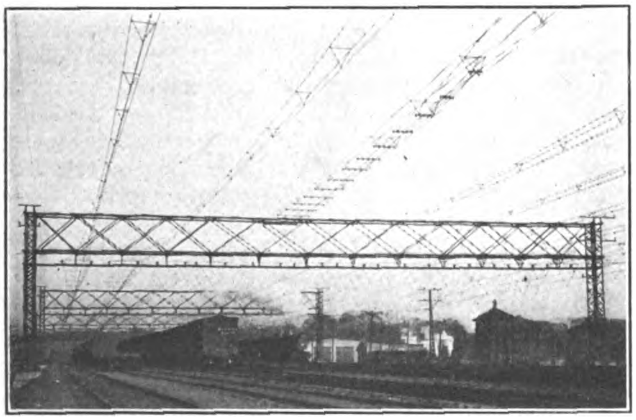
(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Overhead Problems—Catenary Construction—I

BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER THE CONNECTICUT COMPANY

Catenary construction, hailed on its first appearance as a panacea for overhead troubles, is latterly being regarded with more sanity. For high-speed work on private right-of-way in its best form it is admirable, but for ordinary street work it is at least an inexcusable complication.

The fundamental purpose of catenary overhead is to afford sufficiently frequent support for the contact wire to obviate abrupt changes of direction vertically, and to keep low the stresses in the collector wire while permitting a wide spacing of primary support; on a well-designed system the collector raises the trolley wire very little and runs past a hanger as smoothly as past midspan. Essentially it consists of one or more main supporting members or messengers, from which is suspended either the contact wire, or a secondary messenger system in turn carrying the contact wire. Messenger spans are usually 150 ft. with wood pole support, and 300 ft. on steel bridges; hanger spacing, an even part of the span, is generally 10 ft. to 15 ft. for pantograph operation, and twice these values for wheel operation. For the 150 ft. spacing with wood poles, spans or brackets but little heavier than those for regular line construction are used. Span support has the marked advantage of causing minimum interference with the view of the engineman, but the sag must be great or the stresses will be very high. For heavy work most engineers have preferred a stiff cross member to the high or heavy poles required for span support. The latter has been used in some of the early light catenary construction and the New York, New Haven & Hartford Railroad has made extensive use of this treatment for yard work, and to a small extent for the main line, employing heavy lattice poles to sustain it; the new Pennsylvania overhead from Philadelphia to Paoli will employ it throughout. The span wire attaches to the main catenary messenger, while a steady strand attached at or near the contact wire prevents overturning under pantograph pressure. In some instances the span has contained a section of structural steel carrying insulators to which the messengers attach. The New Haven type has long wooden strains in the steady strand, very materially stiffening it; the Pennsylvania will also be of this form.

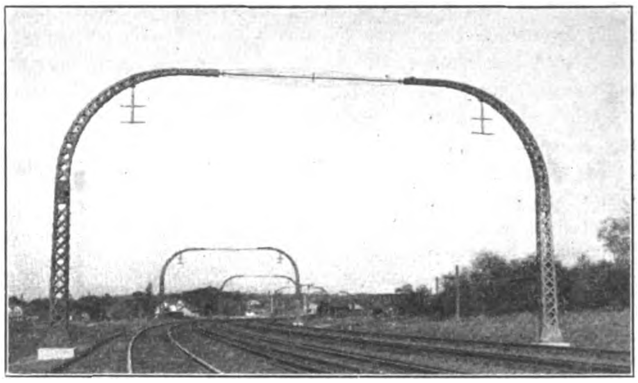


Note deflector on third group from left, also insulators on lower chord, with messenger part of circuit

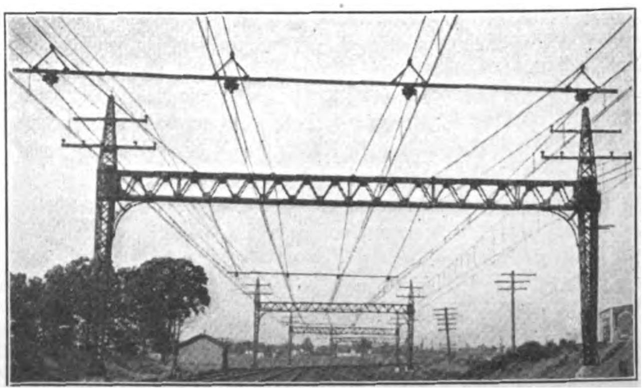
CATENARY CONSTRUCTION—EARLY FORM OF NEW HAVEN BRIDGE

BRACKETS AND BRIDGES

Brackets are of two classes: those made up of paired angles or channels, separated at one end, to go either side of the pole, to which they fasten by a through bolt, or to clasp a casting lagged or bolted to the face of the pole; and those consisting of a single I or T seating in a suitable pole casting. Paired member brackets offer facilities for the attachment of supports, insulators and the like; single member forms offer much less opportunity for corrosion. Brackets which clasp the pole and are through-bolted to it restrict the length of line affected by a break to a few spans either side, but the brackets at the break are usually badly crippled if not completely wrecked; brackets less rigidly secured swing clear, and while dropping a much greater

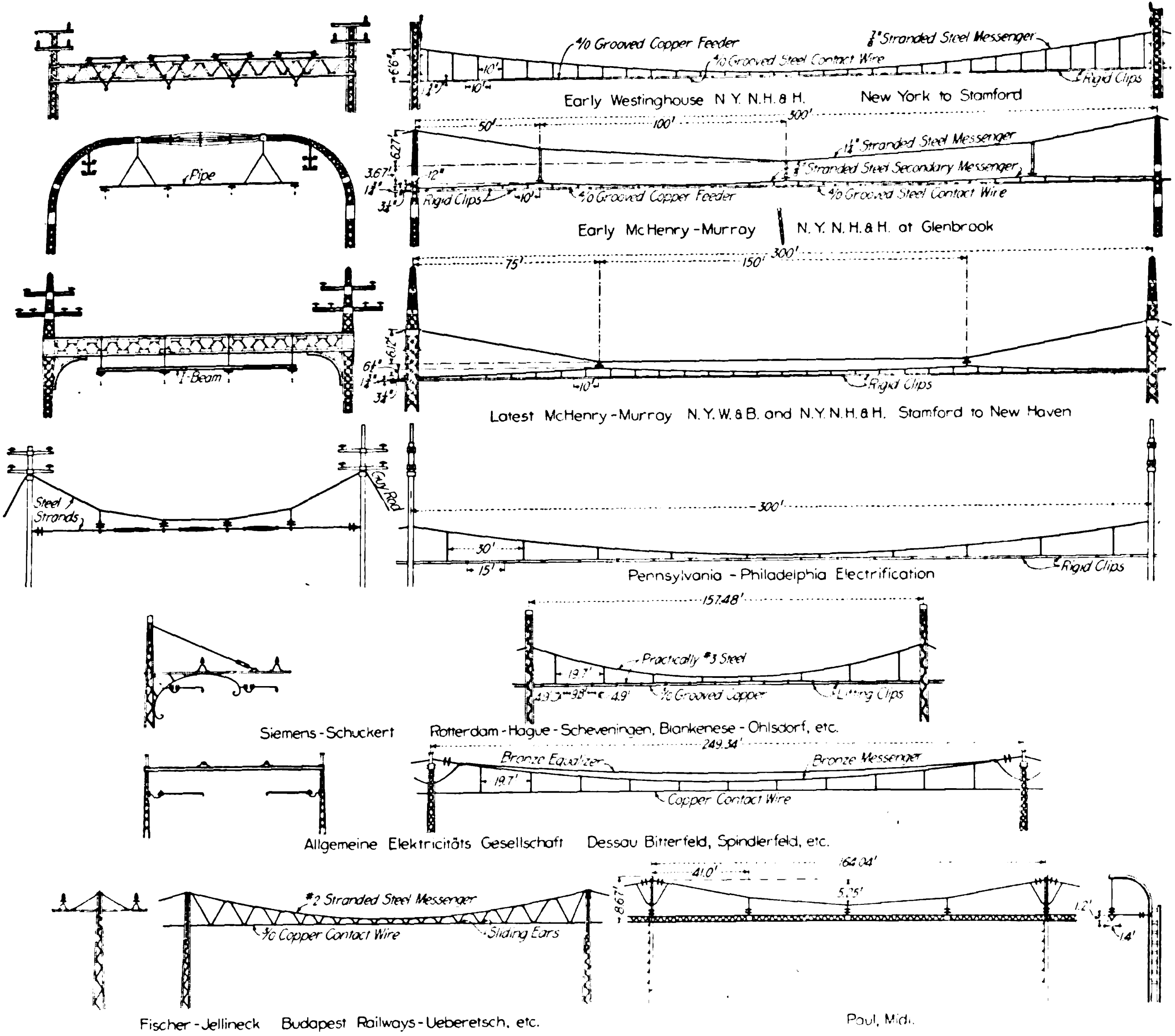


CATENARY CONSTRUCTION—HEAVY NEW HAVEN BRIDGE OF NEW HAVEN-GLENBROOK FORM



Note insulators under the the cross-bents to keep the latter and the main messengers out of circuit.

CATENARY CONSTRUCTION—LATEST FORM OF NEW HAVEN HEAVY BRIDGE


4/0 Grooved Copper Feeder
4/0 Grooved Steel Contact Wire
7/8" Stranded Steel Messenger
Rigid Clips
6'6"
10'
Early Westinghouse N. Y. N. H. & H. New York to Stamford
Pipe
50'
100'
300'
1¼" Stranded Steel Messenger
7/8" Stranded Steel Secondary Messenger
Rigid Clips
4/0 Grooved Copper Feeder
4/0 Grooved Steel Contact Wire
6.27'
3.67'
12"
Early McHenry-Murray N. Y. N. H. & H. at Glenbrook
I-Beam
75'
150'
300'
6.12'
Rigid Clips
Latest McHenry-Murray N. Y. W. & B. and N. Y. N. H. & H. Stamford to New Haven
Steel Strands
Guy Rod
300'
30'
15'
Rigid Clips
Pennsylvania - Philadelphia Electrification
157.48'
Practically #3 Steel
19.7'
9.8'
4.9'
1/0 Grooved Copper
Lifting Clips
Siemens-Schuckert
Rotterdam-Hague-Scheveningen, Blankenese-Ohlsdorf, etc.
249.34'
Bronze Equalizer
Bronze Messenger
19.7'
Copper Contact Wire
Allgemeine Elektricitäts Gesellschaft
Dessau Bitterfeld, Spindlerfeld, etc.
#2 Stranded Steel Messenger
3/0 Copper Contact Wire
Sliding Ears
164.04'
41.0'
5.25'
8.67'
1.2'
14'
Fischer-Jellineck
Budapest Railways-Ueberetsch, etc.
Paul, Midi.

CATENARY CONSTRUCTION—TYPICAL EXAMPLES OF HEAVY ELECTRIC RAILWAY SUSPENSION ON THE PRINCIPAL SINGLE-PHASE LINES OF AMERICA AND EUROPE

length of line are usually injured little if any. Abroad, brackets on special iron poles are used for spans up to 300 ft., and frequently for double-track work, either with center-pole construction or carrying both trolley wires on the one long arm. In American practice two-track brackets are not so frequently used, spans or bridges being employed instead; the latter are also extensively employed on long span foreign lines.

Bridges have a wide range of design, from the light paired angle irons bolted to wooden poles, one on each side of the track, as on the Midland Railway, England, and certain Continental lines, and the light but rigid entirely structural material frames of the Archbold-Brady type, to the very substantial structures of the early New Haven work. The importance of the traffic involved in the latter case and the lack of data as to behavior in such service fully justified the use of a very conservative design in the pioneer installation.

The Continental tendency to soften lines often leads to ornate curved members and little scrolls on both brackets and bridges, which with our heavy construction would appear decidedly "gingerbready"; the American forms are usually severely plain. An arch, consisting of two latticed curved tapered columns with a trussed spreader, is used on a short experimental section of the New Haven, but the latest bridge with tapered posts, small end down, and curved brackets in the angle between post and girder, has a very pleasing appearance and is more readily fabricated.

CATENARY CHANGES

On the first catenaries the main messengers were carried, alive, on insulators mounted on the supports; better practice, however, is to put the insulators closer to the conductor. The latest New Haven form has grounded main messengers, one for each track which supports I-beams called cross-bents, in turn carrying insulators to which the secondary messengers are attached; the value of this grounded shield as a lightning protection has been strikingly shown in several electrical storms which caused troubles on the older forms, while the new construction in the same territory was entirely unaffected.

The earliest catenary consisted of a messenger from which the contact wire was suspended by a series of equidistant hangers. This worked well for short spans, but on long spans the great difference in length, and so in weight, of the mid and end hangers led to the development of compound catenary. The Siemens-Schuckert type, one of the earliest forms if not the pioneer, employs a main messenger, a secondary messenger suspended from the main messenger by hangers approximately 20 ft. apart, and a contact wire suspended from the secondary messenger by hangers approximately 10 ft. apart. The secondary messenger supports come at the quarter points between the main hangers or "droppers," which are of wire, about No. 8 gage equivalent, and are in two parts, linked eyes in the adjacent ends forming a flexible joint; these hangers attach rigidly to both main and secondary messenger. The secondary hangers attach rigidly to the contact wire, but loop over the secondary messenger so they are free to rise 2 in. or 3 in. This has proved very satisfactory in a number of Continental installations, and on the Midland Railway of England.

Of about equal age is the Westinghouse multiple catenary, with two main messengers which have vertical sag and horizontal deflection toward each other. The hangers, spaced 10 ft. apart, are equilateral triangles of pipe, the two upper corners attaching to the messengers while the bottom one holds the contact wire; the entire system is at line potential, the supports at the bridges being insulators as well. As first installed on the New Haven road, the contact wire, No. 0000 grooved copper, was carried directly by the triangles. These points, however, were exceedingly rigid while the midspan was comparatively soft, and when the speed of the train was such that the time interval between hanger points was the same as the vibration period of the collector, the latter chattered with increasing violence until changed conditions, which were not infrequently a broken wire, threw the pantograph "out of step."

The trouble was very satisfactorily obviated by a modification suggested by E. H. McHenry, then vice-president, as follows: A steel contact wire of the same section as the copper is suspended from the latter by clips coming midway between the triangles, which keep the wires 1¾ in. apart, center to center. The clips are rigidly attached to both wires; it was feared that with the heavy shoe pressure a looped clip such as is used in the Siemens-Schuckert form might permit the lower wire to turn sideways, in which case the shoe would foul the clips with disastrous results. The London, Brighton & South Coast Railway, to secure the same end, uses triangles of comparatively light wire, the small ones holding the wire by a loop, while the larger ones have jointed sides to give the desired flexibility. On this system the stresses are all low, the messenger having a sag of 6 ft. in vertical projection for a span of not quite 200 ft.

The extensive experience with the pioneer and McHenry forms under heavy service, and careful study of the behavior of other types has resulted in the McHenry-Murray catenary employed on the latest extension of the New Haven electrification. In this the main messengers, one for each track, have at the quarter points structural steel cross-bents which in turn carry insulators from which the secondary system is hung. This latter consists of the secondary messenger, carrying, through hangers 10 ft. apart, a pair of wires, upper of copper and lower of steel, held 1¾ in center to center by clips which are midway between the secondary hangers. The main messengers and the cross-bents are grounded, and the insulators have only to carry the mechanical load of the secondary system.

The Pennsylvania catenary consists of a main messenger for each track, carried by cross-spans. A paired wire like that of the New Haven, except that bronze is used instead of steel for the lower one, is hung from the main messenger, but these hangers are 20 ft. apart and come midway between every other pair of clips, thus cutting down the load materially.

The general tendency in catenary is towards a flexible line, but there are two recent marked exceptions. The Fischer-Jellinek form employed on the Budapest, Ueberetsch and other Austrian lines, has a triangular hanger which lies in the plane of the catenary and carries at the bottom angle an ear through which the trolley wire is free to slide. Continued and repeated use of this form apparently indicates successful results, but it is difficult to believe that even with the light bows employed there is not severe wear at these loose connections, particularly as the triangular hangers of this form, to insure that the clips remain parallel to the contact wire and do not bind on it, of necessity make very hard spots.

This type is hard incidentally rather than by design, but the Paul catenary of the Midi Railway, France, is essentially hard, the messenger supporting a trussed member, which is an equilateral triangle, a contact rail being secured to the lower vertex while pull-offs and steady braces attach to the top which is horizontal. The trusses are a trifle more than 40 ft. long and are suspended by their ends, there being four to the span. This ought to work well; the writer has always contended that it is abrupt change that causes trouble, and that a uniformly hard line would be as satisfactory as a uniformly flexible one, and hoped to see a rigid bar used on the original Westinghouse form; as a new proposition, however, the rigid construction is much more difficult to obtain.

For ordinary service simple catenary meets all requirements. On the Syracuse, Lake Shore & Northern and on the Rochester, Syracuse & Eastern Railways of central New York there have been used spans of 300 ft. on steel bridges of the Archbold-Brady type, the messenger having a sag of 79½ in. with rigid hangers 15 ft. apart. Long span installations are not so common, but spans of 150 ft. with wood pole support are to be found in all parts of the country, the sag for these ranging from 14 in. to 20 in., while the hanger spacing is from 10 ft. to 50 ft.

Bushings for Iron Armature and Axle Bearings

BY R. H. PARSONS, ELECTRICAL FOREMAN

In old-type motors serious trouble with the iron shells, which after being babbitted are used for armature and axle bearings, arises from the dowel holes. As these holes wear out of round and become too large for the dowel pins, they allow the bearing to move in the housing. The consequence is that the shell and housing are soon worn to such an extent that the bearing must be shimmed to secure a snug fit. As these shells are usually made of cast iron, it has not been found entirely satisfactory to fill the worn holes with new material either by the arc welding or oxy-acetylene process. An iron bushing screwed into the shell and drilled out to the proper size will give good results, but the method here described is cheaper and will work to better advantage.

The worn hole should be drilled to 1 in. or any other size that may be necessary to obliterate the old hole entirely, and then a hard brass plug should be driven into the enlarged hole. The length of the plug must necessarily be as great or slightly greater than the thickness of the shell, and the diameter of the plug should be large enough to require some force to drive it in. After the plug has been driven into the hole it should be upset or riveted into the shell by resting the bottom of the plug at the inside of the bearing on some solid base and hammering the top of the plug in order to force it more securely into the shell. The plug should not be tapered.

After the plug is filed on the outer side to conform to the surface of the shell the inside should be tinned. Then when the shell is babbitted, the brass plug will adhere to the babbitt. After being marked at the proper point, the plug can be drilled to fit the dowel pin when boring out the bearing.

When the plug is so worn again that the hole is too large it can easily be knocked out for replacement by a new one.

The Return Circuit — Selection and Location of Bond

BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY, PUBLIC SERVICE RAILWAY, NEWARK, N. J.

An important feature in rail bonding is the proper cross-section for any given length, and the available space beneath the joint plates. While a bond of No. 00 capacity and 8 in. or less in length may prove entirely satisfactory, it would not be possible to obtain satisfactory results with a 500,000 circ.-mil. bond of the same length. To obtain the necessary flexibility it is essential that a bond of such capacity be at least 14-in. in length and preferably from 16 in. to 18 in. For the same reason a No. 0000 bond should preferably not be less than 10 in. long.

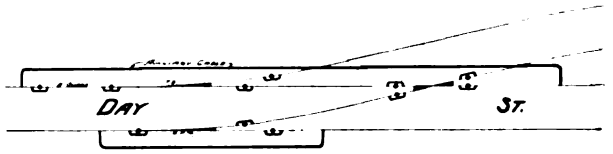
Clearance Under Plates and Proper Length of Bond

The determination of the proper section of bond for any given clearance under the plates cannot be decided by any fixed rule. A safe practice is to allow 1/16 in. as a minimum clearance at all points, and the shape and location of the crimp in the flexible part of the bond must be determined by such conditions as location and size of bolt and bond holes, and whether single or double bonding is to be employed. In connection with the above, it might be mentioned that the plates designed for the standard rails of the American Electric Railway Engineering Association provide adequate clearance for bonds under the plates.

It is probably true that most of the trouble which has been experienced from crystallization and consequent breaking of rail bonds has been due to the fact that the bond used was not flexible enough to provide for the deflection and vibration of the bond under wheel loads and rail movements due to expansion and contraction. Experience has shown that any kind of bond placed beneath the joint plates should be at least 10 in. long, and the general modern practice is to allow for a bond from 12 in. to 16 in. in length. On a 550-volt circuit cross-bonds should be placed approximately every 1000 ft. In cross-bonding the rails of a track, the length of such bonds should be at least 12 in. more than the gage of the track. In the use of exposed bonds, that is to say, bonds which are installed around the outside of the joint plates, such bonds should be at least 10 in., and preferably 12 in., longer than the plates, so that the latter may be removed or the bolts driven with a spike maul and the nuts tightened without danger of injury to the bond.

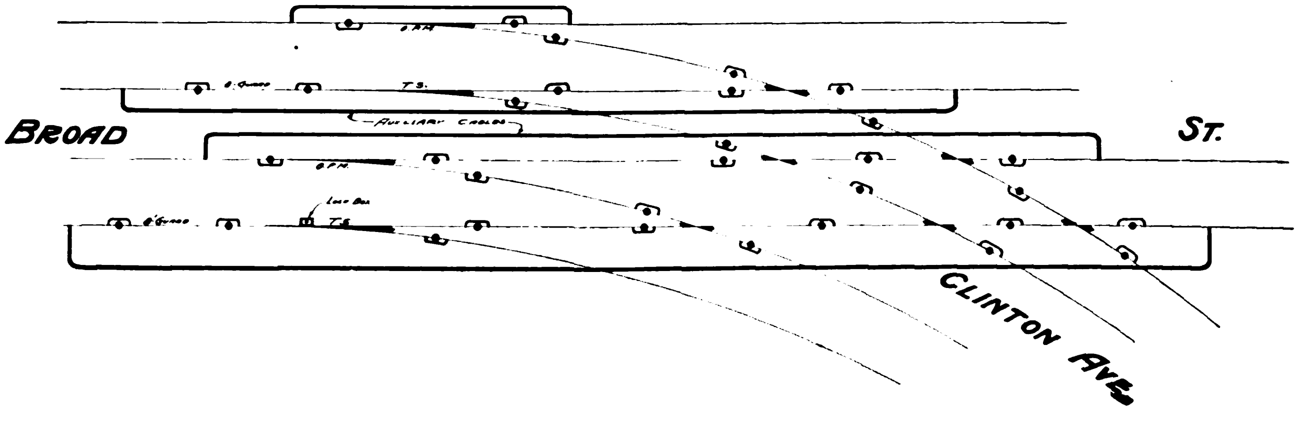
Location of Bond Holes and Relation to Bond Failures

From data collected, it seems to be the general practice to space the terminals midway between the first and second bolt holes, or between the second and third bolt holes. In no case should the bond holes be located close to the ends of the rails, as it has generally been found that the shock from the wheels pounding on the rail ends is dissipated through the copper at the point where it is fixed rigidly to the rail, and this has a tendency to shorten the life of the copper. The increased life and efficiency of the longer bond will generally more than offset the increased cost of the copper as well as the increased energy loss due to increased joint resistance, since the increased flexibility lessens the leverage which the different rail movements tend to exert at the point where the body of the bond joins the head.



RETURN CIRCUITS—PUBLIC SERVICE RAILWAY BONDING INSTALLATION AT A SIDE TURNOUT

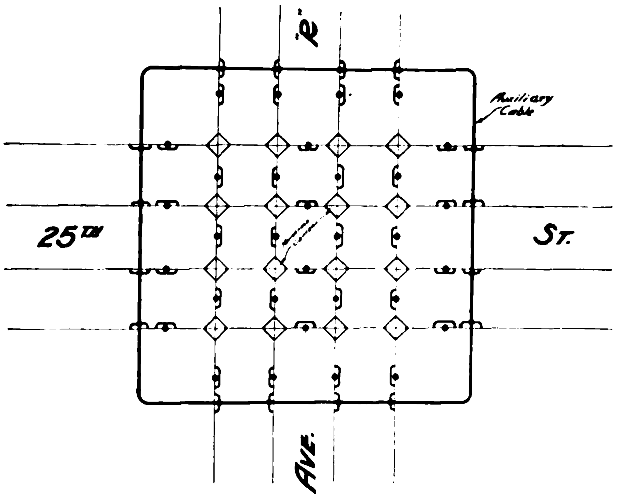
Another explanation offered by some for the loosening of bonds is that when the steel contracts, due to temperature changes, it shrinks around the bond terminal and compresses the copper, causing it to flow slightly. Then, when the steel heats up again, the rail expands and leaves the copper terminal slightly loose in the hole through the rail web. This theory, however, is not generally accepted, as it is believed that the copper is greatly hardened when the taper punch is driven through the terminal or when the hydraulic compressor is applied, giving it a much higher elastic limit and thus permitting a much larger deformation to occur without a permanent set taking place.



RETURN CIRCUITS—PUBLIC SERVICE RAILWAY BONDING LAYOUT FOR A DOUBLE-TRACK BRANCH-OFF

Resistance of Various Types of Bond Terminals

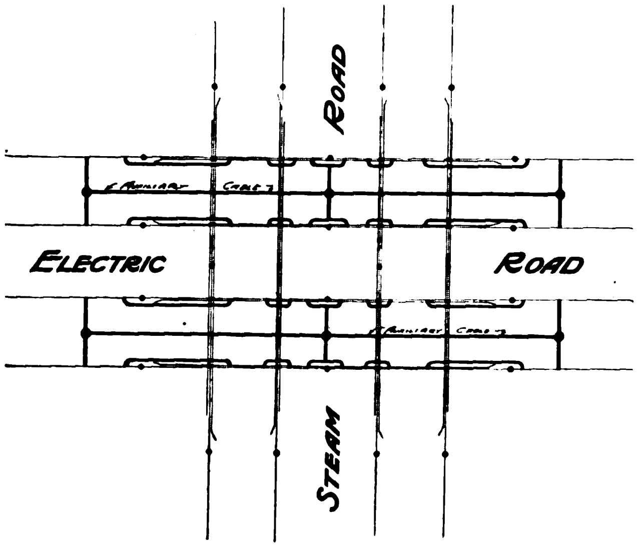
Relative to the efficiency of various types of bonds, it is interesting to note that tests made by one street railway showed that the resistance of a hydraulic compressed bond was 3.35 per cent less than the resistance of a pin terminal bond of the same length and capacity. Still other experiments made at the same time showed that the contact resistance was decreased about 6 per cent by the use of mercury amalgam. Of course the hydraulic compressor is a more expensive and complicated piece of machinery than the outfit which is required for the installation of pin terminal bonds, and the labor required might have to be of a higher class, thus making the bonding cost more. The foregoing tests of the relative resistance of bonds of the same length and capacity but with different types of terminals were made as an experiment. Without doubt, they were made under ideal laboratory conditions, but these conditions were alike for all bonds tested and the results obtained are therefore comparative.



RETURN CIRCUITS—BONDING LAYOUT OF THE PUBLIC SERVICE RAILWAY AT A STREET CROSSING

BONDING THROUGH SPECIAL WORK—EQUIVALENT RAIL RESISTANCE

One part of the track return circuit which is very liable quickly to lose its efficiency as a conductor is that through the special work. For this reason it is not only necessary to bond each individual joint through the entire layout, but it is also necessary to install auxiliary cable bonds running completely through the special work, and connected with the track beyond the limits of the layout. Four accompanying diagrams show the standard method of bonding through some typical special track layouts on the property of the Public Service Railway.

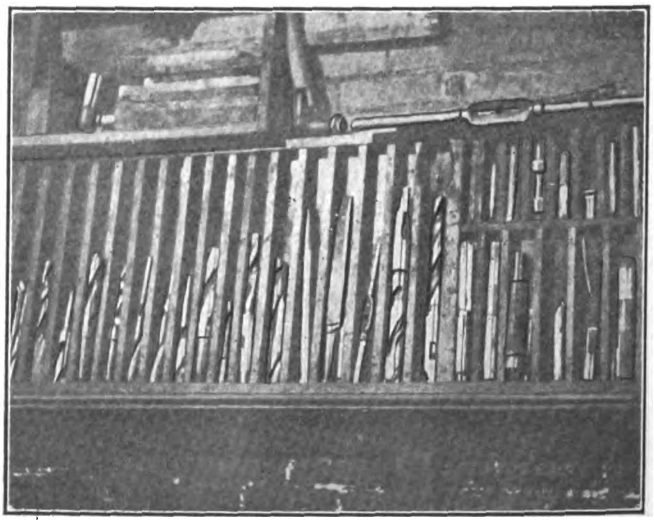


RETURN CIRCUITS—TYPICAL SPECIAL WORK BONDING LAYOUT AT A STEAM-ELECTRIC CROSSING

It is customary to express the resistance of a joint in terms of the resistance of a length of unbroken rail. There is a large difference of opinion as to the proper equivalent in determining whether the joints should be rebonded or not. For instance, one of the questions in the American Electric Railway Engineering Association Question Box (*Proceedings*, 1911) asking the proper figure for this purpose, brought twenty-three replies. Four men agreed that 5 ft. of unbroken rail should be used, three thought 6 ft. was the proper figure, and the rest thought still other lengths should govern. Not more than two of the remaining sixteen concurred as to the proper length, their replies ranging all the way up to 12 ft. of unbroken rail. It would not seem proper to adopt any standard equivalent length to cover all conditions, because the length which would be correct for track in the center of a heavily loaded traffic zone or near the power station would be unreasonable for the outer ends of some suburban lines. Therefore it is not just to classify all joints of a certain fixed length as good, and all more than that length as poor. Bonding may be in A-1 shape and still show a resistance reading greater than the established maximum, because such an expression of the resistance of the joint will depend on the length and size of the bond itself, conductivity of the steel rail, temperature, etc. To determine whether the joint should be rebonded or not, the permissible energy loss or voltage drop across the joint must first be established, and, knowing the resistance of a properly bonded joint, the calculation of the maximum permissible joint resistance can easily be made.

Saving Trips to the Stock Room

At the St. John Street shops of the Portland (Maine) Railroad frequent trips of machinists to the stock room are avoided by the storage of drills and arbors in a home-made wall rack shown in the accompanying half-tone. The rack, which is 7 ft. long and 20 in. high, is divided into fifty-six compartments by 5/8-in. separating sticks. It is mounted about 17 in. above the bench near the principal machine tools and has proved a great convenience to employees.



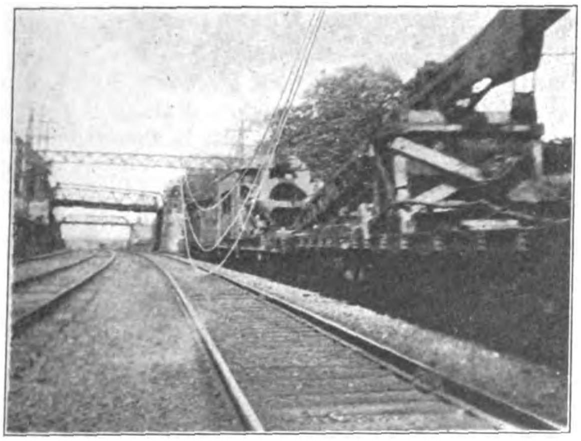
AUXILIARY DRILL AND ARBOR RACK AT PORTLAND, MAINE

The coal contract for the Cincinnati (Ohio) Traction Company has been closed for the next three years. The business will be divided between the Cabin Creek Coal Company and Matthew Addy & Company, both of Cincinnati.

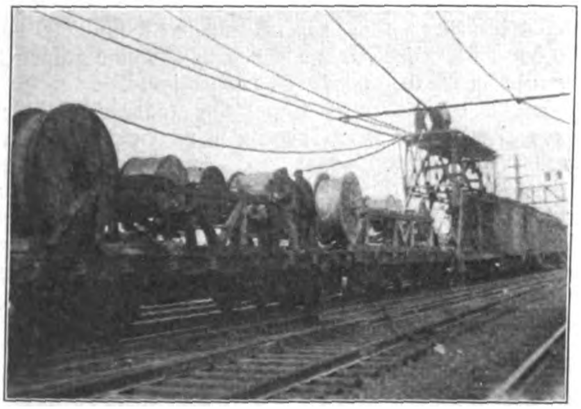
New Haven Railroad Construction Notes—Pulling 5/8-In. Messenger and Copper and Steel Trolley Wire

BY A FORMER INSPECTOR

The engine, reel car, tool car and coach shown in the accompanying views were used in the electrification of the New Haven Railroad for pulling a 5/8-in. steel messenger, a copper and a steel trolley wire. The reel cars were loaded with one reel of 5/8-in. steel messenger, two reels of No. 0000 copper and one reel of No. 0000 steel trolley. The average length of the messenger wire was 10,000 ft. One view shows the train in operation. At the point where the pull was to be started the train was stopped to bring the tower car under the anchor bridge. A 1¼-in. turnbuckle and a high stress dead-end insulator were then attached to the bridge. Next the 5/8-in. steel messenger was taken up from the reel over the top of the tool car to the top of the tower car and attached to the insulator with an open socket. The copper and steel trolley were brought up in the same manner, made up into coils about 150 ft. long and left on the anchor bridge for connecting to the run from the other side. Then the trolleys were attached to the 5/8-in. steel messenger with Crosby clips. After all wires were thus secured, the train was run ahead to the first I-beam bent of the overhead line, where the 5/8-in. messenger was put into the clamps of the main line insulator, leaving it loose so that the cable would run freely, as shown in one of the views. The copper trolley was tied loosely with a heavy tie wire on one side of the insulator and with the steel trolley wire on the other side so that both trolleys would run freely. This method was repeated to the end of the run. After pulling out the first reel of copper trolley, the wires were pulled up one at a time by the train. A Crosby clip was put over the 7/8-in. messenger cable, and any of the three wires (namely, 5/8-in. messenger, No. 0000 steel or No. 0000 copper) was then put into the U-bolt of the Crosby clip and pulled up until it was tight. Following this, the clip was tightened to hold it in place. After all three wires were thus pulled up and tightened, the train ran ahead and the cable was pulled up and tightened in the same manner. The upper views show the three wires in the center of the track before they were pulled up.



THE 5/8-IN. STEEL AND NO. 0000 COPPER AND STEEL TROLLEY WIRES OVER CENTER OF TRACK BEFORE BEING PULLED UP



TRAIN FOR PULLING 5/8-IN. MESSENGER AND NO. 0000 COPPER AND STEEL TROLLEY IN OPERATION

Auxiliary Wiring of Interurban Cars

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD & INTERURBAN RAILWAY COMPANY

The accompanying table and drawing will illustrate the method used by the Rockford & Interurban Railway for wiring light and pump circuits in its interurban cars. These prints are also used by the shopmen to locate trouble on these circuits. By controlling the marker circuits with three-way switches it is possible to carry either white or green signals on the front of car or no signals, as desired. As the incandescent headlight is also operated with a three-way switch, it can be turned on as the arc headlight is turned off when entering a city where the use of arc headlights is forbidden.

WIRING OF LIGHTS, AIR, ETC., ON THE CARS OF ROCKFORD & INTERURBAN RAILWAY

General: All fuses connected to main trolley.

Air compressor connection: From fuse to switch, from switch to governor, from governor to compressor.

Arc headlight connection: From fuse to switch, from switch to headlight resistance, from resistance to headlight plug.

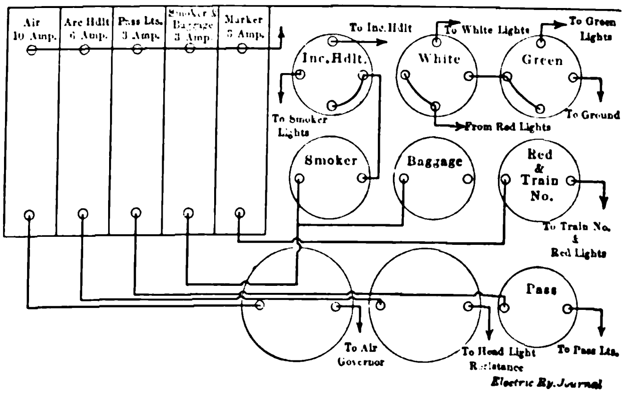
Passenger lights connections: From fuse to switch, from switch to light circuits in passenger compartment of car.

Smoker lights connections: From fuse to switch, from switch to positive pole of three-way switch, from one negative pole of three-way switch to incandescent headlight, from incandescent headlight to smoker lights, from the other negative pole of three-way switch direct to smoker lights.

Baggage lights connections: From fuse to switch, from switch to baggage lights.

Marker lights connections: From switch to train number light, from train number light to red lights and rear platform lights, from rear platform lights to positive pole of first three-way switch, from one negative pole of first three-way switch to white lights, from white lights to ground; from the other negative pole of first three-way switch to positive pole of second three-way switch, from one negative pole of second three-way switch to green lights, from green lights to ground; from the other pole of second three-way switch to ground.

All circuits to be grounded.



PLAN OF SWITCHBOARD FOR AUXILIARY WIRING, ROCKFORD & INTERURBAN RAILWAY'S INTERURBAN CARS

Municipal Railway Machine Shop at San Francisco

All of the repair equipment, now being installed in the Geary Street shop of the Municipal Railway at San Francisco, is driven by direct-connected motors. The railway buys power in the form of direct current at 500 volts for 1 cent per kw-hr. while the rate on other voltages is 3 cents per kw-hr. It was therefore found economical to install in the shop a motor-generator set of 75-kw capacity. This set takes 500-volt current from the supply mains and delivers 230-volt current to the motors in the shop.

The shop equipment includes the following:

One 42-in. Niles wheel-turning lathe, with boring attachment, 30-hp motor.
One 300-ton hydraulic press, 7½-hp motor.
One 24-in. Reed lathe, 7½-hp motor.
One 19-in. Le Blond heavy duty lathe, 5½-hp motor.
One 14-in. Hendy Norton lathe, 2-hp motor.
One 3-ft. Dreses radial drill, 3½-hp motor.
One 20-in. Barnes drill, 1½-hp motor.
One 24-in. Kelley shaper, 5-hp motor.
One No. 7 Racine high speed hack saw, 1½-hp. motor.
One Universal wood working machine, 10-hp motor.
One Beaudry power hammer (300-lb.), 7½-hp motor.
One Bridgeport wet and dry emery wheel, 3-hp motor.
One 2-ton Euclid electric hoist.

Eight Gas-Electric Motor Cars for St. Louis Southwestern Railway

The St. Louis Southwestern Railway is placing in operation the first lot of eight gas-electric motor cars that are now being received from the General Electric Company. At this writing four cars are in use. Car No. 10 is now making the trip between Shreveport, La., and Lewisville, Ark., a distance of 62 miles. Along the route are ten regular stops, seven flag stops and four railroad crossings. The time required for the run is two hours and thirty minutes. The car makes one trip each way a day, totaling 124 miles. Car No. 11 recently made the initial run between Commerce and Sherman, Tex., a distance of 57 miles. The car left Commerce at 8 a. m. and arrived at Sherman at 10.40 a. m. Returning it left Sherman at 4 p. m. and arrived at Commerce at 6.40 p. m.

In the formation of the St. Louis Southwestern Railway are included the Pine Bluff Arkansas River Railway, the St. Louis Southwestern Railway of Texas and the Eastern Texas Railroad. It is known as the "Cotton Belt Route" and its total trackage is 1810 miles standard gage. Starting at St. Louis, Mo., it follows a southwesterly direction across Arkansas into Texas. Here at Mount Pleasant one branch terminates at Fort Worth and the other runs through Waco to Comanche and to Stephenville. Branches connect with important centers like Cairo, Ill.; Memphis, Tenn.; Little Rock, Ark., and Dallas, Tex. The equipment of the road comprises 242 locomotives, 235 passenger cars, and 12,445 freight and miscellaneous cars.

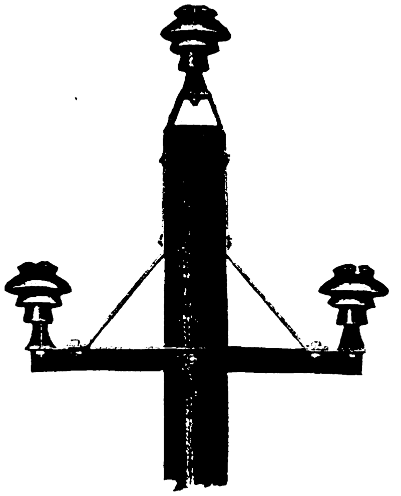
All the gas-electric motor cars for this railway are what is known as type RE-70-B-11. The specific dimensions of the St. Louis Southwestern cars are 70 ft. 1⅜ in. over bumpers by 10 ft. 6¾ in. wide over all. They weigh approximately 49 tons, have a seating capacity for sixty-two passengers, two per seat, and are each equipped with two GE-205, 600-volt, box frame, commutating pole motors having a total of 200-hp capacity. The motors are mounted with nose suspension directly on the axles of the forward truck. The generating unit consists of an eight-cylinder, four-cycle gas engine of the "V" type, direct-connected to a 600-volt, commutating pole generator.

The interior of the cars is partitioned into four compartments. The cab in front containing the power plant apparatus measures 11 ft. 11 in. long; next is the baggage room, 10 ft. 11⅞ in. long; then the smoking section, 12 ft. 5 in. long, and the passenger compartment, 30 ft. 5⅞ in. long. The body of the cars is of all-steel construction, except the seats and interior finish, which are of mahogany. Rear platform entrances are provided. The trucks are of the heavy spring bolster type with elliptic bolster and coil equalizer springs.

Triangular Arms for High-Tension Lines

The Electric Service Supplies Company has placed on the market a new angle-iron cross-arm to be known as the "Keystone" triangle arm. As will be noted in the illustration it consists of an angle-iron cross-arm with braces on either side which are continuous and which form a ridge iron over the top of the pole for a third insulator. The cross-arm proper is shaped to allow the insulators to be on a line with the center of the pole and so that braces and top insulator will also be centered.

To install this arm it is necessary only to shave off two sides of the pole at the top so that it will fit the brace, and to bore three holes. The cross-arm proper does not require gaining. This small amount of preparation can be very readily and accurately done by means of a template where a large number of poles are to be erected. On account of the superior bracing qualities of this cross-arm only three ¾-in. through bolts are required to secure it permanently to the pole. On large installations the minimum time necessary to install these triangle arms should result in some appreciable saving.



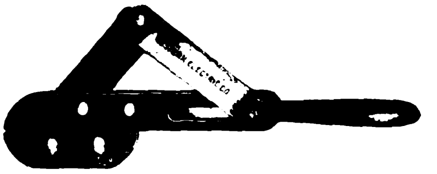
TRIANGULAR CROSS-ARM FOR HIGH-TENSION LINE

Triangle cross-arms are made from 3-in. x 3-in. x ¼-in. steel angle and ¼-in. x 3-in. flat steel. They are made for three-phase circuits up to 35,000 volts and for 50,000-volt, three-phase circuits. Their approximate weight is 36 lb. and 49 lb. respectively.

Probably the most important feature of this new cross-arm is its great strength, particularly where the pull is downward or at any lower angle therefrom. This is partly due to the equal distribution of weight on either side of the pole, and finally to the exceptional bracing and the improved design and great strength of every part. Other claims made for this cross-arm are that the bolts are placed through the pole in opposite directions, giving exceptional rigidity to the installation; that the wires are in a true triangle and all in different vertical planes, thus decreasing the possibility of a short-circuit due to the breaking of an upper wire, which short-circuit is quite possible from some of the varied methods now in use for supporting high-tension transmission lines; that a maximum height of pole is secured in that the ridge iron is actually an extension to the pole, thereby allowing a shorter pole for a given height of wires. Ground wire supports or bayonets when used in connection with these cross-arms are attached by means of the two through bolts which support the upper section of the triangle. They are of the off-set type and are made from 3-in. x 3-in. x ¼-in. steel angle.

A Lineman's Grip

A lineman actually requires three hands to do his work efficiently, a hand for each wire and a third to do the tying or splicing. The Western Electric Company's "Buffalo" grip illustrated does the work of a third hand. Its jaws may be clamped open at any width, the grip held in one hand and the wire inserted, no matter in what position the lineman may be. The locking device makes this possible, while the rest of the construction is such that pulling only serves to strengthen the grip on the wire. The jaws of drop-forged steel will not injure the softest wire or insulation. The grip is made with and without pulley attached. It will hold all sizes of wire, bare and insulated, up to and including No. 0000 B. & S.

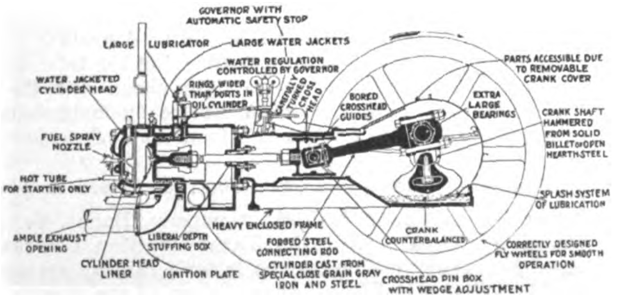


LINEMAN'S GRIP CLOSED

A New Valveless Two-Cycle Oil Engine for Low-Grade Fuels

An oil engine of the valveless two-cycle, low-compression type has recently been brought out by the Chicago Pneumatic Tool Company. This engine can be operated successfully on gasoline, kerosene, crude oil or practically any of the intermediate grades of distillates, and it is, therefore, especially adapted for use in operating air compressors or generators in construction work, the design being exceptionally simple so that satisfactory operation is assured notwithstanding the rough handling likely to be involved in such service.

The engine differs materially from the customary form of two-cycle machine, as it is provided with a piston-rod and cross-head instead of the usual trunk-piston. The compressed air for scavenging after each explosion is obtained by the motion of the piston head in a chamber that is separated from the crank case. The crank case, therefore, does not have to be inclosed, and lubrication of the cranks and cross-head is not affected by the heat from the cylinder. Ignition is obtained by spraying the fuel, which is forced into the cylinder by a small pressure pump, against a hot plate attached to the piston head, a hot tube being used for starting. With the fuel a quantity of water is injected to reduce the temperature of ignition and the supply of water is regulated automatically by the governor, the supply being proportioned to the quantity of fuel injected.



GOVERNOR WITH AUTOMATIC SAFETY STOP
LARGE LUBRICATOR
LARGE WATER JACKETS
WATER REGULATION CONTROLLED BY GOVERNOR
WATER JACKETED CYLINDER HEAD
RINGS WIDER THAN PORTS IN OIL CYLINDER
CAREFULLY TURNED CROSS HEAD
BORED CROSSHEAD GUIDES
EXTRA LARGE BEARINGS
PARTS ACCESSIBLE DUE TO REMOVABLE CRANK COVER
CRANK SHAFT HAMMERED FROM SOLID BILLET OF OPEN HEARTH STEEL
FUEL SPRAY NOZZLE
HOT TUBE FOR STARTING ONLY
SPLASH SYSTEM OF LUBRICATION
HEAVY ENCLOSED FRAME
AMPLE EXHAUST OPENING
LIBERAL DEPTH STUFFING BOX
FORGED STEEL CONNECTING ROD
CRANK COUNTERBALANCES
CORRECTLY DESIGNED FLY WHEELS FOR SMOOTH OPERATION
CYLINDER HEAD LINER
IGNITION PLATE
CYLINDER CAST FROM SPECIAL CLOSE GRAIN GRAY IRON AND STEEL
CROSSHEAD PIN BOX WITH WEDGE ADJUSTMENT

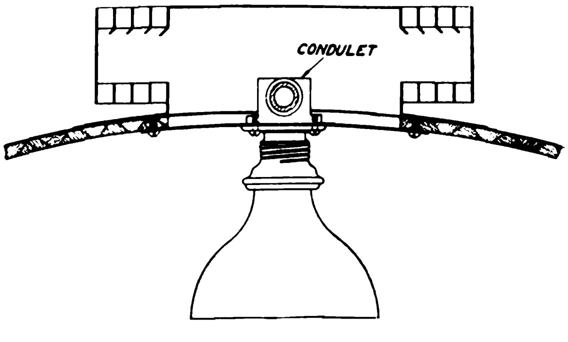
ELEVATION OF OIL-ENGINE SHOWING COMPRESSION CHAMBER SEPARATE FROM CRANK CASE

Ramp-Floor Semi-Convertible Cars for Portland, Maine

The Cumberland County Power & Light Company, operating the electric railway service of Portland, Maine, is equipping ten new cars at its St. John Street shops. The cars are of the semi-convertible type and were built by the Wason Manufacturing Company, Brightwood, Mass. They are designed for prepayment service and are provided with steel underframes and sides up to the belt rail, with an over-all length of 42 ft. 8 in., a seating capacity of forty-four passengers and an over-all width of 8 ft. 3 in. An interesting feature of the design is the use of inclines in the floor for a distance of 6 ft. back of each vestibule, the drop being 3 in. to permit the use of a lower step from the street level. The step heights are 13 in. for each of the first two steps from the ground, the third step being 10 in. high. The steps will fold in conjunction with the vestibule doors, the exit door in the forward end being operated by a pedal under the control of the motorman. The cars are built for double-end operation, each platform being 5 ft. 6 in. long, and are equipped with four GE 40-hp motors each, mounted on Brill 51-E trucks. Johnson fare boxes, Flexolith flooring and Holophane reflectors equipped with 60-watt lamps are among the other features. The interior car lighting is cared for by ten lamps. The fare and transfer register in each car will be operated by pipe levers controlled by pedals mounted above the vestibule floor at the conductor's position, the lever at each end of the car being a ½-in. rod carried inside a 1¼-in. vertical pipe run from the fare box to the roof.

Combined Honeycomb Ventilator and Lamp Fixture

The Railway Utility Company, Chicago, has just put on the market a combined honeycomb ventilator and lighting fixture. The purpose of this fixture is to economize space, and the heating effect of the lamp also aids in ventilating the car when it is standing still. The fixture is easily detached from the supporting condulet, and the connections to the wiring circuit are made on a neat molded block inclosed in the condulet, no soldering of joints being required. This provides a substantial construction which eliminates all chance of wiring difficulties. The shade is held by a special design of holder which provides a flexible grip on the shade, easy to manipulate, and a positive lock. This combined ventilator and lamp socket has been adopted by several steam railroads and is used on the low-level, end-entrance cars of the Third Avenue Railway, New York.



COMBINATION OF HONEYCOMB TYPE VENTILATOR AND MODERN CAR LIGHTING FIXTURE

News of Electric Railways

Hearing on United Railroads and Solano Project

The hearing being conducted by the California Railroad Commission in the case of the United Railroads of San Francisco was continued on Aug. 24. At the last meeting President Lilienthal of the United Railroads agreed to see what he could do to discover the sources of the money contributed to the Solano Irrigated Farms Company. He was the principal witness at the hearing on Aug. 24. He reported that his examination of the books of the Solano Irrigated Farms Company showed that the company had received $1,180,000 in cash from all sources. This amount included about $292,000 which did not come from Mr. Calhoun, former president of the United Railroads of San Francisco. As the investment from funds of the United Railroads in the Solano project amounted to $1,096,000, this left a balance of about $208,000 which, according to the testimony, had not been accounted for.

At the conclusion of Mr. Lilienthal's testimony the commission advised him to refer these findings to the district attorney. It then instructed its secretary to refer all of the evidence in hand to the district attorney.

The remainder of the hearing on Aug. 24 was devoted to a discussion of the methods of accounting followed by the United Railroads. No recommendation was announced in this matter. At the close of the hearing on Aug. 24 the commission announced that the case against the company was adjourned until Aug. 28.

Need for Cleveland Improvements Misunderstood

In the department "Financial and Corporate," elsewhere in this issue, mention is made of the restoration of the transfer charge by the Cleveland (Ohio) Railway and the statement of earnings of the company for July, 1914, and July, 1913, is published. The charge is made by Councilman William Stolte that the company is spending too much money for carshops and buildings and is not endeavoring to keep the fare at 3 cents. He also accused Peter Witt, street railway commissioner, of recommending the expenditure of too much money and said that with the execution of such plans as have been made the rate could never be maintained because of the excessive interest charges. Councilman J. J. McGinty expressed similar views. It is a fact that the company is investing considerable money in shops and division buildings, but this work was delayed for years by the controversy between the city and company. The criticism has come from members of the Council who have not been in close touch with the history of the road and not from the special committee which did study the matter some time ago. The increase in the deficit is partly due to the charges of $18,000 per month, made for the abandonment of power equipment and cars and restoration of the maintenance fund. Since the company was not free to take care of the loss in its own way, the charge had to be made.

Councilman Robert Koch, chairman of the street railway committee, has announced that he will favor the adoption of a flat rate of three tickets for 10 cents in place of the charge for transfers. He argues that the charge for transfers is unfair. This announcement has provoked some discussion of the zone system.

George R. Davies, president of the local branch of the Amalgamated Association, presented another proposition to the company on Aug. 22. It provides for an increase in wages from 27 cents to 30 cents for first-year men and from 30 cents to 35 cents an hour for the men who have been in the service for more than a year. There is a further provision that the minimum work day shall be eight hours and the maximum day, nine and a half hours, 75 per cent of all runs to be made within twelve consecutive hours and the other 25 per cent within fourteen consecutive hours. This change in hours would necessitate a revision of the schedules and seriously affect the cost of operation. J. J. Stanley, president of the company, said that any proposed arbitration must be made on the basis of the original demands, and on Aug. 25 forwarded a communication to the local union refusing the latest demands for increased wages and readjustment of the length of the work day.

Northampton Strike Settled

The strike of the employees of the Northampton (Mass.) Street Railway, which was begun on Aug. 19, was settled on Aug. 25 through the efforts of Bernard F. Supple, secretary of the Massachusetts Board of Conciliation and Arbitration. An agreement has been signed by the company and the local branch of the Amalgamated Association, under the terms of which all employees were to return to work without prejudice and all motormen and conductors receive an increase of 2 cents an hour above their previous rate of pay, employees in carhouse, line and track departments to have an increase of 2½ cents per hour in wages. Motormen and conductors will now receive a minimum of 25 cents an hour in a graduated scale of wages reaching a maximum of 30 cents an hour at the end of six years' service. An extra daily time allowance of ten minutes will be granted for taking out and putting up cars and making reports to the company. The company agrees so far as possible to arrange its schedules of regular runs on the nine-hour basis. As a result of the agreement, the men gain an increase of 2 cents an hour in all grades over the schedule awarded by the recent board of arbitration, while the company is not obliged to grant the demand for $3,600 in back pay for which the men contended, and the men are required to work on platform time. From June 1, 1914, the men receive increases reaching an estimated total of $3,600 per year and the agreement is to remain in force until June 1, 1916.

Beginning Promised on New Buffalo-Niagara Line

According to the Buffalo *Commercial* the International Railway, Buffalo, N. Y., is planning to carry out at once all the preliminaries looking toward the construction of the proposed Frontier Electric Railway on a private right-of-way between that city and Niagara Falls, first proposed about a year ago. In this connection E. G. Connette, president of the company, is quoted as follows:

"The building up of Buffalo, the Tonawandas and Niagara Falls, the increase of traffic between these cities throughout the year and in addition to that the ever-growing tourist travel to and from the falls have made it necessary to go ahead with such an extension and expansion of the International's interurban service.

"We have realized the advantages of a direct trunk-line high-speed service between Buffalo, the Tonawandas and the falls, but it was inadvisable to build a parallel or additional route across the Niagara frontier until the local inter-communication on the present Niagara Falls route grew to such a point that the traffic there would maintain the old line and give the company an opportunity to develop a separate trunk line service.

"It is well understood that it would be difficult to finance a big undertaking at the present time, but the International Railway is in a position to go right ahead with the first portion of this new interurban service by laying out and grading the roadbed for the new trunk route."

Thirty-Year Railway Power Contract Closed in Texas

The Texas Power & Light Company, Dallas, Tex., has closed a contract with the Texas Traction Company to furnish energy to operate the latter's railway system and has leased the McKinney power plant of the railway company. The contract covers the sale of $100,000 worth of energy annually for thirty years. Lines will be constructed connecting the present "transmission district" of the Texas Power & Light Company with the northern group of cities served by the company. Construction will also be begun soon on the new power plant for the latter company on the Oklahoma bank of the Red River.

At present the Texas Power & Light Company operates in thirty-three Texas communities having an aggregate population of 212,000. Its connected load in lighting aggregates 14,000 kw and in motors 12,401 kw. In addition, it operates 3200 street lamps and sells energy to several interurban railways. This railway load alone amounts to 2300 kw and consumes about 1,300,000 kw-hr. each month.

Cotton gins, oil mills, cotton mills, city water pumping and railroad shops make up the principal classes of its industrial customers, while the company has one user, a cement plant, which, with a connected load of 3500 kw in motors, consumes 2,500,000 kw-hr. per month.

The majority of the thirty-three communities now served by the Texas Power & Light Company lie quite close together geographically, and already some twenty-three of them have been linked by the high-tension lines of the company and compose what is known as its "transmission district." This entire central system is fed with energy from two steam plants at opposite ends of one of the main transmission circuits. The communities outside the present transmission district are now served by individual steam or Diesel-engine plants, but will later doubtless be reached by the high-tension network as this is extended from its present nucleus.

The Opportunity of the Panama-Pacific Exposition

C. C. Moore, president of the Panama-Pacific International Exposition at San Francisco, states that at no time had the directors a thought of postponing the opening date of the exposition on account of the European war. Forty-four states of the Union have made appropriations and are actively engaged in building state pavilions and preparing their exhibits. The various state appropriations are made for a stated period, and a delay in the exposition would necessitate going to the legislatures for more money. The exhibit palaces are completed and the installations have already begun on a large scale. Thirty-four foreign nations have made appropriations and are actively engaged in erecting their official buildings and preparing their exhibits regardless of war, so that any postponement in the exposition would complicate the situation. Of the foreign nations that are now preparing buildings and exhibits, only three are concerned in war, and none of these has indicated that its arrangements for participation will be interrupted. France and Italy have cabled that their preparations to participate are proceeding despite the war. The Argentine government cabled on Aug. 13 that it was preparing to increase its exhibits and accordingly requested the exposition officials to assign additional space. Brazil also cabled that it intended to proceed with larger plans for an exhibit at the exposition. For the first time in its history China has made application to display machinery, and space has been assigned the Chinese Republic in machinery palace in addition to assignments in the other exhibit palaces. The operation of the new regional banks and the added number of ships flying the American flag and making quick time from coast to coast, through the Panama Canal, places the United States in a most favorable position to bring American manufactures to the attention of the distributors and consumers of the world who are at peace.

Hearings on Location of Kansas City Interurban Terminal

Public hearings on the location of the new interurban railway station in Kansas City, Mo., were held during the week ended Aug. 22 by the board of control of the Kansas City Railways. Citizens interested in the various sites presented their arguments, and plans for financing the building were outlined. Several groups offered definite building plans. In most cases the suggestions were for a building of several stories to occupy a block. The board has instituted an investigation of the subject for itself. Among the details which will influence the result are the currents of traffic and the comparative number of transfers as shown by the records. It is said that 40 per cent of the passengers on the interurban railways now transfer to the Kansas City Railways. This would indicate that only 60 per cent would stay on the cars to the station. There is also a large amount of transferring from the city lines to outbound interurban cars. Another factor is the traffic on the interurban railways in connection with the old Union depot in the west bottoms. This will be radically changed, perhaps, when the new union station is opened.

The physical plant of the Kansas City Railways has been improved under the receivers. About three years ago special reports made to the engineers showed that nearly 70 miles of track needed immediate attention, and repairs were begun. The chief trouble was due to paving and the depreciation of the foundation of the rails. It is said now that less than 6 miles need attention. Some heavier rails have been laid, notably near the new union station and in the west bottoms where the cable line will be replaced by electricity.

New Colorado Commission

Governor Ammons, of Colorado, has named George T. Bradley as a member of the State Public Utilities Commission which replaced the State Railroad Commission of Colorado on Aug. 13. When the public utilities law was enacted it provided that A. P. Anderson and S. S. Kendall, two of the members of the Railroad Commission, should be two of the three members of the new commission. Mr. Bradley is the third member. The law was suspended until Aug. 13 through the filing of a referendum petition, but Judge George W. Allen, of the district court, recently held the petition was fraudulent, and enjoined the Secretary of State from submitting the law to the people. The act extends the jurisdiction formerly exercised by the State Railroad Commission, which had control only over railroads, to every form of public service, including telephone, water, light, power and telegraph. Mr. Anderson, of the commission, said:

"While the new act requires a much larger office force than we now have, we do not propose to make any very large extension of the force at the present time. The two 'revenue making' sections of the bill are still held up by a petition referring them to the vote of the people at the coming election. The act appropriated $25,000 to maintain the commission, with the expectation that there would be considerable revenue from fees, but these fees will not be forthcoming until after the election, and if the referred sections are defeated we will get no revenue at all until after the Legislature can meet and amend the act."

Improvements in Schenectady

In accordance with its agreement to extend its lines from Schenectady to South Schenectady and to Carman and through the Grand Boulevard if it were not compelled to sell six tickets for a quarter, the Schenectady (N. Y.) Railway has announced that it will soon proceed to make these improvements. The improvements as estimated at that time, and the estimated cost of the improvements to be made in the next three years follow:

Grand Boulevard and double-tracking of lines in Union and Wendell Avenues and Rugby Road	$206,500
Renewals of present rails and overhead construction	194,700
New emergency carhouse	14,000
New machine shop and equipment	100,000
New substation in McClellan Street	102,430
Block signal systems on three interurban lines	75,000
Six new interurban cars	54,000
Ten trailers for city lines	30,000
Remodeling seventy cars into pay-at-entrance type	42,000
Changes in underground and overhead feeder systems	84,125
Changes incident to widening Lafayette Street	96,100
Total	$998,855

Though the statements of J. F. Hamilton, general manager of the company, provide that these improvements were intended to be made within three years, plans already have been made to extend the lines to suburban districts in the near future. The company has also drafted petitions to be sent to the Schenectady Common Council and to the Town Board of Rotterdam at its next meeting.

Brooklyn Subway Section Contract Let

During the week ended Aug. 22 the Public Service Commission for the First District of New York awarded to the Flinn-O'Rourke Company, Inc., the contract for the construction of Section 3 of Route No. 33, the Montague Street portion of the Whitehall-Montague Street tunnel line in Brooklyn. This firm was the lowest of eight bidders at $3,395,152. The bids ranged from the figure given to a little more than $5,000,000. The contractor must begin work within sixty days after the delivery of the contract and give a bond for $500,000. He will have thirty-six months in which to complete the work. This contract is a continuation of the Whitehall-Montague Street tunnel line for operation by the New York Municipal Railway Corporation, and the same company has the contract for building the tunnel.

The third contract for special work for the Fourth Avenue Subway in Brooklyn has been awarded by the commission.

It covers the supply of switches and frogs for certain portions of that subway. The contract went to the lowest bidder, the Pennsylvania Steel Company at $37,426, for final delivery within 100 days.

The commission has advertised for bids to be opened on Sept. 15, for the construction of Section 2 of Route No. 48, the William Street portion of the Park Place, William and Clark Street Subway to be operated by the Interborough Rapid Transit Company. The plans call for a two track underground railroad to be completed within twenty-eight months from the delivery of the contract.

The Third Avenue Railway has begun operation with storage battery cars of the line from Bartow Station on the New York, New Haven & Hartford Railroad to Belden Point, City Island. Eventually the road will be operated by overhead trolley, but for the present eight storage battery cars are used.

Attempt to Organize Baltimore Employees Fails

The attempt that was made to organize the employees of the United Railways & Electric Company, Baltimore, Md., and precipitate a strike in that city has failed dismally. The men who became affiliated with the union were largely trainmen who had been discharged for cause, and the call for a strike which was issued on Aug. 24 at three o'clock ordered the men to quit their cars at 7 p. m. The attempt to stop service resulted only in delay to the cars and in the arrest of about thirty disorderly persons. On the morning of Aug. 25 practically the full force of motormen and conductors reported for duty. The relations of the company with its employees have always been very friendly. William A. House, president of the company, announced that he considered the attempt to array the men against the company not only adverse to the best interests of both the men and the company, but to the riding public as well. That the relations of the company and the employees were satisfactory, he said, was shown by the loyalty with which the men supported the company.

Municipal Ownership Carried at Pekin, Ill.—The proposition to authorize the city to issue bonds to provide funds to purchase, reconstruct and extend the Pekin & Petersburg Railway in Pekin as a municipal undertaking carried at a special election at Pekin, Ill., on Aug. 21.

Extension of City Line Opened in San Francisco.—The Van Ness Avenue line of the San Francisco (Cal.) Municipal Railways has been placed in operation. The branch is 3½ miles long and extends from Market Street and Van Ness Avenue to the Chestnut Street terminus. Seventeen cars have been placed in service, six of them running the full length of Van Ness Avenue and the other eleven running from the ferry to Geary Street and Van Ness Avenue, thence to the exposition grounds.

War Interferes with West Indian Electrification.—The work of reconstructing and equipping the Bridgeton Tramway, Bridgeton, Barbados, West Indies, with electricity will be postponed for the present on account of the war. The property is owned by William B. McKinley, president of the Illinois Traction System, and his associates, and W. R. Morrison, long connected with McKinley properties, was on his way to Bridgeton and had got as far as New York when war was declared. Contracts for part of the material to be used in the reconstruction had been placed with German manufacturers.

Supplementary Bus Service in Seattle.—The utilities committee of the City Council of Seattle, Wash., has recommended for passage a bill appropriating $25,000 from the city stable bond fund for the purchase of five automobile buses, to be operated by the city to connect Divisions "A" and "C" of the Municipal Railway, and run in opposition to the Seattle, Renton & Southern Railway on Fourth Avenue and the lines of the Puget Sound Traction, Light & Power Company on streets where common user rights cannot be obtained without litigation. Transfers will be issued from the buses to the municipal lines.

Hazleton Strike Declared Off.—The strike of the employees of the Lehigh Transit Company, Hazleton, Pa., which was started on Jan. 1, was declared off by the men on Aug. 22. Three of the thirty-eight strikers, members of the grievance committee, voluntarily withdrew from further consideration in the issue and the company agreed to take all of the others back. The charge made by the company against the grievance committee was that its members broke faith with the company when the strike was declared. References to the strike have appeared in the ELECTRIC RAILWAY JOURNAL of Jan. 24, page 201; April 18, page 894; July 18, page 140, and Aug. 8, page 270.

New York City Franchise Abandoned.—The New York (N. Y.) Railways has filed with the Public Service Commission of the First District of New York a declaration of abandonment of its franchise route over what is known as the Roosevelt Street ferry branch of the Madison Street surface line. The route runs from Roosevelt Street ferry to South Street, to James Slip, New Chambers Street, and to the intersection with Madison Street. The company's application for authority of abandonment states that the board of directors authorized the abandonment on May 6, and on July 1 more than two-thirds of the stockholders and upward of two-thirds of the bondholders ratified the action of the board.

Baseball Game Between the Bangharts and the McWhirters.—The annual baseball game between the Bangharts and the McWhirters occurred at Donnelly's, College Point, L. I., last month. The occasion was the annual outing of the McWhirter-Banghart Relief Association. After the game, at which the McWhirters won, a shore dinner was enjoyed. W. O. Wood, president and general manager of the New York & Queens County Railway, was umpire-in-chief. Among those who distinguished themselves during the game were C. S. Banghart and J. S. McWhirter, captains of the respective teams; Major Evans, H. L. Ransom, C. R. Ellicott, W. R. Kerschner, A. Green, C. W. Wilder, F. A. Elmquist, J. J. Dempsey and A. McIver.

Strike in Maryland.—The motormen and conductors in the employ of the Cumberland & Westernport Electric Railway, Cumberland, Md., went on strike on Aug. 19 to enforce their demands for an increase in wages to a uniform scale of 26 cents an hour. This would mean an increase of 1 cent for motormen and 3 cents for conductors. Ferdinand Williams, president of the company, stated that the company was willing to have the Public Service Commission mediate, were the offer acceptable to the men. He said the men could go to work at once, pending the finding of the commission. He added that the company would be willing to give the increase asked by the men if the receipts warranted it, but that this year's income was less and the expenses greater than last year.

Service Resumed in Vincennes.—An appeal to the Federal Court for an injunction enabled S. S. Bush, Louisville, Ky., operator of the Vincennes (Ind.) Street Railway, to resume operation on the lines in Vincennes. Mr. Bush asked that the order be directed against the striking employees, the members of other unions in Vincennes and the city administration. Under protection of the Federal Court, limited operation was resumed pending the hearing on the temporary injunction in the Federal Court in Indianapolis. Mr. Bush is quoted as follows: "We found it necessary to discharge the old employees because they were unfriendly to the company or were intimidated by threats of violence on the part of outsiders. We are putting other men to work as rapidly as we can, though we are not using professional strike breakers to keep the cars moving."

Stone & Webster Men in the War Zone.—A number of Stone & Webster men were in Europe at the recent beginning of hostilities, but so far as is known, all are now outside the immediate centers of military attack. Charles F. Wallace of the Stone & Webster Management Association returned to Boston recently on the *Finland* from England, and E. N. Lake of the Chicago office of the Stone & Webster Engineering Corporation has arrived in Boston after a voyage from Antwerp. J. F. Manning, Frederick Arnold, W. L. Fales, and Henry Houghton of the Boston office were in England at last accounts, as was George Winthrop Lee, librarian of Stone & Webster, who went to Paris in midsummer to attend an Esperanto conference. Mr. Lee was obliged to leave the city twelve hours after his arrival on account of the mobilization of troops. It is expected that Mr. Lee will sail from England for home within a few days and that Messrs. Arnold and Fales will return via the Italian-Mediterranean lines. J. W. Buzzell of the New York office was last heard from in London.

Financial and Corporate

Recent Financial Tendency

As far as the New York Stock Exchange is concerned the policy of the board of governors of "watchful waiting" continued on Aug. 27. The present is the longest period that the New York exchange has remained closed and is the first time in the history of Lombard Street that the London Exchange has suspended. In the panic of 1873 the New York Exchange was closed for ten days. On Aug. 25 it was reported by cable from London that the London Stock Exchange had appointed a sub-committee to consider the advisability of opening. Many suggestions have been made for opening the New York exchange, among them one that the exchange be opened for domestic trading only, under a rule prohibiting buying and selling American securities for account of foreign investors. The recommendation made by Henry Clews was that the exchange be opened on a given day for a limited period, operations to be confined to four designated active stocks.

Some of the influential commission houses in New York are understood to have urged their clients to buy stocks on the cash basis authorized by the exchange. In this connection the return on a number of principal issues on the basis of the closing prices of July 30 has been pointed out, among them Atchison and Steel preferred returning nearly 7 per cent; Brooklyn Rapid Transit 7½ per cent; Steel common more than 9 per cent and Amalgamated Copper better than 12 per cent, to mention only a few.

On Aug. 25 President de Aguero of the Consolidated Stock Exchange in New York, announced that the resumption of trading was being considered by that body, the plan being to confine transactions within a limited range of prices, the minimum being an average of about one point below the closings of July 30, all trades to be for delivery on the following day and no marginal trading to be allowed. The latter rule would eliminate short selling. What the problems are that attach to reopening are indicated by the more than $100,000,000 of European securities dumped on the American market in the last week of trading in New York. The European market absorbs annually about $300,000,000 of American securities, and no less an authority than Sir George Paish, editor of the *Statist*, London, has estimated that $6,000,000,000 of American securities are owned in Europe.

While the matter of opening the exchanges is an important one, the question which at the time this report was being written caused most concern was that of caring for outstanding foreign indebtedness. As regards the restoration of international credits only moderate progress has been made. The national banks and the trust companies necessarily have taken a position against movements of gold that are not essential. In connection with the question of foreign obligations, the suggestion has been made that a clearing house be established for foreign exchange and that all requests for gold to satisfy legitimate commercial credits be referred to the clearing house and that shipments of gold be permitted only in case of necessity. So far interchange credit arrangements have been worked out with France, Italy, Switzerland and Argentina. London still insists upon being paid in gold, wherever obligations contain a provision for payment in that form, and the effort has thus far proved unavailing which was advocated of allowing money owed in England by corporations and banks in the United States being paid here and drawn against for import. In the meantime exports from the United States, while moving now in considerable volume, are still far below the amount needed to offset American debts in the British capital. The question that confronts a number of American railroads with early maturities is whether any of their obligations about to become due are effected by the English moratorium.

It is generally anticipated that the plan worked out by the National City Bank of establishing South American branches will facilitate our trade and tend to enlarge our commercial field. In this respect the direct banking connections made by the Broadway Trust Company, New York, with Japan is of interest. Heretofore importations to Japan have been made through the instrumentality of bankers of London and other European countries. Letters of credit are already being issued under the new arrangement.

According to *Financial America* the most striking feature of the abstract of the condition of the national banks of the United States as to June 30 last, just published in detail by the comptroller of the currency, was the ability of these institutions to preserve their strength in gold holdings notwithstanding the enormous drain of gold to Europe in the first half of the year. For the six months ended June 30, 1914, the net exports of gold in excess of imports was more than $53,000,000 and yet the banks at the end of the month held in gold coin and gold certificates $625,863,069, compared with $592,759,204 on Jan. 13, 1914, as reflected by the comptroller's exhibit, an actual increase of $33.103,865. Compared with the statement of March 4, 1914. the gold holdings on June 30 last fell only $4,789,906. The explanation is offered that in anticipation of a foreign demand the banks operated their accounts so as to displace gold in circulation with silver certificates, as the holdings of silver dollars and silver certificates declined $23,519.980 from Jan. 13 to March 4, 1914, though there was an increase in silver holdings from March 4 to June 30 of $4,259 740. The reduction in this item from Jan. 13 to June 30, 1914, was $19,260,240. The six months' native production of gold was about $45.000,000, assuming an annual output of $90.000 000 gold for the United States. This figure, coupled with the exchange of silver for the more precious metal in the last six months, would have provided a surplus of about $11,000,000 over the gold exports of $53.000,000 in the half-year.

While in individual cases the losses to American trade have been severe, many of the almost wholesale curtailments reported in the daily papers during the early stages seem to have been greatly exaggerated. In the electrical trade only such adjustments have been made as were concomitant with the unprecedented situation with which manufacturers found themselves confronted. The early reports of wholesale automobile and typewriter retrenchment certainly were greatly exaggerated and the interviews with men prominent in New England industry which have appeared in the Boston *News Bureau* do not bear out the early pessimistic utterances. That the grain and the cotton problems are posers none will deny. The problem that confronts the electric railways is largely one of future financing. For the present, at least, one may expect only such important improvement work to be carried out as has already been financed. While the earnings of American public utility companies will probably not suffer materially, except through cessation in industrial work and the consequent loss of traffic, the tendency to go slow has already manifested itself in the suspension of dividends by a number of companies as a means of harboring resources. The cessation of dividends by the Cities Service Company and the Fonda, Johnstown & Gloversville Railroad has already been noted in these columns, and to these companies are added this week the Portland Railway, Light & Power Company, Portland, Ore., and the Tennessee Railway, Light & Power Company, Memphis, Tenn. Furthermore there is the deferring of action by the trustees of the Chicago Elevated Railways in regard to the expected quarterly dividend on the preferred participating certificates of that company.

The features of the country's foreign trade return for July, made public on Aug. 25, were the new high record for July imports of $160,178.000, and the excess for the month of imports over exports of $6.095,000. July therefore was the fourth consecutive month in which the country's imports have exceeded the exports. Taking the seven completed months ending with July, the export balance stands at only $59.625,000, whereas in the same months last year the exports exceeded imports by $307,907,000. A year ago the July figures showed an export excess of $21.929 000. These figures do not of course cover the period of the European war disturbance except during its preliminary stages in the last week of July.

The emergency shipping bill authorizing the admission of foreign-built ships to American registry was signed by President Wilson on Aug. 22. Regulations under the new law are in course of preparation by the Bureau of Navigation.

ANNUAL REPORTS

New York, New Haven & Hartford Railroad

The New York, New Haven & Hartford Railroad and its associated companies have issued a summarized report of operations for the year ended June 30. In that period the parent company had left, after paying interest and rental charges, only $268,662, as compared to a balance of $8,922,000 reported for 1913. In its introduction to the statements the New Haven says of the net income as reported:

"This represents the amount available for the payment of floating debts, additions, and improvements necessary, but unproductive or only partially productive, such as new stations, and therefore preferably payable out of income rather than from new capital, and for dividends. The fiscal year ended June 30 has been a difficult one for all transportation companies and particularly for those in New England. A summary of the figures shows that the many complications and difficulties to be met by the various properties resulted in balances over fixed charges as follows:

New York, New Haven & Hartford Railroad, surplus	$ 268,662
Central New England Railway, surplus	230,020
New York, Ontario & Western Railway, surplus	663,692
New England Steamship Company, deficit	77,802
Hartford & New York Transportation Company, surplus	85,965
New Bedford, Martha's Vineyard & Nantucket Steamboat Company, surplus	62,708
The Connecticut Company, surplus	1,501,072
The Rhode Island Company, surplus	347,642
Berkshire Street Railway, deficit	72,507
New York & Stamford Railroad Company, deficit	5,824
Westchester Street Railroad, surplus	4,883
New York, Westchester & Boston Railway, deficit	246,923
Housatonic Power Company, surplus	78,506
Westport Water Company, surplus	1,664

"Every property of the New York, New Haven & Hartford Railroad earned its fixed charges except four, including the New England Steamship Company. The Berkshire Street Railroad shows a deficit of $72,507, whereas a year ago the deficit was $91,861, showing an improvement of $19,354. The New York & Stamford Railroad Company reduced a deficit last year of $36,556 to $5,281 this year, showing an improvement of $30,732. The New York, Westchester & Boston Railway (apart from the interest on its bonds and notes) reduced its deficit from $334,554 to $246,923, an improvement of $87,630.

"The statements of income, profit and loss for the New York, New Haven & Hartford Railroad and its subsidiaries are shown in the accompanying table. In connection with these statements the preliminary summary gives the interest of the New York, New Haven & Hartford Railroad in the various subsidiaries as follows: Central New England Railway, 99.8 per cent; New York, Ontario & Western Railway, 50.1 per cent; New England Steamship Company, Hartford & New York Transportation Company, New Bedford, Martha's Vineyard & Nantucket Steamship Company, Connecticut Company, Rhode Island Company, Berkshire Street Railway, New York & Stamford Railway, Westchester Street Railway, Housatonic Power Company and Westport Water Company, sole interest, and New York, Westchester & Boston Railway, 99.6 per cent.

TABLE SHOWING STATEMENTS OF INCOME, PROFIT AND LOSS FOR NEW YORK, NEW HAVEN & HARTFORD RAILROAD AND VARIOUS ELECTRIC RAILWAY SUBSIDIARIES.

	New York, New Haven & Hartford Railroad		Connecticut Company		Rhode Island Company		Berkshire Street Railway	
	1914	1913	1914	1913	1914	1913	1914	1913
Operating revenue	$66,703,172	$69,258,950	$8,085,398	$8,454,624	$5,379,148	$5,322,646	$ 994,466	$ 979,068
Operating expenses and taxes	52,083,568	50,942,095	5,767,388	5,868,526	3,896,798	3,561,613	864,577	907,697
Operating income	$14,619,604	$18,316,855	$2,318,010	$2,586,098	$1,482,350	$1,761,033	$ 129,889	$ 71,371
Other income	7,247,989	10,063,785	260,522	62,078	144,658	129,532	2,349	1,430
Gross income	$21,867,593	$28,380,640	$2,578,532	$2,648,176	$1,627,008	$1,890,565	$ 132,238	$ 72,801
Deductions—interest, rentals, etc.	21,598,931	19,458,402	1,077,460	1,039,155	1,279,365	1,220,514	204,745	164,662
Net corporate income	$ 268,662	$ 8,922,238	$1,501,072	$1,609,021	$ 347,643	$ 670,051	*$ 72,507	*$ 91,861

	New York & Stamford Railway		Westchester Street Railroad		New York, Westchester & Boston Railway	
	1914	1913	1914	1913	1914	1913
Operating revenue	$ 371,462	$ 370,100	$ 252,186	$ 242,507	$ 400,910	$ 289,500
Operating expenses and taxes	284,515	320,317	234,013	286,805	559,886	574,547
Operating income	$ 86,947	$ 49,783	$ 18,173	*$ 44,298	*$ 158,976	*$ 285,047
Other income	457	407	205	220	33,772	52,959
Gross income	$ 87,404	$ 50,190	$ 18,378	*$ 44,077	*$ 125,204	*$ 232,088
Deductions—interest, rentals, etc.	93,229	86,747	13,494	10,676	121,719	102,467
Net corporate income	*$ 5,824	*$ 36,557	$ 4,884	*$ 54,753	*$ 246,923	*$ 334,555

*Deficit.

Cleveland Transfer Charge Restored

The report of the Cleveland Railway, made to the directors on Aug. 22, shows the interest account to have been $276,802.05 on Aug. 1. Under the Tayler franchise, the company was entitled to adopt the next higher rate of fare in the fixed scale on that date, but because the figures could not be put into shape until late in August, the higher rate will go into effect on Sept. 1. This change comes about automatically, as the interest fund has dropped below the minimum of $300,000. The rate will now be 3 cents with 1 cent for transfers and no rebate. It will continue until the interest fund reaches $700,000, when it will automatically drop back to the straight 3-cent rate again. The rate taken under the ordinance, however, may not produce a sufficient amount to increase the interest fund to that point and take care of other charges that the company has been compelled to meet. Unless some other plan were adopted, the transfer charge would remain. If found necessary to maintain the interest fund intact a higher rate of fare may be adopted. It is believed, however, that this rate will take care of the expenses and the fund. The charge for transfers is estimated to produce about $800,000 per year.

The monthly reports made by the company for July show the figures based on the ordinance allowances and those based upon actual expenditures, for both 1914 and 1913. These reports are as follows:

Based on Ordinance Allowances

	1914	1913
Operating revenue	$664,869	$629,994
Car mile allowances for maintenance and operation	538,020	487,205
Net operating revenue	$126,849	$142,789
Non-operating income	4,989	1,016
Gross income, less allowances	$131,838	$143,805
Taxes	38,469	38,628
Income, less allowances and taxes	$93,369	$105,177
Interest	142,156	130,369
Deficit	$48,787	$25,192
Special allowances	18,000	......
Net deficit	$66,787	$25,192

Based on Actual Expenses

	1914	1913
Operating revenue	$664,869	$629,994
Maintenance and operating expenses	601,233	485,825
Net operating revenue	$63,636	$144,169
Non-operating income	4,989	1,016
Gross income, less expenses	$68,625	$145,185
Taxes	38,469	38,628
Income, less expenses and taxes	$30,156	$106,557
Interest	142,156	130,369
Deficit	$112,000	$23,812
Obsolete property	12,000	......
Net deficit	$124,000	$23,812

Chicago (Ill.) Elevated Railways.—At the meeting of the trustees of the Chicago Elevated Railways, it was decided to defer action on the declaration of a quarterly dividend of 1½ per cent on the preferred participating shares. Action on the dividend was expected at this time, but no date has been set for any future meeting.

Cincinnati, Lawrenceburg & Aurora Electric Street Railway, Cincinnati, Ohio.—Frank B. Shutts has been appointed receiver of the interests of the Cincinnati, Lawrenceburg & Aurora Electric Street Railway in Indiana. He was appointed receiver of the company in the state of Ohio some time ago.

Cities Service Company, New York, N. Y.—The directors of the Cities Service Company have referred the question of dividends to the executive committee, which will make its recommendation to the board at some future time. Formal announcement was made by the company in the early part of the current month that payment of further cash dividends would be deferred until a reliable forecast could be made of the financial situation and the security markets.

Gary & Interurban Railroad, Gary, Ind.—Willoughby G. Walling recently resigned as trustee of the Gary Connecting Railways and the Gary & Interurban Railway. The directors of the Gary & Interurban Railroad, which is the successor company by consolidation to the above railway, have appointed William P. Abbott to succeed Mr. Walling.

Kansas City Railway & Light Company, Kansas City, Mo.—John B. Dennis, S. L. Fuller, Jerome J. Hanauer and James J. Storrow, composing the committee representing the 6 per cent collateral notes of the Kansas City Railway & Light Company, deposited with the committee at the New York Trust Company under an agreement dated Aug. 15, 1912, announce that interest on the notes from March 1 to Sept. 1, 1914, will be paid on the latter date at the New York Trust Company at the rate of 7 per cent per annum.

Monterey Railway, Light & Power Company, Monterey, Mexico.—The total net earnings of the Monterey Railway, Light & Power Company for 1913 are reported to have amounted to $444,251. After meeting fixed charges and interest on debenture stock and providing for the dividend of 5 per cent on the preferred stock, there remained a balance of $127,251, increasing the surplus brought forward to $601,098, out of which $150,000 has been placed to reserves for contingencies, increasing that fund to $450,000, leaving a credit to profit and loss of $451,098. The loss to the company on account of the disturbed conditions in Mexico is said to be represented principally by diminished earnings. Owing to the unsettled conditions and unknown future, and to the exorbitant rate of exchange upon transfers of money out of Mexico, the directors decided that it would not be in the interest of the holders of the debenture stock to pay the interest due in February, 1914, and a circular to that effect was issued.

Northern Illinois Light & Traction Company, Ottawa, Ill.—The Northern Illinois Light & Traction Company, controlled by the Western Railways & Light Company, reports gross earnings for the year ended June 30, 1914, of $243,207, an increase of $34,505, or 16.53 per cent, over the preceding year. Operating expenses were larger by 9.05 per cent, and net earnings were $115,448, a gain of $23,914, or 26.12 per cent. Interest and other charges were $34,484, an increase of 14.42 per cent, and the surplus, after all charges, was $80,963, a gain of $19,572, or 31.88 per cent.

Pacific Gas & Electric Company, San Francisco, Cal.—As subscriptions have been received for more than 70 per cent of the issue of $12,500,000 of new first preferred stock of the Pacific Gas & Electric Company, the financial plan outlined in a letter to the stockholders under date of June 3, 1914, has been declared operative. Up to Aug. 15 the subscriptions received exceeded $8,750,000 from 3000 subscribers. Many of the subscribers have either paid for their stock in full or have signified their intention of completing the full payment upon allotment, but in view of the disturbed financial conditions the directors have deferred the time of payment of the second installment of $15 a share from Aug. 15 to Oct. 15, of the third installment of $12.50 a share from Oct. 1 to Nov. 15 and of the fourth installment of $12.50 a share from Jan. 1 to Jan. 15, 1915.

Portland Railway, Light & Power Company, Portland, Ore.—In a circular to the stockholders of the Portland Railway, Light & Power Company announcing the passing of the regular quarterly dividend of 1 per cent, which is due at this time and usually payable on Sept. 1, the directors say in part: "The annual report of the company for the year ended Dec. 31, 1913, gave information as to the earnings and financial condition of the company. The figures given showed that the surplus available for dividends upon the stock had been decreasing steadily for two years, owing to business depression, very heavy increase in taxes and increased interest charges. When the report was written on May 1, 1914, it was thought that these unfavorable conditions had about run their course and that gradual improvement might be expected. Up to the present time, unfortunately, the expected improvement has not manifested itself. Under these circumstances, the interests of the stockholders require that the company should conserve its cash resources so as to be prepared for any eventuality, and the directors have accordingly determined to pay no dividend on Sept. 1."

Tennessee Railway, Light & Power Company, Memphis, Tenn.—The directors of the Tennessee Railway, Light & Power Company have decided to defer the usual quarterly dividend payment on the $10,250,000 of 6 per cent cumulative preferred stock. An official statement says in part: "In view of the present unsettled financial and business conditions throughout the world, the board has decided that the only proper policy is to conserve our cash resources in every possible way until the effect of the war is more clearly determined. The regular quarterly dividend on the preferred stock will therefore not be paid on Sept. 1. The dividend of June 1, 1914, was made possible through contributions of the four banking firms which organized the company, without the creation of an obligation of any kind. The earnings during the past year have naturally suffered from the business depression, but it was assumed that with improving conditions due to excellent crops, and the completion of construction work, the company could continue to pay the regular quarterly dividends on the preferred stock. Several large contracts for sale of power were about closed, or under negotiation, and to provide for the increased business expected a contract had been made to purchase a large amount of power from the Brady plant on the Tennessee River, and the construction of the transmission line required for its proper utilization was commenced in May and has just been completed. This will enable us not only to operate most economically, but to take on new power contracts as fast as they can be secured. Owing to the present uncertainty, however, it is impossible to close at this time several large power contracts which were counted on materially to increase the earnings. The retail light and power and the street railway business will depend entirely upon industrial conditions. The company has financed its requirements until June, 1915, when bonds or a note issue must be sold. There would be no difficulty under normal conditions in doing this, but we have no precedents for the present situation, and forecasts of earnings or financial probabilities are of no value. The wise course, therefore, is to keep our cash position as strong as possible."

Washington-Oregon Corporation, Vancouver, Wash.—Federal Judge Cushman at Tacoma has put over until Sept. 21 the question of appointing a permanent receiver for the Washington-Oregon Corporation. The Fidelity Trust Company, Philadelphia, trustee for a mortgage made by the company for $5,000,000, under which $1,563,000 of bonds have been sold, desires to have E. M. Hayden, the temporary receiver, confirmed as the permanent receiver for the railway company.

Dividends Declared

American Railways, Philadelphia, Pa., quarterly, 75 cents, common.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Northern Texas Electric Company, Fort Worth, Tex., 3 per cent, preferred; quarterly, 1¾ per cent, common.

Terre Haute Traction & Light Company, Terre Haute, Ind., 3 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$11,458	*$8,870	$2,588	$1,084	$1,503
1 " " '13	12,101	*8,979	3,121	1,115	2,006
12 " " '14	121,731	*102,208	19,523	12,868	6,654
12 " " '13	122,103	*94,892	27,211	12,871	14,339

CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, NOVA SCOTIA

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$29,696	*$17,595	$12,101	$6,418	$5,683
1 " " '13	30,644	*17,913	12,731	6,081	6,649
12 " " '14	373,646	*207,338	166,307	75,252	91,055
12 " " '13	373,788	*200,742	173,045	70,311	102,734

COLUMBUS (GA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$54,119	*$20,797	$33,322	$26,480	$6,836
1 " " '13	49,093	*27,387	21,705	23,769	†2,064
12 " " '14	646,504	*274,090	372,414	299,445	72,977
12 " " '13	642,711	*294,962	347,749	238,573	109,176

DALLAS (TEX.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$177,619	*$105,887	$71,732	$35,218	$36,514
1 " " '13	168,591	*100,490	68,101	24,690	43,411
12 " " '14	2,279,271	*1,342,137	937,134	325,465	611,669
12 " " '13	2,008,281	*1,174,350	833,931	295,760	538,171

EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$58,250	*$34,201	$24,049	$8,351	$15,697
12 " " '14	624,413	*381,390	243,023	99,695	143,328

EL PASO (TEX.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$80,051	*$49,849	$30,202	$4,202	$26,000
1 " " '13	69,835	*38,775	31,060	4,180	26,880
12 " " '14	966,815	*532,768	434,047	51,307	382,740
12 " " '13	865,623	*466,085	399,538	51,547	347,991

FORT WAYNE & NORTHERN INDIANA TRACTION COMPANY, FT. WAYNE, IND.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$159,837	$93,406	$66,431	$53,771	$12,660
1 " " '13	154,376	92,077	62,299	48,399	13,900
6 " " '14	917,352	530,282	386,070	311,734	75,336
6 " " '13	865,545	512,283	353,262	288,139	65,123

GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$221,694	*$110,281	$111,412	$35,669	$75,743
1 " " '13	206,916	*111,907	95,008	34,754	60,254
12 " " '14	2,457,051	*1,374,886	1,082,164	434,069	648,095
12 " " '13	2,216,829	*1,273,959	942,869	410,585	532,284

HOUGHTON COUNTY (MICH.) TRACTION COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$24,507	*$16,610	$7,897	$5,550	$2,347
1 " " '13	26,162	*14,466	11,696	5,628	6,068
12 " " '14	288,368	*179,648	108,720	67,140	41,580
12 " " '13	311,526	*177,861	133,665	67,980	65,685

JACKSON (FLA.) TRACTION COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$59,531	*$40,570	$18,960	$12,491	$6,469
1 " " '13	56,702	*36,362	20,339	10,512	9,827
12 " " '14	730,804	*463,422	267,382	154,503	112,879
12 " " '13	593,015	*399,550	193,464	126,994	66,407

KENTUCKY TRACTION & TERMINAL COMPANY, LEXINGTON, KY.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$76,738	$38,220	$38,518	$19,682	$18,836
1 " " '13	70,199	33,058	37,141	19,145	17,996
12 " " '14	814,293	412,509	401,784	245,183	156,601
12 " " '13	772,825	401,507	371,318	225,267	146,051

MONONGAHELA VALLEY TRACTION COMPANY, FAIRMONT, W. VA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$90,857	*$37,615	$53,242	$25,535	$27,707
1 " " '13	78,737	*27,414	51,323	24,126	27,196
6 " " '14	494,717	*189,270	305,446	152,946	152,500
6 " " '13	442,066	*151,655	290,411	144,660	145,751

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$24,613	*$16,272	$8,340	$7,528	$12
1 " " '13	23,760	*15,446	8,313	7,540	773
12 " " '14	308,016	*196,515	111,500	91,623	19,877
12 " " '13	287,203	*190,440	96,763	87,952	8,811

PENSACOLA (FLA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$24,363	*$14,868	$9,494	$7,137	$2,357
1 " " '13	24,050	15,338	8,712	6,604	2,108
12 " " '14	285,662	*178,361	107,301	85,707	21,594
12 " " '13	285,832	*180,582	105,249	76,752	28,497

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$668,255	*$413,509	$254,745	$176,658	$78,087
1 " " '13	683,956	*402,562	281,393	171,961	109,432
12 " " '14	8,701,960	*5,059,171	3,642,788	2,096,611	1,546,177
12 " " '13	8,377,564	*4,901,470	3,476,094	2,025,892	1,450,202

SAVANNAH (GA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$73,014	*$49,122	$23,892	$22,646	$1,246
1 " " '13	69,390	*45,772	23,618	22,576	1,042
12 " " '14	848,180	*564,169	284,010	273,782	10,228
12 " " '13	787,028	*558,879	228,148	224,549	3,599

TAMPA (FLA.) ELECTRIC COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$81,685	*$44,011	$37,673	$454	$33,219
1 " " '13	69,773	*41,201	28,572	4,528	24,044
12 " " '14	933,560	*514,778	418,781	55,701	363,080
12 " " '13	779,434	*413,389	366,045	55,140	310,905

VIRGINIA RAILWAY & POWER COMPANY, RICHMOND, VA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., June, '14	$442,193	$221,775	$220,418	$135,828	$84,590
1 " " '13	426,512	197,876	228,636	128,209	100,427
12 " " '14	5,236,957	2,565,908	2,671,049	1,615,459	1,055,590
12 " " '13	4,950,810	2,416,988	2,533,822	1,500,501	1,033,321

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*Includes taxes. †Deficit.

Traffic and Transportation

Safety Zones in Louisville

The Louisville (Ky.) police department, in conjunction with the officers of the Louisville Railway, is making a test of the safety zone standards at Fourth and Walnut Streets, perhaps the busiest corner in the city. The moveable standards, with heavy iron pedestals and topped by a red metal flag with the words "Safety Zone" painted on them in white, have been placed on Fourth Street, about 50 ft. from the intersections and between the curbing and the street railway tracks on the sides at which the cars stop to discharge and take on passengers.

Samuel Riddle, superintendent of the Louisville Railway, agreed to co-operate with the police department, and the experiment is being tried out with interest not only to the police but to the owners and users of vehicles. If the trial at Fourth and Walnut Streets proves successful, similar standards will be placed at other busy corners in the retail section of Fourth Street, such as at the Chestnut Street and the Green Street intersections. At other corners the standards will need to be placed only on Fourth Street as that is narrow while the cross streets are exceptionally wide and give room enough for traffic to pass and people to board and leave cars at the same time.

A city ordinance prohibits any vehicle passing a street car which has been stopped to discharge or take on passengers, but the ordinance has been violated, especially on outlying streets where no traffic police are stationed. Recent accidents at downtown corners have prompted the trial of the standards, and, it is said, if they prove desirable, the system may be extended to include the intersection corners and transfer points of the Louisville Railway lines elsewhere in the city than the heart of the business section.

Anticipating a Public Need

The following interesting statement, complimenting the management of the Citizens Traction Company, Oil City, Pa., was contained in the *Democrat* of that city on Aug. 13:

"J. Harvey McClure, general manager of the Citizens' Traction Company, has introduced many changes in the operation of the cars of the company, with other conveniences for patrons, adding largely to the popularity of the service, with a corresponding increase in its patronage, since he assumed the duties of his important position. But there is probably none of these that will be more generally appreciated than that inaugurated yesterday when all of the big open cars running between Oil City and Franklin were furnished with a stool similar to those used by the Pullman Company on its sleepers.

"When the big cars were introduced into Oil City some years ago, each was equipped with a double step, running its full length on each side. The length of the car made it impossible to make the many sharp curves on Oil City's short streets in safety with the double-deck step, hence the lower one was removed. This left the distance from the street to the first step so great that an aged person, or one the least inclined to weight, could not negotiate it with any degree of comfort. Where the patron had passed middle age, getting on or off the car was also attended with considerable personal risk.

"As the cars were used only during the park season, the discomfort of boarding them or disembarking was submitted to without complaint. But Mr. McClure does not wait for complaints before conserving the comfort and safety of the men and women who travel on trolley cars. He gave the matter considerable thought, his inventive ability being stimulated by the new styles in gowns, which candor compels the admission were never designed to permit the wearer to take the high step the cars require. The Pullman stool seems to be the only solution of the problem. It is carried under the front or rear seat of the car and is easily placed when its use is necessary or demanded by a patron. That the device will be popular when it is more generally known that it is available is without question. It will tend to increase the patronage of these cars by ladies of modesty, besides eliminating the present name of the intersection of Sycamore and Center Streets known as 'rubber-neck corner.'"

Pussy-Footed Men Undesirable

At the annual meeting of the American Association of Railroad Superintendents in New York recently a communication was read from F. D. Underwood, president of the Erie Railroad, who was unable to be present. Mr. Underwood said in part:

"A retrospection shows me that I fell far short in all the essential qualifications I now attempt to portray. Even now I should like another chance on a red-hot division to prove I could be a better superintendent than I was.

"A superintendent should not do physical acts that can be done by someone else. The bawling, hauling we old-timers did is unwise from several points of view. A man who is never angry is not an efficient boss; the spur of anger should be concealed, used but to stimulate the stroke—never paraded.

"There are in all walks of life those who bluster, plead, lie and bring pressure from many sources. The processes used to carry their point are ingenious, plausible and persuading. Quietly sidetrack them when sure you are right; never willingly recede from a position that is fair.

"Breaking a rule or doing something outside of the rules is many times an offense to be condoned, provided the offender has brains. His action showed him fearless and perhaps expedient. There are the seeds of a good man in every rebel. Mentally pussy-footed sort of men are not desirable. An argufier—sometimes called a sea lawyer—has his uses.

"Never condemn a measure you want to kill; praise it, tell in how many times and places it would be fine, then put in the local misfit color."

Near-Side Stop in Leavenworth.—The Kansas City-Western Railway instituted the near-side stop in Leavenworth on Aug. 15.

Transfer Hearing in Missouri.—The Public Service Commission of Missouri will meet in Joplin on Sept. 19 to consider requests for broader transfer privileges from the Southwest Missouri Railroad.

Increase in Fare on New York Line.—The International Railway, Buffalo, N. Y., has filed with the Public Service Commission of the Second District of New York notice of a proposed increase in fare between North Tonawanda and La Salle from 10 cents to 15 cents, the increase to be effective on Sept. 15.

Decline in Traffic in Cincinnati.—Application has been made by the Cincinnati (Ohio) Traction Company to Mayor Spiegel and Service Director Fosdick for permission to reduce the service on all lines. The reason advanced is that many factories have laid off part of their forces and that the receipts of the company have declined about $500 a day. Mayor Spiegel has announced that he will take the matter under consideration, but that he will not consent to a reduction in service until an investigation now under way by the city has been completed.

Stopover Privilege Denied.—The Southwest Missouri Railroad, Joplin, Mo., having denied the request of the city that stopover privileges at the city market be granted, Charles A. Patterson, the city commissioner of public utilities and public property, ordered that cars stop at the market. The company refused stopovers because the tickets might be transferred by persons going to the market to others who are bound for destinations farther on the company's line.

Worcester Company Reduces Suburban Fare.—The Worcester (Mass.) Consolidated Street Railway is issuing special tickets which are to be used by passengers of the Worcester and Jefferson division of the company's lines. Under the new arrangement the tickets, used during certain hours of the day, entitle persons to ride between City Hall, Worcester, and the end of the line at Jefferson for 10 cents, or from Jefferson to City Hall. The fare has been 15 cents between Worcester and Jefferson. The tickets are good only between certain hours in the afternoon and in the evening.

New Through Illinois Traction System Service.—The Illinois Traction System, Peoria, Ill., has decided to run its local cars between Peoria and Decatur via Bloomington without change, the same as its limited cars. The running time between Peoria and Bloomington and Bloomington and Decatur will be shortened, and radical changes will be made in the leaving time of trains. An additional late train, which heretofore ran only to Mackinaw, will hereafter be operated through from Bloomington to Peoria. The company is now arranging to handle large crowds during the Illinois State Fair at Springfield and the National Implement and Vehicle Show at Peoria.

Changes in Fare Methods.—The Buffalo & Lake Erie Traction Company, Buffalo, N. Y., has announced that on Sept. 2 the regulation governing the collection of excess fare where fare is paid on cars will be changed to provide that no excess fare will be collected on fares of 10 cents or less; also establishing a new regulation to the effect that the point to point fares in the tariff do not apply to through transportation of passenger in cases where the through fare between the point of boarding and of leaving the car is more than 10 cents. In such cases the through fare will be charged and the regulations governing collection of excess fare will be applied.

Service Complaint in Hannibal.—The city attorney of Hannibal, Mo., has filed a complaint with the Public Service Commission of Missouri against the Hannibal Railway & Electric Company. The commission is asked to issue an order directing the company to provide better equipment; double track its lines on Broadway; provide sufficient cars to care for the traffic in the rush hours; sell tickets in lots at reduced rates, and make extensions which will insure transportation facilities to the northern part of the city. Extensions are asked to the Country Club and Riverside Park and the request is made that the company sell books of six tickets for 25 cents, and books of 100 tickets for $3.75.

Politics in Gary Fare Controversy.—On Aug. 18 the Common Council of Gary, Ind., issued a notice declaring the 3-cent-fare clause of the franchise of the Gary & Interurban Railroad to be in force. The franchise states that after the lines are in operation five years, tickets must be sold eight for a quarter. This clause the company will resist, it is stated, and an appeal will be made to the Public Utilities Commission. Alderman Dwight M. Kinder, Republican candidate for senator, is leading the attack on the company. State Senator Frank N. Gavit, Mr. Kinder's opponent and Progressive candidate for re-election, is president of the railroad. The company has been operating in the morning and evening rush hours for some time past at a 3-cent fare.

Traction Company Not to Transport Intoxicants.—At the last spring local option election in Decatur, Ill., the city went "dry" by a large majority, and the City Council passed an ordinance recently refusing any steam or electric or express company the right to bring any intoxicating liquor into the city. The chief of police called upon the agents of various companies and presented the order of the City Council in writing and demanded a receipt to the effect that the notice had been served. The representative of the Illinois Traction System, the Wabash, the Vandalia and the Cincinnati, Hamilton & Dayton Railroads, and the Adams, Wells-Fargo and America Express Companies complied with the order, but the agent of the Illinois Central declined to receipt for it.

Wreck on Chicago, Ottawa & Peoria Railroad.—A serious wreck occurred on Aug. 22 on the line of the Chicago, Ottawa & Peoria Railroad between Princeton and Joliet, Ill. The cause of the disaster was a broken brake rod on one of the limited interurban cars. The car was making usual schedule time on a straight stretch of track, and when the motorman attempted to stop his car as it approached a curve near Peru, Ill., a brake rod broke, causing the car to take the curve at such speed that it was overturned. After the motorman found his brake inoperative, he reversed his motor, which reduced the speed materially, and as a result the accident was not as serious as might have been expected. Fifteen passengers received injuries sufficient to require hospital attention. The car body, however, was but slightly damaged, it being one of this company's standard arched-roof interurban cars with composite underframe and a wooden superstructure.

Field Day of Beaver Valley Employees.—The third annual field day and picnic of the employees of the Beaver Valley Traction Company, New Brighton, Pa., was held on Aug. 7. For the twenty-nine events of the field meet 224 prizes, consisting of sweaters, clocks, thermos bottles, carving sets, hair brushes, manicure sets, razors, neckties, handkerchiefs, etc., were awarded. After the events on the program were run off supper was served. A number of persons besides employees of the company were invited and attended. They included physicians, members of Councils and other friends of the company throughout the Valley. The employees of the company do not solicit prizes from merchants, as do members of other relief associations throughout the section in which the company operates. Each individual contributes whatever he sees fit to the field day fund, the balance of the amount needed being made up by the company. This year the employees contributed three times the sum donated by the company.

Change in Signs in Louisville.—For many years certain of the Fourth Street cars of the Louisville (Ky.) Railway have continued out to Iroquois Park, which is 4 miles south of the city proper, though included in the city limits. Some of these cars take the Third Avenue route and some the Seventh Street route. These cars have lately been designated by large enameled signs carried on the front end, replacing small wooden signs and reinforcing the small signs in the windows over the motorman's head. Samuel Riddle, superintendent of the company, noted that considerable time was lost and confusion caused because would-be passengers often could not identify cars and had to stop them to inquire of the conductors whither they were bound. Frequently passengers got on the wrong cars. Now, however, the big red signs, appropriately lettered, indicate the cars which take the Third Avenue route and the big black signs the cars that take the Seventh Street route. Both cars run to populous suburban sections with a 5-cent fare, and carry large numbers of passengers to resorts at the edge of the park and to the park itself.

B. R. T. Holds Big Field Day.—An enthusiastically attended athletic field day was held on Aug. 27 by the employees of the Brooklyn Rapid Transit Company at Dexter Park, Brooklyn. Two baseball games were played during the day by teams representing depots of the company. These games form part of a regular series of about ninety games played during the summer by the Brooklyn Rapid Transit baseball league. During the afternoon much interest was shown in the field events and races, the most exciting of which was a relay race between thirteen teams for a loving cup. The events were not confined merely to the employees themselves but were extended to their wives and children, who participated in egg and potato races, while the gastronomic powers of their sons were taxed to the utmost by a pie-eating contest for boys. A collection of forty prizes, including gold-filled watches, rings, cameras, fountain pens and medals was distributed among the winners. Concerts given throughout the day by the regular Brooklyn Rapid Transit brass band added much to the attractiveness of the program. The athletic events were followed by a dance in the evening.

Through Interurban Service in California on 241-Mile Line.—A joint time-table has been agreed upon by the Oakland, Antioch & Eastern Railway, the Northern Electric Railway and the Sacramento & Woodland Railway whereby through service was established on Aug. 24 between Oakland and Chico, Cal. The distance between the cities is 241 miles, of which the Oakland, Antioch & Eastern Railway covers 107 miles and the two other roads the remainder. On one daily through train each way an observation car belonging to the Oakland, Antioch & Eastern Railway will be run, but on other trains than this passengers and freight will be transferred at junction points so that each line will operate only its own equipment. A total of 299 miles, including branch lines, is involved in the chain thus linked together. The cities north of Sacramento which are tapped are Woodland, Gridley, Colusa, Marysville, Oroville and Chico. The three-car trains operating from Oakland as far as Sacramento will have a total seating capacity of 146 and will make this 90.1-mile run on a regular schedule of two hours and fifty-seven minutes, or at an average speed, including stops, of about 30.5 m.p.h.

Personal Mention

Mr. H. G. Williams, assistant chief clerk of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been advanced to the position of chief clerk of the company.

Mr. John I. Fiscus, inspector on the Sharon branch of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been made assistant division superintendent of that branch.

Mr. J. B. Stewart, Jr., has been appointed superintendent of freight of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, in addition to safety and efficiency engineer.

Mr. Charles C. Beckman, who has been with the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, many years, has been appointed superintendent of ways and structures of the company.

Mr. M. C. McElligott, chief clerk to Mr. G. J. A. Paul, manager of railways for the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has been promoted to superintendent of transportation.

Mr. Thomas Flanigan, superintendent of the local division of the Mahoning & Shenango Railway & Light Company, at Sharon, Pa., has been promoted to division superintendent of the Youngstown & Sharon division.

Mr. Frederick L. Ray, superintendent of motive power of the Louisville (Ky.) Railway, is one of the incorporators of the Ray Manufacturing Company, which will manufacture and market a patented boiler feed regulator.

Mr. Bion J. Arnold and Mr. Walter Fisher, Chicago, who visited Europe this summer to study the terminal stations in large cities, are reported to have arrived safely in London. They are expected back in Chicago on Sept. 1.

Mr. James Compton, who has been master mechanic of the Atchison Railway, Light & Power Company, Atchison, Kan., has been appointed manager of the Omaha & Lincoln Railway & Light Company, Ralston, Neb. Both properties are controlled by the Illinois Traction System.

Mr. George B. Prest has been elected president and a director of the New London & East Lyme Street Railway, New London, Conn., to succeed the late Thomas Hamilton. The New London & East Lyme Street Railway is operated under lease by the Shore Line Electric Railway.

Mr. Alonzo L. Lockwood has been appointed division superintendent of the Niles branch of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. He succeeds Arthur P. Newlin, who was killed in an accident on Aug. 14, when he fell under the wheels of a moving car.

Mr. George T. Bradley has been appointed a member of the new Colorado State Public Utilities Commission by Governor Ammons. Mr. Bradley was formerly chairman of the Democratic state central committee. He will serve on the new commission with Mr. A. P. Anderson and Mr. S. S. Kendall, formerly members of the Colorado Railroad Commission.

Mr. Howard S. Butler, who has been assisting Mr. LeRoy T. Harkness, assistant counsel of the Public Service Commission of the First District of New York, in the work of preparing and supervising rapid transit contracts, has been made an assistant counsel. Mr. Edward Riegelman has also been appointed an assistant counsel. Mr. Riegelman has been an assistant corporation counsel in charge of the street opening bureau for Brooklyn.

Mr. R. H. Sperling, retiring general manager of the British Columbia Electric Railway, Vancouver, B. C., was presented recently with a solid gold cigar box suitably engraved and bearing the Sperling family coat-of-arms as a token of esteem from his associates. Mrs. Sperling was the recipient of a diamond ring. The presentation was made by Mr. F. S. Barnard, resident director of the company. Subsequently a farewell banquet was tendered to Mr. Sperling at the Hotel Vancouver by the officials of the company, presided over by Mr. George Kidd, now general manager of the company. Representative officials from all over the company's extensive system were present.

Mr. F. N. Koziell, who was recently appointed chief engineer of the Railway Storage Battery Car Company, New York, began his railway experience with the West End Street Railway, Boston, Mass., after graduating from the Massachusetts Institute of Technology. Later on he was sent to Manaos, Brazil, by Flint, Eddy & Company as superintendent of motive power, line construction and track, and from there was transferred to the Rio de Janeiro (Brazil) tramways as superintendent of motive power. He returned to the United States in 1907 and became superintendent of equipment of the Union Railway, New York. Later he was appointed general manager of two electric lighting properties at Montpelier, Vt. When these properties were taken over by Tenney & Company, Mr. Koziell returned to the Pearson Engineering Corporation, Ltd., and was sent to Barcelona, Spain, as superintendent of motive power of the tramways in that city.

OBITUARY

Charles Alldis, for fifteen years superintendent of the Torrington division of the Connecticut Company, with offices at Burrville, Conn., is dead.

Isaac Newel Barton, railroad builder, died in his home at Flushing, Long Island, recently at the age of eighty years. He retired from active business fourteen years ago. Mr. Barton was the first superintendent of the Harlem Railroad. After serving seventeen years with that company he became general superintendent of the Long Island Railroad. He also was an assistant to Gen. George B. McClellan in the construction of the Atlantic & Great Western Railroad, and later was connected with the Brooklyn Union Elevated and Brooklyn Bridge Railroad.

Charles E. Bonney, formerly of Chicago, died on Aug. 16 at Jacksonville, Fla., where he had resided for the last ten years. Mr. Bonney was born in Peoria, Ill., on Jan. 23, 1858. He entered the traction field in Chicago by building the street railway in West Twenty-second Street. This work was begun in 1895. The company which operated the line was called the West & South Towns Street Railway, but the name was later changed to the Chicago General Railway. After the company was forced into the hands of a receiver in 1900 Mr. Bonney retired from business and removed to Florida.

Charles A. Ricks, secretary and assistant treasurer of the G. C. Kuhlman Car Company, died suddenly at his home in Cleveland on Aug. 24 as a result of heart trouble. Mr. Ricks was born in Massillon, Ohio, and was forty-five years old. He was the son of Judge Ricks, who sat on the bench of the United States Circuit Court when former President Taft was a circuit judge. His first business connection in Cleveland was with the Standard Oil Company. When the Kuhlman Car Company was reorganized about ten years ago he aided in this work and was made secretary and assistant treasurer at the time the property passed into the control of The J. G. Brill Company. Mr. Ricks was a member of the Country, Union and Tavern clubs. He is survived by a widow. The interment was at Massillon.

Mayor Marx Renominated in Detroit

Mayor Oscar B. Marx of Detroit, Mich., has been renominated on the Republican ticket by 10,000 majority over John McVicar. The latter's attack was largely on the ground that Mayor Marx, in perfecting the agreement with the Detroit United Railway in August, 1913, which provides for the sale of seven tickets for a quarter, had betrayed municipal ownership of street railways, to which he was pledged. The charge was denied by the Mayor. F. H. Ingram, the Democratic nominee, has indicated that the municipal ownership will be a leading feature in his campaign against Mr. Marx.

The work of appraising the properties of the Detroit United Railway within Detroit is progressing steadily under the direction of Prof. E. W. Bemis. Some question has been raised as to whether the appraisal would be completed within the time limit, fixed as Oct. 15, but the street railway commission has stated that the report will be forthcoming at this time.

Negotiations are proceeding between the representatives of the interested municipalities and representatives of the London & Lake Erie Railway & Transportation Company, London, Ont., looking to the extension of the company's line from St. Thomas to Aylmer, Ont.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

NEW INCORPORATIONS

***Southern Minnesota Traction Company, St. Paul, Minn.**—Incorporated in Minnesota with a capital stock of $250,000 to acquire and operate steam and electric railways. Incorporators: William D. Mitchell, George Hoke and Wilfred Rumble, all of St. Paul.

***Frederick & Brunswick Railway, Frederick, Md.**—Incorporated with a capital stock of $100,000 to construct an electric railway from Jefferson to Brunswick. It will connect with the main line of the Baltimore & Ohio Railroad at Brunswick and will be about 9 miles long. As soon as it is completed the line will be leased by the Hagerstown & Frederick Railroad. Among the promoters are T. H. Haller, E. L. Coblentz, T. B. Hayward and others identified with the Hagerstown & Frederick Railway.

FRANCHISES

Stockton, Cal.—The Stockton Electric Railroad has received a 50-year franchise to build double-track extensions in San Joaquin County.

Vallejo, Cal.—The Vallejo & Northern Railroad has asked the City Commissioners for an extension of time in which to complete its line in the northern section of Vallejo.

***Pocatello, Idaho.**—J. D. Browning has received a 30-year franchise for a street railway in Pocatello. The franchise provides for one track loop covering both sides of the town and specifies that additional mileage must be built for a period of three years.

Pekin, Ill.—The proposition for a municipally owned street railway and the authority to provide a bond issue to operate the same was carried at a special election held in Pekin on Aug. 21.

Peoria, Ill.—The Peoria Railway has filed a petition with the City Council for the double-tracking of its lines on Pennsylvania Avenue from Jackson Street to Indiana Avenue.

Cedar Rapids, Ia.—At a special election held in Cedar Rapids last week the people voted in favor of the ordinance giving the Waterloo, Cedar Falls & Northern Railway an entrance into Cedar Falls. The franchise gives the company perpetual rights to operate steam trains over some of the streets. The rights to operate electric cars over other streets are for a period of twenty-five years only. The ordinance now goes to the Council for adoption.

Hopkinsville, Ky.—A franchise providing for the construction of an electric railway in Hopkinsville was sold to R. E. Cooper on Aug. 22. [E. R. J., Aug. 15, '14.]

New Orleans, La.—The Thompson ordinance providing for the extension of the Claiborne Avenue line, rerouting of the Levee and Barracks line and the rearrangement of the Dauphin line was introduced in the Commission Council recently. These lines are operated by the New Orleans Railway & Light Company.

Patchogue, N. Y.—The Suffolk Traction Company has petitioned the Public Service Commission of the Second District for permission to build an extension of its line in Bayport and Sayville and for approval of the exercise of a franchise therefor.

North Tonawanda, N. Y.—The International Railway has applied to the Common Council for a new franchise in place of the one granted the Frontier Electric Railway for the construction of the proposed electric railway between Niagara Falls and Buffalo.

***Milwaukie, Ore.**—L. H. Campbell has received a 25-year franchise from the Council for a street railway in Milwaukie. It is stated that this franchise is not altogether for local purposes but that construction of an interurban line eastward from Milwaukie through the Mt. Hood country is contemplated.

Washington, Pa.—The Monongahela, Ellsworth & Washington Railway has received a 60-year franchise from the

Washington Borough Council over certain streets in the borough. The section of the line between Monongahela and Bentleyville is completed. [E. R. J., Aug. 8, '14.]

Dallas, Tex.—The Dallas Northwestern Traction Company has received from the Council six months' additional time in which to begin and complete the construction of 20 miles of track in Dallas. E. P. Turner, Dallas, president. [E. R. J., Aug. 15, '14.]

***Dallas, Tex.**—John T. Jones and associates have received a franchise from the City Commission for a street railway in East Dallas.

Waco, Tex.—The Southwestern Traction Company has filed an application with the County Commissioners of Waco for a right-of-way through incorporated towns south of Waco. [E. R. J., Aug. 1, '14.]

TRACK AND ROADWAY

Edmonton (Alta.) Interurban Railway.—This company will resume operation, with an hourly service, between Edmonton and St. Albert on Oct. 1. It is at present electrifying the line under the supervision of W. T. Woodroofe. It is understood also that negotiations are being carried on between the company and the Edmonton municipality whereby the latter will supply current for the operation of the line.

***Tramways, Ltd., Edmonton, Alta.**—This is a new company formed for the purpose of constructing a railway from Edmonton to Fort Saskatchewan, via Nanao, a distance of 18 miles. This company, together with the Edmonton Interurban Railway, is negotiating with the city with a view to securing running rights to some central point within the city limits. If a tentative agreement can be reached the ratepayers will probably be asked to vote on it.

Penticton, B. C.—In connection with plans for the operation of an electric railway between Oroville and Penticton, the Okanagan Valley Electric & Power Company recently acquired the Oroville electric light plant from the Similkameen Power Company, and will develop the power at Similkameen Falls to the fullest extent.

Fresno (Cal.) Interurban Railroad.—This company announces that it will begin building the second unit of its line between Alvina Heights and Clovis by Sept. 1. The contract for the work has been awarded to Mahoney Brothers. Material for the completion of the line has been ordered. About 2 miles of the line have been placed in operation. [E. R. J., Aug. 1, '14.]

Los Angeles (Cal.) Railway.—This company is extending the East First Street and Brooklyn Avenue line along North Gage Street to the site of its new carhouse. This line will be extended eventually to Eastlake Park.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—This company will spend $475,000 on its mole and wharf on the Oakland side of the bay. Contracts have been signed with the San Francisco Bridge Company for the work. The contract includes dredging, wharf building and mole construction. There will be an elaborate switching system. Track improvements amounting to $200,000 are being completed by this company in and around Oakland. About 50,000 ft. of new track and roadbed have been laid.

Visalia (Cal.) Electric Railroad.—This company will build a 2-mile extension of its line from Rose Station to Elderwood.

Shore Line Electric Railway, New Haven, Conn.—This company has received permission to extend its line from Backus Corner out along the Salem turnpike. The extension will be about one-third of a mile long.

Miami (Fla.) Traction Company.—This company has placed an order with C. C. Atkinson, of Little River, for 7000 ties to be used in the construction of its line. The ties will be laid in solid concrete and will carry 105-lb. girder rails through the business sections of the city and 90-lb. rails on the other streets. Surveys have been begun by this company in Miami. L. D. Llewellyn, Miami, engineer. [E. R. J., Aug. 1, '14.]

Covington & Oxford Street Railway, Covington, Ga.—Work will be begun within the next few weeks by this company on its line between Covington and Oxford. A loop will be built in Oxford.

East St. Louis & Suburban Railway, East St. Louis, Ill.—L. C. Haynes, vice-president of the East St. Louis & Suburban Railway, conferred recently with the president of the Belleville Commercial Club and a committee of East St. Louis business men and agreed to have the interurban cars, which are operated to the Belleville Square, run four blocks farther east on Main Street and to double track this stretch of four blocks.

Rock Falls & Southern Traction Company, Rock Falls, Ill.—Plans are being considered by this company to begin the construction of this line in the fall. The railway will connect Sterling, Ladd, Rock Falls, New Bedford, Tampico, Princeton, Setonville and Kewanee. Andrew S. Goodell, Rock Falls, secretary. [E. R. J., May 30, '14.]

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—It is stated that this company will build an extension this fall on West Tenth Street from Holmes Avenue to Tibbs Avenue.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—This company has nearly completed its right-of-way for the extension of the line between Bonner Springs and Lawrence, Kan. Construction on this section, about 21 miles, will begin about Sept. 30 and cars probably will be running in the spring of next year. The company began operation between Kansas City and Bonner Springs, 17 miles, on July 20. Four cars are used at present.

Skowhegan & Shawmut Electric Railway, Fairfield, Maine.—Surveys have been completed by this company for its 12-mile line between Skowhegan and Shawmut, but no plans have been made to begin construction. The greater part of this line will be through private right-of-way. It will connect at Shawmut with the Fairfield & Shawmut Railway, and with the Skowhegan & Madison Railway at Skowhegan.

Hagerstown & Frederick Railway, Frederick, Md.—An extension westward from Hagerstown to the Country Club is being contemplated by this company in the near future.

United Railways & Electric Company, Baltimore, Md.—The Public Service Commission has decided favorably upon the proposal of this company to divert the Emory Grove, Pikesville and Pimlico line into Madison Avenue at Whitelock Street and to make the route as follows: down Madison Avenue to Eutaw Street, to German Street, to South Street, returning over same course in Baltimore.

Salisbury (Md.) Interurban Railway.—Work will probably be begun in the fall by this company on the construction of its electric line to connect Salisbury, Hebron, Tyaskin, Bivalve and Nanticoke, a distance of 30 miles. [E. R. J., April 4, '14.]

Holyoke (Mass.) Street Railway.—This company will spend about $15,000 for the laying of new rails from the Willimansett Bridge through Holyoke.

Billings, Mont.—A. J. Showalter is said to have interested Butte capitalists in a proposition to construct an electric railway between Red Lodge, Bear Creek, Carbon and Stillwater. [E. R. J., May 23, '14.]

Charlotte (N. C.) Electric Railway.—This company is extending the Myers Park line from Queens College to Briar Creek, a distance of about 1 mile.

Jamestown (N. Y.) Street Railway.—Extensive double tracking operations have been begun by the Jamestown Street Railway in West Third Street, the most congested part of the city. It is intended to equip this section of the city with double tracks.

New York, N. Y.—The Public Service Commission has awarded the third contract for special work for the Fourth Avenue Subway. It covers the supply of switches and frogs for certain portions of that subway. The contract went to the lowest bidder, the Pennsylvania Steel Company, at $37,426, for final delivery within 100 days. Bids have recently been advertised by the commission to be opened on Sept. 15, for the construction of Section 2 of Route No. 48, the William Street portion of the Park Place, William and Clark Street Subway to be operated by the Interborough Rapid Transit Company. The plans call for a two-track underground railroad to be completed within 28 months from the delivery of the contract. The Public Service Commission of the First District has awarded to the Flinn-O'Rourke Company, Inc., the contract for the construction of Section 3 of Route No. 33, the Montague Street portion of the Whitehall-Montague Street tunnel line in Brooklyn. This contract is a continuation of the Whitehall-Montague Street tunnel line for operation by the New York Municipal Railway Corporation, and the same company has the contract for building the tunnel.

Toronto, Ont.—Municipalities will vote on Sept. 21 on the question of closing contracts with the Hydro-Electric Power Commission of Ontario to build an electric railway through the Newmarket, Port Perry and Uxbridge districts.

Oregon Electric Railway, Portland, Ore.—The Oregon Electric Railway has been formally invited by the people living between Eugene and Santa Clara to construct an interurban line down the River road, in case of the failure of the Portland, Eugene & Eastern Railroad to do so.

York, Pa.—George B. Wilson, Allan A. Herr and H. S. Williamson are securing right-of-way for an electric railway on the Harrisburg Pike to Long Park and the fair grounds adjoining the park. It is understood that the Conestoga Traction Company will assume the construction of the new line if a certain amount of stock is taken by persons interested in the new company.

Hull (Que.) Electric Company.—Improvements made to the lines of this company between Deschenes and Aylmer are expected to be completed shortly. About 2½ miles of track has been relaid and considerable ballasting has been done.

Nashville (Tenn.) Traction Company.—It is announced that operations of this company's line from the northern boundary of the city near St. Cecilia Academy to the corporation boundary on Lafayette Street will begin on Nov. 1. The company has adopted plans for the extension of the line to Una, but work will not be begun on this strip until the right-of-way recently granted by the County Court can be amended so as to give the line more territory along the road. It is thought probable that the company will obtain its current from the plant at Hale's Bar. [E. R. J., July 18, '14.]

Tacoma, Wash.—Bids will be received by Public Works Commissioner Woods until Sept. 8 for rails for the municipal street railway. A 5 per cent check must accompany the bid.

West Virginia Light & Traction Company, Charleston, W. Va.—This company is in the market for 5 miles of 70 to 80-lb. relaying rails, delivery to be made at Fayette, W. Va.

SHOPS AND BUILDINGS

Edmonton (Alta.) Interurban Railway.—It is stated that this company will erect a carhouse and repair shops at St. Albert.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—The general contract for the construction of the new carhouse of the Indianapolis Traction & Terminal Company at Highland Avenue and St. Clair Street has been let to W. P. Jungclaus. The F. S. Cannon Company is the architect.

Louisville (Ky.) Railway.—This company has completed the transfer of its equipment from the old shops at Eighteenth and Walnut Streets to the new shops on West Broadway. All the shop work is being done in the new quarters. The old buildings and site are to be offered for sale.

International Railway, Buffalo, N. Y.—This company has filed plans and specifications in Buffalo for the immediate construction of a brick addition to the Hertle Avenue carhouse to cost $20,000. Plans for a new station in Lockport as a terminal for the Buffalo, Lockport & Rochester Railway have been presented to the Aldermen of the city by the International Railway.

POWER HOUSES AND SUBSTATIONS

Pennsylvania Railroad, Philadelphia, Pa.—Braun & Stewart, Philadelphia, have received a contract from the Pennsylvania Railroad for the erection of substations at Bryn Mawr and Paoli in connection with the electrification of the main line to the latter point.

Manufactures and Supplies

ROLLING STOCK

Havana Central Railroad, Havana, Cuba, has ordered six electric cars from the Wason Manufacturing Company.

Buenos Aires (Argentina) Southern Tramways is contemplating the purchase of twenty new cars, inquiries on which have recently been issued.

Albany Southern Railroad, Rensselaer, N. Y., has ordered one express car from the Wason Manufacturing Company. This corrects an item in the ELECTRIC RAILWAY JOURNAL of Aug. 22, in which the name of the car-builder was mentioned incorrectly.

Corpus Christi Street & Interurban Railway, Corpus Christi, Tex., has ordered two single-truck one-man cars from the Cincinnati Car Company, through W. R. Kerschner, its Eastern agent. The order was placed by A. M. Burke, consulting engineer American Properties Company, Wilmington, Del.

Laconia Car Company, Boston, Mass., is building a new type of car which is to be exhibited at the Atlantic City Convention. It is a low center-entrance car seating forty-four passengers. The car, completely equipped, weighs less than 500 lb. per seated passenger. It is a four-wheel car without trucks, but with novel connections to journal pedestals to prevent oscillation. This company is planning to show the car completely equipped with motors and air brakes. Westinghouse motors and HL control have been selected.

TRADE NOTES

Curtain Supply Company, Chicago, Ill., has received an order to equip with Forsyth fixtures and Rex rollers the 228 new cars recently ordered by the Chicago Surface Lines from The J. G. Brill Company.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received an order to equip with control, air brakes and automatic couplers the 100 new subway cars recently ordered by the New York Municipal Railway.

Art Metal Construction Company, Jamestown, N. Y., has appointed E. St. Elmo Lewis as vice-president and general manager, effective Sept. 1. Mr. Lewis has been for the past ten years advertising manager of the Burroughs Adding Machine Company.

Hess-Bright Manufacturing Company, Philadelphia, Pa., is planning to erect a new factory building at its present location on the main line of the Pennsylvania Railroad, Front Street, for the manufacture of its ball-bearings, and is also adding greatly to the machinery equipment in its present buildings.

William Wharton, Jr., & Company, Inc., Philadelphia, Pa., have appointed R. C. Hoffman & Company, Inc., as their representatives for the Southern Atlantic Coast, with main offices in the Continental Building, Baltimore, Md., and an Atlanta, Ga., office in charge of F. McDermott, located in the Candler Building.

Railway Storage Battery Car Company, New York, N. Y., has appointed Lee Klopman, for fifteen years treasurer of the Eugene Dietzgen Company, as general manager. F. N. Koziell, formerly connected with the Pearson Engineering Corporation, Ltd., has been made chief engineer of the Railway Storage Battery Car Company.

Electric Railway Improvement Company, Cleveland, Ohio, has recently leased bonding cars to the following electric railways: Des Moines (Ia.) City Railway, second car; Bell & Jamison, Los Angeles, Cal., second car; Jamestown, Westfield & Northwestern Railroad, Wilkes-Barre & Hazleton Railway, and Shore Line Electric Railway.

Willard Doud, formerly engineer of shop improvements for the Chicago, Burlington & Quincy and Illinois Central Railroads, has completed the engineering work involved in the design, construction and equipment of the new shops of the Belt Railway of Chicago, at Clearing, Ill., and announces the opening of offices at 538 South Dearborn Street, Chicago, for the handling of all matters pertaining to design, construction, equipment and operation of industrial and railroad shops, factories and power plants.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has elected J. J. Hanauer, a junior member of the firm of Kuhn, Loeb & Company, as a director of the company to succeed Paul M. Warburg, recently confirmed as a member of the Federal Reserve Board. T. P. Gaylord, formerly district manager at Chicago, has been appointed acting vice-president to succeed H. D. Shute, who has been elected treasurer and assistant secretary of the company, succeeding T. W. Siemon, who resigned to become secretary and treasurer of the Union Switch & Signal Company.

ADVERTISING LITERATURE

Railway & Industrial Engineering Company, Pittsburgh, Pa., has issued a folder describing its Burke Horn Gap lightning arrester.

Dielectric Manufacturing Company, St. Louis, Mo., has issued a folder which contains colored samples of its various interior paint finishes.

Reading Chain-Block Company, Reading, Pa., has issued a catalog describing and illustrating its multiple-gear chain blocks, stationery hoists, jib cranes and steel plate, I-beam and geared trolleys.

Royal Enameling & Manufacturing Company, Chicago, Ill., has issued a catalog describing its porcelain enameled iron signs, which are for use in the electric railway field as guidance and danger signs and other purposes.

M. H. Treadwell Company, Inc., New York, N. Y., has issued a catalog describing the equipment for and containing views of installations of its industrial railways. Another catalog issued by this company describes its two-way dumping cars.

Barrett Manufacturing Company, New York, N. Y., has issued a folder entitled "Another Mile!" which contains a panoramic illustration of the vast plant of the Standard Steel Car Company's Works at Butler, Pa., which extend a mile in length and are equipped with 750,000 sq. ft. of specification roofing manufactured by this company.

Railway Accessories Company, Chicago, Ill., has issued a catalog describing the Wightman mechanically welded rail joint. As shown in the catalog this rail joint has been practically tested by a number of railroads, among which are the following electric railways: Seattle (Wash.) Electric Railway, Portland (Ore.) Railway, Light & Power Company, and Tacoma (Wash.) Railway & Power Company. Testimonial letters from these companies are quoted in the catalog.

Prepayment Car Sales Company, New York, N. Y., has issued a strikingly colored folder entitled "Origin and Development of Prepaying on Street Cars." The prepayment idea (on street cars) is declared to have been originated by Messrs. Ross and MacDonald and was later developed by the Prepayment Car Sales Company. The prepayment idea was developed on the theory that a small minority of the public are willing to appropriate anything to themselves without pay. The folder calls attention to the fact that though a "free ride" does not seem to be a very heinous crime to the perpetrator, yet enough free rides would wreck the richest railway in the world. The value of the prepayment car is shown in that it prevents accidents and continual accident claims and also checks the free rider.

C-A-Wood-Preserver Company, St. Louis, Mo., has issued a folder entitled "The Third Degree," which contains a declaration that the manufacturers will furnish to every purchaser a sworn analysis of their wood preserver, together with a blank affidavit to be executed by the seller offering his product in competition. This company has also issued a sheet containing information relative to comparative tests of its wood preserver and other similar preparations. A chart attached to the sheet which was prepared by the U. S. Forest Products Laboratory shows that in a test made a cubic foot of wood absorbed 13.45 lb. of coal-tar creosote and 15.1 lb. of wood preserver, and that in a twelve weeks' open test the wood treated with creosote lost 22.42 per cent in weight, while wood treated with the wood preserver of this company lost only three-tenths of 1 per cent.

Trolley Supply Company, Canton, Ohio, has issued a folder describing its roller-bearing trolley base, which is designed to prevent trolley wheels from jumping. The higher the pole goes up the more tension there is against the wire, and the tension decreases as the pole goes down. The lowest tension occurs when the pole is hooked to the roof of the car. This arrangement makes it easy for the conductor to pull the trolley pole down when desired. Another catalog has recently been issued by this company describing and illustrating its trolley supplies, including Knutson trolley retrievers Nos. 2 and 5 for high-speed roads, "Ideal" trolley catcher, simplex roller-bearing trolley base, Peerless roller-bearing trolley base No. 10, Peerless check valve and Junior headlight, pressed-steel headlight, Hollis safety fender, and detachable fender. In the Knutson No. 5 trolley retriever, the same retrieving mechanism is used as in the No. 2, but the opening of the case is enlarged and the method of connecting the rope to reel by means of a chain, screw eye, ferrule and rivet is eliminated. A knot is tied in the end of the rope, which is inserted in a slot in the reel. By inserting the knot it releases the knot pawl and throws the weak spring in action. Should the rope break while the retriever is in action, it would not be necessary to remove it from the car to replace the rope, as the operator himself can do this in a few minutes simply by tying a knot in the rope and inserting it in the reel.

NEW PUBLICATIONS

Traffic Glossary. By R. E. Riley. La Salle Extension University, Chicago, Ill. Paper bound, 136 pages, $1, postpaid.

In the study of interstate commerce and general railway traffic many terms of a technical nature are used for which in the past it has been difficult to obtain convenient, reliable and clear definitions. This traffic glossary prepared for La Salle Extension University should be of material aid in supplying this need. The book is divided into four sections covering the following points: Definitions of traffic territories, definitions of traffic terms and provisions, application of classifications and suggestive questions. Such problems as the meaning of western termini, S.U.L.C.L. (set up in less than car-loads) or reciprocal demurrage can easily be solved by reference to the glossary. It is realized, of course, that territorial definitions are supplemented and superseded from time to time, and where the actual movement of traffic is involved the glossary must naturally give way to the latest official publications on the subject. For general information concerning technical traffic terms and interpretation of abbreviations, however, the glossary serves as a convenient reference book.

Business Administration. By Edward D. Jones. The Engineering Magazine Company, New York, N. Y. 5 in. x 7½ in. Bound in cloth, 275 pages, $2.

In the belief that the administration of manufacturing and operating companies under modern conditions is developing into a new profession, the author of this book has sought its scientific principles by a study of the older professions with which it is most closely allied. His argument is briefly that success in dealing with men and affairs depends upon certain basic laws which can be discovered by studying the work of successful administrators, that the rules and methods followed by masters of business and finance are usually deliberately hidden with no records throwing full light on their lives and acts, but that leaders in stage craft, war and science are figures of world-wide interest, whose career and practice are fully illumined by public and private records, correspondence and personal reminiscences. From such data as these Professor Jones has analyzed different primary principles of administration. In history and the biographies of military conquerors, diplomats and scientists he finds the elementary rules of success.

It has sometimes been stated that the study of scientific management may direct itself to machines, materials, methods and men. Heretofore the first force of scientific management investigation has been expended along the lines of the first three items. It is being realized more and more at present, however, that the human factor is the one of superlatively high rank. For this reason the present book is very interesting, for it examines the best thought of the world to find out how great statesmen and generals have worked with the human beings under their control. The plea of the author in general is for the conduct of modern industrial life in harmony with modern thinking, and it must be said that his treatment of the subject tends to raise administration to a higher plane among the profession than heretofore.

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WANTED— A PURE PRODUCTS LAW

Although several states and the national government have laws relating to the purity of foods and drugs, nothing has been done, so far as we know, toward securing a standard of purity in such items as paints, varnishes, insulating compounds and wood preservatives. All of these classes of material are highly complex chemical and physical aggregates, which cannot be graded in the order of merit as empirically as pieces of timber. The buyer is expected to take for granted the word of the purveyor that the materials are of standard purity and proper combination. To-day the only remedy open to the careful purchaser is to subject specimens of the offered materials to some recognized testing laboratory which can assure him whether the goods are adulterated. Such tests for purity are no reflection on the great body of honest manufacturers, but they are a necessary precaution against the temptations of the adulterator with his alluringly low prices. Although a buyer can protect himself adequately through laboratory help it is a pity that he should not receive adequate protection under a law which would make adulteration practically impossible. We do not mean that a manufacturer should be forced to reveal the exact quantitative and qualitative analyses of his products. He should be obliged, however, to state the names of the ingredients together with other data which would indicate the limitations of the product, such as a wood preservative's distillates at different temperatures. Drastic legislation would make it unnecessary to test articles simply for purity, but there is still left a profitable field for testing materials as to their suitability for any given set of conditions.

ELECTRIFICATION IN THE POLAR ZONE

An old writer on biology once noted that the hog and man were the most adaptable of animals, for they prospered in every zone from the torrid to the frigid. The electric railway is not an animal, but the story of the Kiruna-Riksgraensen electrification, as related elsewhere in this issue, entitles it to lay claim to an equally high degree of adaptability. Although located in a land where snow is present during eight to nine months a year, this short railway carried in 1913 some 3,000,000 tons of the famous Swedish steel. Under steam single-track operation, the capacity of the road was approaching its limit. The climatic and physiographic conditions would have made double-tracking for the desired capacity to 5,000,000 tons a year a most costly proposition, and since abundant water-power was available, electrification was merely a matter of a reliable contact system. It is therefore interesting to observe that a simple catenary line with A-frame poles spaced 172 ft. apart should have been considered ample for the greater part of this arctic installation. The contact system differs only in a few particulars from much of the standard European single-phase construction for temperate zones. Thus, sectionalization has been employed to an unusual extent to facilitate the location of defective insulators, and single, though larger, insulators have replaced the double insulators common in more populous regions. The swiveling bracket construction which helps to take care of temperature variations is also an interesting feature of the catenary line. On the whole, the simplicity of the construction is a noticeable feature of this line which has to meet the problem of high-tension distribution under most arduous climatic conditions.

INTERNATIONAL CONVENTION ABANDONED

This week the convention of the International Street & Interurban Association was to have been held in Budapest, but it is, of course, indefinitely postponed. Several advance papers were received in this office last month, evidently having been mailed before the outbreak of hostilities, and are on such up-to-date subjects as rail corrugation, registration and cancellation of tickets, relative advantages of a.c. and d.c. for railways, roller bearings and ball bearings, etc. Instead of the benefit which would result from international discussions on matters of this kind, a pall has fallen over Europe. Even an official notification of the cancellation of the International convention has not been received in this country. The last direct report from our Budapest correspondent, who was to report the convention for this paper, was written on July 27. It simply said that matters then looked unsettled and the convention might have to be postponed. In the meantime, reports received from Brussels, the headquarters of the association, are that the Germans were commandeering the receipts of the Brussels Tramway Company, and, in consequence the company had begun to carry passengers without charge. One of the most unfortunate results of the present war is the inevitable cessation both during war operations and for a long time afterward of a great deal of the valuable pioneer work and investigation in electric railway operation which has been conducted in Europe. We owe a great deal, in the science of electric railroading, to our confrères in all of the nations now at war, but it is vain to assume that much will be done by them to advance electric railway science for years.

The energies of all will have to be devoted to restoring civilization, and to making up, as far as possible, for the immense losses caused by the destruction of property and life. Therefore upon those nations not at war must fall the duty of developing and advancing the art.

CONSERVATION OF CASH RESOURCES

One way in which the present unsettled state of business and finance throughout the world, brought about by the European war, has manifested itself in this country, is through the deferring of corporate dividends. It is estimated that during the last month American companies with $300,000,000 capital have been transferred from the dividend-paying to the non-dividend-paying list, with an annual decrease in dividends of nearly $15,000,000. This suspension of dividends, however, is not entirely a product of the present war situation, for the general financial depression in this country for the past year and a half has also had its effect. It is estimated that since Jan. 1, 1913, stockholders have suffered a loss of revenue aggregating $75,000,000 a year, and according to the *Wall Street Journal*, in the last twenty months dividends have been either passed or reduced by more than 100 of the larger companies, of which seventeen were railroad, eight electric railways and the others industrials. In view of the generally recognized stability of public utility earnings, it is not surprising that electric railways should be at the bottom of this list. In spite of this fact, however, the recent deferring of dividends by the Cities Service Company, the Fonda, Johnstown & Gloversville Railroad, the Portland Railway, Light & Power Company, the Tennessee Railway, Light & Power Company and the Chicago Elevated Railways has caused a slight apprehension among all public utility stockholders. It can be said emphatically that the greater portion of this fear is altogether baseless.

In almost all cases the suspension of dividends has been accompanied by the statement that the reason impelling the action has been the desire to conserve the cash resources or working capital of the corporation. Now, in general, the amount of actual cash needed by a corporation varies with the size of its payroll and other current demands for cash, with the amount and character of its accounts and bills payable in connection with its accounts and bills receivable, with the discounts obtainable by making cash payments and with its facilities for securing temporary loans. These points are of much more vital concern to industrial than to public utilities. The reason is that public service corporations have no turnover where a large amount of capital must be sunk into the product and where there must be sufficient capital to keep the company going, perhaps in the face of slackening trade, until cash is ultimately received for the goods. There is a generally well-defined regularity of demand for the service of electric railways, and the payment for the commodity offered is not deferred. Electric railways secure their passenger revenue daily and thus have a more constant influx and replenishment of their cash assets.

While it appears, then, that public utilities usually need comparatively little working capital, yet it must be said that under certain conditions the problem of adequate current resources is not one of which they are entirely devoid. Through some extra large current liabilities falling due, through some drain on the current revenues, such as strikes or long-continued storm blockades, or through a steady increase in operating costs owing to higher prices for materials and higher wage scales, the railway may find its working capital seriously depleted. A more common difficulty, however, is that exemplified by some of the railways now deferring dividends. The Cities Service Company is in a developmental stage and is constantly in need of new financing for improvements, betterments, additions and the like. Moreover, the company has interested foreign capital in its securities, but this is now withdrawn at a time when financing in this country is difficult. The Tennessee Railway, Light & Power Company is also at an early stage of its growth. It has financed all its requirements until June, 1915, when bonds or a note issue must be sold. Under normal conditions, no difficulty would arise in effecting such a sale, but at present the free disbursement of dividends based on forecasts of easy financial probabilities next year is hardly desirable. The Portland Railway, Light & Power Company is confronted with the problem of raising large sums each year to carry out the requirements of its franchises, many expenditures being inevitable under municipal direction. With the maturing of a $5,000,000 note issue on May 1, 1915, and also of paving assessments for previous work done, and with a record of increased taxes and interest charges and a business depression for two years, it is evident that the company is confronted with conditions requiring close attention to its present working resources.

Such cases as the above, however, are the exception and not the rule. Practically all instances where dividends have been passed, deferred, paid in scrip or reduced have been those of companies confronted with some special or peculiar difficulty during a stringent period when the exercise of corporate prudence made necessary the conservation of all liquid resources. Those companies that are provided with strong working capital, as judged by the requirements of the electric railway field, and are not confronted with the imperative need of financing in the immediate future, are paying their usual dividends. Stockholders may rest assured that a possible impairment of corporate credit through an unnecessary suspension of dividends is too great a danger to run at this time. Even in England, in spite of the present crisis, *The Electrical Review* of London warns firms against refraining from distributing dividends, and that such a measure of precaution might be disastrous to the shareholders. Business here may fall off on account of the war in some cases, as with the factory traffic of the Chicago Elevated Railways, but unless national and world financial conditions become much worse, most companies will not be at all justified in passing their dividends or reducing their dividend rates.

CORROSION OF ALL-STEEL CARS

A prominent designer of permanent structures, in commenting upon a recent editorial on the subject of side sheathing for steel cars, has stated that a 1/16-in. sheet is too thin for practical purposes, pointing out that in ordinary structural design it has become a rule to use sections not thinner than ¼-in. to withstand corrosion successfully. Corrosion of the members of steel cars has, however, by no means the importance that it has in permament structures. The latter are at all times exposed to the action of the elements. Examinations are often cursory in character, and paint is applied more often with regard to economy than to complete protective action.

Certainly it is never the case for a permanent structure to be subjected to the elaborate painting processes that are the rule with passenger cars, and the fact that such paint is applied for the purpose of improving the appearance of the car is a practical guarantee that corrosion is not going to begin at the outside of the structure. Corrosion of the floor framing is, of course, a possibility, for this is never painted with the same care that is devoted to the sides of the car, but these members in modern designs are generally easy of access, and parts of them, in fact, are affected by the same conditions due to flying oil that have permitted many roads to stop altogether the painting of the trucks.

From the inside of the car there is, however, an ever-present tendency toward corrosion, owing to the occasional use of water for car washing. That this must tend to rust the side sheets and posts at the floor line cannot be denied, and when the protective covering of paint breaks down it must be renewed if deterioration is to be avoided, even though there is no evidence that the deterioration will be any more rapid in action than that caused by the rotting which occurs from the same cause at the bottoms of wooden posts. However, if this interior rusting is allowed to go unchecked it would seem to make little difference whether the side sheathing was 1/16 in. or ⅛ in. in thickness. Once the corrosion was well established it would be only a comparatively short time before the sheet would have to be renewed, and while the labor involved would be trifling the expense with a large number of cars might become heavy.

The most obvious remedy is to keep the inside of the side sheathing well painted, and this is certainly preferable to the alternative of using an unnecessarily heavy side sheet which is not only costly to install but involves a continual cost for the energy required to haul the additional weight. To this end the use of an easily-removable inside lining has been suggested, although the use of no inside lining at all would be preferable and is entirely feasible except, perhaps, in very cold climates. Now that the drop sash has practically disappeared the original necessity for using a heavy and permanent inside lining has become solely a matter of custom, the requirements being only those involved by insulation, as the appearance of such a thoroughly inconspicuous surface is hardly important.

WELDING AND TRACK REPAIRS

During the past two or three years the portable welding outfit has come to play a very important part in electric railway track repairs. While many companies have taken advantage of this new means of obtaining renewed life in track, others, either due to a lack of information or because they are not progressive, have looked askance at this method of making repairs. Recently it has been our privilege to inspect track repaired in this manner in a number of large cities and by different methods of welding, and we feel convinced that the plan is an unquestionable success. While some companies have obtained better results than others, the unsatisfactory work may be attributed principally to the failure to employ an intelligent operator. Successful welding is the result of real scientific study, therefore it cannot be properly done by rule of thumb or "cut and try" methods. It is a study in itself, hence the work of welding should be in the charge of not only an intelligent operator but one who is especially interested in the subject. If in the welding process certain things occur which result in the success or failure of the repair, the operator should know why so that he can apply this information in his future work.

Probably most welders have found their principal trouble in trying to restore manganese inserts and solid manganese pieces. While the inherent characteristics of this metal do not make it especially fitted for repairs by any welding process, yet certain precautions taken during the welding operation make it possible to obtain a large proportion of successful welds. For instance, it has been found that if the portion restored is large and the operation is made continuous, the weld usually is unsuccessful. On the other hand, if the restored work is quenched frequently during the welding operation so that no part of the body casting is heated to a critical temperature, success usually follows. Again it is found impossible to make metals of different characteristics bond, principally because of the shrinkage strains which break down the bond when the work cools. Manufacturers of welding outfits have studied this problem carefully and recommend the use of certain metals for certain kinds of repairs. While it may be possible to purchase these metals locally, it is well to have a thorough knowledge of the proper chemical analysis if one desires to obtain best results.

Some operators believe that the finished work should be ground to surface, while others believe that the work should be done under traffic and left in the rough when complete. The latter class believes that welds made under traffic are more compact and homogeneous and that a good operator can do the work sufficiently accurate to make grinding unnecessary. Built-up welds are being made at cupped joints, at chipped intersecting flangeways and at other badly worn points. In fact, many pieces have been restored which otherwise would have required renewal at the time the repair was made. Even if the percentage of unsuccessful repairs is quite large, the cost of making them is so small that as a whole the work undoubtedly will figure as an economy.

MUNICIPAL OWNERSHIP IN LONDON

The perennial question of tramway versus motor bus has again come to the foreground in connection with the London County Council Tramways. As noted elsewhere in this issue, the operating report for the year 1913-1914 shows the financial condition of the tramways to be more hopelessly involved than ever. The anticipation of a surplus of £43,399, as expressed in the 1913 report, has not been realized, there being instead a deficit of £88,526. During the year the actual increase in income was only £16,939, while the operating expenses increased £102,790. Moreover, in spite of increasing withdrawals from the renewals fund, during the year the additions to the fund decreased from the £497 of the year previous to nothing at all, whereas if a full provision had been made for renewals on the agreed basis of two-thirds of a penny per car mile for five years the fund would have received more than £160,000. It is needless to say that the renewals fund cannot long continue unless its depletion is met and remedied in some way. Furthermore, it is estimated that the general fund of the company will have decreased 57 per cent during the two years ending March 11, 1915.

These data are sufficiently interesting in themselves, but similar ones have been previously commented on in these columns. The most striking point in connection with present operating conditions has to do with current English editorial comment. Most of the blame is laid on the power of motor bus competition, but *The Electrician* states that the fault lies in the company's double policy of endeavoring to run the undertaking on a commercial basis and at the same time conducting it for the benefit of certain sections of the community. As we pointed out recently in connection with municipal railway operation in San Francisco, the use of railways as forerunners of urban development may be excellent from the point of view of city congestion, but it does not tend toward satisfactory commercial results. Furthermore, our British contemporary calls attention to the fact that recent concessions to employees have involved expenditures of £14,388 and that demands now made in the face of the present deficit would necessitate the spending of £90,000 more. Nothing could show better than this the political power that the employees of a municipally operated railway may bring to bear on the local legislative body.

The Engineer believes that "had the tramways been run from the first as a business concern by business men the present position would never have been reached. The highways committee forgets in complaining about motor omnibus competition that the tramways when first introduced affected the incomes of certain railroads. One railroad very successfully met competition by electrification and business economy." It is true that business principles and scientific management are not and never have been innate or even acquired attributes of government ownership. But if the difficulties are not due to faulty direction but to conditions which could not have been foreseen, they present an equally strong argument against municipal ownership. As we have many times declared, the electric railway business presents many hazards, some of which may be escaped by good management and some may not. Certainly these hazards are greatly increased by municipal ownership, while the opportunities for escaping those which are common to both public and private ownership are greatly lessened when the city operates the railways.

The only safe plan is for the municipality to refrain from all commercial undertakings possible. The funds which a city can invest in enterprises of this kind are essentially "trust funds," and it should be as careful of exposing them to the hazards of ordinary business as are the administrators of other trust funds. When to this argument is added the demonstrated fact that a municipal enterprise cannot be conducted as efficiently as one under private direction, the inadvisability of municipal operation of electric railway systems is evident.

RAILROAD PASSENGER FARE INCREASE

We know of nothing that has happened for a long time which is more important to the interurban electric roads of this country than the announcement made this week that the Pennsylvania Railroad intends to increase its passenger mileage rate for mileage books from 2 cents to 2¼ cents, and the subsequent statements that nine other steam railroads are planning to take similar action. In explanation of its increased passenger rates the Pennsylvania Railroad says, briefly, that it is due to the increased cost of operation and refers to the greater use of steel cars, the more general adoption of automatic signals and other safety apparatus, the general cost of materials and the higher wages of trainmen which have been characteristic of the last few years.

Facing such a condition and confronted with the half-hearted and only partial grant of increased freight rates recently made by the Interstate Commerce Commission, it is not surprising that the steam lines have followed out the suggestion then made by the commission in the rate decision that they might well consider an increase in their passenger fares rather than devote all of their attention to seeking higher rates for freight.

The connection between this proposed passenger rate increase on steam railroads and the interurban electric railway interests in the country is not difficult to see. For years most of the long interurban electric railroads have been charging fares which are too low—certainly under present conditions. They have been prevented from raising their rates by a number of factors, among which public opinion and steam railroad competition have been perhaps the most important. Now, however, on the initiative of the steam lines, both of these factors will be removed. The public will not fail to recognize that the conditions of higher operating costs of which the steam railroads complain apply to the electric roads as well and they are equally as much entitled to an increase in rates. From a competitive standpoint, also, the electric roads will be able to make an increase of ¼ cent per mile without altering the respective positions of existing steam and electric fares. There will be this difference, however, in which the electric roads will be the gainers. On the average steam railroad of the country, according to the statistics of the Interstate Commerce Commission, the passenger receipts amount to only 20 per cent of the gross, so that an increase in passenger receipts of 12½ per cent, or that accomplished if all of the passenger fares were increased in the same proportion as the mileage fares, would increase the gross receipts only 2½ per cent. But on the electric road, where the business is almost exclusively passenger, the gross would increase in almost the same ratio as the passenger receipts. That is to say, the electric roads ought to benefit almost five times as much as the steam railroads with such a parallel increase in passenger rates.

We do not mean to say that such increase on both lines, even though justified and though supported by the prestige of the Interstate Commerce Commission, will not meet some obstacles. This will have to be expected. An increase in mileage rates will necessitate an increase in many local rates, and this may not only create much local opposition but involve a rate in excess of that permitted by state law. However, the tendency in rate making is constantly to vest more power in the federal authorities, and with the Shreveport decision as a precedent we do not believe that such local rate-making statutes will be allowed by the federal courts to interfere with the rates deemed just by the Interstate Commerce Commission.

If the action by the steam railroads this week should be instrumental in increasing the rates of the interurban electric railways it will prove a boon to the industry.

WHAT DO WE KNOW ABOUT ELECTROLYSIS MITIGATION?

The control of the return currents in electric railway circuits is different from ordinary engineering undertakings because it involves so many variables, several of which are somewhat indeterminate. To illustrate the complex character of the calculations involved, those required in electrolysis investigation need merely to be compared with those involved in the design of a bridge. In the one case we are dealing with definite forces; in the other case with forces and quantities for the most part indefinite and vague. Electrolysis calculations are even much more complicated and uncertain than those associated with inductive interference from single-phase railways to which so much attention has been given of late. Not only are the underlying facts difficult to determine in the case of electrolysis, but there is a conflict of interest and responsibilities. If electrolysis mitigation could be reduced to a science much of the present uncertainty could be avoided.

Of course there is a basis for a complete science of the subject. A large amount of experimentation has been done, especially along the line of measuring the electrical and other quantities involved, namely, current in rails, current in pipes, emf between rails and other conducting structures, and the corrosive effect of current on various metals and in various soils. Various remedies have also been suggested. This was clearly explained in the report of the committee on electrolysis of the American Electric Railway Engineering Association presented last fall. The fact that this committee made no recommendations is indicative of the further fact that the time was not considered propitious for such action. The present situation can be summed up in the statement that while there is general agreement now as to the nature of the disease and its diagnosis, the experts are far from being unanimous as to the remedy to be applied. In other words, the present is a period of "watchful waiting" in the expectation that those commissioned to formulate recommendations will address themselves earnestly to the task.

This paper has been fortunate in securing, during the past few months, a number of articles containing information of a distinctively constructive character. The general tendency of the writers has been to favor the insulated return feeder system. This is done also in the article in this issue by I. W. Gross. While the use of insulated negative feeders is by no means new, the plan has only recently attracted much attention in this country. It is inherently an attractive proposition because it lends itself readily to calculation. As soon as it is determined that a certain rail drop will not cause electrolysis, then comparatively simple electrical calculations suffice to determine the size and location of the proper negative feeders. The plan is also attractive from the standpoint of operation in that all of the measurements needed to show the condition of the return system can be made readily.

On the other hand, all of the installations of the return feeder systems made up to this time have been on a small scale or under very favorable circumstances. Whether the different conditions presented by large surface railway systems would render the system less desirable in such cases remains to be determined. It is not difficult to see that the troubles with the return feeder system will increase rapidly if there is considerable metal in the streets, consisting in part perhaps of uninsulated return feeders and ground connections installed for railway use in the early days. It is also easy to understand that the cost of the return feeder system would increase rapidly with the number of cars operated by the railway. Still more serious might be the effect of the rerouting of a city system upon the return-feeder layout, which would have to be readjusted to suit each alteration of the routes and schedules. For these reasons we can, as yet, regard the insulated return feeder scheme as only one of several remedies for wandering ground currents. The determination of its exact place among the other means for prevention is one of the tasks properly falling to the committee on electrolysis of the American Electric Railway Association.

Building an Electric Railway Within the Polar Circle

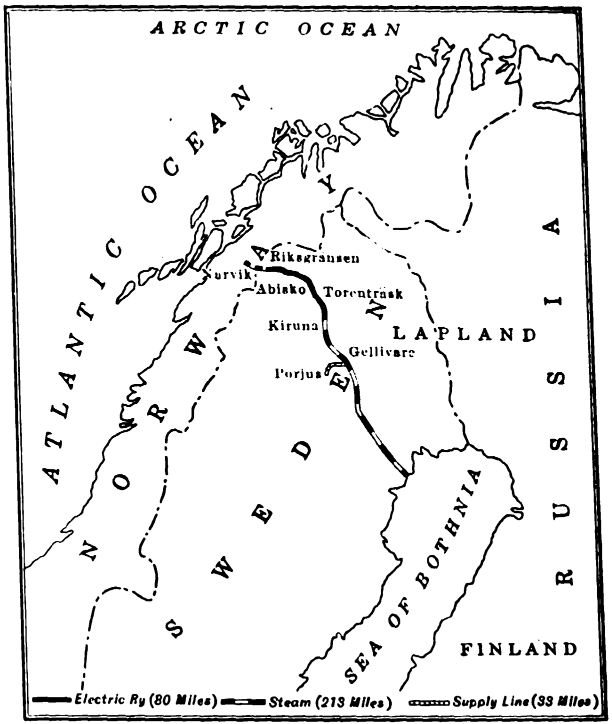
Electricity at 15,000 Volts Single Phase Was Adopted to Increase the Capacity of the Kiruna-Riksgränsen Railway Without Double-Tracking—This Article Describes the Equipment and Unique Conditions Under Which This Ore-Handling Railway Was Built

In two recent issues of *Elektrische Kraftbetriebe und Bahnen*, F. Zolland, engineer at Kiruna, describes the construction of the Kiruna-Riksgränsen Railway which is notable as the first electrification within the polar zone. In 1910 the Swedish government determined to electrify the Kiruna-Riksgränsen section of its standard-gage lines between the port of Lulea on the Gulf of Bothnia and Riksgränsen, the latter name signifying the location of the border line between Sweden and Norway. The Norwegian section of the line ends at Narvik on the Atlantic coast. Practically the sole freight business is that of transporting iron ore. Three million tons were hauled by steam in 1913, but as it was desired to raise the output to 5,000,000 tons a year electrification was adopted in preference to partial double-tracking. Electrification will eliminate smoke in tunnels and permit heavier trains and higher average speeds. The present steam trains comprise twenty-eight 11-ton cars capable of carrying 35 tons each while electric trains will have forty cars. The maximum speed of steam trains is 24.8 m.p.h. on level track and 7.4 m.p.h. on 1 per cent grades; the electric speeds for corresponding conditions will be 31 m.p.h. and 18.6 m.p.h. On the whole, the average speed of the trains will be raised about 25 per cent. The large amount of water power and the scarcity of coal were also important economic factors in choosing electrification.

Single phase was adopted owing to the length of the line and the large amount of energy to be transmitted. The transmission potential is 80,000 volts while the contact line carries 15,000 volts at fifteen cycles.

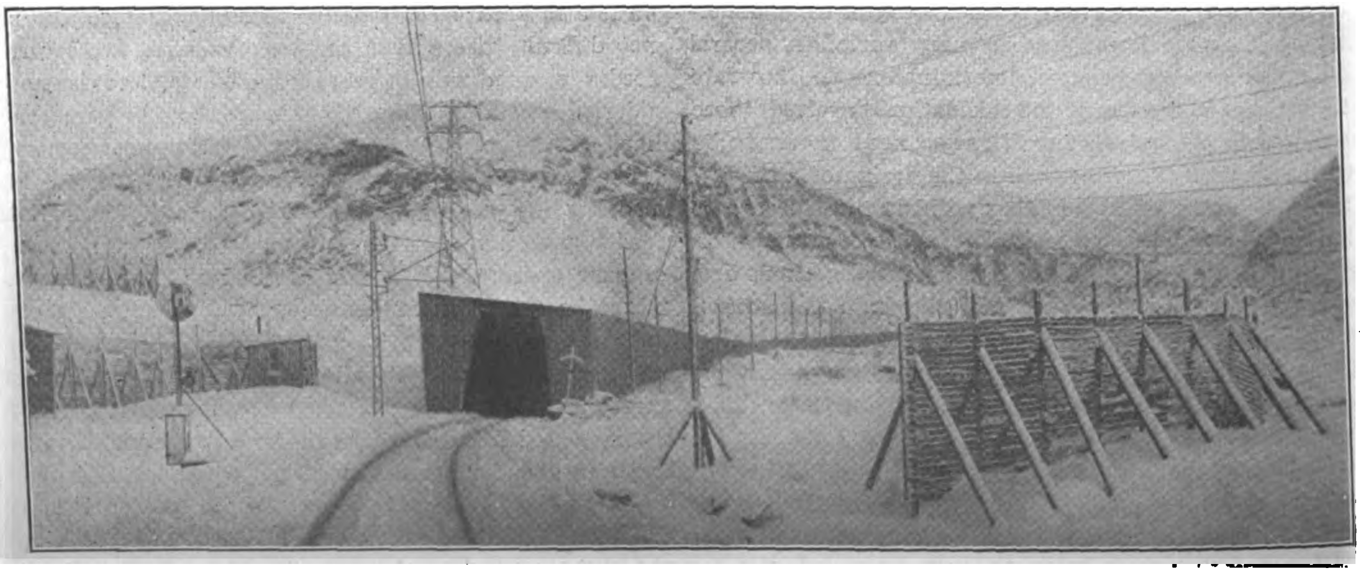
GEOGRAPHICAL AND CLIMATIC CONDITIONS

The extreme northern location of this railway naturally makes its electrification exceptionally interesting. Kiruna, the starting point of the electrification, is about 87 miles north of the polar circle. The lowest recorded temperature here is 52 deg. Cent. below zero. During January and February 25 deg. to 35 deg. below zero are considered normal temperatures. From October until the beginning of May the temperature rises little above zero, and snow is almost always in sight. Owing to the extreme dryness of the atmosphere these temperatures are not severe except when the wind velocities are high. An unpleasant accompaniment of warm weather is the large number of midges and mosquitos.

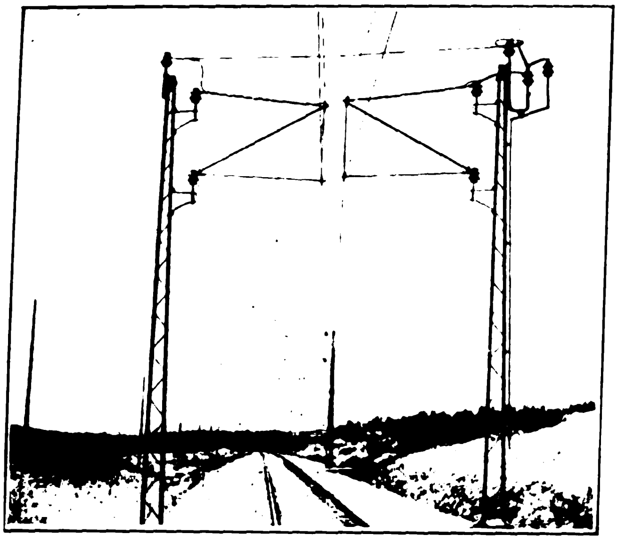


Electric Ry Journal

POLAR ZONE RAILWAY—MAP SHOWING EXTREME NORTHERLY LOCATION OF KIRUNA-RIKSGRAENSEN RAILWAY



POLAR ZONE RAILWAY—VIEW OF SNOW SHEDS AND SNOW FENCES, ILLUSTRATING THE DIFFICULTY OF ELECTRIC OPERATION WITHIN THE ARCTIC CIRCLE



POLAR ZONE RAILWAY—SINGLE-TRACK CONSTRUCTION AT A POLE CARRYING A SECTION BREAKER

June, July and August are the only months during which frost is usually absent at night.

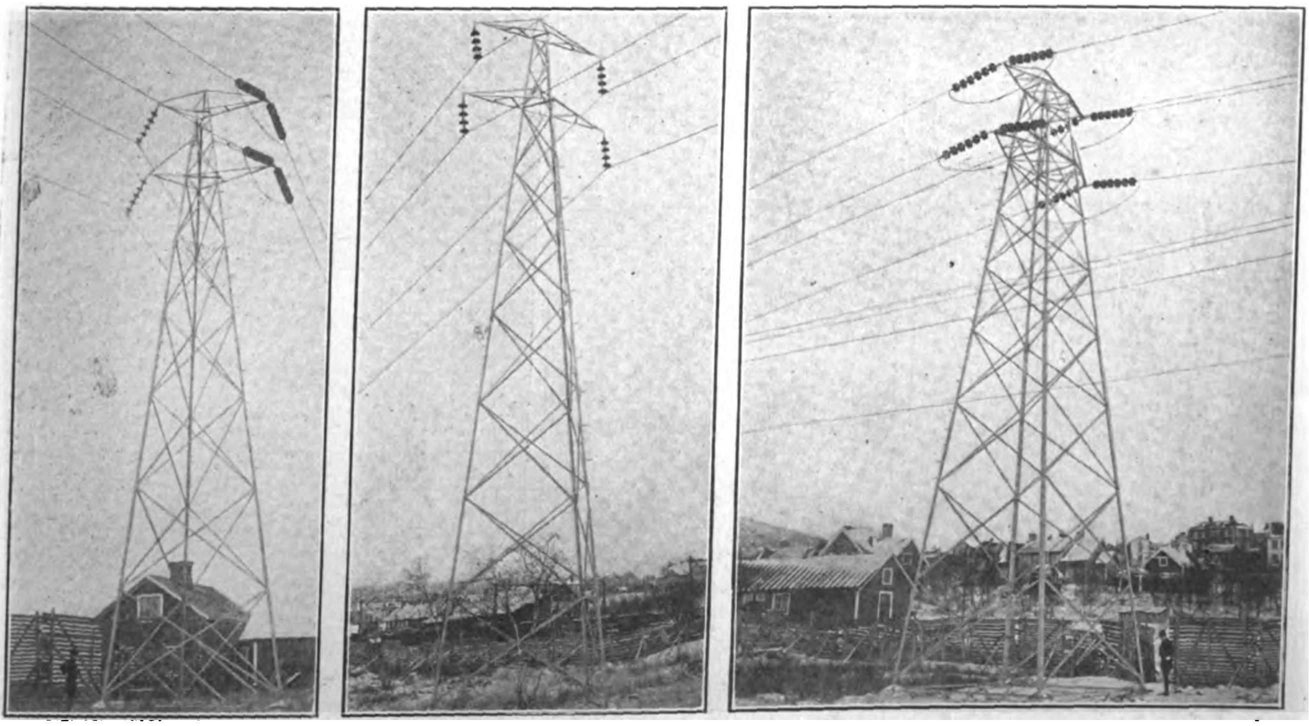
The entire electrification is through an absolutely uninhabited and uncultivated country. At Kiruna one may see a few stunted birches hardly more than 15 ft. high, but at Riksgränsen there is no vegetation at all. Kiruna has about 8000 people, most of them miners. The only inhabitants along the line are employees of the railway except the native Laplanders, whose possessions consist only of their tent equipments and reindeer. From the end of May to the beginning of July the sun does not sink below the horizon; on the other hand, it is invisible in December and January, during which period only a few hours of twilight occur.

Both the light and temperature conditions naturally offered some difficulties in building the transmission and contact lines, but the handicaps were minimized by careful preparation. The contract called for the completion of the work in two years, whereas the actual time available for work was only seven months. Most of the employees were secured from southern Sweden and were engaged about three or four months before the beginning of the work. The question of living quarters was settled by the use of about ninety old freight cars which were furnished by the Swedish State Railways. The men were divided into messes of ten each, every mess being supplied with one sleeper and one diner. Tents were also provided for shelters in sudden storms and for meals during working hours. The use of freight cars for living quarters proved a good expedient inasmuch as the men could move their homes as the work progressed. Food and clothing were supplied through a firm at Kiruna upon the delivery of paper tokens, which were cashed when the men were paid twice a month.

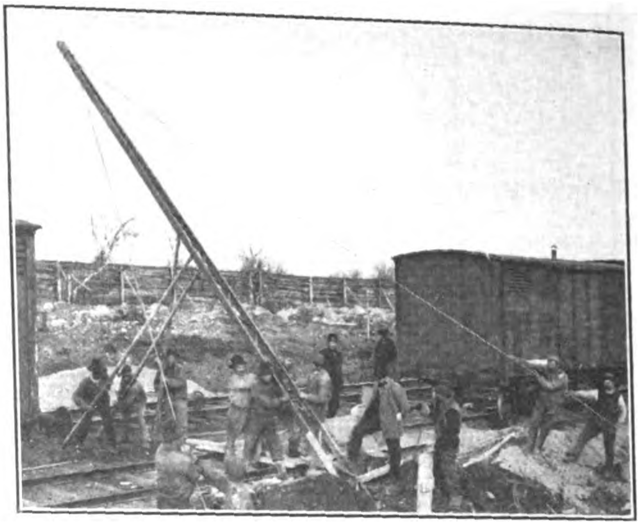
POWER STATION

It was intended originally to place the power station at a point 12.4 miles north of Kiruna, but this plant would have proved of insufficient capacity after the line had been extended to Lulea. It was therefore decided to build the station at Porjus Falls, 74.4 miles south of Kiruna. The ultimate capacity of these and the neighboring falls is placed at 250,000 kw, so that the location is ideal for further railway and industrial applications.

The first construction at Porjus Falls involved the erection of a dam to raise the level of Lake Porjus about 16 ft., thereby attaining a head of 180 ft. A number of subsidiary reservoirs take care of the great fluctuations which are to be expected in railway service. The machinery room is built in solid rock at a depth of 164 ft. The initial installation consists of three eight-pole single-phase generators for railway service, each with a maximum capacity of 10,000 kva, and one three-phase generator with a maximum capacity of 11,000 kva for supplying energy to the mining works at Gellivare and Kiruna. An emergency three-phase machine can also be coupled to one of the single-phase



POLAR ZONE RAILWAY—TRANSMISSION TOWER AT A CURVE. STANDARD 80,000-VOLT TRANSMISSION TOWER WITH SUSPENSION INSULATORS FOUR IN SERIES. ANCHORAGE TRANSMISSION TOWER WITH INSULATORS SIX IN SERIES ON EACH END generators. The railway machines generate 4000 volts at fifteen cycles and are driven by turbines which run at 225 r.p.m. The machines are completely inclosed but are furnished with forced ventilation. Although the turbo sets are started and stopped by hand, speed regulation is obtained by means of remote control from the switchboard. Both the transformers and switchboard are built above the machinery room to secure the benefit of daylight. The six individual transformers step up the voltage to 40,000, the transmission potential of 80,000 volts being obtained by connecting the low-tension side of each pair of transformers in parallel and the high-tension side in series. Each transformer has a continuous rating of 3000 kva, and is of the oil-cooled type. The high-tension middle point of the transformer group is grounded across resistance in order to carry off static charges and to reduce the demands upon the insulation. The transformers are also protected with horn type lightning arresters and choke coils. Only the high-tension side of the power station has oil switches and these are operated through remote control.

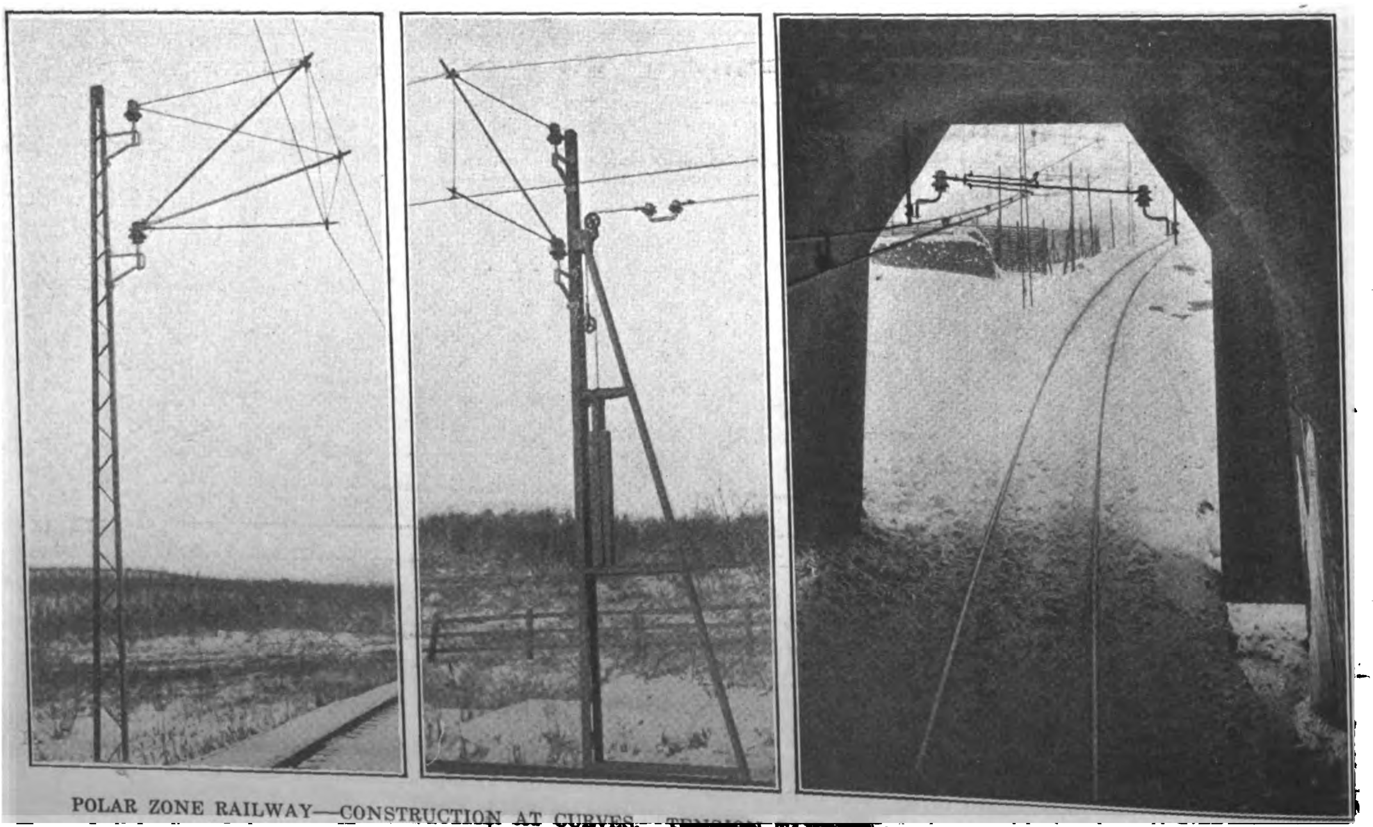


POLAR ZONE RAILWAY—ERECTING AN A-FRAME POLE FOR THE CONTACT LINE. SHOWING ALSO FREIGHT-CAR QUARTERS OF WORKERS

Transmission System

The power station, as previously noted, is 74.4 miles south of Kiruna. The electrification between Kiruna and Riksgränsen itself is 80.6 miles long and is supplied with four substations, namely; Kiruna, Torneträsk, Abisko and Vassijaure, located respectively 30.3 miles, 25.8 miles and 18.2 miles apart. The 80,000-volt lines are carried from suspension type insulators, which are hung from the opposite ends of structural steel cross-arms. On tangent and slight curves the insulators are placed in chains of four. At sharp curves, however, six pull-over insulators are the rule. The four cables between Porjus and Kiruna are of 80 sq. mm. (nearly No. 000) cross-section. Between Kiruna and Torneträsk the cross-section is 70 sq. mm. (a little more than No. 00) and between Abisko and Vassijaure 50 sq. mm. (slightly less than No. 0). All cables have seven wires. The transmission is carried on triangular steel towers 59 ft. to 62 ft. high which are generally located 640 ft. apart, but some spans are as long as 1050 ft. The towers are anchored in concrete foundations sunk 6 ft. to 8 ft. in the ground. Owing to the great length of the section between Kiruna and Porjus, three circuit-breaker houses were built and equipped to facilitate the discovery of defective insulators and to serve as lightning arrester houses.

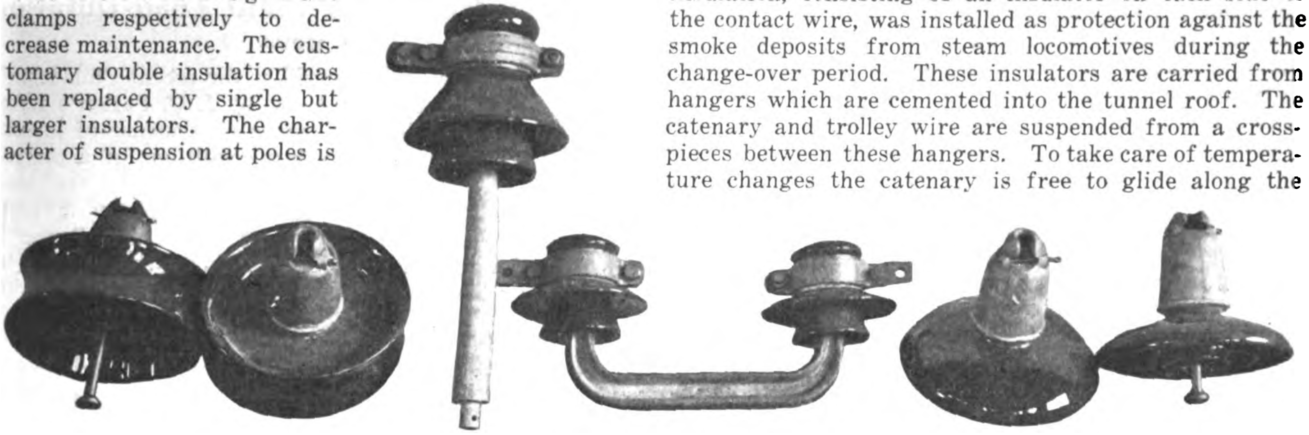
Each substation has three oil-insulated transformers, which have a continuous rating of 1000 kva each. These transformers are arranged to step down the voltage from 80,000 to 15,000. The highest permissible momentary loading per transformer is 2700 kva. In addition to the oil insulation, a ventilating shaft supplies cold air to each transformer. As at the power station, every transformer is placed in a separate compartment and rails are used to permit them to be rolled out for



POLAR ZONE RAILWAY—CONSTRUCTION AT CURVES. TENSION TAKE-UP DEVICE. STANDARD FORM OF TUNNEL CONSTRUCTION inspection and repair. The generating equipment was furnished by the "A. S. E. A." of Västeras, Sweden, while the other electrical equipment is of Siemens-Schuckert manufacture.

CONTACT LINE

The greater part of the contact line is of the single catenary type with A-frame poles spaced 172 ft., and hangers spaced 58 ft. The catenary is a seven-strand copper cable of 50 sq. mm. (approximately No. 0) section, while the trolley is of No. 8 profile of 80 mm. (approximately No. 000) section. Copper and bronze were used for the hangers and clamps respectively to decrease maintenance. The customary double insulation has been replaced by single but larger insulators. The character of suspension at poles is somewhat unusual. A separate gas-pipe bracket is employed for the catenary and contact line, that for the catenary being stiffened by a diagonal which is carried outward from the insulator of the trolley bracket. Both insulators are screwed by means of hemp into strap-iron struts within 9 in. from the poles. The bracket piping is attached to the insulators by means of lead-lined caps in such fashion that the brackets turn automatically to allow for dilatation in the suspension system. The customary tension take-up weights are installed at intervals of 0.8 mile. At these points, also, the railway has installed section breakers comprising a simple knife switch, horn arc blowout and a lever which can be operated from the ground. Sectionalization to so great an extent is unusual but will be helpful in discovering the location of defective insulators.



POLAR ZONE RAILWAY—DEAD-END TRANSMISSION INSULATORS AT LEFT, CONTACT LINE INSULATORS IN CENTER AND SUSPENSION TRANSMISSION INSULATORS AT RIGHT

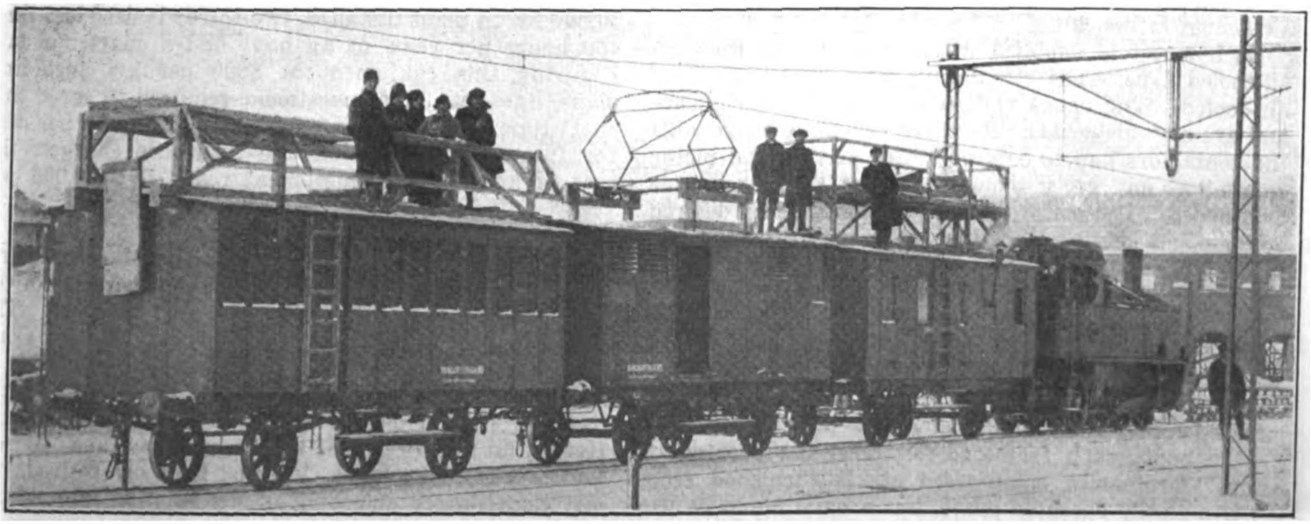
At yards and in other places where there are more than three tracks the contact system is carried from light catenary bridges. In this construction the bracket from which the catenary is suspended is also a piece of movable piping, and all insulation is afforded by double insulators in the catenary itself. Protection against static charges at stops where there are no sub-stations is afforded by lightning arresters and enamel resistances which are installed in wooden huts. These equipments may be cut out of circuit by the horn switches at the tension take-up points.

Special attention is directed to the construction devised for tunnels and snow galleries. In tunnels, double insulation, consisting of an insulator on each side of the contact wire, was installed as protection against the smoke deposits from steam locomotives during the change-over period. These insulators are carried from hangers which are cemented into the tunnel roof. The catenary and trolley wire are suspended from a cross-pieces between these hangers. To take care of temperature changes the catenary is free to glide along the cross-piece within loops. In the snow galleries the standard outside construction is used wherever clearance conditions are found to be satisfactory. On open sections the trolley wire is at least 18 ft. above the rails and in covered sections as low as 15 ft.

In constructing the overhead line, special trains were made up on which working platforms were built on the roofs of alternate cars to a length equal to a complete span. The catenary and contact wire were unreeled and erected simultaneously, the erection of the hangers following.

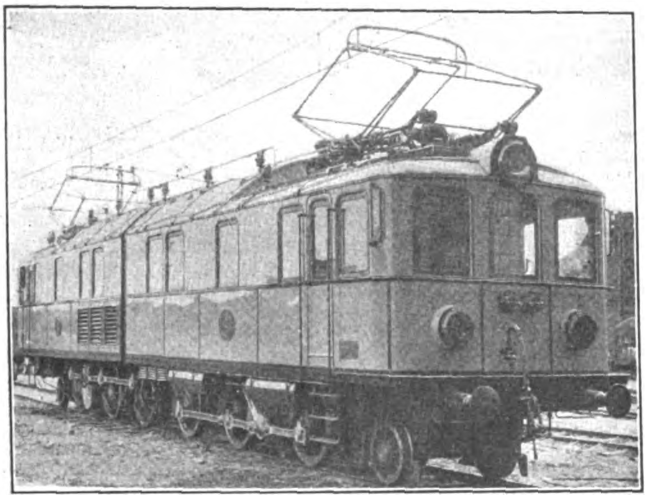
LOCOMOTIVES

Exclusive of the locomotives, the average weight of a passenger train is 200 metric tons and of an ore train, 1855 tons. It was specified that the passenger and ore trains must be hauled at 31 m.p.h. and 18.6 m.p.h. re-



POLAR ZONE RAILWAY—CONSTRUCTION TRAIN WITH PANTOGRAPH SET UP TO GAGE CONTACT WIRE CLEARANCES—SHOWING ALSO BRACKET SUSPENSION OF CATENARY AT BRIDGES spectively over grades of 1 per cent and curves of 1640 ft. radius. The equipment secured from the Siemens-Schuckert Company comprises two passenger locomotives of Type 2-B-2 (two pony axles, two drivers and two pony axles on one truck) and thirteen ore locomotives of Type 1-C + C-1 (one pony axle and three drivers per each of two trucks). Each half of the ore locomotives has a floor-mounted motor with jackshaft connection to the driving rods. The oil reservoir for the jackshaft is fitted with a small heating resistance to prevent the freezing of lubricant during low temperatures. Wood faced with sheet iron is used for the locomotive housing on account of climatic conditions, but side louvers are provided for ventilating the apparatus. The roof may be taken off to exchange parts of the machinery. Each housing of the twin locomotive is partitioned into a motor and compressor room, high-tension room and control cab. For operation of loaded trains the New York automatic air brake is used, while straight air is employed for empties.

The motors are of the series type with auxiliary excitation. No resistance leads are used between the armature coils and the commutator. The speed of the motors is regulated by changing the secondary voltages at the main transformer. The reverser is built on the motor frame in order to secure the shortest possible course for the heavy current circuits between this device and the motor brushes. The reverser is operated by means of a compressed air cylinder which is controlled from a solenoid in the cab.



POLAR ZONE RAILWAY—STANDARD FREIGHT LOCOMOTIVE FOR KIRUNA-RIKSGRAENSEN RAILWAY

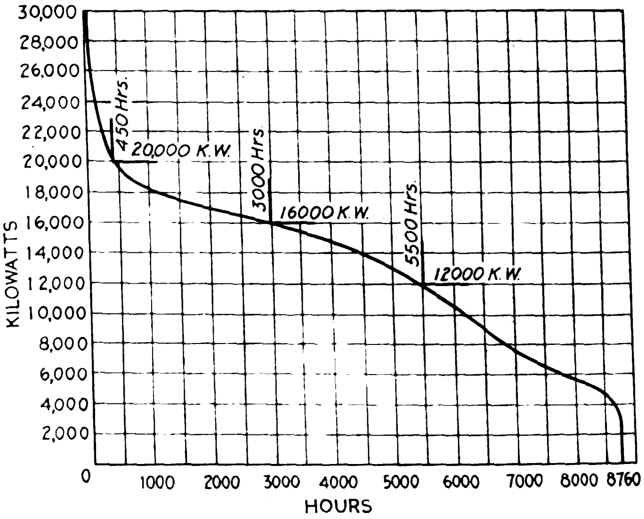
Each motor is supplied with a core transformer of oil-cooled type. The circulating piping for the oil is air-cooled. The choke coils are provided in triplicate and are also air-cooled. As there are three choke coils the contactors handle only one-third of the total motor current at any given moment so that they are never overloaded. The motorman may operate at any desired voltage and speed within his range without returning the controller to the zero position. The controller has the usual deadman's handle and emergency braking feature. The high-tension oil switch may be opened and closed mechanically or from push buttons in the cab. The current collectors are of the ordinary Siemens pantograph type with auxiliary bow, but the compressed air cylinder and springs are placed very close to the pantograph frame to minimize the packing of snow. Ordinarily, compressed air is furnished from an electrically operated pump, but a hand pump is also available for contingencies. The locomotives are illuminated by means of 23-volt metallic filament lamps, which are connected to a storage battery when line current fails. Two 2-kw electric heaters are placed in each cab, and heaters are also provided for drying sand.

OPERATION

If trains could be operated every day the proposed schedules would take care of 4,130,000 tons to 6,200,000 tons of ore a year. In view of snowstorms, irregular outputs, holidays, etc., the actual amounts which will probably be transported under these schedules are 3,200,000 tons and 4,850,000 tons. The regular operation of ore trains is to begin at the end of the current year.

The Electric Power Plant Load-Duration Curve

Much interest was aroused at the recent Philadelphia convention of the N. E. L. A. by J. C. Parker's reference to the load-duration curve as a means of investigating the efficient operating conditions of a central-station system. Reproduced herewith is the load-duration curve for the Rochester Railway & Light Company, Rochester, N. Y., of which Mr. Parker is electrical engineer. The curve shows the relation between the load carried and the number of hours in the year for which the load endures. For example, only about 4000 kw of load continues every hour in the year. The equipment necessary to carry 12,000 kw is used 5500 hours per year. But, on the other hand, of the 30,000 kw in plant installed, two-thirds is used less than 450 hours per year, or an hour and a quarter a day. Figuring this equipment at $500 per kw, including plant, lines, etc., the investment required to serve this short-time demand is $5,000,000. Allowing 15 per cent for interest, depreciation and insurance charges, the cost of keeping this equipment ready is $750,000 per year.



LOAD-DURATION CURVE OF ROCHESTER COMPANY.

The Bridgeport *Farmer* in its issue of Aug. 25 reviewed the incidents connected with the operation of the first trolley car in that city on Aug. 24, 1894. The company was known as the Bridgeport Traction Company, and the property is now included in the system of the Connecticut Company. Two of the officers of the company still reside in Bridgeport. They are Col. N. H. Heft, who was president of the company, and Andrew Radel, general manager. Colonel Heft has retired, but Mr. Radel, after disposing of his traction interests in Bridgeport and other cities, entered the oyster industry and is said to be the largest operator in that field in the world.

Railway Electrolysis and Methods of Treatment

The Author Describes Methods of Making Electrical Measurements to Determine Electrolytic Conditions and Discusses the Several Methods in Use for Preventing Electrolytic Corrosion

BY I. W. GROSS, NEW YORK

The subject of railway electrolysis has been understood in a general way for some time, but it is only recently that its relation to electric traction problems has been extensively analyzed and that remedial measures have been adopted. This change has been brought about in part by the increase in density of traffic over railway lines, in part by the increase in the number of gas, water and cable lines paralleling the tracks, thus increasing the conductance of the leakage current path, and in part by the widespread application of electric power to traction purposes.

The result of these natural growths of traffic and population has been to bring the electrolysis problem to the point where the deteriorating effects of stray currents can no longer be passed off as atmospheric corrosion, where damage is caused to gas or water pipes, or as plain chemical action where cable sheaths are injured. On the other hand, not all failures of gas pipes or cable sheaths are due to electrolysis, even where railway tracks parallel or cross them. It is only by thorough testing and careful analysis that trustworthy results can be obtained and definite conclusions drawn.

It is the purpose of this article to describe the most generally used methods of testing for electrolytic troubles, to present actual test data, and to discuss several of the methods employed in mitigating electrolysis trouble, pointing out their merits and defects.

In dealing with electrolytic problems three questions are involved. In the first place, does any electrolysis exist? Second, what is its source? That is, does the stray current come from the railway tracks or from some other conductor, and if from the former from what part of it? Finally, what is the most effective and economical method of removing or alleviating the trouble?

MANIFESTATIONS OF ELECTROLYTIC CORROSION

Where electrolytic action on a lead cable sheath is severe there are formed dark red or white deposits upon it. It seems probable that the red deposit, an oxide of lead, is formed electrolytically first, and that later this oxide is chemically changed to an insoluble lead salt when acidified water leaches through the duct line and runs along the bottom in contact with the oxidized lead. Sometimes the deposit is white from the very start, the red oxide of lead not being apparent. Whatever the deposit on the sheath, be it either red or white, continued electrolytic action ultimately pits the cable until the sheath is eaten through in spots, and failure takes place when air and water gain access. The spots where the cable is pitted are on the side in contact with the duct, and are usually from 1/8 in. to 1/4 in. in diameter. Sometimes, where the action has been violent, these pits or spots are sufficiently close together to give the sheath the appearance of a grater. For several feet the lead may be more than half eaten through and yet the cable may remain intact.

Since electrolytic action takes place only between a metal and an electrolyte, and since, even in wet manholes, the cables are often clear of water, most of the electrolytic action takes place wholly within the duct line where the trouble cannot be detected until the cable is removed. Such is the usual case, and means other than mere inspection must be adopted.

With cast-iron pipe, electrolytic action manifests itself in a layer of non-magnetic material over the outside of the pipe, identical in external appearance with the pipe itself, but far lighter and absolutely devoid of mechanical strength. Unlike lead, cast iron does not pit but is deposited in a uniform layer about the pipe where the current leaves it for water or some other electrolyte. In the case of a certain 14-in. cast-iron pipe, 3/4 in. thick, submerged in salt water, the writer found a half-inch non-metallic coating on the outside, formed by electrolytic action. When the pipe was removed from the water it was uniform in size and symmetrical in shape, but it took only a few blows from a light hammer to separate the half-inch coating from the thin metallic shell which remained of the original pipe. Here again, while the pipe was in service inspection alone would not have detected the trouble; and some other means must be adopted in such cases to detect trouble before the damage has assumed serious proportions. This at once leads to electrical tests to determine the presence of current in these conductors.

TESTS FOR CURRENT IN PIPES

The current survey, as it is generally known, is the first test to apply to a conductor where electrolytic action is being sought for. This merely consists in spanning a short section of the conductor, say, a gas pipe, with a low-reading voltmeter and observing the deflection. A millivoltmeter is generally used, since the drop along the pipe is always small. From the size of the pipe its resistance per foot can readily be obtained from tables, and the current flowing in the conductor can be computed by the application of Ohm's law.

In using a low-reading millivoltmeter as above described, there are several precautions which should be observed. In the first place, the meter should have its zero in the center of the scale rather than at the end, as in most commercial test meters. This is advantageous, as the current on a pipe often reverses, and it is impossible to reverse the connecting leads quickly enough to permit the observation of the negative reading.

Second, great care should be taken to thoroughly clean all contacts before starting the test, as the meter itself is of very low resistance (even when specially constructed for this kind of work). Where contact is made to a gas pipe, the pipe surface can be cleaned best with a sharp file to remove paint and rust.

As a third precaution, the millivoltmeter should never be used to take measurements across joints in pipes or from one pipe to another, before these tests have been made with a high-range voltmeter. This precaution is necessary to avoid burning out the millivoltmeter. Joints in supposedly electrically continuous conductors have been observed by the writer, across which there were drops of from 1 volt to 17 volts. The normal voltage drop across such joints when in good condition would under the most adverse circumstances not be over 0.01 volt, i.e., 10 millivolts.

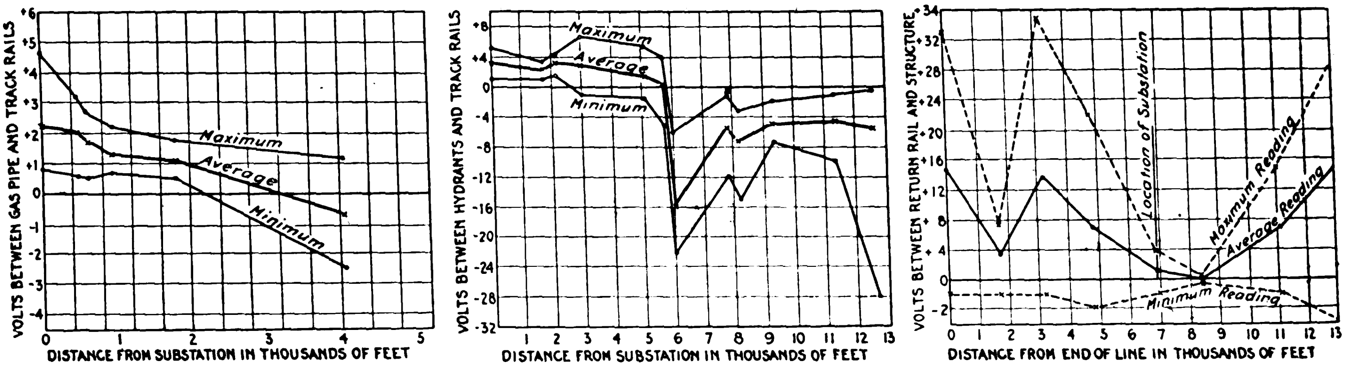
When current has been detected in a pipe the survey should be continued at various points along the line. Measurements made at distances of 500 ft. are usually frequent enough to show consistent results, and often the distance between data points can be increased to 1000 ft. or more.

If the source of current is a railway line, the cur-

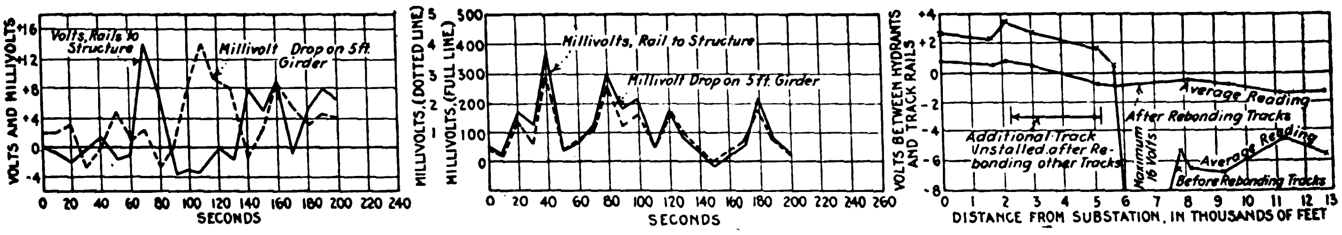
[NOTE: Mr. Gross is an associate member A. I. E. E. and engineer motive power department Interborough Rapid Transit Company.—EDS.]

rent will fluctuate over a considerable range, and in most locations it will reverse in direction from time to time. To obtain any comparable results, therefore, it is best to take forty or more readings at ten-second intervals and to average them algebraically to find the effective value of current in the pipe at the test point. As few as twenty readings will give results which can be checked consistently if the traffic on the line is heavy, while if it is very light, as on suburban trolley lines, a period of observation extending over five or ten minutes may be necessary.

In general the period of test should extend over one complete cycle of car movement; that is, from the time one car passes over the test point until the subsequent car reaches that point. The average readings obtained in this way are now plotted as ordinates against the distances from the station as abscissas, and in this way a graphical plot showing the relative magnitudes of currents in the pipe is obtained. After gaining some facility with this method of testing it is often unnecessary to make the actual plot, as the average readings show the conditions.



RAILWAY ELECTROLYSIS—FIG. 1—POTENTIAL SURVEY OF RAILWAY TRACK RETURN, GAS PIPE TO RAILS. FIG. 2—POTENTIAL SURVEY, HYDRANTS TO RAILS, SHOWING EFFECT OF DEFECTIVE BONDING. FIG. 3—POTENTIAL SURVEY, RETURN RAILS TO STRUCTURE



RAILWAY ELECTROLYSIS—FIG. 4—POTENTIAL AND CURRENT FLUCTUATIONS, STRUCTURE NOT BONDED TO RAILS FIG. 5—POTENTIAL AND CURRENT FLUCTUATIONS, STRUCTURE BONDED TO RAILS. FIG. 6—POTENTIAL SURVEYS, SHOWING EFFECT OF REBONDING TRACKS

The object of this current survey is not only to show the magnitude of current in the pipe but, from the average readings, to obtain some conception of where the current is entering and leaving the pipe.

POTENTIAL SURVEYS

The potential survey is identical with the current survey, except that readings are taken between the pipe under study and trolley rails, water mains and other paralleling conductors. A voltmeter is used for this test and no special precautions are necessary, as the meter has a high resistance. The voltmeter should have a center-zero scale, as potential readings, like current readings, are constantly reversing in most localities. The potential survey gives data for a chart showing the potential of the pipe referred to track rails, hydrants, etc. The purpose of this chart is to show the points along the line where it is possible for current to flow from one conductor to another. The results of several such potential surveys taken on different railway lines are shown graphically in Figs. 1, 2 and 3. The significance of these curves will be discussed later.

TESTS OF SOURCES OF LEAKAGE CURRENT

In some cases where electrolytic trouble is suspected there may be two or three foreign companies from whom it is possible for stray current to come. For example, a water main may be running along parallel to the car tracks of two different railway companies. There is current in the water pipe, let us say, and the tracks of both lines average positive in potential with respect to the water pipe. The problem is to determine which company is responsible for the stray current on the pipe. A method of fixing the blame which has met with considerable success is what may be termed the "volt-ampere" test. It consists in measuring simultaneously the potential difference between the water pipe and the rails of one company, and the current flow in the pipe. Readings of both meters taken together at ten-second intervals for about three minutes will usually give the desired information. The results of two such tests are shown in Figs. 4 and 5.

The object of a test such as the above is to associate the change in potential difference between the water pipe and rails with the values of current in the pipe. For example, if the current increases with increase of potential difference between pipe and rail evidently part of the stray current is coming from the rail, as is the case in the example shown in Fig. 5. If there is no corresponding change in current, as indicated by the millivoltmeter, very little if any current is coming from the rail. Fig. 4 shows such a case.

Another test sometimes applied with good results is the "ground" test, or, as it might properly be called, the "short-circuit" test. It consists of temporarily joining the return rail and the gas pipe by a good conductor with an ammeter in series, to determine the amount of "current flowing from rail to ground" or vice versa. Such a test is apt to lead to erroneous conclusions unless the results are carefully interpreted.

Suppose, for example, that a connection made as above indicated carries 250 amp. It cannot be inferred that 250 amp is the current flowing from the rail under normal conditions. A current as great as 250 amp under these test conditions indicates merely that the conductivity of the leakage path of the current from the gas pipe to the negative bus of the substation is high, although under normal conditions there may be very little, if any, current flowing from track rails to gas pipe. In other words, this test does not in any way indicate the normal current flow from or to the rails. On the other hand, suppose the current flow through the bond is but 15 amp. Then it is evident that the conductance from gas pipe to negative bus is very low and, even if artificial electric contact were made at this point between rail and pipe, the leakage current from this pipe at some other point would be comparatively small.

SUMMARY OF TESTS

The tests which are generally most effective and instructive in analyzing electrolytic action as described above may be made advantageously in one tour of the ground. From the current survey is obtained the magnitude of current flowing on the conductor under test, and in general the points at which it enters or leaves the conductor. From the potential survey are obtained the possible sources and the distribution of the stray current. From the volt-ampere test can be determined the actual sources of the current.

When the magnitude, location and source of the stray current have been determined by the above methods, the query which presents itself is, "What is the most effective and economical method of removing or alleviating the trouble?"

ELECTROLYSIS MITIGATION

There are at the present time four well-recognized methods of protecting conductors against serious danger from stray current. They are: The bonding of the conductor to points of low potential on the rail return; the breaking up of the conductor into electrically short sections by the use of insulated joints; the limitation of the drop in the track rails, either by means of parallel conductors or insulated feeders, and the insulation of both positive and negative sides of the system.

BONDING TO STATION NEGATIVE BUSBARS

The first of the above-mentioned methods has been widely used, especially by telephone companies whose underground cable sheaths normally carry no current of their own. By bonding the sheaths of the cables to the negative bus in the substation, it is possible in most cases to maintain the potential of the sheaths negative to the earth throughout their entire length. Thus the current leaking into the sheath is conducted through a metallic bond to the substation from which it came and corrosion of the lead is eliminated. The same scheme of bonding has been applied to water and gas pipes, but on account of possible high resistance in joints in the pipes this scheme is not entirely satisfactory, even for the protection of the pipes themselves. Where the joint resistance is high, current will shunt around the joint through the ground, or the water, in the case of water pipe, and injury may result where least expected.

The magnitude of the stray current in conductors is increased enormously by bonding to a substation bus. Cases have been observed where the increase in cable sheath current has been from thirty to 180 times the value of current with the unbonded condition. The result of this increase is that the larger current, being drawn from the rails produces electrolysis of the rails themselves, thus transferring the trouble from the cable sheaths or pipes to the property of the railway company. Further, the bonding of cable sheaths alone to the negative bus results in increased danger to gas and water pipes which are not bonded to anything, and at points along the line where gas and water pipes are negative to the rail damage may still result due to the cable sheaths being lower in potential than the pipes. Thus the section of the gas pipes which is in danger has been increased from an area near the substation to one covering the entire length of the line.

The use of the bonding system has resulted in increased stray currents and increased damage to railway tracks and, in general, to gas and water pipes. It seems undoubtedly true that this scheme of protection, which has been used quite extensively up to the present time, is the most to be feared of all remedies for electrolysis. Only by careful and painstaking tests and conclusions can the bonding system be applied with any degree of success, and even then its combined net effect is doubtful.

USE OF INSULATING JOINTS

The second method, that of breaking up the electrical continuity of the conductor carrying stray current, is very good in theory but its application is limited due to the labor of making and maintaining the insulated joints. Such joints in high-tension cables have, however, been in service for over two years to the writer's knowledge and have never given any trouble, although installed in a damp place. Similarly insulated joints in water pipes have effectively eliminated stray currents and, with a drop of 5 volts across the joint, have failed to show any signs of electrolysis. Some of these joints, also, have been in place for two years. The scheme of insulating the conductor, therefore, has been effective where tried, but it is costly and the joints are difficult to install and maintain.

INSULATED RETURN-FEEDER SYSTEM

The third method, that of using insulated return feeders, which has recently been discussed in the columns of the ELECTRIC RAILWAY JOURNAL, is meeting with considerable favor. It is interesting to note that this system was installed in the New York subway when first built about ten years ago, and it has been in successful operation ever since. The success of the system in New York is due to a large extent to the good insulation between track rail and ground furnished by the ties and rock ballast, as well as to the insulated feeder system.

The return-feeder scheme has been so thoroughly discussed of late that the method itself need not be repeated at length. In brief, it consists of limiting the drop in the track to a predetermined value, a value of 7 volts having been recently advocated, and allowing the larger part of the return drop to occur in the insulated feeders. This plan is reported to have reduced stray currents, but it should be borne in mind that its adoption does not eliminate electrolytic trouble but merely lessens it. By the proper placing of return feeders, the location of the dangerous sections can be altered as desired, but not the total area when the permissible voltage drop has been fixed. It is often possible, in this way, to remove a danger section to points remote from gas, water or cable lines. Thus, while the return-feeder scheme does not remove the trouble absolutely from the pipes it may very much lessen it.

COMPLETE INSULATION OF CONDUCTORS

The fourth method of electrolysis mitigation, that of insulating both positive and negative sides of the railway system, is the only method of giving perfect protection with railways using direct current. Such systems are now in use in Washington, D. C., and in the system of the New York Railways Company in New

York City. The New York company employs a telltale device, located in the substation, to indicate a ground on the system, thus permitting the maintenance of excellent insulation from ground for both positive and negative feeders. When applied to systems using overhead wires this method necessitates two overhead trolley wires and in such cases the conductance of the track rails is absolutely lost and an additional conductor must be supplied to carry the return current.

This insulating scheme has also been applied to elevated roads with absolute success. Here, however, only the conductance of the structure itself is lost, the track rails still being used for the return circuit, and additional copper is added where necessary to keep the drop within economic limits.

DISCUSSION OF TEST DATA

The potential survey represented in Fig. 1 was taken along the line of a trolley road using a ground return. The conditions for only part of the line are shown as, in this test, it was merely desired to determine the location of the neutral point, that is, the point where the rails became positive to the gas pipes. This potential plot is typical of grounded tracks, and the maximum average value of 2.6 volts between gas pipes and tracks at the substation is not excessive.

Fig. 2 represents the potential conditions of the tracks of the same trolley line, fed by the same substation as in Fig. 1 but along a different route. This is an end section, that is, it is fed entirely from one end. The erratic potential of the rails at about the middle of the line is due to broken bonds, as was determined by finding a maximum drop of 17.5 volts across two adjacent rail ends. This diagram represents abnormal track conditions, directly traceable, in this case, to a poorly bonded return.

Fig. 6 represents potential conditions before and after rebonding the above track. It will be observed that in this case an over-all potential reading, as referred to in recent issues of the ELECTRIC RAILWAY JOURNAL, would not show any abnormal conditions on the line. The over-all drop is approximately 8.1 volts, assuming no drop in the water pipes, while the maximum average potential difference between any two points of the line is 18.7 volts; or over twice that indicated by the over-all measurement. Thus it appears the over-all measurement is not final in determining track conditions.

It might be of interest to note in connection with the potential distribution shown in Fig. 2 that the potential gradient from the middle to the end of the line is away from the substation. This would lead one to believe that the return current was entering the ground in the vicinity of the end of the line. The correctness of this theory was proved by the condition of the track rails at the end of the line when removed. These rails, which gave no sign of excessive wear due to traffic, were found with the lower flanges almost entirely eaten away, and in some cases more than half the vertical web was gone.

Referring again to the 7-volt total permissible voltage drop regulation, it is interesting to note that the approximate value of 8.1 volts is about 17 per cent in excess of the recognized safe value. Yet here is a case where nearly half the line current must leave the rails before reaching the substation. In other words, the 7-volt drop regulation alone is not a sufficient safeguard without further stipulations as to the condition of the track return.

The data shown in Fig. 3 were taken along the line of an electric road where the tracks were not in normal contact with the ground. The point 1.7 miles from the end of the line, where a comparatively low potential is observed, is at the termination of negative insulated feeders. The distribution of potential is, therefore, due to the negative feeder system rather than to any abnormal track conditions.

At the end of the line the average potential of the rail is 15 volts above the track structure, or roughly above earth. This is more than twice the 7-volt standard. This relatively high potential was misinterpreted by the owners of a building situated at this point, who thought that they detected evidence of stray current in the steel work of their building. The high potential was believed by them to indicate a large current flow in their building. To settle this point the volt-ampere measurements shown in Figs. 4 and 5 were taken. These show conclusively that no leakage current from the rails to the structure existed under normal conditions, but that an accidental bond between rail and building would be most detrimental. High-potential readings from conductor to rails show, then, nothing whatever in regard to conditions of current flow in the conductor.

GENERAL SUMMARY

It has been the endeavor in this article to bring out the following points:

1. It is usually possible to tell from the appearance of lead and iron whether they are being acted upon by stray currents, wherever they can be freely inspected.

2. Electrical tests are the only sure means of determining existing electrolytic conditions. Of these tests the current survey is the only one that gives a real criterion, the potential survey merely showing locations where electrolysis is likely to occur. High-potential differences, with no current flow on the conductor under suspicion are not injurious. The volt-ampere test may be effectively used to trace out the source of stray current.

3. Of the remedial measures adopted in connection with electrolytic troubles up to the present time, the methods of cure in order of effectiveness are as follows. *a.* Insulated positive and negative rails. This system is, in general, very expensive. *b.* Insulated joints in all water, gas and cable lines, with due consideration for the condition of the return bonding system. On account of the high cost of installing insulated joints this scheme is impracticable, especially where there is any considerable number of foreign conductors paralleling the railway line. Further, the durability of such joints is open to question; and experience has not been sufficient to assure immunity from electrolysis when there is a considerable drop across the joints. *c.* Insulated feeder systems with regulated drop in the track circuit. *d.* Solid bonding of endangered conductors to the negative bus of the substation, or to other points of low potential on the line. This is the most dangerous method of protection and should be avoided wherever possible.

4. It is firmly believed that the specified limitation of the average rush-hour drop between any two points in the track to 7 volts is not applicable in all cases. It is believed that in some cases this drop can be exceeded with safety, while in other cases it should be reduced below 7 volts.

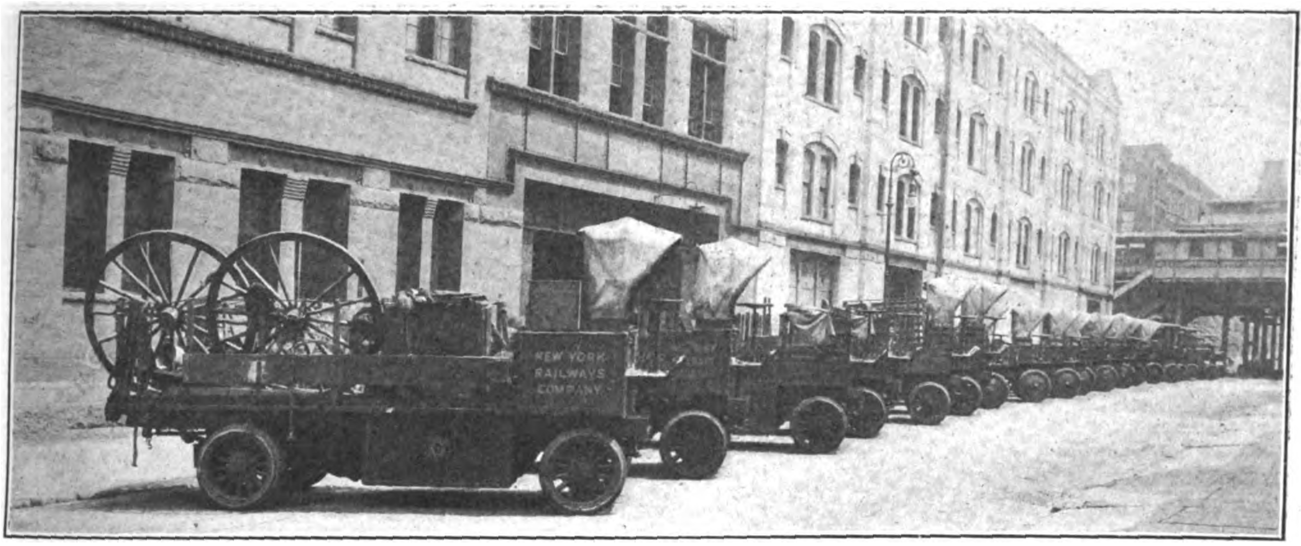
5. Since it is evident that the condition of the track bonds materially affects electrolytic conditions, it is suggested that the voltage drop across the rail joints be specified in terms of feet of rail, in addition to the specifying of the allowable voltage drop in the tracks. Satisfactory track bonding can be maintained only by periodic tests.

6. The over-all voltage check on a line is not sufficient evidence of adherence to the stipulated allowable drop, as shown in Fig. 2. However, this over-all voltage check would be adequate if the bonding were all in good condition and good bonding can be obtained with the aid of periodical tests.

Electric Motor Trucks for New York Railways

Particulars Are Presented of the Twenty-nine Electric Vehicles Which Are Used by This Company as Service Trucks of Different Types

The New York Railways Company placed in operation during the latter part of 1913 the largest equipment of self-propelled trucks ever ordered by an electric railway to replace horse-drawn trucks and wagons of various kinds. In order to fix the number of each kind of vehicle required, a diagrammatic study was made of the horse-drawn vehicles then in use to determine the moving and standing time of each truck and of the number of trucks employed continuously throughout the year. The time data were obtained from the reports of arrival and departure at stopping points as turned in by the drivers, while mileage was calculated from a map. A detailed comparison was also made of gasoline versus electric vehicles, and this showed that for the short runs in congested districts, comprising most of the service, electric vehicles were to be preferred because of their greater simplicity of operation and their economy on the bases of total first cost, operation, fixed charges and depreciation. All of the motor trucks were ordered from the General Vehicle Company, Inc., Long Island City, N. Y.



NEW YORK RAILWAYS MOTOR TRUCKS—ASSEMBLY OF TRUCKS WITH 10,000-LB. CABLE WAGON IN FOREGROUND

Specifications were prepared by J. S. Doyle, superintendent of car equipment, for twenty-nine vehicles of different capacities as follows:

- One 1000-lb. open express type wagon,
- Two 3000-lb. panel type delivery wagons,
- One 2000-lb. panel type bank wagon,
- Five 4000-lb. emergency wagons,
- Fourteen 7000-lb. steel dump trucks,
- Four 7000-lb. platform and stake trucks,
- One 10,000-lb. platform, stake and reach truck,
- One 10,000-lb. platform, stake and windlass truck.

At present these vehicles are charged at night from one central charging station, although the use of more stations for day boosting charges is contemplated.

1000-LB. AND 2000-LB. TRUCKS AND BANK WAGON

The 1000-lb. open and 2000-lb. closed delivery trucks carry transfers, stationery, light track material, pipe and lumber for small jobs, etc.

The bank wagon was built for collecting money at different receiving points in the carhouses and carrying it to the company's banks. The bank wagon route covers from 25 to 30 miles a day. On account of its purpose, the body has been designed with the following special features:

An inside sliding steel door, 22 in. x 30 in., is installed 8 in. in the back of the driver's seat, on the right-hand side, to serve as a passage for money bags only. This door has been made sufficiently large to allow a man to lean out and place a money bag, which weighs from 50 lb. to 75 lb., on the shoulder of a man standing on the sidewalk. It may be observed that by this arrangement the man to whom the money is handed is always facing the sidewalk, and, therefore, he is not likely to be taken by surprise. A barred window, 12 in. x 12 in., is built in at the rear end of the body for ventilation.

Two heavy wire screen doors, swinging inwardly against the sliding steel side door, at the back of the driver's seat prevent access to the interior of the body when money is being handled at the side door described. Doors which swing inwardly are used because the inside guard is compelled to close them before he can get at the side door to open it. Thus only one kind of door can be open at a time. There are doors on each side of the footboard, as is ordinarily the practice now with pleasure automobiles, that is to say, the four-door arrangement is used. This makes it difficult for a highwayman to obtain a foothold. Steel plates are placed inside the body to protect the men from gun fire.

EMERGENCY TRUCK

The emergency truck is used for accidents, and as a hook is attached to each end it can be maneuvered more easily than a horse-drawn wagon when it has to pull wagons or other obstructions off the track. It weighs 7600 lb. complete and has a maximum drawbar pull of 4500 lb. While an average trip is about 3 miles and an average daily performance is 15 miles, the battery on one charge is capable of propelling the regular load of 4000 lb. for at least 30 miles. This truck also carries a complete tool kit.

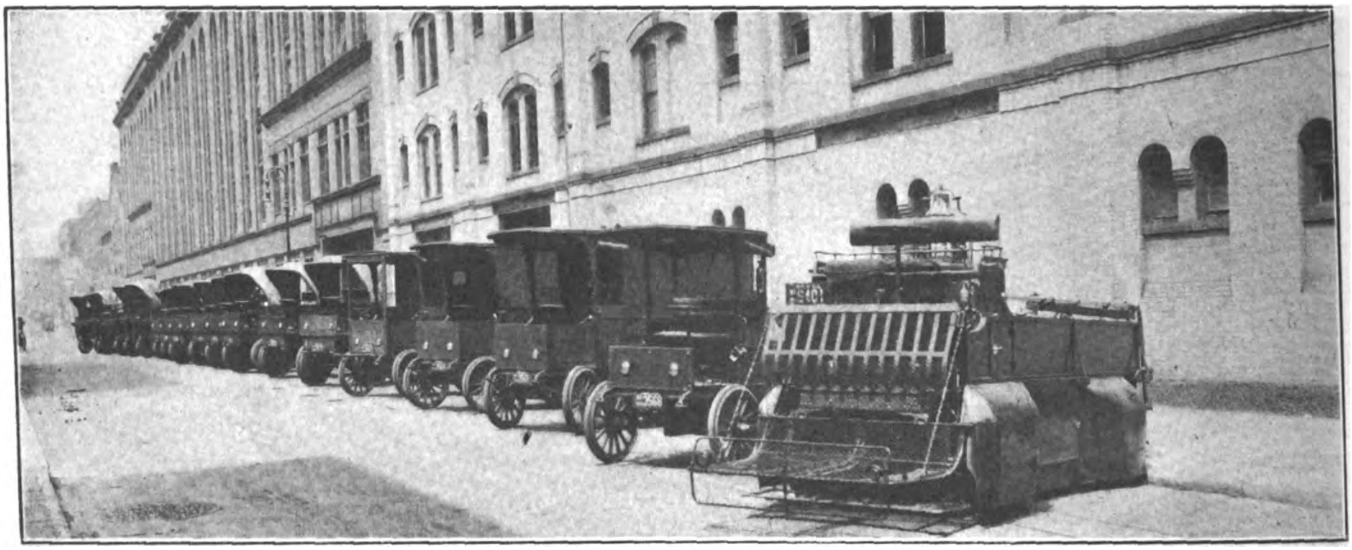
Owing to the fact that accidents are apt to occur through pedestrians being side-swiped when this wagon is turning corners at high speed, it was decided to completely inclose the running gear. The illustration shows that the front of this wagon is protected by the company's own type of combination wheel guard and fender. If this apparatus strikes a standing person, the upper part of the gate or apron of the guard throws the victim into the fender, while the lower part of the apron forms a continuation of the fender to take care of the overhanging limbs of the person struck. Furthermore, at the time of impact the wheel guard section is tripped in the ordinary way, so that even if the person struck should fall out of the fender, it would still be impossible for him to be dragged under the car. If this apparatus should strike someone who is lying prone on the track the wheel guard action alone is sufficient to prevent him from being caught under the trucks. The fender on striking a person, who is either standing or lying prone, automatically stops the truck by shutting off the power and applying the brakes.

7000-LB. TRUCKS

TABLE III, SHOWING GENERAL DIMENSIONS (LOADING SPACE) OF VEHICLES

	Length	Height	Width	Gage	Wheelbase
1,000-lb. open express	8 ft.	....	3 ft. 6 in.	56 in.	86¾ in.
2,000-lb. panel delivery	8 ft.	5 ft. 6 in.	4 ft.	60 in.	103 in.
2,000-lb. panel bank	8 ft.	5 ft. 6 in.	4 ft.	60 in.	103 in.
4,000-lb. open emergency ...	10 ft.	....	4 ft. 8 in.	61 in.	111½ in.
7,000-lb. dump* .	....	60 cu. ft.	....	69 in.	100 in.
7,000-lb. platform and stake** ..	15 ft.	....	4 ft. 6½ in.	65 in.	128¼ in.
10,000-lb. platform and reach*** .	15 ft. 6 in.	....	5 ft.	68¼ in.	139 in.
10,000-lb. platform and windlass .	15 ft. 6 in.	....	5 ft.	69 in.	139 in.

* Height 5 ft. from ground to the top of dump body, full load.
** Side stakes 3 ft. 6 in. Rear stakes 5 ft.
*** Side stakes 3 ft. 6 in. Rear stakes 5 ft. 6 in.



NEW YORK RAILWAYS MOTOR TRUCKS—ASSEMBLY OF TRUCKS WITH EMERGENCY WAGON IN FOREGROUND

TABLE I, SHOWING MAXIMUM SPEED AND MILEAGE OF DIFFERENT VEHICLES

Vehicle	Maximum Speed	Maximum Mileage
1,000-lb. open express	12	45
2,000-lb. panel delivery	10	50
2,000-lb. panel bank	15	50
4,000-lb. open emergency	15	30
7,000-lb. dump	5	40
7,000-lb. platform and stake	8	40
10,000-lb. platform reach	5	30
10,000-lb. platform windlass	5	30

The 7000-lb. dumping trucks for sand, manhole refuse, etc., are of steel watertight construction. The dumping is effected through the rear end of the body by a manually-operated arrangement located just in front of the dump body. Two round iron-bound oak blocks, about 10 in. in diameter, are placed on each side of the rear end of the dump body to take the shock when the body, in dumping, strikes the pavement or the guard timbers on the dumping platform. This protects the body from the damage which would otherwise occur during the dumping operation. The platform stake trucks are used for hauling from the yards miscellaneous material like cement, tie rods, lumber, piping and also paving material when the dump wagons are not available. These wagons are furnished with removable side planking up to the height of the tailboard, so that small, loose material can be readily carried.

10,000-LB. TRUCKS

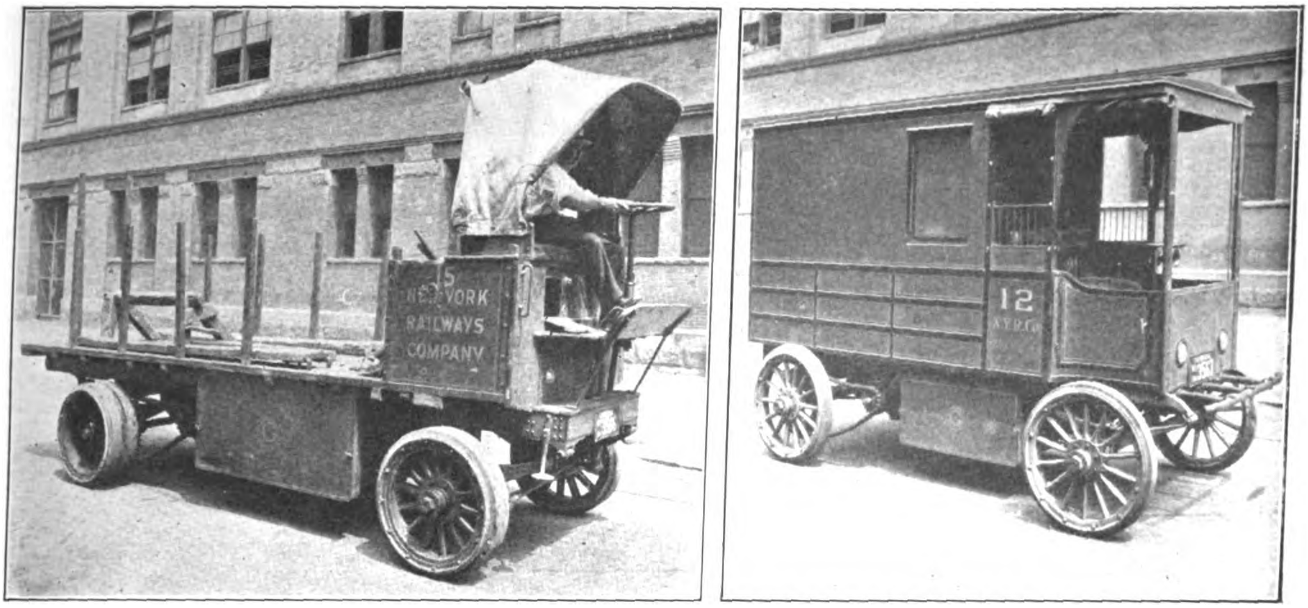
The 10,000-lb. stake-and-reach truck is intended chiefly for rails and structural material. The 10,000-lb. platform windlass truck is used principally for handling reels, pulling cables, etc. The windlass is operated by a GE-1020 motor, driving a "niggerhead" through spur gearing. It may be run backward or forward by means of two controllers, one of which is used on battery voltage and the other on railway voltage. In the latter case connection is made to the channel rail through a manhole. With this apparatus the cable is pulled at the rate of about 60 ft. per minute, compared with the hand-winch speed of 30 ft. per minute.

GENERAL FEATURES

Although a wide variety of service is called for in this order, certain parts and requirements are common to all of the equipments or differ only in dimensions,

TABLE II, SHOWING TYPES OF DRIVE, BATTERY AND CONTROL FOR THE STORAGE BATTERY MOTOR TRUCKS OF THE NEW YORK RAILWAYS

Vehicle	Drive	Battery	Controller
1,000-lb. open express	1—No. 1020, 3 hp, 85 volts, 20 amp., 2000 r.p.m.	44 WT cells, 11 plates	S-35 continuous torque, 4 speeds ahead, 2 reverse
2,000-lb. panel delivery	1—No. 1026, 3 hp, 85 volts, 28 amp., 1200 r.p.m.	44 WTX cells, 17 plates	S-35 continuous torque, 4 speeds ahead, 2 reverse
2,000-lb. panel bank	1—No. 1026, 3 hp, 85 volts, 40 amp., 1600 r.p.m.	44 WTX cells, 17 plates	S-35 continuous torque, 4 speeds ahead, 2 reverse
4,000-lb. open emergency	1—No. 1022, 4 hp, 85 volts, 60 amp., 1600 r.p.m.	44 WTX cells, 21 plates	S-103f, continuous torque 4 speeds ahead, 2 reverse
7,000-lb. dump	2 couple-gear wheels with one 2-hp motor in each wheel.	44 WT cells, 21 plates	G. E. special
7,000-lb. platform and stake...	1—No. 1022, 4 hp, 85 volts, 40 amp., 1200 r.p.m.	44 WT cells, 21 plates	S-103 F
10,000-lb. platform and reach...	1—No. 1030, 5 hp, 85 volts, 50 amp., 850 r.p.m.	44 WT cells, 25 plates	S-103 F
10,000-lb. platform and windlass.	1—No. 1030, 5 hp, 85 volts, 50 amp., 850 r.p.m.	44 WTX cells, 31 plates	S-103 F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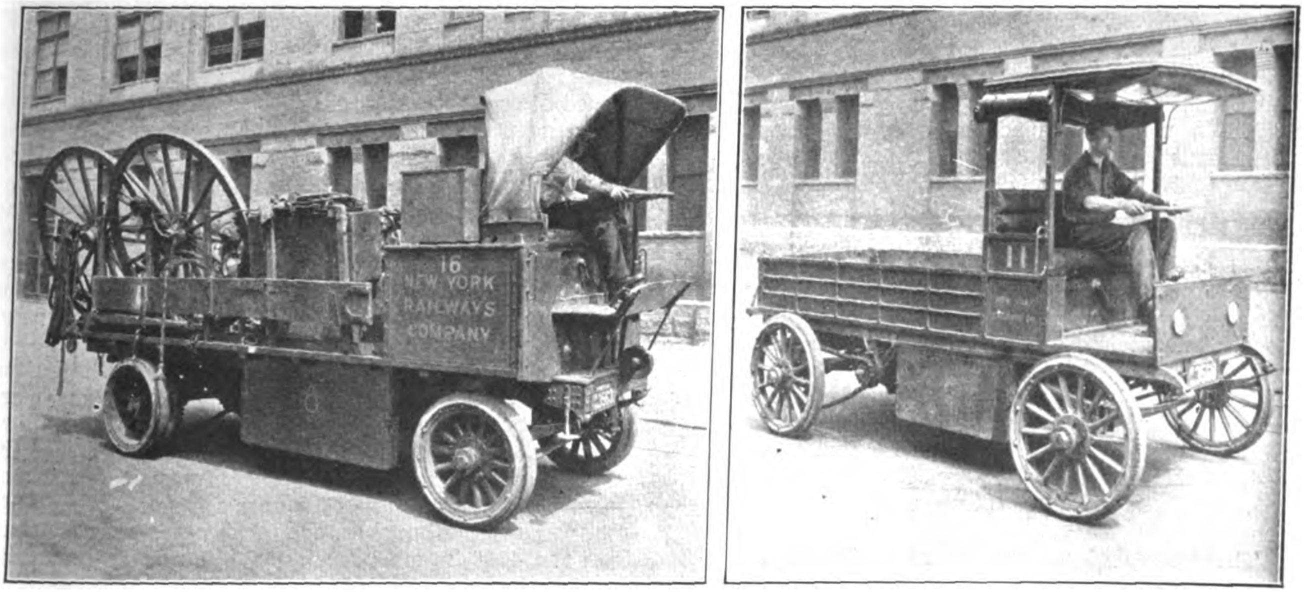
NEW YORK RAILWAYS MOTOR TRUCKS—PLATFORM AND STAKE WAGON OF 10,000-LB. CAPACITY; BANK WAGON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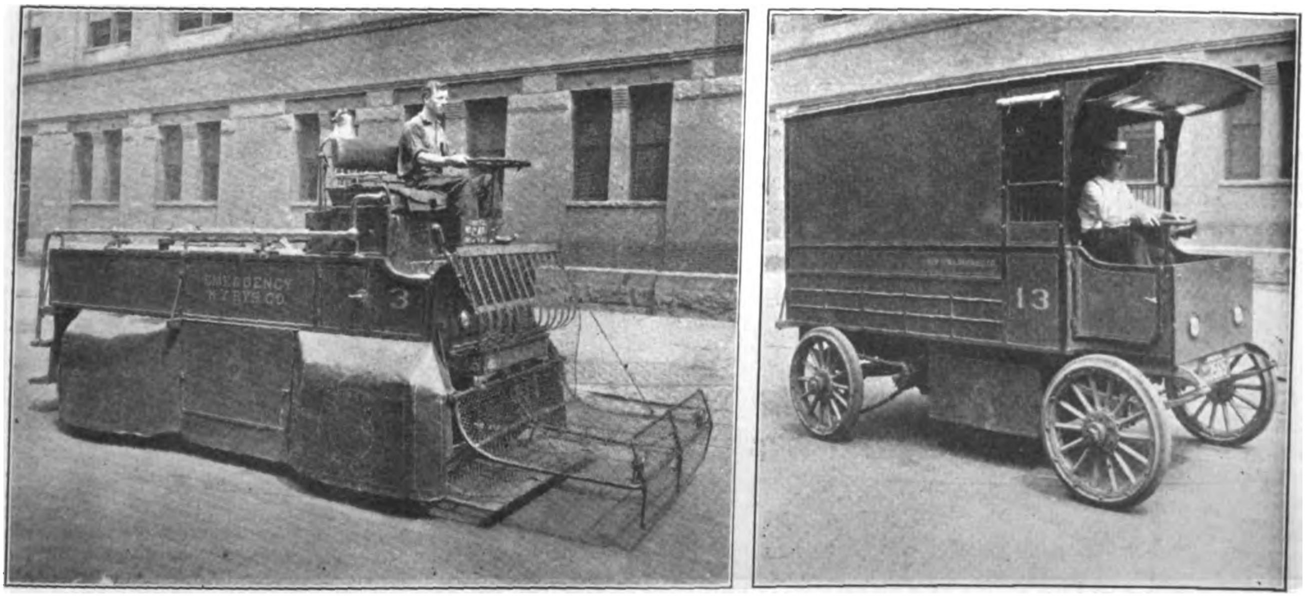
NEW YORK RAILWAYS MOTOR TRUCKS—CABLE WAGON OF 10,000-LB. CAPACITY; OPEN DELIVERY WAGON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NEW YORK RAILWAYS MOTOR TRUCKS—EMERGENCY WAGON WITH FENDER AND WHEELGUARD COMBINED, ALARM BELL, ETC.; WAGON FOR TRANSFERS AND STATIONERY etc. For convenience in description these general features are summarized in Table I, which gives the maximum speed and mileage which obtain when the vehicles are loaded to one-half their rated capacity and the run is made on hard level roads.

The motors are all of the General Electric series-wound automobile type with Hess-Bright ball bearings. The electrical equipment for each class of vehicle is given in Table II and the general dimensions in Table III.

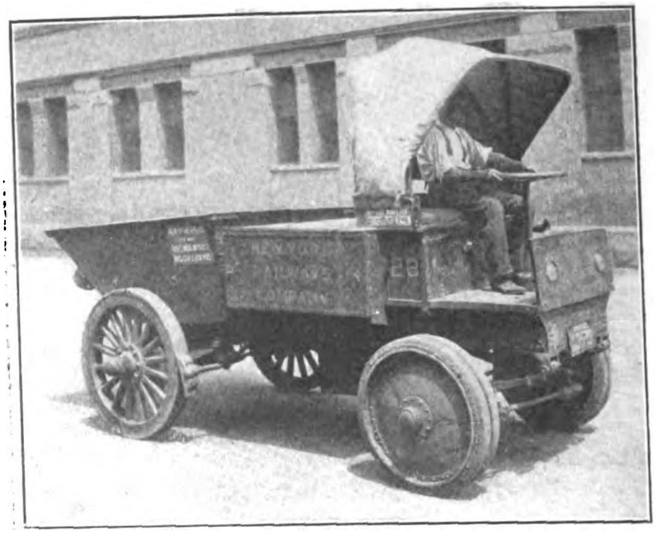
EQUIPMENT

All batteries are of lead type, equipped with waterproof covers and means for ventilation in summer. The minimum clearance between the ground and the bottom of the battery box when the truck is loaded is 8½ in. to 12½ in. The capacity of the 44-cell battery on the 4000-lb. emergency truck is 250 amp-hr., when discharged at 42 amp, and 200 amp-hr. when discharged at 56 amp. Its normal charging current is 30 amp, its maximum charging voltage, 115, and its weight, 1970 lb. The WTX type mentioned in the tables is a thin plate, high-capacity design.

The safety vehicle cut-out switch is of railway drum controller type and has three points: running, neutral and charging. Each wagon also carries a Sangamo ampere-hour meter of proper capacity with resetting device and zero contact for circuit-breaker trip. The circuit breaker is of 50-amp or 100-amp (for 7000-lb. and 10,000-lb. wagons) capacity, single-pole, double-break with shunt coil cut-out.

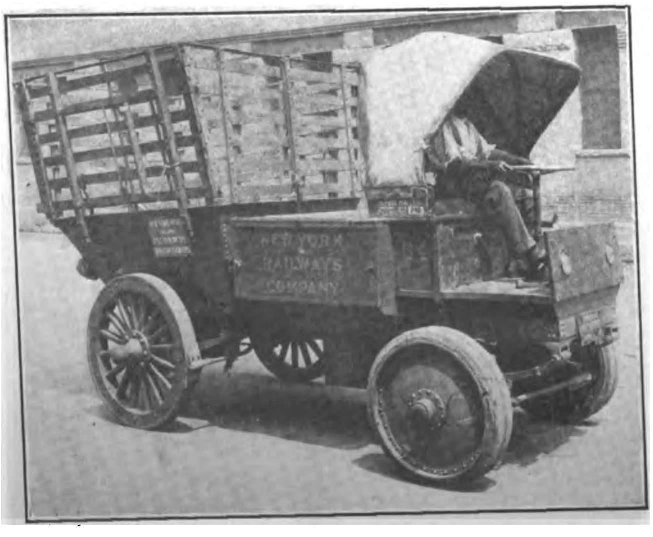
The controller compartment under the seat is of fireproof construction, and in this are mounted the controller, safety vehicle cut-out switch and meter. Standard electrical conduit is used throughout. The motor leads are connected to the vehicle wiring by a standard Westinghouse connector with which no set screws are used. The resistors are of railway type and are protected by a ventilated cover. The charging receptacles, which are of 100-amp capacity are standardized to receive the charging plug of public charging stations, so that there is practically no likelihood that a truck would ever be stranded for lack of energy. Two electric dash lamps and one electric tail lamp are furnished with each truck.

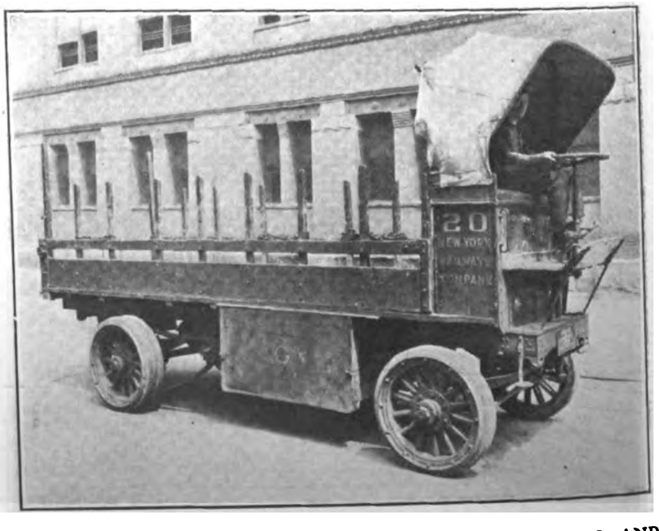
The frames of all trucks, except the 4000-lb. emergency and 7000-lb. steel dump, are of 3-in. rolled steel channels, braced with cross-channels reinforced with gussets. The other trucks have 5-in. members. The battery compartment is suspended on three heavy frames, upon which are fastened the angle-iron slides of the battery. The sides of this compartment are covered with sheet iron. The battery compartment doors are of wood.


NEW YORK RAILWAYS MOTOR TRUCKS—7000-LB. DUMP WAGON

All countershafts are fully housed and mounted on anti-friction bearings. The differential is of fully inclosed design, with spur gears upon which a large Morse chain gear is mounted. The chain between the motor and countershaft is also fully inclosed. The springs, front and rear, are of the half-elliptic type with nib construction and with bronze bushings in the eye. On the 7000-lb. dump type wagon, however, there are half-elliptic springs at the front and quarter-elliptics at the rear.

All wheels are of demountable heavy artillery type placed on Timken roller bearings throughout, except that the front wheels of the dump trucks are of the type made by the Couple Gear Freight Wheel Company with solid rubber tires, while the rear wheels are of the standard steel-tired type as used on horse-drawn wagons. The front axle and steering knuckles of the 1000-lb. wagon are drop forgings of special heat-treated steel; the front axle is of square section. On the 2000-lb. wagons the knuckles are of chrome vanadium steel. On the 4000-lb. emergency, 7000-lb. platform and both 10,000-lb. wagons, the front axle is of chrome vanadium steel, round section, with end castings of chrome vanadium steel for carrying the steering knuckle and spring seat. The steering knuckles are drop forgings of chrome vanadium special heat-treated steel.


NEW YORK RAILWAYS MOTOR TRUCKS—7000-LB. RUBBISH WAGON


NEW YORK RAILWAYS MOTOR TRUCKS—PLATFORM AND STAKE WAGON WITH SIDE BOARDS

On the 7000-lb. dump wagon the front axle is of the couple-gear type having two driving motors, which also act as steering wheels.

The rear axle of the 1000-lb., 2000-lb., 4000-lb., 7000-lb. platform and 10,000-lb. wagons is of chrome vanadium steel of round section with crucible steel castings for the spring seat and brake anchorage. The rear axle of the 7000-lb. dump wagon is of the standard horse-drawn vehicle type with plain bearings.

All steering gear is of the pinion and sector type, with hardened and ground steel bushings and pins for all steering connections.

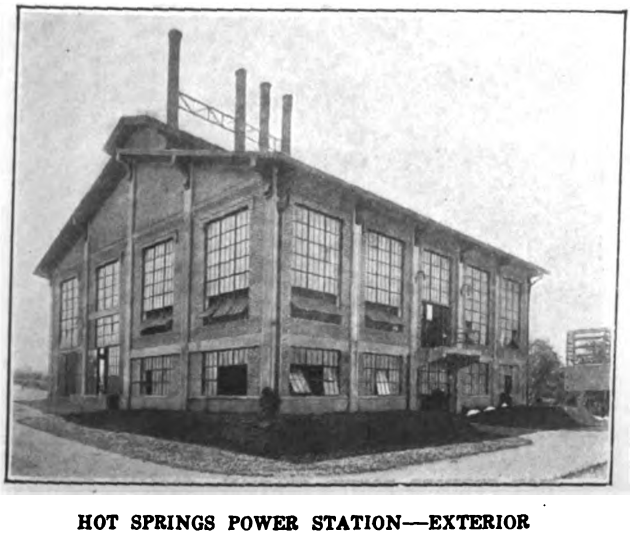
In general the service brakes are of the internal expanding type in the rear wheels. The emergency brake is of the contracting band type operating upon a brake band which is attached to the countershaft sprockets. The brakes are operated by means of pedals located on either side of the steering post. On the 7000-lb. steel dump wagon the service brake is of the contracting band type installed on the front wheel and the emergency brake operates upon the steel tires of the rear wheels.

All of the vehicles, except the emergency wagon, are fitted with two types of protective storm hoods for the drivers. All trucks except the one 1000-lb. and the three 2000-lb. types have canvas hoods, the remainder, with the exception of the emergency truck, being furnished with a covering formed by the forward projection of the body structure. All wagons, except the emergency type, have front and side curtains to afford protection against the weather.

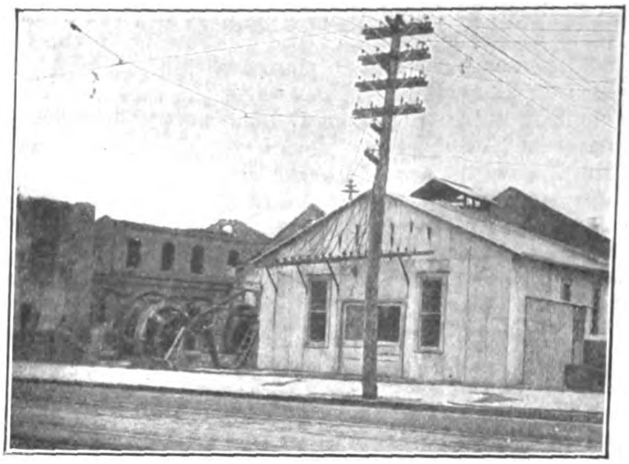
The character of the service rendered by these trucks has been generally satisfactory up to the present time, except during almost unprecedented weather conditions encountered last winter when blizzards made the streets practically impassable. Under these conditions the trucks failed to give continuous service.

Rapid Power Plant Construction at Hot Springs

The Citizens' Electric Company, Hot Springs, Ark., a subsidiary of the Federal Light & Traction Company, New York, has the distinction of breaking all previous records in constructing its new 2500-kw generating plant within 115 days after the destruction of its old station by fire Sept. 5, 1913, exactly one year ago. The old plant and several miles of feeder and distribution lines radiating therefrom were in the path of the conflagration which swept Hot Springs that September day, devastating nearly one-third of the city—an area of fifty-five blocks—and crippling all electric service, including that of the Hot Springs Street Railway Company, an affiliated corporation. Accounts and news of the damage caused by the fire were published in the ELECTRIC RAILWAY JOURNAL for Sept. 13 and Oct. 4, 1913.



HOT SPRINGS POWER STATION—EXTERIOR



HOT SPRINGS POWER STATION—RUINS OF BURNT PLANT, AND EMERGENCY STATION

Before the fire was out at Hot Springs, the New York office of the Federal Light & Traction Company had become a scene of intense activity. W. A. Haller, general superintendent and chief engineer of the Federal Light & Traction Company, started for Hot Springs on the afternoon of the fire, even before the destruction of the power station was reported. He reviewed the ruins and quickly outlined plans for the restoration of temporary service and the construction of a new station. Meanwhile the executive and purchasing departments began to rush new equipment to the stricken city, and manufacturing companies were called upon to aid. Telegrams were sent to all parts of the country tracing turbines and other equipment, either new or second-hand, which could be bought and hurried to Hot Springs. Rush orders were also placed for transmission, trolley and feeder wire.

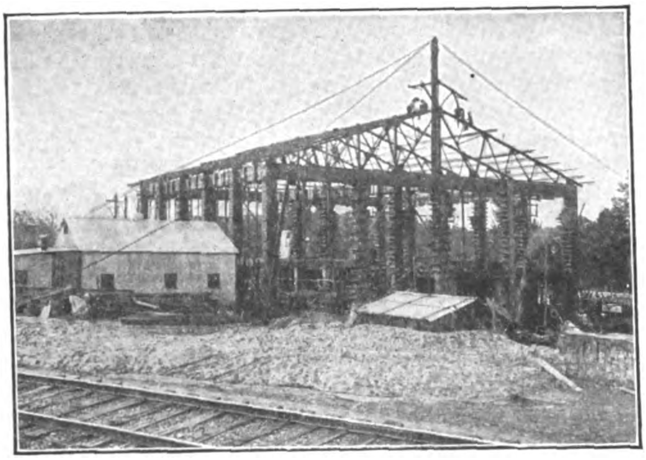
Within ten days after the disaster emergency service was furnished the city, which had not yet recovered from the demoralizing effects of the fire, and coincident therewith the designs for a new station had been developed sufficiently to permit ordering apparatus and material for the construction of the new plant. From this new plant regular service was established on Jan. 1, 1914, just 115 days after the fire. The new station, although built in this record-breaking time, is well arranged and presents the appearance of a beautiful and efficient piece of construction.

As the old property had acquired a value which made it undesirable to reconstruct the generating station on that site, the company's representatives selected and purchased a tract of land about a mile south of Hot Springs on the "Iron Mountain" railroad and the Hot Springs Creek. Although the new site is not so near the load center of the system as was the old plant, it is admirably located for the future since the city is rapidly extending in that direction.

Building plans for the new station were started on Sept. 10, all the engineering and designing being done on the job so that actual construction could be carried on in parallel with the drafting, thus avoiding delay. Ground was broken on Sept. 16, a work office was constructed, and temporary electric service lines were erected to supply energy for lighting and motors on the job when emergency service from the temporary station was restored on Sept. 15. Meanwhile rush orders for immediate shipment had been sent out for equipment and building material.

By Sept. 23 foundation forms were in place and concrete was being poured. The concrete up to the main engine-room floor was all poured within two weeks, and by Oct. 21 the roof trusses, with the exception of the monitor, were in place. Boilers were being installed early in November and steam was raised and some of the apparatus had a preliminary try-out on Dec. 10. The station was operated intermittently thereafter until Jan. 1, when the electrical equipment was in shape for regular service. From that time on energy for lamp and motor service has been delivered regularly from the new station. The 1250-kw generator and the 300-kw motor-generator set in the temporary station were then transferred to the new plant, making the total rating of the station 2250 kw.

The removal of the 300-kw railway motor-generator from the temporary station to the new station was a feature worthy of note. The second motor-generator had not arrived in Hot Springs at the time the new station was ready for operation; therefore it became necessary to remove to the new station the machine then being operated in the temporary station. To secure the least possible interruption to the railway service, the motor-generator was shut down at midnight Jan. 14, disconnected and transported 800 ft. on rollers, there loaded upon a flat car and transferred to the new station, installed, connected and placed in operation by 7.15 the following morning, the total time consumed being six hours and forty-five minutes.

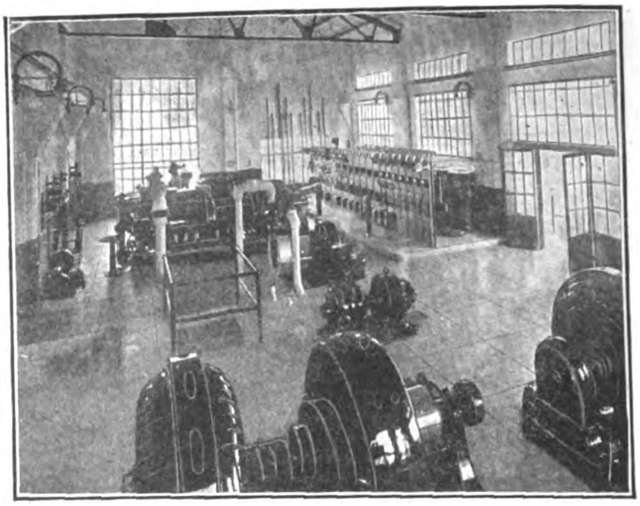


HOT SPRINGS POWER STATION—STEEL FRAME ERECTED IN THIRTY-TWO DAYS

DESCRIPTION OF NEW STATION

The new station is a reinforced-concrete structure with brick curtain walls, steel sash and doors fitted with wired glass throughout, and steel roof trusses carrying a roof consisting of two layers of corrugated galvanized iron with a layer of 1-16-in. asbestos placed between to prevent sweating.

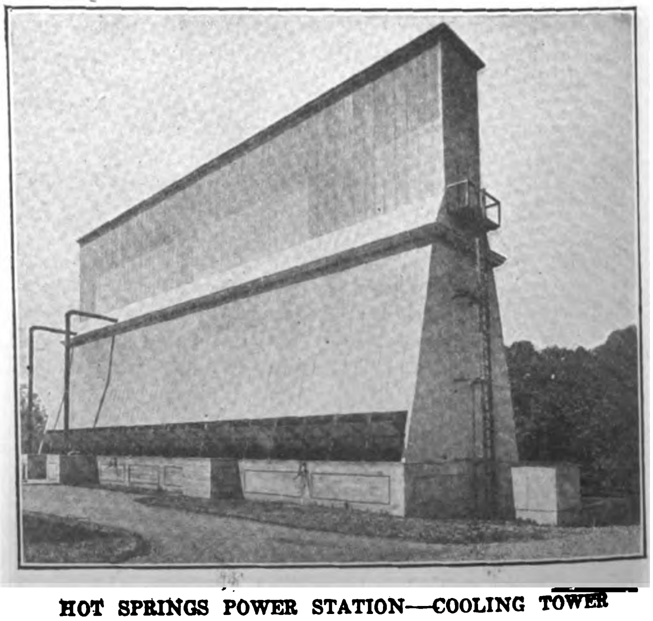
The present equipment of the new station consists of two 2300-volt turbo-generator units rated at 1000 kw and 1250 kw respectively, two 300-kw synchronous-motor-generator sets, one 30-kw induction-motor-driven exciter, one 30-kw marine-engine-driven exciter, four 316-hp Heine boilers equipped to burn gas or coal, a 20-ton Whiting crane, and the usual auxiliaries. The motor-generator sets operate at 2300 volts. The switchboard was constructed, assembled and shipped thirty days after the order was given. Space has been provided in the station for the addition of two more boilers and one more turbo-generator set. All of the electrical equipment, except the motor-driven exciter, was furnished by the General Electric Company. The exciter was built by the Westinghouse Electric & Manufacturing Company.



HOT SPRINGS POWER STATION—INTERIOR OF ENGINE ROOM

As the water in the creek adjoining the plant comes from an overflow of the famous hot springs and is too warm for condensing purposes, besides containing considerable sewage, it was necessary to erect a cooling tower. This tower, which is of the natural-draft type, consists of a long trough at the top connecting with projecting laterals which are slotted to allow water to trickle down over the cooling surfaces. The latter consist of square wooden bars supported in a horizontal position with one diagonal in the vertical position. By arranging the bars in this position a larger effective cooling surface is presented to the water, which is also assisted in its downward course by the sharp edges of the bars being lowermost.

Each boiler is equipped to burn either gas or coal. Eleven Gwynn gas burners are employed under each boiler for burning gas, and two Jones underfeed stokers are installed under each boiler for coal firing. The gas nozzles are arranged above the furnace doors so that they do not interfere with coal combustion, it being possible to carry on both methods of firing at the same time. When only gas is being burned the grates are kept covered with ashes to prevent their being fused by heat reflected from the furnace arch. Natural gas is piped into this plant from the Caddo-Louisiana fields.



HOT SPRINGS POWER STATION—COOLING TOWER

Electric Railway Trade Outlook

Opinions of Electric Railway Manufacturers Regarding Present Commercial Conditions, the Probable Effect of the Present War on Domestic and Foreign Trade and the Proper Means for Improving our Trade in South America—Experiences of Americans in the War Zone

As an amplification of the interviews which the ELECTRIC RAILWAY JOURNAL procured with officials of the General Electric Company, the Westinghouse Electric & Manufacturing Company, the Pearson Engineering Corporation and the J. G. White Engineering Corporation and published in its issues of Aug. 22 and Aug. 29, opinions of additional electric railway manufacturers have been requested during the last week both personally and by letter. Each company has been asked for its ideas regarding the effect of the present war with reference to the receipt from abroad of materials necessary for its manufactured articles, the possibility of producing in this country materials not obtainable abroad, and also the chance of introducing substitutes for any unobtainable materials without any substantial increase in the cost of production. Furthermore, advice has been sought in regard to the possible interference caused by the war with both the domestic and the foreign business of the various companies and in regard to the special steps being taken to improve South American trade. The answers of the manufacturers on the above points follow in part.

United States Electric Signal Company, West Newton, Mass.—Roland F. Gammons, second vice-president, believes that the sales of his company must be affected adversely to some extent as long as the unusually high rates of interest for capital continue, for signal apparatus is charged by the purchaser to capital account, and the outlook is poor for electric railways in the immediate future to secure new capital for permanent improvements. The foreign business of the United States Electric Signal Company has been principally with the countries now at war. Consequently the company expects no further trade there as long as present conditions prevail. The company has completed arrangements, however, for representation in one of the principal South American countries and is also seeking suitable connections in other countries. South American trade heretofore carried on by the company has been confined to Brazil, where the principal railway systems use its material. Mr. Gammons states that he does not expect a large volume of business in South America but is hoping to secure some increase and through the present opportunity to establish relations which will be useful in the future as the country develops.

The Tool Steel Gear & Pinion Company, Cincinnati, Ohio.—E. S. Sawtelle, assistant general manager, says that the war situation is interfering to a considerable extent with his company's foreign business, since at the present time it has a good sized trade developed with England, France and Germany. At the present time it is furnishing to English manufacturers a large number of gears and pinions used on the new motor equipment for the electrification of some of the large steam railroads. Several carloads of this material caught between Cincinnati and New York at the time the war became acute are still held in New York and cannot be forwarded on account of shortage in shipping facilities. German business will be entirely paralyzed while the war lasts, but English and French business will right itself and possibly improve as soon as the seas are clear. The company is taking general steps to increase its South American business in expectation of a considerable increase.

National Carbon Company, Cleveland, Ohio.—Officials of this company state that preparations are being made to take care of all the carbon business that comes from those countries which have been depending upon Europe for their supplies. That they must look elsewhere for carbons is a foregone conclusion and, without doubt, a demand will be made upon the United States to meet their needs. As far as the battery business is concerned, the situation remains unchanged. The company has had a good battery business from almost all foreign countries for some years, and the war can make but little difference with the countries not now affected by it.

Ohmer Fare Register Company, Dayton, Ohio.—John T. Ohmer, president of the company, advises the ELECTRIC RAILWAY JOURNAL that material used by his company is produced in this country with the single exception of rubber, which is used in limited quantities. Mr. Ohmer says that domestic business may show a slight depression on account of the false impression of a few operators that the acquisition of Ohmer fare registers will increase operating expenses. As regards foreign business, for several years the company has not bid for any except in the Dominion of Canada.

Niles Car & Manufacturing Company, Niles, Ohio.—This company is concerned with the European war only through the general depression resulting from financial uncertainty and the reluctance of bankers to finance new railways until the war takes some definite turn. No material used by the company is affected. The company does no foreign business except with Canada, which it obtains when Canadian builders are unable to handle the business, and it expresses a lack of desire to obtain foreign trade.

Standard Paint Company, New York.—C. E. Smith, manager of electrical department, states that the war has increased this company's cost of manufacturing insulating materials by advancing the price of certain imported raw materials. In some instances it has been possible for the company to make use of locally manufactured articles, but not in the case of standard staple commodities. The products of this manufacturer in the electric railway field are employed chiefly for the insulation of motors and for repair work in car repair shops. Since the larger part of this use is required constantly for maintenance and repair work it is not believed that the war will reduce the demand for insulating materials in this country to any great extent, except as the decrease in new equipment will lessen the amount thus used. The foreign business of the company has stopped. The London factory has been shut down, while everyone has left the Hamburg factory for the war except a few directors. Trade with the Orient has decreased a great deal because of the heavily increased insurance rate. Considering the discontinuance of German trade with South America and with the prospect of better banking facilities with the United States, the company anticipates a fairly successful business from this source through its special representatives.

Pyrene Manufacturing Company, New York.—H. W. Chapman, office manager, states that the business of this company has not been affected by the war in regard to procuring the materials necessary for the manufacture of its fire extinguisher, Pyrene, because its products are all obtained in this country. The war will interfere with domestic business only indirectly, as a result of the general retrenchment. Before the war a large number of fire extinguisher sales were made to England and the Continent, through the London office. This European business has nearly entirely fallen off, though a temporary stimulation due to the war has arisen with the British and French governments owing to the desire on the part of the armies representing these countries to equip with extinguishers their motor cars and aeroplanes. The company carries on a considerable foreign business with China, Japan, India and South Africa. A marked falling off in this is believed to be inevitable. The South American and Australian business of the company is represented by Chipman, Ltd., of New York. The likelihood of any increased business from this quarter is questioned, owing to the scarcity of money with which to buy.

Wasson Engineering & Supply Company, Milwaukee, Wis.—F. A. Wasson, general manager, states that his company uses no imported materials in the manufacture of its apparatus. It was making plans for European representations before the war, but negotiations have now been indefinitely postponed. By coming to the rescue financially of some of the neutral nations now left in a helpless condition by the withdrawal of commercial and financial support, the United States would establish a prestige, the benefit of which would be permanent. As a solution of the present situation Mr. Wasson offers the following suggestion: "Remain neutral at all events; provide an adequate merchant marine; ascertain the needs of neutral nations and supply them where practical; decide what business is wanted and then go for it; have absolute confidence in American government, American industries and American prosperity, and act accordingly."

The Elyria Iron & Steel Company, Elyria, Ohio.—According to J. L. Varner, secretary and assistant treasurer, this company is concerned only in a general way with the probable expansion of the commerce of this country. Its product as well as the raw material from which it is made will not be affected by the war situation, for the company purchases none of its supplies from Europe and does not export any of its materials. It expects its business to increase simply through local requirements.

The Wheel Truing Brake Company, Detroit, Mich.—J. N. Griffin, president and general manager, states that inasmuch as his company uses domestic material his business will not be affected by the war so far as raw materials are concerned. American domestic business is concerned only to the extent that our country becomes directly involved in the European struggle. There will be at least a temporary suspension in the European trade, but South American trade is improving.

Monarch Refillable Fuse Company, Buffalo, N. Y.—This company believes that the war will interfere with its foreign business with Germany and her allies but that the trade with England and France will be carried on as usual with a certain present drop. The company had directed its attention to South American business before the war but is now studying conditions there even more intently. If the United States manufacturers develop the manufacture of goods now made in Europe they can secure and hold the business of not only South America but also Africa and other foreign countries.

Dossert & Company, New York.—According to a statement made by H. B. Logan, president, war conditions have not as yet affected the company adversely. On the contrary, orders were received in such gratifying volume during the latter part of July and the first half of August that the company now has more unfilled orders on hand than at any time during the past fifteen months. All the materials used in the solderless connectors of the company are produced in this country and no embarrassment is suffered from the cutting off of imports. No estimates can be made of the effect of the war on the company's foreign business, which is chiefly in the western hemisphere.

Tubular Woven Fabric Company, Pawtucket, R. I.—Speaking for this company, William Kennedy says that with the general increased business which must come to America as a result of the present war a new impulse will be felt that must naturally cause the company's business to expand. All the raw material used is obtainable in this country, and it is believed that the coming year will be the biggest in the company's history.

Diamond State Fibre Company, Elsemere, Del.—The fiber for electrical insulation manufactured by this company is made from cotton rags and hemp twine, 80 per cent of which is imported, principally from the countries involved in the present European war. A large quantity of such raw material is produced in America and other countries but not enough to meet ordinary demands. Prices have already gone up, and a further advance is mentioned. While eventually the war will benefit the company's domestic business, no improvement is expected for several months, as a large percentage of the company's products was exported to Germany and other foreign countries and the loss of this business has been severely felt. It is stated that the company intends to push vigorously the sale of its product in all South American countries.

Hope Webbing Company, Providence, R. I.—This company thinks that the war should not interfere materially with its domestic business, and its foreign business is limited and not likely to be much reduced by the foreign disturbance. It feels that it is likely to gain more business in Canada than is lost abroad, and can also increase its export business in South America.

Dielectric Manufacturing Company, St. Louis, Mo.—According to J. J. Kessler, president, raw materials for insulation, such as oils, gums and waxes, have increased in price. None of these are produced here and most of them are incapable of being so produced. It would not be possible to produce substitutes except to a limited extent. Mr. Kessler believes that the war will not interfere with his company's domestic business to any considerable extent. In regard to foreign trade he says that it will materially increase our export business on account of the new trade possibilities in territories where we have heretofore been unable to compete.

Stackpole Carbon Company, St. Mary's, Pa.—This company's sources of supplies abroad will be able to fulfil its contracts for raw materials in spite of the war, but the company is unable to say how long this condition will last because it is obliged to look for manganese in belligerent countries. There is no substitute for manganese in the manufacture of dry cells. Mr. Stackpole was optimistic in regard to the increase of the company's business, both at home and abroad. The only step being taken to increase South American business is the enlarging of advertising space in publications printed in South American languages.

Tower Specialty Company, New York.—This company does not export to Europe but builds its superheaters in Europe. This business, of course, is very seriously affected by the war. Careful investigations have been made in regard to means for increasing business in South America, but no definite steps have as yet been decided upon. One difficulty to be overcome in securing this business is the fact that European manufacturers have educated South American purchasers to long deferred payments. The company's domestic trade will be injured by the war only to the extent that the business of the customers is affected.

Nachod Signal Company, Philadelphia.—The effect of the European war upon the sale of automatic signals has been a temporary postponement of business. The present unsettled condition of business will continue for some time, but enough business will be secured to cause no serious stagnation. The company has already been soliciting South American business in various ways. The prospects of improving trade in this direction are bright, but the possibility of any extensive business being developed in South American countries is seriously questioned.

Thayer & Company, Inc., New York.—This company has not yet felt any trade depression caused by the European war. During the last three months orders have shown a marked increase in number and size and territory represented, regardless of the reported curtailment in the expenditures of electric railways. This is attributed solely to the special character of the product. Optimism is expressed in regard to the opportunity offered in South America.

L. S. Brach Supply Company, New York.—As yet it is impossible to determine whether the war or domestic conditions are affecting this company's business, but general railroad work is at low ebb and there does not seem to be any immediate outlook for improvement. There are no materials that have been purchased abroad which could not be supplied in this country. The war will not interfere with domestic business if financial conditions here can be properly adjusted. As yet no special attempts have been made to increase the export business to South America.

J. W. Paxon Company, Philadelphia.—S. C. Bougher, treasurer, says that the European war affects all the departments of the company, on account of the use of foreign raw material. It is not seriously disturbed, however, by the lack of imports or exports. Foreign export trade is not catered to and there is very little in the company's business that is attractive abroad. Sales can be made more readily to South America, however, and closer relations are being established in that country.

Green Engineering Company, East Chicago, Ind.—P. Albert Poppenhusen, president, says that inasmuch as steel and iron enter into the manufacture of the company's chain grate stokers, business has not yet been affected by the cutting off of foreign supplies, although it is presumed that the price of steel will advance. Raw materials can be obtained from other countries than formerly and can also be produced in this country, but this would take some time, during which period much business cannot be anticipated. The companies should be able to introduce substitutes for such material without substantially increasing the cost of production. The war will not seriously interfere with exports for these are made only to Japan, Africa and Australia and shipping there is protected by the British. No steps have been made to increase export business to South America, for it is believed that coal conditions there oppose.

In addition to those companies quoted above, this paper has interviewed a number of companies prominent in the electric railway business, who were willing to express their opinions but did not wish their names quoted. One large manufacturing company, which does not desire to have its name used, believes that foreign business will be largely cut off until the end of the war, and many changes may be made necessary in the agency arrangements of a great many American manufacturers. This same company believes that the export business to South America will not amount to anything immediately in view of the predominance there of British and German capital. Later, however, South American countries will have to go to America, for Germany and Great Britain will be absolutely cut off.

Another company, in discussing the rubber situation said: "The rubber market is one controlled by London, and the supply of crude rubber in the United States is not up to the standard. This will be overcome to a certain extent as long as the European government keeps the routes of commerce open. It is not possible to obtain rubber from sources other than the countries involved in the war. In a great many instances, however, substitutions can be used in place of rubber."

A third manufacturer, after being established in South American trade for sixteen years, expects business to be increased to the extent that there is interference with the competitive materials shipped from Europe.

MR. SHONTS ON PARIS CONDITIONS

Theodore P. Shonts, president Interborough Rapid Transit Company, New York, had an interesting experience in Paris, where he arrived on Sunday, Aug. 2, soon after war was declared. He came on what proved to be the last train from Switzerland for several weeks. He found at the railroad station that all of the conveyances for driving to the hotels had been commandeered by the military authorities and that the baggage room was in such great confusion that he could not get out his baggage. Finally he found an old express wagon and induced the driver by a large fee to take him and his party to their hotel. In the morning he returned to the station to get his baggage, and found the place surrounded by soldiers and no one was allowed to enter. Finally, through the courtesy of a member of the French House of Deputies, the trunks required by him and the members of his family were obtained. During the week in which he remained in Paris Mr. Shonts served on the relief committee appointed by Ambassador Herrick to help Americans to leave France.

Commenting on the general situation in the city, as observed by him, he said to a representative of this paper that the work accomplished by the French government in mobilizing its troops was marvelously well done and the spirit of the French people indicated a sober sense of the perilous position in which they were put and a firm resolution to accomplish all that was possible for a brave nation to do. Although the troops were constantly marching through the city military bands were very few. The streets exhibited a deserted appearance, partly because most of the shops were closed and partly because in all of those which were open most of the employees had gone to the front. The Metropolitan underground railway in Paris was in operation but with greatly reduced service, and ran no trains after 8 p. m. All of the restaurants were ordered closed at the same hour.

In London, where Mr. Shonts arrived on Aug. 15, matters had a more natural appearance, although there seemed to be fewer buses on the streets. This may have been due to the vehicles being commandeered by the government or possibly because of the lighter traffic due to the war.

MR. SWOPE'S EXPERIENCES

Gerard Swope, vice-president Western Electric Company, contributes a very interesting article on his European experiences to the current issue of the *Western Electric News*. He was in Antwerp when the war broke out, and the Belgium government immediately requisitioned space to house 500 soldiers at the factory of the Bell Telephone Company in that city. In the meantime many of the workmen there and in the company's factory in Paris were called out, and owing to the difficulty of drawing currency to meet the payrolls both factories were closed down. It was soon found that unless the factories could operate, even though on part time, the want and distress due to the war would be much increased by lack of employment, so that both factories were soon reopened although, of course, with largely decreased forces. The workmen are being paid in checks which the company has promised to redeem as soon as possible at their face value. The English factory is still operating under conditions that are nearly normal.

Mr. Swope arrived in New York on Aug. 22 and has heard by cable that on Aug. 24 about 500 employees were still working in the Antwerp factory and about 200 in the Paris factory. The prospects were that these factories could continue at work for some time without the receipt of further raw material. The conditions at the London factory are nearly normal.

AMERICAN ROLLING STOCK EXPORTS.

The table published herewith shows the exports of American electric railway rolling stock to the countries of the entire world for the years 1908 to 1912, inclusive, and for the first ten months of 1913. For the last mentioned period, Brazil led the list with an importation of rolling stock amounting to $2,502,572, far ahead of the only other serious competitors, Cuba, with $722,188, Canada with $564,258, Mexico with $186,933, Europe with $185,312, and Australasia with $124,016. The most interesting feature in the whole table is the fact that Brazil, with its total of $2,502,572, took more than one-half of the total rolling stock exports for the 1913 period, probably because the two largest electric railways in Brazil make most of their purchases in the United States. On the other hand, in Argentina, Peru and Chile, where English and German capital predominates, there were exports of only $87,905, $68,124 and $29,034, respectively.

Foreigners' Patents in England

The London Board of Trade made an announcement on Aug. 22 in regard to patents owned by subjects of countries with which England is at war, as follows:

"The Board of Trade has issued rules under the patents, designs and trade-marks (temporary rules) act, 1914, regulating the procedure for the avoidance of suspension of any patent or license or trade-mark granted, the proprietor of which is a subject of any state at war with His Majesty, where an application is made to the board for this purpose. The board must be satisfied that the applicant intends to manufacture the article concerned or carry on the patented process, and also that it is in the public interest that this should be done. The rules provide also for the avoidance or suspension of any application for a patent or trade-mark by a subject of an enemy state."

Illinois Association May Send Ship to South America

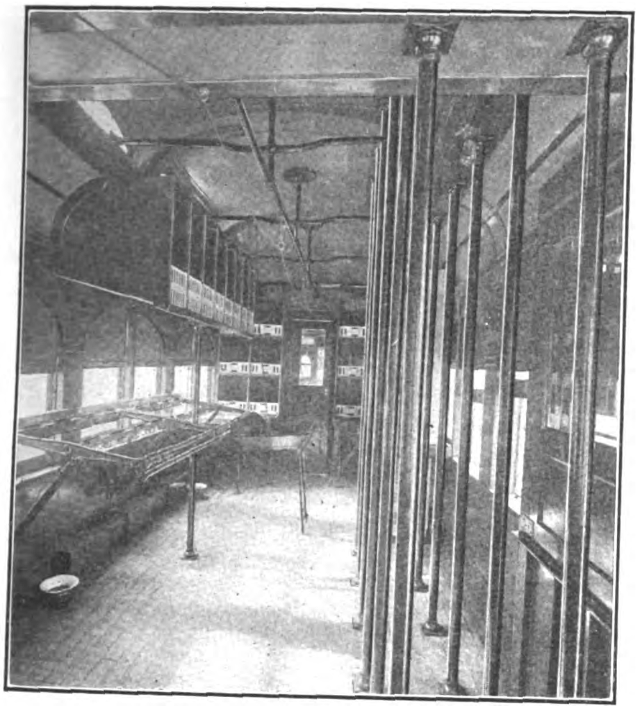
Under the chairmanship of E. N. Hurley of Chicago the foreign trade committee of the Illinois Manufacturers' Association has been very active in its efforts to expand trading relations between business men in South America and in the United States. The association has warmly seconded the efforts of its committee and has decided to go ahead with the project of chartering a small steamship, say of about 5000 tons, to go from the United States to South American ports with samples of American machinery and manufactured goods of all kinds. It is planned to fit up the main deck of the boat and also portions of the hold as an exposition of manufactured products suitable for the South American market. Salesmen, and possibly saleswomen as well, will be on board to explain the exhibits, and it is planned to make stops of perhaps several weeks' duration in the principal South American ports, on the East Coast at all events and possibly on the West Coast. A special effort will be made to show the goods of smaller manufacturers, as it is felt that a co-operative effort such as this should appeal particularly to those American producers who have not the great resources of the large manufacturing concerns. Novelties and specialties of all kinds are especially desired. It is quite possible that there will be room on the boat for non-members of the association who desire to take advantage of the trip. Electrical manufactures, among other things, are desired. John M. Glenn, secretary of the Illinois Manufacturers' Association, 76 West Monroe Street, Chicago, will no doubt be glad to give further information about the plan.

TABLE—SHOWING EXPORTS OF ELECTRIC RAILWAY ROLLING STOCK FROM THE UNITED STATES TO VARIOUS FOREIGN COUNTRIES.

	1908	1909	1910	1911	1912	First Ten Months 1913
Europe	$116,884	$72,126	$58,803	$121,591	$112,770	$185,312
Canada	113,915	135,559	112,155	266,473	365,677	564,258
Central America	168,920	103,001	154,606	156,088	54,353	34,732
Mexico	298,019	130,755	187,980	496,741	125,004	186,933
Cuba	155,597	246,630	344,136	549,189	590,420	722,188
Other West Indies	18,054	18,281	31,069	40,359	59,936	23,219
South America:						
Argentina	249,038	111,290	214,691	55,189	30,313	87,905
Bolivia	87,144	13,521	270	....	784	16,691
Brazil	389,778	408,480	134,178	241,098	416,841	2,502,572
Chile	283,543	17,255	28,817	54,021	63,328	29,034
Colombia	53,087	22,871	11,188	90,008	10,027	4,610
Ecuador	4,420	6,894	5,248	......	4,499	14,698
Guianas	1,012	962	215	16	601	177
Paraguay	250	...	......	......	....	......
Peru	25,198	3,846	17,118	56,478	21,908	68,124
Uruguay	105,828	2,854	165	2,870	4,000	1,138
Venezuela	15,341	22	5,385	793	3,734	2,384
China	1,495	12,154	40,311	36,964	50,883	2,852
Japan and Chosen	78,249	115,748	77,180	404,341	353,192	55,035
Australasia	40,646	32,675	60,099	58,232	124,566	124,016
Philippines	44,452	8,629	34,837	145,811	67,807	......
Africa	6,461	11,151	4,366	5,105	9,540	15,464
All other	29,424	2,575	......	687	6,463	5,539
Total	$2,286,755	$1,477,279	$1,522,817	$2,782,063	$2,476,646	$4,646,881

Texas Traction Carries U. S. Mail

On Aug. 15, 1914, the Texas Traction Company, Dallas, Tex., put in service the first of two cars which will be used as United States railway post-offices on its Denison-Sherman-Dallas interurban line. This is the first service of its kind to be inaugurated on the interurban lines in the Southwest, and a second car will be equipped in the near future. The territory served by this line desired the interurban railway mail distribution, because of its more frequent service. It is believed that this will be a great help to every town and city between Denison and Dallas, since it assures mail delivery between any of the points on the day it is written.



TEXAS TRACTION MAIL CAR—INTERIOR OF MAIL ROOM

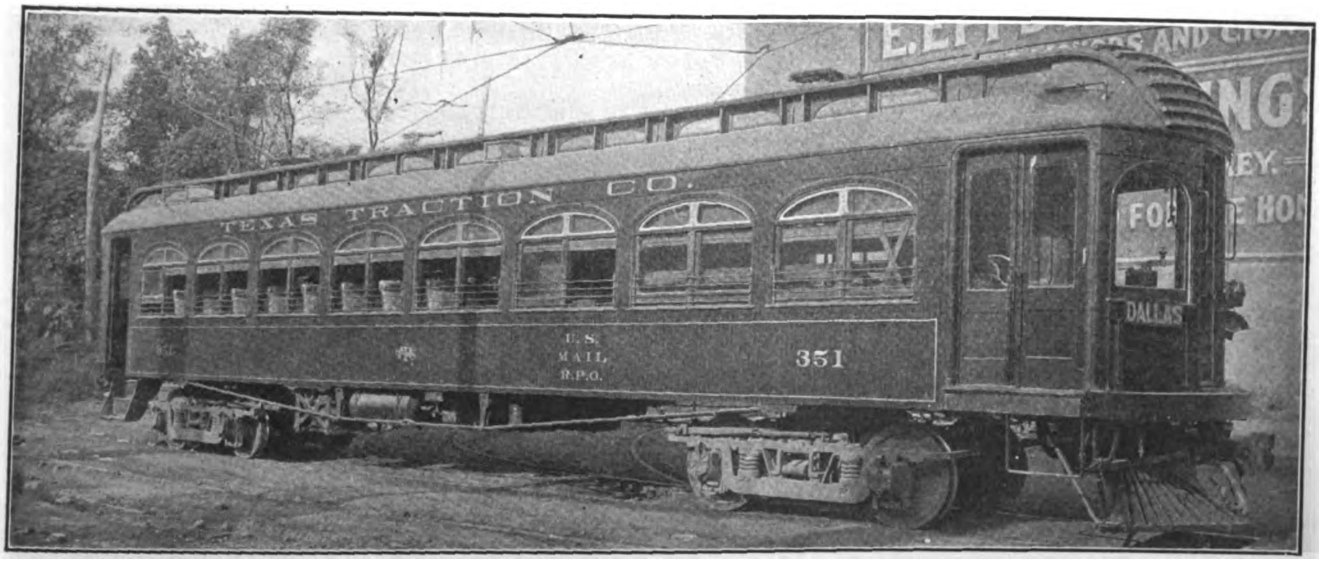
In order to contract for this mail service it was necessary for the traction company to remodel two of its standard passenger coaches into railway post-offices. The rear end of this car is a regulation passenger compartment, while the front end is equipped as a United States railway mail car. Exterior and interior views of this car are shown in the accompanying illustrations. The mail room is equipped with standard paraphernalia used in the distribution and handling of United States mail, which includes sorting counters, registered mail sack compartments and mail sack holders. This compartment will at all times be in charge of two United States mail clerks.

The initial schedule for this interurban railway postal service includes two trains each way daily, leaving Denison at 5:50 a. m. and 3:50 p. m. respectively, and leaving Dallas at 11 a. m. and 8 p. m. respectively. The run, which is approximately 86 miles, will be made in about three hours and forty minutes, and the two mail clerks will handle and distribute mail en route.

Montana Public Service Commission Report

The sixth annual report of the Railroad and Public Service Commission of Montana for the year ended Nov. 30, 1913, has recently been issued. The book covers the orders from the commission in regard to station and train service, tariffs, rates, charges, train accidents and personal injuries, as well as the activities of the Public Service Commission. By the 1913 act of the Montana Legislature the Board of Railroad Commissioners was made ex-officio the Board of Public Service Commissioners of the State. The commission report contains the full text of the Public Service Commission law and the rules and practices of that body. The first annual report of the Public Service Commission will be made for the year ending Nov. 30, 1914. The chief work of the commission thus far has been the perfection of its organization, although it has prepared and placed in the hands of all public utilities a standard accounting system effective July 1. There is presented a list of the public utilities coming under the jurisdiction of the commission and also an outline of the electrification of the Chicago, Milwaukee & St. Paul Railway in Montana, prepared by C. A. Goodnow, assistant to the president, and a story of the electrification of the Butte, Anaconda & Pacific Railway, written by R. E. Wade, electrical engineer.

The directors of the Third Avenue Railway, New York, have recently authorized the construction of a printing plant for the printing of its own transfers. This is expected to result in the saving to the company of not less than $25,000 a year.



TEXAS TRACTION MAIL CAR—EXTERIOR VIEW OF CAR

Program for the A. E. R. A. Convention

Below Is Given the Complete Program for the 1914 Convention of the American Electric Railway Association and Its Affiliated Associations.

The annual convention of the American Electric Railway Association and its affiliated associations will be held, as last year, at Atlantic City, N. J. The exhibits and convention halls will be located on Young's Pier and the dates are from Monday, Oct. 12, to Friday, Oct. 16. The following program has just been completed and announced by Secretary E. B. Burritt. This is subject to revision.

PROGRAM OF AMERICAN ASSOCIATION

Tuesday, Oct. 13

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, entrance to Young's Million-Dollar Pier.

2 p. m. to 5 p. m.

Annual address of president.
Annual report of executive committee.
Annual report of secretary-treasurer.
Announcements.
New business.
Reports of committees:
  (a) Subjects,
  (b) Education,
  (c) Special committee on joint use of poles.
Address on "Mooted Principles in Valuation," by Frank W. Stevens, chairman of the valuation committee, New York Central Lines, New York, N. Y.
Address on "The Organization and Functions of a Valuation staff" by H. C. Donecker, assistant general manager Public Service Railway, Newark, N. J.
Reports of committees (continued):
  (d) Company membership,
  (e) Company sections and individual membership.

Wednesday, Oct. 14

2 p. m. to 5 p. m.

Appointment of committee on nominations.
Reports of committees:
  (a) Changes in constitution and by-laws,
  (b) Relations with sectional associations,
  (c) Relations with manufacturers' association,
  (d) Electrolysis,
  (e) Company section medal,
  (f) Anthony N. Brady medal,
  (g) Ways and means,
  (h) Public relations.
Address on "Electric Securities from the Standpoint of the Corporation" by Calvert Townley, chairman board of directors Lackawanna & Wyoming Valley Rapid Transit Company, New York, N. Y.
Address on "The Aspects of Workmen's Compensation Laws" by Harry A. Bullock, secretary New York Municipal Railway Corporation, Brooklyn, N. Y.
Reports of committees (continued):
  (i) A. E. R. A. advisory,
  (j) Insurance.

Thursday, Oct. 15

2 p. m. to 5 p. m.

Reports of committees:
  (a) Compensation for carrying United States mail,
  (b) Federal relations,
  (c) Cost of passenger transportation service.
Address on "A Zone System of Fares in Practice" by R. B. Stearns, vice-president and assistant general manager The Milwaukee Electric Railway & Light Company, Milwaukee, Wis.
Reports of committees (continued):
  (d) Taxation matters,
  (e) Legal association,
  (f) 1915 convention.
Report of committee on nominations.
Election of officers.
Installation of officers.
Resolutions.
Unfinished business.
Adjournment.

PROGRAM OF ENGINEERING ASSOCIATION

Monday, Oct. 12

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, entrance to Young's Million-Dollar Pier.

2 p. m. to 5 p. m.

Annual address of president.
Annual report of executive committee.
Annual report of secretary-treasurer.
Appointment of convention committees.
Reports of committees:
  (a) Constitution and by-laws,
  (b) Power distribution,
  (c) Standards (on recommendations contained in above report),
  (d) Electrolysis.

Tuesday, Oct. 13

9.30 a. m. to 11 a. m., joint session with Claims and Transportation and Traffic Associations.
Report of accident prevention board.
11 a. m. to 12.30 p. m., joint session with Transportation and Traffic Association.
Reports of committees:
  (a) Block signals,
  (b) Joint sub-committee on block signal rules,
  (c) Transportation-engineering.

Wednesday, Oct. 14

9.30 a. m. to 12.30 p. m.

Reports of committees:
  (a) Equipment,
  (b) Standards (on recommendations contained in above report),
  (c) Buildings and structures,
  (d) Standards (on recommendations contained in above report).

Thursday, Oct. 15

9.30 a. m. to 11.30 a. m., joint session with Accountants' Association.
Reports of committees:
  (a) Life of railway physical property,
  (b) Engineering-accounting.

11.30 a. m. to 12.30 p. m.

Reports of committees (continued):
  (c) Power generation.
  (d) Standards (on recommendations contained in above report).

Friday, Oct. 16

9.30 a. m. to 12.30 p. m.

Reports of committees:
  (a) Way matters,
  (b) Standards (on recommendations contained in above report),
  (c) Heavy electric traction,
  (d) Standards (on recommendations contained in above report).

General business.

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF ACCOUNTANTS' ASSOCIATION

Monday, Oct. 12

9.30 a. m. to 5 p. m.

Registration and distribution of badges at booth, entrance to Young's Million-Dollar Pier.

Tuesday, Oct. 13

9.30 a. m. to 12.30 p. m.

Annual address of president.

Annual report of executive committee.

Annual report of secretary-treasurer.

Reports of committees:

(a) Standard classification of accounts,
(b) Interline accounting,
(c) Accounting definitions,
(d) Representing association at convention of railroad commissioners,
(e) Bureau of the census,
(f) Express and freight accounting,
(g) Committee on education.

Address on "The Education of To-day" by John R. Wildman, professor of accounting New York University.

Appointment of committees:

(a) Resolutions,
(b) Nominations,
(c) New business.

Wednesday, Oct. 14

9.30 a. m. to 11 a. m.

Report of committee:

(a) Overhead charges.

Addresses:

"Investment Bankers and Public Service Accountants" by H. S. Swift, treasurer West Penn Traction Company, Pittsburgh, Pa.

"The Accounting Treatment of Bond Discounts" by J. F. Fogarty, secretary The North American Company, New York.

11 a. m. to 12.30 p. m.

Joint session with Claims Association

Report of committee:

(a) Claim Accounting.

Thursday, Oct. 15

9.30 a. m. to 11.30 a. m.

Joint session with Engineering Association

Reports of committees:

(a) Life of railway physical property,
(b) Engineering-accounting.

(Accountants adjourn to accountants' hall.)

11.30 a. m. to 12.30 p. m.

Addresses:

"The Accounting Features of Valuation" by A. T. Smith, assistant chief division of valuation, Interstate Commerce Commission, Washington, D. C.

"The Accounting Treatment of Depreciation" by Robert Sealy, The North American Company, New York.

Report of committee on resolutions.

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF CLAIMS ASSOCIATION

Monday, Oct. 12

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, entrance to Young's Million-Dollar Pier.

2.30 p. m. to 5.30 p. m.

Annual address of president.

Annual report of executive committee.

Annual report of secretary-treasurer.

Reports of special committees.

Appointment of convention committees.

Paper on "How Investigations Should Be Conducted from a Legal Point of View, Having in Mind Defense as Well as Adjustment" by E. P. Walsh, United Railways Company of St. Louis, St. Louis, Mo.

Written discussion:

(a) L. S. Hoffman, general solicitor Public Service Railway, Newark, N. J.
(b) Wallace Muir, claim agent Kentucky Traction & Terminal Company, Lexington, Ky.

Tuesday, Oct. 13

9.30 a. m. to 11 a. m.

Joint session with Engineering and Transportation and Traffic Associations

Report of accident prevention board.

11 a. m. to 12.30 p. m.

Paper on "Accident Prevention."

General discussion.

Wednesday, Oct. 14

9.30 a. m. to 11 a. m.

Paper, "Claims Department Policies and Principles" by Cecil G. Rice, superintendent claims department Pittsburgh Railways Company, Pittsburgh, Pa.

(a) "The Relation of Claims Departments to the Public,"
(b) "The Psychology of Claims Adjustments,"
(c) "Efficiency in Claim Department Work,"
(d) "Office Kinks in Claim Departments."

Written discussion:

(a) W. Tichenor, claim agent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.,
(b) J. H. Handlon, claim agent United Railroads of San Francisco, San Francisco, Cal.

11 a. m. to 12.30 p. m.

Joint meeting with Accountants' Association

Report of committee:

(a) Claims accounting.

Thursday, Oct. 15

9.30 a. m. to 12.30 p. m.

Paper on "Is Publicity Beneficial to Claims Department Work?" by C. E. Redfern, claim agent The Rhode Island Company, Providence, R. I.

Written discussion:

(a) J. J. Reynolds, claim agent Boston Elevated Railway, Boston, Mass.,
(b) J. S. Kubu, claim agent New York State Railways, Utica, N. Y.

General business.

Reports of convention committees.

Report of committee on nominations.

Election of officers.

Installation of officers.

Adjournment.

PROGRAM OF TRANSPORTATION AND TRAFFIC ASSOCIATION

Monday, Oct. 12

9.30 a. m. to 12.30 p. m.

Registration and distribution of badges at booth, entrance to Young's Million-Dollar Pier.

2.30 p. m. to 5.30 p. m.

Annual address of president.

Annual report of executive committee.

Annual report of secretary-treasurer.

Resolutions.

Appointment of convention committees.

Reports of special committees.

Reports of committees:

(a) Rules,
(b) Schedules and time-tables.

Tuesday, Oct. 13
9.30 a. m. to 11 a. m.

Joint session with Engineering and Claims Associations
Report of accident prevention board.

11 a. m. to 12.30 p. m.
Joint session with Engineering Association

Reports of committees:
(a) Block signals,
(b) Joint sub-committee on block signal rules,
(c) Transportation-engineering.

Wednesday, Oct. 14
9.30 a. m. to 12.30 p. m.

Reports of committees:
(a) Express and freight traffic,
(b) Passenger traffic,
(c) Transportation-accounting,
(d) Fares and transfers,
(e) Uniform definitions.

Paper on "Organization of a Transportation Department," by N. W. Bolen, general superintendent Public Service Railway, Newark, N. J.

Thursday, Oct. 15
9.30 a. m. to 12.30 p. m.

Reports of committees:
(a) Standards for car loading,
(b) Training of transportation employees.
General business.
Report of committee on nominations.
Election of officers.
Installation of officers.
Adjournment.

ASSOCIATION NEWS

ARRANGEMENTS FOR CONVENTION TRAINS

As announced in this column last week arrangements have now been completed by the convention transportation committee of Chicago for the special train to Atlantic City. This train will be run over the Pennsylvania Lines, leaving Chicago at 5 p. m. Saturday, Oct. 10, and arriving at Atlantic City Sunday at 4 p. m. The schedule for this special train provides for its arrival at Ft. Wayne, Ind., at 8.20 p. m., at Lima, Ohio, 9.40 p. m., at Mansfield, Ohio, 7.50 p. m. and at Pittsburgh, Pa., at 5.50 a. m. Eastern time. The train will be composed of all-steel cars, and includes an observation car, a buffet car, two diners and compartment and standard sleeping cars. Last year the special train consisted of twelve cars, and it will undoubtedly be the same this year.

Railroad fare from Chicago to Atlantic City, one way, will be $19.65, from Chicago to Atlantic City one way for a party of ten or more, $17.50, from Chicago to Atlantic City and return, $35, good returning reaching Chicago not later than Oct. 20. The return trip may be routed via Washington, provided it is so specified at the time of purchasing the ticket. Pullman fares are as follows: lower berth, $5; upper berth, $4; compartment, $14, and drawing room, $18.

Already a number of reservations have been received from the West. Those desiring to take this train may send their reservations at any time to C. Bixby, district passenger agent Pennsylvania Lines, 175 W. Jackson Boulevard, Chicago. The convention transportation committee is preparing a pamphlet which will give all the foregoing information. This pamphlet will be mailed to all member companies and manufacturers' representatives who might be interested in this train.

A special train de luxe will leave St. Louis at 12:10 p. m. Saturday, Oct. 10, stopping at Terre Haute, 4:47 p. m.; Indianapolis, 6:47 p. m.; Columbus, 12:15 a. m. Sunday; Pittsburgh, 7:05 a. m.; North Philadelphia, 3:40 p. m., arriving at Atlantic City at 5 p. m., Oct. 11. The train will contain bath-room, barber shop and buffet, clothes presser, library, compartment observation car with maid and manicure, baggage car, etc. A special round-trip fare of $40.65, available for return to St. Louis by midnight of Oct. 20, has been arranged. Sleeping-car fares are $6 for lower berth, St. Louis to Atlantic City; upper berth, $4.80; compartment, $17; drawing room, $21. Two railroad tickets are required for the exclusive use of a drawing-room and one and one-half tickets for a compartment. Meals will be a la carte excepting that a $1 table d'hote will be served as the meal out of St. Louis to "break the ice." Applications for space should be made to C. C. Curtice, 1000 Olive Street, St. Louis. The announcement regarding the train is signed by Bruce Cameron, chairman transportation committee, and the following representatives: (Railway), G. K. Jeffries, C. N. Wilcoxon, H. E. Chubbock, J. E. Gibson, A. J. Purinton, C. J. Griffith, R. D. Long, Samuel Bamburger and C. B. Wells; (Manufacturers) Scott H. Blewett, O. W. Uthoff, W. E. Norris, E. B. Meissner, E. J. Clark, H. C. Avis, A. V. Handcock, C. W. Hobson, P. A. Hendendahl, H. C. Glaze and Mervin D. Wells.

COMMITTEE ON ENGINEERING ACCOUNTING.

The final meeting of the Joint Committee on Engineering Accounting was held at association headquarters on Sept. 1 and 2. Those in attendance were J. P. Barnes, chairman, general manager Syracuse & Suburban Railroad Company; M. R. Boylan, general auditor Public Service Railway Company; M. W. Glover, secretary and auditor Mobile Light & Railroad Company; L. H. Parker, railway engineer Stone & Webster Management Association, and J. P. Ripley, J. G. White Management Corporation. The committee considered in detail the criticisms of the preliminary report which had been submitted to the members of the committee as stated in the issue of the ELECTRIC RAILWAY JOURNAL for July 25. It was found possible to harmonize conflicting ideas and the report will now be put into final form.

ACCOUNTANTS' EDUCATIONAL COURSE

The advance registration for the correspondence course which has been arranged by the committee on education of the American Electric Railway Accountants' Association has now passed the "320 mark," and there is no doubt that the remaining necessary eighty enrollments will be secured at once. The committee desires to get the course into operation at once, and F. L. Pryor, comptroller American Railways Company, chairman, urges prompt action on the part of those who still have the matter under consideration.

MANUFACTURERS' ASSOCIATION

The Manufacturers' Association office has sent out full instruction details for shipping goods for exhibits, reminding exhibitors that the exhibit committee is prepared to place the goods and assist in arranging the exhibits. Most of the exhibitors have agreed to have their exhibits complete by Saturday morning, Oct. 10, so that the convention will be virtually lengthened one day as far as the exhibit feature is concerned. The last of the series of circulars, just mailed, covers orders for electric signs.

COMMUNICATION

The Alton Plant of the East St. Louis & Suburban Company

E. W. CLARK & COMPANY MANAGEMENT CORPORATION
COLUMBUS, OHIO, Aug. 24, 1914.

To the Editors:

Some information regarding certain design features of the Alton power plant, in addition to the description which you published in the issue of the ELECTRIC RAILWAY JOURNAL for Aug. 15, may be of interest to your readers. This station appears to be rather elaborately equipped with measuring instruments for a relay station. The fact is, however, that we do not expect to operate it as a relay station longer than about the first of October. After that time we shall have our transmission line finished between Alton and East St. Louis, and then this station will carry a constant load. The amount of the load may vary from one week to another, or from one month to another, but it will not vary from hour to hour, or from day to day. Under these conditions recording instruments can make records the use of which will decrease the cost of supervision. In other words, the general superintendent of the company can follow the operation of the plant when he has such records and so keep closely in touch with the situation. As the plant is going to carry a steady load for several days at a time, he will be able to direct changes in operation from time to time as the system requires.

A low-voltage turbine-generator was purchased because, at the time we purchased this machine, the General Electric Company did not recommend 13,200-volt generation. Aside from their recommendation, however, we have always considered the auto-transformer a desirable piece of equipment, and it is quite possible that in any case of this kind we would consider its use.

A single-unit turbine-generator was purchased for this plant because we felt that in a system of the size of this one, with a peak load from 15,000 kw to 20,000 kw, units smaller than 5000 kw would not be economical. Further, this station was laid out with a definite idea that it would comprise part of a plant to contain ultimately two 5000 kw turbine units, which number will be much more desirable than a large number of small units.

Referring to the use of economizers, we have had very good success using economizers in stations of this size. The economizer with its induced-draft equipment gives, in case of an emergency station, two important resources:

First, ability to vary the draft quickly and to almost any extent; and

Second, ability to carry heavy overload on short notice, due to the considerable quantity of water in the economizer, which is nearly at steaming temperature.

In view of the facts mentioned we do not feel that the steam equipment of this station is very elaborate. The amount of money spent for recording instruments is a very small percentage of the cost of the entire station.

We have tried to put in this station meters and measuring instruments to give us the following data: Kilowatt-hours generated; pounds of coal burned; pounds of water evaporated. With these quantities before us, we work out and put into all of our reports the kilowatt-hours generated, the pounds of coal required per kilowatt-hour and the pounds of steam per kilowatt-hour. We always feel that these figures are as essential as the cost per kilowatt-hour.

I wish to point out that the most rigid economy was pursued in building this power plant and that the cost per kilowatt of station capacity is as low as any that we know of, because all available space in the station is made use of and no money was wasted for elaborate architectural designs. Although the plant is built of hard-burned brick, laid up with cement mortar, and it has a steel and concrete roof, it is a building which we feel does not require any insurance and it will last longer than the equipment. It is also designed so as to give us a great deal of light and good ventilation. So far, even though we have had an extremely hot season, we find that the station is as cool as any station could be.

Another feature which perhaps has not been noticed, is that the boilers are set single, not in batteries. This enables us to blow the boilers from both sides. From a preliminary investigation we found that this form of setting cost but slightly more than the usual battery settings and enabled us to use buck-stays for holding the furnace arches.

LOUIS R. LEE, Chief Engineer.

Public Hearing on Universal Standard Specifications for Steam Boilers

The American Society of Mechanical Engineers has announced that a public hearing is to be held on the preliminary report of the committee appointed by the society to formulate a universal standard specification for the construction and care of steam boilers. This hearing, which will be opened at 10 a. m. Tuesday, Sept. 15, in the rooms of the society in New York, has been arranged so that the report may be thoroughly discussed. A number of organizations concerned in the construction and maintenance of boilers are to be represented at the hearing, several of these having already presented written statements to the society regarding various details of the report. It is requested by the society that all those who attend the hearing send in written criticisms of the report previous to the hearing so that the progress of the deliberations may be assisted.

A number of copies of the original draft of the report are available and may be secured on application to the American Society of Mechanical Engineers. The basic idea of the work of the committee making this report has been the formulation of a standard of the highest requirements which, if adopted universally throughout the United States, will reduce the great loss of life and property due to boiler explosions and derangements which are, for the most part, preventable. It is the intention to create a standard which, it is hoped, will be ultimately adopted by the federal government and by such state governments as have no boiler regulations at present. Thus, through uniform legislation it should become possible to produce such a condition of affairs that a boiler built for any one state will be acceptable in any other.

Railway Company Offers Park to City

The municipal authorities of Joplin, Mo., have entered into negotiations with the Joplin & Pittsburg Railway with a view of taking over Schifferdecker Park, donated a year ago to the city by Charles Schifferdecker, subject to a lease which is held by the company. At the time the gift was made, the Joplin & Pittsburg Railway offered to turn the park over to the city provided it would operate it as a muncipal park. William A. Satterlee, general manager of the company, has indicated his willingness to enter negotiations, though the company has profited from the lease.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Overcoming Field Bucking in a Motor-Generator Set

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

In a certain newly-erected substation which contains one 600-hp, 2200-volt a.c., 400-kw, 600-volt d.c. motor-generator set, the d.c. end is an eight-pole commutating pole machine connected to run in parallel with a 500-kw rotary converter. Both substations supply 600-volt energy to run an interurban railway.

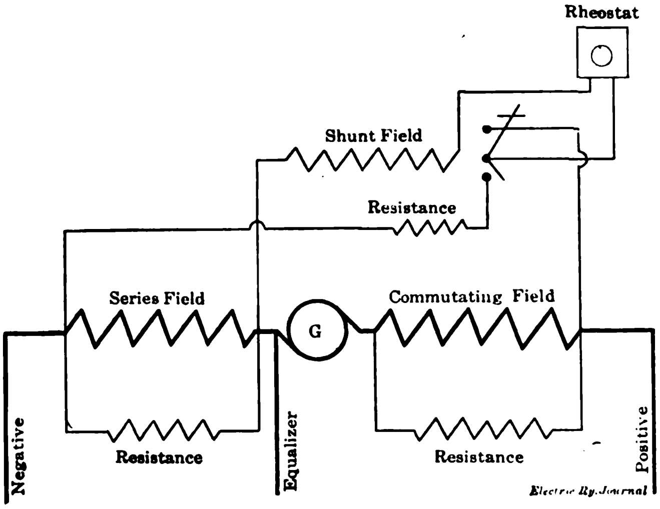


FIG. 1—WIRING DIAGRAM OF CONNECTIONS WHICH CAUSED BUCKING OF SERIES FIELD

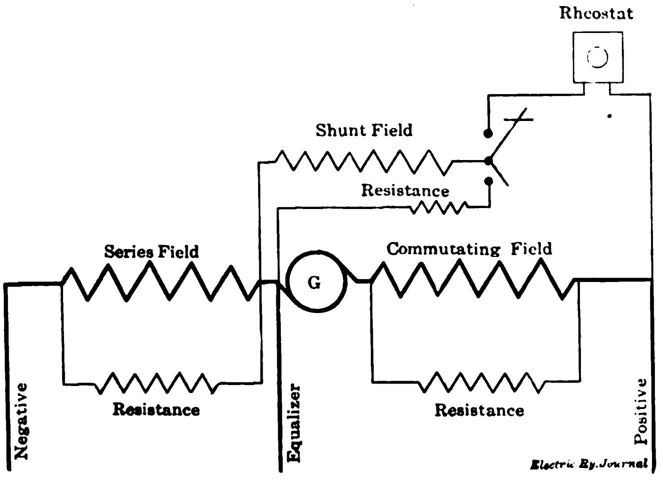


FIG. 2—WIRING DIAGRAM OF CONNECTIONS WHICH ELIMINATED BUCKING OF SERIES FIELD

In the operation of this particular motor-generator equipment, one of the most common sources of trouble was that the set in starting up always reversed the polarity so that the voltage picked up in the reverse direction; but the polarity was reversed back by the flashing of the field, and the machine was put in parallel. One day in starting up this equipment the voltage picked up in the reverse direction again, and the operator thought that the easiest way to remedy the trouble would be to reverse the leads on the voltmeter terminals. Then when the voltmeter registered 600 volts he cut in the d.c. machine to run in parallel with the other substation. On doing this a big flashover followed immediately, burning out the voltmeter and blowing out all the fuses in the lighting circuit, thus indicating that the two substations were short-circuited on themselves in series. Following this accident an expert was called to remedy the trouble.

Of the two accompanying diagrams, Fig. 1 shows the original connections of the shunt field circuit and rheostat, which indicate that when the machine was stopped by opening the shunt field circuit to cut in the field circuit discharge resistance, the shunt field circuit was in series with the series field circuit and rheostat. The investigator found that the bucking of the two fields was caused by stopping the machine in a hurry and by opening the field switch to cut in the field circuit discharge resistance before the voltage had dropped to zero. Upon this the shunt field circuit and rheostat were connected as shown in Fig. 2, and no more trouble was experienced.

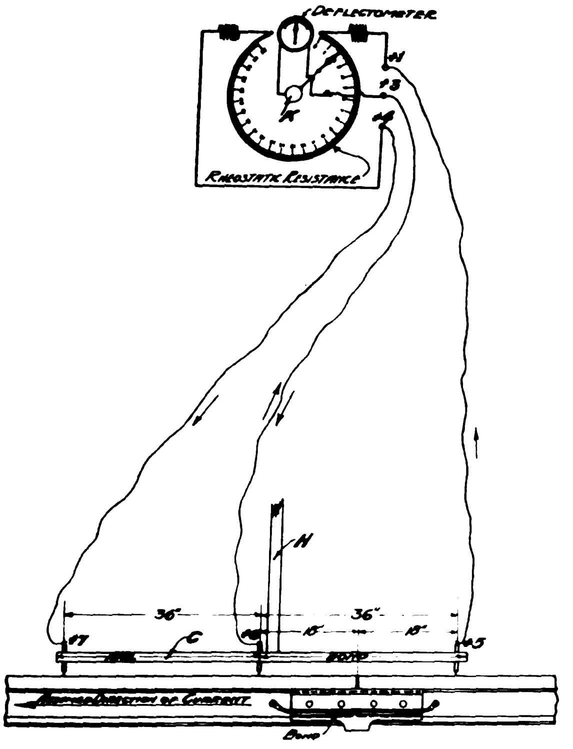
The Return Circuit—Testing the Bonds

BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY, PUBLIC SERVICE RAILWAY, NEWARK, N. J.

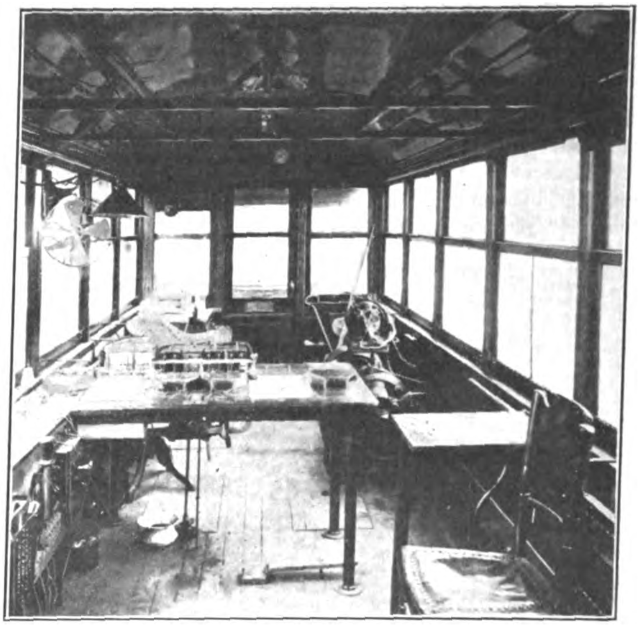
Track resistance is most easily determined by taking ammeter readings of the current flowing through a given length of track and determining the drop in potential by means of a low reading voltmeter connected to the opposite ends of the section. The calculation of the total resistance of the given length of circuit is then made according to Ohm's law, and this figure, less the rail resistance alone, will give the total joint resistance.

RETURN CIRCUITS—BOND TESTER IN USE ON PUBLIC SERVICE RAILWAY

If it is found that this is greater than the permissible allowable joint resistance, an individual test of each joint should then be made.

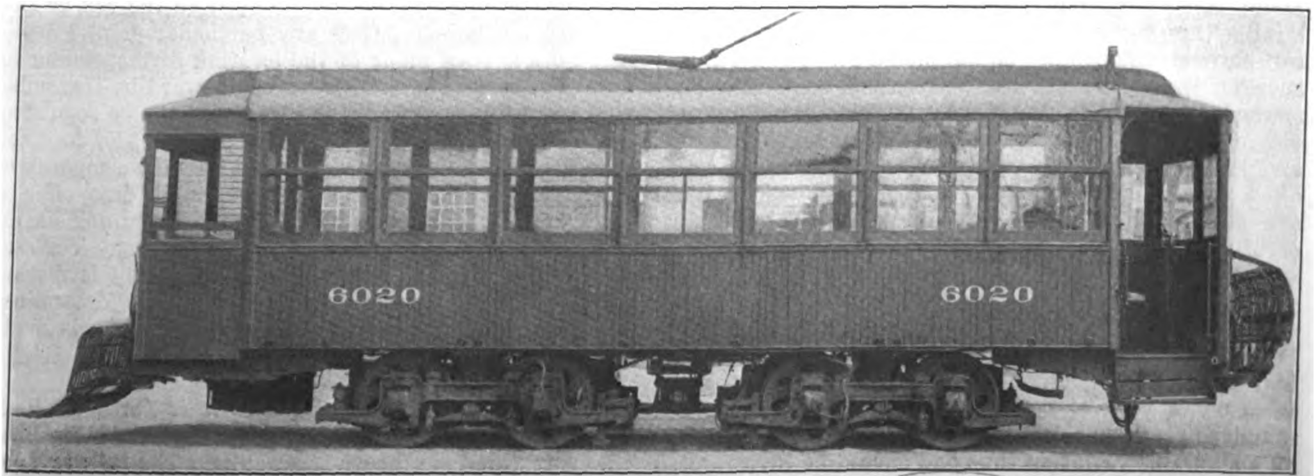


RETURN CIRCUITS—DIAGRAM SHOWING OPERATING PRINCIPLE OF BOND TESTER



RETURN CIRCUITS—GENERAL INTERIOR VIEW OF THE PUBLIC SERVICE RAILWAY BOND TEST CAR

On the Public Service Railway property such individual joint tests are made with the Roller-Smith bond tester. This is a compact, direct, reading instrument and the readings obtained are probably accurate to within a few inches of the theoretically equivalent rail length. The apparatus is shown in use in one view, its principle of operation being shown in a diagram. It consists of a T-shaped bar, *C*, upon which three contacts are mounted, and connected with the electrical mechanism as shown. The contacts are made of short pieces of hacksaw blades held in clamps. By rocking the handle *H* of the bar at right angles to the rails the blades saw through the dirt and scale on the rails and insure good contacts. The principle of its operation, like that of other bond testers, is that of the Wheatstone bridge. Assuming that the connections have been made as indicated, and that the direction of the current in the rail is the same as that shown by the arrow, there will be a certain small drop in potential between contacts Nos. 5 and 6, due to the resistance of the rail and bond. There will also be a small drop in potential between contacts Nos. 6 and 7, due to the resistance of the rail only, the distances between the two sets of contacts being the same in both cases. If the bond capacity is theoretically correct and if the bond installation has been perfectly made and has not been disturbed, the drop in the two cases should be very close to the same amount, but this is rarely the case. When the contacts have been made on the rail a portion of the current between contacts Nos. 5 and 6 is shunted through the connecting wires from contact No. 5 to terminal No. 1 of the instrument, thence over a part of the rheostatic resistance (the amount of which depends on the position of the dial), through the deflectometer to terminal No. 3 and out to the rail again through contact No. 6. This current will cause a deflection of the needle of the deflectometer. In the same way a part of the current in the rail between contacts Nos. 6 and 7 is shunted through the connecting wire from contact No. 6 to terminal No. 3 (this time in a direction oppo-

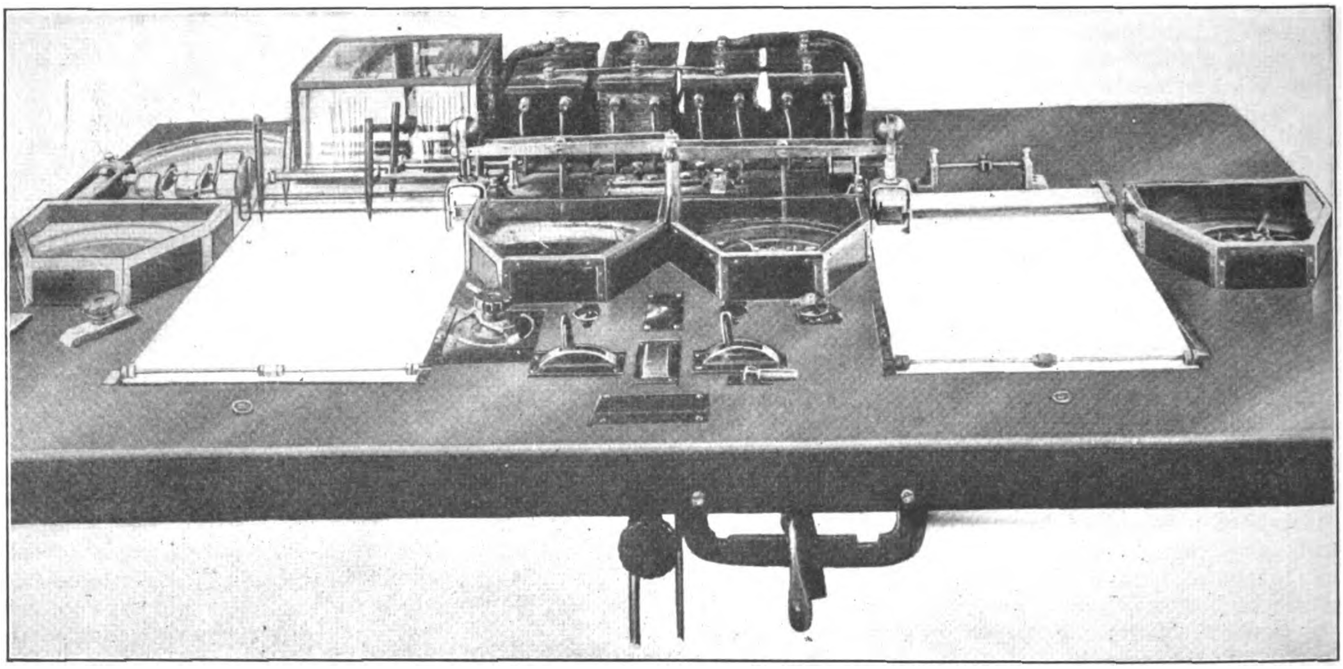


RETURN CIRCUITS—BOND TEST CAR OF PUBLIC SERVICE RAILWAY, SHOWING WIRE CONTACT BRUSHES BETWEEN THE TRUCKS

LIBRARY UNIVERSITY OF CALIFORNIA

site to that of the return circuit in the first shunt), thence through the remainder of the rheostatic resistance and the deflectometer to terminal No. 4 and back to the rail again through contact No. 7. This current also tends to deflect the needle of the deflectometer, but in a direction opposite to that in the first case. Assuming that the rheostatic resistance regulator is set at the zero point, if the resistance of the section of the rail containing the joint and bond is greater than that of the section containing the unbroken rail (which is almost invariably the case), then a greater amount of current will be shunted through the first circuit than through the second, and the result will still be a deflection of the needle in the deflectometer. If then, we can make the resistance of the two circuits the same, their effect will be to neutralize each other, and there will be no deflection of the needle. This is the function of the rheostatic resistance. By turning the handle K the resistance of the two legs of the circuit is varied. The indicator attached to the handle K moves around a scale which is so graduated as to read directly the resistance of the section containing the bond in terms of the resistance of feet of unbroken rail when the needle deflection is zero. For instance, suppose the reading of this indicator to have been 5 ft. of rail. This would have meant that the resistance of the section containing the joint would be equal to that of the 3 ft. of rail between the contact points plus 2 ft. of rail resistance for the bond itself and its terminal contacts. The method, therefore, is simply comparative, depending not only on the bond and type of contact, but on the weight and kind of rail used. However, this device offers a quick way of determining the locations of bonds which are defective. In using this method it is advisable carefully to install a few bonds under the most favorable conditions, and then take readings to establish a standard by which all other similar bonds are to be compared. Once this allowable standard resistance has been established the instrument will quickly detect all bonds with excess resistance. It is of course customary to allow a certain percentage of variation over the standard resistance, but if the resistance is greater than this allowable variation the bond should be investigated and the defects remedied. Care must be taken in using the instrument not to close a circuit over an "open joint." The instrument is very sensitive, and if too strong a current is shunted through the rheostatic resistances these are liable to be burned out. At least once, and preferably twice, a year all bonded joints should be gone over and retested to maintain a high standard.

On our own property all bonds are tested about once a year. To facilitate such an extensive scrutiny, the car shown was equipped with the Herrick bond-testing apparatus to get an autographic record of the relative resistance of every foot of rail over which the car is operated. Two wire brushes on each rail comprise the contacts. A motor in the car using line current drives a generator which sends a high amperage current through the rail between the brushes and through the testing apparatus. A special switch permits the direction of this current to be changed so as to follow that running through the rail. A part of the apparatus consists of a millivolt meter, so designed that a spark is formed as the needle is deflected. As the spark travels backward and forward it burns small holes in the roll of chart paper. The scale of the paper allows the relative resistance of each foot of rail to be read direct. A separate record for each rail is made on one roll. For later identification a numbering machine is used so that consecutive numbers can be stamped on the roll by the operator as the car passes any particular point. Separate note is then made of the location corresponding to each number. The roll is moved forward by transmission from the car wheels and its speed can be regulated at the will of the operator. This method, too, does not give direct resistance readings, but only the comparative equivalent rail resistance. However, it does offer a very rapid and dependable way of determining on an extensive scale the condition of the bonding. The sections of the track where defective bonding is discovered are then gone over and a more accurate determination of the condition of the individual joints is made with the Roller-Smith instrument.



RETURN CIRCUITS—DETAIL VIEW OF RECORDING DEVICE IN PUBLIC SERVICE BOND TEST CAR

It is reported that the Lancashire & Yorkshire Railway, Lancashire, England, intends to electrify its lines in central and southeast Lancashire. The railway is at present electrifying its lines between Manchester and Bury.

Safe Utilization of Scrap Material

BY F. J. FOOTE, MASTER MECHANIC THE OHIO ELECTRIC RAILWAY COMPANY, COLUMBUS, OHIO

There are very few subjects on which mechanical men will disagree so widely as on the subject of utilizing scrap material. This wide difference of opinion is in part due to the technical training or lack of such training on the part of the men. A man without technical training is likely to regard a piece of metal taken from the scrap pile as just as good as a new piece so long as its size and shape are suitable for the work in hand, not realizing that metal that has been in use under strain for a long time is very likely to be crystallized and the structure thereby weakened and made unfit for use where heavy strains will be again put upon it. Furthermore, much old material is inferior to new material on account of the improvements made in the art of metal working since the old material was made up, as some material found around a car shop is from fifteen to twenty years old. It is, of course, true that old steel and iron that is crystallized by overwork can be improved by working under the hammer, and it is sometimes a good proposition to work over certain old material provided the shop is fortunate enough to have a steam or power hammer. As a general rule, however, the cost of working over heavy steel and iron by hand will more than eat up the cost of new material. A great deal of old material can be used by selecting places for its use where severe strains are not put upon it, but for parts like brake rigging and parts of trucks where a failure is liable to cause an accident the use of scrap material is to be discouraged. In cases of this kind the motto "The Best Is None Too Good" is a very good one to keep constantly in mind. Another objection to the use of scrap material is that it rarely fits the job in hand and some alteration must generally be made in it; these alterations, if slight, make its use profitable, but in many cases the alterations and the work required to put the material in shape for use will more than pay for new material.

This brings up also the question of "home-made" tools and devices. Some mechanical men get the idea that because they are ingenious enough to devise and construct tools in their own shops, it is good policy to do so rather than to purchase them from reliable dealers. In the case of special tools that cannot be found on the market at a reasonable price, or in case the management absolutely refuses to purchase much needed tools, the practice of making tools is justified. Generally speaking, however, the home-made tools are not up to the standard in quality or capacity of the commercial tools, and often the actual cost in labor and material is greater than the price of the tools. The writer remembers one case in particular where a certain tool was made in the home shop for the track department at the expense of much of the blacksmith's and machinist's time when they should have been kept on more important work.

Some scrap material was used, yet the actual cost was without doubt as much as the tool could have been purchased for. Owing to the fact that this tool was not designed, but simply "built," it proved entirely too light for the work it was to be used on and it is now in the scrap pile to stay, a total loss.

But to return to the subject of scrap, it is certainly every master mechanic's duty to make frequent visits to the scrap pile to see if his men are throwing away parts that could have been used safely for a greater length of time, and also to see if any material is scrapped that should have been laid by for other uses at some future time. Someone has said that he can tell what kind of a man the shop foreman is by looking at his scrap pile. The writer is willing to agree to this, with some restrictions; but the point to be emphasized is that errors are made in utilizing too much scrap material, just as surely as in not using enough of it.

A Home-Made Crossing

BY CARL H. FULLER, ENGINEER MAINTENANCE OF WAY MACON (GA.) RAILWAY & LIGHT COMPANY

At the intersection of our Third Avenue single-track line with our Mulberry Street double-track line, we had an old crossing of irregular shape, as shown in Fig. 1 of the accompanying drawing. This had become badly shattered, all intersections being broken and the wing joints battered down. Owing to heavy renewals elsewhere this crossing was neglected until its rapid disintegration necessitated immediate renewal. As the mills at that time were unable to promise delivery under ninety days and as the necessity for a new crossing was urgent, we decided to manufacture a temporary one to care for the emergency. A sketch was prepared, as per Fig. 2, with all the wing rails of equal length and long enough to eliminate the bad joints. From this sketch a crossing was made and installed on Nov. 18, 1913. Both the shop and field work was done with great care, so that although the crossing has been in service nine months under 900 to 1000 car movements a day, it appears to be as good as when put in. At the same time a saving of $300 was effected over the shop-built crossing.

The cost of manufacture was as follows:

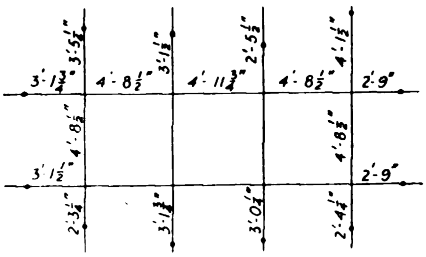
Bolts and miscellaneous fittings	$12.56
Eight cast-iron angle-bars and pattern	41.70
Twenty-four forged angle-bars, material only	36.00
Labor fabricating crossing	64.15
Total	$154.41
Quotation for shop-built crossing	452.00
Saving over price of manufactured crossing	$297.59

No rail is included in the foregoing costs, as scrap ends from new 6-in. 72-lb. rail, left over from 60-ft. rails used on paving jobs, were utilized. The double track rails, marked *A* in Fig. 2, run clear through the crossing without any break except the slot in the ball for the passage of the wheel flange. All rail was cut to length on a power hack saw, and all drilling for bolts and bonds was done with a Duntley electric track drill. The intersecting joints are made up of three forged angle-bars ground to a tight fit and one cast-steel angle-bar, Figs. 3 and 4, the latter cast at a local foundry. The cast angles were made for a bevel fit with two slight ridges on the side next to the web of the rail to give an even bearing.

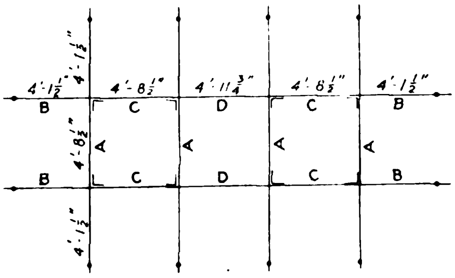
The cost of installing the crossing was as follows:

Bonds and bonding material	$30.24
Paving material, cement, brick, etc	23.00
Labor including repaving	40.40
Total	$93.64

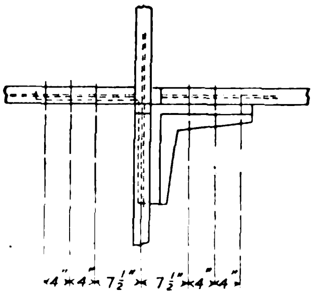
The removal of paving began late in the afternoon, and when the last car went to the carhouse at midnight the old crossing was pulled out bodily, after which we had four hours to cut the old running rails with hack saws and put in the new crossing. Rails *A* were placed first and exterior joints bonded and bolted, after which rails *B*, *C*, *D*, *C*, *B* were placed in that order and the angle intersections bolted up, this work being finished in time for the first car leaving the carhouse at 4.50 a. m. (The last car turns in at 11.40 p. m.) Bonding of the internal joints followed, one 9-in. concealed bond being used in each external joint and three 36-in.



OLD CROSSING
FIG. 1



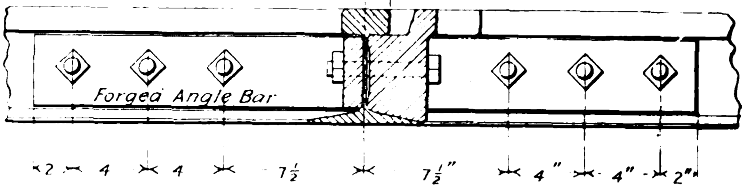
NEW CROSSING
FIG. 2



INTERSECTION FIG. 3

BILL OF MATERIAL

24-36" Stranded Bonds
12-9" Concealed Bonds
12 Pair Std. Splice Bars-Bolts & Nut Locks
48-1" Machine Bolts 4½" Long
48-1" " " 6" Long
4-6" 72-Lb. Rail Sec. 331-12'-11½" Long Marked A
4- Do 3'-11" " " B
4- " 4'-8¼" " " C
2- " 4'-9¼" " " D
24- Forged Angle Bars 1" Metal Ground to Fit
8- Cast Steel Angle Bars



ANGLE SPLICE
FIG. 4

DETAILS AND BILL OF MATERIALS FOR HOME-MADE CROSSING OF THE MACON RAILWAY & LIGHT COMPANY

stranded bonds for each intersecting joint. Repaving with concrete and brick followed the bonding. The slightly dampened concrete was thoroughly tamped under the rails and around the ties, the brick being laid on a 1-in. sand cushion and the joints filled with thin grout. The slight roughness of the paving surface is due to the fact that teams were driven over the work before it was finished, but otherwise it is firm and solid. Four working days and one night were required from the time of cutting the first rail in the shop to the final grouting of pavement.

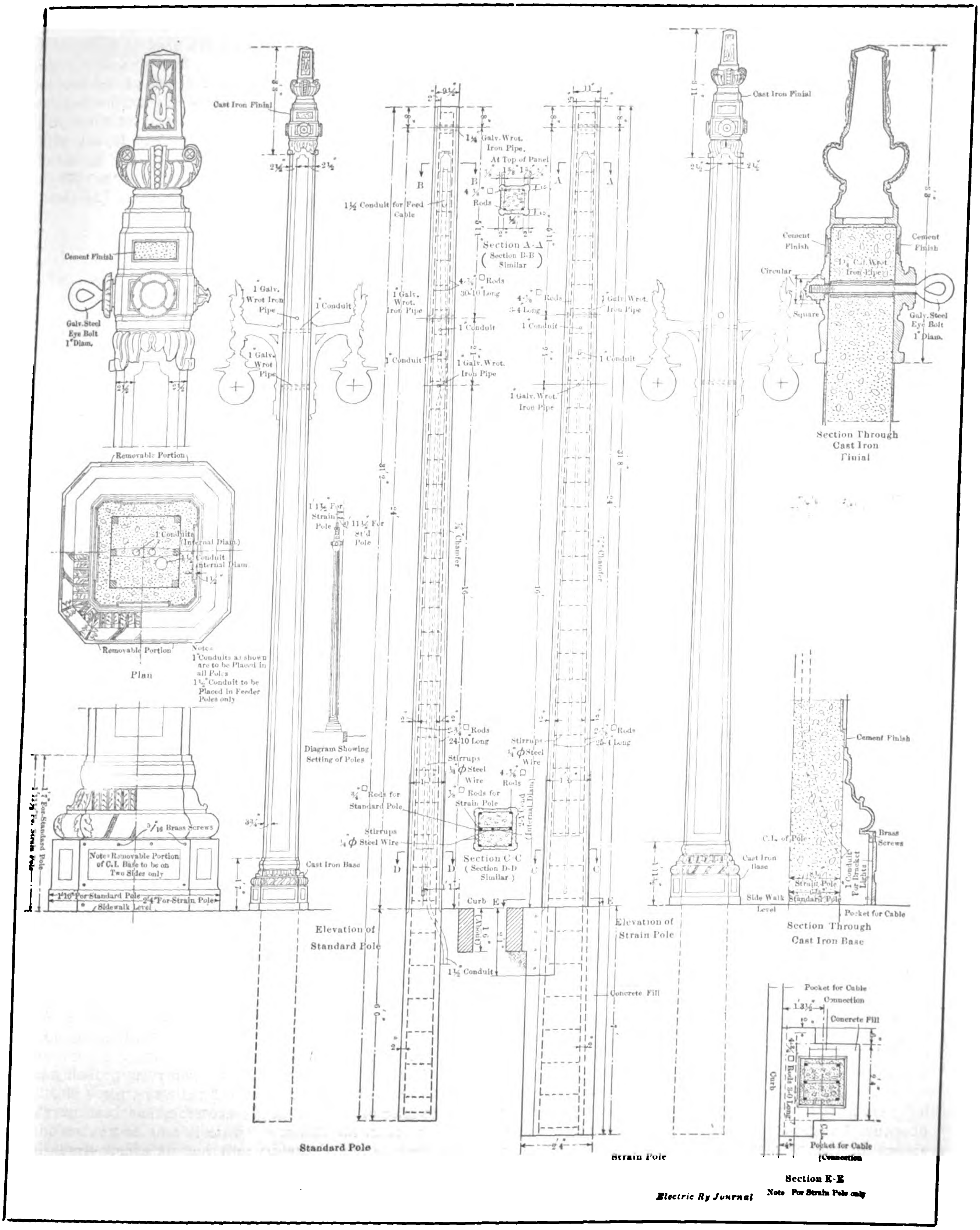
Only one criticism appears to have been made about this crossing, aside from the fact that it is much lighter than shop-built crossings, and this refers to the effect of the nosing of car wheels in the rail slots. This objection could easily be avoided by using three cast angle-bars and one forged angle-bar in place of the one cast angle used at each intersection, as the groove in these cast angles is slightly flared to take the wheels. This change would increase the cost slightly, but not as much as might appear, since the price, $41.70 for the eight castings, includes the cost of the pattern. This type of construction also has the advantage of permitting the renewal of any single part without much trouble, owing to the all-bolted joints. The cast angle-bars appear of ample section to take care of the wheel hammer, and the grooves were made high enough to carry the wheel flange over the rail slots.

The Pacific Motor Coach Company has installed a service of double-deck motor buses between Los Angeles and Venice—a suburban resort near Los Angeles. Eleven buses have been received, and it is stated that ninety-four more have been ordered from the Kelly-Springfield Company. Each bus has seats for fifty-four passengers, and the fare for the round trip is 50 cents.

MACON HOME-MADE CROSSING AS INSTALLED AT THE INTERSECTION OF THIRD AVENUE AND MULBERRY STREET

Concrete Trolley and Lighting Poles in San Francisco

San Francisco has adopted concrete trolley wire poles for the municipal railway system to be built under the $3,500,000 bond issue approved last year. For the most part these poles will be non-ornamental concrete shafts, equipped with metal cross-arms where feeders are carried, and on other lines provided only with eyebolts for wire supports. On Van Ness Avenue, however, it was desired to use an ornamental pole suitable for carrying the street lamps as well as the trolley wire, and a more elaborate design was developed. The concrete shafts for these ornamental poles have already


Cast Iron Finial
Cement Finish
Galv. Steel Eye Bolt 1" Diam.
Removable Portion
Plan
Note: 1" Conduits as shown are to be Placed in all Poles. 1½" Conduit to be Placed in Feeder Poles only
1 Conduits (Internal Diam.)
1½" Conduit Internal Diam.
5/16 Brass Screws
Note: Removable Portion of C.I. Base to be on Two Sides only
1'10" For Standard Pole
2'4" For Strain Pole
Sidewalk Level
1" Galv. Wrot Iron Pipe
1" Conduit
1" Galv. Wrot Pipe
Cast Iron Base
Elevation of Standard Pole
Standard Pole
1½ Conduit for Feed Cable
1" Galv. Wrot. Iron Pipe
1¼" Galv. Wrot. Iron Pipe. At Top of Panel
4 ⅝" □ Rods
Section A-A (Section B-B Similar)
4-⅞" □ Rods 30-10 Long
4-⅞" □ Rods 3-4 Long
1" Conduit
1" Galv. Wrot. Iron Pipe
1½" For Strain Pole
11½" For St'd Pole
Diagram Showing Setting of Poles
⅞" Chamfer
2-⅞" □ Rods 24-10 Long
2-⅞" □ Rods 25-4 Long
Stirrups ¼" ϕ Steel Wire
¾" □ Rods for Standard Pole
⅞" □ Rods for Strain Pole
Section C-C (Section D-D Similar)
Curb
1½" Conduit
Elevation of Strain Pole
Concrete Fill
Strain Pole
Circular
Square
1¼" C.I. Wrot Iron Pipe
Section Through Cast Iron Finial
Brass Screws
C.L. of Pole
1" Conduit For Bracket Lights
Strain Pole
Standard Pole
Side Walk Level
Pocket for Cable
Section Through Cast Iron Base
Pocket for Cable Connection
Concrete Fill
4-⅞" □ Rods 9-0 Long
Curb
Pocket for Cable Connection
Section E-E
Note For Strain Pole only
Electric Ry Journal

STANDARD AND ORNAMENTAL TROLLEY AND LIGHTING POLES FOR SAN FRANCISCO been cast and will be erected on completion of the track-laying, which is now under way.

As shown in the accompanying illustration, these poles have bases, lamp brackets and caps of metal, and each will carry two 200 cp tungsten lamps. Van Ness Avenue is 81 ft. wide between curbs, immediately back of which the poles will be set. The sidewalks are 22 ft. wide, and the poles will be placed every 92 ft. The contract has been awarded for about 2 miles of double track served by poles of this ornamental type.

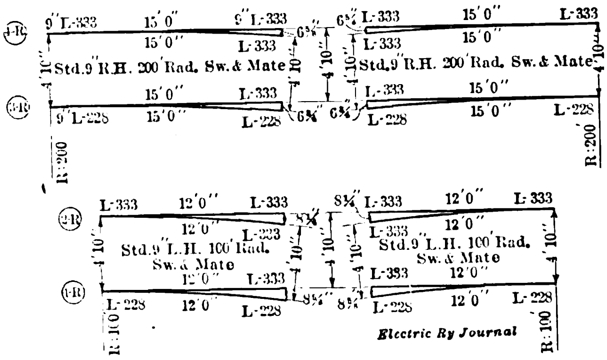
The contract for supplying and erecting the ornamental poles was awarded on a basis of $128.22 for the standard poles and $132.50 for the strain poles. The non-ornamental poles in place, with cross-arms, are to cost $51.15 for the standard poles and $55.70 for the strain poles. Riser poles with two conduits are to cost $65.67.

The ornamental design was developed by the city's consulting board of architects, and the engineering details of these poles were worked out by R. J. Wood of the engineering department, who also designed the other concrete poles in the municipal railway system. The entire work is under the supervision of M. M. O'Shaughnessy, city engineer of San Francisco.

St. Louis Track Special Work Standards

The track department of the United Railways of St. Louis has not only adopted up-to-date track-work standards but is adhering to them in new construction. In August, 1911, the standards described in this article were adopted, and since that time approximately 1800 of the standard pieces have been purchased.

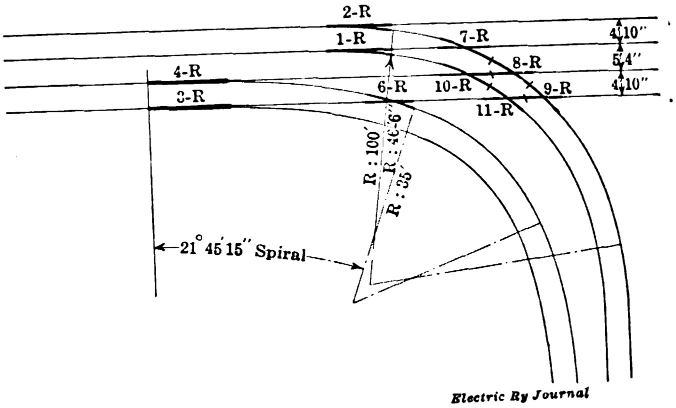
Standard special-work pieces include switches, mates and frogs, both right and left hand, totalling twenty-five in all. All of these standard pieces are purchased in several rail sections and weights to meet varying traffic conditions. These rail sections include a 9-in. Lorain section 440, Trilby rail, weighing 132 lb. to the yard, and 9-in. Lorain 333, weighing 112 lb. to the yard. In the 9-in. girder-guard rail the sections used are the Lorain 441, weighing 150 lb. to the yard, and the Lorain 228, weighing 117 lb. to the yard. Under light traffic conditions a 6-in. Lorain 225, weighing 78 lb. per yard, is used with a 6-in. Lorain section 257, weighing 97 lb. per yard as a guard rail. Most special work, however, is purchased in the Lorain section 333, with section 228 guard rail.



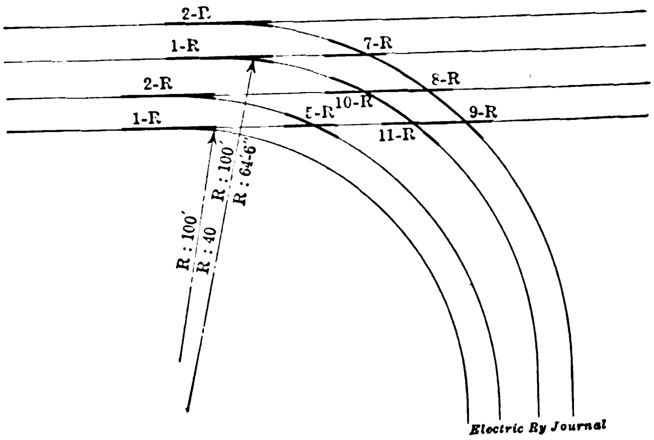
SPECIAL WORK STANDARDS—SWITCHES AND MATES,

Switch and mate standards include 9-in. right and left hand, 100 and 200-ft. center radius pieces. The over-all dimensions of these four combinations are shown in the accompanying illustrations. They conform to the recommended designs adopted by the A. E. R. E. A. in 1911. The 200-ft. radius switch and mate, shown as pieces Nos. 3 and 4, are used in combination with frog piece No. 6, where it is possible to get car clearance. Pieces Nos. 1 and 2 are considered as the standard switch and mate and are generally used with frog No. 5 in most of the single-track branch-offs. When frog No. 5 cannot be used on account of obstructions or because of other clearance difficulties, frog No. 7 with a slightly flatter angle usually takes its place.

Pieces Nos. 7, 8, 9, 10 and 11 are used in conjunction with pieces Nos. 1 and 2 in right-hand trailing and left-hand facing branch-off of double track. On occasions pieces Nos. 8, 9, 10 and 11 are used to make up a curve crossing over straight track. The over-all dimensions of these five frogs are shown in one of the accompanying illustrations. It will be noted that the lengths of arms are designed so that short-rail sections will be unnecessary to make up the complete layout with the standard track centers of 10 ft. 2 in. As noted before, frog No. 7 is sometimes used in the 100-ft. radius standard turnout in order to obtain car clearance. Accordingly it will be seen that this curved crossing begins with a 100-ft. radius turnout and ends with a 46-ft. 6-in. inside radius curve. It also must be noted that the St. Louis standard gage is 4 ft. 10 in., consequently these dimensions would not apply to standard gage track. This layout also is made up with right or left-hand pieces.



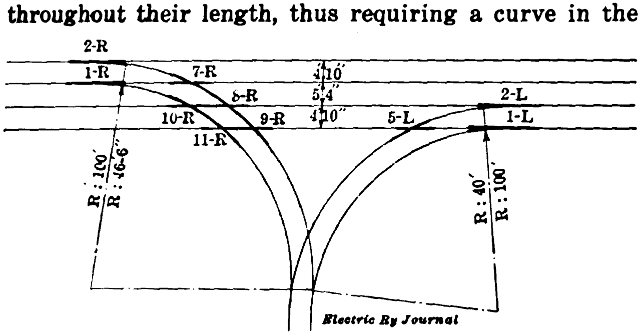
SPECIAL WORK STANDARDS—RIGHT-HAND BRANCH-OFF, CARS CLEAR



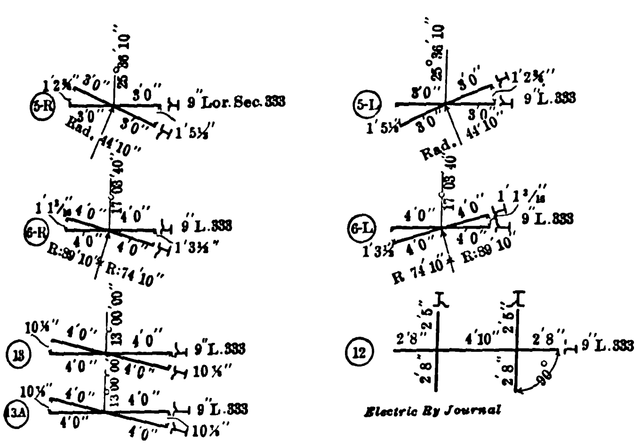
SPECIAL WORK STANDARDS—RIGHT-HAND BRANCH-OFF, CARS DO NOT CLEAR

On the United Railways property, as probably would be the case with other street railways, piece No. 12, or one-half of a right-angle crossing, has been purchased more than any other. While it may be contended that a right-angle crossing will not fit every street intersection, most of them are within a few minutes of 90 deg. Consequently the United Railways ignore any variation of ten minutes or less without any apparent effect on the track alignment. In the adoption of the over-all dimensions, the exterior arms were made of the correct lengths to eliminate short-rail sections between tracks, and the two interior arms were made equal to one-half the track gage in length.

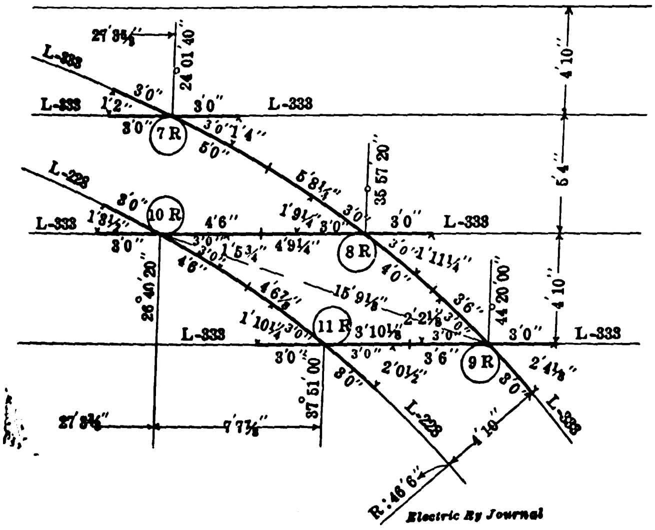
Cross-overs also have been standardized, and frogs No. 13 and 13A with a 13-deg. exterior angle are used in these layouts. These frogs also are used in long-radius branch-offs at streets intersecting at acute angles. As will be noted, these frogs are tangent throughout their length, thus requiring a curve in the lead and a curve beyond the frog. As will also be noted, at one end of piece No. 13 the rails are back to back and at the other lip to lip. In 13A, however, both ends are lip to back, which is required when the frogs are in the two rails of the same track. This is shown in the diagram of a standard 13-deg. branch-off.


2-R
1-R
7-R
6-R
10-R
9-R
11-R
5-L
2-L
1-L
4'10"
5'4"
4'10"
R:100'
R:46'-6"
R:40'
R:100'
Electric Ry Journal

SPECIAL WORK STANDARDS—TRAILING WYE


5-R
5-L
6-R
6-L
13
13A
12
9" L or Sec. 333
9" L.333
Electric Ry Journal

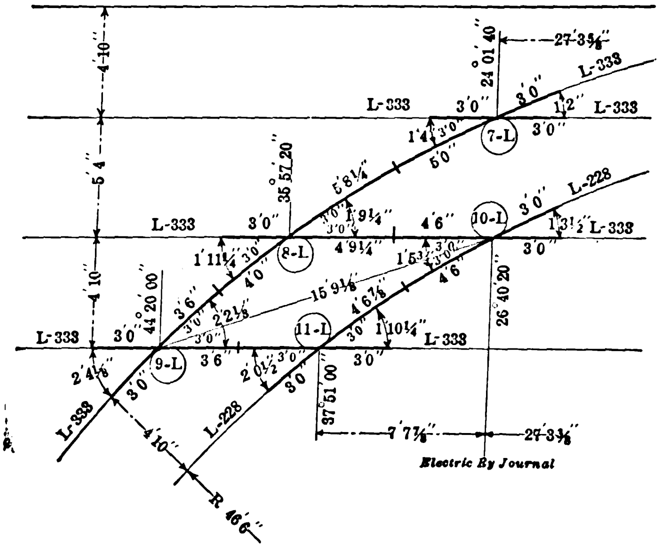
SPECIAL WORK STANDARDS—FROGS AND CROSSING


L-333
L-228
7R
10R
8R
11R
9R
27'3¾"
24°01'40"
35°57'20"
44°20'00"
26°40'20"
37°51'00"
4'10"
5'4"
7'7⅛"
R:46'6"
Electric Ry Journal

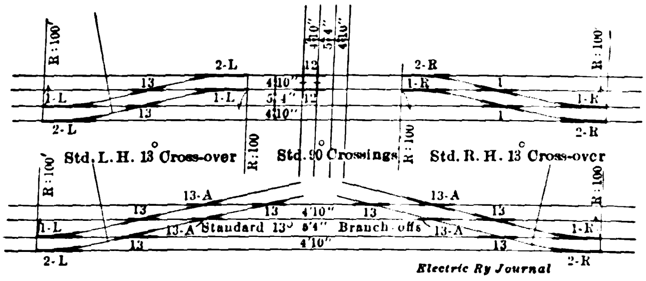
SPECIAL WORK STANDARDS—RIGHT-HAND CURVED CROSSING

As the railway company has strictly adhered to these standards in all special work layouts, it was possible for the manufacturers to carry patterns in stock, and in some instances where the pieces were bought frequently the manufacturer carried a few of them in stock. In either case, however, deliveries could be made on short notice, and the company did not hesitate to order an excess of its requirements, because none of the pieces were special. All of these layouts are being purchased in solid manganese steel, but the over-all dimensions and the standards adopted could just as readily be furnished in hard center or ordinary built-up work.

To give an idea of the number of pieces of each kind purchased since the adoption of these standards, the following list is given: Pieces 3 and 4R, 27; pieces 3 and 4L, 29; pieces 1 and 2R, 364; pieces 1 and 2L, 382; piece 5R, 44; piece 5L, 44; piece 6R, 8; piece 6L, 10; pieces 13 and 13A, 77; piece 12, 390; piece 7R, 23; piece 10R, 17; piece 8R, 16; piece 11R, 16; piece 9R, 14; piece 7L, 22; piece 8L, 16; piece 10L, 16; piece 11L, 18, and piece 9L, 15.


L-333
L-228
7-L
10-L
8-L
11-L
9-L
27'3¾"
24°01'40"
35°57'20"
44°20'00"
26°40'20"
37°51'00"
4'10"
5'4"
7'7⅛"
R 46'6"
Electric Ry Journal

SPECIAL WORK STANDARDS—LEFT-HAND CURVED CROSSING


2-L
1-L
2-R
1-R
13
13-A
R:100'
Std. L. H. 13° Cross-over
Std. 90° Crossings
Std. R. H. 13° Cross-over
13-A Standard 13° Branch offs
4'10"
5'4"
Electric Ry Journal

SPECIAL WORK STANDARDS—RIGHT-HAND AND LEFT-HAND 13-DEG. CROSSOVERS AND 90-DEG. CROSSING

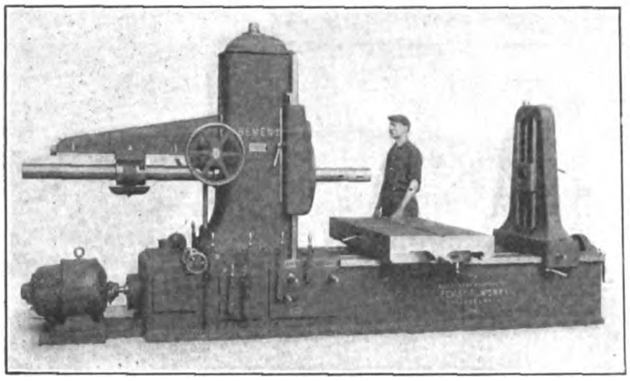
According to the sixth annual report of the Railroad Commission of Nevada for the year ended Dec. 31, 1913, the total capital stock of the Reno Traction Company was $1,000,000 and of the Nevada Interurban Railway $44,695. The funded debt of the Reno Traction Company was $136,000. The total cost of plant to date of the Reno Traction Company was $1,323,474 and of the Nevada Interurban Railway $86,686. The income account of the Reno Traction Company showed the following items: Gross earnings from operation, $57,878; operating expenses, $42,327; taxes, $2,461; gross corporate income, $13,089; net corporate income, $8,714. The gross earnings from operation of the Nevada Interurban Railway were $9,426; operating expenses, $9,535, giving a net corporate deficit of $109.

Use of Binoculars

Referring to the article "Detecting Line Troubles with Binoculars," in the ELECTRIC RAILWAY JOURNAL for May 30, 1914, G. W. Palmer, Jr., electrical engineer Bay State Street Railway, Boston, Mass., states that the Bay State company has, for the last five years, inspected its 65 miles of transmission line with binoculars monthly, in addition to the daily patrol of the entire line. Mr. Palmer adds that the use of the field glasses has revealed defects which otherwise would not be apparent and which, if not attended to, would have resulted in line trouble.

Duplex Control, Horizontal Borer, Driller and Miller

Realizing the importance of duplex control on boring machines, the Niles-Bement-Pond Company is now manufacturing the improved horizontal borer, driller and miller illustrated herewith. This machine is of the elevating spindle type, but is symmetrical throughout with respect to the spindle axis, permitting the operator to stand on either side and have all the controlling levers within convenient reach. It is adapted for work requiring great accuracy and at the same time is designed for heavy boring. Service and durability are prominent features, the entire design being free from delicate parts.



HORIZONTAL BORER, DRILLER AND MILLER WITH DUPLEX CONTROL

Perhaps the most striking feature of the design is the location of the spindle saddle within the post. This makes possible the symmetrical construction about the spindle axis which has been carried throughout the design of spindle post, bed, tables and control—an arrangement very essential on a large part of boring work. This design also affords most rigid support for the spindle. The thrust is taken on two *V* tracks, one on either side of spindle, eliminating entirely the distorting strains which are inevitable in machines where the spindles and saddles are on the front side of the post.

The standard table is 33 in. wide x 60 in. long, and the travel across the machine is 48 in. The spindle diameter is 4½ in.; diameter of the taper hole at the large end, 3 in.; the traverse is 60 in. in two shifts of 30 in. each, and the speeds are 5 to 150 r.p.m. Six feeds are provided for each spindle speed. The amount or advance of the feed selected is always per turn of spindle and is independent of any change made in the spindle speed. As to capacity, the maximum distance from the center of the spindle to the standard work table is 30 in., and the maximum distance between the face plate and the outboard bearing 7 ft.

For d.c. drive a 10 hp variable speed motor of 3 to 1 range is recommended. If alternating current only is available, a four-speed motor of 600, 900, 1200 and 1800 r.p.m. is recommended. Cone and counter, or single pulley through speed box, drives are also available.

Among the extra attachments of this machine are the following: a plain circular table 38 in. in diameter, graduated in degrees; a circular table 38 in. in diameter, having power rotary feeds; an auxiliary work support on bed for long pieces; boring bars of any diameter; bell chuck for driving boring bars not having taper shanks; and facing head which may be attached to the face plate or boring bar with capacity to face up to 25 in. diameter.

Four Hundred and Fifty-six Additional Motors for Chicago

Four months ago the Chicago City Railway, now one of the Chicago Surface Lines, Chicago, Ill., started to place in service 100 new cars equipped with 200 GE-242 motors, or 100 double motor equipments, air-brake equipments and accessories. All of these cars have been in service for some time, and the performance of the motors and equipments has been so satisfactory that the Chicago Surface Lines have recently placed another order with the General Electric Company for 456 motors of the same type, or 228 double motor equipments, air-brake equipments and accessories to be installed on new, double-truck, semi-convertible cars being built by The J. G. Brill Company.

The details of the construction of the GE-242-A motor were described very fully in the June 20 issue. GE-242 Form B motors will be installed on the last lot of new cars. Under the A. I. E. E. standard, the GE-242 motor has an hourly rating of 65 hp at 600 volts and 55 hp at 500 volts, but has a greatly increased service capacity when compared with motors of the closed type having the same hourly rating, on account of the positive circulation of air that is maintained throughout the motor by the system of self-ventilation. The motors are of the box-frame type, fully ventilated, and are provided with commutating poles and arranged for tap-field operation. They will be fitted with seventy-one-tooth, solid, armorized steel gears and fifteen-tooth pinions having a working face of 5 in.

The controllers are of the K-51-A platform type. Straight air-brake equipments will be used with CP-27-B compressors. The compressor has a piston displacement of 15 cu. ft. of free air per minute when operating at 600 volts against a reservoir pressure of 90 lb. per square inch.

Representative runs, calculated on a basis of actual operation, will indicate the service conditions on the surface lines in Chicago. A representative average run may be taken at a speed of 11.76 m.p.h., not including the duration of stops, with 6.77 effective stops per mile. The average duration of stops is 6.04 seconds. The average load on a run of this kind is thirty-two passengers. A representative maximum average run may be taken at an 11.9 m.p.h. schedule, not including the duration of stops, with 8.1 effective stops per mile. The average duration of stops is 8.5 seconds and the average load for this run is thirty-two passengers. A representative maximum run may be taken at a 12.3 m.p.h. schedule, not including the duration of stops, with 8.5 effective stops per mile. The average duration of stops is 8.4 seconds and the average passenger load is forty-two for the maximum run.

The car completely equipped will weigh about 40,000 lb. It has a total seating capacity for fifty-four passengers and is mounted on 32-in. wheels.

LONDON LETTER

Motor Bus Service, the Midland Electrification and London's Electricity Supply Discussed

(From Our Regular Correspondent)

The manager of the Southampton Corporation Tramways has reported on the question of running motor buses in conjunction with the tramways. Taking the running expenses in six towns in various parts of the country where motor buses are being used, the manager states that they vary considerably, but with modern double-decked vehicles would appear to be about 10d. per bus-mile. For the purpose of comparing this figure with the cost of running the Corporation trams, the manager has taken the average costs per car-mile for the last three years, including traffic and general expenses, repairs and maintenance, cost of power, interest on capital, repayment of capital, income tax, and claims paid out of the third party insurance fund. The figure he gives is 9.42d. per car-mile. He has added the average cost of all renewals for the last ten years, 0.57d. per car-mile, thus making the total cost of running the cars, including everything, 9.99d. According to the report it would cost exactly the same, 10d. a mile, to run a double-decked petrol bus, with a seating capacity of thirty-four, as it does to run a tramcar, with a seating capacity of, say, fifty-six. Assuming that each vehicle annually ran an average of 30,000 miles, the cost per seat per annum for running the tramcar would be £22, and for the motor bus £36, an increase for the latter of 63 per cent. The difficulties of dealing with rush traffic on a wet day would necessitate a large fleet of spare buses, which would be used for two or three hours daily. If buses were substituted for trams in Southampton, many more miles would have to be run to earn the same revenue, with a consequent reduction, if not an entire loss, of profits. On these grounds the manager bases his opinion that the tramcar is still the most suitable vehicle for transporting passengers in a provincial town like Southampton, and finds that there are no substantial grounds for assuming that it will shortly be ousted from its place by the motor bus. After considering the report, the tramways committee has resolved to recommend the purchase of three buses, at a cost of about £2,600.

With regard to the Manchester Corporation bill, the tramways committee has obtained powers to carry out a number of extensions. It has permission to run omnibuses as stage carriages for the convenience of passengers, with or without passenger luggage, and small parcels not exceeding 56 lb. in weight. The committee has authority to run these omnibuses in the city, and outside the city along roads in which tram lines are laid and which are rented or leased by the Manchester Corporation, on condition that the Corporation contribute to the local authority concerned at the rate of three-eighths of a penny a car-mile for each omnibus, this contribution to be applied towards the upkeep of the roads. As to the slopes connected with railway bridges, the obligation to repair is placed by statute on the owning companies. Under the new bill, however, the companies will be entitled to receive three-eighths of a penny per car mile, the same as the local authorities receive, for the use of such slopes. Under the bill the Corporation has power to acquire land and construct a new generating station in Trafford Park, and to connect such station with the Manchester area of supply.

The House of Lords Committee has passed the Middlesex County Council bill. This measure contains a clause whereby the omnibus companies will have to pay three-eighths of a penny per mile run towards the maintenance of roads. A committee of the House of Commons had already approved this clause. The companies must allow the County Council access to their books. The Derbyshire County Council has also made a charge of three-eighths of a penny per car-mile on the Sheffield Corporation omnibuses, and the same committee which passed the Middlesex bill subsequently dealt with the Walsall bill. The Corporation of Walsall has agreed to the principle of a three-eighths of a penny per car-mile road tax upon its omnibuses.

The new electric omnibus service has been established between Stanhope Road, South Shields and Green Lane West. The service is intended to link up the Green Lane district with the South Shields Corporation Tramways. The electric buses which have been acquired by the South Shields Corporation are the first of their kind to be used in England. They were supplied by the Edison Accumulators, Ltd., and were placed in experimental service in London over 13 miles of busy streets in the West End.

The committee of the House of Commons which has been considering the Kelvin Bridge new road and tramway proposal in the Glasgow Corporation bill has passed that proposal without alteration, and has also passed the remainder of the bill. The attempt which had been made to come to an agreement with the Queen Margaret College authorities was not successful, so that the committee heard the rest of the evidence in opposition to the bill by that body. It rendered its decision after deliberating five minutes.

The Midland Railway's electrification scheme is far more ambitious than is generally realized. There are really two projects, one for the conversion of the London, Tilbury & Southend Railway, now part of the Midland, and the other for the electrification of the company's original suburban lines in the Metropolitan area. Each of these is an imposing scheme in itself, and there is in addition the proposal for a new line between Bromley and Stepney. Although this is to be only 1½ miles in length, it is of the utmost importance in the working out of the electrification scheme. The cost for this section is estimated at about £630,000. In addition, the present lines from Barking to Upminster will be doubled for a distance of 7¾ miles, so that there will eventually be a four-track road from Fenchurch Street to Upminster. The Fenchurch Street terminus will also have to be enlarged, but it is considered useless to proceed with this or with the electrification until the work previously described has been carried out.

The Cardiff Tramways committee has decided to hand over another £4,800 from its profits for the relief of the rates. A similar contribution was voted for the half year ending September last.

The Bristol branch of the Electrical Trades Union has passed a resolution viewing with pleasure the decision of the citizens of Bristol to purchase the trams, and strongly urging the City Council, in order to obtain the fullest advantage of this vote, to conclude the purchase and arrange to work the undertaking at the earliest opportunity.

In its battle with motor-bus competition, the London County Council is considering the construction of a series of tramway extensions and the linking of existing lines at several points. If all the proposals are adopted the cost, as estimated by the finance committee, will exceed £1,250,000. Many of the proposals, however, are opposed by the borough councils on various grounds, and it is doubtful if the Council will eventually secure Parliamentary power for all its schemes, which are being considered in conjunction with the report of M. Mariage, the French tramway expert. The Council also proposes to run more trail cars and to issue more return tickets. Great interest has been aroused by the announcement that a proposal for "penny-all-the-way" fares is to be brought before the Council. Traffic experts say that the adoption of such a principle would revolutionize the tramway system, and many believe it would enable the tram to compete successfully with the motor bus.

The London County Council has announced its plan of dealing with the problem of London electricity. The proposal is not to have a municipal scheme, but rather to arrange for co-operation with all existing undertakings, though ultimately all the concerns will become the property of the municipality. There will be no scrapping of plant, but the Council recognizes that electricity will have to be generated in bulk on a site down the Thames. No compulsory purchase of existing concerns is suggested, but it is proposed that these undertakings should receive the option of at once handing over their organizations upon agreed terms to the new authority. These proposals will require Parliamentary sanction and are put forward by the London County Council because it is recognized that Parliament will not sanction either a municipal or a private company scheme.

A. C. S.

News of Electric Railways

INDIANAPOLIS ARBITRATION FINDINGS

Twelve Questions Affecting Employees and Company Passed Upon—Company's Summary of Decision

The board of arbitration selected to settle disputes between the Indianapolis Traction & Terminal Company, Indianapolis, Ind., and its union employees, has decided twelve questions at issue between the two parties, some of which have been before the board for adjudication for several months. The paramount question, that relating to the individual contracts which the company and its non-union men have been signing, was decided by the board in favor of the union men in all points wherein the individual contracts conflicted with the former award of the Public Service Commission, sitting as a board of arbitration in the strike arbitration last fall. The decision, however, expressly stipulated that the individual contracts would become effective Nov. 8, 1916, the date of the expiration of the "Governor's agreement, which settled the strike last fall, or at an earlier date if all employees execute it."

Among other findings of the arbitration board were the following: That the union officials or agents have not the right to solicit membership or collect dues from members of the union on the premises of the company; that the eight-hour rest provision of the original award shall continue unabridged in any particular; that the company shall have the right to employ extra men for services on Sundays and holidays, paying them at the regular rate an hour fixed by the award of the commission, this pay not to be subject to the $45 monthly minimum provided for the men on the "extra" list of the company; the board orders and directs the company "not to encourage or authorize any of its employees to carry concealed, dangerous and deadly weapons, under any circumstances, while on duty," that the company should not coerce any of its employees into entering into the insurance scheme, which the union employees allege the company now is operating, although "the prudence of the employee who seeks, by means of some reliable insurance plan, to protect himself and family against the contingency of accident and sickness cannot be gainsaid or questioned."

The following summary of the decision was issued by the company:

"These words from the decision fully explain the status of our service contract: 'On Nov. 8, 1916, this contract will determine the rights of all who have then executed it. It will become effective at an earlier date if all employees execute it. It is now effective in every particular in which it does not conflict with the original award.'

"The decision of the board of arbitration leaves our service contract in full force and effect except that wherever it now appears to conflict with the award of February, 1914, it must be construed in harmony with that award.

"The effort of the committee to embarrass the company in the employment of extra men on Sunday by enforcing the payment of a $45 per month minimum monthly wage for four days' work, failed. Under the present and prospective labor conditions, the company hopes to have no difficulty in getting extra men to run the cars on Sunday. The chief effect of the award is to disqualify our regular employees from taking their regular Sunday runs on one Sunday in each month, and also whenever eight hours do not intervene between the end of the Sunday run and the beginning of the Monday run. This frequently happens for the reason that the service demanded by the public on Sunday is chiefly in the afternoon and evening, while on other days in the week the heavy service is required in the early morning. We will continue under these conditions to have work for about 200 extra men each Sunday.

"The decision does, however, leave a clear and plain opportunity, resting with the men themselves, to secure the right to do this Sunday work by continuing to sign the service contract, until by numbers they make it clear that it is their desire to run the cars on Sunday, rather than to permit the extra men to do so. As nearly 70 per cent of the regular motormen and conductors have already signed the service contract and others are doing so daily, it seems probable that the employees of the company will not long leave the Sunday runs to outsiders.

"The compensation which our motormen and conductors could earn by operating their cars on Sunday, and of which they are deprived by this decision, is a matter of considerable importance to many of them."

NEW YORK COMMISSION EXHIBIT

Maps, Statistics and Miniature Block Signal System Among Things on View at State Fair

At the State Fair in Syracuse, which opened on Aug. 31, the Public Service Commission for the First District of New York has a large and important exhibit, which occupies about 1600 sq. ft. in the center of the building devoted to liberal arts and manufactures. It shows the general character of the work which the commission has been doing, especially in the field of providing additional rapid transit for New York City. Maps and statistics of the dual system show the scope and extent of the new lines, the progress of the work, the amount of money already expended and the number of contracts already under way. The large models, made carefully to scale, give an excellent idea of the appearance of two of the principal stations of the new underground lines when completed. These are the so-called diagonal station in Forty-second Street in front of the Grand Central Terminal, which will connect the new Lexington Avenue subway with the existing subway, and the Times Square station at the intersection of Forty-second Street and Broadway and Seventh Avenue, where the new subway in Seventh Avenue will join the existing subway running north in Broadway. Close by is the Forty-second Street station of the new Broadway subway, and the model shows how the two stations will be connected by underground passageways.

The commission also shows a model of the latest track construction to be used in the new subways. This model is made of sections of steel rails laid on ties and ballasted with concrete, all of the materials being typical of those which will be used in actual construction. A part of the commission's exhibit, loaned by the Interborough Rapid Transit Company, shows a miniature section of the existing subway equipped with an exact duplicate of the block signal system used in actual operation. Miniature trains are operated back and forth and the workings of the signal system which guards the safety of the millions of passengers carried every year in the subway are demonstrated. Near by is also shown a model of the Interborough Company's main power station, which generates the electric current used for the operation of the subway.

An interesting part of the exhibit is a display by the materials inspection division of the commission's engineering department. Here are shown samples of all the materials used in the construction of subway and elevated railroads and the careful tests to which they are submitted by the commission's engineers before being accepted for use. They include samples of sand and gravel which enter into the composition of concrete; samples of cement; sections of steel rails, girders and beams and fragments of timber from which the ties are made. The samples are selected to show the defects which cause the rejection of materials as well as the perfect specimens which are examined and pass all tests.

A large assortment of charts and maps illustrate various phases of the commission's work in building subways, regulating transportation companies, gas and electric companies, and eliminating grade crossings on steam railroads. A collection of photographs shows some of the fender tests held by the commission, which resulted in a series of orders requiring all street surface railroads operating in Greater New York to equip their cars with effective life-saving fenders and wheel guards. Many interesting views of actual construction work on the new subway and elevated lines are shown on an illuminated screen by means of an electrically operated stereo-motorgraph which automatically projects and changes the views. The exhibit at Syracuse will form a part of a larger exhibit to be made by the commission in the city of New York Building at the Panama-Pacific Exposition in San Francisco next year.

UNITED RAILROADS HEARING

Final Action by California Commission in Inquiry Into Finances Not Likely for Several Weeks

The investigation into the finances of the United Railroads of San Francisco which is being conducted by the California Railroad Commission was continued on Aug. 28. The first hearing was reported in the July 25 issue of this paper and the second hearing, that on Aug. 24, was reported in the last issue. At the hearing on Aug. 24, after the commission had considered the question of the Calhoun note, as described last week, it called for an explanation of the methods of accounting employed by the United Railroads, with which the commission has differed for some time. John F. Forbes, an expert accountant representing the firm of Haskins & Sells, who was then put on the stand, declared that during the period of Mr. Calhoun's administration he had audited the United Railroads' books and that they had been kept in accordance with the requirements of the American Electric Railway Accountants' Association and the Interstate Commerce Commission.

In answer to the statement previously made by L. R. Reynolds, expert for the commission, who could not account for $3,906,000 that he thought should appear in the company's books, Mr. Forbes produced figures to show that the United Railroads has a real surplus of $1,018,632. He also defended the system of bookkeeping used and claimed that the company had a right to declare dividends on the first preferred stock of $5,000,000.

At the hearing on Aug. 28 the witnesses included Messrs. Black and Legare and two certified accountants. The keynote of Mr. Black's testimony was that under the provisions of the city charter since the 1912 amendment went into effect, it was absolutely impossible for the United Railroads to undertake new construction and that the company's activities would be confined to improving the present system and service. Evidence was introduced to show the present good condition of track work, paving and overhead construction. The rapid rehabilitation after the fire was explained with charts and cost figures. It was pointed out that the present average monthly maintenance cost, about $38,000, was far less than formerly because of the introduction of more efficient methods. Electric welding was cited as one of the many savings by which this had been effected, as many of the damaged parts which would have been scrapped in former years were now made serviceable again by this method.

The company finished submitting its evidence at this hearing and the hearing was declared closed. Attorney E. J. McCutcheon, who said that he represented the interests of certain bondholders in the matter under discussion, requested permission to file a brief. This was granted, provided the brief should be filed within ten days. The commission then said that it would grant to the attorney of the company another ten days to file a reply to this brief if such action was desirable. As the commission will then have to take the matter under advisement, no final decision is likely to result for four to five weeks.

TRAMWAY MEN AT WAR

About 5000 Employees on Eleven English Systems Called Out—Reinstatement After War

Many of the English tramway systems have been particularly hard hit by the war. Not only are losses in earnings reported, but there is depletion of the operating forces by the enlistment of officers and trainmen for service at the front. Both the municipal tramways and the privately owned properties have shown a very liberal spirit toward their men. The London United Tramways, for instance, notified its staff that all employees who joined the army or navy would on their return be reinstated in their present positions, or if necessary found employment with some other suitable company. The London County Council has guaranteed half pay to all men now in its service who have been called out and are married or have dependent relatives. The Council has also guaranteed to reinstate such men without loss of seniority. The British Electrical Federation, which includes about forty tramways and electric companies, has established a fund for the relief of dependents of tramway and electric supply men called for service. Under the conditions of this fund the companies subscribe an amount equal to the total contributions made by the employees who remain at work. The contributions are not in any case to be less than 3d. per week for each man in the employ of the company. The companies included in the federation have also indicated that in the event of a reduction in service becoming necessary they will endeavor to equalize the work so as to prevent a reduction in the staff.

The London County Council Tramways are reported to have lost 700 men through enlistment out of a total of 12,000 employees. Of the employees of the London General Omnibus Company, 2000 men have been called. The last company has also had a number of its omnibuses taken temporarily by the military authorities for transport purposes. The buses of the Norwich Electric Tramways were also commandeered. From Glasgow it is reported that 600 employees of the Municipal Tramways have been called. In Leeds, more than 250 men have joined the government forces; in Sheffield, about 140 men; in Cardiff, more than 100 men; in New Castle-on-Tyne, about 120 men; in Ipswich, 33 men; in Liverpool, about 400 men; in Birmingham, about 340 men; in Salford, about 90 men. The London County Council Tramways has reduced the number of cars and has suspended for the time being the stipulation fixing the number of passengers to be carried on each car.

A recent report from Berlin states that about 800 women are employed as conductors on the Grosse Berliner Strassenbahn. It is stated that these women are members of the families of employees now at the front.

A message from Brussels under date of Aug. 24 stated that the German forces occupying that city are collecting the gross earnings of the local street railways. It was not stated, however, whether any of the earnings are being devoted to wages and the purchase of supplies. It is hardly likely that the gross earnings of the Brussels Tramways would pay even for these items under the present conditions.

ILLINOIS TRACTION SYSTEM IMPROVEMENTS

Improvements on the Illinois Traction System under way at the present time include the reconstruction of the overhead lines between Danville and Champaign, Ill., and raising the transmission voltage to 33,000 to conform with that on the rest of the system. These overhead lines are on the oldest section of track on the Illinois Traction System and were of spanwire construction. In the new construction 10-ft., 6-in. arms are applied to 40-ft. poles. The three-phase, 33,000-volt, high tension lines are carried on the same poles on a 10-ft. cross-arm with 45,000-volt, three-petticoat insulators. All poles and the high tension cross-arms are being treated with creosote. At a number of points the old alignment is being straightened. These include the entrances to Urbana and Champaign. In both of these cities freight haulage has been restricted materially owing to several sharp curves at street intersections. Other improvements include the installation of four interlocking plants on the line between Springfield, Ill., and St. Louis, Mo. These plants will provide protection at steam road crossings. They include a standard manually operated interlocking system. The towers conform to the standard substation design. This includes a dark red paving brick base with buff pressed brick walls and a red tile roof.

CONSTRUCTION PROGRESS ON BOSTON SUBWAYS

Steady progress is being made at Boston in the construction of the subways now being built under the direction of the Boston Transit Commission. The Boston Elevated Railway is making vigorous efforts to complete the installation of track and electrical equipment in the Boylston Street subway so that this line may be opened early in the fall, and enlargements of the Park Street subway station are expected to be completed in December. Work is being rushed on the inclined subway approach at the Public Garden, the eastbound track connecting the surface car lines of the Back Bay with the Public Garden subway spur now being in service. It has been decided to employ blue and maroon color schemes in the Copley and Massachusetts stations of the Boylston Street subway, as in the Washington Street tunnel. The Boylston Street subway differs from earlier tubes in Boston in its roof construction, which is flat with rounded corners. Rock-ballasted track will be used throughout. At the stations parallel and opposite platforms with short stairways connecting with lobbies and the streets will be in use. It is expected that the running time between the Charlesgate district and Park Street will be cut from fourteen to eight minutes by this subway. The West End subway extension from Scollay Square will increase the traffic capacity of the East Boston tunnel from 80 to 250 cars an hour, and will probably be completed in about eighteen months. No date has yet been set for the opening of the Cambridge subway extension to the South Station, but contracts have now been let for the sections not previously placed under construction, and rapid progress is being made on the work between Park Street and Church Green. A station will be provided in this subway which will afford close connections with the Washington Street tunnel, with inclined elevators leading to Hawley and Chauncey Streets.

NOTICE TO DISCONTINUE LOCAL BRIDGE SERVICE

Bridge Commissioner Kracke of New York has served on the Brooklyn Heights Railroad, the Bridge Operating Company, the Coney Island & Brooklyn Railroad and the New York Railways an order terminating the contract under which the local service over the Williamsburgh Bridge is operated. The contract, dated Sept. 1, 1904, terminated on Sept. 1, 1914. Under its terms, the operation of cars upon the surface tracks is to be continued until one year after the notice to stop. The formal notification to the companies was as follows:

"Pursuant to Sec. 3 of the agreement, dated May 21, 1904, between the city of New York and the Brooklyn Heights Railroad, Coney Island & Brooklyn Railroad, New York City Railway and the Bridge Operating Company, you are notified to cease operation of cars upon the surface tracks upon the Williamsburgh Bridge, across the East River, from and after midnight on Aug. 31, 1915."

Commissioner Kracke considers the profits of the company on this contract have been disproportionately large. The capitalization of the Bridge Operating Company is $100,000.

TOLEDO NON-PARTISAN LEAGUE DESIRES ACTION

The Non-Partisan League of Toledo, Ohio, is growing restive under the delay of the franchise committee of the City Council in taking action upon the franchise draft submitted by it some time ago. It is said that the organization may take steps to have the proposed franchise submitted to a vote of the electors, if something is not done soon by the committee. After two meetings with the league, the committee decided to discuss the matter in executive sessions and the organization was informed that its members would be sent for when wanted. The same information was given the Toledo Citizens' Franchise Association, which also has a franchise draft pending in the committee.

So far as known, nothing has been done with the municipal ownership ordinance which was passed by a referendum vote of the people some time ago. It is possible that the franchise committee of the City Council is awaiting the outcome of the injunction suit recently brought by the company to prevent the city from interfering with it in the operation of its cars at the old fare and from removing its cars. The hearing in this case will take place before Judge Killits on Sept. 8.

The Toledo Railways & Light Company has appealed a case from the city courts, in which there is some interest. In this suit William Jacobs, business agent of the Moving Picture Operators' Union, claimed that he and two large grips which he carried were put off a car when he proffered 3 cents for fare. He asked for $300 damages and was awarded $100 in the city court. Attorneys for the company argue that Jacobs was not put off the car, but that the grips were put off because he refused to pay extra for them. This would seem to resolve itself into the question of whether the road is under obligations to carry baggage for its passengers.

Public Service Railway Franchise Tax.—The amount of the tax paid recently by the Public Service Railway into the city treasury of Newark, N. J., was greater than that paid last year and not less as stated in the ELECTRIC RAILWAY JOURNAL for Aug. 29, page 387. The amount paid in 1914 was, as stated, $173,976.99, and the amount paid in 1913 was $168,920.13.

California Report on Inductive Interference.—The Railroad Commission of California has just made public the results of an exhaustive investigation into the subject of inductive interference caused by high-voltage power lines. The work was conducted by a committee of electrical engineers selected from the larger public utilities of the State and the commission's engineering staff. The problem which this committee, working with the Railroad Commission, was called upon to solve, briefly stated, relates to the regulation and control of stray electrical currents from high-voltage power wires.

Service Improvements in Pittsburgh.—Mayor Joseph G. Armstrong of Pittsburgh, Pa., has sent to the City Council a communication announcing that an early settlement of the controversy with the Pittsburgh Railways seems likely. He says that several conferences have been held and that satisfactory progress is being made. The city recently presented to the company a series of suggestions in regard to improvements it thought the company should make in its service, intimating that unless the city and the company were able to reach a satisfactory adjustment the case would be carried to the Public Service Commission.

The Public as Guests in McAlester.—In connection with its application for extended franchise rights for its power and light service the Choctaw Railway & Lighting Company, McAlester, Okla., recently invited the public to be the guests of the company in an inspection of its plant and equipment. A special day was set aside for the inspection and free transportation was furnished to the company's plants over its own lines. Those who desired to take advantage of the offer of the company were requested to communicate with the company direct or with its representative who was stationed in one of the prominent downtown drug stores.

Newark Terminal Work Delayed.—The following statement has been made by E. W. Hine, secretary of the Public Service Corporation of New Jersey, Newark, N. J., in regard to the proposed suspension of work on the company's new electric railway terminal in that city: "We have discontinued work on the terminal part of our building plans, but work on the tunnel will be continued and pushed to completion. As a measure of prudence we made overtures to Hedden & Company and it was by mutual agreement that work under the contract will be temporarily suspended. This does not mean an abandonment of work by any means." The contract on which operations have been interrupted calls for an expenditure of $700,000. While the structural plans were in progress arrangements were under way to have the bonds of the newly formed Terminal Railway Corporation floated. The uncertainty of making a satisfactory disposition of these bonds made the present action seem prudent.

Service Resumed in Vincennes.—Owing to the effects of a Federal Court injunction, the Vincennes (Ind.) Traction Company has been operating normally. The temporary restraining order, which named some twenty-eight individuals and "all others," not only requires the twenty labor unions to use their influence against violence, but it requires the Mayor and the police department to protect the company and requires the company to maintain service. On Aug. 26 the temporary order was continued indefinitely by Federal Judge F. E. Baker, who heard the case at Indianapolis. Commenting on the order, the court said: "It means that every citizen of Vincennes and Knox County must obey it, and I hope all these defendants will go home and obey it." In this case S. S. Bush and S. A. Culbertson, Louisville, Ky., owners of a majority of the stock of the Vincennes Traction Company, took the case to the Federal Court, out-maneuvering Mayor James M. House, who sought a writ in the State courts disadvantageous to the company. The company has 9 miles of track and employs about fifty trainmen.

PROGRAMS OF ASSOCIATION MEETINGS

Kansas Gas, Water, Electric Light & Street Railway Association

The date of the annual meeting of the Kansas Gas, Water, Electric Light & Street Railway Association, which was scheduled for Oct. 15, 16 and 17, has been changed. In order to avoid a conflict with the annual meeting of the Jovian Order to be held in St. Louis, the Kansas Association has postponed its meeting until Oct. 22, 23 and 24. The convention will be held at Arkansas City.

New England Street Railway Club

The annual ladies' outing of the New England Street Railway Club will be held at Bass Point, Nahant, Mass., on Sept. 10. The trip from Boston will be made on the steamers of the Boston, Nahant & Pines Steamship Company. This route offers a delightful sail of one hour each way. The party will leave Boston from Otis wharf at 440 Atlantic Avenue at 9.30 a.m., but tickets will be good on any of the regular boats. The return will be made from Bass Point at 6.30 p.m. At noon a shore dinner will be served at the Relay House. After dinner there will be dancing in the pavilion, box bowling and regular bowling, all free. The Nahant & Lynn Street Railway will provide free transportation for those who attend. Boats will also be provided for those who desire to try their hand at deep-sea fishing. Tickets, including all attractions, are $2.50 each. The club desires that requests for tickets be filed with the outing committee, 12 Pearl Street, Boston, as early as possible. The members of the outing committee are J. E. Dozier, H. B. Ivers, W. W. Field and H. A. Faulkner.

National Tax Association

Final plans are announced for the eighth annual conference of the National Tax Association to be held at Denver, Sept. 8-11. A special train over the Burlington Road, leaving Chicago Sept. 7, will take the eastern delegates. The program this year contains the following papers and reports of particular interest to the electric railway field:

"Tax Legislation and Important Court Decisions in the Past Year," by M. M. Flannery, chief tax division, Bureau of Corporations.

"Taxation of Securities." by W. H. Lyon, counsel to committees, Investment Bankers' Association of America.

"The Federal Income Tax Law," by C. J. Bullock, professor of economics, Harvard University.

"Simplification of the Federal Income Tax Law," by A. C. Rearick.

"Administrative Problems of the Federal Income Tax," by L. F. Speer, deputy commissioner of internal revenue, Treasury Department.

"Work and Possibilities of Public Efficiency Bureaus," by W. H. Allen, director Bureau of Municipal Research, New York.

"Report of Committee on Double Taxation and Situs for Purposes of Taxation."

In addition to the above papers on the federal income tax, there will be a general discussion on this subject, in which Prof. E. R. A. Seligman of Columbia University, the leading authority on the subject, K. K. Kennan, Milwaukee, and Ralph Norton, New York, as well as many other students and professional men who are especially interested, will participate.

A session will be devoted to efficiency and economy in governmental affairs, participated in by Wm. H. Allen, John L. Coulter of the Federal Census Bureau and E. Dana Durand, former director of the census. The practical questions will center about the facts as to increase in expenditures, the propriety of checking them and the means and methods of doing this. Another session will be devoted to the recent movements toward increase in land taxation involving a critical review of experiments along this line both in Canada and in the United States.

Prof. E. R. A. Seligman is president of the association and T. S. Adams, tax commissioner of Wisconsin, is secretary. Delegates have been appointed by practically all the states and by Canadian provinces.

Financial and Corporate

RECENT FINANCIAL TENDENCY

All Proposed Moves Weighed Carefully—Decision Against Restricted Bond Transactions—Clayton Bill Passed

There has been no significant change in financial conditions in New York during the week. All proposed moves are weighed cautiously as to their immediate and ultimate effect. Even the plan to resume trading in bonds has been abandoned for the present. This matter was taken up by representatives of a number of the leading bond houses. After several conferences it was decided that it would be unwise to take any action at this time looking to the resumption of even restrictive dealings. It is generally understood that this decision was reached after a conference with the committee of the Clearing House.

A conference was scheduled to be held in Washington on Sept. 4 between the members of the Federal Reserve Board and committees of bankers from New York and other cities. It was expected that it would be proposed at this meeting that the government contribute relief to the international exchange situation by placing at the disposal of the banks $30,000,000 in gold for the specific purpose of easing the international exchanges. The proposed adoption at this conference of the plan for opening up the exchange market would help materially the work of financing international trade.

The settlement on the London Stock Exchange of the business which was left open when trading came to an end has been further postponed as a result of the extension of the English moratorium. The Paris Bourse on Sept. 2 ceased the very limited operations in securities in which it had been engaged since the war. On the other hand, on the same day, it was reported from Berlin that the governors of the Bourse there had under consideration a plan to resume trading in a number of issues. So far no steps have been taken in New York to make public the cash transactions which are conducted through the clearing house of the exchange. On Sept. 2 in New York call money was at 6 @ 8 per cent. Sight drafts on London were quoted about $5.06½, while cable transfers were quoted about $5.07½.

The Senate on Sept. 2 passed the second number on the administration's anti-trust program—the Clayton bill supplementing the Sherman act. The bill provides fines and imprisonment for officers of corporations convicted of offenses against the trust laws; prohibits exclusive and tying contracts which restrict independence of purchasers; prohibits holding companies where their effect is to lessen competition or create monopoly, and makes illegal two years after the passage of the act interlocking directorates in competing corporations any one of which has a capital of more than $1,000,000. It also forbids the interlocking of railroad directors with corporations dealing in securities, railroad supplies, or contracts, and liberalizes procedure in injunction and contempt cases. Directors of railroads under the terms of the bill cannot be interlocked with corporations dealing in securities, railroad supplies, or other articles of commerce or contracts for construction, maintenance, etc., to an amount of more than $50,000 in any one year unless purchases are made after competitive bidding under recommendations of the Interstate Commerce Commission. A penalty of two years' imprisonment and $25,000 fine is prescribed for violation. As the President has practically consented to the abandonment of the railway securities bill for this session, at least, the Clayton bill is the last of the regular measures on the legislative program for the present session.

Much has been written about the difficulties of new financing. Figures now available show that for August the total was only $12,000,000, compared with $40,000,000 for August, 1913, which was the low month last year. Of this $12,000,000 $6,000,000 was new capital and $6,000,000 refunding. The total of $1,095,000,000 for the first eight months of the current year was $191,000,000 less than the amount for the same period in 1913 and $387,000,000 less than in 1912.

A review of conditions among some of the principal manufacturers who furnish equipment and supplies to the electric railway industry is published elsewhere in this issue.

ANNUAL REPORTS

United Railroads of San Francisco

A statement of income, profit and loss showing the correct method of accounting for the United Railroads of San Francisco, San Francisco, Cal., for the period of approximately nine years from Jan. 1, 1906, to June 30, 1914, has been issued by Mason B. Starring, president United Railways Investment Company, which controls the United Railroads of San Francisco. This statement, which was prepared and certified by Haskins & Sells, is as follows:

Operating revenue		$61,763,681
Operating expenses		38,708,143
Net operating revenue		$23,055,538
Other income:		
Sinking fund earnings		$860,273
Discount and interest		343,303
Miscellaneous		142,045
Total		$1,345,621
Total income		$24,401,159
Deductions from income:		
Interest and discount		$992,286
Rentals and leases		538,508
Total		$1,530,794
Net income before deducting fixed charges		$22,870,365
Fixed charges:		
Interest on United Railroads securities		$8,856,859
Interest on underlying bonds		6,549,839
Total		$15,406,698
Net income		$7,463,667
Profit and loss credits:		
Surplus at beginning of period		$1,217,932
Amount transferred from sinking fund reserves on account of sinking fund investments made during the period—net		1,207,821
Miscellaneous		56,967
Total		$2,482,720
Profit and loss gross surplus		$9,946,387
Profit and loss charges:		
Depreciation charges:		
Loss account earthquake, fire and strike		$1,646,472
Less face value of 12,000 shares of common capital stock reacquired through contribution		1,200,000
		$446,472
Reserve for depreciation, renewals and contingencies		2,678,588
Loss on buildings, equipment and materials		800,569
Total depreciation charges		$3,925,629
P. Calhoun's note written down (Solano land matter)		1,096,110
Loss on Panama Pacific Exposition stock		79,998
Loss on securities bought and sold—net		137,007
Appropriations and adjustments:		
For contingencies	$100,000	
Miscellaneous—net	44,009	
		$144,009
Dividends:		
First preferred stock (7 per cent—1909, 1910, 1911, 1912, 1913; 3½ per cent—1914)	$1,925,000	
Preferred stock (1906—$1,120,000; 1913—$200,000)	1,320,000	
Common stock (1906)	300,000	
		$3,545,000
Total		$8,927,754
Profit and loss surplus at end of period		$1,018,632

London County Council Tramways

During the year ended March 31, 1914, the income from the electric lines of the London County Council Tramways was £2,247,042. The working expenses were £1,585,251, thus leaving a surplus of £661,791. On the horse lines the income was £21,625 and expenses £30,214, a deficiency of £8,589. The total income was £2,268,668 and expenses £1,615,466, a surplus of £653,202. Interest absorbed £328,109 and redemption £408,488, and after deducting the income tax of £28,196 and making various other adjustments the deficiency to be met out of the general reserve fund was £88,526.

The Council decided on June 23, 1908, that for five years provision should be made for renewals at the rate of 2-3d. per car-mile each year and also that a general reserve fund to provide for general contingencies should be established, to which any balance remaining, after providing fully for renewals, should be carried. In view, however, of the falling off in the traffic receipts, the Council decided on July 8, 1913, that for two years from April 1, 1913, any available surplus should be paid into the renewals fund. In 1912-1913 the sum available for transfer to the fund was £497, while for 1913-1914 there was no sum available. The fund on March 31, 1914, amounted to £539,749. If full provision had been made for renewals on the basis of 2-3d. per car-mile, the fund would have received about £165,000 for the past year. There was no balance available to be carried to the general reserve fund for 1912-1913 and for 1913-1914, but the fund has to be drawn upon to the extent of £88,526 to meet the present deficiency. The fund now amounts to £190,596. The poor condition of the company is mostly laid at the door of motor omnibus competition.

The London County Council has ordered 150 trailers and the equipment of 200 electric cars with couplers and traction gear for drawing trailers. The highways committee estimates that the cost of operating a trail car is £338 a year less than that for an ordinary electric car. The total number of passengers carried on the electric cars during the fiscal year was 516,338,859, and the number of car-miles run 58,572,356; on the horse cars the numbers were 6,613,781 and 636,933, making the totals 522,952,640 and 59,209,289 respectively. The capital expenditure on the undertaking up to March 31, 1914, amounted to £13,028,119, of which £409,276 represented expenditures in 1913-1914.

Cities Service Company

Based upon an examination made by Price, Waterhouse & Company of the books of the Cities Service Company, New York, from the time of its organization up to and including April 30, 1914, and also of a substantial portion of the subsidiary companies for the twelve months ended the same date, the income statement of the Cities Service Company for the year ended April 30, 1914, is as follows:

Company's proportion of earnings applicable to common stock of subsidiary companies	$2,836.931
Dividends on preferred stocks of subsidiary companies	21,221
Interest on bonds of subsidiary companies	176,607
Interest on bills and accounts receivable	293,772
Total	$3,328,531
General and administrative expenses	$65,879
Interest on bills and accounts payable	97,598
Interest on five-year 7 per cent convertible gold notes	246,685
Interest on Consolidated Cities Light, Power & Traction Company 5 per cent bonds	175,000
Total	$585,162
Profits	$2,743,369
Deduct—dividends paid:	
Preferred	$1,202,242
Common	646,329
Total	$1,848,571
Balance, transferred to surplus account	$894,798

The above balance includes the company's proportion of earnings applicable to common stock for six months on the properties acquired from the Utilities Improvement Company and the Consolidated Cities Light, Power & Traction Company. It is stated that the gross earnings of the subsidiary companies examined aggregated about 60 per cent of the total gross earnings. The accountants' examination showed the records of the Cities Service Company to be correct for the period and, subject to depreciation, the examination of the books of the subsidiary companies did not indicate the necessity of any other than minor adjustments.

The company has also issued a comparative statement of earnings for the years ended July 31, 1914 and 1913, as follows.

	1914	1913
Gross earnings	$3,543,736	$1,487,344
Expenses	97,269	74,582
Net earnings	$3,446,467	$1,412,762
Interest on notes	320,991	17,904
Net to stock	$3,125,476	$1,394,858
Dividends on preferred stock	1,422,124	699,305
Net to common stock	$1,703,352	$695,553
Dividends on common stock	702,686	326,354
Net to surplus	$1,000,666	$369,199

The above statement covers three months on the old basis and nine months on the new basis after the Cities Service Company acquired the Utilities Improvement Company and the Consolidated Cities Light, Power & Traction Company. There is a deduction of $22,184 for surplus reserve which was not featured in any of the previous statements, but which it has been deemed advisable as a conservative measure to create as a depreciation fund in addition to the regular maintenance charges. In this last report the total surplus is $2,755,718, as compared with $2,626,869 in the report of the company for April 30. The percentage earned on the average amount of common stock outstanding is 11.73 per cent, as compared with 11.42 per cent on April 30.

LOCAL TRACTION OWNERSHIP

Change in Common Stock Ownership of New England Investment & Security Company Sought

A preferred shareholders' protective committee, consisting of Henry B. Cabot, Moses Williams, Jr., and Eugene V. R. Thayer, of Boston, has been formed with a view to purchasing all the $100,000 of common stock of the New England Investment & Security Company, which was acquired in August, 1913, by Sanderson & Porter, as noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, 1913. A statement has been issued by the protective committee in part as follows:

"The public of Worcester, Springfield and other communities served by the New England Investment & Security Company's electric railways will be interested in the report that a movement has been begun among preferred shareholders to restore those properties to local ownership and control. The organization of this company is peculiar. The owners of 1000 common shares select four of its seven trustees, and the owners of the 40,000 preferred shares select only three. For several years all these properties, operating about 420 miles of street railways, have been controlled, now by one set of owners of common stock and now by another set—the whole common representing a par value of only $100,000. The preferred stock, largely held by investors in Springfield, Worcester and Boston and of a par value of $4,000,000, has been legally in the position of a minority.

"The preferred stockholders have become uneasy at this anomalous situation and now influential ones have been led to form a protective committee. This proposes, if sufficient shareholders join in the plan, to purchase in the interest of the preferred shareholders all of the common stock. The Merchants' National Bank of Boston is the depositary of the committee and the protective agreement is lodged with that bank.

"Any preferred shareholder may become a party to the agreement by subscribing to the same at the office of the depositary and agreeing to pay such amount not exceeding $10 per share as the committee may call for. The committee reserves the right to abandon the plan for the purchase and to return to the subscribers the amount of their several subscriptions (less expenses, not to exceed 50 cents per share) unless the holders of at least three-fourths of all outstanding preferred shares become partners to the agreement."

One of the objects of the purchase, in addition to securing home control, is said to be a simplification of the present elaborate financial structure of the companies concerned. The New England Investment & Security Company was owned and controlled for years by the New York, New Haven & Hartford Railroad until the latter was forced by the United States government to dispose of some of its holdings in New England. At present there are two voluntary associations and seven corporations concerned in the electric railway situation around Springfield and Worcester. The Worcester Railways & Investment Company controls the Worcester Consolidated Street Railway, which in turn leases the Worcester & Webster Street Railway and the Webster & Dudley Street Railway. The New England Investment & Security Company controls the Worcester Railways & Investment Company and also directly controls the Springfield Street Railway, the Milford, Attleboro & Woonsocket Street Railway, the Interstate Consolidated Street Railway and the Attleboro Branch Railroad. The Springfield Street Railway is a consolidation of the Western Massachusetts Street Railway and the Springfield & Western Street Railway. The presumption is stated to be that if all the holders of the preferred shares of the New England Investment & Security Company take part in the purchase of the common stock it will be possible to simplify the situation, possibly through the formation of a new corporation.

American Public Utilities Company, Grand Rapids, Mich.—At the annual meeting of the American Public Utilities Company, John H. Blodgett and W. J. Ripley were elected to succeed H. L. Mason and W. H. Snow respectively on the board of directors. W. J. Ripley was elected assistant secretary and treasurer. The executive committee is composed of John H. Brewer, chairman; C. B. Kelsey, C. A. Boaldt, J. S. Hart, G. C. Whitworth, Charles McPherson and Blaine Gavett.

Chicago (Ill.) Elevated Railways.—In connection with the deferring of the quarterly dividend of 1½ per cent on the 160,000 of 6 per cent cumulative preferred shares of the Chicago Elevated Railways, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 29, Henry A. Blair, member of the board of trustees, has issued the following statement: "We could only expect that a European war would affect the demand for manufactured goods, and in view of the extent of the conflict I think Chicago conditions, generally, are satisfactory. The manufacturing district has been hit heavily by the war. This conclusion is reached by reports from our investigators who find that most of the losses in traffic of the Chicago Elevated Railways have occurred in the factory district. A good part of this loss, however, may be caused by the fact that a large number of foreigners elegible to bear arms for their native countries have come to the Atlantic seaboard with the expectation of getting back home. For about ten years we have been showing an average increase in receipts of from 7 per cent to 8 per cent. Since the depression in business occurred, that is in the past three weeks, our receipts have shown a falling off and the rate of increase over the corresponding period of last year has dropped to approximately 1 per cent. This shows that even with poor business prevailing we are still able to keep our receipts above those of last year."

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky.—The shareholders of the Cincinnati, Newport & Covington Light & Traction Company voted on June 25 to authorize an issue of $200,000 of first mortgage sinking fund twenty-five year 5 per cent bonds by the Licking River Bridge Company to cover the cost of reconstructing the Eleventh Street bridge between Covington and Newport. The new bonds, which are not yet sold, will be guaranteed by the Columbus Gas & Electric Company and the South Covington & Cincinnati Street Railway.

Hudson & Manhattan Railroad, New York, N. Y.—The directors of the Hudson & Manhattan Railroad on Sept. 1 declared the interest earned on the adjustment income mortgage bonds for the six months ended June 30, 1914, at the usual rate of 2 per cent per annum, or $10 per $1,000 bond, payable Oct. 1, 1914. The balance of net income for July available for interest on the adjustment bonds was $40,333, an increase of $10,318 over July, 1913. The number of passengers carried during July was 4,653,546, compared with 4,367,764 during the same month of the previous year.

New York (N. Y.) Railways.—Theodore P. Shonts, president of the New York Railways, announced on Sept. 2 that the company had prepared a summarized statement showing that the net income payable as interest on the adjustment mortgage bonds for the six months ended June 30 amounted to 1.24 per cent; also that the mortgage provided that such a statement must be signed by three-fourths of the directors elected by the bondholders; that the unavoidable absence in Europe of one of the directors representing the bondholders and the refusal of another to sign the approval made it necessary to agree with the trustee of the mortgage upon the selection of a board of experts to ascertain the income; that the directors had authorized the necessary procedure, and that there probably will be no delay in the interest payment due on Oct. 1.

Norwood, Canton & Sharon Street Railway, Canton, Mass.—The Norwood, Canton & Sharon Street Railway has petitioned the Massachusetts Public Service Commission for the approval of an issue of $300,000 of first mortgage 5 per cent twenty-year bonds to retire an equal amount of capital stock.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company has made application to the California Railroad Commission for authority to issue $1,000,000 of general and refunding mortgage gold bonds to be used in connection with the filing of certain surety bonds amounting to $700,000. The bonds will be filed with the United States District Court clerk to insure the payment of sums which the company may require it to pay in connection with the suit brought by the company to restrain the city and county of San Francisco from enforcing the gas and electric rates provided for in certain ordinances adopted June, 1913.

Portland Railway, Light & Power Company, Portland, Ore.—Application has been made to the New York Stock Exchange by the Portland Railway, Light & Power Company to list $1,064,000 additional first and refunding 5 per cent sinking fund mortgage convertible coupon bonds, series A.

Salt Lake Light & Traction Company, Salt Lake City, Utah.—The Salt Lake Light & Traction Company was recently incorporated in Utah with $1,000,000 of authorized capital stock. The incorporators of the company are O. J. Salisbury, president; J. D. Walker and C. W. Johnson, vice-presidents; A. H. Parsons, secretary, and S. A. Whitney, treasurer. There have been reports that the Utah Power & Light Company is to take over the Utah Light & Railway Company, now controlled by the Union Pacific through the Oregon Short Line, but it is understood that negotiations had not been consummated and that the Utah Light & Railway Company will be purchased by this new company, which is said to be organized by J. C. Jackling, president of the Utah Power & Light Company. The Union Pacific Railroad desires to sell its street railway, lighting and power properties in order to carry out its segregation plans. The probability is that if the control passes to Mr. Jackling and his associates a separation would be made of the lighting and power properties and the street railways. The electrical distribution would then be sold to the Utah Power & Light Company and the street railways operated separately.

Titusville (Pa.) Electric Traction Company.—The rights, franchises and holdings of the Titusville Electric Traction Company were sold on Aug. 27 by Receiver W. J. Smith to Fred W. Garvin, New York City, for $225. Besides the payment of this price, however, the new owners buying the road are said to have accepted debts and obligations exceeding $300,000.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.—The Wisconsin-Minnesota Light & Power Company, successor to the Chippewa Valley Railway, Light & Power Company, has declared the regular quarterly dividend of 1¾ per cent on its preferred stock, payable Sept. 1 through the Boston Safe Deposit & Trust Company. This is the initial dividend under the new organization.

York (Pa.) Railways.—With a capital stock amounting to $1,361,500, a large corporation is being formed to provide most of the electrical service for York and a considerable portion of York county. The new company, known as the Edison Light & Power Company, will include the Edison Light & Power Company, the Merchants' Electric Light, Heat & Power Company, the Lower Windsor Township Light, Heat & Power Company, the Spring Grove Light, Heat & Power Company, the Jackson Township Light, Heat & Power Company, and the Heidelberg Township Light, Heat & Power Company. The last-named six companies, recently organized by the Edison company, are now applying for charters. Providing the application for the merger of the companies is granted by the Public Service Commission, the corporation will be managed by the York Railways through stock ownership. The city voted by ordinance to approve the merger plan on July 3. The city will receive 3 per cent of the gross receipts of the new company, whereas at the present time it receives only that amount of the gross receipts of the Merchants' Electric Light, Heat & Power Company.

DIVIDENDS DECLARED

Brooklyn Rapid Transit Company, Brooklyn, N. Y., quarterly, 1½ per cent, preferred.

Galveston-Houston Electric Company, Galveston, Tex., 3½ per cent, common; 3 per cent, preferred.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common; 2½ per cent, preferred.

Frankford & Southwark Passenger Railway, Philadelphia, Pa., $4.50, quarterly.

Second & Third Streets Passenger Railway, $3, quarterly.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR MAINE.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., July, '14	$67,805	*$34,246	$33,559	$17,351	$16,208
1 " " '13	72,090	*31,548	40,542	17,292	23,250
12 " " '14	778,667	*367,699	410,968	208,850	202,118
12 " " '13	734,480	*337,535	405,945	205,601	200,344

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., July, '14	$92,696	*$61,435	$31,261	$28,130	$3,131
1 " " '13	95,521	*57,360	38,161	24,878	13,283
12 " " '14	1,159,210	*711,202	448,008	324,043	123,965
12 " " '13	1,162,587	*694,091	468,496	283,734	184,762

COLUMBUS RAILWAY, POWER & LIGHT CO., COLUMBUS, OHIO.

1m., July, '14	$241,965	*$156,675	$85,290	$41,156	$44,134

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE.

1m., July, '14	$258,004	*$132,359	$125,645	$63,294	$62,351
1 " " '13	235,247	*115,514	119,733	58,675	61,058
12 " " '14	2,470,163	*1,426,799	1,043,364	757,926	258,438
12 " " '13	2,232,200	*1,227,524	1,004,676	680,575	324,101

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

1m., July, '14	$218,659	*$130,214	$88,445	$61,342	$27,103
1 " " '13	224,352	*135,676	88,676	49,603	39,073
12 " " '14	2,758,242	*1,733,817	1,024,425	630,863	393,562
12 " " '13	2,597,892	*1,455,862	1,142,030	585,860	556,170

GRAND RAPIDS (MICH.) RAILWAY

1m., July, '14	$115,756	*$73,308	$42,448	$13,566	$28,882
1 " " '13	118,261	*73,578	44,683	15,075	29,608
12 " " '14	1,294,505	*837,522	456,983	156,372	300,611
12 " " '13	1,276,828	*750,003	526,825	177,953	348,872

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1m., July, '14	$172,089	$82,154	$89,935	$57,440	$32,494
1 " " '13	162,401	81,230	81,170	46,665	34,505
12 " " '14	1,851,129	898,833	952,295	667,482	284,813
12 " " '13	1,686,525	837,812	848,713	538,791	309,921

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE.

1m., July, '14	$72,565	*$41,199	$31,366	$15,497	$15,869
1 " " '13	75,102	*40,048	35,054	15,551	19,503
12 " " '14	675,185	*459,324	215,861	184,780	31,081
12 " " '13	657,469	*406,447	251,022	175,236	75,786

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., July, '14	$184,081	*$110,802	$73,279	$42,100	$31,179
1 " " '13	178,217	*117,082	61,135	39,077	22,058
12 " " '14	2,247,867	*1,388,327	859,540	500,428	359,112
12 " " '13	2,155,735	*1,257,006	898,729	449,792	448,937

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.

1m., July, '14	$351,658	$206,169	$145,488	$50,848	$94,640
1 " " '13	319,131	185,186	133,945	47,589	86,356
7 " " 14	2,073,359	1,265,804	807,554	352,683	454,871
7 " " '13	1,816,369	1,113,644	702,724	318,312	384,411

PORTLAND (MAINE) RAILROAD

1m., July, '14	$116,551	*$62,740	$53,811	$20,462	$33,349
1 " " '13	120,011	*58,952	61,059	18,024	43,035
12 " " '14	1,043,214	*646,655	396,559	249,998	146,561
12 " " '13	1,015,907	*705,021	310,886	132,399	178,487

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

1m., July, '14	$511,005	*$280,020	$230,985	$182,303	$48,682
1 " " '13	568,371	*284,374	283,997	171,378	112,619
12 " " '14	6,664,511	*3,340,255	3,304,256	2,127,126	1,177,130
12 " " '13	6,671,029	*3,312,858	3,358,171	1,882,149	1,476,002

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., July, '14	$825,062	$410,774	$414,288	$232,327	$181,960
1 " " '13	773,499	389,533	383,966	239,632	144,333
7 " " '14	5,342,615	2,797,482	2,545,133	1,590,884	954,248
7 " " '13	5,004,030	2,555,758	2,448,272	1,641,072	807,199

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*Includes taxes.

Traffic and Transportation

TRAINMEN UNDER CIVIL SERVICE

San Francisco Municipal Line Prescribes Difficult Tests for Trainmen—Experience Rated Low

A written examination of applicants for appointment as motormen on the San Francisco (Cal.) Municipal Railway was scheduled to be held in San Francisco on Aug. 29 and for conductors on Sept. 5. The matter of the selection and appointment of trainmen was put in the hands of the civil service commission to keep politics and the "personal element" from being injected. The men were to take the physical examination and the medical examination first, and then, on the dates announced, were to be quizzed under civil service supervision. Thus when C. A. Cashin, superintendent of the railway, wants additional men he will call on the civil service commission and will instruct the men assigned to him in car operation on an unused spur track. He has purposely rated experience low so as to encourage "green" men, as he says he would prefer to break in his own force. About 300 platform men will be needed to operate the lines now under construction. More than 3000 men applied to take the examinations.

The general rules laid down for the examination by the Civil Service Commission follow:

"1. Scope for motormen—Subjects and weights on a scale of 100: General knowledge of duties, 20; equipment and its care, 20; writing of report, 15; arithmetic, 5; athletic test, 35; experience, 5.

"2. Scope for conductors—Subjects and weights on a scale of 100: General knowledge of duties, 30; writing of report, 15; arithmetic, 15; athletic test, 35; experience, 5.

"Each of the above subjects will be rated on a scale of 100: By multiplying the rating by the weight the percentage on a subject is secured. By dividing the sum of the percentages by the sum of the weights the general average percentage is obtained. For the examinations named in this circular the minimum general average percentage for eligibility will be 70.

"The written examination for motormen will be held in the Mission High School Building, Eighteenth and Dolores Streets, on Aug. 29, 1914, at 1.30 o'clock. The written examination for conductors will be held in the Mission High School Building on Sept. 5, 1914, at 1.30 o'clock. If the school building named will not accommodate all the applicants, other school buildings will be used also. The athletic tests will be held in the Southside Playgrounds, Seventh and Harrison Streets, beginning on Aug. 17, 1914.

"Persons filing applications for examination as motormen will be furnished with a copy of the circular containing the questions and answers covering the subjects 'general knowledge of duties' and 'equipment and its care,' and those filing applications for examination as conductors will receive a copy of the circular containing questions and answers relating to the subject 'general knowledge of duties.' Applicants are expected to study these circulars, as the questions in the written examination on said subjects will be taken from the circulars.

"'Writing of report,' in both examinations, will be a test of the applicant's ability to write a correct report on subjects to be named by the commission and will be rated on form and substance.

"The subject 'arithmetic' in both examinations will consist of primary examples covering common and decimal fractions.

"The 'athletic test' in both examinations will consist of the following exercises:

1. Ladder work—Hand over hand on ladder, up and down five rungs. Mark, 10 credits.

2. Lifting 40 lb. dumbbell—Five consecutive lifts with each hand. Lifts to be made from the lowest reach of arm to highest reach, without aid of jerk or swing, while standing erect with feet close together. Perfect mark, 10 credits.

3. High jump—3 ft. 4 in., 10 credits; 3 ft., 5 credits. Use of springboard will not be permitted.

4. Vaulting the horse—Perfect vault over horse 3 ft. 10 in. high, without touching it with any part of body excepting the hands, 10 credits; good vault, 7½ credits; fair vault, 5 credits.

5. Dipping on parallel bars—Two dips, 5 credits each. Dips must be made with legs straight and without assistance of kick or swing.

6. Carrying 125-lb. sack of sand—Sack must be lifted from floor, placed on shoulder and carried up and down six steps. Mark, 10 credits.

7. Running—(Distance about 145 yd.):

Time	Credits	Time	Credits
21 seconds	40	25 seconds	30
22 "	38	26 "	26
23 "	36	27 "	22
24 "	34	28 "	15

(Fifth-seconds will be rated proportionately.)

"Applicants taking the two examinations named in this circular need appear but once for the athletic test, as they will be rated in both examinations from the one athletic record. Candidates who fail to appear for the athletic test will be barred from further examination.

"The subject 'experience' will be rated as follows: Three years' experience had in San Francisco as a motorman of railway cars, 100 credits; two years, 80; one year, 60. Experience as a motorman of railway cars had outside of San Francisco, but within the State of California, will be rated 10 per cent less than experience had in San Francisco, and such experience had outside of California will be rated 20 per cent less than experience had in this city.

"Experience as a conductor will be rated in the same manner as is provided above for rating experience of motormen.

"Applicants must be in sound bodily health and, before appointment, must pass a medical examination before physicians appointed by the commission. Candidates who secure places on the eligible lists and who fail to pass such medical examination will be removed from the eligible lists. Candidates who are unable to hear with each ear, ordinary conversation at a distance of 20 ft., or who are unable to read, without glasses, with each eye, at a distance of 20 ft., letters on Snellen's eye chart marked '30,' will be rejected. Applicants taking examination both for motormen and conductors need take but one medical examination.

"Applicants must be citizens of the United States, twenty-one years of age or over, and residents of San Francisco for at least one year next preceding Aug. 17, 1914, the date of the beginning of these examinations.

"Application blanks (Form 40) may be had by applying in person or by mail at the office of this commission, room 341, City Hall, 1231 Market Street. Receipt of applications closes Aug. 13."

Statement of Service Reductions Filed in Cincinnati.—The Cincinnati (Ohio) Traction Company has filed with Service Director Fosdick a list of the proposed reductions in its car service. On the advice of Mayor Spiegel, however, the list will not be made public until a thorough investigation has been made, as the Mayor wishes to avoid precipitating at this time the protests that are likely to follow the public announcement.

Suburban Fare Hearing in Seattle.—The Public Service Commission of Washington has fixed on Oct. 1 as the date for the hearing of the case relative to the rates recently proposed by the Seattle, Renton & Southern Railway, Seattle, Wash. The company, a few weeks ago, filed with the commission a tariff schedule, based on a zone system, which will double the fare from Renton, the terminus of the line, to Seattle. A number of citizens and the city of Seattle protested against the rates and the commission suspended the tariff for ninety days, pending an investigation.

Montreal Picnic Trophy.—Some years ago the Montreal (Que.) Tramways offered a shield as a prize to the station selling the larger number of tickets to the annual picnic of the company's mutual benefit association, the shield to become the permanent property of the station winning it for three consecutive years. As the employees of the Cote Street station sold the greatest number of tickets again this year the shield has become their property. The interest that has been taken in the picnic is shown by the fact that the number of tickets sold at the Cote Street division averaged seventy-four per man.

Resumption of Service Ordered.—The Public Utilities Commission of Ohio has decided against the Hocking Valley Railroad in the matter of the complaint regarding the discontinuance of service operated by electricity by the company since 1896 between Jackson and Hamden, Ohio, a distance of 15 miles. The complainants contended that the service influenced many individuals, firms and corporations to locate in the territory mentioned and that public convenience requires the continuance of the service. The company discontinued service on Aug. 23. It has been directed by the commission to resume its schedule in full on Sept. 15.

Electric Railway Service to New York Markets.—S. C. Van Blarcom, president of the Board of Trade of Paterson, N. J., has notified the New York market committee that his organization and the Public Service Corporation, Newark, N. J., have petitioned Governor Fielder to permit electric railways to operate freight service. The idea is to bring into the New York market fresh produce from within a radius of 50 miles. The sub-committee on transportation, of which D. W. Cooke of the Erie Railroad is the chairman, is arranging with the express companies and the operators of auto trucks to distribute foods brought in in this way.

Accidents in New York in August.—According to the report of the National Highways Protective Society fifty-three persons lost their lives by vehicular accidents on the streets of New York City during August, the same as the corresponding month last year. Twenty-six of this number were children under sixteen years of age. Automobiles caused the death of twenty-nine persons; wagons killed thirteen, and trolleys, eleven. Of the children killed, fourteen met their deaths by automobiles, ten by wagons and two by trolleys. In August, 1913, twenty-six persons were killed by automobiles, twelve by trolleys and fifteen by wagons.

New Freight Tariff on Puget Sound Electric Railway.—The Puget Sound Electric Railway, Seattle, Wash., operating between Seattle and Tacoma, has been granted the right to put into effect special freight rates affecting feed, grain, milk and furniture shipments. Following are the reductions: grain and feed from either Seattle or Tacoma to Kent and Auburn, from 10 cents to 8 cents a hundredweight; milk in 10 gal. cans or larger, from Auburn, Kent and intermediate points to Seattle, from 15 cents to 12 cents a hundredweight; furniture from manufacturing establishments or in compact and large quantities from Tacoma to Seattle or from Seattle to Tacoma, from 20 cents to 10 cents a hundredweight.

"Near-Side" Ordinance in Effect in New York.—The new ordinance, requiring all surface cars to stop for passengers on the near side of a crossing, went into effect in New York on Sept. 1. A rectangular space, extending 8 ft. from the side of the car tracks, has been painted on the pavement on the near side of crossings. Persons may stand within this marked inclosure while a car is approaching without danger from automobiles and other vehicles, which are not to be permitted to pass over such places while cars are approaching or while passengers are getting off them. The first safety zones are being tried on Broadway, between Thirty-fourth and Forty-fourth Streets, and if the system proves successful it will be extended throughout the city.

Reduce Parking of Cars.—By reason of the removal of a large portion of the mechanical department of the Detroit (Mich.) United Lines from the Monroe Avenue shops to the magnificent new workshops in Highland Park the company is now enabled greatly to reduce the parking of cars in the streets. Heretofore interurban cars that were to be held some considerable time before being sent on their runs have been parked at some of the city carhouses while others have been kept on Larned Street and near the old Third Street depot. The majority of such cars together with those staying in Detroit over night now run to the Monroe Avenue property which is known as the Detroit interurban carhouse. This new regulation will not, however, affect those cars that have but a few minutes to wait between their arriving time and their leaving time.

Steam Railroads Increase Passenger Rates.—Following the lead of the Pennsylvania Railroad, the New York, New Haven & Hartford and its associated lines, the Boston & Maine and the Boston & Albany, announced on Sept. 1 a proposed increase in mileage book rates. The three roads have filed new passenger tariffs increasing the old from 2 cents a mile to 2¼ cents. The higher rate will become effective on Oct. 1 if approved by the Interstate Commerce Commission. A hearing also will be held on the matter by the Massachusetts Public Service Commission. In this connection the Lehigh Valley, Pittsburgh & Lake Erie, Lake Shore, Delaware, Lackawanna & Western, and Delaware & Hudson Railroad filed revised tariffs with the public service commissions on Sept. 1 advancing the mileage rate from 2 to 2¼ cents per mile on Oct. 1. Similar action regarding the filing of new rates was taken by the Pennsylvania Railroad and the Philadelphia & Reading Railroad on Aug. 31.

Ruling in Regard to Excess Fare.—On July 31, 1914, the Public Service Commission for the First District adopted an order fixing the maximum fare to be charged for transportation in either direction between Manhattan and Rockaway Park at 15 cents. Complaint had been made to the commission that it was the practice of the operating companies to sell through tickets for 15 cents, but to collect an extra nickel, or 20 cents in all, if a passenger paid his fare on the cars. The order limiting the charge to 15 cents was served upon the operating companies, namely, the New York Consolidated Railroad and the Long Island Railroad and they were directed to answer by Aug. 8. On that date both companies applied for an extension and the commission extended their time to answer to Aug. 21. On this date both companies presented an application for a rehearing. This application was denied and the companies were informed that the order of July 31 should be put into effect immediately.

Strike on Cumberland & Westernport Electric Railway Settled.—The strike of the employees of the Cumberland & Westernport Electric Railway, Cumberland, Md., declared on Aug. 18 on account of the refusal of the company to grant the demand of the men for an increase in wages, has been settled and service was resumed on Aug. 27 at noon. Officials of the company, at a joint conference with the representatives of the employees, at which Frank A. White, chief of the State Bureau of Statistics and Information, was present, agreed to grant the increase. In suggesting that the company comply with the request of the men, Mr. White said he would make every effort, through his bureau, to have the Public Service Commission of Maryland allow the company to adjust its passenger rates so that the advance in the cost of operating the cars can be met. The company's officials maintained that the earnings were not sufficient to warrant the advance. The increase is 1 cent an hour for motormen and 3 cents an hour for conductors.

Traffic Between Kansas City and St. Joseph.—Both passenger and freight service by the St. Joseph & Grand Island Railroad between St. Joseph and Kansas City was discontinued on Sept. 1. The railroad had been using the tracks of the Santa Fê, Quincy, Omaha & Kansas City and the Chicago, Milwaukee & St. Paul Railroads between the two cities, and those contracts have been terminated. J. R. Harrigan, general manager of the Kansas City, Clay County & St. Joseph Railway, the electric railway between Kansas City and St. Joseph, is now negotiating with the Grand Island for its passenger business from St. Joseph southward to and through Kansas City, and for Grand Island business from Southern points and Kansas City. The Kansas City, Clay County & St. Joseph Railway is running limited cars, with only two stops between Kansas City and St. Joseph, and is planning to increase this service four cars each day each way between the two cities. The electric line is 10 miles shorter than any of the five steam roads that now run passenger trains between Kansas City and St. Joseph. The fare by electric railway is 20 cents cheaper than by steam and the running time somewhat less. The electric line reaches the union depot in St. Joseph. Mr. Harrigan is said to feel that an opportunity exists to get much traffic previously handled by the steam roads. The electric railway carried 19,967 passengers between Kansas City and St. Joseph in July, against about 1500 for the steam roads.

Personal Mention

Mr. H. P. Taylor, of H. P. Taylor & Company, Pittsburgh, Pa., has been elected president of the Ephrata & Lebanon Street Railway, Ephrata, Pa., to succeed Mr. A. E. Lane.

Mr. John Johnstone has resigned as general superintendent of the Billings (Mont.) Traction Company. He expects to re-enter electric railway work after a vacation of about three months.

Mr. Charles Monroe Nash, who has been chief clerk to the auditor of the Ohio Electric Railway, Springfield, Ohio, has been appointed an accountant in the southern district of the division of valuation of the Interstate Commerce Commission, with headquarters in the Municipal Building, Chattanooga, Tenn.

Mr. John P. Fox has been appointed transit expert of the committee on city plan of the Board of Estimate and Apportionment of the city of New York. Mr. Fox is well known for his work as investigator for civic betterment clubs, both in this country and Canada. The exact scope of his work for the city of New York is still somewhat indefinite, but one of his first undertakings will be to make a time-zone study of all the transit facilities in the city of New York.

Baron Empain, of Brussels, who was one of the four men said to have guaranteed the payment of $40,000,000 to the Germans as a German war levy, is well known in electric railway circles in Europe. He has long been active as a builder and owner of tramways and interurban lines, his operations being conducted under the unofficial name of the Empain syndicate. Among the larger interurban lines controlled by this syndicate is that centering at Lille, France, which city was also captured by the Germans during the present war.

Mr. C. F. Beames has completed his three-year engagement as chief electrical engineer to the government of His Highness the Maharajah of Mysore, India, having under his charge the operation of the Cauvery power scheme, the largest long-distance high-tension power transmission in operation in the East, supplying power to the Kolar gold fields and the cities of Bangalore and Mysore. Mr. Beames will visit England and return to the United States on or about Oct. 1. He will take up temporary quarters at 55 Highland Avenue, Yonkers, N. Y.

Mr. Howard S. McNair has been elected secretary and treasurer of the American Cities Company, New York, N. Y., with offices in New Orleans, La. Mr. McNair entered railway work in 1903 as a clerk in the office of the superintendent of the New Orleans & Northeastern Railroad. Subsequently he became connected with the Southern Pacific Company, but resigned the latter position in 1906 to enter the engineering department of the New Orleans Great Northern Railroad during the construction of the road. He became connected with electric railway work in 1909 as secretary to Mr. Hugh McCloskey, then president of the New Orleans Railway & Light Company, New Orleans, La. While holding this position Mr. McNair was also assistant secretary and treasurer of the New Orleans Railway & Light Company, and served in other official capacities. He was elected assistant secretary and treasurer of the United Gas & Electric Engineering Corporation on Jan. 1, 1914. He was recently elected secretary and treasurer of the American Cities Company and took up the duties of that office on Sept. 1.

Howard S. McNair

Mr. James N. Hatch, who has been connected with Sargent & Lundy, engineers, for eleven years, has resigned to open an office in Chicago as a consulting engineer. At first Mr. Hatch will devote particular attention to appraisals and valuations. He is associated with Prof. M. E. Cooley in the appraisal of the properties of the Detroit (Mich.) United Railway. Mr. Hatch was graduated from the University of Michigan with the degrees of C.E. and M.E. He is a member of the American Society of Civil Engineers, Western Society of Engineers and of the Engineers' Club of Chicago.

Mr. J. E. Bigham, assistant treasurer of the Tampa (Fla.) Electric Company, was elected president of the Southeastern Section of the National Electric Light Association at the recent annual convention. Mr. Bigham was born in Grand Rapids, Ohio, on Sept. 10, 1877. He was educated at the Prima State Normal School. He was early employed in the construction department of the American Bridge Company at Pittsburgh, Pa., and later in the operating department of the American Sheet & Tin Plate Company. During the Spanish-American war he joined the army and served in the Philippines as sergeant in a volunteer regiment, and later as a sergeant-major. Mr. Bigham began electrical work with Stone & Webster in Terra Haute, Ind., in the Terre Haute Electric Company, in 1901. He later became assistant treasurer of the Paducah Light & Power Company, Paducah, Ky. In 1909 he became assistant treasurer of the Jacksonville (Fla.) Electric Company, and in 1910 became assistant treasurer of the Tampa Electric Company.

OBITUARY

James H. Van Dorn, president of the Van Dorn & Dutton Company and the Van Dorn Iron Works Company, Cleveland, Ohio, died suddenly at his home in that city on Aug. 29, as a result of an attack of heart trouble. He was seventy-three years of age. Mr. Van Dorn was born in York, Ohio. At eighteen years of age he was apprenticed to a blacksmith in Elyria, Ohio. Later he became an iron worker at Akron. In 1873 he went to Cleveland and laid the foundation of the companies that have since been developed into important industries. He is survived by a widow, two sons and three daughters.

Charles F. Baker, until six months ago connected with the Bay State Street Railway, Boston, Mass., as mechanical engineer in charge of power station construction, is dead. He had been with the company four years. Mr. Baker was long prominently identified with electric railway work. More than twenty years ago he was connected with the E. P. Allis Company, Milwaukee, Wis., engine builders, and had charge of the installation of the steam plant at the works of C. A. Pillsbury & Company, Minneapolis. In 1893 he entered the service of the West End Street Railway, Boston, now the Boston Elevated Railway. While with these companies Mr. Baker's titles were master mechanic and superintendent of motive power and machinery, and under his designs and supervision the East Boston, Charlestown, Dorchester and Howard power stations were built and the central power station was changed from a belt to a direct-connected plant. In 1905 Mr. Baker entered the service of the Brooklyn Rapid Transit Company as superintendent of power. Later he served as a member of the staff of Mr. Louis B. Stillwell at Baltimore and on the Hudson & Manhattan Railroad. Mr. Baker was a member of the American Society of Mechanical Engineers and the New England Street Railway Club, and in 1904 was elected president of the American Railway Mechanical & Electrical Association, the predecessor of the American Electric Railway Engineering Society.

The Hartford & Springfield Street Railway, recently announced a popular excursion to the base of Mount Tom, one of the most popular resorts in New England. The cars used on these trips are fifteen-bench open cars which under ordinary conditions carry six passengers to each seat. In order to assure patrons of more than ordinary comfort the capacity of each seat was limited to four. In announcing the excursion the company said: "No change of cars will be made from Hartford to Mountain Park, which is situated at the base of Mount Tom. From there the trip to the summit can be made at small expense by way of the inclined railway. Refreshments may be obtained either at Mountain Park at the base of Mount Tom or at the summit house on the mountain."

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Teal Creek Railway, Falls City, Ore.**—Incorporated to build a steam or electric railway from Falls City to a point in Polk County. Capital stock, $10,000. Incorporators: F. J. Cobbs, Zera Snow and Wallace McCamant.

FRANCHISES

Victoria, B. C.—The British Columbia Electric Railway Company, Ltd., has asked the Council for a franchise to double-track its line on Esquimalt Road between Dundas Street and Catherine Street. The company plans to build a double track on the entire line from Point Ellice Bridge to the terminal.

Pasadena, Cal.—The Pacific Electric Railway has applied to the City Commission for a 50-year franchise for a double track on North Lake Avenue.

Pocatello, Idaho.—Mayor Turner has vetoed the ordinance granting a franchise to J. D. Browning to operate a street railway in Pocatello.

Murphysboro, Ill.—The Murphysboro & Southern Illinois Railroad has applied to the Councils of Carbondale and Murphysboro for thirty-year franchises. Right-of-way has been offered across all but two pieces of property between the cities.

Neodesha, Kan.—On Sept. 8 citizens will vote on the proposal to grant a franchise to the Independence, Neodesha & Topeka Traction Company to build lines in and through Neodesha.

Holyoke, Mass.—The Holyoke Street Railway has received a revised franchise from the Board of Aldermen for double-tracking and extending its line in Aldenville.

TRACK AND ROADWAY

Lethbridge (Alta.) Municipal Railway.—A by-law is being advertised in Lethbridge which includes a clause to provide $13,153 for municipal electric railway extensions in that city.

Fort Smith Light & Traction Company, Fort Smith, Ark.—In a statement to the City Commissioners responding to complaints as to the progress of track work, the Fort Smith Light & Traction Company called attention to the fact that work now under way footed up $24,000, that the company had spent $71.000 in relaying tracks and preparing them for paving, and that the company would expend all the earnings over the interest charges in improvements; that no dividends had been paid on the common stock for three years and none on preferred stock for more than a year. The company expressed willingness to move its working force to such streets as might be designated.

Phoenix (Ariz.) Railway.—This company has asked the Corporation Commission for permission to build an extension to its Brill line.

Los Angeles, Cal.—The Pacific Electric Railway has filed an appeal to the City Council, asking that it be allowed to delay compliance with the orders of the Board of Public Works requiring the company to bring to street grade its tracks on several streets, until its application for a franchise for its two outside tracks on the four-track system of Long Beach Avenue is finally acted upon.

San Francisco, Cal.—The North Beach Promotion Association has filed with the Board of Supervisors a petition to extend the Stockton Street municipal line north along Stockton Street to the Embaracadero.

Waterbury-Milldale Tramway, Waterbury, Conn.—This company which is building an electric railway to connect Waterbury and Southington has nearly finished the erection of poles from the mountain top to Milldale. The grading for the roadbed is completed as far as Marion. The line will be 8½ miles long. Charles H. Clark, president.

***Liberty, Ind.**—The citizens of Liberty, Ind., and vicinity have been asked to contribute $60.000 toward the construction of an electric railway from Richmond, Ind., to Hamilton, Ohio. Union Township will give $20,000 and Center Township $40,000. The plan includes the extension of the line from Indianapolis to Connersville, connecting with the Richmond line east of Liberty with a station at Liberty.

Fort Scott & Pittsburg Interurban Railway, Fort Scott, Kan.—The first stock issue, $3,000, has been made by the Fort Scott Industrial Association, which has taken hold of the proposition and proposes to build the line between Fort Scott and Pittsburg.

Topeka (Kan.) Street Railway.—This company is laying new rails on Second Street and planning extensions of that line.

Bay State Street Railway, Boston, Mass.—The amusement resort of this company at Island Park was destroyed by fire on Aug. 25. The dance hall, bathing houses, shore dinner house and kitchens that comprise the company's main buildings were burned. A loss estimated at $10,000 is covered by insurance. It is stated that the company will rebuild the park next season.

Berkshire Street Railway, Pittsfield, Mass.—This company announces that it will lay 1300 ft. of 95-lb. T-rails on North Street from the end of the Wahconah Street work southerly, and will also replace tracks on East Street from Appleton Avenue to the court house.

Springfield (Mass.) Street Railway.—The Public Service Commission has issued three orders on the petition of the Springfield Street Railway for certificates preliminary to operation of sections of its railway in Springfield and Westfield. One order certifies that all laws have been complied with in the construction of a single-track connection in State and Hancock Streets. A similar certificate has been granted the company for a relocated turnout in Walnut Street. In Westfield the certificate granted to the company covers a section of railway consisting of a single-track extension in Franklin Street.

Battle Creek, Mich.—The Chamber of Commerce announces that J. T. Adams, contractor, will begin work at once on the interurban railway between Coldwater and Battle Creek. The Chamber of Commerce announced further that the financing was complete, but the names of several out-of-town men who helped swing the deal were not made public. The line will be 28 miles long and touch Beadle Lake, Newton, Lee Lake, Burlington, Girard, Morrison Lake and Coldwater, with a probable extension to Union City.

Kansas City (Mo.) Railways.—The board of control of this company met with the Board of Public Works of Kansas City last week, and approved plans for the changing of curves to reroute cars. and for reconstruction of tracks between Tenth and Twelfth Streets on Main Street.

***Atlantic City, N. J.**—William F. Wahl, Atlantic City, has proposed the construction of a high-speed electric railway along the western edge Inside Thoroughfare from Longport through Margate and Ventnor Heights to lower Chelsea and thence to a junction with the main line of the Pennsylvania Railroad on the meadows. In a proposition which Mr. Wahl will submit to the Pennsylvania Railroad on behalf of the residents of these resorts it will be pointed out that the motive power and rolling stock of the West Jersey & Seashore Railroad could be applied to the Longport extension.

***Riverside, N. J.**—Residents of Riverside, Riverview and Muhlenberg Park are interested in a plan to provide electric railway service between Riverside and Tuckerton. It is proposed to use the franchise granted several years ago on the Stoudt's Ferry Bridge Road. It is also planned to lease that portion of the Berks and Lehigh branch of the Reading Railway between Riverside and Muhlenburg Station. This section of track which is now used for storage purposes would be electrified. The formation of a company to finance the new line is planned.

Cincinnati, Indiana & Louisville Railway, Cincinnati, Ohio.—Engineers for this company are in the field making surveys for its roposed 85-mile gasoline-electric and steam railroad which is to connect Cincinnati, Lawrenceburg, Aurora, Rising Sun, Detroit, Patriot, Vevay and Madison. L. S. Cook, president. [E. R. J., March 21, '14.]

Glengarry & Stormont Railway, Cornwall, Ont.—This company, which plans to build a 27-mile railway between

St. Polycarpe and Cornwall, Ont., will operate the railway with steam and not by electricity. G. W. Farrell, Montreal, Que., president.

***Bridgeburg, Ont.**—The Hydro-Radial survey for an electric railway between Bridgeburg, Ont., and Dunnville, Ont., with a connecting line from Port Colborne to Welland, has been completed and J. N. Stanley, engineer in charge, and his staff are now engaged in preparing data for presentation to the Hydro-Electric Power Commission. The Bridgeburg-Dunnville line is about 39 miles long. It is about midway between the Grand Trunk's line and the shore of Lake Erie. Only two bridges will be necessary, one across the Welland Canal and the other across the feeder. The route from Port Colborne to Welland is about 8 miles in length and will follow the east side of the Welland canal to connect with the electric railway at present operated in Welland.

Baker, Ore.—Jacob Kreis, representing Portland capital, is projecting the construction of an electric railway to connect the city of Baker with the Panhandle section of the county.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—The Vance Avenue extension of the Chattanooga Railway & Light Company is rapidly nearing completion. Rails have been laid for practically the whole distance and a large proportion of the ballasting is completed.

Nashville (Tenn.) Traction Company.—Work is rapidly progressing on the line of the Nashville Traction Company which will run from the northern boundary of the city to the city limits on Lafayette Street, and it is said that service can be begun on Nov. 1. The company has completed plans for extending the line out on the Murfreesboro pike to Una, but work will be delayed until the right-of-way recently granted by the County Court can be amended so as to give the line more territory. The Detroit-Nashville Construction Company is building the lines for the new company. It is said that current will be supplied from the plant at Hale's Bar.

Nashville Railway & Light Company, Nashville, Tenn.—The City Commission is to authorize the Nashville Railway & Light Company to lay double tracks along West End Avenue, from Twenty-first Avenue to the city limits, in accordance with the contract by which the railway company will share with the city the cost of condemnation proceedings and such reconstruction of the street as will be necessary.

Northern Texas Traction Company, Fort Worth, Tex.—This company has been asked to build an extension through Niles City to Diamond Hill. The company has decided to build a 1-mile extension to its Summit Avenue line in Fort Worth.

***Orange, Tex.**—J. C. Cox of Dallas is interested in a plan to construct a street railway in Orange.

Ogden (Utah) Rapid Transit Company.—This company has selected the route through Brigham City via Collinston and over the divide into Cache County for its Ogden-Preston extension, work on which is now said to be under way in Cache County. The engineers who have been engaged on the various surveys during the year have completed maps for the extension, and a moderately low grade has been established along the proposed route. The survey practically parallels the Oregon Short Line from Ogden to Collinston, taking a course just east of the Short Line's right-of-way. At a point just beyond Collinston the survey runs over the divide, eliminating the Bear River Canyon, and the proposed road will enter the towns of Wellsville and Hyrum, just south of the eastern end of the divide. Construction from this end will probably not commence until next spring, it is said.

Lynchburg Traction & Light Company, Lynchburg, Va.—This company contemplates extending its College Hill line out Fort Avenue at an early date. The terminus of the extension is to be opposite the Lynchburg Fort.

Tacoma Railway & Power Company, Tacoma, Wash.—Five street railway proposals have been placed before L. H. Bean, manager of the Tacoma Railway & Power Company by Mayor Fawcett. The extensions and changes proposed by the Mayor include the following: Extension of the Pacific Avenue line to South Sixty-fourth Street; extension of Center Street line; extension of Tacoma Avenue line so as to connect at present terminals with the Point Defiance and South Tacoma lines; extension of the K Street line to Twenty-sixth and Proctor Streets to meet the Point Defiance line; extension of Sixth Avenue line from southern terminals to Seventeenth Street and Pacific Avenue, in the city of Tacoma.

SHOPS AND BUILDINGS

Centralia & Central City Traction Company, Centralia, Ill.—This company is building a new station in Centralia. The building will also be used by the company for storing supplies.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—It is announced that this company will build a large terminal station in Lafayette. The building will serve both as a station and for general offices.

Kansas City-Western Railway, Kansas City, Mo.—This company has under construction a new interurban depot at Lansing.

Rochester & Eastern Rapid Railway, Rochester, N. Y.—This company has completed plans for enlarging its station at Victor, N. Y.

Austin (Tex.) Street Railway.—This company has moved its offices from West Sixth Street to Congress Avenue, Austin. A clubroom has been fitted up for the use of the employees.

POWER HOUSES AND SUBSTATIONS

Illinois Central Traction Company, Peoria, Ill.—This company will place in operation two new General Electric 500-kw, 600-volt rotary converters with the necessary starting panels.

Chicago & Milwaukee Electric Railroad, Highwood, Ill.—This company will install in its North Chicago substation a 500-kw rotary converter, three 165-kva transformers, switchboard and accessories, which have been purchased from the General Electric Company.

Moncton (N. B.) Tramways, Electricity & Gas Company, Ltd.—This company is installing three 200-hp high-pressure boilers to replace four low-pressure boilers which have been used for several years.

New York Central & Hudson River Railroad, New York, N. Y.—Two new 2000-kw rotary converters and six 735-kva air-blast transformers and switchboards will be added to the substation equipment of this company. The contract to build and install the apparatus has been placed with the General Electric Company.

New York Municipal Railway, Brooklyn, N. Y.—This company has ordered from the General Electric Company three 4000-kw and three 2000-kw rotary converters, together with transformers and switchboard apparatus. The distribution of this apparatus among the various substations of the company will be as follows: Hudson Avenue substation, two 4000-kw rotary converters; Thirty-eighth Street substation, one 4000-kw converter; Utrecht Avenue substation, two 2000-kw converters; Coney Island substation, one 2000-kw converter.

Nashville Railway & Light Company, Nashville, Tenn.—It is reported that the Clark interests, which own the Nashville Railway & Light Company and the power plant at Ocoee, have contracted with the Brady interests for current from the power plant at Hale's Bar and that it is to be supplied to operate the local railway system. Transmission wires have been strung.

Virginia Railway & Power Company, Richmond, Va.—This company will add to its substation equipment two 400-kw, two-unit, three-bearing synchronous, frequency-changer sets, 14-kw and 17½-kw induction motor-generator sets and switchboards, this apparatus having been purchased from the General Electric Company.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company will add to its substation equipment a 1000-kw motor-generator set with switchboard and accessories. The General Electric Company will supply the equipment.

Manufactures and Supplies

ROLLING STOCK

Kansas City (Mo.) Railways is reported to be constructing twenty-five new cars in its own shops.

Southern Traction & Power Company, Alexandria, La., is reported as expecting to purchase two new cars.

Parkersburg, Marietta & Interurban Railway, Parkersburg, W. Va., is reported to have ordered two all-steel interurban cars from the Cincinnati Car Company.

TRADE NOTES

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received from the Third Avenue Railway a repeat order covering twenty-five PK control equipments for use on its low floor 24-in. wheel cars.

Transportation Utilities Company, New York, N. Y., has opened an office at 1201 Virginia Railway & Power Building, Richmond, Va. This is now a regular branch office and devoted exclusively to the well-known appliances that are manufactured by this company. The Richmond office is in charge of Frank N. Grigg.

General Electric Company, Schenectady, N. Y., has received an order to equip with GE-200 double motor equipment, K 36 controllers and air-brake equipments the twelve interurban cars which were recently ordered by the Empire United Railways from the St. Louis Car Company.

Fred. B. Corey, formerly for eleven years in the engineering department of the General Electric Company, and for the past three years engineer of inspection and tests of the Union Switch & Signal Company, reporting to the general manager, has resigned that position and opened an office at 404 Arrott Building, Pittsburgh, Pa. He will conduct a consulting engineering business, making a specialty of inspection methods and organizations for manufacturing companies. He will also give attention to electric railway signaling and allied subjects.

Truman P. Gaylord, who has succeeded H. D. Shute as acting vice-president of the Westinghouse Electric & Manufacturing Company, was born at Shelby, Mich., and attended preparatory school at Allen Academy, Chicago. He subsequently attended the University of Michigan, and in 1895 received the degree of electrical engineer from the Armour Institute of Technology, Chicago. Mr. Gaylord was an engineer of underground construction during the World's Fair, at Chicago, in 1892-1893. At the close of the Fair he became assistant professor of electrical engineering in the Armour Institute, which position he retained until 1898 when he became associated with the Commonwealth Edison Company of Chicago as electrical engineer. In July, 1899, he entered the employ of the Westinghouse Electric & Manufacturing Company as a salesman, following this line of work until 1902, at which time he was appointed district manager of the company in Chicago, which position he held until his recent election as acting vice-president.

Henry D. Shute, who was recently elected treasurer of the Westinghouse Electric & Manufacturing Company, was born at Somerville, Mass. He attended high school in Boston, and was graduated from the Massachusetts Institute of Technology in 1892 with the degree of Bachelor of Science in Electrical Engineering. Following his graduation he spent a year in Germany at the School of Mines, Clausthal, and also in Dresden. In 1893 he entered the works of the Westinghouse Electric Company at Pittsburgh as an apprentice and spent his first two years in the testing department, following which he was engaged for a considerable time in erection and laboratory work under the direction of Charles F. Scott and Lewis B. Stillwell, and later as assistant foreman. He entered the engineering department in 1897. One year later he was transferred to the commercial department and in 1901 he was made head of the alternatiing current division of that department. Two years later he was promoted to the position of assistant to Vice-President L. A. Osborne, in which position he was particularly active in the development of the heavy electric traction and single-phase railway work. In 1910 Mr. Shute succeeded Walter McFarland as acting vice-president of the company, which position he held until his recent election as treasurer. Mr. Shute is a director of the Pittsburgh Chamber of Commerce, and is closely identified with a number of technical and social organizations.

ADVERTISING LITERATURE

Dielectric Manufacturing Company, St. Louis, Mo., has issued a folder on its wood preservative, phenoleum.

Ohio Brass Company, Mansfield, Ohio, has issued a folder entitled "A Question of Moment," on the subject of its rail bonds.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a guide to useful Spanish words and phrases, compiled for the use of tourists and travelers.

William J. Niles, Philadelphia, Pa., manufacturer of flake white cement paint and specialist in the coating of concrete buildings, has issued a folder illustrating the work done in coating the Barcley Building, Newark, N. J.

Nachod Signal Company, Inc., New York, N. Y., has issued a leaflet describing the Philadelphia (Pa.) Rapid Transit Company's installation of trolley contact signals on its Chester Short Line, showing the signaling layout and car movements.

National Tube Company, Pittsburgh, Pa., has issued a catalog describing its regrinding valves. Three illustrations show a valve which was opened and closed 327,094 times. After being reground several times this valve was opened and closed over 3,046,280 times and is still in use.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued a bulletin describing its Ruby all-steel sectional buildings for railroad purposes. The special uses to which these buildings are applied include hand-car and tool houses, storehouses, warehouses and interurban shelter stations.

De La Vergne Machine Company, Mott Sand Blast Department, New York, N. Y., has issued a reprint of a paper recently read before the Associated Foundry Foremen of New York and Vicinity by H. D. Gates, sales manager, sand blast department of this company, which gives practical points on the selection and operation of sand blast equipment.

Stewart Warner Speedometer Corporation, Chicago, Ill, has issued a catalog describing its railway meters adapted for use in interurban railway cars and in school cars for training motormen how to operate cars at correct speeds in order to run them on time, also how to economize on power, An illustration in the catalog, accompanied by a letter, shows this latter application, as practiced in a school trolley car of the Toronto (Ont.) Railway.

Cutler Hammer Manufacturing Company, Milwaukee, Wis., has issued a series of bulletins for July, 1914, of which Nos. 4500, 4510, 4520 and 4530 describe its new line of automatic machine tool controllers for use with shunt or compound-wound d.c. motors, adapted for constant or adjustable speed work, with or without interpoles. Increased output and lower cost of production is claimed for this automatic control owing to the ability of the operator to start and stop without leaving his normal position; the possibility of the foreman setting the control at the proper speed for a job and leaving the operator free to start and stop, but unable to change speed; and the dynamic brake, by which a tool that would otherwise run several seconds after the power is cut off, is brought to rest practically at once by the motor, which acts as a generator and stops the tool. Bulletin No. 4510 describes automatic machine tool controllers of the plain starting type; Bulletin No. 4520, those of the speed setting type, and Bulletin No. 4530, those of the speed regulating type. Bulletin No. 6753 describes double-pole diaphragm regulators for d.c. and a.c. motors; Bulletin No. 7131, full magnetic controllers; Bulletin No. 9125, secondary resistance starting rheostats for polyphase slip ring motors; Bulletin No. 9130, multiple-switch starters; Bulletin No. 9135, drum type starters; Bulletin No. 9155, drum reverse switches; Bulletin No. 9320, panel type speed regulators; Bulletin No. 9350, drum reversible crane controllers; Bulletin No. 9355, hoist controllers; Bulletin No. 9359, rope operated drum reverse switch; Bulletins Nos. 9360 and 9365, speed regulators.

Electric Railway Journal

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Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

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HARD TIMES AND THE CONVENTION

Expenditures are being scrutinized this year with unusual care. The expense of sending delegates to Atlantic City will necessarily come up for review, and there may be a tendency to cut down at this point. It is to be hoped that this tendency will be resisted, for the industry needs the convention more this year than ever. The necessity for care in expenditure will have the advantage of enforcing the choice of the best-equipped men as delegates. It must be remembered that the convention is still the most vital thing in the Association. Once it was the whole thing, but now we have the elaborate machinery of the secretary's office, the effective midwinter meeting and the continuous grind of committee activity. The success of the association, however, is still bound up in that of the convention, and its increasing size demonstrates that this fact is appreciated. The exhibits this year will be at least as extensive as ever, an excellent program has been prepared, and there is every reason to expect a more than usually fine convention.

SINGLE-LINE WIRING DIAGRAMS

At the risk of repetition, we desire to emphasize the great value of single-line wiring diagrams in studying the operating features of generating plants, transmission and distribution systems. Continued observation of the usefulness of such sketches, whether made by free-hand or instrumental methods, justifies the opinion that the electric service or railway company which does not employ these simple aids to convenient operation when using alternating current is suffering from a severe case of executive mental friction in the technical department. One is almost inclined to assert that without such diagrams it is scarcely feasible to operate a high-tension system with due regard to safety and reliability of service; but the value of the single-line wiring layout applies to the distribution system as well. It would be hard to find any branch of engineering in which symbols of standard types of apparatus save more time than in applied electricity, and there is no easier way of taking into one's mind the essentials of the electrical arrangements in a modern plant, transmission system or substation than through the combination of such symbols with single-line connections. Such drawings are, of course, merely skeletons of plant arrangement, but they can be prepared in a few moments even for a fairly complex installation, including every essential switch, busbar, transformer coil and feeder type. The space occupied by such a sketch is trifling and admirably adapted to cards and loose leaves; auxiliary connections associated with measurement and automatic control of circuits are omitted without the slightest sacrifice of convenience. The bird's-eye comprehension of the system thus afforded is of the utmost value.

STEEL SHEATHING FOR CAR SIDING

It is interesting to note from the communication by F. R. Phillips, published elsewhere in this issue, that the standard thickness of side sheathing used on the Pittsburgh steel cars has been reduced recently to that of No. 14 gage sheet metal. This is halfway between the more commonly used thickness of 3/32 in. and the minimum, which, so far as we know, is 1/16 in. It is also interesting to note that this thickness of sheet with a flat bar for a belt rail and an angle for a side sill was found by Mr. Phillips to be more than sufficient to carry the load imposed by the weight of the car. This evidence in support of the use of the car siding to carry weight in place of the cumbrous center and side sills required in the underframe type of design is cumulative in character, but it is none the less valuable in pointing out the reason why the steel or semi-steel car is infinitely preferable with regard to weight and strength to one that is built of wood. The latter may, of course, be built in accordance with the principles of the side-girder design, such a construction having been reported as used many years ago on some cars for the old Atlantic Coast Electric Railway. However, the complication of the construction in wood was enormous in comparison to that required now that steel is available, and it is not surprising that the basis of the arguments on steel versus wood has centered on the relative merits of the side-girder truss construction as opposed to the underframe. It is this fact largely which makes the outlook so hopeless for the wooden car.

TRAIN RESISTANCE FORMULAS

In a communication printed in a recent issue of the ELECTRIC RAILWAY JOURNAL D. D. Ewing stated that he feared "that we shall have as much trouble in learning how to measure train resistance by direct measurement as we have had in deriving the 'generalized' formula for train resistance which C. O. Mailloux so 'devoutly' wishes for." Professor Ewing exhibited some curves showing that tests made on different cars within the past year yield data so different that they are applicable to other cases only under the conditions of the tests from which they were derived. In spite of the large expenditures made to secure facts of general application we seem to be little farther along in this direction than we were ten years ago. The data accumulated by temporary scientific organizations such as the Studiengesellschaft für Schnellbahnen and the St. Louis Electric Railway Test Commission seem not to have been utilized as they might. The former made many measurements of the resistance to the motion of models of car fronts through the air at all speeds besides investigating conditions of pressure, power consumption, etc., in large, specially built cars driven up to enormous speeds. The latter hung actual car vestibules on frictionless supports and drove them at various speeds, measuring the air pressure by means of dynamometers. Many other less extensive tests have been made and reported from time to time. Most of these experiments dealt with air resistance because this was considered most to need investigation. But the friction of journals, flanges, etc., has been under investigation also and much information along this line is available in other fields. With all of it at hand it would seem that a rational formula should be in sight. There has been a lull in activity in this subject for a few years. Possibly it is time to take it up again with renewed interest.

BROKEN BOLTS IN BUILT-UP CROSSINGS

Engineers for both electric and steam roads are constantly confronted with the problem of the best method of reducing the number of broken bolts in built-up railroad crossings. The usual plan is to reduce the vibration from traffic to a minimum by the installation of especially heavy timber sleepers to support the crossing on a ballast foundation, which usually is of extra depth. Many engineers have also increased the size of the bolts as a means of reducing this incessant breakage. Unquestionably the treated bolts which have recently come into general use have materially reduced the problem of broken bolts at crossings, but even with untreated bolts a number of steps may be taken to reduce materially the percentage of breakage.

Undoubtedly the broken bolt is the result of an unequal distribution of the load over all the bolts in a crossing. It is a well-known fact that ordinary track bolts stretch, and as soon as this has occurred the load is shifted from the loose bolt to a tight one which cannot carry a double load and breaks in a short time. If all the bolts are kept uniformly tight in a crossing, breakage will be reduced to a minimum. This means constant attention, and in any crossing all nuts should be provided with locking devices which will resist vibration.

If locking devices are used one cause of bolt breakage will be removed, and if followed by systematic and frequent tightening of the nuts, the second cause for trouble will disappear. Even with the treated bolt in a built-up crossing a lock device of some character should be employed so as to insure maximum life from the rails which form the composite crossing structure. All rails, namely, the running, easer and guard rails, must assume their portion of the load if maximum life in service is to be attained.

STANDARDIZATION IN CAR DESIGN

In any branch of any industry the possibilities of standardization are limited only by the industry's needs. The opportunities for economy, not only in first cost but in repairs as well, which are made available by standard design are of literally enormous scope. Ford, turning out complete automobiles at a manufacturing cost of some $200 each and providing repair parts in every hamlet throughout the country, is a living example of what strict standardization can accomplish. Although this case is an extreme one, it is only so because the needs of the automobile industry make it peculiarly susceptible to the advantages of the single design.

That the same conditions do not exist in the street railway industry may be accounted for largely by the less need for it in the past. A single design of car in universal use would, no doubt, have effected considerable savings during the last few years, although balanced against this would have been the loss of the experience gained by innumerable experiments together with the limitations, often exaggerated perhaps, that are imposed by the different physical conditions existing in different cities. However, the main reason for the present complete absence of standards in car design must be ascribed mainly to the fact that the need for them has by no means been a crying one. Electric railway cars, until a very short time ago, were universally built of wood, and on account of the ease and flexibility with which this material can be worked a change in design has meant but very little added expense.

With wooden cars it has been almost literally true that when an order for a car was received the builder sent out to the lumber storage and had it whittled out without waiting for detailed drawings. Under such circumstances it is hardly extraordinary that no exact standards have been developed. However, these conditions are now beginning to change. The all-steel car has made its appearance in both city and interurban service, and it is unquestionably going to stay. Indeed the steadily diminishing supply of wood makes the universal use of steel only a question of time, even neglecting its present inherent advantages.

This new factor in car construction cannot fail to change the viewpoint of the industry in regard to standard car design. The steel car cannot be whittled out like a wooden one. Dies, jigs and templets are required everywhere in its construction, and even the raw material from the steel mill is too costly to be maintained in large stocks by the builders. Standardization in car design has, therefore, suddenly become a need of the electric railway industry. That this need will grow with time cannot be doubted, and the premium placed upon uniformity in design will soon be too great to be neglected.

How far standardization can be carried in the near future is, of course, a moot question. The adoption of uniform dimensions for width and length is, perhaps, an impossibility, but there are numerous other features in design which need little more than official action for their standardization. This has been shown by the replies of a number of railways to letters sent by the ELECTRIC RAILWAY JOURNAL in regard to their practice in establishing certain dimensions, the information thus far received showing that some approximate standards actually exist to-day, although these have been adopted unconsciously and in accordance with the dictates of experience rather than through a desire for uniformity in design.

Certain roads have, of course, established standards of their own, and to the extent of reducing repair costs, these are of undoubted value. What is needed, however, is the standard of general application, and it is probable that the individual or local standards will prove rather a hindrance than a help. Be that as it may, if full benefits are to be obtained from the use of the steel car, many universal standards must eventually be fixed. This issue cannot be avoided, and it might better be faced now than several years hence, when the steel car has passed its infancy and is, in consequence, much less subject to modification than it is at present.

MAKING THE MOST OF THE CONVENTION

Advance copies of the A. E. R. A. committee reports will be sent out to members in a few days with a view to stimulating intelligent interest in the discussion. We take pleasure in responding to Secretary Burritt's suggestion that we urge advance study of these preprints, especially by those who expect to attend the convention. The expense to the association in publishing these reports is very great, and strenuous work on the part of committees has been necessary to complete them early. It is therefore highly desirable that the best possible use be made of them. Each year it becomes more important for the individual members of the American and allied associations to do some study preliminary to the conventions. Electric railroading is increasingly complicated, for development on the technical side is very rapid, while the public expects more and expects it cheaper. The association and its conventions must take a more vital grip on the industry and must be a source of information and inspiration to all concerned.

With the publication of these reports the association has done its part of the work. It is now up to the companies and the men whom they send to make the conventions a success or a failure. Success means that the companies must send their best men, and that these men must go prepared to discuss the papers and reports. Every company planning to send delegates, therefore, should insist that the contents of the reports be mastered at once. In this connection it is our belief that the comparatively inexperienced man who prepares himself thoroughly on one or more fundamental topics will do more for the convention and get more out of it than the more experienced one who depends upon the inspiration of the moment.

There is another advantage in such a preparation as we have mentioned. It safeguards the interests of the industry by insuring close scrutiny of committee reports. Conventions are too apt to accept and adopt committee reports because the committees are made up of good fellows, who ought to know their business, and each attendant feels that he is not as well qualified to discuss the subjects at issue.

Advance distribution of reports is intended to prevent this and will do so if the reports are studied. Proper use of preprints, then, benefits the industry, the association and the individual. There is no danger of becoming one of the "bump-on-the-log" type if one is studying in this way.

THE REVIVAL OF THE FLAGGING RULE

Elsewhere in this issue appears a communication by John Leisenring on the subject of the erstwhile rule which, at one time, permitted a train to proceed when protected by a flag in advance. Mr. Leisenring's experience in the electric railway field and his prominence in committee work naturally lend a great deal of weight to his opinion on this question which, summed up, is that, since present practice prohibits a train from accepting a clear signal as superior to the time-card it should logically refuse to accept a stop signal except as a warning when the indication could not possibly be produced by any scheduled train.

Mr. Leisenring's point is well taken when it is confined to consideration of normal operation, but there is one objection to his argument which we might raise at this time. This is the fact that motormen, and even dispatchers, sometimes make mistakes. If they did not, there would be no need for signals as now used. The delayed train, meeting an unexpected stop signal, as in the case cited by Mr. Leisenring, has, in the first place, no means of knowing that no one in advance has made a mistake. Even after waiting for a period long enough to permit any train to get through the block in advance (and this is something not always provided in the rule books) the delayed train has no surety that an opposing train has not entered the block, contrary to rules, while the wait was being made.

All of this, of course, assumes perfect observance of the old flagging rule, but, as a matter of fact, we all know that, in practice, its provisions are very carelessly followed. When signals are installed the permission to proceed past a stop indication under the doubtful protection of a flag can lead to nothing but disrespect for the importance of the horizontal semaphore arm and red light, and it is just this that causes most of the accidents in signalled territory. Indeed, if it is going to be necessary for railroads to fall back upon the time-card and standard code when the signals do anything more than present the most stilted and obvious indications, it is likely that the trainmen will cease to regard them as anything more than a joke. It is to provide for the extraordinary condition, the error in judgment or action, that signals are most often considered necessary. Signal rules might better support this well-established doctrine than to render it negative for the sake of saving a little time when signal failures occur.

The Chicago and West Towns Railway

Operating and Engineering Features of a City and Suburban Railway in a Densely Populated District West of Chicago—The Line Has Recently Been Rehabilitated for Efficient Operation

The beginning of what now forms the Chicago & West Towns Railway System, containing approximately 75 miles of track, was the natural growth in the surface railway lines extending beyond the corporate limits of Chicago, Ill. The original properties were the Cicero & Proviso Street Railway and the Ogden Street Railway, which later were operated by the Chicago Consolidated Traction Company. These companies passed through several consolidations and reorganizations until, in 1910, three years after the city of Chicago had granted new ordinances to the Chicago Railways, of which a portion of these lines was a part, a decree was entered by the United States Supreme Court ordering the sale of that portion of the lines outside the Chicago city limits. These lines were then purchased by the County Traction Company. In July, 1913, the County Traction and the Suburban Railroad were taken over by the Chicago & West Towns Railway and are now operated as a unified property.

TERRITORY SERVED

The following are the principal cities and towns served: Oak Park, River Forest, Maywood, Melrose Park, Forest Park, Cicero, Berwyn, Lyons, Riverside, Brookfield and LaGrange. Within recent years this territory has grown rapidly and now has become densely populated. It covers an area of approximately 35 square miles, and is served by five main east and west lines of the Chicago & West Towns Railway. One of these is known as the suburban line and extends from the corporate limits of Chicago to LaGrange, Ill.

In all these five lines traverse seventeen different cities made up largely of two classes of people, namely, those who travel into the city of Chicago in the morning and out at night and those who work in the factories located in this territory. Both classes of passengers tend to develop an abnormal morning and evening peak. A relatively good average load factor is obtained, however, because of the midday traffic to and from several large cemeteries located directly on the routes of this road. Also, during the summer months, many picnics and outing parties are carried to the summer parks and groves located on this company's lines in the territory along the Desplaines River.

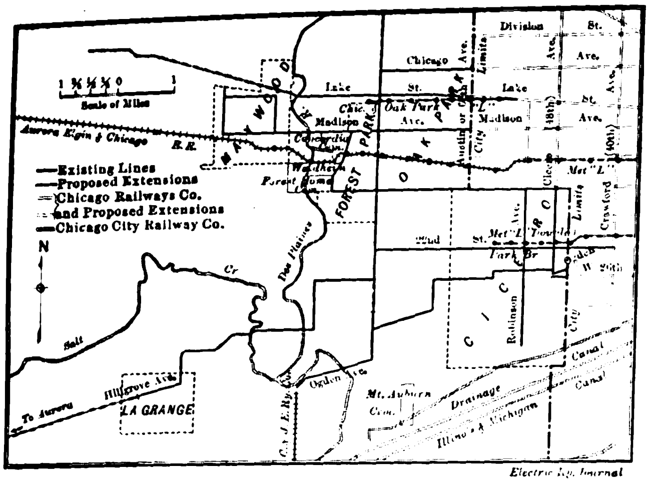
RATES OF FARE

For a number of years a single 5-cent rate was charged over this company's entire system. Recently, however, the fare on the "suburban" line was increased to a maximum of 10 cents. At an intermediate point, namely, the east boundary line of Riverside, a 5-cent fare limit has been established. To regular riders beyond this point, however, several forms of commutation tickets have been issued. These are furnished as ten rides for 90 cents, twenty-five rides for $2, and sixty-ride monthly individual tickets for $3. In order to provide for those passengers living between the end of the line and this 5-cent fare limit, a 7-cent single fare is charged from points midway between the 5-cent far limit and the end of the line. Commutation rates are also available to regular riders from the intermediate points, the lowest individual commutation fare being 5 cents. A map of the system is shown herewith.

TRACK STANDARDS

Within the past two years practically all of the track in paved streets has been rehabilitated. The standard type of track construction used in this work included a 96-lb. 7-in. girder-grooved rail in 60-ft. lengths. This was laid on 5-in. x 7-in. x 7-ft. white oak ties on a 6-in. rolled crushed-stone foundation. Surmounting this is a 7-in. concrete base for the pavement foundation, a 1-in. sand cushion and the brick paving surface. The irregular section formed by the rail is squared by plastering grout on each side, between the base and the head of

CHICAGO & WEST TOWNS RAILWAY—OAK PARK OFFICE AND REPAIR SHOPS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Madison
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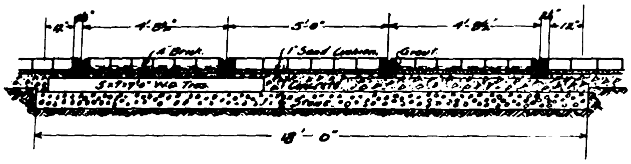
Waldheim
Forest Home Cem.
Des Plaines R.
Salt Cr
22nd St.
Met "L"
Hillgrove Ave.
To Aurora
Ogden Ave.
Mt. Auburn Cem.
Drainage Canal
Illinois & Michigan Canal
Robinson
Crawford
Electric Ry. Journal

CHICAGO & WEST TOWNS RAILWAY—MAP



CHICAGO & WEST TOWNS RAILWAY—CROSS-SECTION OF TRACK

the rail, thus insuring a water-tight joint where the paving joins the rail. Sixty-foot rail lengths were used to reduce the number of joints and they are made of 26-in. channels with six bolts. Track bonding is of the exposed type, being formed of one No. 0000 solid wire bond, 32 in. long and with compressed terminals.

On the "suburban" line, in unpaved streets and in the private right-of-way, the standard track construction consists of 7-in. 70-lb. T-rail laid on 6-in. x 8-in. x 8-ft. cedar ties spaced at 2-ft. centers. The track foundation under this class of construction is exactly like that in city paved streets; that is, it consists of 6 in. of rolled crushed-stone ballast. This is brought up to the level of the tops of the ties, and cinders are used to make up the road surface, which is leveled off even with the tops of the rails. The rails are fitted with round tie rods at 7-ft. 6-in. intervals, and are provided with four-hole 22-in. channel-plate joints. This class of construction also includes 60-ft. rail lengths and two types of bonds, namely, a No. 0000 8-in. brazed bond or two No. 00 expanded terminal bonds.

Two classes of special work were used in the standard types of track construction, namely, a built-up T-rail construction for frogs and crossings on the "suburban" line and at points in unpaved streets, and the cast-iron bond manganese insert construction in paved streets. Most of the lines are laid as double track with a standard track spacing of 9 ft. 8 in. between centers. One type of track construction is shown in cross-section in an accompanying illustration.

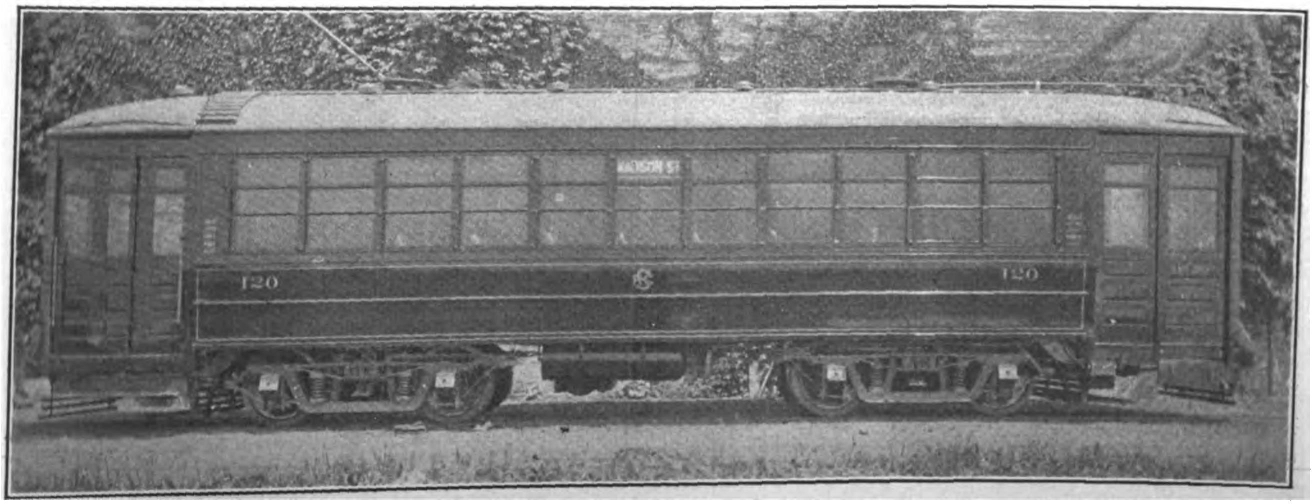
BRIDGES AND STRUCTURES

As indicated on the accompanying map of this company's lines, a number of important bridges and trestles were necessary where the lines cross the Desplaines River and Salt Creek. These include five structures, two of which are reinforced concrete arches built under contract with the cities. Each of the latter structures provides a wide walkway and roadway, and the one known as the Madison Street bridge in River Forest carries a single track while the other concrete structure, known as the Lake Street bridge, in Maywood, provides for paved driveways and walkways and a double track. On the line extending into Lyons, the track crosses the Desplaines River on a combination steel and wooden bridge used exclusively by the railway company but provided with walkways for the convenience of picnic parties, which are carried to this point during the summer months.

POWER GENERATION AND DISTRIBUTION

At the present time the Chicago & West Towns Railway owns two generating stations, one in Oak Park, known as the West Lake Street and Harvey Avenue station, and another as the Harlem Avenue and West Twenty-second Street station. The generating units at the Lake Street and Harvey Avenue station include two 465-kw and two 750-kw Siemens-Halske d.c. generators. These are driven by two 26-in. x 40-in. x 48-in. cross-compound Corliss engines, one 24-in. x 38-in. x 60-in. compound Corliss engine and one 28-in. x 48-in. simple Bullock engine. The tandem compound Corliss engine is direct connected to the two 465-kw generators. The cross-compound engine is direct connected to the two 750-kw units, which are generally used to take care of a railway power demand, the outer unit serving as spare. The generator and engine room is served by a 25-ton 55-ft. electric crane mounted on a runway which extends the full length of the building.

The boiler equipment consists of eight 300-hp Campbell & Zell water-tube boilers with Murphy automatic stokers and smokeless furnaces. These are served by a 200-ft. octagonal brick stack, 12 ft. in diameter. Coal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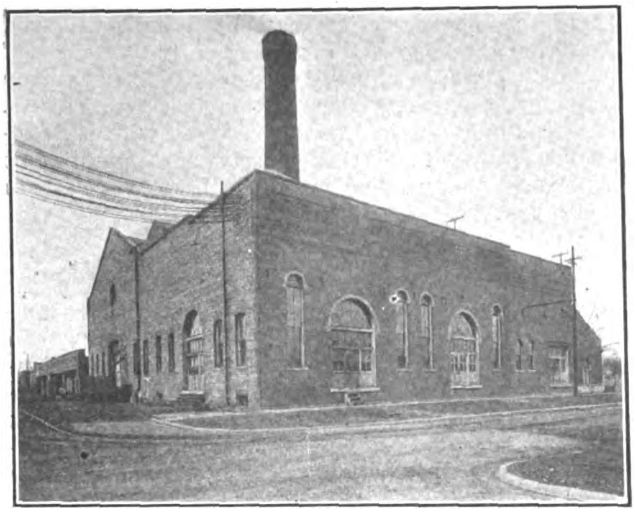
CHICAGO & WEST TOWNS RAILWAY—STANDARD CITY CAR



CHICAGO & WEST TOWNS RAILWAY—POWER STATIONS AT LAKE STREET AND HARLEM AVENUE

is supplied from overhead steel bunkers, which in turn are charged by a combination bucket and belt conveying system. Coal is dumped into a track hopper outside the power station, where, if necessary, it is passed through crushers to the conveying system. Boiler feedwater is supplied by a Worthington vertical duplex pump and two Blake vertical duplex pumps. From these the make-up water passes through a Cochrane feedwater heater and purifier of 500-hp capacity.

The overhead steel bunkers over the boiler-room aisle have a fuel storage capacity of 150 tons, and a storage shed in the yard adjoining the station building provides additional capacity for 550 tons of coal. The coal conveying system also serves for handling ashes, which may be delivered direct to cars on the street railway company's tracks beside the power station.

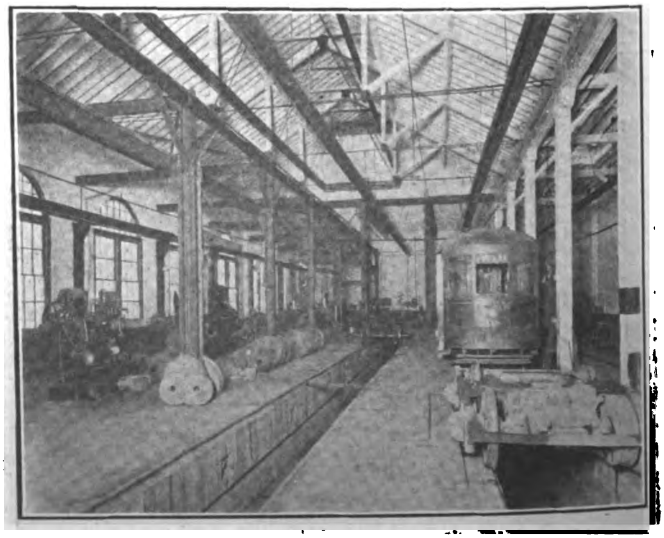
An unusually good load factor is obtained at this station, both for the average week-day and average Sunday loads, which is an evidence of the regular and continuous movement of traffic from 7 o'clock in the morning until about 8 o'clock in the evening. The average load during Sunday is somewhat unusual, reaching approximately 1300 kw at 1.30 p.m. and continuing at that point until about 9.30 in the evening. The average daily output is approximately 22,500 kw-hr.

The power-plant equipment at the Harlem Avenue and West Twenty-second Street station consists of two Walker generators of 750-kw capacity, direct connected to two Greene tandem engines. The boiler equipment consists of three 300-hp Sterling boilers served by a steel smokestack with a brick base, having a total height of 145 ft. There is also a condensing system lagoon built of concrete, the area of which is 21,109 sq. ft.

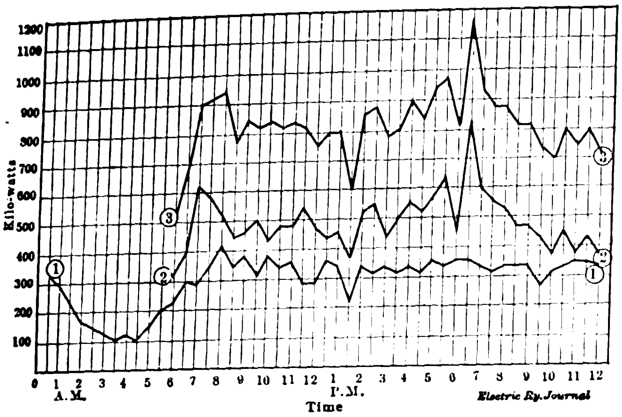
ROLLING STOCK

The rolling stock of this company includes eighty-four cars of the following types: twenty-one double-truck interurban motor cars, twenty-four double-truck city motor cars, sixteen double-truck trail cars and twenty-three general utility cars. The interurban cars operate over the suburban line from the Chicago city limits to LaGrange. They have double-end, closed monitor-roof bodies, 44 ft. 6 in. long by 8 ft. 8 in. wide, arranged for a seating capacity of forty-eight passengers. The interior finish is cherry and the cars are fitted with twelve drop sashes on each side. The car bodies are mounted on McGuire-Cummings trucks with a 6-ft. 6-in. wheelbase and are equipped with four GE-203 motors and type MK control. During the rush-hour periods these motor cars haul trail cars of a similar design, which have seating capacity for thirty-six passengers.

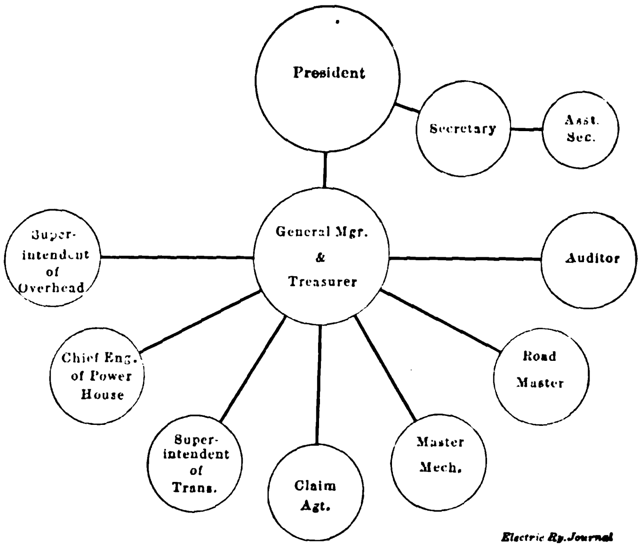
The standard city motor cars have closed arched-roof bodies, 45 ft. 6 in. long by 8 ft. 6 in. wide. They are of semi-steel construction and designed with eleven drop sashes on each side. The interior finish of these cars is cherry. They have reversible rattan seats for forty-four passengers. These cars were built by the McGuire-Cummings Manufacturing Company. Four-



CHICAGO & WEST TOWNS RAILWAY—DESPLAINES RIVER BRIDGE AND INTERIOR OF REPAIR SHOP



CHICAGO & WEST TOWNS RAILWAY—AVERAGE WEEK-DAY KILOWATT LOAD



CHICAGO & WEST TOWNS RAILWAY—ORGANIZATION CHART

teen of them are equipped with four GE-226 motors with K-35 control, and ten cars are equipped with two GE-203 form-L motors with K-51 control.

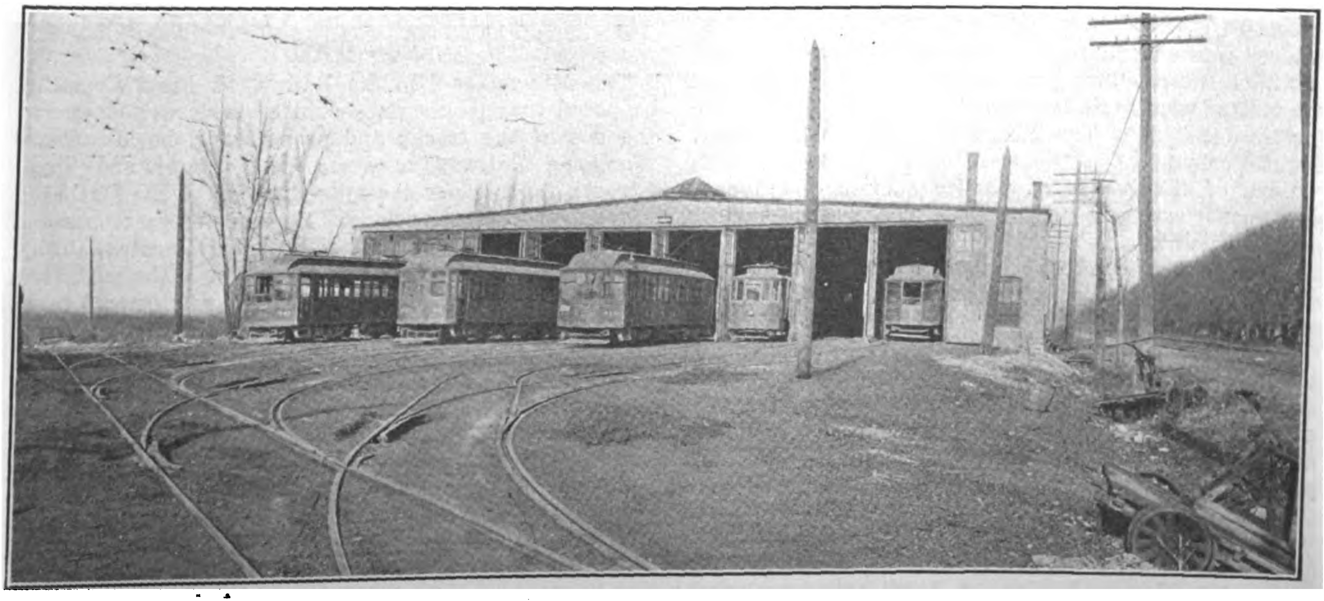
CAR STATIONS, SHOPS AND OFFICE BUILDING

Located at West Lake Street and Cuyler Avenue in Oak Park is a combination car station, repair shop and office building. This is a pressed-brick and steel structure, 192 ft. x 227 ft. 7 in. in plan, the office portion of which is two stories in height. This building occupies an entire block. The entrance to the office building leads from West Lake Street. Entrances to the carhouse and repair shops are from a ladder track on North Boulevard. Three tracks enter the repair shop, in which two of them pass over 180-ft. concrete inspection pits extending approximately the full length of the shop. These three tracks occupy about one-half of the floor space, the other half being equipped with repair-shop machines installed with individual motor drive. The repair shop joins the two-story office building on the rear. Connected to these is a one-story brick and steel carhouse with eight single-track bays. A brick partition wall with fire doors separates the repair shop and carhouse. The bays in the carhouse are separated by hollow-tile partition walls, also fitted with fire doors. All car entrances are provided with Kinnear rolling doors manually operated.

A second carhouse and repair shop for interurban cars is situated on the same property with the Harlem Avenue generating station. This is a brick and steel structure 115 ft. wide by 225 ft. long. As shown in one of the illustrations, nine tracks enter one end of this building through double swinging doors. These tracks lead from a single ladder track located at a sufficient distance from the building entrances to provide clearance for at least one car in the open. Light repairs are made at this carhouse, and it also serves as headquarters for the train crews for the suburban line.

OPERATING ORGANIZATION

The personnel of the executive and operating organization and heads of departments is as follows: Willard H. McEwen, president; Frank L. Butler, general manager; Charles F. Propst, secretary; John Whitsell, superintendent of transportation; W. C. Bell, assistant superintendent of transportation; Bert C. Collette, claim agent; William Armstrong, auditor; Orville C. Badger, engineer maintenance of way; P. S. Woodward, master mechanic; H. R. Chadwick, superintendent of overhead; B. F. Nickerson, roadmaster, and J. A. Olson, chief engineer of power stations. The attention of the operating officials during the past year has been directed largely to the rehabilitation of the property. It has been modernized and rebuilt for efficient operation. Plans are now being made for various extensions that have become necessary because of the growth of the territory.



CHICAGO & WEST TOWNS RAILWAY—GENERAL VIEW OF HARLEM AVENUE CARHOUSE

Joint Use of Tracks in Milwaukee

Decisions in Cases of Milwaukee Electric Light & Railway Company Versus Milwaukee Northern Railway and Versus the Chicago & Milwaukee Electric Railway—Railroad Commission Settles Questions Regarding Liability for Damages, Right to Furnish Power and Compensation for Power and Use of Tracks and Equipment

Two decisions on joint use of tracks have been rendered by the Railroad Commission of Wisconsin in the cases of The Milwaukee Electric Railway & Light Company versus the Milwaukee Northern Railway and versus the Chicago & Milwaukee Electric Railway. The Milwaukee Electric Railway & Light Company owns practically all the lines in Milwaukee, and each of the other companies operates an interurban line, one from the north and the other from the south, over single streets and along its own tracks to about the center of the city. The cases involved the right of the city company to improve traffic conditions by operating its cars over certain portions of the tracks of the other two companies within the city limits, as well as the placing of the liability for accidents and the determining of the right to furnish power and the compensation for the use of track, power, etc.

MILWAUKEE NORTHERN RAILWAY

The section in question in the case of the Milwaukee Northern Railway lies between Fifth and Sixth Streets. The company operates under the authority of an ordinance passed on March 22, 1906, which provides among other things that the city reserves the right to grant permission to use the company's tracks and motive power on payment of a just and adequate compensation by other lines in the city. Acting under the rights reserved in this ordinance, the city on April 14, 1913, passed an ordinance permitting The Milwaukee Electric Railway & Light Company to extend its tracks on Wells Street from West Water Street to Fifth Street and from Sixth Street to Eleventh Street. This move was taken because of the congestion of traffic on the tracks of The Milwaukee Electric Railway & Light Company and the possibility of re-routing some of its lines in case the new line was built. It was provided that the tracks should be completed within six months and that The Milwaukee Electric Railway & Light Company should receive permission, subject to the prior and preferential rights of the Milwaukee Northern Railway, to the latter's tracks and other equipment on Wells Street between Fifth and Sixth Streets. The two companies entered into negotiations looking toward an agreement, but upon their failure to meet upon the terms involved the matter was carried before the Railroad Commission for its decision by The Milwaukee Electric Railway & Light Company.

Each of the interested parties submitted a formal agreement embodying its ideas concerning various points which it considered ought to be covered. Most of these were in substantial accord and no mention was made of them in the commission's decision. In the matter of liability for accidents and compensation for the furnishing of power and the use of tracks and equipment, however, the two companies did not agree; and, after stating that public necessity and convenience demanded the joint use of the tracks, the commission devoted most of its decision to a discussion of these points.

LIABILITY FOR ACCIDENTS

The Milwaukee Northern Railway proposed that The Milwaukee Electric Railway & Light Company should indemnify it for all liabilities and claims growing directly or indirectly out of the operation of cars or equipment owned by the latter company over the tracks on Wells Street between Fifth and Sixth Streets, the intention being to place on the latter company all liability, whether accidents were due to acts of its own employees or officials, to acts of the employees or officials of both companies or even to acts of the employees or officials of the Milwaukee Northern Railway alone. This view was taken on the ground that the joint use of these tracks would mean increased risk and that the compensation which the Milwaukee Northern Railway would receive for the use of the property would be comparatively small. The commission stated that it realized that the earnings from this source for a period of years might be wiped out by the losses due to a single accident, but that this was not sufficient reason for taking all the burden of responsibility for accidents from the Milwaukee Northern Railway and placing it upon the other company. According to the commission, the joint use of the tracks was something that was being forced in a measure upon both companies for the benefit of the public and no reason existed for discriminating between them.

The commission decided, therefore, that the Milwaukee Northern Railway must indemnify the city company for any loss or damages which the latter may sustain to its property by reason of the operation of cars or equipment of the Milwaukee Northern Railway or any cars operated in its custody, and vice versa. In the case of the damage being caused by the fault or negligence of both companies, each company must bear one-half of the loss, excepting attorneys' fees. When any claim is brought against one company based solely upon the operation of the other company's cars, the first company shall notify the latter company and the latter must at its own expense settle the claim or defend any action brought. In the case of a joint liability, each company must notify the other in order to give it the right to appear and participate in the action.

COMPENSATION FOR USE OF TRACK AND OVERHEAD EQUIPMENT

The Milwaukee Electric Railway & Light Company proposed that payments should be made as follows for the use of the tracks and property of the Milwaukee Northern Railway between Fifth Street and Sixth Street: 6 cents per car mile for each of the first 5000 car miles or fractional part thereof per year operated over this section by The Milwaukee Electric Railway & Light Company; 4½ cents for each of the next 5000 car miles or fractional part thereof per year; 3 cents for each of the next 5000 car miles or fractional part thereof per year, and 2½ cents for each car mile or fractional part thereof over 15,000 car miles per year. According to the exhibit presented by The Milwaukee Electric Railway & Light Company, as based on its own experience, the maintenance and operating cost per car mile would amount to 1.08 cents. The fixed charges, estimated as a percentage of the investment, would amount to 7.60 per cent for depreciation, 1.97 per cent for taxes and 7.50 per cent for return on the investment, giving the total fixed charges of 17.07 per cent. On a basis of an aggregate investment of $38,559 per mile of single track, the fixed charge would amount to $6,582 per year. Then, by assuming various annual car miles per mile of track, the rental was shown to vary as follows: From 1.08 cents for operating expenses per car mile and 6.58 cents for fixed charges per car mile, or a total of 7.66 cents, in the case of 100,000 car miles to 1.08 cents for operating expenses per car mile and 2.19 cents fixed charges per car mile, a total of 3.27 cents, in the case of 300,000 car miles per year. This last figure was supposed to be the maximum that could be operated to advantage on a single track. In arriving at the sliding scale of compensation proposed, the aim of The Milwaukee Electric Railway & Light Company was to get an average rate of 4 cents per car mile.

It was found by the commission, however, that under the sliding scale the compensation paid by The Milwaukee Electric Railway & Light Company would not always be adequate, and there appeared to be no condition under which each company would bear a share of the burden exactly proportionate to the use of the tracks. In the opinion of the commission the proper basis for such compensation would involve the consideration of the cost of maintaining the property in good repair, net cost of renewals, replacements and reconstruction, taxes paid upon the property and a reasonable rate of return.

On account of the fact that the items mentioned vary for different railways and even for different sections of the same railway, the commission deemed it better to determine the actual cost so far as possible on the particular piece of property in question rather than the average cost for the entire system. The proposal of The Milwaukee Electric Railway & Light Company was held to be open to the objection that a portion of the figures used represented the average cost of its own property instead of the actual cost on the property of the other company. Furthermore, the use of car miles as a unit would not give a just division, since the types of cars used by the two companies might vary considerably in weight and capacity.

DETERMINATION OF TON MILEAGE

For the above reasons the commission decided upon an exact accounting of cost on the property in question and upon a division of the cost upon a ton-mile basis about in accordance with the plan proposed by the Milwaukee Northern Railway. This company proposed that the ton miles operated should be computed upon a basis of the total number of tons of 2000 lb. passing over the tracks, except that in the case of passenger cars the weight of passengers, merchandise and express matter should be excluded from the tonnage. The Milwaukee Electric Railway & Light Company's proposal was similar, but it provided that in the case of all cars used exclusively for the transportation of merchandise or express and in the case of passenger cars where the space devoted to the transportation of such commodities should exceed 16 sq. ft. the actual weight of the car and the contents should be included. The commission decided, however, that the weight of the passengers was so variable and uncertain a quantity as to be practically impossible of exact determination and that to omit the load in the case of passengers and to include it in the case of merchandise would under certain conditions result in discrimination. For the sake of simplicity, therefore, it was determined to omit the weight of the load altogether. It was not contended that this omission would result in exactly the same proportioning of cost as would be the case if the loads were included, but it was believed that the results could be determined with sufficient accuracy without knowing the exact tonnage.

COMPENSATION FOR ELECTRICAL ENERGY

Owing to the greater reliability of the energy output it was conceded by the Milwaukee Northern Railway to be advantageous for The Milwaukee Electric Railway & Light Company to supply the current over the tracks from Fifth to Sixth Street. This company proposed that the Milwaukee Northern Railway should pay the sum of 1 cent per kw-hr. for all current actually consumed. The Milwaukee Northern Railway did not criticise the 1 cent per kw-hr rate as being excessive, but it objected to this basis on the ground that this figure was greater than its own cost and that it should not be put to any additional expense in using the power of the other company because the latter's cars were operated over its own tracks. No figures were offered, however, to show the exact cost to the Milwaukee Northern Railway under its own proposal. Although on general principles the commission felt that it would be fair to both companies for The Milwaukee Electric Railway & Light Company to charge a rate equal to the Milwaukee Northern Railway's own output cost for energy, still it considered that any attempt to fix such a rate would be likely to result in disputes. The amounts involved in the case were held hardly to justify the time and expense necessary for a full investigation of this on the part of the commission, and since the rate offered by The Milwaukee Electric Railway & Light Company admittedly was not excessive, it was adopted. The rate is subject to revision at the end of any fiscal year upon the application of either company to the commission.

DUTIES OF COMPANIES

According to the decision of the commission, the Milwaukee Northern Railway is to make the necessary changes in the arrangement of its tracks and overhead installations between Fifth and Sixth Streets. The Milwaukee Electric Railway & Light Company is to stand the expense of connecting its double track with that of the other company by suitable frogs and switches and also the expense of making all necessary connections between the overhead systems.

After the commencement of the joint use of the tracks the Milwaukee Northern Railway is, at its own expense, to maintain, replace and renew the double tracks and the overhead system. The Milwaukee Electric Railway & Light Company is to maintain, replace and renew all frogs and switches and the connections between the overhead system of its own line and that of the section on Wells Street.

The Milwaukee Electric Railway & Light Company is to furnish the electrical energy required for a period of three years beginning at the commencement of joint operation. At the expiration of this period, upon the application of either company, the commission will open the question of the further supply of electrical energy and the conditions under which the same shall take place.

On or before the first day of each month the Milwaukee Northern Railway is to pay The Milwaukee Electric Railway & Light Company for the power used at the specified rate of 1 cent per kw-hr. The amount of energy consumed by the Milwaukee Northern Railway is to be considered as having the same ratio to the total energy drawn from the overhead system on the section of Wells Street in question as the ton miles operated over the tracks by the Milwaukee Northern Railway bear to the total ton miles. The energy is to be measured by suitable meters located on Wells Street, to be installed at the expense of The Milwaukee Electric Railway & Light Company. Provision is made for an examination of the meters in case of suspected error and for the payment of the test by the Milwaukee Northern Railway in case the meters do not register in excess of 2 per cent above normal, the cost of the test otherwise being borne by The Milwaukee Electric Railway & Light Company.

On or before the last day of each month The Milwaukee Electric Railway & Light Company must pay to the Milwaukee Northern Railway the following amounts: (1) Such proportion of the monthly cost to the Milwaukee Northern Railway of maintaining in good repair the Wells Street section situated on the south side of the street as the ton miles operated thereover by The Milwaukee Electric Railway & Light Company bear to the total ton miles. (2) A similar proportion of the monthly cost of maintaining the tracks on the north side of the street. (3) Such proportion of the monthly net cost to the Milwaukee Northern Railway of renewing, replacing and reconstructing that part of its system (including paving) on the south side of the street as the ton miles operated thereover by The Milwaukee Electric Railway & Light Company bear to the total ton miles. (4) A similar proportion of the monthly net cost of renewing, replacing and reconstructing the track on the north side of the street.

The net cost to the Milwaukee Northern Railway of replacements, renewals and reconstructions is to be determined as follows: The commission is to determine the initial accrued depreciation as of the date of the commencement of joint operation and the final accrued depreciation at the time of the lawful expiration of joint operation. The difference between these shall be added to or subtracted from the cost of all renewals, replacements and reconstruction during the life of the order and the result shall be considered the total net cost. The monthly net cost shall be that amount of replacements, renewals and reconstruction due and payable each month, but the difference between the initial and final accrued depreciation shall be considered as falling due only when operation under the order of the commission has lawfully terminated. The initial accrued depreciation shall be taken as $175 for the southern section of the track and $417 for the northern section.

On or before the last day of July The Milwaukee Electric Railway & Light Company is to pay to the Milwaukee Northern Railway the following amounts for the use of the latter's track and other property: (1) Such proportion of the annual taxes paid by the Milwaukee Northern Railway upon the part of the system (including paving) situated on the south side of Wells Street between Fifth and Sixth Streets as the ton miles operated by The Milwaukee Electric Railway & Light Company bear to the total ton miles. (2) A similar proportion of the annual taxes paid for the part of the system on the north side of the street. (3) One-twelfth of such proportion of an annual return of 8 per cent of the value new of that cost of the Milwaukee Northern Railway's system (including paving) situated on the south side of the Wells Street section as the ton miles operated by The Milwaukee Electric Railway & Light Company bear to the total ton miles. (4) One-twelfth of a similar proportion of an annual return of 8 per cent of the value new of the line on the north side of the street. The values new shall be taken as $3,240 for the portion south of the center line of Wells Street and $2,930 for the portion north of the center line.

On or before the twentieth day of each month each company must render a statement to the other company showing the ton miles it has operated. The Milwaukee Northern Railway is to include in its statement the amounts paid during the previous month for maintenance and renewals, the amounts paid in connection with the portions of the track on the north and south sides of the street being kept separate. On or before the twentieth day of each July the Milwaukee Northern Railway is to render to the other company a statement showing the amount paid for taxes on the two separate portions of the line. Each company is to give to the other company access to its books and records for the purpose of verifying the accuracy of any of its reports. Any over-payment or under-payment is to be adjusted yearly, June 30 being considered as the end of the fiscal year.

CHICAGO & MILWAUKEE ELECTRIC RAILWAY

The case between The Milwaukee Electric Railway & Light Company and the Chicago & Milwaukee Electric Railway is similar to the above, with the exception that the line involved tracks on Wells Street from Second to Fifth Street.

SUPPLYING THE ELECTRICAL ENERGY

The chief point of contention in this case was in regard to which company should supply the power for the operation of cars. The Milwaukee Electric Railway & Light Company stated that it was willing to supply the power at a lower rate per kilowatt than it costs the Chicago & Milwaukee Electric Railway for power delivered to its trolley wire under present conditions, and also that it could furnish a more reliable supply than the other company for the reason that its source of supply in the district would be close enough to enable it to furnish current of good voltage and because it has several feeder cables available so that the supply would not be dependent upon a single cable. The Chicago & Milwaukee Electric Railway, however, insisted upon its right as owner of the property to furnish the necessary power and contended that under its present power contract with The Milwaukee Electric Railway & Light Company the minimum consumption limit would be passed if it did not furnish the power for Wells Street and it would be obliged to pay double for a portion of its power.

The commission stated that it would be possible to string two separate trolley wires so that each company could use its own power. Such an arrangement would simplify matters of bookkeeping and compensation, but under it opportunity would exist for cars of one company to take power from the wires of the other company by merely shifting the trolley pole. A mistaken sense of loyalty on the part of employees, a personal grudge against the other company or an appreciable difference in the potential of the two power supplies, leading to an easier and faster operation of the cars, might cause this taking of power from the wrong wire. Such a theft of power would be difficult to detect and guard against, and even though no intention of theft actually existed, the situation would create an opportunity for suspicion and recrimination between the companies. For these reasons the commission did not feel inclined to order the installation of two sets of trolley wires.

The commission took the general view that the company owning the tracks should be permitted to furnish the power, provided it could furnish power reliable in character and sufficient in quantity. The investigation of the commission, however, showed that the Chicago & Milwaukee Railway buys power from The Milwaukee Electric Railway & Light Company and transforms it to a 625-volt d.c. current at its substation, situated at the southern city limits. The current is transmitted from the substation to the trolley over a 750,000-circ. mil feeder cable, extending to a point on Wells Street within 45 ft. of Second Street, a distance of approximately 3¼ miles. While the Chicago & Milwaukee Electric Railway could probably take care of the ordinary power requirements arising from the joint use of tracks on the Wells Street section, the commission felt that it was not equipped to supply the current that might occasionally be required under emergency conditions. With a 750,000-circ. mil feeder cable 3¼ miles long, two 3-0 trolleys and a double-track rail return, a blockade of traffic on the Wells Street section might lead to a voltage drop of 380 volts or more, which could not be considered good practice. Then, too, the actual cost of transmitting a.c. power to the interurban company's substation at the city limits, transforming it and turning it back to Wells Street would be greater than the actual cost of supplying the current direct from the Oneida Street or the Commerce Street station of The Milwaukee Electric Railway & Light Company, both of which are near the Wells Street section. Finally, as regards the contractual minimum consumption of power as between the Chicago & Milwaukee Electric Railway and The Milwaukee Electric Railway & Light Company, the commission found that the former company could use to advantage on other portions of its system the small amount of current it would not use on Wells Street in case the power there should be furnished by the city company. The commission decided, therefore, that The Milwaukee Electric Railway & Light Company should furnish all the electrical energy required for the joint operation of cars for a period of three years, beginning at the commencement of joint operation. At the expiration of this period, upon application of either company, the commission will determine the question of future supply and the governing conditions.

COMPENSATION FOR ELECTRICAL ENERGY

The Milwaukee Electric Railway & Light Company proposed to furnish power at the rate of 1 cent per kw-hr. Statement was made during the hearings that the Chicago & Milwaukee Electric Railway under its present arrangement for power pays from 1.4 cents to 1.7 cents per kw-hr. As this statement was not refuted, the proposed rate was fixed.

DETAILS OF ORDER

The Milwaukee Electric Railway & Light Company is ordered to make the necessary connections between its overhead system and that of the other company and also to join its double track with that of the Chicago & Milwaukee Electric Railway. From the time of joint operation the Chicago & Milwaukee Electric Railway is to maintain, replace and renew the double-track and overhead system on Wells Street from Second to Fifth Street, and The Milwaukee Electric Railway & Light Company is to maintain, replace and renew the connecting frogs and switches and the connections between the overhead systems of the two companies.

DIVISION OF ENERGY

The amount of energy consumed by the Chicago & Milwaukee Electric Railway is to be considered as having the same ratio to the total energy drawn from the overhead system of the Wells Street section as the ton miles operated by the Chicago & Milwaukee Electric Railway bear to the total ton miles operated over the track. In the determination of the number of ton miles, only the weights of the cars are to be considered.

PAYMENTS

On or before the last day of each month The Milwaukee Electric Railway & Light Company is to pay to the Chicago & Milwaukee Electric Railway such proportions of the monthly cost to the Chicago & Milwaukee Electric Railway of maintaining its system (including paving) between Second and Fifth Streets on Wells Street in good condition and the monthly cost of renewing, replacing and reconstructing it as the ton miles operated thereover by The Milwaukee Electric Railway & Light Company bear to the total ton miles. In computing the net cost to the Chicago & Milwaukee Electric Railway of renewals, replacements and reconstruction, the same procedure is to be followed as in the case of the Milwaukee Northern Railway. The initial accrued depreciation is set at $2,438.

The following additional payments are to be made by The Milwaukee Electric Railway & Light Company: (1) One-twelfth of such proportion of an annual return of 8 per cent of the value new of the section as the ton miles operated by The Milwaukee Electric Railway & Light Company bear to the total ton miles, this value new to be considered at the date of this order as $17,654. (2) Such proportion of the annual taxes paid by the Chicago & Milwaukee Electric Railway on the section Electric Railway & Light Company bear to the total ton miles. This payment for taxes is to be made on or as the ton miles operated thereover by The Milwaukee before the last day of each July.

Conferences on South American Trade Conditions

The National Foreign Trade Council has issued a statement calling attention to certain fundamental conditions surrounding South American trade which must be taken into consideration by United States manufacturers before existing trade can be improved. The chairman of the council is James H. Farrell, president United States Steel Corporation. The council consists of thirty-five national representatives of manufacturers, merchants, railroad and steamship men and bankers, representing all sections of the country and collectively standing for the general interest of all elements engaged in foreign trade. The statement discusses the characteristics of South American trade, the influence of the European war upon commerce and the need of better banking and credit facilities between South America and the United States.

In view of the widespread attention and comment that has been given to the present trade opportunity in South America, the industrial bureau of the Merchants' Association of New York has been investigating South American trade conditions. In its issue of *Greater New York* of Sept. 7, it publishes an interview regarding general conditions and cautions applying to commerce as a whole. In its future issues it intends to publish a series of articles covering specific opportunities in different countries and the grades of goods demanded in different lines, such as electrical goods, machinery, etc.

A conference between Latin American diplomats and various bankers and representatives of exporting houses, called by Secretary of State Bryan, was held in Washington on Sept. 10. The development of the trade of the United States with South American countries was the subject of discussion. It is said that nearly all South American countries are looking to the United States to supply the exports formerly furnished by Europe, and also that these countries will call upon United States banking houses for more than $100,000,000 of capital to develop their domestic resources.

Kansas has been progressing rapidly in the matter of transit facilities. Five years ago there were only five interurban railways in that State. Now there are sixteen, some of them still in course of construction. The expansion has been due to the awakening of Kansas to the fact that interurban service is an important adjunct of commercial development.

Electric Railway Trade Prospects

Additional Opinions from Electric Railway Manufacturers and Others Concerning Effect of European War on American Trade, Domestic and Foreign—Special Discussions on Increasing South American Commerce by Theodore Stebbins, Gano Dunn and Robert W. Hunt

The ELECTRIC RAILWAY JOURNAL of Sept. 5 contained a compilation of opinions of various electric railway manufacturers regarding present commercial conditions, the probable effect of the European war on both domestic and foreign trade and the proper methods to be used for the improvement of South American trade. Answers from additional manufacturers in regard to these same points follow in part:

H. W. Johns-Manville Company, New York.—This company is meeting considerable difficulty in manufacturing certain of its products on account of the shortage of supplies from foreign countries. Among these are cork from Spain and sal ammoniac from England. A certain amount of sal ammoniac can be obtained in this country, but it is usually of an inferior quality. Difficulty is also being experienced in obtaining suitable quantities of rubber. A large amount of orders is being received, although the tendency shown is toward small amounts.

Crocker-Wheeler Company, Ampere, N. J.—Dr. Schuyler S. Wheeler, president, believes that the cessation of imports due to the war will have no important bad effects upon his industry, because, unlike most others, it uses exceedingly little foreign material. Moreover, all industries, even those that have used much imported material, can adjust themselves to the use of domestic material without serious consequences, except possibly in a few cases. Aside from the reduction of business in this country caused by the cessation of exports, much of the dullness so generally discussed is owing to anticipated slight increases in the cost of the finished product, but this increased cost will be disregarded when the available supply is depleted. There will be a considerable restriction of business for a time owing to the natural conservatism which holds owners back until they have ascertained the exact status of their product under the new conditions in which cost changes, even though very slight, are for the moment considered important. The depression and loss caused by the war will, of course, be largely, though not fully, offset by the gains in business.

Griffin Wheel Company, Chicago, Ill.—While this company has some business in the Orient, it has not been able to meet German, English and Belgian competition in South America. Most South American railways require a steel-tired wheel for both passenger and freight equipment. In order for an American chilled-iron wheel company to obtain much business from railways prejudiced to the steel-tired wheel as well as disposed to purchase in Europe on account of European investments, it will require not only an educational campaign but also more friendly relations between American capitalists and South American railways. While it is possible that American wheel manufacturers may be able to obtain the South American business during the European war period, it is doubtful whether they will be able to retain it after the war has ceased. The company maintains agencies in Argentina and China, which have been instructed to make a strenuous effort to obtain the orders formerly placed in Europe. Aside from the prospective foreign business, the European war has not affected the company's American trade. The total business to date approximately equals that of last year. Orders for wheels for new equipment, however, are at a minimum, since American railroads do not care to finance new propositions on a 7 per cent interest basis. If the European situation is continued this company may be affected by its failure to obtain the 80 per cent ferro-manganese used in manufacturing its high-carbon chilled-iron wheels. It is believed, however, that before the supply is exhausted, American concerns will be in a position to supply satisfactory ferro-manganese. It is possible to use a substitute, such as ferro-chromium, but this would make an increase in the market price of chilled-iron wheels necessary.

Wendell & MacDuffie Company, New York.—This company, which deals in electric railway cars and equipment, is making preliminary arrangements for possible future South American business. Realizing that the initiative must be taken in this country to develop business and that the financial limitations in South America will tend to discourage development, plans are being made through manufacturing companies represented, to investigate commercial opportunities, supply the necessary technical skill and arrange for credit as required. Preliminary arrangements have already been made with one of the large banks for the last-named purpose. One of the interesting war developments has been a revival of inquiries in the foreign field where the company formerly did a large business and advertised widely. The present inquiries are based upon advertising discontinued years ago.

Niles-Bement-Pond Company, New York.—Walter L. Clark, vice-president, reports a general depression in the machine-tool trade owing to tightness of the money market, the principal encouraging feature being some demand from the warring countries for tools. One large order for approximately $500,000 of tools has been received recently by the Pratt & Whitney Company. As the company is not dependent in any way upon the warring countries for materials, there is no direct embarrassment resulting from the war. The South American business has not as yet been affected.

The Protective Signal Manufacturing Company, Denver, Col.—S. L. Shober, president of the company, states that no material used by this company is purchased from abroad. Domestic business will be affected by the war only to the extent that the present financial complications restrict all business enterprises. The foreign business of the company is at present too small to be affected. The company expects to take up the question of developing trade in South America, but now its chief attention is being paid to domestic business.

Keyes Products Company, New York.—Thus far war conditions have not seriously affected this company. The company uses foreign material but believes this can and will be produced in this country. As yet, however, the company has not regarded it as necessary to consider this phase of the matter seriously. Inasmuch as the company's business is largely with ship owners and builders and railroads it is safe to assume that its business will ultimately be much curtailed. The foreign business of the company will be practically at a standstill. No more efforts than usual have been made to develop South American trade, although it is felt that the attention being given by financial men to the establishment of better banking facilities with South American companies will go far toward stimulating the ambition and efforts of American electrical and other manufacturers.

The Thew Automatic Shovel Company, Lorain, Ohio. —According to F. A. Smythe, president, very little foreign business is done by this company and practically no attempts have been made to secure orders of this nature. No material is imported from foreign countries. No effort is being directed at present toward securing South American business, and it is not clear whether the opportunities for securing such orders are materially increased as a result of the existing European conflict.

Yale & Towne Manufacturing Company.—Henry R. Towne, president, says that the United States is the only great industrial nation whose industries are not disjointed by the present European war. The country is exceptionally sound and strong financially. Its vast industrial facilities, while at present not fully employed, are ready to respond immediately to an accelerated demand whether at home or abroad. Under present conditions there is no cause for alarm, but there is much to justify the early expectations of a betterment of business conditions in this country. Mr. Towne believes that American foreign trade will soon be resumed and that domestic industry and commerce will soon show signs of recovery and may by the end of the year become very active. In brief, he advises the exercise of patience for the present and the maintenance of confidence for the near future.

Street Railway Signal Company, Philadelphia.—Broader inquiry from railways and the booking of some substantial orders are viewed by this company as making a trend toward business improvement, the wholesome effect of which must be felt in various lines. Robert W. Withington, president of the company, says he regards the outlook as very promising and believes the railways, in going ahead with improvements to their systems, are harbingers of better all-round business conditions.

Railway Improvement Company, New York.—A. J. Pizzini, vice-president and general manager, states that no imported materials are used in the goods manufactured, with the exception of some chemicals in the porcelain cover of the sanitary straps. The war has caused the complete dropping off of foreign business, including the cancellation of some orders on hand. Domestic business has been affected temporarily, but a strong reaction with increased sales will come as soon as financial conditions adjust themselves. The company is now trying to arrange for a representative to be sent to South America with a view of introducing its goods into that market.

The Baldwin Locomotive Works, Philadelphia.—According to Alba B. Johnson, president of the company, there are no imported materials used in the manufacture of electric railway trucks, so that the company is not concerned with the necessity of finding new sources of supply or using substitutes. The cessation of normal financial conditions owing to the closing of the stock exchanges and the impossibility of selling securities or effecting loans, has caused a total suspension of domestic business. This is true of foreign business as well. The company's agencies throughout South American countries are giving close attention to the opportunities for business, although these countries also are for the present affected by financial conditions. With the restoration of normal conditions, Mr. Johnson believes that there should be a considerable increase in trade relations with South America.

Power Specialty Company, New York, N. Y.—L. B. Nutting, general sales manager, states that his company obtains from this country practically all of the materials, including chiefly iron and steel, which are necessary for the manufacture of its superheaters. Since contracts for superheaters are not generally placed until three or four months after boiler equipment has been purchased, it is too early at the present time for any appreciably decreased demand for new equipment to be felt as a result of the European war. The foreign business is handled independently by an English office and factory, which are still in operation. The company has no representatives in South America, since this region is not considered much of a field for superheaters.

Morgan Crucible Company.—H. W. Knott, manager, states that the raw materials used by his company to manufacture its carbon brushes include carbon or graphite, which is obtained from England, and American copper and American-made machinery. The war has not affected its supply of materials from England, and should the supply be cut off, the Brooklyn factory of the company, which manufactures brushes for the United States, has enough stock on hand to continue its output for at least one year. The war has interfered very little with its domestic business. In fact, in August the company experienced the most prosperous month it has ever had and this present month an even greater output is anticipated. European trade is conducted independently by companies in the various countries on the continent. This trade has not been affected very much so far as is known, excepting in the countries in which war is being actually carried on. South American materials are manufactured separately by a company with offices and factory in Buenos Aires. No steps, therefore, along the lines of better credit facilities are necessary in order to increase this business.

Dearborn Drug & Chemical Company, Chicago, Ill.—The European war situation has not materially affected this company's business, since it is so closely related to economical operation that it is looked upon as a necessity rather than a luxury. Moreover, the chemicals necessary in making water analysis, which is the principal part of this company's business, are purchased from American manufacturers, so that the cutting off of the German chemical supply causes no inconvenience. At the company's agencies in the Orient, including the Philippine Islands, Hawaiian Islands, Japan, Corea and China, business has been only slightly retarded. In South America, where the company also maintains an agency, an opportunity is offered for increased business. Heretofore Europe has furnished the chemical engineering knowledge to South America, so that the present interruption of communication offers to America a possibility of increasing business, at least temporarily.

In addition to the companies quoted above, a number of companies were interviewed who were willing to express their opinions but did not wish their names quoted. A fuse manufacturing company uses practically no foreign materials and the stock of the few imported materials used is adequate to serve the requirements for a long period. Moreover, these few imported materials can in all probability be produced in the United States. A serious temporary decline is anticipated in the domestic business. The company is confident that a good business can be developed in South

America and at the present time advertising appropriations for trade papers in that field are being increased. The company is also endeavoring to secure local representatives.

A large manufacturer of mica for commutators expresses the opinion that the demand for its materials will not be appreciably decreased during the war because it receives much larger orders from electric railways for repair work than it does for new equipment. This repair work is now increasing in demand because railways are showing an unwillingness to scrap their old motors and pay the advance in price on new equipment. This same company does not consider it necessary in its own case to take any unusual steps toward promoting South American trade facilities, because in Buenos Aires, the only South American electric railway center of importance outside of certain large properties which already have purchasing agencies in New York, it believes the electrification is not yet old enough to require any large amount of repair work.

One of the large companies in the electric railway manufacturing field says that practically none of its business is affected by the war as regards the receipt from abroad of raw materials. Its domestic business will undoubtedly be interfered with, as far as extensions of present systems and the building of new plants are concerned, owing to the complete unsettlement of credits and sales of securities brought about by the tremendous foreign demand for money. It is hoped that business in miscellaneous supplies and renewals will increase in a number of lines, as this naturally follows where equipment is not being purchased. Foreign business has not been materially affected by the war, excepting as regards transportation of some goods on old order. The company is giving active attention to the trade situation in South America. In due time favorable results will be seen, but a great deal of careful planning and hard work are requisites for any material success. Large stocks of foreign-made electrical goods are still available in many sections of South America, and if the war should terminate before this supply is exhausted, the demand for American-made goods would naturally grow very slowly.

A manufacturer of car heaters considers that while domestic business will be delayed until it will be possible correctly to foresee the outcome of the European war, with the resumption of shipping there will be a great industrial revival. The company believes that its product is not marketable in South America on account of the climate. This might not apply to the extreme Southern part of the continent, but there is not sufficient business there to warrant any sales activity.

It is stated by another company that steel mills have raised the price of structural steel and bars used for raw material on account of the increased price of ferromanganese. It is believed, however, that the ferromanganese situation is easing and that there are deposits in this country which have not been developed. Customers are having difficulty in financing their requirements for construction purposes. The company will be busy for some time with orders on hand, but a period of decline is expected later. A comparatively small amount of business is carried on in foreign countries, no particular soliciting having been done. Doubt is expressed as to the possibility of a field for overhead construction materials being developed in South America. It is felt that it is better to confine attention to the trade in the United States, for this affords an ample field for the company's efforts.

According to a railway supplies manufacturer, the potassium cyanide used in the plating department is imported and at present there seems to be a shortage. It is not known whether this can be obtained from neutral countries or whether it can be manufactured in this country. The sales of supplies and fare registers will be affected only through the restriction of railway earnings and financing of railway extensions, and the company states that pessimistic reports have been received from electric railway customers regarding earnings. The company does not look forward to an improvement in the South American conditions for the reason that the field there has been already well covered.

A large brake manufacturing company reports that it has sufficient work at the present time to keep it busy for a long period, and when it has caught up with the deliveries of orders now on hand it believes that general business will have taken a turn for the better. This company at present is not interested in the development of foreign trade on account of the fact that all its business is confined by contract to North American countries.

A prominent manufacturer of electrical wires and cables states that requisitions for maintenance work are now so much in excess of what they were a few years ago that orders for upkeep constitute what in the old days would have been considered good, big business. Timidity in the security market, however, has made new business in wires and cables for construction and extensions comparatively slow during the last year. This condition existed before the war. With regard to the electrical field in general, it is pointed out that the United States need look abroad for practically none of its manufacturing materials. There is an abundance of cotton and apparently the price will be lower than for several years. At the beginning of the war there was an unnecessary scare regarding rubber, because it was feared that the Ceylon supply would be cut off. That is not the case. Moreover, there is enough good rubber available from Africa, South America and Central America to meet the demands of the world, particularly so since there is a reduction in this demand. It is expected that the supply sources are sufficient in capacity to keep the prices within limits established during the last year or two.

UNITED STATES TRADE WITH PAN-AMERICA

Trade of the United States with other American countries in the fiscal year ended June 30, 1914, aggregated $1,303,000,000, or 33 per cent below the high record of 1913, and constituted 30 per cent of the entire commerce handled by domestic ports. Of this large New World commerce, $956,000,000 was with North America and $347,000,000 with South America.

United States imports from North American countries, valued at $427,000,000 in the fiscal year, were chiefly from Canada, Cuba, Mexico, the Central American States and the British West Indies. Exports to North American countries, $529,000,000 in value, were chiefly to Canada, $345,000,000; Cuba, $69,000,000, and Central America and Mexico, each about $39,000,000. The United States supplies a larger proportion of the leading countries of North America than any other nation, and in the case of Canada, Central America and Cuba more than all other parts of the world combined.

Of $223,000,000 worth of imports from South America, nearly one-half were from Brazil, about 20 per cent from Argentina, and the remainder chiefly from Chile, Colombia, Venezuela and Peru. Nearly one-fourth of the total exports of $125,000,000 value to South America went to Brazil and more than one-third to Argentina. In sharp contrast with the high position of the United States in the North American markets is its low rank among the nations selling goods in South America, where in the case of such important countries as Argentina, Brazil and Chile, only about 15 per cent of the imports were from this country. South America as a whole imported in 1912 $965,000,000 worth of foreign goods, the share of the United States being about 14 per cent.

SOUTH AMERICAN TRADE CONDITIONS

NEED OF BETTER UNDERSTANDING OF STABILITY AND PROGRESS OF SOUTHERN REPUBLICS—OPPORTUNITY FOR CONSTRUCTIVE WORK IN SOLVING SALES, BANKING AND SHIPPING PROBLEMS

BY THEODORE STEBBINS

The development of our commercial relations with South America becomes a freshened subject with the outbreak of the European war. The consequent stoppage of European shipments will compel South America to buy a few more things from us. To what extent and for how long can we hold their valued trade? Let me say at once that to hold the principal part will be no easy task. In making the effort it is vital to understand the reason in the past for our small proportion—about one-seventh—of their trade.

The dominant classes in South America are European by origin, and admixture and the constant flow of emigration. The relations with Europe of blood and race are manifold. The youth obtain their education in Europe. Those of means travel in Europe. The rich retire to Europe. All are bound to Europe by ties of race, blood, sympathy, custom and fashion. The habitations and the habits of the people are pronouncedly European. Literature, poetry and the arts flourish. Their best people have a more distinctly European education, culture and charm than our own.

Between North and South America ignorance, indifference and distrust predominate. Our most exiled citizens have found South America a convenient refuge, and their activities have too largely created South America's opinion of us. When I was residing in the capital of one of their smaller republics a jewelry store was robbed. All Americans were promptly locked up on suspicion except those of known diplomatic or business connections. The newspapers are responsible for the continuance of much of this distrust. For the same reason that some of our newspapers seek profit in circulation at the expense of morals by giving an undue prominence to scandals and crimes, our newspapers do not find "good news" in the peaceful achievement of South America but publish exaggerated and absurd rumors of "revolutions." Eighty per cent of South America, measured industrially, has had strong stable governments for many years. Likewise, the South American newspapers take note of our bloody industrial wars in Colorado, etc. So the readers on each side get the worst pictures of the other. And remember this. Our lawless destruction of life and property exceeds theirs. So let us have more respect for the South Americans. And let us view their trade requirements as an expression of their habits and customs and in a sympathetic cosmopolitan spirit. In brief, we must establish social relationship as the broadest basis of general trade. Its absence has been the fundamental cause of our failure in general South American trade.

Next in importance in determining the origin of imports I would call attention to the extensive railroad systems and other enterprises established in South America of recent years. The British, German, French and Belgians have gone into South America with materials of their own manufacture and built those railroads and other things, and own and operate them. Our manufacturers can stand little show, or none, in the sale of these construction and supply materials, until we become a lending, not a borrowing, nation, and can go forth to build foreign railroads and the like. Our own railroad field is being made so unprofitable by our government that our own surplus capital may soon seek foreign fields.

Direct banking connections with South America are a necessary aid to trade. Our own self-imposed laws have forbidden foreign banking branches but now have been amended to allow them, and our largest bank, the National City of New York, is proceeding to establish South American branches with broad functions and dealing with the situation in a very liberal and intelligent manner.

Between North and South America no regular steamship lines operate tonnage adequate for any considerable trade. The present steamship laws which have driven our flag from the seas are in process of amendment. What Congress will do remains to be seen. Government owned ships are proposed. Are our politicians competent to run them? In any case the law should not longer create handicaps for our private ship owners. The law obliges expenses in wages and otherwise about 30 per cent more than those of foreign competitors. So Congress is now legislating to permit or prevent the necessary shipping link in our South American trade connections.

Finally, to explain the smallness of our South American trade our manufacturers have their failings, namely, to study and supply the character of goods needed, to send suitable salesmen (imagine a foreign salesman attempting to sell goods to our merchants without knowing a word of our language!), to give terms of payment as long as European competitors and, with goods once sold, to pack and ship them properly.

The general war in Europe has suddenly shut off European exports to South America and our exports to Europe. Cannot our European exports be diverted to South America? Apparently, it is the opportunity of a generation. Unfortunately we are not prepared at once to take the full benefit of the situation. It will take a long time, not a short time, to get acquainted with these countries and their people and their needs, and to establish foreign branch banks and steamship lines and commercial branches and, finally, the export business itself. But let us now make a serious beginning. And we must secure the foothold now to secure the immensely larger trade of future South American development. The means by which this may be done are beyond the scope of these few paragraphs.

South America is a continent of vast areas with corresponding diversity of climate and products. The average North American seems to picture it as a tropical region only. Conditions of the whole should not be drawn from conditions of a part. Argentina, Brazil and Chile are the principal importing countries and have stable governments, and the remaining countries are relatively negligible. All the large cities have modern conveniences. Buenos Aires and Rio de Janeiro have more than a million inhabitants each and enjoy European luxuries in greater measure than we. The leading cities are served by electric light and railway systems excellently constructed under European specifications.

The trade should be sought by studied and intelligent and persistent efforts through co-operative methods. While our general South American trade is small, yet in certain industries it is large. The agricultural machinery trade is secured efficiently by one international concern (which, incidentally, our government is seeking to destroy). The increasing excellence and cheapness of our automobiles should secure a large market for them. American sewing machines and typewriters find a large market. But Europe gets the preference in the ordinary items of domestic consumption, owing to the European habits of the consumers, and on construction material and supplies, owing to European ownership of the purchasing companies.

Our electrical manufacturers have made intelligent, well organized and long continued efforts to sell electric apparatus and have secured a gratifying proportion of the business, considering that the South American operating companies are of European ownership. All such business can be secured by one simple means, namely, the purchase of the operating companies by our own capitalists. The European war will compel a low purchase price. The "reasonable return" on investment, so glibly discussed here, so universally evaded in terms of per cent, by which our utilities are partially confiscated, that is, robbed of a part of their proper market value, gets a fairer interpretation in South America. So our constructive builders of industry may well consider the transfer of their activities to South America.

REVIEW OF BUSINESS SITUATION

GANO DUNN BELIEVES THAT EFFECTS OF DESTRUCTION OF CAPITAL BY EUROPEAN WAR WILL BE COUNTERBALANCED BY INCREASED EXPORT TRADE

Gano Dunn, president J. G. White Engineering Corporation, who was in Europe at the time war was declared, has given, at the request of the ELECTRIC RAILWAY JOURNAL, a statement of his views in regard to the effect of the conflict upon business conditions in this country. It is as follows:

"First—An enormous amount of the world's capital has already been destroyed and more will be destroyed. Consequently construction enterprises and new projects of all kinds which flourish on surplus capital seeking investment will be severely checked for a long time.

"Second—Further destruction of capital due to the continuation of the war will probably be greater if the allies are defeated than if Germany is defeated, since the capital of Great Britain, France, Belgium and Russia is much greater than that of Germany and Austria, and it is probable that the former nations would go far toward exhausting their greater joint resources before accepting defeat. The financial and industrial effects of the war, therefore, are involved to a considerable extent in the result of the fighting.

"Third—There will probably be greatly increased exports of foodstuffs and manufactures from the United States, which will mitigate and to some extent offset the tremendous capital losses in the United States resulting from the destruction of security values and the contraction of credits. There will probably be a general increase in interest rates and a certain amount of American capital available for smaller construction enterprises that are near enough home to be locally known and bring out the resources of the very small investor.

"Fourth—South America will suffer not only through lack of European capital, which has been the principal source of supply for the development of her new enterprises and the extension of her commerce, but also severely through the reduced capacity of Europe to take and pay for South American exports. American and Canadian markets will inevitably be benefited by the demand for such South American imports as Europe cannot supply. While these South American purchases will be of much benefit on account of the business they represent, they will be of more value because of the new channels of trade they will open up and the new connections they will establish. Their immediate value should not be overestimated, however, in view of the reduced buying power South American countries will experience from the reduction of their usual exports to Europe.

"Fifth—Any forecast at this time can be presented only as an offhand opinion, since the consequences of the great struggle will so fundamentally affect American international commerce, finance and industry that no one can see clearly the adjustments that must follow."

CANADIAN AND SOUTH AMERICAN COMMERCE

TRADE REDUCTION IN CANADA AND DIFFICULTIES OF SOUTH AMERICAN SITUATION DESCRIBED BY CAPTAIN HUNT

In an interview with a representative of the ELECTRIC RAILWAY JOURNAL, Capt. R. W. Hunt, of Robert W. Hunt & Company, Chicago, Ill., stated that practically all the European and Canadian trade of this company has been brought to a temporary standstill. Some inspection work, however, is being carried on in both these countries, but it represents only a very small percentage of what was under way before the war started. Canada is a large money borrower, principally from England and Belgium. Hence the use of capital for war purposes in these countries has caused practically an absolute cessation of railroad activity, and new purchases have been discontinued. Heavy construction work under way and not completed by the Canadian Pacific, the Grand Trunk Pacific and the Mackenzie interests has been stopped. This has seriously affected all Canadian industries, including rail mills, bridge builders, cement mills and other manufacturing industries dependent upon railway business. There has been more than a 50 per cent reduction in production due to this inactivity of the railroads. The labor market, however, has not been affected by the enlistment of Canadian young men for service in Europe, there being plenty of labor because so many factories have been closed.

While business in the United States has not been so seriously retarded as that in Canada, the closing of the security market, the failure to market the record-breaking cotton market, as well as the restricted grain market, were adverse conditions. The commercial possibilities of South America as an outlet for American trade are not generally understood. There are many conditions which must be overcome, such as the great financial depressions in Argentina and Brazil, which are heavy borrowers of European capital. These countries have a large English, German and French representative population which makes it natural for them to look to Europe for their capital. Mr. Hunt feels that there is little probability of overcoming this prejudice in a short time, since the South American countries are curtailing expenses like this country. If the war continues, however, there will ultimately be an opening, but American manufacturers cannot meet with immediate overwhelming success in capturing the South American markets. Indeed, says Mr. Hunt, so closely are South American markets related to Europe that his company found it advisable to handle all of its South American business through its London office. An optimistic view of the situation, however, indicates that the European war will ultimately redound to American advantage.

The York Railways Company recently inaugurated religious services for its employees at the carhouses on Sundays. On the opening day the entire force was present and joined heartily in the service. Early cars were sent out to different parts of the city for the men, who were all in place by 6 a. m. The services were conducted by a local pastor. The secretary of the Y. M. C. A. and officials of the company were present. General meetings of this character will be held once a month and local meetings every Sunday. The railway company is highly pleased with the results of the meeting.

Toledo Injunction Hearing

The hearing on the Toledo Railways & Light Company's amended bill asking for an injunction against the city of Toledo, Ohio, to prevent the enforcement of the Schreiber 3-cent-fare ordinance and from interference with the company in the withdrawal of its cars from the streets was begun before Federal Judge Killits in the United States District Court on Sept. 8. The city solicitor's department filed no answer, but Judge Killits decided to proceed with the hearing just as if the answer had been filed. He ruled that the company had made a *prima facie* case that the ordinance is unreasonable, although the city might be able to show that it is not unreasonable.

An affidavit from Frank R. Coates, president of the company, showed that from April 1 to Aug. 1, 1914, the road carried 15,913,504 pay passengers. At the rate of fare in effect prior to the passage of the Schreiber ordinance there should have been a stimulation of traffic amounting to 6 per cent. This would bring the number up to 16,868,314. The average rate per passenger carried during that period was 3.9334 cents, which would have yielded a revenue of $663,498 if the old rate of fare, with 3 cents morning and evening, had been in effect. With earnings of $55,000 from other sources the revenue would have been $718,498. Because of the fact that passengers who refused to pay the fare were carried free, the actual revenue for the period was $471,796. The operating expenses amounted to $606,435, showing a loss of $134,637. City Solicitor Thurstin objected to the affidavit on the ground that it was speculative, but the objection was overruled.

E. R. Kelsey's affidavit presented clippings from Toledo papers quoting Mayor Keller and City Solicitor Thurstin as threatening to man the cars with police if the company attempted to collect fare exceeding 3 cents.

Judge Killits said that one of the questions before him was whether this court had jurisdiction. He considered the Schreiber ordinance enforcible in only one way. It is beyond the power of the Mayor of Toledo to attempt to enforce it until the provision in the ordinance determining how it shall be tested is passed upon in a court of competent jurisdiction. The company is entitled to the same protection in court as an individual.

C. E. Murray, auditor of the company, presented an affidavit showing that 7,968,935 passengers had been carried between April 1 and Aug. 1, 1914. A. G. Van Dreisen, chief clerk, was called upon to present some of the company's books of record before adjournment of the forenoon session.

An affidavit from Peter Witt, street railway commissioner of Cleveland, stated that the report of the examination of the company's accounts made by Carl Nau can be understood by any one, whether in the railroad business or not.

On the afternoon of Sept. 9 Federal Judge Killits brought the hearing of the injunction suit to a rather abrupt termination and intimated that the application of the Toledo Railways & Light Company would be granted. The case was submitted to the court without argument and he explained that his formal decision would be prepared and filed a few days later, perhaps on the afternoon of Sept. 11 or on Sept. 14. Further, he said if the decision sustained the company, the operation of the decision would be postponed a few days to allow the people to become acquainted with it and adjust themselves accordingly.

As previously stated, the forenoon of Wednesday was spent in hearing affidavits offered by the company in support of its claims. City Solicitor Thurstin began the presentation of his case just before noon, when Chief Clerk A. C. Van Dreisen, of the company, was called to identify a number of books and records of the company.

Finding that the city was not prepared with evidence to combat the company's statements, as had been expected, the hearing was adjourned until 8:30 a. m. on Sept. 10, but before doing so the court learned that the city did not question the company's report relative to its expenses.

Judge Killits, during the hearing, announced that he would not appoint a receiver for the company. He feels that such a course would delay a settlement of the franchise controversy, which in his opinion should be adjusted just as soon as possible.

At the hearing on Thursday, Judge Killits asked Mr. Thurstin whether on the facts before the court he was contending that the ordinance, if obeyed by the company, would pay running expenses and a return on a fair valuation of its property. Mr. Thurstin replied that this was a matter of calculation. The contention of the city had been from the start that the ordinance passed on Nov. 27, 1913, was a valid and legal ordinance and was such until repealed or passed upon by a court. He contended that the burden of proving it otherwise was on the company; that the measure was *prima facie* a valid ordinance, and that the showing of the company must be conclusive and clear that the company could not operate under it with profit. Mr. Thurstin agreed with Judge Killits that the ordinance was confiscatory if it did not provide for a revenue sufficient to meet operating expenses, maintain suitable service and leave a surplus for a fair return upon a reasonable valuation. In this connection Mr. Thurstin said:

"I would never ask Council or any city official to lend a hand in asking this company to operate if it could not make money."

The judge said that he was glad to know that the City Solicitor's office was not responsible for the ordinance and had inherited the troubles incident to the measure.

Mr. Thurstin protested that the court was attempting to put him in an embarrassing position, whereupon Judge Killits expressed the opinion that the court was warranted in asking advice as to Mr. Thurstin's views. Judge Killits said further that Mr. Thurstin would do the city a service by saying publicly that the ordinance was a mistake if that was his opinion.

In conclusion, Judge Killits said:

"I shall assume, when it comes to the question of fact, that the city has been unable to sustain the ordinance as practicable as far as the rate of fare is concerned under existing conditions. There is no question whatever but there is a presumption that Council, in passing the ordinance acted intelligently, fairly and with a desire to impose conditions with which the company could comply. That is a presumption. But it does not control. In this case we find that the city of Toledo and its officers, in passing the ordinance, had the same information and the same advice that this court has now and that the ordinance is confiscatory and inoperative.

"The conclusion is almost compelling to say that the ordinance was buncombe when passed. That is no reflection on the present administration. It has done its duty in trying to have the ordinance obeyed. These comments from the bench are unusual. So are the conditions in this city. It is unfortunate that so many people have been misled into the belief that this corporation is infringing on their rights. It does seem to me as a citizen that the time has come, whatever our relations may be, to attempt to relieve ourselves of prejudice and to get ourselves and our fellows into the position where we can see things clearly."

The Citizens' Franchise Committee has been inactive pending the decision on this case. Just what move it will now make, if any, has not been outlined, but it is stated that something will be done to hasten a settlement in the mater.

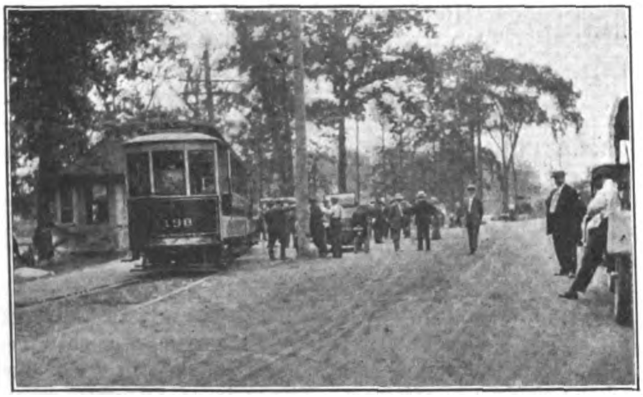
The company was represented at the hearing by Thomas H. Tracy and Rathbun Fuller, while the city was represented by City Solicitor Thurstin and his assistants, E. H. Horton and Mr. Schlatter. Henry L. Doherty and C. A. Frueauff were present.

Henry M. Doherty, chairman of the board of directors, said if the decision is in favor of the company the rates of fare agreed upon temporarily between the company and former Mayor Whitlock will be put into effect and maintained until an agreement on the franchise question is reached. Under this arrangement the company collected a 5-cent cash fare, with a 3-cent straight fare for two hours each morning and evening. Tickets were sold at the rate of six for 25 cents.

Storage Battery System for City Island, N. Y. Built in Seventeen Days

BY W. R. WOOD, FOREMAN STORAGE BATTERY CARS THIRD AVENUE RAILWAY SYSTEM.

The historic village of City Island, 16 miles from New York, has not heretofore enjoyed adequate transit facilities. Through the efforts of E. A. Maher, vice-president and general manager Third Avenue Railway, and leading citizens of City Island, arrangements were perfected whereby the Union Railway took over the existing horse-car line, and extended it to the City Island station on the Harlem Division of the New York, New Haven & Hartford Railroad. One and one-half miles of new track were laid, a waiting station was built at the Pelham Park Boulevard, and a temporary charging station was erected at Orchard Beach within a period of seventeen working days. Twelve of the Third Avenue Railway's storage battery cars were then lightered to City Island, and the new service was inaugurated on Aug. 18, the last horse car passing over the line at 12:15 p. m., followed by the first battery car carrying a party of officials and guests at 12:30 p. m.

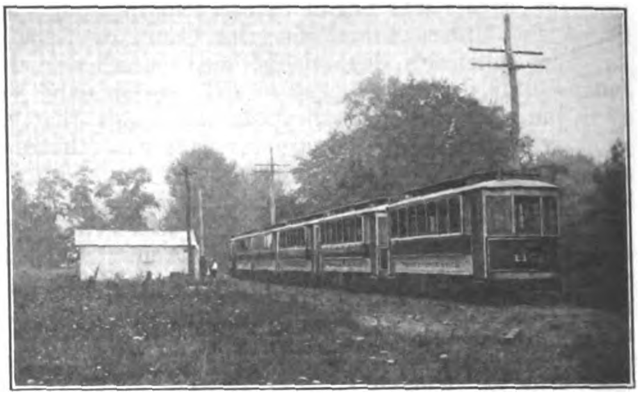


THE FIRST BATTERY CAR

Power for charging is furnished by the Westchester Lighting Company at 220 volts from its two-phase line passing the charging station. Mercury arc rectifiers are used for converting this to direct current at 130 to 160 volts for charging the batteries.

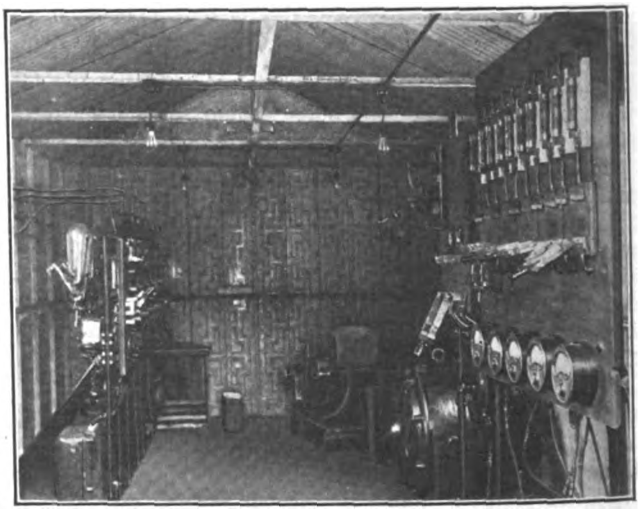
The output of each arc is 50 amp., but for rapid charging reactances have been provided on the d. c. side so that two of the arcs may be connected in multiple for charging a single car at a high rate. A two-phase motor and a 200-amp. generator which were on hand were also installed as a reserve power supply to be used in an emergency.

A galvanized iron building 10 ft. x 24 ft. was erected for housing the charging apparatus, and a siding was laid to accommodate the twelve cars. These cars are equipped with Hess-Bright anti-friction bearings on the armatures and Rollway bearings on the journals. As they have Peacock brakes and are heated by coal stoves located on the trucks, it will not be difficult to attend to all maintenance and repair work on this open siding without pit facilities.



CHARGING STATION AND SIDING

Since its opening the road has been very popular, carrying more than 6200 passengers in a single day. The cars are being operated by men from the old horse-car line and are maintaining a schedule of 9 m. p. h. on an energy consumption of less than 1.25 a.c. kw-hr. per car mile purchased. It is anticipated that as the men become more familiar with the work this performance will be improved. Meanwhile it is expected that the present line, which is laid with 9-in. grooved rail and bonded, will soon be electrified and extended.



INTERIOR VIEW OF CHARGING STATION

Proposals have been made for the electrification of the Eastern Bengal suburban lines. The proposition includes four lines from Calcutta to Naihati and two from Naihati to Kanchrapara. The d.c. overhead system is recommended in place of the third-rail, owing to trespassers. The principal object of the electrification is a financial one, and the consulting engineers report that it will pay to electrify the lines as the gross capital outlay required for the scheme will be $4,406,643, while the annual saving in train operation alone is reckoned at $399,340 in spite of higher speeds and better train service.

COMMUNICATIONS

Steel Sheathing for Car Siding

PITTSBURGH RAILWAYS COMPANY
PITTSBURGH, PA., Sept. 3, 1914.

To the Editors:

I was very much interested in your editorial on steel sheathing for car sides, appearing in the Aug. 15 issue, and particularly with the discussion in the Aug. 29 issue. It would seem to me that, with the thoroughness that Mr. McPherson analyzes the situation, there should be small room for doubt in the minds of those who are actively considering car design of this character.

It might be interesting to state that, some six years ago, the Pittsburgh Railways Company adopted the side-girder type of car construction with a special bulb angle as the top member and a tee section for the bottom member with 1/8-in. sheathing. Some five years ago the company changed the top member to a flat bar, and the bottom member to commercial angle and reduced the thickness of the sheathing to 3-32 in. Lately we have again reduced the thickness of this side sheathing to No. 14 gage sheet steel. Mr. McPherson's assumption and calculations closely resemble those used in the determination of the sizes and members used in the construction of our cars, and some six years' experience and use of cars designed in this manner have demonstrated to us that they are absolutely safe.

The low-floor type of motor car and trail car used in Pittsburgh has its floor load and its equipment load practically balanced over the trucks, and the calculated unbalanced moment on the side girder on these cars is approximately 600,000 in.-lb., which is considerably less than that assumed by Mr. McPherson. In our case, the calculations show that the side sheathing could be entirely omitted without exceeding the accepted maximum fiber stresses for open-hearth steel.

However, there is another factor which in a large measure influences car design and many times takes precedence over theoretical requirements, that is, the factor of utility. To illustrate, assuming that it is entirely safe from the standpoint of strength to omit the side sheathing, no one would think of doing so in this type of car. Therefore, what thickness should the sheathing or plate be to resist shocks in contact with wagon wheels, poles and other street obstructions? What thickness should it be to maintain a reasonably smooth, unbuckled surface? What length of sheet should be used properly to facilitate construction and repairs? Our experience has shown that a 3-32-in. plate is amply thick to meet these requirements, and if desired, it may be used in lengths no greater than the distance between post centers.

The question of post design in car construction influences largely the strength of the side girder, and of all the various types of posts used and considered, the flanged, "U-shape," pressed-steel post offers, in our opinion, the greatest advantage. From the standpoint of strength and lightness, it may be surprising to know that this type of post with its cover plate and the sash and curtain guides weighs less per lineal foot than the smallest commercial section of tee post similarly equipped. Also, with this type of post, gussets at the belt rail and side sill have not been found necessary and do not appear in our construction. I might say further that the use of aluminum alloy for side sheathing has been seriously considered in this country, but its cost up to the present time has been found prohibitive.

Referring to the effect of a top plate or letterboard (either in steel or wood) upon the strength of the side of the car, there is no doubt that a properly shaped plate reinforces the strength of the side girder. We are using a pressed sheet steel letterboard, approaching a channel shape in form, which materially stiffens and strengthens the side of the car. However, if the sections used in the belt rail, side sills and posts are as light as permitted by the design, the required strength and the utility factors, and if, at the same time, the section modulus exceeds that required, such added strength as the letterboard or top plate introduces hardly becomes a factor in the problem. The most important single item in the construction of steel cars is the one of riveting.

I am satisfied, that if all car designers analyze their requirements with the same degree of thoroughness as displayed by Mr. McPherson, the question will be no longer one of opinion but one of fact.

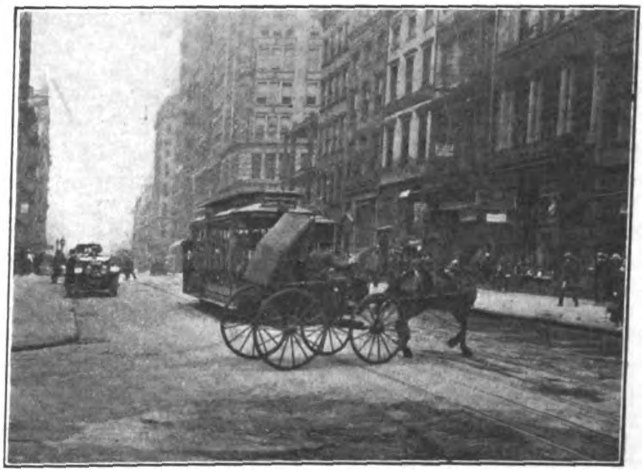
F. R. PHILLIPS, Superintendent of Equipment.

Advantage of Near-Side Stop

NEW YORK, Sept. 5, 1914.

To the Editors:

Of the many kinds of accidents which happen where vehicular traffic is heavy, and for which the street railway company in most cases is not in any way responsible, perhaps the most prevalent are those caused by cars coming in contact with horse-drawn or other types of vehicles. Of this general type of accident, perhaps the most troublesome class is caused by vehicles coming out of a side street and approaching a main thoroughfare without first ascertaining whether any cars are approaching that corner. Drivers and chauffeurs are particularly careless about crossing a street which has double tracks, in that after one car has passed the corner they do not investigate whether another car is coming in the opposite direction.



A NEAR-ACCIDENT AT A FAR-SIDE STOP ON BROADWAY, NEW YORK

The photograph (not posed), reproduced herewith, illustrates the carelessness described. The driver, at a good rate of speed, was coming down the side street directly after a car on the north-bound track had passed the corner, but he did not stop to ascertain whether or not a south-bound car was approaching. What might have been a serious accident was averted by good brakes and the quickness with which the motorman on the car approaching the horse and buggy acted. The driver of the vehicle had whipped up his horse and endeavored to pass in front of the car, but, fortunately, the motorman was able to bring the car to a stop in time to prevent a serious accident. Another interesting point is that a passenger was standing on the running board of the car, preparing to alight. The conductor had apparently given the signal to stop the car, but before that the passenger was already out on the running board.

The illustration indicates that if an accident had occurred the street railway would not have been responsible, yet it would have been put to the needless expense of defending a suit for damages not only to the horse and vehicle but to the driver as well, and the accident might have resulted fatally.

At the point shown the car makes a "far-side" stop. The photograph was taken by the writer recently while standing at the southwest corner of Eleventh Street and Broadway, New York. G. O. SMITH,
Director of Safety, Doherty Operating Company.

A Discussion of the Flagging Rule

ILLINOIS TRACTION SYSTEM
SPRINGFIELD, ILL., Sept. 4, 1914.

To the Editors:

The article appearing in the Aug. 1 issue entitled "Proceed, Protected by Flag—A Fallacy," seems to the writer to merit much more consideration than a mere passing thought, and the lack of comment made on it up to the present time is to be deplored. The writer cannot entirely agree with the article in question, as he feels that it does not clearly outline the governing factors which may have led some roads upon the installation of automatic signals, seemingly to revert back to an obsolete and so-called dangerous practice.

It is not my intention to take issue with the Transportation & Traffic Association, which in 1911 eliminated as unsafe a promiscuous flagging rule. This was undoubtedly the proper course at that time. Instead, this letter is intended simply to point out the difference in the conditions, as they appear in my mind, between those which existed at the time the rule was eliminated and those which are considered in the editorial in question.

Railroads are not dependent upon either the telephone or the automatic signal for their operation, although it is true that both of these devices facilitate and safeguard traffic. To the writer's personal knowledge, a 40-mile division of interurban track, with hourly service, was operated for more than a week with no telephone service whatever, and with very little delay. This was long before automatic signals were considered as a necessity for electric railways, but not before the operating officials, on this particular road, realized the danger in trains proceeding under flag protection, and this method of operation was not allowed. How, then, was this feat accomplished? Simply by running trains according to the printed time-card, and compelling them to make the carded meeting points.

In the editorial under discussion it is pointed out that block signals are, at the present time, considered only as an additional "safeguard superimposed upon the structure of operating rules," but, at the same time, it is argued that, under certain conditions, they must take precedent over the fundamentals of operating methods, which have been in effect for years.

To illustrate: consider a railroad without signals and upon which two opposing trains are approaching their meeting point. One train is running on time and the other has been considerably delayed and is several sidings away from the place of meeting. The train which has reached the carded meet attempts to call the dispatcher on the telephone, and the delayed train does likewise from the next or second next adjacent siding. Both find the telephone line to be in trouble. What is to be done? It is doubtless a fact that this condition is arising almost daily and is being handled without the least doubt in the minds of the train crews involved. The only thing to do, sanely or safely, is to go to the carded meet and wait there until the opposing train arrives, and no loophole is now provided in the rules whereby a man could construe his instructions to do otherwise.

Also consider a signaled railroad (this entire argument applies, of course, only to single track): the same two trains find themselves in the same positions as described above, under similar conditions, except that the delayed train finds a signal set against him two sidings in advance of his meeting point, while the signal for the opposing train which has arrived at the meet indicates proceed. We agree that it would be unwise to allow the last-mentioned train to consider the signal indication superior to his time-card and proceed. Why, then, should we unqualifiedly consider the stop signal indication as superior to the time-card to the utter demoralization of our train service?

The writer wishes to emphasize his unfailing regard for block signals and his belief that they must have the fullest attention and trust from the trainmen, but, at the same time, he believes that something can and should be done to recognize the difference in the present conditions from those existing in 1911.

JOHN LEISENRING,
Signal Engineer and Superintendent of Distribution.

Census Report on Electric Railways

The Bureau of the Census, Department of Commerce, has issued Bulletin No. 124, devoted to electric light and power stations and street and electric railways and giving the statistics of these properties for the year ended June 30, 1912. Some preliminary figures from this census report, so far as the street and electric railways are concerned, were published during the early part of the year. The tables contained in Bulletin 124 do not present all of the results which the bureau will issue. It is the intention to publish later a detailed report which will contain analytical text discussing the statistics and giving information in regard to the development of the industries. The present bulletin is published in order to distribute the important facts at an earlier date than they would be available if the publication was delayed until the final report is finished.

The statistics in regard to the electric railways cover fifty-five pages. The introduction says that an attempt has been made in the case of the electric railway companies to separate the income and investments from non-transportation activities, but this has not always been possible. A notable instance where the non-railway property was not separable from the railway property was that of the Hudson Terminal buildings of the Hudson and Manhattan Railroad in New York. The titles of the tables presented in the bulletin follow:

Tables 1, 2 and 3—Comparative summaries, 1912, 1907, 1902, for (1) commercial and municipal central electric stations combined, (2) commercial stations, and (3) municipal stations.

Table 4—Number of municipal central electric stations and increase, by geographic divisions: 1907 to 1912.

Table 5—Commercial electric stations, by character of ownership: 1912 and 1907.

Table 6—Comparative summary—Central electric stations and gas plants: 1912, 1907 and 1902.

Table 7—Central electric stations and electric railways—Number, kind and horsepower of primary power machines: 1912, 1907 and 1902.

Table 8—Commercial and municipal central electric stations—Number, kind, and horsepower of primary power machines: 1912, 1907 and 1902.

Table 9—Central stations and electric railways—Kilowatt capacity of dynamos: 1912, 1907 and 1902.

Table 10—Commercial and municipal central electric stations—Number, kind and kilowatt capacity of dynamos: 1912, 1907 and 1902.

Table 11—Central electric stations and electric railways—Output of generating stations: 1912, 1907 and 1902.

Table 12—Number of commercial and municipal central electric stations having no generating equipment, by geographic divisions: 1912.

Table 13—Central electric stations and stations operated in connection with electric railways—Line equipment: 1912, 1907 and 1902.

Table 14—Commercial and municipal central electric stations—Line equipment: 1912, 1907 and 1902.

Table 15—Comparative summary—Central electric stations and electric railways—Primary power, dynamo capacity, and output of stations, by geographic divisions and states: 1912 and 1907.

Table 16—Commercial companies—Capital stock, funded debt and dividends: 1912, 1907 and 1902.

Table 17—Summary for all central electric stations and hydroelectric stations reporting water power of 1,000 horsepower or more: 1912.

Table 18—Hydroelectric stations reporting water power of 1,000 horsepower or more, by geographic divisions and states: 1912.

Table 19—Commercial and municipal central electric stations—Comparative summary, by geographic divisions and states: 1912, 1907 and 1902.

Tables 20 and 21—Balance sheet—Assets and liabilities: 1912.

Tables 22, 23 and 32—Income.

Tables 24, 28 and 33—Expenses.

Tables 25, 29 and 34—Primary Power.

Tables 26, 30 and 35—Generating and subsidiary equipment.

Tables 27, 31 and 36—Line equipment.

Report of the Joint Committee on Inductive Interference

At the Pacific Coast meeting of the American Institute of Electrical Engineers held at Spokane, Wash., Sept. 9 to 11, A. H. Babcock, chairman of the sub-committee on publicity of the joint committee on inductive interference, presented a report which had been prepared for the Railroad Commission of the State of California. The organization and work of this committee has been described in the ELECTRIC RAILWAY JOURNAL in the issues of March 15 and Oct. 11, 1913, and Feb. 7, 1914. The complete report was transmitted to the Railroad Commission on July 7, 1914.

The report presents briefly an account of the formation of the committee, its activities and the results accomplished to date, together with recommendations for such rulings by the railroad commission as the committee believes are justified at this time, and included a technical discussion and explanation of the results and recommendations. The report gives a historical summary of the work of the committee which shows that it was the outgrowth of certain interferences involving power, communication and railroad interests which were brought to the attention of the Railroad Commission of Calfornia. The commission desired that the subject be thoroughly investigated before the general principles involved in the difficulties could be passed upon. To this end a general conference was called to select representatives to form the joint committee with power to conduct tests, experiments and investigations, the results of which would serve as a basis of recommendation. The conference was held Dec. 16, 1912, and the organization and personnel of the joint committee were approved on Jan. 6, 1913. Since this date the committee has been engaged in field work and in other investigations and has prepared a series of fifty technical reports which present and discuss in detail the various features of the work, the methods and apparatus employed and the results accomplished. A list of these is appended to the report.

The report deals practically altogether with interference to the operation of telephones, telegraph and signal circuits from power transmission lines, interference from single-phase railways being only incidentally mentioned.

The committee has determined from its experiments the following facts: 1. Interference in telephone circuits under normal operating conditions of power circuits arises almost wholly from the harmonic voltages and currents of the power system. 2. The effect of induction of the fundamental frequency on telephone circuits is comparatively unimportant unless it is of a magnitude sufficient to constitute a physical hazard. 3. Interference to telegraph and other signaling circuits is due principally to the fundamental and lower harmonics. 4. Power circuit currents and voltages may be divided into two factors, balanced and residual, of which, for equal magnitude, the latter in general produce the greater inductive interference. By "residual" is here meant the vector sum of the currents or voltages. 5. Inductive interference to communication circuits, rising from balanced voltages and currents, can in a large measure be prevented by means of an adequate system of transposition applied to both power and communication circuits, assuming that the latter are metallic and located with due regard to each other. 6. Abnormal conditions of line switching operations produce transient disturbances of a very serious character.

The committee recommends certain rules to be used as guides in connection with future construction and operation of power and communication circuits which are, or are proposed to be, so located as to create a "parallel." The term "parallel" here refers to sections where a power line and a communication line follow substantially the same course, or are otherwise in proximity for a sufficient distance, so that the power circuit is liable to create inductive interference in the communication circuit.

The rules are divided into these parts: avoidance of parallelism; conditions under which parallelism will be permitted; provisions applying to existing parallels; waiver conditions for a communication company, and parallelism with alternating current railways. These rules are discussed at length in the report. Appendixes to the report contain technical discussion on harmonics, balanced and residual voltages and currents, and transposition.

Under the heading "parallelism with alternating current railways" the report states that it is recognized that railroads operating alternating current trolleys with ground return create serious inductive interference with parallel communication circuits. In the present state of the art, no means for completely overcoming inductive interference from such parallels is known, hence, they are to be avoided if possible, and where unavoidable, responsibilities arising therefrom must be settled by mutual agreement, or in case of inability to agree the matter shall be referred to the Railroad Commission of the State of California.

Since the Topeka (Kan.) Street Railway moved a bandstand to Gage Park, gave it and 300 benches to the city, and paid a band for a public concert in the park, the city is considering giving concerts there.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Overhead Problems—Catenary Construction—II

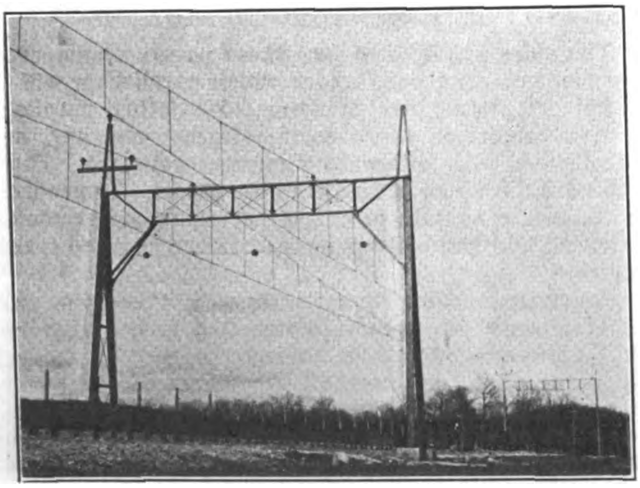
BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER THE CONNECTICUT COMPANY

An almost infinite variety of hangers has been tried but very few of the forms have persisted, the majority either taking too much time to install or shaking loose in service, not a few doing both. That which seems to meet conditions best is a mechanical three-screw clip rigidly attached to a steel strap, the top of which is formed into a loop 3 in. or 4 in. long, permitting the contact wire to rise to that extent. The other types, with all sorts of cam, screw, toggle, wedge and what-not locking devices, many of them exceedingly ingenious, are for the most part of interest only as a matter of history. Early forms of strap hangers were hinged at the lower end, but this permitted the loop to tip over, and with each lift to crawl further out on the messenger until all the lift was taken up and the flexibility lost.

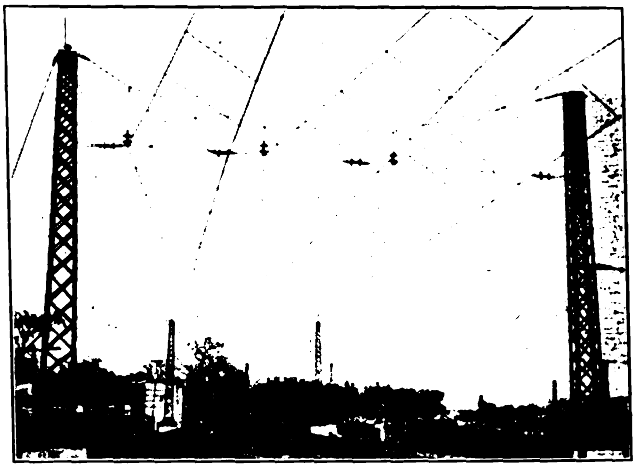
To facilitate installation several ingenious ways of making the loop have been devised. In one the end is twisted back of the main stem, leaving a space of such shape that the hanger screws on to the messenger; another snaps into place, the spring of the shaft normally keeping the loop closed; while a third, also of the snap type, has the tail of the strap so bent up inside the loop that, once snapped on, the messenger cannot get into a position to wedge its way out.

COMPENSATION FOR TEMPERATURE CHANGES

Changes in temperature tend to cause corresponding length changes in the various members of catenary construction, but the actual result is largely affected by the character of the construction. The messenger, contracting or expanding, tends to lower or rise, the movement being a maximum at mid-span, and zero at supports; the contact wire tends to do likewise, but at a different rate because of its different sag. The hangers tie the two together and compel equal movement, giving to the contact wire in cold weather an inverted sag, so to speak, and in hot weather slack wire between the hangers.



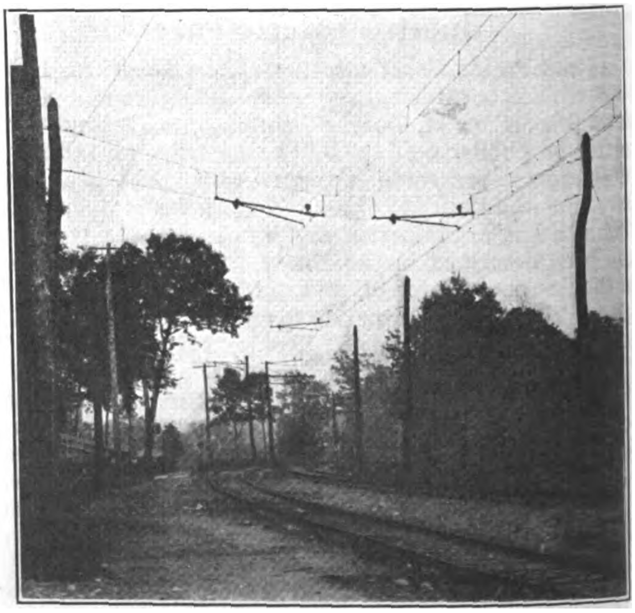
CATENARY CONSTRUCTION—LIGHT BRIDGE, SYRACUSE, LAKE SHORE & NORTHERN RAILWAY



Note the Murray curve hangers, and the smooth line obtained.

CATENARY CONSTRUCTION—NEW HAVEN SPAN SUPPORT

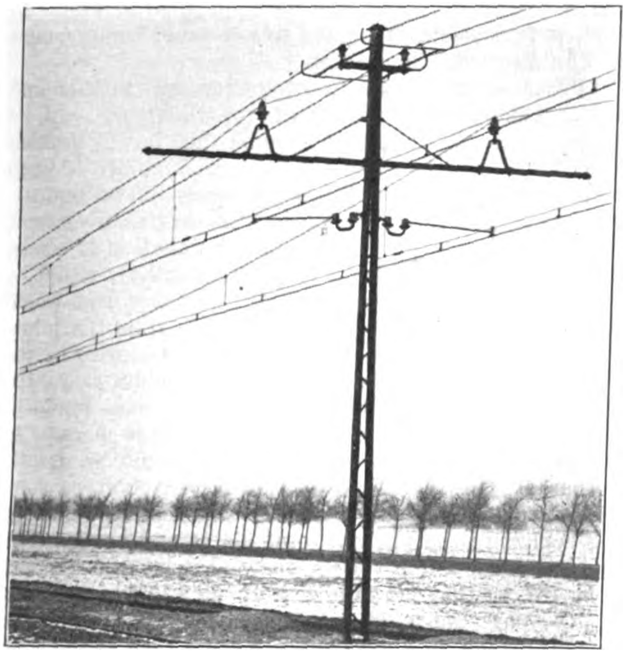
On the Syracuse, Lake Shore & Northern Railway, which was erected in winter, the contact wire was given a very high initial tension and an inverted sag of 1 ft. to the standard 300-ft. span, so that the heavy summer traffic should have a fairly tight straight line. With this one exception, which, it is said, did not entirely meet expectations in this respect, American engineers have considered compensation devices not worth the complication, a belief well justified by the behavior of the lines which are in service without such devices.



CATENARY CONSTRUCTION—SPAN WITH STRUCTURAL MEMBERS CARRYING INSULATOR AND STEADY BRACE

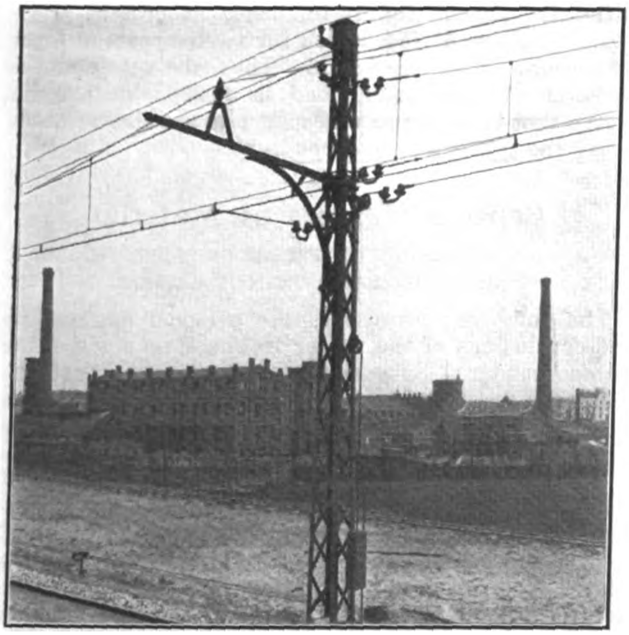
Abroad, however, compensators are almost universally employed. The Siemens-Schuckert device is a weight of about 1200 lb. sliding in or on an ornamental post. The contact wire, approximately No. 000 in section, in lengths of about 3200 ft., has one end anchored while the other is attached, through insulators, to the weight. Although an engineer some years ago proved—on paper—before the American Society of Civil Engineers that unless sheaves more than 25 ft. in diameter were used the effort of bending the wire around the wheel would balance the weight, the use of such compensators is still persisted in by many foreign engineers. By carrying the ends of adjacent sections by each other with a lateral separation of a few inches, they are insulated from each other, except as the collector bridges both as it passes, without a break in the smoothness of the contact surface. The ends are then raised slightly to prevent fouling and are carried to the weights or to anchors. The clips looped over the secondary messenger permit the necessary longitudinal movement of the contact wire. Fear that these loops might bind has developed the Fischer-Jellinek form with loosely gripping ears, through which the contact wire is free to slide.

Weight compensators prevent wide variations in the tension of the contact wire, but also relieve the messenger of the pull in cold weather of the contracting contact wire. Further, the lift at the span center is correspondingly increased, giving a very wavy line. The Allgemeine Elektricitäts Gesellschaft overcomes this by stringing above the messenger and tighter than the latter an equalizer wire which hangs free except for an indirect attachment to the support by a short cable, and the direct attachment of the end to the contact wire, under the support. A temperature drop which shortens the messenger and so lifts the contact wire at mid-span also shortens the equalizer, and through the cable connections lifts correspondingly at the supports.



Note two clips between each pair of main hangers.

CATENARY CONSTRUCTION—BRACKET SUPPORT, ROTTERDAM-HAGUE LINE DOUBLE-TRACK CENTER-POLE CONSTRUCTION



The next pole to the right is also a compensator, taking care of the wire which is seen passing the compensator shown.

CATENARY CONSTRUCTION—COMPENSATING POINT ON BLANKENESE-HAMBURG-OHLSDORF LINE

The Return Circuit—Ultimate Economy of Longer Bonds

BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY, PUBLIC SERVICE RAILWAY, NEWARK, N. J.

The terms "longer" and "shorter" are, of course, only relative, but in this discussion an 8-in. bond will be considered as short and a 36-in. bond as long. It is admitted that under like conditions the amount of energy loss will be greater for longer than for shorter bonds. For this reason, if the joints are to be maintained perfectly the advantage of the short bond will be evident, yet one poorly-bonded joint may cause an energy loss greater than that in the remainder of an entire mile of track without visible evidence of the defective bonding.

Suppose we assume a 10-mile line of single track constructed with 80-lb. 30-ft. rails having a ratio of conductivity of 1:12. With a permissible track loss of 3.5 volts per 100 amp-mile (14 volts per mile for average current of 400 amp), the total resistance per mile would equal $\frac{3.5}{100}$, or 0.035 ohm per mile of single track, or 0.070 ohm per mile of rail. From our tables we find that the resistance of our rail is 0.065757 ohm per mile.

Total rail and joint resistance	0.070000 ohm
Resistance of rail only	0.065757 ohm
Resistance of 170 joints only	0.004243 ohm

Referring again to our tables, we find

Resistance of 170 No. 0000 10-in. bonds	0.0077401 ohm
Plus 4 in. x 0.00000410 ohm per inch	0.0000164 ohm
Resistance of 170 14-in. No. 0000 bonds	0.0077565 ohm

This is larger than our permissible resistance, so again referring to our tables we see that

Resistance of 170 500,000 circ.-mil 10-in. bonds	0.003740000 ohm
Plus 6 in. x 0.000001782 ohm per inch	0.000010692 ohm
Resistance of 170 16-in. 500,000 circ.-mil bonds	0.003750692 ohm

This is within our limit, so that we could either bond with a single 500,000 cir.-mil bond, or with two No. 0000 bonds.

Resistance of rail only	0.065757 ohm
Resistance of 170 16-in. 500,000 circ.-mil bonds	0.003751 ohm
Total resistance per mile	0.069508 ohm
Total resistance per mile of two rails	0.034754 ohm

Continuing the discussion still farther, suppose we assume a 400 amp current (average) for twenty hours per day. The track resistance for the 10 miles would be 0.347 ohm.

Energy loss = $I^2 R = 400^2 \times .347 = 55{,}520$ watts.
Twenty hr. per day × 365 days = 7300 hr. a year.
55.52 kw × 7300 hr. = 405,296 kw-hr. a year.
405,296 kw-hr. × 1 cent = $4,052.96 a year for the 10 miles.

Upon the same basis of figuring an increase in the track loss of 1 volt per 100 amp-mile would mean an increase in the financial loss of more than $1,000 a year. When it is considered that many systems cover hundreds of miles of track, the importance and relative economy of close attention to the conditions of the return circuit will be realized.

The assertion has already been made that the increased life and efficiency of the longer bond will generally more than offset the increased cost of the copper. Keeping in mind the relations which should exist between the proper length and cross-section, the reader will note by reference to the second of the series of articles of this subject that the maximum length mentioned for a 500,000 circ.-mil bond was 18 in. It is apparent at once that a bond of such a length must be installed under the plates and therefore it offers no inducement to copper thieves.

As an illustration of the effect of an increase in the length of a bond on its life, it will be interesting to refer to a series of tests made by one of the rail bond makers, where many two-conductor pin terminal stranded wire bonds of varying lengths, but all of No. 0000 capacity, were tested to destruction in the same vibration machine. These tests should prove in a most convincing way the advantages of longer over shorter bonds, since the principal cause of failure of bonds, assuming that they have been properly installed, is the play of the rail ends where the joints are loose. The following are the results:—

7-in. bonds broke at 41,000 vibrations
8-in. bonds broke at 215,000 vibrations
10-in. bonds broke at 1,279,000 vibrations
14-in. bonds broke at 7,887,000 vibrations

In other words, the 14-in. bond withstood approximately 6.2 times as many vibrations as the 10-in. bond before failure; 36.7 times as many as the 8-in. bond, and 192.4 times as many as the 7-in. bond. To be sure, these tests were made in a laboratory and not under service conditions, but they do give a fair indication of the relative life on the basis of length.

As to increased resistance from longer bonds, the resistance of No. 0000 bare copper strand per 1000 lineal feet at 68 deg. Fahr. (taken from table) is 0.04997 ohm, or 0.000004164 ohm per lineal inch. Therefore, the resistance of the various lengths of bonds used in the tests referred to, neglecting the contact resistances which we can assume to be the same for all lengths, would be as follows:—

Length of Bond	Resistance
7-in.	0.000029148 ohm
8-in.	0.000033312 ohm
10-in.	0.000041640 ohm
14-in.	0.000058296 ohm

If we return to the case of a single track road 10 miles long and laid with 30-ft. rails, we would have 3520 joints. If 14-in. bonds were installed, the resistance of the joints would be increased 0.08794 ohm, compared with 8-in. bonds. If we assume 80 lb. per yard as the weight of the rail, the resistance of the steel (neglecting the joints) would be 0.328785 ohm. The total joint resistance of 3520 joints bonded with 8-in. bonds (again neglecting the contact resistance) would be approximately 0.131406 ohm, or a total resistance of 0.460186 ohm for the return circuit. As shown above, the increased resistance, if 14-in. bonds were used, would be 0.08794 ohm, or an increase in the resistance of the entire return circuit of about 19 per cent. This may seem like a very large percentage, but if the 8-in. bonds were used, since the joints are not liable to be maintained perfectly tight all the time, the life of the short bonds will be only about 1/37 of that of the 14-in. bonds, thus quickly decreasing their efficiency and increasing the total resistance of the return circuit to much more than if the 14-in. bonds had been installed at first. In short, it is a waste of money to use short bonds where the joints are not kept tight.

Suppose we carry the investigation still farther and assume that the estimated life of the track will be twelve years. We will also assume that it was decided to install 8-in. bonds and that the efficient life of such bonds would be six years (an extremely liberal figure). Based upon present market prices the initial investment (not including the cost of original installation of bonds, which would be the same for both lengths), would be about $1,334, which for six years at 6 per cent would amount to $1,815. At the end of this time the joints must be rebonded, and assuming that the price of the bonds has remained the same during the six years, the total cost of the 8-in. bonds for twelve years would be $3,630. To this should be added a charge of, say, $1 per joint (also a fair figure, which would be greatly increased if the paving were brick, asphalt or some other expensive type), to cover the cost of removing and replacing the paving, joint plates and bonds. This equals $3,520, which for six years at 6 per cent amounts to $4,787, so that the total cost of the 8-in. bonds for the twelve years has been increased to $8,418. From this we will deduct an allowance of 5 cents each as the scrap copper value of the first set of bonds, amounting to $176, leaving the net cost of the 8-in. bonds at $8,242.

If the 8-in. bonds were good for six years, it is reasonable to conclude from the tests noted that 14-in. bonds would be good for the entire life of the track. The initial investment for 14-in. bonds at present prices would be about $1,754, which for twelve years at 6 per cent would amount to $3,016. Thus, the net difference in favor of the longer bond is $5,226, which again proves that "it is a waste of money to use shorter bonds where the joints are not kept tight."

Centers—Classes of Material

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK
BROOKLYN RAPID TRANSIT SYSTEM

The following represents the personal observations and conclusions of the writer from a close study of the service rendered by various types of centers, and the matter is presented in an effort to aid all the interests concerned toward a correct solution of the problems discussed.

The growing dissatisfaction at the performance of "hard center" work after twenty years of use is worthy of serious consideration. Perhaps the practical experience of one who has followed the "wearing plate" from its first installation, may be of service in determining such points as the following: Whether the fault is in the material used in the insert, or in the method used to retain or remove it; whether the renewable feature is worth while; what bearing the shape has with regard to the life of the center, and whether it may or may not be possible that most of the dissatisfaction arises from grooves of improper depth and width.

The first center used was a block of Bessemer steel 14 in. x 9 in. x 4½ in., set in an opening a trifle larger than itself, provided in a cast-steel frog, with no provision for retaining it other than a few shims driven in about the sides. The idea was that as the top surface became worn the block could be removed, resurfaced and reset. This was found to be impracticable because the wear on the sides and bottom was so great as to destroy the retaining box. This was replaced by the first really renewable center, made also of soft steel, but case-hardened on the wearing surface by the old English method. In this process a band of hoop iron was placed around the center to make it stand ¾ in. higher than the top of the piece. The combination was filled with bits of leather, horse hoofs, etc., placed in a furnace, heated to the required temperature, withdrawn and plunged into cold water. By this method the temper of the piece could be so graded that the part receiving the impact of the wheel in crossing the groove could be made much harder than the ends which abutted the rails of the frog.

It has been the writer's experience that centers made according to the old English method have given greater satisfaction than any others, and they are the only centers he has known to last as long as the crossing with which they were furnished. When this center became dished it could be removed, the ends ground to a surface level with the lowest part of the center and reset; and it would last longer in the second setting than the first. This tends to prove that the softer metal under the case-hardened surface acted as a shock absorber. This type of center rarely chipped, never cambered from cold rolling and the secondary pound or lamination of the abutting rail end was seldom seen in connection with it.

We have a great number of so-called "case-hardened" centers, but they must not be considered in the same class as the ones first described. These centers are treated in an entirely different manner. A harder steel is used for the stock, and after the planing and fitting has been completed the center is heated to a white heat; then potash is sprinkled or dusted on the top, and when the potash melts or liquefies the center is plunged in cold water. Within a few hours after their removal the writer has known such centers to chip or spall without being touched. He has also known many cases where for the same reason new centers had to be used after the pieces had been finished in the factory and were ready for shipment.

Now as to the all-hard or manganese center. If you reverse the criticism of the original case-hardened or Harveyized center, you have a fairly accurate description of the manganese center under service. This is especially the case in 90 deg. or nearly 90 deg. crossings, for in the frogs of branch-off curves, when the radius is 60 ft. or more, they wear well; but in the shorter radius curves, say between 30 ft. and 45 ft., the dishing or gouging out of the gage lines and guards between and abutting centers is very marked. Instances where derailments are caused from this side wear are quite numerous. We have a case in view now where a curved crossing must be renewed at least two years before its time, according to the life still left in the abutting rails of the curve which have the same radius as the crossing.

From the foregoing it would seem that centers which are all hard, or of one grade of hardness, cannot be used in all cases. We have experimented along this line and have demonstrated that the hard center under extremely heavy traffic ruins more special work than it saves; also that with a soft center under moderate traffic there is more possibility of getting the full value of wear out of 90-deg. crossings than by the use of hard material.

More crossings are removed because of noise complaints than on account of actual wear to the crossing. To illustrate, we have a certain crossing under moderate traffic (950 cars per twenty-four hours). An examination showed that all of its sixteen hard centers were dished at the intersections and that half of them were chipped also. Eight of the manganese centers were replaced in one run by eight open-hearth steel forged centers, while eight of the manganese centers were straightened and surfaced for re-use in the other run. Both runs had the same traffic. An examination made sixteen months later showed all of the soft centers to be tight, practically noiseless and in good order, with little evidence of wear. Of the eight hard centers only one had remained tight, five of the total number were chipped, while the noisy condition of all was very noticeable. Every hard center was then removed and replaced with open-hearth forged centers. The estimated life of the forged centers is six years, a saving of four and one-half years compared with manganese. Evidently this experience demonstrated that a grading of the material to suit the conditions of traffic is necessary.

Coil Room Practice

BY A MISSOURI CONTRIBUTOR

A number of companies complete their coils, that is to say, they give them the last dipping and baking, and then store them. In this way they are liable to accumulate a large number of sets which become hard, and as the first sets made are the ones which are given out the winders always have hard coils to work with. It has been the writer's experience in winding with hard coils that they do not lie together as they should, because the forming thus made necessary is a disadvantage which causes trouble with hard coils. Further, in banding armatures, non-flexible coils do not draw together tight unless they are banded hot. But if the coils are very old such heating will do little good. Another bad practice is the excessive baking of coils. When they are in service they will get baking enough. However, my main point is that the final dipping and baking should be left until the day before the coils are to be used in order that soft coils to work with will always be available. Accumulate as many sets of coils ahead as you want to, but postpone the final dipping and baking. When you need any see to it on the night before that the desired number are dipped and put into the oven ready for use the next day.

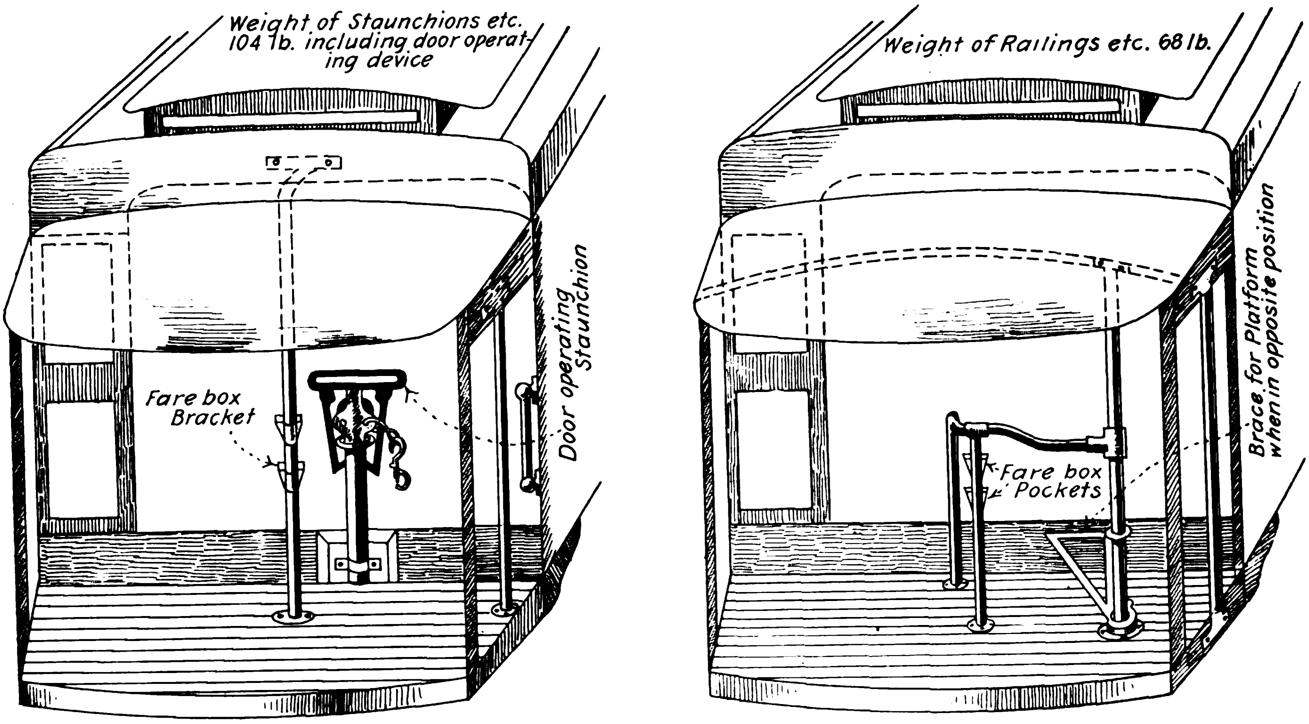
I would suggest the following course in the making of coils: No coil should be passed with the smallest kind of a kink in the wire, as this is liable to cause a short-circuit. Watch out also for welds in the wire. Coils should be held together with small flat clips of lead. It is bad practice to use small tie wires because they are overlooked, thus causing trouble after the armature is wound. After the coils are wound they should be dipped and left in the oven over night. Then the leads should be tinned to insure good connections to the commutator. In assembling coils, if three coils are used the middle coil should be taped all around, if possible. If not, paper insulation should be inserted between the parts of the coil that fit in the slot. When the coils are being assembled and tied, tubing should be slipped on the leads and the coils should be assembled and tied with fine flax thread. They are then ready to be taped with Empire bias tape at about half a lap on the taping machine. Next they are ready to be taped all around with about ¾-in. linen tape at about half a lap, stored away and left for the final dipping and baking during the night before use. In conclusion, railways should be careful about using home-made coil winding machines when so many good ones are available from the manufacturers of such tools.

Weights and Grades of Railings and Other Car Piping

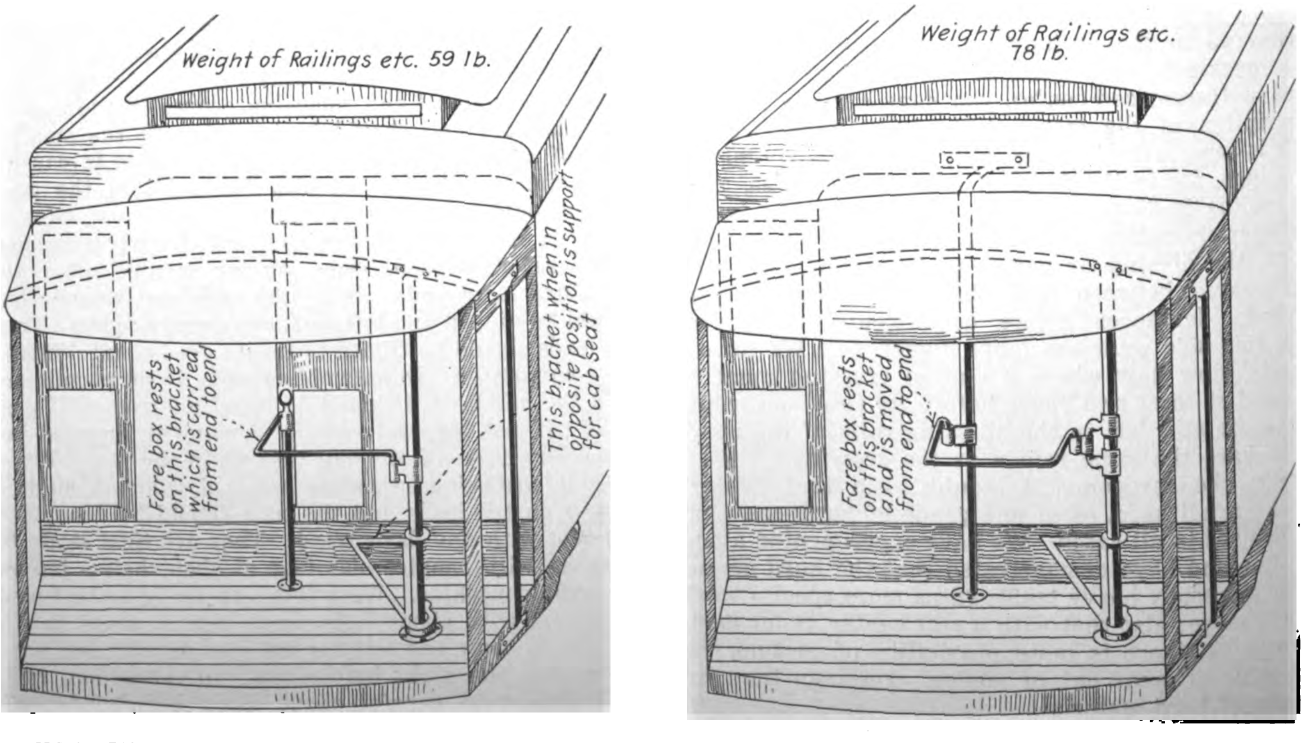
BY R. H. PARSONS, ELECTRICAL FOREMAN

In these days when so much attention is given to all the details of car equipment to the end that unnecessary weight may be eliminated, it is of interest to offer the results of a railing study recently made in this connection on a number of prepayment cars. All of the railings and fittings illustrated are made from 1-in. galvanized piping except for the main stanchion of the pay-within car, which is of gray iron. It was found that in the pay-within type of car the total weight of the fixtures illustrated, comprising the conductor's control and fare-box stanchion, weighed a total of 104¼ lb. On the first of three earlier types of prepayment cars with a dividing rail and support for the fare box the total weight was 59 lb., on the second, 68 lb., and on the third 78 lb.

The old type railings were made of 1-in. galvanized pipe which cost $0.046 per foot. This is the most suitable material for strength, appearance, adaptability for bending and freedom from rust. As the pipe is held to the floor by flanges screwed to the pipe and by special castings, including those used for holding the fare box, it would not be advisable to lighten the same grades of material because good stock is needed to hold the fittings. Such fittings must be strong enough to bear the


Weight of Staunchions etc. 104 lb. including door operating device
Fare box Bracket
Door operating Staunchion
Weight of Railings etc. 68 lb.
Fare box Pockets
Brace for Platform when in opposite position

STANCHION FOR CONDUCTOR'S OPERATION OF DOOR WITH FARE-BOX SUPPORT, PAY-WITHIN TYPE; OLD TYPE PAY-AS-YOU-ENTER


Weight of Railings etc. 59 lb.
Fare box rests on this bracket which is carried from end to end
This bracket when in opposite position is support for cab seat
Weight of Railings etc. 78 lb.
Fare box rests on this bracket and is moved from end to end

RAILING FOR CONDUCTOR AND FARE BOX OF TWO EARLIER TYPES OF PAY-AS-YOU-ENTER CARS, ONE COMBINATION WEIGHING 59 LB. AND THE OTHER 78 LB.

weight of the conductor when he is tired and to withstand the violent movements of passengers who want to steady themselves at the starting or stopping of the car. The stanchion for pay-within cars must be especially strong, as it has no support from the floor up to its full height. On this stanchion rests the burden of making a fulcrum by means of which the doors are opened and closed.

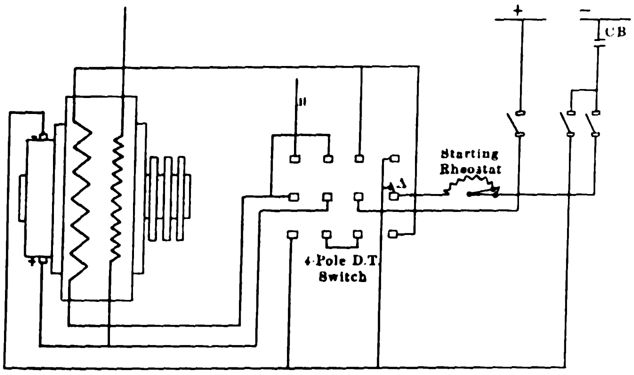
The Flexibility of Rotary Converters

BY T. A. LEES, DEPARTMENT OF MOTIVE POWER AND MACHINERY, BAY STATE STREET RAILWAY

In generator or motor practice no machine offers such flexible operation as the rotary converter.

In one of our larger d.c. plants we also supply a small alternating system. For this service we have a 400-kw rotary operating inverted from the d.c. busbars. A few years ago the a.c. load was increased by an additional service and an 800-kw alternator was installed. This service was later abandoned and therefore the inverted rotary could again take care of its former service.

In order to utilize the 800-kw unit, which is an efficient machine, we have arranged the wiring of the inverted machine so that it may be used as a regular converter and supply power to the d.c. service. During the peak hours or other heavy periods the alternator is run and serves the a.c. system and, through the converter, also feeds into the d.c. system. It was formerly necessary to start another large unit during these periods which are now easily taken care of by the converter.



Note—A is a contact which prevents opening of the shunt field circuit while changing position of main switch

Switch up when Converter
Switch down when Inverted

Electric Ry. Journal

SKETCH SHOWING WIRING OF MACHINE USED AS PLAIN AND INVERTED ROTARY CONVERTER

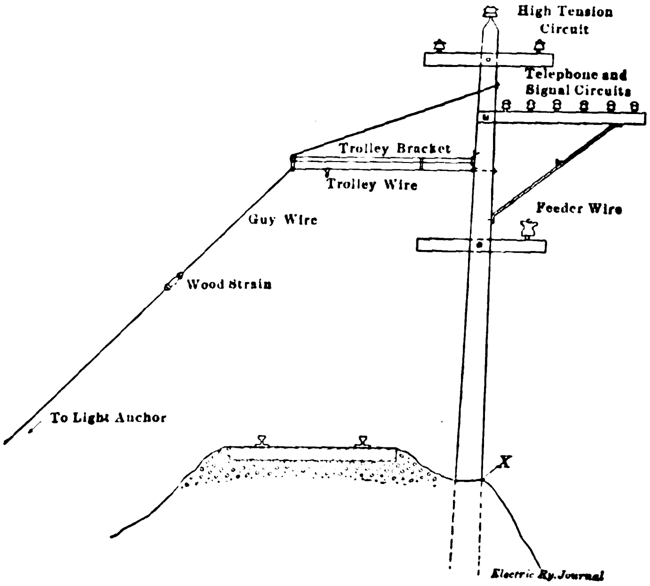
While converters have been floated between a.c. and d.c. systems on other installations the connections of this installation are unusual. The converter is arranged for d.c. starting only and therefore is started as a compound motor with the series field on the negative side. After the machine is up to speed the series field is opened and the machine then is run as a shunt inverted converter in order to give proper speed control. The rotary then feeds into the a.c. service through step-up transformers to a potential of 5500 volts.

The alternator generates 5500 volts and is phased in on the regular buses. To change from an inverted converter to a regular converter the d.c. side is disconnected and a double-throw switch is thrown, with changes the connections of the machine to a regular compound converter with the series field now on the positive side. The entire change is made in a moment by simply throwing this switch up or down with the converter running from the a.c. side. The accompanying sketch shows the connections that were necessary to obtain this flexibility of operation.

The same plant also contains another interesting unit which is somewhat flexible in its uses. It is a 400-kw engine-driven double-current generator which in reality is an engine-driven rotary converter. This unit is sometimes operated as an alternator or as a d.c. generator, and occasionally it has served both systems at the same time. It has also been equipped with an extra series field coil so arranged that in times of necessity the machine is run as a series line booster on one of the long feeders.

Maintaining Alignment of Poles

Practically every line foreman can recall a group of poles with which he has had trouble on account of their seeming persistence in getting out of alignment. In most of these cases the setting of the poles has been done improperly or the character of the soil is such as to prohibit satisfactory pole line installation. A typical instance of such a pole line is shown in the accompanying sketch, the poles here carrying high-tension, trolley and auxiliary circuits, and being set too near the edge of the embankment to insure stable conditions. As the earth behind the pole becomes soft in wet weather the pole has a tendency to lean away from the track, for as vibration at right angles to the line is set up by winds or passing cars the earth at *X* offers little resistance in a longitudinal direction, while that on the opposite side of the pole gives very little. After such a pole has once settled to the right from its perpendicular position its own weight tends to aggravate the trouble.



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GUY WIRE AND ANCHOR FOR MAINTAINING ALIGNMENT OF POLES

To correct this condition a transmission and electric railway company in northern Illinois has adopted the expedient of attaching a guy wire to the end of the mast arm and to a light anchor of some type quickly and cheaply installed. With this wire drawn taut while the pole stands upright no difficulty is experienced in keeping the poles in line and the line is given an added factor of safety against wind.

The bureau of mines of the Department of the Interior has recently issued a preliminary report, known as Technical Paper No. 63, based on investigations made on the subject of factors governing the combustion of coal in boiler furnaces.

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New San Francisco Municipal Railway Cars with Mechanical Reverser Throw

The Van Ness Avenue and Chestnut Street extension of the San Francisco Municipal Railway was completed on Aug. 4, the contractors thereby earning the maximum bonus of $15,000 for completion ahead of schedule. Regular service on the new line, which is designed primarily to handle traffic to the exposition grounds, was commenced on Aug. 15 with seventeen of the new cars just received from the factory. A total of 125 of these cars have been ordered, and they are now being delivered in San Francisco at the rate of twenty-five per month. As fast as received they are being assembled and substituted for the old cars on the Geary Street line. The old cars will not be put back in service until the increase in traffic to the exposition requires their use.

The new cars are of the California type, with semi-steel construction, and are finished in three-ply veneer. In order to increase the carrying capacity the inclosed section has longitudinal seats, but the car frame is fitted with lugs for cross-seats, which it is the intention to install when the rush of exposition traffic is over. The drop platforms on each end are ramped toward the sides to insure drainage in wet weather, and the center aisle is depressed for the use of steel mats to be flush with the remainder of the floor. The light wiring is run in open conduits, a Crouse-Hinds condulet being provided for each lamp outlet, so that all wiring is accessible for repair. A switchboard mounted directly over the motorman's station at each end of the car carries the terminals of all buzzer signal lamp and pump circuits.

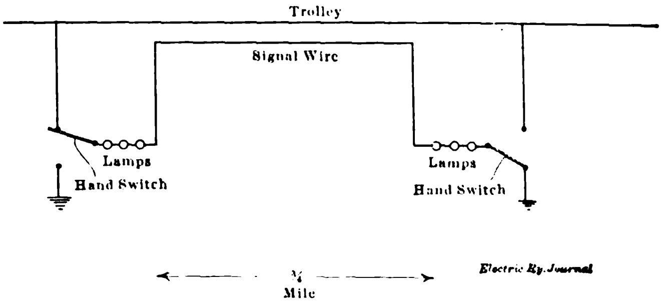
The electrical equipment includes Westinghouse 306-CA 50-60-hp motors with a gear ratio of 15:69 and HL control. This control, however, is not the original HL type, as it includes means to give the motorman absolute control of the car regardless of air pressure or energy supply. To accomplish this the reverser is connected by means of levers and flexible wire rope to a handle at the motorman's station at either end of the car. In case of failure of current, with defective brakes, the operation of this handle throws the reverser so that the motors are utilized for braking power. This emergency device is interlocked with the control circuit so that in the normal position the current is fed through interlocking fingers to the controllers. When the reverser is operated mechanically from the platform it opens the interlock fingers and breaks the control circuit. Thus a car can be reversed without throwing the controller to the off position. The chief advantage of the interlocking, however, is that it prevents the accidental burning and blistering of the reverser contacts by making it necessary for the motorman to bring the car to a full stop, leave the platform, and reset the interlock fingers and the reverser at the side of the car before the master controller is again effective for its regular duties.

Other features of the control equipment are the two conductor's valves used in connection with Westinghouse type H emergency valves. The conductor's valves, which are arranged to be operated from either platform, connect the main reservoir with the brake cylinder, and at the same time operate the air sanders. A break in the pipe lines on either end of the car has the same effect as opening the conductor's valve.

The new cars were built by the Jewett Car Company. T. A. Cashin is superintendent of the San Francisco Municipal Railway, and the cars are being assembled under the supervision of William C. Bendel, master mechanic.

Home-Made Crew Signaling Device of Bangor Railway & Electric Company

A convenient device for calling car crews and inspectors to the telephone is used by the Bangor (Maine) Railway & Electric Company. It is illustrated in the accompanying halftone and wiring diagram, and consists of a pole box at each end of the line section covered, the box containing three 16-cp incandescent lamps wired in series and installed behind red bull's-eyes mounted on three sides of the box, so that when the lamps are lighted the attention of the desired employee will be more readily attracted. At each box is a spring switch of the single-pole, double-throw type. The two boxes are connected in series, and energy for the operation of the lamps is derived from the local trolley circuit. The switch in each box is always on one contact or the other, and the wiring is so arranged that when the movement of the other switch from one contact to the other throws a current through the six lamps the inspector or car crew is called to a telephone located in the box. One switch contact in each box is connected to the trolley and the other to ground, and it is impossible for the switch to short-circuit the line. In times of irregular car service over the single-track line thus equipped it is often a great convenience to be able to call up the car crew or the downtown inspector after a car has entered the section concerned, and to give orders or find out the situation regarding the prospective movement of traffic.



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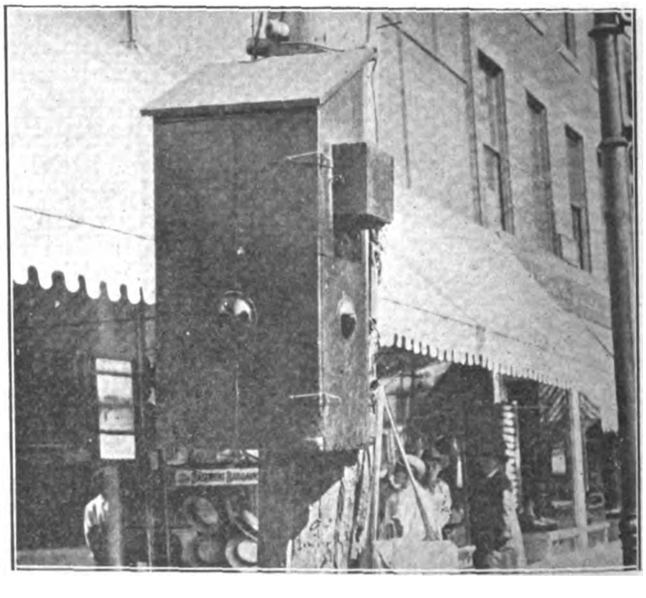
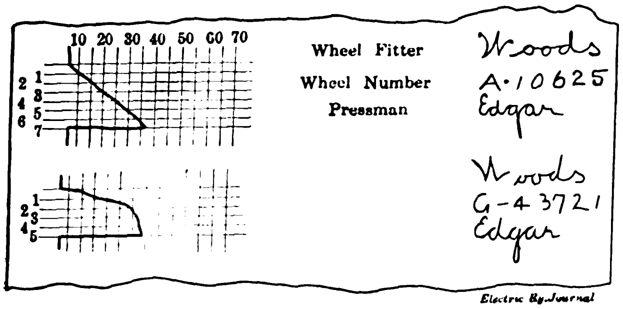
HOME-MADE SIGNAL OF THE BANGOR (MAINE) RAILWAY & ELECTRIC COMPANY



SIGNAL BOX OF THE BANGOR (MAINE) RAILWAY & ELECTRIC COMPANY AS INSTALLED ON A STREET POLE

Wheel Press Recording Gage

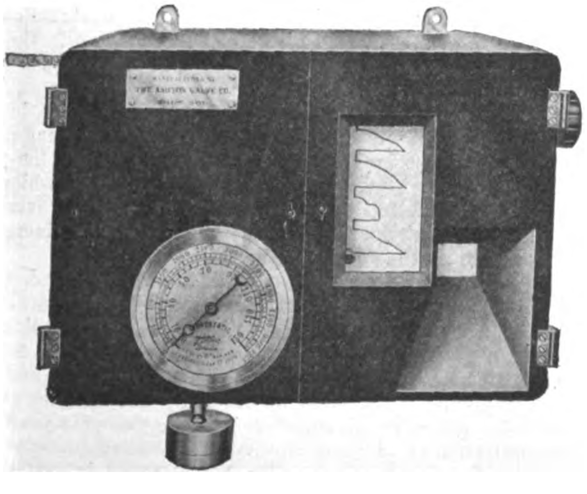
The possibilities for securing exact results in electric railway shopwork are demonstrated again by the use of gages to insure the perfect mounting of wheels on axles. These gages give a graphic story of how the work was done, disclosing immediately such defects as improperly finished axles, loose wheels and excess pressures. The gage made for these purposes by the Ashton Valve Company, Boston and Chicago, is shown in one of the accompanying cuts, and sample records of good and bad work are shown in another view. The upper curve shows a perfect wheel fit for 5⅛-in. bore, hub 7 ft. long, with 7 tons pressure per inch of bore applied gradually in proportion to the travel of the wheel on the axle. The lower curve shows a bad wheel fit because a 30-ton pressure was applied for the first 1½ in. of fit leaving only 7 tons additional pressure for the remaining 3½ in. so that the wheel fits only on the side of the hub first forced on the axle.



Electric Ry. Journal

TYPICAL RECORDS OF GOOD AND BAD WHEEL FITS

The graphic gage is the combination of a hydraulic pressure gage and a recording device. The latter operates automatically in conjunction with the former, furnishing on a continuous record roll a diagram of each pressure application and means for registering opposite each diagram such information as may be desired to identify the wheel number, fitter and pressman. The record roll has a capacity of 300 diagrams, or 150 pairs of wheels. It can be readily removed for filing when complete, and a new roll inserted without any appreciable loss of time.



WHEEL PRESSURE RECORDING GAGE

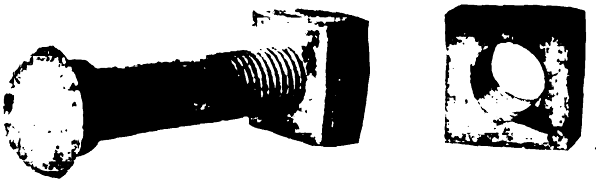
Included with the equipment of each gage are the following accessories:

A ⅜-in. hydraulic relief valve to protect the machine from any excessive over-pressure; a ½-in. pulsating check valve to protect the gage spring and both the registering and recording hands from sudden fluctuations in pressure; a ½-in. lock-up stop cock to be used as a shut-off when demounting wheels; a graduated scale with which each diagram can be measured for both the length of the fit in inches and the pressure at each corresponding point in tons on ram. Each 1/16-in. open space in vertical base line of the diagram represents a 1-in. length of fit on the axle. The pressure record is measured horizontally from the readings on the scale; instruction data.

This gage can be adapted for use on any single ram wheel press, provided the diameter of the ram is known. All gages are graduated to a maximum of 150 tons pressure unless otherwise specified.

Pawl and Ratchet Principle Self-Locking Nut

By taking advantage of the pawl and ratchet principle, and applying it to an ordinary nut and bolt, the Daniel Safety Device Company, Chicago, Ill., has recently put on the market a new type of self-locking nut. The application of the pawl and ratchet principle to the nut is quite simple and embraces a spring steel pawl swedged into a pocket pressed into the nut when it is made. As shown in the accompanying illustration, this pawl occupies only a portion of the nut depth, and its size is varied so that it may be applied to any nut, from the smallest to the largest.



SELF-LOCKING NUTS, SEPARATE AND APPLIED

The angle of the pawl to the thread is such that as the nut is turned onto the bolt the pawl rides freely on the bolt threads. If an attempt is made to reverse the nut the sharp edge of the pawl immediately bites into the bolt thread, thus effectively locking the nut against loosening. Vibration acts only to tighten the nut, since a reverse movement merely causes the pawl to cut a deeper recess for itself in the thread. In actual service it has been found that when a bolt stretches, vibration tends to cause this nut to take up the extra length.

The "Bulldog" self-locking nut, as this pattern has been named, is made in several types. Thus the type for trackwork is not provided with an arrangement for releasing the pawl, since it was believed that few trackmen take the time to unscrew a nut when it is necessary to remove an angle-bar. However, if it is desired to make provision for unlocking the nut, the pawl may be set on the outside of the nut instead of the inside, in which position the pawl may be released by inserting a nail behind it. For high-grade machine work the same principle is employed but the pawl is set in a pocket on the inside of the nut. This pocket, however, is pierced by a hole from the face of the nut to permit the insertion of an unlocking key. Besides serving as a lock, the pawl also prevents anyone from applying the nut in the wrong position. If the back and the base of the nut are reversed, the pawl engages with the threads as it is turned onto the nut.

The electric railway mail cars formerly used by the Post-office Department in Brooklyn, N. Y., have been supplanted by twelve automobile trucks.

News of Electric Railways

HAZLETON STRIKE SETTLEMENT

Company Issues Statement to Public Giving Facts in Regard to Terms

In order to make the position of the company clear with reference to the declaring off of the strike of employees, Alvan Markle, president of the Lehigh Traction Company, Hazleton, Pa., issued the following statement to the public on Aug. 24:

"It was the hope of the Lehigh Traction Company, when the strike was officially declared off, that the public announcement of the fact would not be accompanied by any declaration that might tend, in the slightest degree to complicate the present status or future relations between the company and its employees. Our hope has not been realized. The statement published in the press and the inferences drawn therefrom by the press and public are quite misleading. They give rise to a false impression concerning the status of the recent striking employees with the company and its obligations to them.

"If these statements were persisted in and these false impressions permitted to remain, they would only serve to confuse and complicate the future and become the subject of renewed strife. For that reason this statement is issued and we hope it will be the last.

"When Mr. Colgan sought on Aug. 17 to learn the attitude of the Lehigh Traction Company toward the men on strike, we informed him it was fully expressed in our public statement of July 16 and particularly by the following paragraph:

"'We say to you, our former employees, that there are vacancies open to a considerable number upon the lines of the Lehigh Traction Company. We say to every one of you who is worthy of confidence that we will be glad to receive your application and place you at work as soon as the circumstances warrant. No one will be discriminated against because of union affiliations. . . . We regret that all worthy employees cannot be taken back at this time. We cannot repudiate our existing contracts with our present employees. . . .'

"We stated to Mr. Colgan at that time that this was still our position. To him and to others who came we repeated it. And the last authoritative utterance that came from this company upon the subject to him and all others was this: 'We stand to-day in that position. We will neither advance nor recede from it.'

"This statement now governs this company in meeting the present conditions and will continue to control its action in the future. At no time did this company agree to the statement that 'all men except three will be given employment.'

"It will carry the above out generously in letter and spirit. But it has not agreed to more, nor will it permit such impression to be created. It would perhaps be easier at this time to remain silent and let the future solve its own problems. But it would not be honest or fair to the public, to the men, nor to ourselves. Hence, this statement to set the present conditions aright and guard against misunderstanding in the future."

The distinct understanding had with the committee of former employees of the company, together with one of the national board members of the organization, was that while the men were on strike none would be considered for positions on the line. If the men desired to declare the strike off the company announced that it would, when vacancies occurred, consider for employment any men in whom it had confidence. At no time did the company agree to reinstate all but three men.

On Jan. 1 the company discharged five men who were on the committee, representing five-sevenths of said committee, because they broke faith with the company. At no time did the company change its position. These men will not be taken back, but such other men who while on strike were honest with the public and fair to the company will be considered as vacancies occur. The company has at present a full complement of men under contract who will not be discharged without cause. The officers do not, of course, know at this time when there will be any vacancies, but they have notified a committee of the men that when these vacancies occur selections will be made from the old men if they can honestly be considered before new men are employed.

INTERBOROUGH COMPANY PROGRESS

System of 85 Miles of Subway and 117 Miles of Elevated Handles 651,886,671 Passengers for Year

The general remarks contained in the annual report of the Interborough Rapid Transit Company, New York, N. Y., for the year ended June 30, 1914, touch upon traffic carried, the company's financing and new subway construction progress. The company operates all the elevated railway and the subway lines in Manhattan and Bronx boroughs and the present subway extension into Brooklyn. The system comprises 117 miles of elevated railway and 85 miles of subway. In regard to the matters previously mentioned, Theodore P. Shonts, president of the company, says in the report:

"The increase in the net corporate income of your property for the fiscal year ended June 30, 1914, is greater than during the previous year, notwithstanding the general depression in business conditions, which has resulted in almost universal decreases in railroad earnings throughout the country. While a small part of this increase resulted from interference to surface line traffic by snowstorms during the winter, the net result nevertheless establishes in no uncertain degree the stability of the earning power of the rapid transit lines in Greater New York, and furnishes an excellent barometer of the basic value of their securities.

"That this stability of earning power attaches to new rapid transit lines as well, the new mileage creating a corresponding increase in travel commensurate with the additional facilities furnished, is evidenced by the number of passengers carried per annum at the end of each ten-year period since the opening of the elevated lines for operation. In 1874 the Manhattan Elevated Railway carried 796,072 passengers, in 1884 it carried 96,702,620 passengers, in 1894 it carried 196,159,323 passengers, in 1904 it carried 286,634,195 passengers, while in 1914 the elevated and subway lines carried 651,886,671 passengers, an increase of approximately 100,000,000 passengers for each of the ten-year periods during which the facilities were not appreciably increased, and an increase of 365,000,000 passengers during the period of subway operation. The increase in mileage during this last ten-year period, by reason of the construction of the subway, was approximately 70 per cent, while the increase in the number of passengers carried was 127 per cent. Thus the new mileage not only created new traffic equivalent, per mile of road, to the old, but the increase in the number of passengers carried on the combined mileage was greater per mile of road than during any previous ten-year period. This illustrates, as nothing else can, that while the increase in population bears its due relation to the increase in traffic, the number of rides per capita per annum increases in proportion as the facilities for travel multiply.

"Your company's agreement with J. P. Morgan & Company for the purchase of not exceeding $170,000,000 of its 5 per cent bonds, the proceeds to be used for refunding the company's obligations and making its contribution toward the construction and equipment of new subways and elevated extensions, has been modified by a reduction of the company's actual requirements. For the calendar year 1913 the requirements of your company amounted to only $68,658,000 instead of $78,000,000, as mentioned in last year's report. This reduces the total number of bonds to be sold for the purposes above mentioned by $9,342,000, making a reduction in your company's estimated capital obligations to that extent. In addition to the above reduction your company has the option of still further reducing the total amount of bonds to be sold by such amounts as may be found available to the company from other sources for the discharge of its obligations under contract No. 3, and the Manhattan and Interborough certificates.

"Under the terms of contract No. 3 the city, through the

Public Service Commission, has engaged to construct the new subway lines and lease them to your company for operation. In awarding the contracts for this construction, the city's aim has been to place the trunk lines and tunnels under contract in advance of the outlying extensions, so that the entire system may be completed, as nearly as possible, at substantially the same time.

"The Lexington Avenue line from Forty-second Street to 152d Street is entirely under contract and the construction work well advanced. The plans and contract for the short diagonal connection with the present subway at Forty-second Street are about completed and the work will be advertised at an early date. The Seventh Avenue line extending from Forty-second Street to South Ferry is completely under contract, and the work on most of the sections is well under way. The new Brooklyn extension branching from the Seventh Avenue Line at Park Place and extending under the Post-office, William Street and the East River to the Borough Hall Station in Brooklyn, is partially contracted for. The contract for the tunnel under the East River has been awarded and the work is now under way, and the contract for the extension from Clark Street under Fulton Street to the Borough Hall Station of the existing subway is now being advertised. Plans and contracts for the sections under the Post-office and William Street, though somewhat retarded by the protracted negotiations between the city and the federal authorities for the right to pass under the Post-office Building, have now been completed and the contracts are about to be advertised. As soon as these two sections and the diagonal connection at Forty-second Street are awarded, the two principal trunk lines in the Borough of Manhattan and the extension to Brooklyn will be completely contracted for.

"The work on the extension in the Bronx is also well advanced. The Jerome Avenue line extending from 157th Street to Woodlawn Road is under contract, and all of the sections of the White Plains Road line from Bronx Street to 241st Street have been awarded and the work is well under way. The Southern Boulevard line branching from the Lexington Avenue line at 138th Street has also been placed under contract as far as Bancroft Street.

"The contract for the reconstruction of the Belmont Tunnel has been awarded and the work is nearing completion. As soon as completed the tunnel will be available for temporary operation, as contemplated under contract No. 3. The extension from Van Alst Avenue to Queensboro Bridge is also under contract, as well as the lines to Astoria and Corona.

"The extension of the present subway from Atlantic Avenue, Brooklyn, up Flatbush Avenue to the Park Plaza has been placed under contract and the work commenced, but none of the other Brooklyn lines have yet been awarded.

"All of the additional third tracks authorized by the certificate to the Manhattan Railway have been fully legalized by the orders of the Appellate Division in lieu of property owners' consents, and a general contract covering the work has been made.

"Progress has also been made in the preliminary work on the elevated extensions and connections."

WAGE ARBITRATION FINDING

New York State Railways Employees Awarded Slight Increase Dating Back to May 1

In the matter of the arbitration concerning rates of wages between the New York State Railways and the Amalgamated Association of Street and Electric Railway Employees of America, through its divisions at Rochester, Schenectady, Syracuse and Utica, Charles P. Neill, Thomas Spratt and James E. Roach, arbitrators, found as follows on Sept. 4:

"We, the undersigned, Charles P. Neill, Thomas Spratt and James E. Roach, selected under and pursuant to the agreement of arbitration entered into by the above-named parties by written agreement, bearing date of May 21, 1914, beg to report that we have been attended by the respective parties and their representatives and attorneys, have heard the testimony and the arguments by respective counsel, and after due deliberation we find and award that the rate of wages to be paid by the said company to its said employees for a period of one year, being from May 1, 1914, to May 1, 1915, be increased by the payment of an additional 1½ cents per hour over and above the rates respectively paid immediately prior to May 1, 1914, to all of the employees designated in said agreement of arbitration who have heretofore been paid by the hour and that a proportionate increase of wages be paid also to such employees as have been paid by the week or the month for the same period above given.

"We also find and award that where conductors or motormen are used as flagmen on work or utility trains they shall be paid their platform rate. We beg further to add that we have noted with great pleasure that the best and kindliest feelings exist between the officers and employees and we earnestly hope that this condition of mutual good-will may continue for the time to come, as we believe it to be for the best interest of all, including the patrons of this important public utility. Lastly, we hand down this decision to the two parties respectively with the hope that, while it may not be acceptable as a whole to either party, it will be accepted and carried out in good spirit by both parties in the belief that it is our best joint expression of justice in the matter of this arbitration."

The working agreement between the New York State Railways and its employees expired last April. The men asked for an increase in pay from the maximum limit of 26½ cents an hour to 35 cents, basing their claims on the increased cost of living. The company agreed to make a substantial advance provided the new schedule extend over a period of three years. This proposition was refused. Later the company agreed to a slight increase for the current year. Numerous conferences were held without an agreement. As a last resort an arbitration board was appointed, consisting of Thomas Spratt, Ogdensburg, representing the company; James E. Roach, Schenectady, for the employees, and Charles T. Neill, former State Labor Commissioner, as the third member. Hearings were held by the arbitration board in Utica, Syracuse, Rochester and Schenectady since July 1.

LOANS TO SAN FRANCISCO EMPLOYEES

The United Railroads, San Francisco, Cal., has under consideration a plan for making loans to its employees to meet emergencies and contingencies against which its men have been unable to provide. Jesse W. Lilienthal, president of the company, is quoted in this connection in part as follows:

"The details of the plan are about ready to be announced. I am free to give the underlying reasons which have prompted the company to test the plan. I believe it is a wise and proper thing to do, because I do not believe that any corporation gets the best of service from employees who are worried or bothered about financial matters. Any man who is working steadily for a fair rate of remuneration should have some place to go when he needs an accommodation. I recognize that at the present time the salary loan man is about the only source of money for many worthy men. The banks will not loan to these people and many of them have no direction in which to turn. Yet they are honest and in many instances, due to illness and other good reasons, their need for accommodation is great. There is no reason why such people should pay exorbitant rates of interest. Surely character is an asset.

"The United Railroads will have a department to which its employees who need money may turn. If the record of the applicant is good, if the requirement is a legitimate one, there will be no necessity for this employee to go further for money, because it will be supplied. The mode of repayment will be easy and plenty of time will be allowed. In other words, the aim of this department will be to meet a demand that I am sure exists among salaried people everywhere.

"I am just enough of a believer in human nature to think that with this department in operation we will build closer relations with the employees and that any money which may come from this fund will be regarded as a debt of honor by every employee who makes use of this avenue for securing a loan in times of stress. If the plan of the United Railroads proves a success I should like to see other corporations adopt the same course, for I am informed that corporation employees are considered as especially good risks by the salary loan concerns."

CHANGES IN PERSONNEL OF KEY ROUTE

A number of changes have been made in the personnel of the San Francisco-Oakland Terminal Railways, Oakland, Cal., as a result of the inability of George C. Moore and his associates to carry out the plan of financing the company agreed upon when Mr. Moore succeeded to the interest previously held in the company by F. M. Smith. Mr. Moore had arranged to interest capital in Europe in his plans, but the war has prevented him from carrying out the details of the undertaking. Under the new administration the major portion of the old staff of the company under W. R. Alberger has been reinstated, and it is thought that local capital in San Francisco will become interested. It is stated unofficially that the construction work will be continued just as had been planned in so far as this is feasible. A. W. McLimont, general manager of the company, has been succeeded by W. R. Alberger as vice-president and general manager. Robert Morrison, Jr., secretary and assistant treasurer, has been succeeded by Angus Clark, assistant secretary, and F. W. Frost, assistant treasurer. George H. Harris continues with the company as general superintendent. E. M. Boggs continues with the company as chief engineer of docks and wharves. George H. Binckley continues with the company as chief engineer of maintenance of way. F. W. Brown, traffic manager, is succeeded by J. H. Brown. W. E. Hendley, in charge of the efficiency department, is succeeded by U. S. Sliter. L. B. Cramer, electrical engineer, is succeeded by H. P. Bell. Pomeroy Ladue, purchasing agent, has been relieved and purchases will hereafter be handled through the office of the general manager.

REHEARING ASKED IN HOCKING VALLEY CASE

The Hocking Valley Railroad has applied to the Ohio Public Utility Commission for a rehearing of the case in which it was recently ordered to resume the operation of electric service on the Jackson Wellston belt line. Of the fourteen reasons assigned for the rehearing, the most important perhaps is that the Commission does not have jurisdiction to designate the kind of service that a utility shall furnish and that the steam train service substituted for the interurban service is adequate to the needs of the community. The Hocking Valley Railroad operated the electric line for eighteen years in connection with its steam railroad. It also developed power business along the line, but abandoned the service and deprived the users of current.

The commission held that after a railway has gone into a community and supplied it for years it cannot withdraw at will and leave the community without the service. That part of the company's property is suffering a loss just now was not considered sufficient grounds for the abandonment of the service.

PROGRESS ON NEW YORK RAPID TRANSIT CONTRACTS

According to the report of Robert Ridgway, acting chief engineer of the Public Service Commission for the First District of New York, for the month ended Aug. 15, satisfactory progress is being made generally on all rapid transit contracts. Construction work is proceeding actively in the boroughs of Manhattan, Brooklyn, Queens and The Bronx under contracts awarded by the city of New York to twenty-two different contracting firms, who are employing a daily average of 13,000 men. The total contract price of all city contracts awarded to date is $135,910,269, and in addition to this the Interborough Rapid Transit Company and the New York Municipal Railway Corporation have contracts under way to the extent of about $15,000,000 under contractors employing about 2,400 men. While the chief engineer says nothing as to the date of the beginning of operation on any of the lines, it is apparent from his report that the Fourth Avenue subway in Brooklyn and the Steinway tunnel from Manhattan to Long Island City will be the first parts of the dual system to be placed in operation. The outlook is that operation of both these lines will begin shortly after the first of the coming year. At about the same time it is also expected that the two additional tracks in the Centre Street loop subway not now operated will be ready for use, and that the connection of that subway with the Brooklyn and Manhattan bridges will be completed. It is now connected only with the Williamsburg bridge, over which Brooklyn elevated trains have been running into and through the loop subway for the last year.

CONSTRUCTION AND ROUTING PROBLEMS IN CLEVELAND

Application has been made to the City Council of Cleveland, Ohio, by the Cleveland Railway for permission to erect a building at Superior Avenue and East 123d Street to be used as division offices, clubhouse and carhouse. The resolution granting the request has been referred to the street railway committee. The cost of the building is estimated at $128,000.

Director of Public Service Sidlo has requested the company to lay tracks on East Ninth Street from St. Clair Avenue to the lake front in order to take care of the passenger service to the new boat piers which will be completed in the spring. This will probably be commenced within two weeks.

Trouble has arisen over the routing of the West Fourteenth Street cars and Mayor Baker has come forward with a plan that will probably prove satisfactory. Peter Witt, street railway commissioner, opposed a plan that the City Council proposed to adopt.

The charge of 1 cent for transfer was restored on Sept. 1. The change went into effect without active opposition and the charge will continue until the interest fund reaches $700,000. It is estimated that this will require something like a year.

New Pennsylvania Line Opened.—The West Side Electric Street Railway has been placed in regular operation between Charleroi, Bentleyville and Ellsworth, Pa. Hourly service is maintained. The line is 11 miles long.

Tacoma's Proposed Municipal Railway.—The first bids for work in connection with the construction of the proposed municipal railway in Tacoma, Wash., have been opened. They are for pile-driving. While the contract will probably be awarded to the lowest bidder, it will not be signed until the bonds voted for the line have been sold. The bids for the bonds will be opened on Sept. 19. Commissioner of Public Works Woods will receive bids until Sept. 14 for the special work and rails.

Power Station Plans Approved.—The plans and memoranda presented by the Buenos Aires Western Railway, Buenos Aires, Argentina, relative to the erection of an electric power station on a site between the River Plata and the canal of the second section of the South Dock (east side) have been approved by the government. This station is to supply the energy required for electrification of the company's suburban service between Plaza Once and Moreno and also to the tunnel route to the port of Buenos Aires.

Interchange of Transfers Urged in San Francisco.—The exposition committee of improvement clubs has addressed the Board of Supervisors of San Francisco, Cal., urging that an agreement be entered into between the city and the United Railroads for the exchange of transfers to facilitate travel during the exposition period. The matter has been referred to the public utilities committee and Sept. 16 was set as a date for hearing the improvement clubs on the subject. The committee also suggests that the United Railroads, upon some basis to be worked out, be given the right to route its cars over the tracks of the Geary Street Municipal Railway.

Special Issue of "Manufacturer's Record."—The issue of the *Manufacturers' Record* of Baltimore for Sept. 3 was a special edition in two sections. Part I was the regular weekly issue and Part II a special illustrated supplement devoted to the upbuilding work in progress in the city. Since the great fire, ten years ago, some hundreds of millions of dollars have been expended in broad constructive work in the rebuilding of Baltimore. The story of how this has been done and of the work now in prgress appears in full in Part II. Two pages and a half of the issue are devoted to the work of the United Railways & Electric Company in rebuilding and maintaining its system. Six halftone illustrations show some phases of the company's work.

Flood in Manila Interrupts Electric Service.—Electric lighting and street railway service in Manila, P. I., was partially interrupted on Sept. 2 and 3 by a flood resulting from recent typhoons. According to cable advices received from the Manila Electric Railway & Light Company by The J. G. White Management Corporation, New York, N. Y., operating manager of the company, parts of the company's generating plant were under water, the operation of the street railway was interrupted part of one day and considerable difficulty was experienced in maintaining full electric service. On Sept. 3 seventy-five cars were operated. Normal service was resumed on the following day. Aside from slight damage to a few cars and to roadbed of the street railway the company suffered little loss.

Opportunity in Bahamas.—W. F. Doty, United States Consul at Nassau, New Providence, Bahamas, writing to the bureau of domestic commerce, Department of Commerce, says: "An electric street-car system in Nassau and vicinity would probably be profitable, as have others in small tropical communities. Storage-battery cars would make the cost of equipment low. Twenty cars might be sufficient to start with for the city. Later the line might be extended along the western shore to The Caves, Orange Hill, Old Fort, and even to Clifton and Southwest Bay. Several hundred carriages now ply the streets and charge 12 cents per passenger for even two or three blocks. In the heat along unshaded streets one prefers to pay this high fare rather than walk. Improved transportation facilities are therefore needed."

New Haven Dissolution Decree.—The negotiations that have been in progress between the Department of Justice at Washington and the New York, New Haven & Hartford Railroad appear to have reached the point of an "agreed decree" that the company shall dispose of its Boston & Maine stock within a year, or failing that, the courts of Massachusetts shall determine the basis upon which the divorce shall be consummated. In the general plan are included separation of the New Haven from its ownership of the electric railways in Connecticut and Rhode Island, controlled by the Connecticut Company and the Rhode Island Company, respectively, but the fate of its Long Island Sound steamship holdings is left to the discretion of the Interstate Commerce Commission. The new Attorney General has expressed a wish that the civil suit that has been pending shall be settled at the earliest possible moment.

Ohio Valuation Committee in New York.—A committee composed of R. R. Stevens, representing the Ohio independent telephone companies, Robert Lindsey of the Cleveland Electric Illuminating Company representing the gas and electric companies, Allard Smith representing the Cleveland Telephone Company, Frank C. Dunbar, representing the Ohio companies of the American Telephone & Telegraph Company and F. W. Coen, vice-president and general manager of the Lake Shore Electric Railway, representing the electric railways of Ohio, has been in New York for several days on matters connected with the valuation of public utilities ordered by the Ohio Public Utility Commission. By order of the commission every utility in the State must, before Jan. 1, make and file with the commission a certified valuation of all its property. The utilities selected this committee to arrange schedules and to formulate methods of valuation.

Survey Motor Truck Boulevard from City to Port of Los Angeles.—In order to reduce the cost of transporting freight from Los Angeles proper to its water front, it is proposed to build a concrete-paved highway 30 ft. wide specially for the use of automobile trucks. On Aug. 24 the board of supervisors instructed the county road commissioner to survey the proposed route and submit a report estimating the cost of the road. The route proposed is expected to take the auto trucks away from the roads over which the lighter vehicles would naturally travel and runs through the logical industrial and warehouse district. The plan is to begin at Seventh and Alameda Streets and run in a straight line through Vernon and Compton to the harbor front, a total of 18 miles. Interests which have been active in securing a favorable move in this matter are the Automobile Club of Southern California, the Jobbers' Association, the Wilmington Chamber of Commerce and the Harbor Truck Association.

Decision in Seattle Franchise Case.—Judge Jeremiah Neterer in the Federal Court at Seattle, Wash., recently declared valid the franchise of the Seattle, Renton & Southern Railway. This franchise was repealed by the City Council in December, 1910. By the same ruling the city of Seattle acquires the right to connect the tracks of Division "A" of the municipal car line with the tracks of the Seattle, Renton & Southern Railway and operate its cars over the line of the latter on Fourth Avenue. The city also may order the improvement of streets over which the Renton line is routed, and may compel the company to conform to these improvements in the construction of its tracks. If the City Council still desires to have municipal cars run into the downtown districts from Division "A" and the Lake Burien line, the Seattle, Renton & Southern Railway, under its franchise, must grant common user rights to the city. Under the decision the city will have access for Division "A" cars to the Union Depot and to the station of the trans-continental lines which operate into Seattle.

Public Utility Legislation in Alabama.—Although the next session of the Alabama Legislature will not be held until January the political platform builders are predicting the trend that legislation will probably take. The Birmingham *Age-Herald* recently discussed the prospects for public utility legislation in part as follows: "Probably one of the most important questions which will come before the next Legislature is the establishment of a public utility commission. Such a commission would have powers similar to those of the present Railroad Commission, though much wider in scope. For instead of railroads and street railways, the utility commission would have supervision over all public service corporations, such as water power and electric companies, steamship lines, telegraph and telephone companies, ferries and all other public utility concerns. That the next Legislature will endeavor to establish a public utility commission there is little doubt, and it is also probable that the state lawmakers will attempt to make the members of the commission appointive rather than elective."

Official Opening of New Utah Line.—The official opening of the Salt Lake & Utah Railroad between Salt Lake City and Provo, Utah, took place the last week of August, although electric trains were placed in operation between the two cities on July 24, as noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, page 271. The celebration was under the direction of the Provo Commercial Club. Governor William Spry, the mayors of all the cities along the line of the new road and many other prominent citizens were among those who participated. The celebration ended with a banquet, where covers were laid for 200 guests. W. C. Orem, president of the company, and his associates were complimented and congratulated on the completion of the road. The line now in operation is 48.5 miles long. It will be extended southward from Provo to Payson, Utah, 20 miles. Connections are made at Salt Lake City with the Salt Lake & Ogden Railroad, thus giving electric service from Provo to Brigham City, Utah, a distance of almost 100 miles. A joint terminal building will be erected at Salt Lake City.

Disbursements for Rapid Transit Work in New York.—The Public Service Commission for the First District of New York has furnished the Department of Taxes with a statement of the disbursements made by the city of New York for rapid transit purposes from the beginning of the existing subway work to June 30, 1914. The statement also shows the disbursements for the first six months of 1914, by which it appears that the city of New York for those six months paid out on an average more than $1,650,000 a month, or a total for the six months of $9,703,443. In addition during the same six months the Interborough Rapid Transit Company paid out of its contribution $560,289 and the New York Municipal Railway Corporation out of its contribution $393,005 on account of city-owned line construction. Excluding purchases of real estate the disbursements of the city for regular and extra work in rapid transit construction from the beginning to June 30, 1914, aggregate $100,338,171, of which more than $48,000,000 is chargeable to the existing subway. These figures represent actual disbursements. The total amount of contracts awarded by the city to Aug. 15, 1914, aggregated $135,910,269 on the new lines alone.

Financial and Corporate

RECENT FINANCIAL TENDENCY

Stock Exchange, Customs, Foreign Exchange and Railroad Problems Reviewed Briefly

Suggestions continue to be advanced looking toward the resumption of business on the New York Stock Exchange. Such ideas as have been put forward, however, are by no means unanimous. It is not intended here to review any considerable number of such plans. Two examples will suffice to illustrate the divergence of the views which have been expressed lately. The *Financial and Commercial Chronicle* recommends a $500,000,000 banking syndicate to take over at private sale the foreign holdings of American securities that remain to be liquidated. Under the plan suggested this syndicate would not engage to sell on the Stock Exchange at all, but would place the securities taken over with moneyed people with an appreciation of the value of the securities offered for sale.

On the other hand M. E. de Aguero, president of the Consolidated Exchange, thinks that the solution of the problem of resuming trading might be found in Congress authorizing the Secretary of the Treasury to issue treasury notes not to exceed $5,000,000,000 to acquire dividend and interest paying stock and bonds held abroad, the return on such securities to be converted into a sinking fund to retire a corelative amount of the treasury notes. Following the retirement of all the notes at the end of twenty years the income could be applied to the general uses of the government.

Another question of pressing concern is the one of overcoming the problem of the dwindling customs returns and of keeping the treasury unimpaired. The customs revenues for August fell off $10,629,538 as compared with August, 1913. President Wilson has estimated that with a continuation of this decrease in the same proportion for the current fiscal year there would be a loss in customs revenues of from $60,000,000 to $100,000,000. He is opposed to borrowing and has suggested taxation as the alternative.

Addressing Congress the President recommended that "such source of revenue be chosen as will begin to yield at once and yield with a certain and constant flow." In this connection taxes were first suggested on magazines, gasolene, beer, patent medicines, soft drinks and railroad and amusement tickets. On Sept. 8 the Democrats of the House ways and means committee completed their deliberations over the emergency tax measure. It was said at the time that the majority favored the raising of the present income tax and its extension to include incomes of $2,000 of unmarried persons and $3,000 of married persons. On Sept. 10 it was announced, however, that the new bill would be introduced on Sept. 11 and that it would provide for a tax of 3 per cent on railroad freight, from which it is estimated $65,000,000 will be realized annually, an additional tax of 50 cents a barrel on beer, which will bring in about $33,000,000, and a tax of 20 cents a gallon on domestic wines, the probable yield of which will be $9,000,000.

The committee appointed on Sept. 4 by the conference of clearing house delegates to solve the foreign exchange problem completed its report on Sept. 5 and submitted it to the comptroller of the currency. This committee, of which James B. Forgan, Chicago, is president, recommended that the banks be requested to contribute to a gold fund of $150,000,000, of which $25,000,000 would be immediately paid into the depository of the Bank of England in Canada, the remainder of the amount to be payable subject to call. J. P. Morgan and Jacob H. Schiff conferred on Sept. 10 with Secretary of the Treasury McAdoo and the Federal Reserve Board in regard to this plan. The official announcement which Mr. McAdoo made following the conference was concluded with the statement that "the board has not yet taken any action in the matter, but has the whole situation under advisement." It is said, however, that members of the Reserve Board expressed approval of the Forgan plan in principle, but found it difficult to arrange the details for carrying it out. The New York bankers told the members of the board that a syndicate had been formed with the banking houses of J. P. Morgan & Company and Kuhn, Loeb & Company to take charge of the maturing obligations of New York City within the next two months, amounting to $82,000,000. It was explained that the New York syndicate had done, or was preparing to do, precisely what the Forgan committee recommends should be done by the bankers generally throughout the country.

In connection with the matter of restoring normal market conditions for international exchange David Lloyd-George, Chancellor of the Exchequer of England, announced on Sept. 4 that the Bank of England would provide acceptors with the funds necessary to pay at maturity all bills contracted before the moratorium was declared, acceptors to be under obligation to collect from their clients as soon as possible the funds due them and apply such funds to the advances made by the bank, for which interest will be charged at 2 per cent above the ruling bank rate.

On Sept. 9 the President met a delegation of railroad men at Washington to consider the financial situation which confronts the railroads. This committee submitted two requests to the President, namely, that attention be called to the need for the support of railroad credits and that recognition be urged of the need for increased revenues on the part of "the appropriate governmental agencies," supposedly the Interstate Commerce Commission. With the President's approval the committee issued a statement dealing with the problem before the railroads. This statement characterized the situation as "an emergency of a magnitude without parallel in history."

Sterling exchange was very strong on Sept. 9, cable transfers being quoted as high as $5, and demand bills at $4.99. The quotations on Sept. 8 were as low as $4.98 for cables and $4.97 for demand. It was reported that the rise was due almost wholly to heavy buying of exchange by the banking syndicate which is floating the 6 per cent notes of the city of New York. The statement was made on Wednesday that more than 140 institutions have signified their intention to take the new notes, which were to be issued on Sept. 11. The first of the city's foreign obligations will be paid on Sept. 14 out of funds furnished by the purchasers of the city bonds.

The first regular meeting of the Stock Exchange governors since June 24 last was held on Sept. 9, but only routine business was transacted. The question of opening the exchange was not discussed, according to one of the members.

PACIFIC GAS & ELECTRIC COMPANY FINANCING

According to the complete text of the order of the California Railroad Commission, the Pacific Gas & Electric Company was recently authorized to issue $5,000,000 face value of general refunding mortgage 5 per cent gold bonds, series A, maturing in January, 1942; $12,500,000 par value of first preferred stock; as much additional first preferred stock as may be necessary to exchange for original preferred stock on and after July 1, 1916, and common capital stock of the par value of $1,159,800. The company is restricted from issuing the above-named bonds until it has secured from the commission a supplementary order specifying the minimum selling price. It must sell the first preferred stock so as to net in cash not less than 82½ per cent of the par value, and also dispose of the common stock at not less than par.

The company is to use the proceeds from the sale of the $5,000,000 of bonds and the $12,500,000 of first preferred stock to discharge and refund its 6 per cent and its 5 per cent gold notes, proceeds not to exceed $7,000,000; to discharge and refund obligations incurred and reimburse its treasury for the acquisition of property and the making of improvements, proceeds not to exceed $4,586,661, and to cover such other capital expenditures as may be supported by supplementary orders from the commission. The proceeds from the sale of the common stock are to be used for the reimbursement of moneys expended for the retirement of bonds through sinking funds from Jan. 1, 1914, to April 30, 1914, not to exceed $40,760; to provide cash for meeting sinking fund payments now due and unpaid, not to exceed $394,376, and to provide cash for retiring bonds through sinking funds from April 30 to Dec. 31, 1914, not to exceed $724,687. Previous references to the new financing of the Pacific Gas & Electric Company were made in the ELECTRIC RAILWAY JOURNAL of July 11, July 25, Aug. 15 and Aug. 29.

ANNUAL REPORT

Interborough Rapid Transit Company

The comparative statement of income, profit and loss of the Interborough Rapid Transit Company, New York, N. Y., for the years ended June 30, 1913 and 1914, follows:

	1914			1913		
	Manhattan Railway Division	Subway Division	Total	Manhattan Railway Division	Subway Division	Total
Revenue from transportation	$15,594,075	$17,003,496	$32,597,571	$15,365,164	$16,358,675	$31,723,839
Other street railway operating revenue	360,762	557,061	917,824	324,751	449,280	774,031
Gross operating revenue	$15,954,837	$17,560,557	$33,515,395	$15,689,915	$16,807,955	$32,497,870
Operating expenses:						
Maintenance of way and structures	$906,064	$800,633	$1,706,697	$906,377	$791,581	$1,697,958
Maintenance of equipment	1,090,001	1,234,309	2,324,311	1,022,229	1,781,057	2,803,287
Traffic	102	36	138	277	175	453
Transportation expenses	4,142,751	3,384,063	7,526,815	4,045,763	3,364,179	7,409,941
General expenses	591,317	752,776	1,344,092	641,692	707,413	1,349,104
Total operating expenses	$6,730,235	$6,171,817	$12,902,053	$6,616,338	$6,644,405	$13,260,743
Net operating revenue	$9,224,602	$11,388,740	$20,613,342	$9,073,577	$10,163,550	$19,237,127
Taxes	1,695,760	386,188	2,081,948	1,727,475	389,405	2,116,880
Income from operation	$7,528,842	$11,002,552	$18,531,394	$7,346,102	$9,774,145	$17,120,247
Non-operating income	59,713	553,139	612,852	47,444	440,046	487,490
Gross income	$7,588,555	$11,555,691	$19,144,246	$7,393,546	$10,214,191	$17,607,737
Income deductions	5,882,656	$5,237,010	$11,119,666	$5,865,156	$5,205,513	$11,070,669
Net corporate income	$1,705,899	$6,318,681	$8,024,580	$1,528,390	$5,008,678	$6,537,068
Dividends on Interborough Rapid Transit Company stock (10 per cent—5 per cent extra for 1914, 2 per cent extra for 1913)	....	5,250,000	5,250,000	....	4,200,000	4,200,000
Surplus	$1,705,899	$1,068,681	$2,774,580	$1,528,390	$808,678	$2,337,068
Per cent expenses to earnings:						
Excluding taxes	42.18	35.14	38.49	42.17	39.53	40.80
Including taxes	52.81	37.34	44.71	53.18	41.85	47.32
Passengers carried	311,473,568	340,413,103	651,886,671	306,845,006	327,471,510	634,316,516
Daily average passengers carried	853,352	932,639	1,785,991	840,671	897,182	1,737,853

The gross operating revenue for the year ended June 30, 1914, was $33,515,395, an increase of $1,017,525, or 3.3 per cent. The net corporate income was $8,024,580, equivalent to 22.92 per cent on the capital stock of the company, as compared to 18.68 per cent for the preceding year, 16.07 per cent for 1912 and 14.68 per cent for 1911. The operating expenses were $12,902,053, a decrease of $358,690, or 2.7 per cent. The amount charged to operating expenses and credited to the depreciation reserve was $655,993 below the charge for the previous year, but the expenditures for maintenance showed an increase of $185,757, resulting in a net decrease in charges for both depreciation and maintenance of $470,236. The cost of operation, exclusive of depreciation and maintenance, increased $111,546. The "tax refunds and other credits" for 1914 showed a decrease of $2,303,483, because during the year ended June 30, 1913, there was carried to profit and loss $2,057,033 of interest upon advances made to the trustees of the New York & Long Island Railroad to provide means for the construction of the Belmont tunnel. The total surplus on June 30, 1914, was $15,214,403, as compared to $13,072,956 the year previous.

The gross operating revenue gained on the subway division was $752,602, or 4.48 per cent, and on the Manhattan Railway division $264,923, or 1.69 per cent. The operating expenses of the subway division decreased $472,588, or 7.11 per cent, while the Manhattan Railway division expenses increased $113,898, or 1.72 per cent. The net operating revenue of the entire system was $20,613,342, an increase of $1,376,215, or 7.15 per cent over 1913, resulting from a gain on the subway division of $1,225,190, or 12.05 per cent, and a gain on the Manhattan Railway division of $151,025, or 1.66 per cent.

The total amount of taxes was $2,081,948, as compared to $2,116.880 in 1914, a decrease of $34,932, or 1.65 per cent, the subway division decreasing $3,217, or 0.82 per cent, and the Manhattan Railway division $31,715, or 1.83 per cent. Income from operations increased $1,411,147, or 8.24 per cent, the subway division increasing $1,228,407, or 12.57 per cent, and the Manhattan Railway division $182,740, or 2.49 per cent. The non-operating income of the company increased $125,362, or 25.71 per cent, principally owing to the increase in interest on bank balances and loans. The subway division showed a gain of $113,093, or 25.7 per cent, while the Manhattan Railway division increased $12,269, or 25.87 per cent. The gross income increased $1,536,509, or 8.72 per cent, the subway division gaining $1,341,499, or 13.13 per cent, and the Manhattan Railway division $195,099, or 2.64 per cent. The total income deductions increased $48,997, or 0.44 per cent. The net corporate income increased $1,487,512, or 22.75 per cent, the result of a gain on the subway division of $1,310,003, or 26.15 per cent, and on the Manhattan Railway division of $177,509, or 11.61 per cent.

The surplus over dividends of 15 per cent (including the extra dividend of 5 per cent) on the capital stock was $2,774,580. On a basis of 10 per cent dividends for each year the surplus for 1914 would be $4,524,580, as compared to $3,037,068 for 1913, giving $1,487,512 as the gain in surplus over the concluding year. The operating ratio for 1914 was 38.49 per cent, as compared to 40.8 per cent for the preceding year, a decrease of 2.31 per cent, the result of a decrease on the subway division of 4.39 per cent and an increase on the Manhattan Railway division of 0.01 per cent. The total number of passengers carried was 651,886,671, as compared to 634,316,516 for 1913, an increase of 17,570,153, or 2.77 per cent. The subway division traffic increased 12,941,593, or 3.95 per cent, and the Manhattan Railway division traffic increased 4,628,562, or 1.41 per cent.

There was expended for maintenance throughout the year $3,700,513. The report gives in detail the various items included among maintenance expenditures, among which are the following: steel rails renewed on 17 miles of single track, 28,500 ties renewed and station platform extended at nine stations on the Manhattan Railway division; steel rails renewed on 21 miles of single track, 16,618 ties renewed, 297 cars equipped with porcelain enameled sanitary hand-holds and 283 cars furnished with white enameled ceiling on the subway division. Additions and betterments for the year ended June 30 chargeable to capital account amounted to $233,963 on the Manhattan Railway division, and $115,430 on the subway division, while charges for improvements under the new subway system totaled $8,426,882.

The report states that the substitution of heat-treated for non heat-treated axles is being continued and also that subway cars are being made more sanitary and better lighted by the substitution of white enameled ceilings and white decorations. Experiments are being continued with a view to providing better facilities for identifying private subway entrances through office buildings, etc. Along the lines of the new elevated construction the company has secured easements for approximately one third of the frontage affected.

The amount expended for claims, suits and damages in 1914 was $296,415, a decrease of $65,927. Expenses were

$160,148, an increase of $6,932, or a net decrease of $58,995, or 11 per cent. The company voluntarily settled 3094 claims for $152,839 before any suit was brought and compromised 318 suits before trial for $118,734. The total judgments paid during the year aggregated $24,841. The plaintiffs lost 71 per cent of all cases, compared to 65 per cent for the preceding year. The aggregate verdicts during the year amounted to $28,289, or $37,871 less than in 1913. The disbursements for claims, disputes and damages amounted to 0.88 per cent of the gross operating revenue, and expenses were 0.48 per cent, or a total of 1.36 per cent of the gross, compared to 1.58 per cent during 1913.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—The Birmingham, Ensley & Bessemer Railroad has defaulted interest due Sept. 1 on its $2,650,000 of first mortgage 5 per cent bonds dated 1911 and due March 1, 1941. The Equitable Trust Company, New York, is trustee. This company operates under a ninety-nine-year franchise in Birmingham and under a perpetual franchise in Bessemer. It has 36 miles of track in operation, with a total of fifty-two cars. Operation was begun in September, 1912.

Central California Traction Company, San Francisco, Cal.—G. A. Starkweather has been elected a director of the Central California Traction Company, to succeed Walter Arnstein, resigned.

Chicago (Ill.) Railways.—It is reported that no further payments will be made this year on the series 2 participation certificates of the Chicago Railways, all the cash funds of the company being required for corporate purposes. An initial distribution of $2 per share was made on this class last February.

Cleveland (Ohio) Railway.—Application has been made to the Ohio Public Service Commission by the Cleveland Railway for permission to issue $1,068,500 of additional capital stock. The proceeds are to be used to reimburse the company for expenditures made for extensions and betterments and also to pay for further extensions that are to be made.

Gary & Interurban Railroad, Gary, Ind.—Interest due Sept. 1 on the $350,000 of three-year 6 per cent notes of the Gary & Interurban Railway is in default and the Baltimore Trust Company, as trustee of the mortgage under which the notes were issued, is taking steps to protect the holders' interest. Under the Indiana law stockholders can, it is said, be assessed without foreclosure, and failure to pay the assessment within the prescribed time subjects them to forfeiture of their stock. Acting under this law, the company has called upon the stockholders for the payment of an assessment of 10 per cent within sixty days. Since there is $4,750,000 of stock on the Gary & Interurban Railroad outstanding, the assessment equals $475,000, which would enable the company to pay off its floating debt and leave a balance of about $125,000. The notes are secured by $500,000 of first mortgage 5 per cent bonds and $500,000 of stock of the East Chicago Railway, a link in the Gary & Interurban system.

Idaho Railway, Light & Power Company, Boise, Idaho.—According to Receiver W. J. Ferris, a recent decision of Judge Dietrich of the United States Circuit Court removes all doubt regarding the stability of the Idaho-Oregon Light & Power Company and opens the way for the bidding in of the property by the bondholders at the forthcoming sale on Sept. 30. The judge held that $718,000 of first and refunding mortgage bonds claimed to be owned by the Idaho Railway, Light & Power Company were obtained without consideration.

Jamestown, Westfield & Northwestern Railroad, Jamestown, N. Y.—The Public Service Commission for the Second District of New York recently granted an application to change the motive power of the Jamestown, Westfield & Northwestern Railroad from steam to electricity and to issue $100,000 of capital stock, which is to be given to S. B. Broadhead and A. W. Broadhead in part payment for the properties purchased from the receiver of the Jamestown, Chautauqua & Lake Erie Railway. The order of the commission does not consider the question of paying the balance to the vendors, said to be $357,500, which it is proposed to meet by an issue of mortgage bonds. The commission has approved the lease to the Erie Railroad of certain portions of the line and of the freight terminal east of Fairmont Avenue in Jamestown and the Falconer branch line. The Jamestown, Westfield & Northwestern Railroad was formerly the Jamestown, Chautauqua & Lake Erie Railway, the sale of which to the Broadhead interests was noted in the ELECTRIC RAILWAY JOURNAL of Sept. 1 and Oct. 25, 1913. These interests also own the Jamestown Street Railway and the Chautauqua Traction Company.

Lethbridge Municipal Railway, Lethbridge, Alta., Can.—According to the city auditor's report, the car earnings of the Lethbridge Municipal Railway for 1913 amounted to $59,045. The income from advertisements was $1,564, giving total receipts of $60,609. Direct operating expenses for maintenance and repairs, labor and sundries totaled $59,873. To this was added $4,884 for general and miscellaneous expenses, giving a total of $64,757 for working expenses. The net loss in earnings for the year, therefore, was $4,148. When this was increased by the addition of debenture interest, $14,813, other interest, $4,982, and sinking fund payments, $6,888, the total deficit for the year was $30,831. This compared with the deficit for 1912 of $5,176, shows an increase of more than 500 per cent.

Los Angeles (Cal.) Railway.—A final hearing was recently held by the California Railroad Commission regarding the application of the Los Angeles Railway to issue $23,544,000 of bonds. The city of Los Angeles is resisting the application of the Los Angeles Railway Corporation and its subsidiary, the City Railway, to transfer their properties to the newly incorporated Los Angeles Railway, and the plan of the latter company to issue the above mentioned amount of bonds in exchange for the bonds of the Los Angeles Railway Corporation and the City Railway. The main question at issue between the city and the railways has been that of the value of the two operating lines and the bonds to be issued in accordance therewith. The companies assert that the present value of the property is $24,288,400 and the reproductive value $26,030,865; while the city estimates $14,782,112 as the present value and $19,762,389 as the reproductive value. The question of value has finally been submitted to State Railroad Commissioner Edgerton for decision. The plan of financing for the new company was described in the ELECTRIC RAILWAY JOURNAL of Dec. 13, 1913, and the different valuation figures were noted in the issues of Jan. 31 and March 28, 1914.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The California Railroad Commission has issued a supplemental order authorizing the Los Angeles & San Diego Beach Railway to issue two promissory notes, totaling $34,000, to be used in renewing similar notes outstanding.

New York (N. Y.) Railways.—Theodore P. Shonts, president New York Railways, has issued the following statement: "The New York Railways has prepared a summarized statement showing the net income payable as interest on the adjustment mortgage bonds for the six months ended June 30, 1914, amounting to 1.24 per cent. The mortgage provides that such a statement must be signed by three-fourths of the directors to be elected by the bondholders. The unavoidable absence in Europe of one of the directors representing the bondholders, and the refusal of another to sign the approval, made it necessary to agree with the trustee of the mortgage upon the selection of a board of experts to ascertain the income. The directors have authorized the necessary procedure and there probably will be no delay in the interest payment due Oct. 1."

Ocean Shore Railroad, San Francisco, Cal.—The California Railroad Commission has issued an order dismissing the application of the Ocean Shore Railroad for permission to issue $200,000 face value of bonds. The application was dismissed at the request of the company.

Sedalia Light & Traction Company, Sedalia, Mo.—The Sedalia Light & Traction Company secured permission on Aug. 28 to sell $91,600 of its bonds at 75.

Utah Light & Railway Company, Salt Lake City, Utah.—The Utah Power & Light Company has applied to the Salt Lake City Commission for permission to purchase the Utah Light & Railway Company, which owns and operates an electric railway and electric light and power system in Salt Lake City and adjoining towns, as well as a gas, electric and power system in Ogden. This is merely a formal step. As noted in the ELECTRIC RAILWAY JOURNAL of Sept. 5, the Salt Lake Light & Traction Company has been incorporated by officials of the Utah Power & Light Company to take over the Utah Light & Railway Company, and if the plan is successful this new company will own the 98 per cent interest in the common and preferred stocks of the Utah Light & Railway Company, which is now owned by the Union Pacific interests through the Oregon Short Line. The stockholders of the Utah Light & Railway Company are to vote on Sept. 18 on the question of approving the sale of their properties. The Utah Power & Light Company, the issued stock of which is owned by the Utah Securities Company, is to own all the outstanding stock of the Salt Lake Light & Traction Company and will finance the acquisition of the Utah Light & Railway Company by means of its own treasury and securities now on hand. The acquisition will give full control of the electric business in both Salt Lake City and Ogden to the Utah Power & Light Company.

Warren, Brookfield & Spencer Street Railway, Brookfield, Mass.—A report has been filed with the Supreme Court of Massachusetts by Frank Paul, master, setting forth $75,000 as a fair price for the properties of the Warren, Brookfield & Spencer Street Railway and recommending that Thomas T. Robinson, receiver, be permitted to sell at this price. The original price set by the owners was $150,000, and three attempts have been made to sell the road at auction. The master recommends that the next sale be held on Jan. 14.

Winnipeg (Man.) Electric Railway.—It is stated by officials of the Winnipeg Electric Railway that the revenues of the company will be materially affected by the industrial depression in Canada resulting from the European war. At present the effect is most noticeable in the hours when the heavy traffic of men to and from work usually keeps the cars busy. This patronage is steadily becoming smaller. All undertakings which the company has under way will be completed, but no new work will be considered until financial developments of the future can be clearly seen.

DIVIDENDS DECLARED

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent.

Brockton & Plymouth Street Railway, Plymouth, Mass., 3 per cent, preferred.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, common; quarterly, 1 per cent, preferred.

El Paso Electric Company, El Paso, Tex., quarterly, 2¼ per cent, common.

Federal Light & Traction Company, New York, N. Y., quarterly, 1½ per cent, preferred.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, quarterly, 2 per cent.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1½ per cent, common; quarterly, 1¾ per cent, preferred.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AMERICAN RAILWAYS, PHILADELPHIA, PA.					
1m., July, '14	$509,216	......	......	......	......
1 " " '13	496,101	......	......	......	......
ATLANTIC SHORE RAILWAY, SANFORD, MAINE					
1m., July, '14	$49,184	$27,948	$21,235	$667	$20,568
1 " " '13	49,743	28,942	20,800	673	20,127
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.					
1m., June, '14	$181,431	*$97,551	$83,880	$26,009	$57,871
1 " " '13	174,568	*93,577	80,990	18,993	61,997
12 " " '14	2,161,691	*1,211,550	950,140	301,590	648,550
12 " " '13	2,004,713	*1,066,080	938,632	283,152	655,480
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.					
1m., July, '14	$252,949	*$147,745	$105,205	$57,792	$47,413
1 " " '13	258,301	*160,117	98,184	62,936	35,248
12 " " '14	3,088,496	*1,870,794	1,217,703	699,313	518,390
12 " " '13	2,877,425	*1,780,517	1,096,908	647,624	449,284

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*Includes taxes.

Traffic and Transportation

SUBURBAN FARE INCREASE

Railroad Commission of Oregon Grants Application of United Railways, Portland, for Suburban Fare Increase

Holding with the complaint of the company that its revenues are not just and adequate, the State Railroad Commission of Oregon has issued an order increasing the rates of the United Railways on its Portland-Linnton line. The new rates from Portland, which became effective on Sept. 1, compare with the old ones as follows:

Station	Miles	Present rate	New rate
Stockdale	4.0	$0.05	$0.05
Cliff Inn	4.5	.05	.10
Linnton, Willbridge, Webster, West Oregon Lumber Company and intermediate stations	8.7	.05	.10
Harborton	10.1	.10	.15
Miller	10.5	.15	.20
Armona	10.8	.15	.20
Burlington	13.1	.20	.20
Falkenburg	14.8	.25	.25
Tunnel Spur	15.3	...	.30
Rockton	16.7	.30	.30
Valle Vista	17.6	.35	.35
Bowers	18.4	...	.40
Helvetia	18.9	.40	.40
Groveland	19.7	.45	.45
Connell	20.5	.45	.45
Lincoln	21.6	.50	.50
North Plains	23.3	.55	.55
Davis	24.6	...	.60
Dersham	25.1	.60	.60
Christie	26.8	.65	.65
Wilkesboro	27.8	.70	.70

The increases are largely between Portland and near-by stations. Many rates between intermediate stations and virtually all rates on the west end of the road remain unchanged or are slightly decreased by a readjustment proposed by the company. The company has for some time issued Saturday to Monday round-trip excursion tickets between Portland and stations west of Harborton, and special Sunday round-trip tickets from Portland to stations Miller to Burlington, inclusive. It also has a thirty-ride family commutation ticket between Portland and stations from Burlington to Wilkesboro, inclusive, limited to ninety days from the date of sale. It is proposed to extend the Saturday to Monday round-trip rates to include all stations, and to make certain increases in the special Sunday round-trip tickets to make them approximately one and one-third times the one-way local fare. It proposes to furnish in lieu of the thirty-ride family ticket a fifty-ride individual commutation ticket, limited to thirty days from date of sale between Portland and stations east of and including Tunnel Spur. The basis suggested is about 1 cent a mile. It will furnish a twenty-five-ride commutation ticket, limited to ninety days from date of sale, between Portland and all stations, the basis of the charge being 1½ cents a mile.

Regarding the answer of the city of Portland to the complaint, in which it sets forth that the franchise of the company provides it shall charge 5 cents for each passenger over its line in that city, the commission says:

"The question as to whether the rate of fare named in the franchise granted by the County Court of Multnomah County to the company was a contractural condition, and as to whether the company can or should be allowed to keep the consideration granted it, that is, the right-of-way over the Portland and St. Helens road, and at the same time repudiate the rate of fare named in the franchise from the County Court, are judicial and not administrative in nature, and are not within the jurisdiction of the commission to determine."

Permission to increase rates within Portland was not asked in the complaint.

The commission found that the original cost of the operating properties of the main system, which does not include the Mount Calvary line, rates for which were not considered, was approximately $2,756,367. Of this $1,893,448 represents the original cost of the road and general expenses of the line between Linnton and Wilkesboro, and $731,265 the original cost of the road and general expenses east of Linnton.

To reproduce the operating main line properties of the company other than the Mount Calvary line, the commission estimates it would cost $2,175,460. The total operating revenue of the company for the fiscal year ended June 30, 1913, was $123,337. There were transported during the year 704,091 passengers between Portland, Linnton and intermediate stations, the average cost to the company of each passenger being 9 2-3 cents. There were transported during the year on the main line 727,283 passengers at an average cost a passenger of 8.81 cents, with revenue derived of 8.55 a passenger, or 2.6 mills less than cost.

RAILROAD PASSENGER FARE INCREASES IN NEW YORK

The Public Service Commission of the Second District of New York has included in its bulletin of tariff changes for the week ended Sept. 3 the almost universal increase of passenger mileage rates in the State, to be effective on Oct. 1, by the railroads taking advantage of the recommendations of the Interstate Commerce Commission in the Eastern freight rate cases. Generally speaking, these increases represent a change from 2 cents a mile to 2 @ 2¼ cents a mile on all mileage books. The New York Central does not increase its 2-cent rate, but subjects its mileage books to numerous restrictions not heretofore imposed, such as the discontinuance of its 500-mile book, and the restriction of the use of the 1000-mile book to between points on its own lines and those of the West Shore on a journey wholly within the State of New York.

In many instances limits of tickets are changed from "Good until used" to "One year from date of sale." With the exception of the Delaware & Hudson Company all mileages sold prior to Oct. 1 will be honored according to the contract under which sold. The Delaware & Hudson Company will redeem all mileage unused on Oct. 1 at 2 cents per mile. Many minor changes have also been made on certain special rates heretofore in vogue. Among the more important of these is the discontnuance of the 100-person round trip ticket rate much used by theatrical and other large parties traveling together. This type of ticket made available for a party of 100 or more traveling together a round-trip rate of 3 cents a mile, or 1½ cents a mile per mile actually traveled. The Delaware & Hudson Company has almost wholly done away with the practice of selling individual round-trip tickets at rates less than the rate for two single-way tickets.

In the case of the trunk line interchangeable 1000-mile refund tickets, all roads selling these forms have changed the regulations governing the redemption value of the cover so as to raise the rate for travel from 2 cents to 2¼ cents a mile. While this form of ticket has never been good over the Lake Shore, the New York Central, or the West Shore, such tickets sold after Oct. 1 will be honored by these roads.

Near-Side Stop in Belleville.—The East St. Louis & Suburban Railway, East St. Louis, Ill., on Sept. 1 inaugurated a near-side stop policy for its cars in Belleville, Ill.

Freight Right Allowed in Massachusetts.—The Public Service Commission of Massachusetts has authorized the Bay State Street Railway to act as a common carrier of baggage and freight in Dighton.

Minister Preaches "Safety First."—The work of the Lincoln (Neb.) Traction Company in placing warning signs on its cars was praised by Rev. H. H. Heberly, a local pastor in that city, who delivered a sermon on "safety first."

Berkshire Street Railway Agreement.—An agreement as to new working conditions for employees has been signed by officials of the Berkshire Street Railway, Pittsfield, Mass., and of the men. This contract will expire on June 1, 1915.

Newsboys a Menace.—The Public Service Commission of Maryland has asked its general counsel for an opinion as to whether it has authority to exclude newsboys from the street cars while selling papers. This action is the result of a number of accidents which have occurred recently.

New Traffic Regulation in Jackson.—New regulations to govern street traffic have been adopted by the City Commissioners of Jackson, Miss. A feature of the new regulations is the provision that automobilists who persist in passing street cars which have stopped to take on or discharge passengers shall be liable to arrest.

Change in Fares on New York State Railways.—The New York State Railways, Rochester, N. Y., has amended its passenger tariff eliminating collection of any excess fare when paid on cars and reducing the fares for the fifty-four-trip commutation and forty-six-trip school commutation tickets for all distances 5 miles and over.

Safety Slogans for Employees.—The Utah Light & Railway Company, Salt Lake City, Utah, has issued an eight-page booklet "Safety Slogans for Employees." The book is 4 in. wide by 6 in. high and is bound in a heavy paper cover. The advice contained in the publication is addressed under separate headings to carmen, linemen, station employees, shopmen and track employees.

Electric Railway Hospital Car.—A car of the Southern Michigan Railway was chartered recently to convey a prominent resident of South Bend, Ind., to that city from St. Joseph, Mich., where he was taken sick suddenly. The car was converted into a temporary hospital ward, a doctor and nurse being in attendance upon the man as well as the members of the family who were with him when he was stricken.

Co-operative Store in Kansas City.—Employees of the Metropolitan Street Railway, Kansas City, Mo., at the Fifteenth and Kensington Street carhouse, have organized a co-operative store. They have rented a building and are selling stock to trainmen. There are 150 trainmen living near the carhouse. Employees working at other stations of the company are also talking of forming similar organizations for the sale of family supplies.

Discouraging Conversation With Motormen.—The motormen in the employ of the Dubuque (Ia.) Electric Company have been furnished with a card which it is intended they shall hand to passengers who attempt to engage them in conversation while they are on duty. The card reads: "The safety of passengers and the operating rules of the company forbid that I should carry on conversation with a passenger while engaged in the performance of my duty. Please help me to observe this rule in both letter and spirit."

Louisville Safety Zones Indorsed.—The action of the Louisville (Ky.) Railway and the Board of Public Safety in establishing safety zones at busy Louisville corners has been indorsed by the directors of the Louisville Commercial Club, which says: "This device will undoubtedly meet with popular approval, both with pedestrian and motorist, and will materially aid careless drivers in a more strict adherence to the new automobile law which prohibits motor vehicles from passing a car stopped at a street corner."

Near-Side Stops in Lexington.—In Lexington, Ky., the Kentucky Traction & Terminal Company has begun an experiment by which only the front doors of the street cars will be used, the ultimate intention being to close the rear entrances. At the same time it was ordered that cars should stop on the "near side" at all street intersections and that smoking would be permitted only on the inclosed rear platform. The conductor is posted at the front end, just back of the motorman, occupying the position formerly assigned to two seats.

Transfers in Los Angeles.—The public utilities committee of the City Council of Los Angeles, Cal., has recommended that the petition of the Edendale Improvement Association relative to the city taking steps to secure a system of universal transfers be referred to the Public Utilities Commission, in connection with other petitions and communications on this subject. The papers will be placed before the commission and it is expected that a statement will be sent to the Council by President Wright explaining the commission's stand on this subject.

New Experimental Trailer in Kansas City.—The Kansas City (Mo.) Railways has remodeled one of its trailers on a new plan, with entrance at front. The present trailers have the exits at the front end and the entrance at the rear. Persons waiting for cars, however, usually congregate at the point where the rear end of the motor car stops and most of them pile on the crowded motor car rather than walk to the rear end of the trailer. The exit of the new trailer is next to the entrance and the conductor, standing behind a railing on the opposite side of the front end, opens and closes that door also.

Effective Measures to Protect Live Stock at Private Crossings.—With a view of reducing the liability from accident caused by livestock trespassing through private gateways left open by landowners, the Indianapolis & Louisville Traction Railway, Scottsburgh, Ind., mailed a circular letter by registered mail in June to all tenants and landowners along its lines. Since this letter was sent out an improvement has been noted in the state of repair of gates at private crossings and in their being kept closed. In addition the company has had several requests for padlocks, showing that the property owners are anxious to co-operate with the railroad in keeping the gates closed.

Albany Working Agreement Signed.—The working agreement between the United Traction Company, Albany, N. Y., and its employees on the Albany and Troy divisions has been signed by James F. Hamilton, general manager, for the company, and Joseph F. McLoughlin and Joseph Droogan for the men. No mention of increased wages is made in the agreement, as it was decided to await the outcome of the arbitration of this question on the properties of the New York State Railways. There is a provision in the new agreement, however, under which the men will be paid for every minute of the time they are on service after leaving the carhouse. All regular men are to be paid time and one-half for overtime.

Light Signals for Controling Traffic in Cleveland.—An electric traffic signal has been installed at East One Hundred and Fifth Street and Euclid Avenue, Cleveland, Ohio. The signal consists of four pairs of red and green lamps mounted on the tubular steel trolley poles, controlled from an electrically heated police booth placed on the sidewalk at the corner. In addition to the control switches for the signals, the booth also contains connections with the police and fire alarm circuits so that the street may be cleared for the rapidly moving emergency vehicles. Bell signals ring and red lamps appear in such emergencies. The work of developing the signals was done by the Cleveland Construction Company, and the installation was made by the American Traffic Signal Company.

Service Reduction Question in Cincinnati.—On Sept. 4 W. Kesley Schoepf, president of the Cincinnati (Ohio) Traction Company, called at the city hall in person to take up with the Mayor and Service Director Fosdick the question of reducing the service furnished by the company. He handed Mr. Fosdick a letter replying to the communication sent him by Mr. Fosdick in which the latter rejected the company's request to be permitted to take off a number of cars. Mayor Spiegel stated that he would at once have Chief Street Car Inspector Harry Wiesehahn make a detailed inspection of various lines, supplemental to that already made by him. In the meantime, he stated, he would permit of no reduction in service beyond that already made. This reduction includes the taking off of two cars on the College Hill line, two on Colerain Avenue, one on Seventh Street and one on Sixth Street. Mr. Schoepf assured the Mayor that he would comply with all orders, and would restore the service reduced whenever requested.

Accident Faker Arrested.—The Philadelphia (Pa.) Rapid Transit Company has succeeded in apprehending Frank J. Marter, twenty-nine years old, of Shermansdale, Pa., who tried to victimize the company through a fake accident. Marter has several aliases, being known as "Slim Jim," "Moter" and "Jones." In the confession which he made to officers of the Philadelphia Rapid Transit Company, Marter acknowledges having mulcted the Brooklyn Rapid Transit Company and the New York Railways. He also had a fake claim allowed against Fox's Fourteenth Street Theater, New York, for $500. Terry & Tench, New York, contractors were victimized for the sum of $300 and other companies for similar amounts. In Philadephia Marter pretended to fall from a train at the Fifth Street Station in the subway. He complained to a policeman, but instead of going to a hospital asked to be directed to a private physician. The following day he presented a claim for $1,500 damages against the company. It is said that Marter's right arm was broken when he was ten years old and that he had the peculiar faculty of throwing his arm out of joint at the elbow whenever he so desired. All his recent claims for injuries have been on account of this arm.

Personal Mention

Mr. Charles H. Armatage has resigned as traffic manager of the United Traction Company, Albany, N. Y.

Mr. M. H. Pengra, formerly superintendent of the Freeport Railway & Light Company, Freeport, Ill., is now in business at Eugene, Ore.

Mr. J. H. Brown has been appointed traffic manager of the San Francisco-Oakland Terminal Railways, Oakland, Cal., to succeed Mr. F. W. Brown.

Mr. U. S. Sliter has been placed in charge of the efficiency department of the San Francisco-Oakland Terminal Railways, Oakland, Cal., to succeed Mr. W. E. Hendley.

Mr. J. Q. Brown, formerly chief engineer for the San Francisco-Oakland Terminal Railways, Oakland, Cal., is manager for a new electric power company at Rochester, Nev.

Mr. W. V. Hunt, formerly electrical engineer of the British Columbia Electric Railway, Vancouver, B. C., has resigned from the company to enter private practice in that city.

Mr. A. Patterson, formerly electrical engineer with the Fort Smith Light & Traction Company, Fort Smith, Ark., is now general superintendent of the Southwestern Gas & Electric Company, with headquarters at Texarkana, Tex.

Mr. M. V. Knapp, for a number of years superintendent of the Pennsylvania Power Company at Ellwood City, Pa., has been transferred to the plant of the Mahoning & Shenango Valley Railway & Light Company at Youngstown, Ohio.

Mr. W. R. Alberger, formerly with the San Francisco-Oakland Terminal Railways, Oakland, Cal., has been appointed vice-president and general manager of the company to succeed Mr. A. W. McLimont, who retires from the company in accordance with the changes in the personnel, which are noted elsewhere in this issue.

Mr. George B. Tripp, vice-president and general manager of the Harrisburg Light & Power Company, Harrisburg, Pa., has become operating executive of the United Gas & Electric Company, New York City. He still acts as vice-president of the Harrisburg company, but has been succeeded by Mr. C. M. Kaltwasser as general manager.

Gen. F. E. Pierce, president of the Connecticut Valley Street Railway, Greenfield, Mass., has announced his candidacy for the Republican nomination of State Treasurer. Gen. Pierce had eleven years experience in the First National Bank of Greenfield, leaving that institution to become postmaster of Greenfield, which office he conducted for twenty years. Since its organization he has been president of the Connecticut Valley Street Railway. For more than twenty-five years he has served in the Massachusetts Militia, retiring a little more than a year ago with the rank of major-general. During the Spanish American War he commanded Company L of the Second Regiment and had a part in the battles of El Caney, San Juan, and Santiago de Cuba. For several years he was one of the Armory commissioners and is now president of the National Guard Association of Massachusetts.

OBITUARY

Frank A. Schwertner, of the Berger Manufacturing Company, Canton, Ohio, is dead.

Thomas E. Hughes, manager of the Philadelphia office of the Standard Underground Cable Company, died at his residence in Atlantic City, N. J., on Aug. 27. Mr. Hughes had long represented the Standard company throughout its Atlantic coast territory from Philadelphia south, and for the past seventeen years had been manager of its Eastern and Southeastern branch office sales department at Philadelphia. Mr. Hughes, while about to return from a visit to Bermuda for his health in the spring of 1913, suffered a stroke of paralysis from which he recovered sufficiently less than a year later partly to resume his regular duties. Prior to this connection with the Standard company, Mr. Hughes was connected with John A. Roebling Sons Company at Trenton and Scranton, and with the Washburn & Moen Manufacturing Company at Worcester, Mass., and Pittsburgh. He leaves a widow and two daughters.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Hamlin & Guyandotte Railroad, Hamlin, W. Va.**—Chartered in West Virginia to build an electric railway from Hamlin to West Hamlin, 5 miles. Capital stock, $50,000. Incorporators: L. R. Sweetland, J. S. Pridemore, L. M. Thacker and A. F. Morris, Hamlin; J. W. Dingess, Huntington, and George E. McComas, Milton, W. Va.

FRANCHISES

Los Angeles, Cal.—The Mayor and Council have authorized the Board of Harbor Commissioners to construct a single or double track railway from a point of connection with the tracks of the Pacific Electric Railway, northerly of Seventh Street, Wilmington, in the city of Los Angeles, and extending thence southerly across Seventh Street and along McFarland Street, to the intersection of McFarland Street with the northerly line of Tide Land Location No. 153.

Murphysboro, Ill.—The Murphysboro & Southern Illinois Railway has asked the Council for a thirty-year franchise on East Walnut Street, Twenty-second Street and Logan Street in Murphysboro.

***Hopkinsville, Ky.**—R. E. Cooper, Hopkinsville, has received a twenty-year franchise from the Council in Hopkinsville.

Methuen, Mass.—The Massachusetts Northwestern Street Railway has asked the Council for a franchise to relocate its tracks on Jackson Street in Methuen.

Portland, Ore.—An ordinance has been presented to the Council on request of the Portland Railway, Light & Power Company relieving the company from the requirements in its franchise to build a double-track railway on Twenty-sixth Street, from Thurman to Upshur, Upshur Street, from Twenty-fifth to Twenty-seventh, and Twenty-fifth Street, from Thurman to Upshur. These portions of streets are to be paved, and the company desires to lay only single tracks. Commissioner Daly has recommended that the ordinance be passed providing the company pays for the paving of the street which would be covered by a double track. It is understood the company has consented to do this.

Portland, Ore.—The franchise of the Portland & Oregon City Electric Railway will come up for final action in the Council about Sept. 15. The grant will allow the company the use of the streets in the southeast section of Portland and through a part of the downtown business district. It is proposed to run the cars into Portland along Tacoma Avenue. A provision of this proposed ordinance gives the city the right to order the company to change the location of its tracks whenever the city deems it necessary. This is the first time such a provision was ever contained in a grant for the use of streets.

Three Rivers, Que.—The Three Rivers Traction Company has asked the Council for a franchise to build an electric railway in Three Rivers. [E. R. J., Aug. 1, '14.]

Salt Lake City, Utah.—The Utah Light & Railway Company has received a franchise from the Council for a line from its terminus at Thirteenth Street East and Fifth Street South to connect with its line at Thirteenth Street East and Seventh Street South in Salt Lake City.

TRACK AND ROADWAY

Medicine Hat, Alta.—The Montreal Engineering Company having failed to carry out its agreement for the building of an electric railway in Medicine Hat, the agreement will in all probability fall through, and the company will be called upon to compensate the city for its failure to comply with the terms of the document. An extension of time for carrying out the agreement was granted to the company, but proceedings were taken against the Council to have the extension set aside, on the ground that it could not be valid without a by-law having been passed by the ratepayers. The action was finally defeated on technical grounds. The City Council is now negotiating with an Ottawa syndicate respecting the building of an electric railway under practically the same agreement as that made with the Montreal Engineering Company, and that a by-law granting a franchise will be submitted to the ratepayers at an early date.

British Columbia Electric Railway, Vancouver, B. C.—This company has been asked to extend its lines on Fifty-fifth Avenue between Victor Road and Kerr Road in Vancouver. A contract is reported awarded to M. J. Coughlan & Sons for the erection of a steel bridge across False Creek at Kitsilano, on the Eburne line, to replace the present wooden trestle, Vancouver, B. C.

Los Angeles (Cal.) Railway.—Right-of-way has been secured by this company for its proposed line through Schuetzen Park in Los Angeles.

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company laying new track on North Lake Avenue in Pasadena. Rather than pay for the paving on both sides of its private right-of-way on Las Tunas Drive in San Gabriel this company has notified the City Council that it will abandon its line on that street and turn over the strip of land owned by it to the city.

San Francisco, Cal.—The Board of Public Works has awarded the contract to Eaton & Smith for the construction of the municipal railway on Stockton Street from Sutter to Sacramento Street, this part of the line having been delayed to await the completion of the Stockton Street tunnel.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—Within the next three weeks this company plans to begin work on its 8-mile electric railway between Murphysboro and Carbondale. Its power station and repair shops will be located at Murphysboro and it will furnish power for lighting purposes. Capital stock, authorized, $250,000. Officers: A. B. Minton, Murphysboro, president; C. H. Clay, 771 Clanton Street, Los Angeles, Cal., vice-president; W. C. Alexander, Murphysboro, secretary, and John G. Hardy, Murphysboro, treasurer. [E. R. J., July 18, '14.]

Taylorville Railway, Light & Power Company, Taylorville, Ill.—This company has surrendered its charter and dissolved.

Evansville, Chrisney & Eastern Railway, Evansville, Ind.—Plans are being made by this company to begin work within the next six weeks on its line from Boonville to Chrisney, Ind. Later on this line will be extended to Louisville, Ky., through Cannelton and Corydon, Ind. J. P. Chrisney, president. [E. R. J., Aug. 15, '14.]

Davenport & Muscatine Railway, Davenport, Ia.—During the next few weeks this company will award contracts to replace 3725 ft. of old track with new 70-lb. T-rails, new oak ties, rock ballast and 5-in. concrete brick face.

Keokuk (Ia.) Electric Company.—Work has been begun on the extension through the new McKinley Avenue district in Keokuk.

Hutchinson & Northern Railway, Hutchinson, Kan.—Plans are being considered by this company to build an electric line from Hutchinson east to Burrton and possibly Halstead, where connection will be made with the lines to Wichita. George Theis, Jr., president. [E. R. J., July 25, '14.]

Union Traction Company, Independence, Kan.—This company has placed in operation its new Coffeyville-Nowata interurban line between Coffeyville and Howden, Okla.

Consolidated Street Railway, Strong City, Kan.—During the next three weeks this company will be in the market for ten or fifteen tons of 45-lb. rails.

Arkansas Valley Interurban Railway, Wichita, Kan.—Arrangements have been completed by this company for the extension from Halstead to Hutchinson, Kan., connecting with the electric interurban systems out of Wichita. It is planned to use the tracks of the Hutchinson Street Railway into Hutchinson.

Springfield (Mass.) Street Railway.—The State Public Service Commission has issued three orders on the petition of this company for certificates preliminary to operation of sections of its railway in Springfield and Westfield.

Kansas City (Mo.) Railways.—Work has been started on the extension of the Prospect Avenue line of the railway northward from Fifteenth Street, and new tracks and routing will afford service to a large territory now inadequately supplied with tracks and cars. The new tracks will cross several east-and-west lines, and furnish a crosstown service to a considerable area. The board of control authorized the improvement, which will cost about $140,000.

Carbon & Stillwater Electric Railway, Red Lodge, Mont.—Preliminary arrangements are being made by this company to build its electric line between Red Lodge and Columbus, a distance of 40 miles. William Larkin, Red Lodge, is interested. [E. R. J., March 28, '14.]

Red Lodge (Mont.) Electric Railway.—This company, which plans to build an electric railway between Red Lodge, Washoe and Bear Creek, is still in the promotion stage. C. C. Bowlen, president. [E. R. J., March 21, '14.]

St. Johns (N. B.) Railway.—Plans are being considered by this company to extend its line through the Glen Falls subdivision as far as Manor House, St. Johns, N. B.

Poughkeepsie City & Wappingers Falls Electric Railway, Poughkeepsie, N. Y.—Work has been begun by this company on the construction of 2200 ft. of single track rock foundation with 7-ft., 70-lb. T-rails through certain streets in Poughkeepsie, replacing the 4-ft., 60-lb. T-rails.

Berlin & Northern Railway, Berlin, Ont.—Plans are being made by this company to extend its line from Bridgeport to Bloomingdale, Ont.

London & Lake Erie Railway & Transportation Company, London, Ont.—W. N. Warburton, general manager, stated that the company had in view a number of extensions of its lines, one being from London to Stratford, and that the company did not propose to ask for a franchise for city lines, but simply an entrance for a radial line, with a terminus at the Grand Trunk Railway station.

Port Arthur (Ont.) Street Railway.—A by-law was submitted recently authorizing the expenditure of $33,500 for street railway extensions.

Toronto Suburban Street Railway, Toronto Junction, Ont.—Construction was resumed by this company on the section of the Lambton-Guelph line between Lambton and Islington on Aug. 4.

Philadelphia (Pa.) Rapid Transit Company.—Work has been begun by this company laying new track on Chester Avenue, between Forty-ninth and Forty-second Streets in Philadelphia.

Hull (Que.) Electric Railway.—Plans are being made by this company to improve its lines in Hull.

Knoxville Railway & Light Company, Knoxville, Tenn.—This company is laying brick on Gay Street between its tracks from Commerce Avenue to the Southern Railway tracks in Knoxville.

Nashville, Tenn.—By an agreement with the Nashville Railway & Light Company, the City Commissioners have perfected plans for converting West End Avenue into a boulevard, with a broad parked space through which the tracks of the railway will pass, ornamental iron standards being erected to replace the trolley poles which are now in use along the thoroughfare. The cost, which will include condemning property on each side of the present roadway for a certain distance, will amount to about $42,000, and the city and railway company will share it equally.

***Nashville, Tenn.**—Extension of the interurban line projected from Nashville to Springfield, Tenn., into Kentucky, was announced as a part of the program of the promoters of the line at a recent meeting of the board of governors of the Nashville Commercial Club. The meeting was held to consider a proposition that the club endorse a subscription of $200,000 by Davidson County. The subscription would divide $200,000 of 6 per cent preferred stock among the subscribers. H. H. Mayberry is at the head of the new project.

***Castroville, Tex.**—Surveys are being made to build an electric railway to connect Castroville, San Antonio and Medina Lake. Subscriptions to the bonus list as well as the right-of-way are being solicited and meeting with great encouragement.

East Dallas, Tex.—Plans are being made to begin work at once on the electric railway along Parry Avenue from Kentucky Street to Carroll Avenue, and on Banks Street, ending at Henderson Avenue. This line will extend through the East Side in Dallas. John T. Jones, Dallas, is interested. [E. R. J., Aug. 29, '14.]

Greenville, Whitewright & Northern Traction Company, Greenville, Tex.—This company has changed its name to Greenville Northwestern Railway and plans to build an electric line from Greenville to Merrit and also from Greenville to Blue Ridge, Westminster and Anna and thence to Denton and Gainesville, Tex. A line from Westminster via Whitewright to Bonham is also planned. A. R. Nicholson, Greenville, president. [E. R. J., June 29, '12.]

***Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.**—Grading has been completed and 1 mile of track has been laid by this company on its 14-mile line between Walnut Springs and Glen Rose. J. H. Farr, Walnut Springs, is interested.

Wisconsin Valley Electric Railway, Madison, Wis.—This company, which was organized in 1907 to build an electric railway from Grand Rapids to Stevens Point, has filed a notice of dissolution in the office of the Secretary of State. The company was capitalized at $25,000. The proposed line was not built. Henry F. Whitcomb, vice-president.

SHOPS AND BUILDINGS

British Columbia Electric Railway, Vancouver, B. C.—Work has been begun by this company in its new carhouses at Fourteenth Avenue and Main Street in Vancouver.

Northern Electric Railway, Chico, Cal.—Plans are being made by this company to build a new depot upon the northwest corner of the company's depot yards at the corner of Myers Street and Robinson Street in Oroville. The structure will be of wood, and it is expected that work will be begun within the next three months.

Toronto (Ont.) Civic Car Lines.—Plans have been prepared for the erection of a new carhouse at Hillingdon Avenue on the Danforth line in Toronto. The building will probably be 198 ft. x 199 ft., of brick and terra cotta on a steel framework. It will contain six tracks, and the offices will be in the wing at the rear end. Work is to be begun at once. The cost is estimated to be about $25,000.

Portland Railway, Light & Power Company, Portland, Ore.—The Milwaukee Commercial Club has petitioned this company to build an additional station on Washington Street in Milwaukee.

Austin (Tex.) Street Railway.—This company has moved its offices from the second floor of 113 West Sixth Street to the basement of 600 Congress Avenue in Austin.

Seattle (Wash.) Municipal Street Railway.—The Board of Public Works has awarded a contract to J. E. Crequer, Seattle, for the erection of a one-story carhouse for the Seattle Municipal Railway on the Lake Burien line.

Spokane & Inland Railway, Spokane, Wash.—Contracts have been awarded by this company to I. Abraham, Spokane, to build a new depot in Spokane.

POWER HOUSES AND SUBSTATIONS

Winona Interurban Railway, Warsaw, Ind.—This company has purchased from the Westinghouse Machine Company four Roney stokers for use in its boiler room of four 300-hp boilers at Winona Lake.

Maryland Electric Railway, Baltimore, Md.—This company will place in operation new substation equipment purchased from the General Electric Company consisting of a 2000-kw rotary converter, three 750-kva transformers and switchboard.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—This company's substation in Lowellville was destroyed by fire on Sept. 2.

Nashville Railway & Light Company, Nashville, Tenn.—This company has placed an order with the General Electric Company for a 6000-kva cooled transformer, switches and accessories for its power plant in Nashville.

Greenville & Northwestern Railway, Greenville, Tex.—Plans for the construction of a new power plant in Greenville are well under way.

Manufactures and Supplies

ROLLING STOCK

Winona Interurban Railway, Warsaw, Ind., expects to purchase one freight car body for express and freight service.

Devil's Lake & Chautauqua Electric Line, Devil's Lake, N. D., expects to purchase one storage-battery car about March 1, 1915.

Portland, Eugene & Eastern Railway, Portland, Ore., has ordered one electric locomotive for operation on its branch between Oswego and the paper mills of Oregon City, Ore.

Port Arthur (Ont.) Street Railway has been authorized in a by-law passed by the rate payers of Port Arthur to purchase at least four new street cars at a cost of $22,000.

Santiago (Cuba) Tramways reports that it has not recently ordered rolling stock from any car builder as it constructs all its cars in its own shops, of special wood grown in Cuba.

Boston (Mass.) Elevated Railway, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 22 as expecting to purchase thirty-seven center-section bodies for articulated cars, has ordered this equipment from the Laconia Car Company.

Winnipeg (Man.) Electric Railway will adapt its entire stock of cars for pay-as-you-enter service. City Traffic Supervisor Lewis reported to the Board of Control on Aug. 1 that this would necessarily take some time. There were on that date thirty-three pay-as-you-enter cars in operation in the city.

London (Ont.) Street Railway has ordered four single-truck pay-as-you-enter cars from the Preston Car & Coach Company, similar to those ordered last year and added to the company's equipment during this year. The company has also decided to remodel four large open cars so that they will be suitable for winter service, and yet be convertible to open cars at a small expense. It has also been decided to remodel the older cars to the pay-as-you-enter system as rapidly as they can be spared from the service.

TRADE NOTES

Pyrene Manufacturing Company, New York, N. Y., has appointed C. L. Allen, formerly automobile sales manager, as general sales manager of the company.

Rooke Automatic Register Company, Providence, R. I., reports the recent installation of its system of fare collection on all cars operated by the Lehigh Traction Company, Hazelton, Pa., and the Monmouth (N. J.) County Electric Company.

Frank F. Fowle, consulting engineer, New York, was recently appointed one of the receivers of the Central Union Telephone Company, with headquarters in Chicago, and was obliged for this reason to close his New York office as consulting engineer at 68 Maiden Lane and move his headquarters to Chicago. The Central Union Telephone Company extends over Ohio, Indiana and Illinois, and the executive duties in connection with this system require practically the entire time of Mr. Fowle for the present. He intends to resume his work in consulting engineering after the conclusion of his duties as receiver.

General Electric Company, Schenectady, N. Y., has recently received the following orders for electrical equipment: Morris County Traction Company, ten GE-200, 40-hp, four-motor car equipments; Connecticut Company, twenty Type MK, double-end control equipments; Steubenville & East Liverpool Railway & Light Company, four GE-200, 40-hp, four-motor car equipments with MK-control equipments, and air-brake equipments with CP-27 compressors; Pier Railway, four GE-200, 40-hp, two-motor car equipments; Southern Traction Company, eleven GE-203, 50-hp, two-motor equipments; Mahoning & Shenango Railway & Light Company, forty GE-247, 30-hp railway motors and ten emergency straight air-brake equipments; Portland, Eugene & Eastern Railway, three GE-205, 110-hp, 1500-volt, four-motor equipments; Third Avenue Railway, fifty GE-247, 30-hp railway motors; San Antonio (Tex.) Traction Company, eleven GE-200, 40-hp, four-motor car equipments; Sacramento Electric, Gas & Railway Company, eight GE-203, 50-hp, two-motor car equipments with K-36 controllers.

ADVERTISING LITERATURE

Prepayment Car Sales Company, New York, N. Y., has issued a folder entitled "Royalty."

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a sheet which lists its various kinds of line material.

Transmission Engineering Company, Pittsburgh, Pa., has issued a folder describing its weatherproof oil circuit breaker for 2500 volts.

American Blower Company, Detroit, Mich., has issued Bulletin No. 27 describing an installation of its system of heating and ventilation.

Oakley Chemical Company, New York, N. Y., has issued a catalog describing its cleansing product, "Oakite" for use in cleaning cars and locomotives.

Canton Foundry & Machine Company, Canton, Ohio, has issued a folder describing its new portable floor crane and hoist for heavy lifting in car and repair shops.

Roto Company, Hartford, Conn., has issued a series of catalogs describing its Roto tube cleaners. Catalog No. 41 describes boiler tube cleaners driven by air or steam; No. 42, water driven cleaners; No. 43, cutter heads for boiler tube cleaners; No. 45, safety tube cleaners for fuel economizers; No. 48, condenser tube cleaners for copper tubes.

National Scale Company, Chicopee Falls, Mass., has issued a folder describing its Multicall, a code-calling system used with or without a telephone system, by which instant communication may be obtained with any one in a business establishment without disturbing or annoying delays to disinterested parties, thus eliminating the daily waste of minutes that accumulate in many lost hours yearly in an effort to locate some one in the plant.

Chandler Brothers & Company, Philadelphia, Pa., have recently issued a special letter containing general financial information regarding the General Electric Company. A résumé is given of the company's history from the standpoint of intercorporate relations and physical growth, and a discussion is presented commending the company on its policy in regard to earnings and dividends. At the end of the letter there is a statistical summary showing, among other features, approximate dividend dates, a comparative table of annual reports and general balance sheets, and a list of high and low stock prices.

American Engineering Company, Philadelphia, Pa., has issued a handsomely colored catalog on its gravity underfeed stokers. In the case of these stokers coal is fed beneath the burning fuel instead of upon it, as with the hand-fired furnace or natural draft stokers. The fuel bed is inclined and the refuse from the fuel flows automatically out of the ignition zone as soon as released from the carbon. The catalog describes the design and operation of the stoker and shows its results in labor economy, low maintenance, smokelessness, fuel saving, overload capacity and flexibility. A number of large illustrations show representative installations, among which are included those of the Boston (Mass.) Elevated Railway, Northern Ohio Traction & Light Company, New York, New Haven & Hartford Railroad and Elmira (N. Y.) Water, Light & Railroad Company.

Universal Lubricating Company, Cleveland, Ohio, has issued a folder describing its lubricant "Tulc," adapted for use in connection with roller and ball bearings, compression cups and air compressers, hydraulic presses and pumps, armature and motor axle bearings, trolley wheels, cranes, hoists, and conveying machinery, jacks, air brakes and pneumatic tools. This material is a petroleum product carrying sufficient pure, fatty substance to make it a suitable lubricant on bearings carrying either heavy or light loads and under conditions of extreme heat or cold. This substance is said to contain the advantages of both oil and grease as a lubricant by eliminating the wastefulness of running oil and the necessity of becoming heated before lubricating qualities are available, as in the case of grease. The manufacturer asserts that this lubricant will not harden or gum and that it leaves no residue, contains no acid or filler, will not corrode metal or grow rancid, and that it prevents rust.

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PAPERS IN THE CONVENTION PROGRAM

Two weeks ago we printed in full the program of the coming convention of the American Electric Railway and affiliated associations for the purpose of stimulating interest in the convention. The program indicates clearly the tendency of the association to concentrate attention upon committee work. This year the total number of papers scheduled on the program is not more than fifteen for all of the associations, ranging from five for the American to none for the Engineering Association. On the other hand, the total number of committee reports is more than sixty, including six joint committee reports. The American Association leads in number of reports with twenty-one. As compared with last year there are about 25 per cent more committee reports and 40 per cent fewer papers. This is a sign of the times, and especially a sign of healthy activity in the association. The change is being brought about not because committee reports are more interesting than addresses but because several hundred specialists have been doing steady work during the year, and they want to get the sanction of the association to their recommendations so that their work can become effective in improving the status of the industry. There is no danger that an association will go to sleep when a reasonable proportion of the members are actively engaged in committee work.

CAN COMMITTEE WORK BE OVERDONE?

The tremendous expansion in the Associations' committee activities carries with it a real danger. A too elaborately organized committee machine may continue to grind out reports because such reports are expected, whether there is really anything to report upon or not. Again, committee appointments in a society are apt to be looked upon as honors as in legislative bodies, and where this is the case it is very difficult to get effective work done. The members of an association have a right to expect results from committee work, and if an existing committee is "marking time" it should either be honorably discharged if it has accomplished what it was appointed for, or revamped if it has failed to appreciate the opportunity which it had for useful work.

LIFE OF ALL-STEEL CARS

One of our readers has called our attention to the question of life of steel cars, stating that one of the real reasons for using steel construction is to obtain a reasonably light car which will give maximum life at a minimum operating cost. This belief is interesting if it is sound. We, on the other hand, are of the opinion that the growing demand for the all-steel car is due to its lightness and low maintenance cost, and, in many cases, to its low first cost as well. Its physical life hardly seems to be an important factor, although the belief is prevalent that a steel car should have even a considerably longer life than a car which is built of wood. As a matter of fact it may be safely said that all cars which escape fire and disastrous wrecks are obsolete long before the end of their normal lives. The lapse of fifteen or twenty years time brings far-reaching improvement, even revolution, in design, and practically any kind of construction with reasonable care will last as long as that. Indeed, the introduction of the prepayment idea nine years ago has alone rendered obsolete most of the earlier cars, and the desire to avoid scrapping the many small single-truck units of eighteen or twenty years ago that are still in good physical condition has involved the most elaborate and ingenious rebuilding schemes. To design, advisedly, a car for a fifty-year life when it will be obsolete in twenty years seems hardly less than the veriest folly.

SOUTH AMERICAN BANKING

The recent decision of the Federal Reserve Board authorizing the National City Bank of New York to establish branches in Buenos Aires and Rio de Janeiro marks the official entrance of American banks into a hitherto undeveloped field. We hope the expectation that the new banking machinery will be put into operation at the earliest date will be soon realized, for there is no time for delay. We need a little of that creative force of easy banking, credit and investment facilities that has been so indispensable to European commercial success. The complete organization of the two new branch banks will help the expansion of credit-acquiring facilities that have been hampered by the requirements of gold deposits in the banks, but the successful completion of all stages of the work will require arduous and persistent effort on the part of more than one American bank. Already urgent pleas are coming from Ecuador and Chile for American financial institutions. That an excellent opportunity exists for improving all commercial conditions with South America is indicated by the action of the Dutch in forming the Banco Hollandese de la America del Sud to help build up Dutch trade in Argentina. This is the first Dutch overseas banking house, except those in the Dutch East Indies and the Far East, and its institution at the present time shows the importance of American banks taking immediate steps to grasp the opportunities offered.

THE RAILROADS' APPEAL While the brief presented to President Wilson last week by a committee of steam railroad executives points out as paramount the vast increase in railroad expenses, the really notable features of the carriers' arguments concern the maintenance of railroad credit and the direct appeal on this point to the American public. The problem of raising new capital for improvements and extensions or for refunding purposes, except at increased interest rates, is one now confronting not only the steam railroads but also the electric railways. Financial prosperity, seriously impaired before the European conflict, is now face to face with an emergency of unparalleled magnitude. Each day of the war adds to the destruction of capital, and even now, as shown by the 6 per cent rate on the New York City loan, all nations are entering the period of higher interest rates caused by poorer credit conditions and a keener competition for capital. Such conditions will affect electric railway financing as well as that of steam railroads, and the net earning power of each class of lines must be increased to cover the additional cost of capital. President Wilson in answering the steam railroads' appeal has called the attention of the public to the necessity of co-operation with and sympathy for the steam railroads. The effect of this is as yet undeterminable, but it is the hope of electric railways that this relief will be granted, for then governors, state legislatures and state commissions may be moved by example to allow electric railway earnings commensurate with present conditions.

TOLEDO SEES THE LIGHT

The injunction order of Judge Killits in the Toledo case is by far the most encouraging development in the long contest conducted by Mr. Doherty for a fair franchise ordinance. To say that it means the turning of the tide of public opinion after so lengthy a controversy may appear to be an over-jubilant conclusion; but the fact cannot be ignored that it immeasurably improves both the legal and the moral position of the company.

The action of the court in issuing an injunction which was denied in an earlier proceeding some months ago, the acceptance of the spirit of the injunction by the public, the candid admission by the city solicitor who contested the application for an injunction of his discovery that the 3-cent fare ordinance was fathered under the previous administration by "political trickery" and, lastly, the plan to reopen negotiations for an equitable franchise are the most eloquent signs of a revolutionary change.

From the beginning, the fight at Toledo has been conducted with the desire to reach public opinion, to show the whole public the facts and in that way to gain direct support for a workable franchise. Toward that end all of the personal efforts of Mr. Doherty were directed, and in his work he had the loyal support of the company officials and employees, clear through to the rank and file. He made his headquarters in Toledo, he wrote interesting, convincing articles full of human touches which were published in the newspapers, and he both talked informally and spoke formally in regard to his plans. The city officials openly encouraged people to ride free, if they could not ride for 3 cents, and the company as openly invited people to ride free if they would not pay the fare provided in the temporary arrangement. Some of the daily newspapers were hostile. In a community where such influences had existed and grown strong Mr. Doherty was a new, untried and novel element. The burden of the attack shifted from the company to him, and he shouldered it. Publicly he has confidently expressed the opinion again and again that a new franchise at a fair rate would be granted because in the end nothing else would suit the needs of the people for transportation and, if they knew the truth, meet the idea of fair play.

It is difficult to trace the influence of all of these circumstances upon public opinion, which is full of surprises and inconsistencies. From the company standpoint the facts underlying the Toledo situation are substantially the same now as they were some months ago. The company showed then, to the complete satisfaction of the accountant selected by the city, that it could not operate at a 3-cent fare and make any return on the investment. It shows that now. People did not accept the showing then or, if they did, they failed to indicate that they accepted the inevitable conclusion. The people, in increasing numbers, do accept the showing now. The reasonable deduction from these conditions is that public opinion has changed.

The decision of Judge Killits, which is published in full elsewhere in this issue, is strong. The city executive neglected the "only proper method of enforcement" of the 3-cent ordinance, which would have involved decision of the company contention "that it was oppressive and unreasonable." In suggesting that the city's power would be used to assist individuals who attempted to ride at 3 cents, the city officials occupied a "wholly indefensible position." "It is to deal with precisely" such situations that courts of equity are open. Judge Killits then mentions a point that is frequently overlooked in these days, that the corporation, like the individual person, "is under the protection of the guaranties of the federal constitution."

In the text of his decision Judge Killits is severely critical of the action of the city executive. The testimony shows without dispute that, when the 3-cent ordinance was passed and signed, that official was "possessed of statistical information in most illuminative detail from the city's trusted expert, which, properly considered, showed that a 3-cent fare was confiscatory." Why the city, ignoring this unanswerable fact, proceed on the road toward confiscation the decision does not discuss. We are not sure that it has been known generally that the city expert, "in advice privately given in writing and orally" to the executive, showed that the 3-cent ordinance should not be passed. That is a scathing indictment of the city attitude. The city purposed to have 3-cent fares without regard to the question of whether or not they were confiscatory. Does public opinion approve of that dishonest course?

The revelation by the city solicitor of the fact that various members of the previous city administration had been apprised of the impracticability of the 3-cent ordinance and his admission that political trickery fathered it do not wholly atone for the grievous wrong done to the company, but they serve the good purpose of showing the animus of the movement. Confession is always good for the soul. The duty of the city officials now is to take up in earnest the work of negotiating a new, reasonable and fair franchise that shall both protect what property the company has and invite outsiders to put more money into additional property. Only by encouraging capital can Toledo hope to have the public utilities that a growing city needs. Toledo has had its experience, costly in time and harmful to the company, with a confiscatory rate of fare. How great the cost is can never be told, but some compensation will arise from it if the result shall be an ordinance that is not only fair to the company and public but that is also a lesson against unreasonable attacks and a lesson that promotes just treatment. If public opinion is determined on a square deal the end of the discreditable Toledo controversy is, if not in sight, just behind the negotiations for a new franchise that will now be started.

RESULT OF INSERT SPECIAL WORK STUDY

The study of insert special work presented on another page in this issue, it is believed, has been sufficiently exhaustive to make the discussion of the causes of and cures for the various forms of failures conclusive. From it we are satisfied that if track and roadway engineers will give the track structure real engineering consideration and will analyze the conditions under which each installation must serve, the life of all types of special work will be greatly increased. In the past, too little attention has been given to the proper choice of special work, the requirements often being only that it would fish with the track rails while the design and materials were left to the manufacturer who was the lowest bidder. It is hardly necessary to say that there is a great difference in the wearing qualities of the various types of insert fastenings and body casting construction under different classes of service. Certain designs are especially suited to certain classes of service, and not to others, and it is just as important to select the design for the work to be done in track work as it is of any class of engineering structure.

The first lesson derived from this study of insert work is that no matter what type of frog or switch piece has been adapted it has cost enough money to justify the purchase of a special set of ties and the preparation of a first-quality foundation to receive it. As mentioned in the article, these ties should be arranged to permit thorough tamping at the time of installation as well as later, when resurfacing is required. More care must be exercised in the selection and spacing of the ties and preparation of the foundations under iron-bound work than under cast-steel arm work, especially when the service includes heavy interurban cars. In either case, however, the installation must be followed by diligent maintenance.

While the life of insert work depends to a large extent upon the care with which it is installed, another factor of equal or greater importance is the care exercised in the manufacture and choice of materials by the maker. For cast-iron bound work, he must provide a casting of sufficient cross-section to insure its ability to stand up under the traffic it has to bear. He should know what service each installation is to perform and recommend a design in accordance. It is believed that the various processes used in toughening the casting against transverse bending strains in the present types of iron-bound insert work are good. They have tended to reduce broken castings to a minimum under street railway traffic, but there is yet room for improvement in the class of special work which is furnished to interurban lines.

Modern heavy traffic conditions such as exist in large cities in congested districts or on interurban roads demand a change in many types of insert fastenings and settings. Large railway companies meeting these conditions successfully and economically with inserts supported strictly on a spelter bed are indeed fortunate. In the past, under light traffic conditions and light cars, the loose insert was an exception to the rule. To-day this form of defect has done more than any other to cause engineers to look with disfavor on the insert type of special work.

An inspection of a large number of layouts under various conditions gives positive proof to the fact that numerous loose inserts are not common to all classes of settings and fastenings. Bolted-down or keyed-down inserts on partially or completely machined bearings are believed to be necessary to meet many present-day heavy traffic conditions. If the former type is employed, treated 1-in. bolts or their equivalents should be used, and the heads and nuts should be securely locked in position. In case the keyed-down insert fastening is employed some method of locking the keys should be provided.

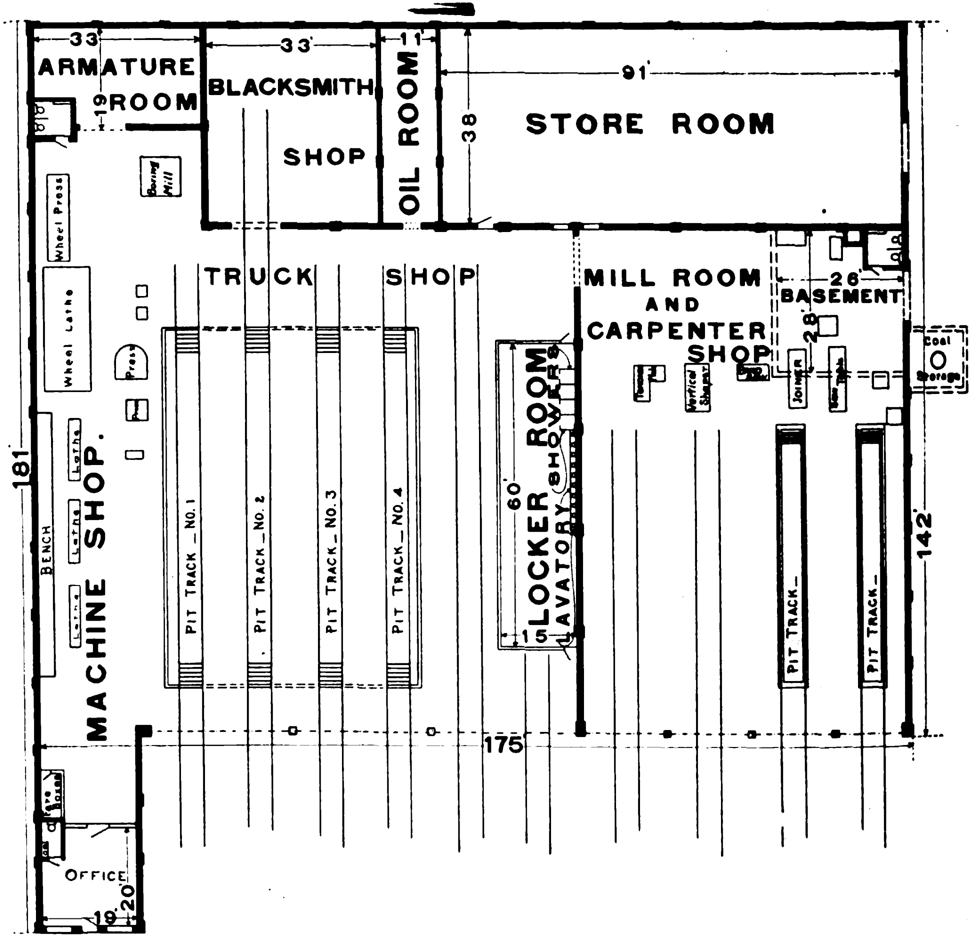
It is hoped that neither the article nor this editorial will lead anyone to believe that insert special work is a failure in track special work. As a rule we believe that it has been giving excellent service, but it has been, and still is, in a developmental stage, and it is hoped that this analysis of existing conditions will be productive of improvement. Lack of complete information on the part of railway engineers and manufacturers has led to dissatisfaction on the part of both. Moreover, some of the failures which have been attributed to workmanship and material are properly chargeable to dilatory maintenance. The remainder are due to improper choice of design from a service standpoint, in conjunction with an insert fastening and setting which is not strong enough mechanically to meet the heavy traffic conditions which prevail on street and interurban railways.

New Repair Shops of Dallas Street Railway

This New Shop Building Embodies Many Features in Design and Compact Arrangement Which Are Well Worthy of Attention

Compactness and convenience of layout, as well as the attention that has been given to the design of the building to obtain efficient lighting and ventilation, are the noteworthy features of the new shops of the Dallas Consolidated Electric Street Railway Company of Dallas, Tex. This shop building was completed recently and is located just outside the business district, thus minimizing dead mileage from the operating divisions. In addition, this location is peculiarly convenient since the main carhouses of the company are just across the street so that the dead mileage in moving cars from the carhouse to the shop for repairs is very small.

The present development includes machine shop, truck shop, blacksmith shop, store room and oil room, all under one roof. The company plans, in the near future, to erect another similar but somewhat smaller building to serve as a paint shop, alongside the carpenter shop, but separated by a 14-ft. alley from it. For the present the painting will be done in the rear end of one of the storage bays across the street from the new shop building. Adjacent property owned by the railway will permit future additions to the present building and will be utilized as necessity may require. The present layout, however, with the contemplated new paint shop, was believed of ample capacity for some years to come.



DALLAS REPAIR SHOP—FLOOR PLAN OF CAR SHOPS

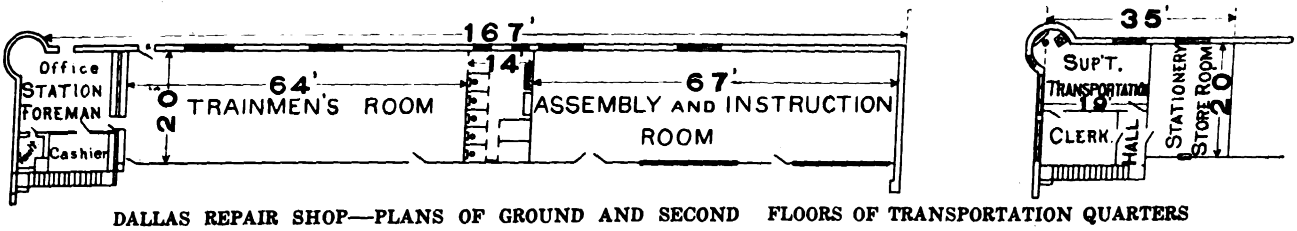
GENERAL ARRANGEMENTS

Reference to the plans of this new repair shop clearly indicate the compactness as well as the convenience of arrangement. In order to provide open storage space for cars between the sidewalk and the shop entrances, the building was set back 39 ft. The area in front was paved and the shop office, which adjoins the machine shop, was allowed to jut out to the sidewalk line. Ten tracks enter the shop building and connect into a special ladder track which parallels the double track in the street in front of the building. By this arrangement the use of a multiplicity of frogs and switches in the main track was avoided. This entire track layout was built of 108-lb. 6-in. girder-grooved rail with cast-steel frogs and switches, and the ladder approach was connected to the main track only at one end.

In adopting the general shop arrangement, special attention was directed to continuity of movement of work through the shops, as well as to the elimination of fire hazard. The machine shop and armature room occupy one side of the building, the former being a part of the truck shop and the latter, although completely enclosed, adjoins both. The blacksmith shop at the rear end of the truck shop is also fully enclosed by brick walls and adjoins the oil room, but is separated from it by a fire wall. At the side of the oil room and occupying a part of the rear of the truck shop, as well as the carpenter shop, is the storeroom. This location is convenient for all shop departments and the storeroom is fully enclosed by brick fire walls. A brick partition wall also separates the two main shop bays, that is, the truck shop and the carpenter shop.

STRUCTURAL DETAIL OF BUILDING

The building walls are constructed of common brick in cement mortar with the exposed walls laid with red-faced brick. All walls are 13 in. in thickness with 17-in. pilasters, and were built upon 19-in. reinforced concrete foundation walls. Between the pilasters of the outer walls, except in the storeroom, are windows 11 ft. x 13 ft. in size. These windows are glazed with ¼-in. wire-ribbed glass set in United States steel sashes, arranged three in a section. The outer walls of the storeroom have only single section windows between pilasters. These windows are just below the roof line, so as to give light and ventilation and still be inaccessible to persons from the outside. In the shop proper the large windows have the top and bottom sashes pivoted, so that they may be opened wide to afford plenty of air circulation, which is absolutely necessary to provide good working quarters during Texas summer heat.



DALLAS REPAIR SHOP—PLANS OF GROUND AND SECOND FLOORS OF TRANSPORTATION QUARTERS

Mill construction was used in framing the roof, which was built of long-leaf yellow pine and covered with Philip-Carey felt roofing. Skylights over each pit, in conjunction with a liberal spacing of windows, insure ample natural illumination in the remotest parts of the building, even on the darkest days. Car entrances are 19 ft. high x 16 ft. wide, and are enclosed with hand-operated Kinnear rolling steel doors. These rolling doors are installed between the lattice steel columns which support the face of the building. During the warm summer months the raising of these doors opens up the entire front of the building and, in conjunction with the open pivoted sashes, provides the maximum amount of light and air.

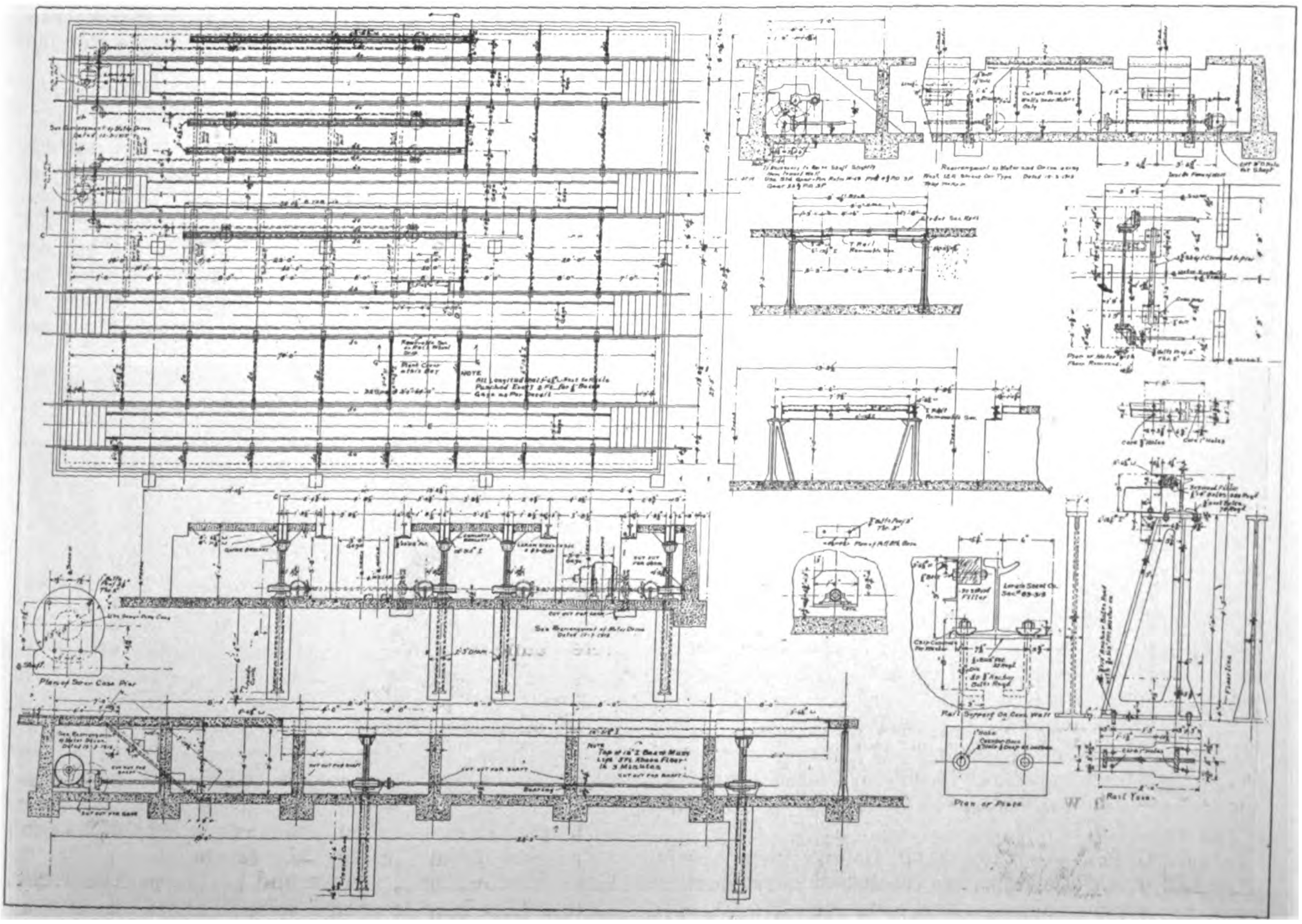
The machine shop and armature room have creosoted wood-block floor, laid on a 6-in. concrete foundation. Other floors except the blacksmith shop, which is cinders, are of concrete. The surface of the concrete floors was hardened with the "Master Builder process," which is nothing more than iron filings and dust worked into the floor wearing surface to increase its abrasive resistance, to obtain a surface of maximum durability.

MACHINE SHOP

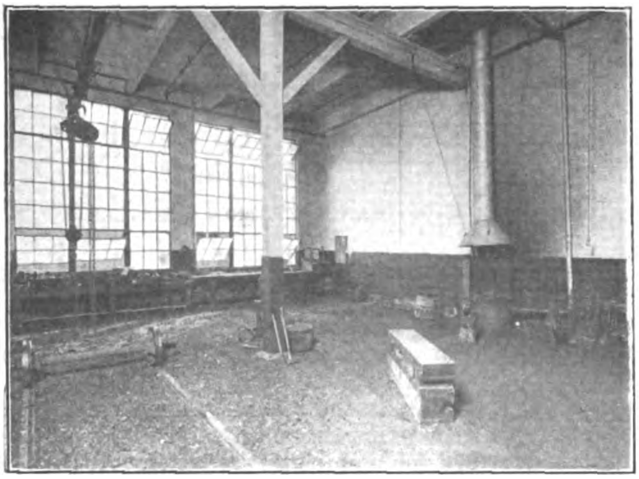
The machine shop, which is 20 ft. x 139 ft. in size, is equipped with all of the tools necessary in modern car repairing, such as wheel lathe, wheel press, wheel boring mill, drill presses and machine lathes. The wheel presses and wheel lathe have individual motor drive, while the other machines are driven from line shafting which is connected by belt to a 40-hp, 600-volt, d.c. motor. Immediately in the rear of the master mechanic's office, which adjoins the machine shop, an enclosed space is provided for repairing fare boxes. At the rear of the machine shop is the armature room. It is equipped with an armature-banding machine, armature rack and work benches. Both of these departments have creosoted wood-block floors, which is believed to have a distinct advantage over other flooring material in that it is easier on workmen while standing, and does not scar when heavy material is dropped upon it or rolled over it.

BLACKSMITH SHOP AND OIL ROOM

A well-lighted and ventilated room, 33 ft. x 38 ft. in size, forms the blacksmith shop. Practically the entire west wall of this shop is occupied by windows, while a 10-ft. door provides access to the main shop. The blacksmith shop is equipped with two forges connected to a centrifugal fan, which in turn is belted to the shop line-shafting. This air-blast connection is through 4-in. supply pipes to the forges.



DALLAS REPAIR SHOP—DETAILS OF PIT SECTION IN TRUCK SHOP



DALLAS REPAIR SHOP—MILL ROOM AND CARPENTER SHOP

DALLAS REPAIR SHOP—VIEW OF STORE ROOM

Beside the blacksmith shop is the oil room, which is 11 ft. x 38 ft. in size. This room was placed next the storeroom so that the storekeeper can conveniently handle the oil stock as well as other storeroom materials. The various oils are stored in Bowser metal tanks equipped with self-measuring pumps. By means of these pumps it is believed that the wasting of oil will be largely eliminated, and at the same time a very close check of its use will be obtained. All paints and varnishes are also stored in the oil room, which is provided with only one entrance, that being on the side toward the main or truck shop.

TRUCK SHOP

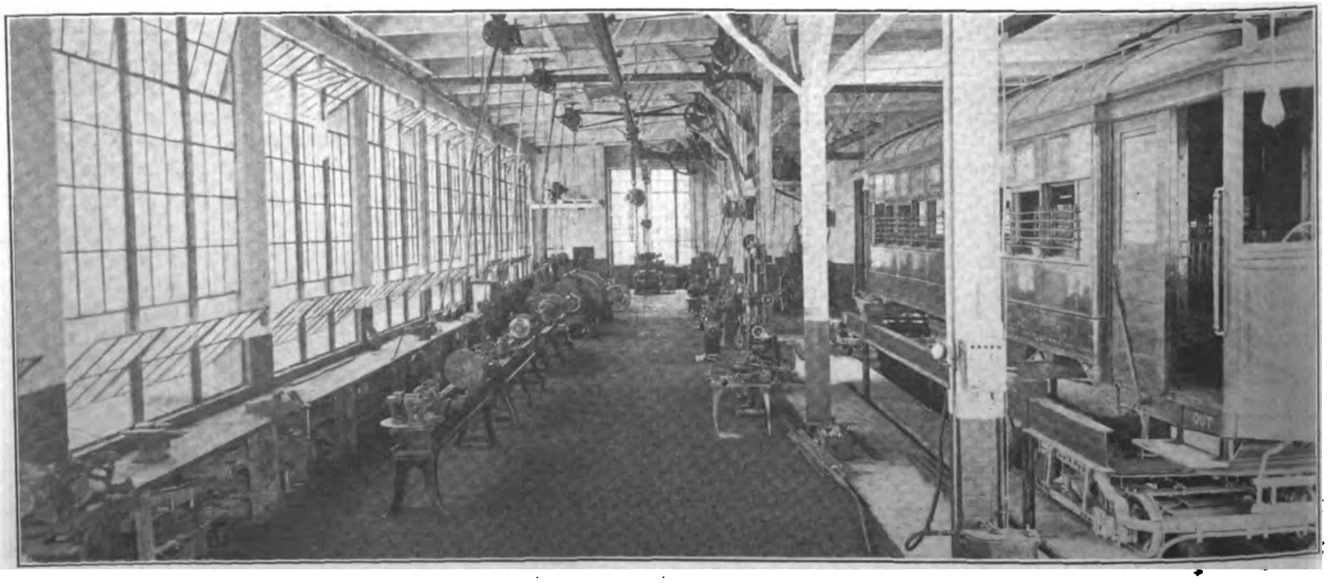
The truck shop has four pit tracks and two tracks without pits. The four pit tracks pass over one large pit which is 70 ft. long by 50 ft. 5¾ in. wide and 4 ft. 5 in. deep, measured from the floor line. The rails over the pits are 91-lb. 9-in. girder-grooved rail, two of the tracks being supported on cast-iron yokes while the other two tracks, which are equipped with car hoists, are supported upon concrete piers. The details of the construction of these pits and car hoists are shown in the accompanying illustrations.

Tracks 1 and 2 are equipped with pit car hoists, arranged for individual motor drive, with worm-and-gear and continuous-shaft connections. Track 3 has a 4-ft. 6-in. removable section of rail which permits wheels to be dropped from trucks into the pit with the assistance of an air hoist. All four of these tracks over the pits extend 20 ft. beyond and upon the shop floor, except track 2 which extends into the blacksmith shop, so that trucks may be rolled direct from under the car body into the blacksmith shop.

An overhead trolley hoist, running upon 8-in. I-beams and having a capacity of 3 tons, serves each of the truck-shop tracks, the blacksmith shop, the armature room and the machine shop. The arrangement of the hoist runway is such as to facilitate the conveying of repair parts from the pits and floor of the truck and blacksmith shops to any machine in the machine shop. The arrangement of these runways may be seen by reference to illustrations showing the machine shop and truck shop. Instead of using trolley wire over the tracks in the shops, 3-in. T-iron was placed in wooden troughs for this purpose. This kind of an overhead installation, it was believed, would be more durable than wire and less liable to break.

LOCKER ROOM AND LAVATORY

A locker room and lavatory, 15 ft. wide, extends along the partition wall between the truck shop and the carpenter shop for a distance of 60 ft. This location, however, is only temporary, as it is planned to build a second story over the store room for this purpose whenever it becomes necessary to occupy this space for shop use. On account of its temporary nature an 8-in. brick wall, 10 ft. high, was erected to screen



DALLAS REPAIR SHOP—INTERIOR OF MACHINE SHOP BAY the lockers and lavatory from the shop. The lockers are of the expanded-metal type, one being provided for each workman. In this room also are four shower baths and ten porcelain wash basins provided for the convenience of the employees.

Carpenter Shop

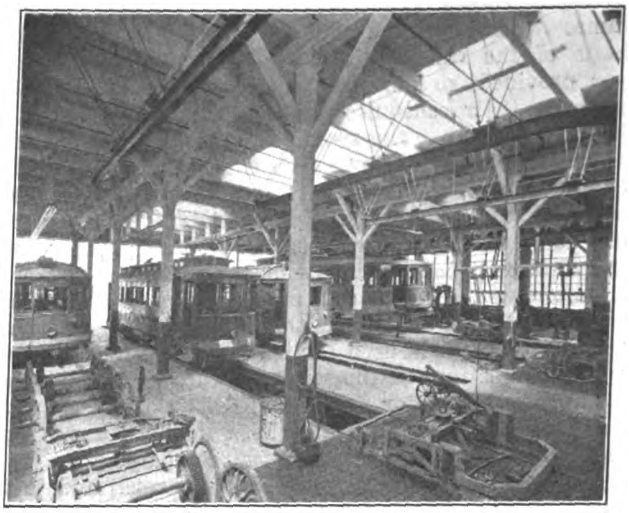
The carpenter shop, which is separated from the truck shop by a brick fire wall, is provided with four tracks 60 ft. in length, two of which pass over repair pits. These pits are built with reinforced concrete walls and are 50 ft. long. The mill machinery in this department is located at the end of the tracks where it is convenient to them. Under a portion of the carpenter shop is a 26-ft. x 28-ft. concrete basement. In this is located an automatic gas heater for hot water, and it will also provide space for the shop heating plant. It is planned to install a hot-air blower heating system which is believed to be best adapted for the purpose in a climate which changes quickly from hot to cold and vice versa.

Store Room

A store room with ample headroom and floor space, and easily accessible to all departments of the shop, is provided at the rear of the carpenter and truck-shop bays. Its central location will result in a minimum loss of time by employees going to and fro after material. A 10-ft. door, opening into the alleyway at the rear of the building, permits material to be unloaded from trucks and wagons directly upon the floor of the store room. All doors in the store room partition walls, as in the walls in the remainder of the shop, are equipped with automatic fire doors furnished by the Gilbert Manufacturing Company, of Dallas, and approved by the national board of fire underwriters. Artificial illumination in the store room as in the other shop departments is by the direct system, drop lights being placed so as to furnish uniform illumination. All wiring is exposed, but installed in conformance with the underwriters' code.

Fire Protection

The entire shop building is protected from fire by a Grinnell automatic sprinkler system, which required the erection of a 50,000-gal. steel tank set upon a latticed steel tower, 100 ft. above the ground. This tank also serves for automatic fire protection in the carhouses, across the street from the repair shop building. In addition to, and at the same time serving, this tank is a two-stage, 7-in. centrifugal pump, with a capacity of 750 gal. per minute at pressure of 100 lb. per square inch.



DALLAS REPAIR SHOP—INTERIOR VIEW OF TRUCK SHOP AND INSPECTION PITS

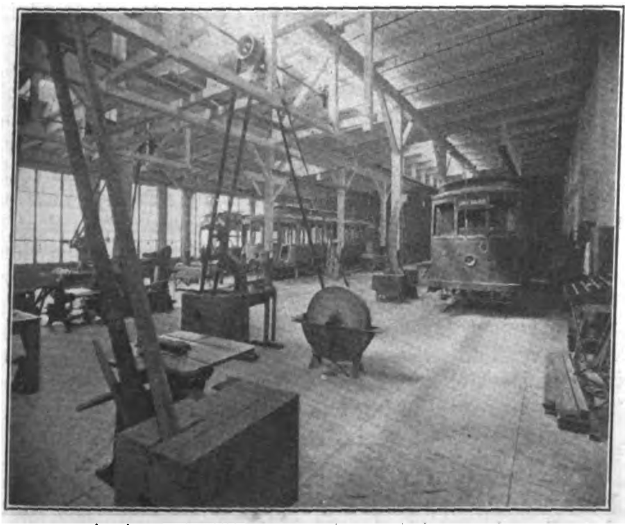
New Transportation Quarters

In connection with the erection of the new shop building, the transportation quarters of the company have been enlarged and remodeled, affording a suitable place for the conduct of that part of the company's business and at the same time providing comfortable and convenient quarters for the men in the train service. One section of the carhouses formerly occupied by the old shop has been remodeled for this purpose.

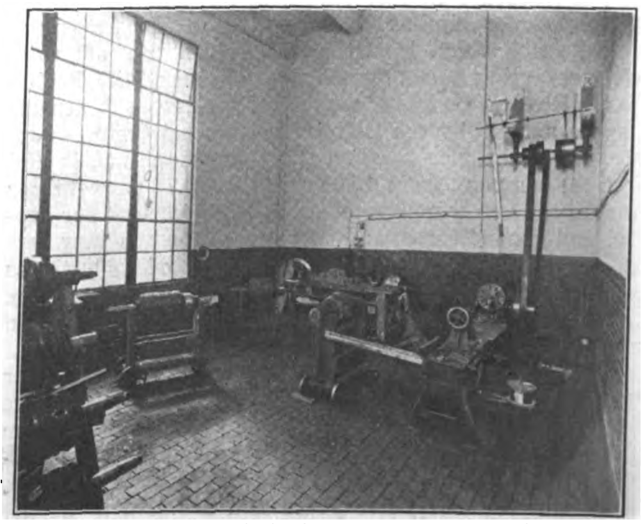
These quarters occupy ground-floor space, 20 ft. x 167 ft. in size, and a portion of a second floor, 20 ft. x 35 ft. in size. On the ground floor is situated the office of the station foreman and the cashier, and the trainmen's room, lavatory, assembly and instruction room. In the second story, which only partially covers the ground-floor rooms, are located the offices of the superintendent of transportation and a store room for stationery.

Concrete floors were provided throughout the trainmen's quarters and the walls are skirted by a 4-ft. wainscoting of pine-stained flemish oak, above which they are plastered with a hard plaster. The lavatory is equipped with every necessary toilet convenience.

Along one wall of the trainmen's room is a shelf for



DALLAS REPAIR SHOP—INTERIOR VIEW OF BLACKSMITH SHOP



DALLAS REPAIR SHOP—VIEW OF CORNER OF ARMATURE REPAIR ROOM writing purposes and above this is a succession of frames attached to the wall for holding the schedule sheets of the various lines. Long benches have also been provided, so that trainmen may sit at the shelf and copy their schedules, make out their trip sheets, etc. In order that the trainmen may have some form of amusement to occupy spare time while waiting to take out their runs, and that the club idea may be encouraged, the company has placed tables for checkers and dominoes in the train room. These games have proved to be popular with the men.

Adjoining the trainmen's room are the lavatory and toilets, and back of these is the general assembly room. This latter room is used for lectures, trainmen's meetings, the meetings of the safety league, and also by the trainmen's instructor for holding his classes in train operation. In this room has been installed a moving-picture machine, with which the company gives two shows each week for the benefit of the men and their families. The seating capacity of the assembly room is about 300, and the attendance at each picture show taxes the room to capacity. These shows are given free to the employees and afford them considerable pleasure. Occasion is taken at these entertainments to throw on the screen "safety first" mottoes and other instructions which may be apropos.

The general design of this new shop and transportation quarters follows the ideas of Richard Meriwether, general superintendent of the company, and John L. Brown, the master mechanic, while the Stone & Webster Engineering Corporation were the contractors and did the construction work. The development of the construction details and the supervision of the construction work were under the direction of T. L. Thornberg, engineer, and J. L. McCampbell, superintendent of the Dallas office of the Stone & Webster Engineering Corporation.

Rate of Return in California

The ELECTRIC RAILWAY JOURNAL of May 16, 1914, page 1075, contained an analysis of conditions under which public utilities in California are required to raise new capital, as presented by A. F. Hockenbeamer in the case of the Pacific Gas & Electric Company vs. the City and County of San Francisco before the United States District Court. An interesting commentary on Mr. Hockenbeamer's testimony appears in a recent decision of the California Railroad Commission in the case of the County of Antioch vs. the Pacific Gas & Electric Company, regarding rates for electrical energy. It is stated that the defence in this case filed an affidavit by Mr. Hockenbeamer similar to that used in the first-mentioned case, which is still pending. In this affidavit, after referring to the financial condition of the Pacific Gas & Electric Company and to certain issues of securities authorized by the California Railroad Commission, Mr. Hockenbeamer reached the conclusion that it had cost the company from 6.1 per cent to 10.75 per cent per annum to borrow money on security obligations for capital and expenditures, and that unless the company was able to derive profits from the operation of its business equivalent to at least 8½ per cent per year on the money invested or to be invested it would be unable to obtain capital necessary to carry on its business.

In commenting upon this statement, Commissioner Thelen assumes as a normal case that in order to secure each $100 to be invested the company secures $75 from the sale of bonds and $25 from the sale of stock. If the utility's bonds bear interest at the rate of 5 per cent, run for thirty-five years and are sold at 85 per cent of their face value, this being the condition obtaining with reference to the Pacific Gas & Electric Company's present general and refunding bonds, the company would be paying for this money, considering both interest and discount, at the rate of 6.1 per cent per annum. The $75 to be derived from the sale of bonds would accordingly cost the company each year $4.575. If a return of 8 per cent were allowed, this would leave a difference of $3.425 to pay dividends on stock and to yield a net profit in excess of interest and dividend requirements. This sum of $3.425 would yield interest at the rate of 13.7 per cent per year on the sum of $25 to be derived from the sale of stock. The commission states that no reasonable person will contend that it is necessary for a company such as the Pacific Gas & Electric Company to offer to its stockholders a rate of return of 13.7 per cent in order to induce them to supply the necessary funds in addition to those derived from the sale of bonds, and the conclusive answer to any such claim is the fact that the company is now selling to its stockholders at 82.5 preferred stock bearing interest at the rate of 6 per cent per annum. If an allowance of 8 per cent were made by the rate-fixing authority on money derived from the sale of stock, the sum of $2 would be necessary on each $25 derived from this source. By adding this sum to the $4.575 necessary for the bonds, the total cost of money derived from both bonds and stock would be $6.575, which falls short by $1.425 of the allowance made to the company if a return of 8 per cent were granted.

Commissioner Thelen then finds that a return amounting to 8 per cent of the fair and reasonable value of the property is at least a fair, reasonable and liberal return on the company's investment. He emphasizes the fact, however, that the commission in granting this return is allowing more than is necessary to secure all the company's capital from both stocks and bonds under proper financing and that the amounts so allowed in excess may well be said to be $1.425 on each $100 in value. The decision rendered is based on the assumption that the utility did not have bonds outstanding in excess of the value of the property but that there is a normal relationship between the face value of the bonds and the value of the property, and that the utility's funds have been secured in part from the sale of bonds and in part from the sale of stock. In reply to Mr. Hockenbeamer's statement that by a mortgage provision no additional bonds of the company can be issued until its net profits during a given period available for the payment of bond interest have been at least one and one-half times the amount of interest on all outstanding bonds, the commissioner states that one and one-half times the above mentioned $4.575 amounts to $6.865, which is still considerably below the sum of $8 allowed.

In regard to the fact that the Pacific Gas & Electric Company during the last year sold $7,000,000 of 6 per cent one-year gold notes on a 10.75 per cent basis, Commissioner Thelen says that this transaction cannot be considered a normal one. The price paid is the highest paid for money by any public utility on any authorization for an issue of securities made by the California Railroad Commission since the effective date of the public utilities act. The money was obtained at a time of recognized financial stringency and at a time when the company was spending millions in foundation expenses which could not be expected to yield a proper return for at least a number of years. The company was compelled to have this money in order to complete its construction work and the price paid cannot be controlling in establishing the proper rate of return.

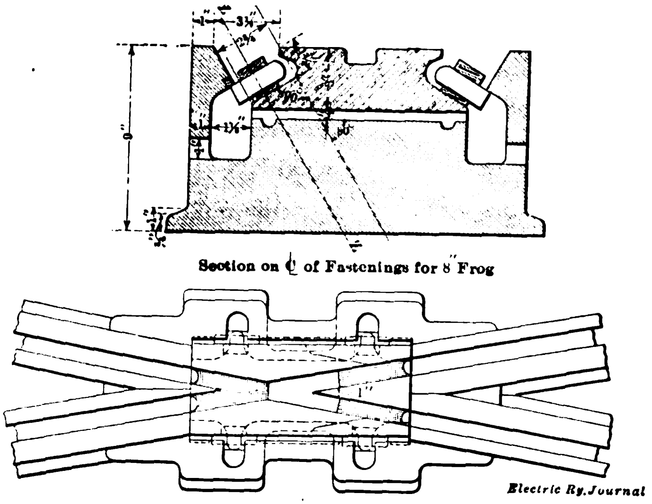
The Society for Electrical Development, Inc., New York, N. Y., has issued a report to its members, which describes in an interesting way the manifold activities of the society in encouraging the progress of the electrical industry.

A Study of Insert Special Work Failures

Results of a Comprehensive Analysis of the Forms of Failures in Various Kinds of Insert Special Work Under Different Classes of Service

The article entitled "Chicago's Experience with Solid and Insert Manganese Special Track Work," published in the issue for May 2 of this paper, attracted a great deal of attention and showed the widespread interest in track work problems on electric railway systems. One of the conclusions derived from that article was that, as a rule, insert special work equaled, and in some instances surpassed the serviceability of solid manganese steel special track work. The quality of the steel in the insert, as compared with that in solid work, was considered at length, but no attempt was made to discuss the defects in the entire piece which develop under service, because that was considered to be a subject for special study.

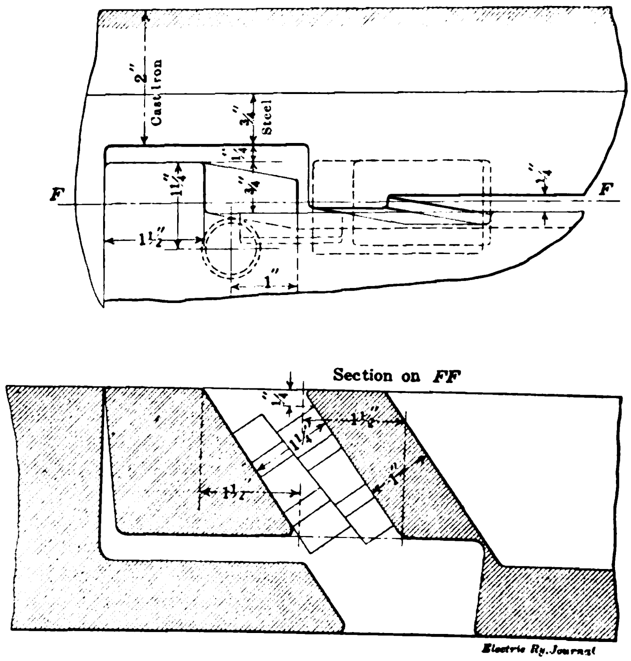
In order to establish a premise for this study of insert special track work, it will be assumed that every defect which prevents a piece from wearing uniformly under traffic is a failure, regardless of the service the piece has rendered. Experience has shown that, although insert work in general is cheaper in first cost, it at least equals the serviceability of the more expensive types of frogs and crossings when installed under similar conditions. Despite this record, however, it is believed that some of these imperfections which hasten the wear-life limit may be eliminated, thereby making it possible to obtain a more uniform and a longer average life from this class of construction. Moreover, it is believed that the problem to be solved is not entirely one of manufacture but that the railways, in many instances, have attributed the causes of failures to material and workmanship when they should properly have been charged to poor choice of design, improper installation and lax maintenance. On the other hand, serious flaws have occurred in a number of pieces which are due to faulty design and manufacture. These usually occur early in the life of a layout, and generally they are directly responsible for other complications in the piece or its foundation.


Section on ℄ of Fastenings for 8" Frog

INSERT SPECIAL WORK—FIG. 1—INSERT WITH SPELTER BEARING AND PATENTED, BOLTED FASTENING

EXTENT OF INSPECTION

In order that this study might be comprehensive in character and convincing in results, an inspection trip was made over the principal properties in the Central West. These properties included the Illinois Traction System, the Michigan United Traction System and the railways in Milwaukee, Chicago, Detroit, Toledo, Cleveland, Columbus, Cincinnati, Indianapolis and St. Louis. In addition to this personal inspection, the benefit of the experience of engineers on other properties has been obtained through correspondence, and the plants of the principal manufacturers of street railway track special work have been visited. From the list of the properties visited it will be seen that all classes of traffic were included, from a simple street railway service, through a combination of street railway and interurban railway service, to that of the exclusively interurban railway. In addition to the various classes of service, considerable care was exercised to see that practically all types of track special work were inspected under the various conditions.



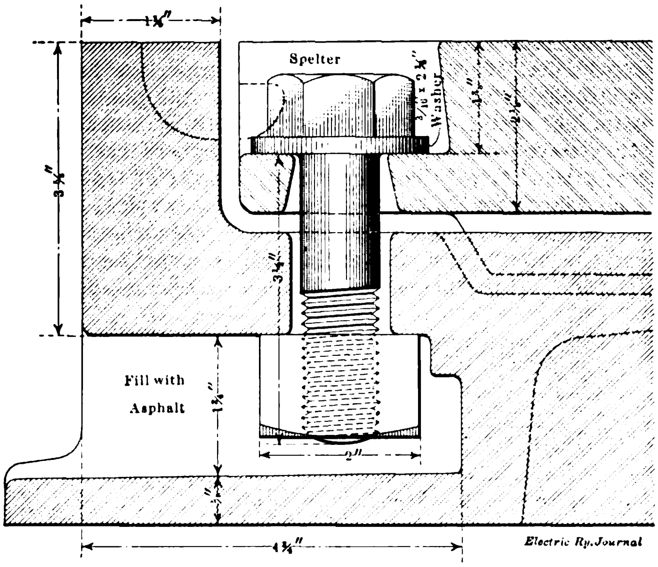
INSERT SPECIAL WORK—FIG. 2—INSERT WITH SPELTER BEARING AND WEDGED-IN FASTENING

TYPES OF INSERT SPECIAL WORK INSPECTED

All insert special work may be divided into three classes so far as the insert setting is concerned, namely, that which is supported entirely in a spelter bed, that which is partially supported on a machined bed and surrounded with spelter, and that which is provided with a completely machined bearing. Insert fastenings are essentially of two kinds, those which may be renewed from the pavement surface, and those which may be renewed only by removing portions of the paving on each side of the insert pockets. The latter type of fastening is manufactured in two designs, namely, the bolted-down and the keyed-down construction, in each of which the bolt or key serves to clamp the insert and the main casting together. The former is in three designs, namely, the keyed-in, the patented setscrew and the bolted-down fastenings. Both of the foregoing types depend on a wedging action between the insert and the main casting to hold the insert tight

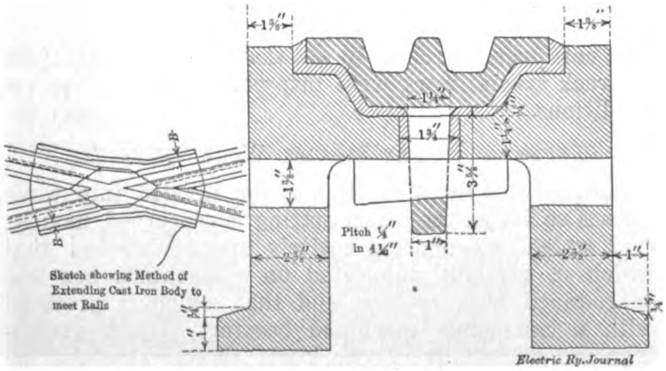
Any of these types of fastenings may be had in cast-iron bound or in cast-steel arm construction.

Fig. 1 is an example of the insert supported wholly in a spelter bed and fastened so that it is renewable from the pavement surface. The durability of the fastening depends upon the pressure brought to bear between the insert and the edge of the pocket by the bolts and washers. In this type of construction the insert is made to fit fairly close where it joins the running rails, but no attempt is made to fit it along the sides of the pocket. After it has been set in its permanent position on shims, the interstices at the edges and beneath the insert are filled with spelter. Openings around the bolt heads are kept free of spelter and afterwards plugged with asphaltum to facilitate tightening in service.



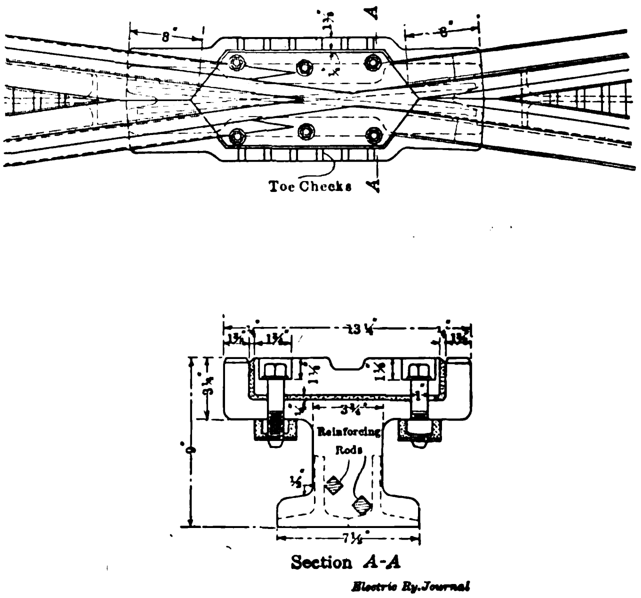
INSERT SPECIAL WORK—FIG. 3—INSERT WITH SPELTER BEARING AND BOLTED-DOWN FASTENING TO SOLID CASTING

Fig. 2 is what is commonly known as the "wedged-in" insert fastening. This is also set and supported on spelter, but depends for permanence on a fastening obtained by two wedges which are inserted in each of four slots between the insert and the main casting. These wedges are tapered in opposite directions and bear against the main casting and the insert, which is forced down on the spelter bearing. In case it is desired to reset or renew the insert from the surface, this is accomplished by driving one of the wedges into the pocket, thus relieving the other. These wedges are not incased in the spelter in their permanent position but are sealed with asphaltum.


Sketch showing Method of Extending Cast Iron Body to meet Rails
Pitch ¼" in 4¼"
Electric Ry. Journal

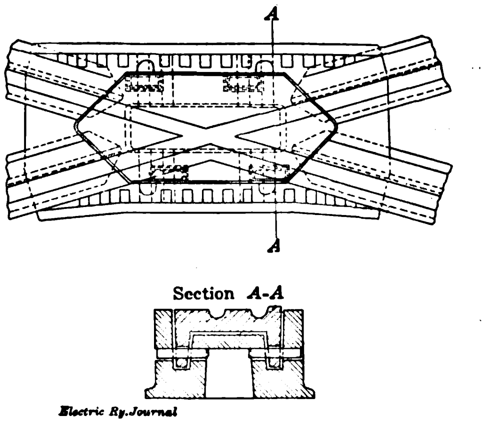
INSERT SPECIAL WORK—FIG. 5—INSERT WITH SPELTER BEARING AND KEYED-DOWN FASTENING TO CHANNEL CASTING

Another form of spelter-set insert is that shown in Figs. 3 and 4, commonly known as bolted-down construction. In the example shown in Fig. 3, pockets in the sides of the main castings are provided to receive the nuts for the bolts, which pass through the insert and the main casting into the pockets, where they engage the nuts and are screwed securely in position. After the insert is located in its permanent position on shims, the opening around the sides and that forming the bearing are filled with spelter. Following this operation the bolts are drawn up tight and their heads incased in spelter. To prevent the bolts from becoming loosened under vibration, the pockets containing the nuts are filled with asphaltum. As in the cases shown in Figs. 1 and 2, while the edges of the inserts adjoining the running rails are not made a machined fit, a neat fit is required at these points.



INSERT SPECIAL WORK—FIG. 4—INSERT WITH SPELTER BEARING AND BOLTED-DOWN FASTENING TO I-BEAM CASTING

Another form of insert fastening is shown in Fig. 5 and is known as the "keyed-down" type. After the insert has been set in its permanent position on strap liners, placed particularly at the points of impact, the spelter is poured in the remaining space to supplement the bearings on the liners. After the keys have been inserted to draw the insert plates down on the liners, they are again driven further to tighten the plate on



INSERT SPECIAL WORK—FIG. 6—INSERT SETTING AND FASTENING USED BY THE COLUMBUS RAILWAY & LIGHT COMPANY the combination liner and spelter bearing, after which spelter is poured around the lugs and keys to prevent the latter from backing. The lugs on the insert plate through which these keys are inserted project through the main casting below the insert, hence the wedges pull the insert down tight against the spelter bearing at the center. This type of fastening is not affected by the peening action of the insert, because any tendency to peen is resisted by the key fastening at the center. Openings on each side of the main casting permit these wedges to be driven or removed after a portion of the surrounding pavement has been removed.

Fig. 6 is another type of spelter-bedded insert of the keyed-down design somewhat like that shown in Fig. 5. This design originated with the roadway department of the Columbus (Ohio) Railway & Light Company. As shown in the illustration, it contains four lugs depending from the sides of the insert plate which fit into openings in the main casting. Each of these lugs is cast with an opening so that a key may be driven to fasten the insert down in its permanent position. The bearing on the main casting and the openings along the sides of pocket are sealed with spelter. In this design no special effort is made to obtain a tight fit between the plate and the running rails. It is claimed that this type of fastening retains the clamping principle of the bolted-down fastening while eliminating the possibility of stretched bolts.

Another type of insert setting and fastening is that known as the partially machined, supported design. Fig. 7 shows this type of construction used in conjunction with the ordinary bolted-down fastening. The plan sketch shows four circles located at points in the insert pocket at the ends of the rolled rail arms. These represent the machined bearing points or seats in the floor of the pocket and in the base of the insert. These machined spots are located so as to receive the impact blow of the wheel as it passes from the running rail to the insert. The opening at the sides of the insert and the remainder of the bearing are sealed with spelter.

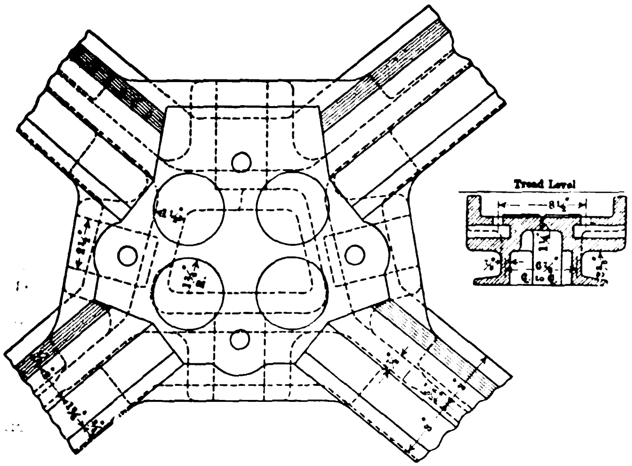
Fig. 8 also represents this partially machined supported insert with the ordinary bolted-down fastening. Like the insert support shown in Fig. 7, machined seats are provided at the points where the insert plate receives the impact blow as the wheel passes from the running rails to the insert. In this construction a neat fit is made between the insert and the running rails, and the ends and other interstices are filled with spelter.

Fig. 9 shows still another form of a partially machined, supported insert of the bolted-down fastening type. In this design, however, the partial support takes the form of machined ribs in the floor of the pocket and in the base of the insert. The design provides for a neat fit at the points where the insert joins the running rails. The interstices in the bearing and around the edges of the insert are filled with spelter.

Fig. 10 represents the type in which the manganese insert rests on a fully machined seat, with a bolted-down fastening. In this class of construction, the floor of the pocket is carefully machined to provide a perfect bearing on the base of the insert, which is ground accurately to surface. The edges of the pocket, as well as the insert, are also carefully machined so that the insert fits tightly when set in its permanent position. This type of insert is usually employed with the cast-iron-bound construction with a minimum insert thickness of 1⅞ in., and the over-all thickness varying from 2¼ in. to 2⅜ in.

In Fig. 11 is illustrated a form of insert used principally in New England. It is cast-iron-bound construction with a forged steel insert which has been heat treated and set on a partially machined bearing. The sides of the insert are not machined to fit the pocket, but the ends of the insert and the pocket are accurately machined. The finished main casting is heated to expand the pocket when the cold insert is set in place. The shrinkage of the pocket is sufficient to hold the insert securely. Spelter is then poured along the edges of the insert and also fills the interstices between the rib seats. This type of construction has been quite successful under average city railway service; in fact, the forged steel insert wearing qualities compare very favorably with the average manganese-steel insert, and it does not chip.

Practically all types of insert fastenings and settings may be had in either cast-iron-bound or cast-steel-arm work. Considerable difference of opinion appears to exist, however, regarding the size and character of the cast-iron sections employed to bind the rolled rail arms in the cast-iron-bound work. The illustrations indicate that three designs are in common use, namely, the solid, the channel supported, and the I-beam supported castings. Some manufacturers are obtaining additional strength to resist transverse bending by increasing the sectional area, others by treating the cast iron to toughen it, and still others by reinforcing the cast iron with concrete reinforcing rods. Any one of these meth-



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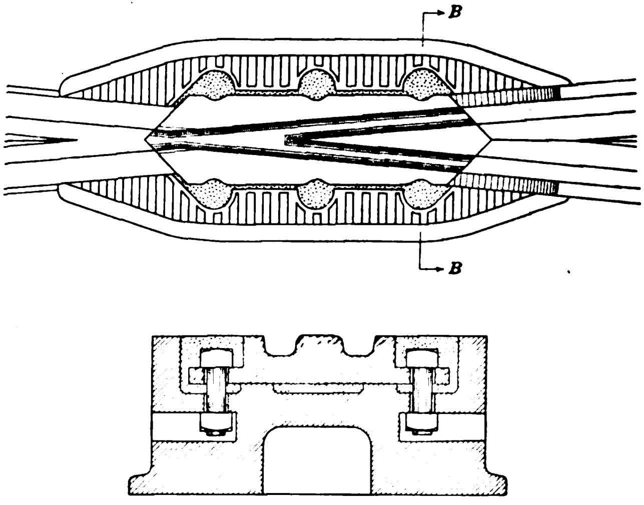
INSERT SPECIAL WORK—FIG. 7—INSERT WITH PARTIAL MACHINED BEARING AND BOLTED-DOWN FASTENING TO CHANNEL CASTING



Section B-B

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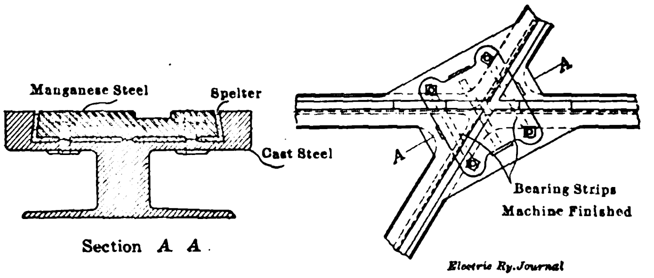
INSERT SPECIAL WORK—FIG. 8—INSERT WITH PARTIAL MACHINED BEARING AND BOLTED-DOWN FASTENING TO CHANNEL CASTING ods is good if the section is calculated for each class of service it is to perform; the only difference is that some insert supports weigh more than others. The cast-steel-arm work is also designed in various sections and depends on the heat treatment largely for its wearing qualities and strength. The remarkable development in the past few years in steel foundry practice has resulted in a marked improvement in cast-steel castings.



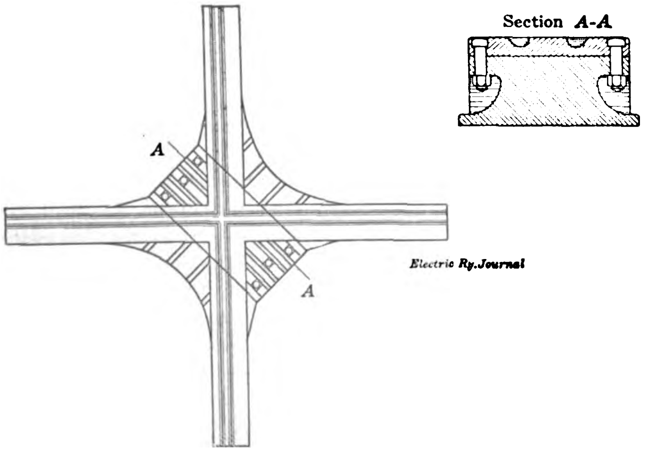
Electric Ry. Journal

INSERT SPECIAL WORK—FIG. 9—INSERT WITH MACHINED RIBBED BEARING AND BOLTED-DOWN FASTENING TO I-BEAM CASTING

CAUSES OF LOOSE INSERTS

Unquestionably the most common weakness of insert special work, under any class of service, is the loose insert. While the loose insert is responsible for many other complications in insert special work if not repaired promptly, other forms of imperfections arise from totally independent causes. Probably the form of failure second in importance is the loose arm in cast-iron-bound work. These loose arms are due either to breaks in the arms at the points where they set in the casting or to the loosening of the arms in the castings. The form of failure third in importance is the cupping in the rolled rail arm at the edge of the insert. Finally, a defect which is found principally where the traffic consists of heavy interurban cars is the broken casting.

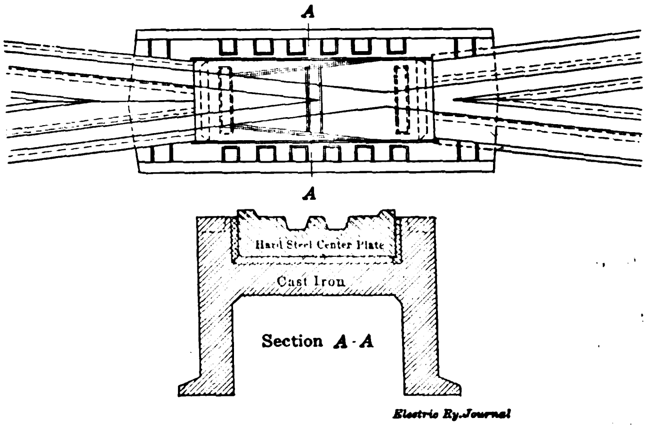
The maximum number of loose inserts occur in the spelter-bed setting. It is also found that certain types of fastenings give better results than others, but few pieces of this type appear to be able to meet modern heavy traffic conditions without becoming loose before the piece is worn out. Loose inserts are also found where the plate has a partially machined support, but as a rule these are not so numerous as in the spelter-bedded construction. In fact, in this class of special work it is believed that the manner of fastening has more to do with the loosening of the insert than the character of the support. Loose inserts are also found in work where the plate is wholly supported on a machined surface, but when they do occur the usual complications do not follow. The loose insert with this latter design, however, is an exception to the rule and in most instances may be attributed to the manner of fastening rather than to the type of bearing.



Electric Ry. Journal

INSERT SPECIAL WORK—FIG. 10—INSERT WITH MACHINED BEARING AND EDGES, AND BOLTED-DOWN FASTENING TO SOLID CASTING

Fundamentally the use of a spelter support under a manganese steel plate, purchased to furnish a material which would withstand the severest service conditions at the wear points, is wrong. Spelter may have a value in compression when confined, but this is comparatively small, and when the insert is subjected to severe impact blows there is a tendency for the manganese steel plate to tilt or flow after which the spelter cannot be expected to withstand the concentrated impact blows without compressing or flowing. It is believed that in many instances the insert becomes loose originally because the fastening does not hold securely. After the insert is once loose the spelter around the edges is sheared from that forming the bearing, and traffic soon jars it from its position beside the plate. When this spelter is gone, there being no bond between the spelter forming the bearing and the plate, it is but a short time until traffic vibration has loosened the insert fastening completely. If the insert is not reset promptly many other complications arise in close succession.



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INSERT SPECIAL WORK—FIG. 11—FORGED STEEL INSERT WITH PARTIAL MACHINED BEARING AND ENDS, AND SHRUNK-IN FASTENING

At best the only purpose of the spelter setting is to save machine work. While the design of most insert pockets in the body castings, either in the cast-iron-bound or cast-steel work, make it difficult to machine the edges or the bearings, it is not impossible to change the shape of the pocket so that it can be machined easily. Of course these difficulties in machining do not arise with the insert shapes except in some instances where they are complicated, and these could be obviated by the use of simpler shapes. Many of the manufacturers are now making the machined bearing insert special work either on specification or as their own standard. While those who have not made a regular business of manufacturing this class of construction claim that it is more expensive than the spelter-bedded pocket type, others state that when everything is equal they are in a position to meet the manufacturing cost of the other types.

The necessity for an all-machined bearing is questionable, and it is probable that a partially machined bearing sufficient to spread the impact load over a reasonable area of the casting will produce the same result. It is important, however, in any case to use a fastening that will not loosen under vibration or be subject to shear under side thrust when an insert becomes thin and peens under severe service. It is possible, of course, to reduce this peening to a minimum if the insert is thickened to a point where it is too rigid to assume a convex shape in the pocket, even up to the expiration of its wear-life. The location of the machined bearings is important and the bearings now in use are good, although it is doubtful whether sufficient area is used.

EFFECT OF STEEL WHEELS

While the use of miter joints between the insert and the running rails has materially aided in reducing the impact blow at this point, a machined fit also helps to reduce the number of loose inserts to a minimum, particularly in acute-angle crossings. In the obtuse and right-angle crossings, however, while the machined miter joint should be used to reduce the impact blow to a minimum at this point, it is very difficult to eliminate this blow at the intersecting flangeways. A number of engineers and manufacturers are attempting to accomplish this by using a flange-bearing insert throatway, but it is almost impossible to maintain it in a flange-bearing condition, owing to the rapid wearing away of metal under thin steel wheel flanges. A long, gentle approach from a non-flange bearing to a flange bearing, however, will materially aid in increasing the life of the metal in the throatway floor. When the approach is short, a slight blow is struck by the wheel flange as it comes in contact with the throatway, and, as a consequence, it is but a short time until the badly-worn flanges have cut their way through the flange-bearing insert plate. The gentle approach is obtained by the use of a large plate, or the cast-steel arm with the shallow throatway may be carried all the way through the piece, or the approach in a rolled rail groove may be built up with a welder.

Since rolled-steel wheels have come into common use in street and interurban railways, a new difficulty has developed in connection with track special work in paved streets. Worn steel wheels are believed to have added to the number of loose inserts. Thin flanges in combination with a canted truck cause one wheel to run flush against the flange while the other wheel on the same axle is pulled away from the gage line. In this position the latter wheel must either mount the insert plate, if the throatway is narrow, or it must strike a hard enough blow at the throatway entrance to right the truck. This difficulty is more or less obviated by providing a long, gradual approach from the running rail into the throatway in the insert plate. Unless this approach is gentle, a considerable blow will be struck on the plate as the wheel passes into or over it. This tends to loosen the insert and at the same time shear off the bolts or other fastenings. In many instances, derailments may be charged to the thin-flanged rolled-steel wheel rather than to any defect in the design of the insert throatway or to any variation in the track gage.

On streets where there is dense vehicular traffic, the heavily-loaded trucks undoubtedly contribute their share to the number of loose inserts as well as worn guards and running rails. Manufacturers usually exercise considerable care in providing a neat joint at the running rail connections to the insert plate to reduce impact but do not take such precaution at the sides of the plate, which are also subjected to impact blows from vehicular traffic. Attention in this direction no doubt would also be productive of improved results.

INSERT REPAIRS

Insert repairs and renewals are being made by the larger companies with more or less success. It may be stated, however, that during the life of the spelter-bedded inserts most companies expect approximately 80 per cent of them to become loose. This means that this percentage of inserts must be reset or renewed. This repair work should be done by a gang especially familiar with insert renewals and replacements. In fact, this gang should do nothing other than inspect work for defects and make the repairs. With the smaller companies it is practically impossible to retain these experts, but most of the manufacturers now have men whom they can send out to do such work, or at least supervise the repairs and replacements.

An inspection for loose inserts can be made to best advantage immediately after a shower. At this time, if the insert is slightly loose a car passing over it will cause the water or air bubbles to be forced up between the edges of a loose insert and the body casting. Many companies make it a practice to allow inserts to become quite loose before they attempt to make repairs. This practice probably renders easier the making of the insert repairs but unquestionably results in the extension of the effects of the loose insert to the rest of the track structure.

LOOSE ARMS IN CASTING

As mentioned earlier in this article, the second most common form of failure is the loose arm in the cast-iron-bound work. Most manufacturers have been able to overcome this difficulty by exercising care in preparing the rolled-rail section to receive the casting. Generally speaking, the rolled-rail arms are very carefully cleaned of scale and rust, after which they are painted with a fluxing material. In addition, most manufacturers are providing lugs or bolts in the rolled-rail web to anchor it in the casting. The shape and size of these lugs vary with the different manufacturers. It is also usual to drill a number of holes in the rolled-rail-arm web so that the cast metal may bond through these holes. In the past it was customary to punch these holes, but it was found that the metal surrounding the hole was checked and this tended to impair its strength. These holes are now drilled so that the metal surrounding them is left in good condition.

While a few isolated cases of loose rails in the castings may be attributed to the manufacturer, many of them are due to non-uniform bearing on the track foundation. The casting surrounding the insert may be high and the point of bearing at the end of the rail arm low, or the reverse may be true. In either case the casting forms a fulcrum, and the rail breaks or is loosened at the weakest point. In cases where the rail is broken the fault probably lies with the railway company, while in cases where the rail loosens in the casting the fault is entirely that of the manufacturer.

Probably there are a few instances where broken rails in the casting were due to partial annealing in the rolled-rail arm caused by the molten metal surrounding it in the mold. Then, too, the difference in shrinkage in the rolled rail and cast iron may have set up internal strains in the rail web which aided in rupture. Rolled rail shrinks about ¼ in. in 1 ft. from the molten to the solidified state, and cast iron shrinks approximately ⅛ in. in 1 ft. Since the cast iron does not shrink as much as the rolled rail, it is possible that the keying action of the head and the base of the rail against the cast iron during the period of solidification may set up strains along the web.

When the arm becomes completely loose, it is usually because there is not sufficient rolled rail area in the cast iron to hold it, under ordinary service. On the other hand, there are cases where the cast metal appears to shrink away from the rolled-rail arm, indicating that a fluxing material has not been used or that some action has taken place in the contact surface to prevent perfect bonding.

In many instances it is believed that a perfect casting with a good grip on the rolled-rail arm has been subjected to unnecessary strains because of lax track maintenance. Unquestionably the severe impact blows dealt at intersecting flangeways of obtuse angle crossings ultimately pound down the foundation beneath them. As a result of this, the portion of the casting immediately beneath the intersecting flangeway becomes a suspended point, and either the casting must break or the arm must loosen or break in the casting. It appears that the only solution for this difficulty is the proper selection of timbers and spacing to support the special work. These timbers must be of sufficient area to transmit the impact load stresses to the track foundation so as to reduce settlement to a minimum. It is also necessary to give the spacing of these timbers consideration so that it will be possible to tamp the track securely at the time it is laid, as this will enable the maintenance gang to retamp it to take care of unequal settlement. Ties of special lengths provide more uniform bearing than ties of standard lengths, because the latter must be interlaced so closely that there is no space left for tamping.

It is possible to eliminate some loose rails by increasing the grip area between the casting and the rolled-rail arm. Most manufacturers, however, now have enlarged the casting to a point where further increases would be uneconomical. On the other hand, if the track and roadway departments expect to lay down track special work and forget it, there is no limit to the size to which these castings must be increased to provide for this dilatory maintenance. It is more economical and better practice to devote closer attention to track maintenance, since an increase in the size of the casting means greater first cost as well as added cost for installation.

BROKEN CASTINGS

A form of failure which appears to be common to interurban railways is the broken casting. In many instances where the modern types of iron-bound insert work are used, the failure of castings may be charged to the railway company, and is probably due to unequal bearing and improper track maintenance. On the other hand, there have been cases where this type of failure may be attributed to the use of castings which are too small, or the point of impact is suspended between ties instead of supported on them. Some interurban railway companies are now using 7-in. girder grooved rail or T-rail in track special work where they should be using a 9-in. rail. This deeper rail would permit the manufacturer to provide castings of sufficient cross-section to withstand reasonable transverse bending stresses.

Another important factor in the failure of iron-bound castings is the choice and spacing of ties. If standard ties are used under a special-work layout, usually it is necessary to interlace them under the frogs, thus making it practically impossible to tamp that portion of the track foundation. Consequently settling occurs, requiring the casting to stand tensile strains in its base far beyond those considered in its design. If, therefore, a reasonable amount of metal is used in the binder casting, allowing a 9-in. instead of a 7-in. rail depth for heavy interurban traffic, and if special ties are employed to provide sufficient spread of the track loads on the foundation as well as to permit proper tamping, and if these are followed by careful and prompt maintenance, breaking of castings will be reduced to a minimum. Moreover, at the present time, failures of this description are not common to all interurban track special work nor to any one manufacturer's design.

UNCOMMON DEFECTS

Other forms of failures occurring in insert special work, important but unusual, include broken arms and cupping in the rolled-rail arms at the point where they join the insert plate. A break in the arm outside of the binder casting is due to the choice of rails with too high a carbon content. Broken rails in the casting, are due either to internal stresses resulting from the difference in shrinkage in the cast iron and the rolled rail, or to the partial annealing of the rolled-rail arm when it is surrounded with the molten cast iron. In any event, uneven bearing on the ties is the primary cause of rupture. In other words, internal strains or the improper annealing seldom sufficiently reduce the strength of the section to a point where it will fail under traffic alone.

In many instances what appears to be a loose arm in the casting will, upon examination, prove to be a break in the arm. Usually this break begins at the base of the rail near the edge of the casting and follows the line of weakest web section, namely, through the holes bored in it for anchor bolts or designed to allow the metal to bond through them, finally reaching a point immediately beneath the ball of the rail at the edge of the insert pocket. Breaks of this character are, as a rule, due to uneven foundations rather than to any cause which could be charged to workmanship or material.

Cupping in the rolled-rail arm at the edge of the insert pocket, is due, in most instances, to the use of too sharp a run-off from the flange-bearing insert to the non-flange-bearing rolled-rail arm. This allows the wheel to drop as it passes from the insert to the rolled rail, hence cupping develops at this point as quickly as it does at joints. On the other hand, there are cases where this cupping is due to the partial annealing of the rolled-rail arm. Cases have also been observed in which the pounding action has been so severe that the ball of the rail has actually been mashed down over the web, but these are exceptions to the rule. If a gentle flangeway approach is provided or if the flangeway in the rolled-rail arm is built up to meet the floor of the flangeway in the insert plate, defects of this character will be eliminated.

It is the intention in a later article in this paper to illustrate and discuss some typical examples of special work failures, as considered in this article.

Circular of Safety Rules

The bureau of standards of the Department of Commerce has recently issued circular No. 49 on safety rules to be observed in the operation and maintenance of electrical equipment and lines. The circular is in three parts, as follows: Part I—Rules for the employer; *a*, organization; *b*, protective methods and devices. Part II—General rules for the employee; *c*, general precautions; *d*, general operation; *e*, handling live equipment and lines; *f*, killing supply equipment and lines; *g*, killing moving parts; *h*, making protective grounds. Part III—Special rules for employees; *i*, power-station operation; *j*, switchboard operation; *k*, overhead line operation; *l*, arc lamp operation; *m*, underground operation; *n*, meter operation; *o*, testing operation; *p*, signal line operation; *q*, tunnel and subway operation.

The circular covers its subject in a most comprehensive manner. S. W. Stratton is director of the bureau of standards.

The *Electric Railway & Tramway Journal* is now the name of the English publication formerly known as the *Light Railway & Tramway Journal*. The change in name is significant as indicating the change from light steam and horse-operated narrow-gage lines to standard gage electric operation.

Export Conditions and the War

Data Showing Trade Prospects of London House of J. G. White & Company and also Export Situation in Brazil—Steam Railroad Moves to Increase Commerce—Experiences of B. J. Arnold in Europe

LONDON TRADE CONDITIONS

J. G. WHITE SAYS THAT THE TRADE OF HIS LONDON HOUSE HAS IMPROVED OVER THE SITUATION EXISTING JUST AFTER THE WAR BEGAN.

J. G. White, president J. G. White & Company, Inc., of New York, and chairman of J. G. White & Company, Ltd., of London, has consented to give his views of the trade conditions resulting from the European war to the ELECTRIC RAILWAY JOURNAL. In answer to an inquiry from a representative of this paper Mr. White explained that the London house conducts all of the business of the organization in South America and the Orient and, in fact, in all parts of the world excepting North America, Cuba, Central America and the Philippines. The business in North America is conducted by the New York company. The London house was established in 1900 and is connected with the New York organization through the fact that Mr. White, the active head of the New York company, is the largest stockholder in the English company. The business of the London house has recently been mainly in South American enterprises of the kind that have been financed principally in England.

Mr. White said that general business conditions, as far as the London house was concerned, have improved over the situation just after the beginning of the war. Necessarily the operations of the London house have been curtailed to some extent. Work on some of the enterprises in which it was engaged has been deferred until after the close of the war, but on others steady progress is still being made. Mr. White said that Great Britain has largely restored normal facilities for overseas shipments and that advices have been received from the London house that English manufacturers are prepared to make prompt deliveries of all of their usual products. The London house is prepared, notwithstanding the continuation of war, to procure and ship promptly, subject to government exemptions and restrictions, any materials or supplies that can be secured in Great Britain or any of the countries with which that nation now trades.

Regarding American business, Mr. White stated that financial conditions preceding the declaration of war were unfavorable to the undertaking of new enterprises, and that these conditions have been tremendously emphasized by the war, with the result that very little new engineering or construction work is proceeding. At the moment the most active part of the J. G. White Engineering Corporation is understood to be its purchasing department. Recently important purchasing commissions have been received from Porto Rico, Cuba, the Philippines and other parts of the world. This department undertakes commissions to purchase in America any kind of machinery, materials or supplies for clients in the United States or, in fact, in any part of the world. It does not attempt to secure orders which otherwise might go to its allied London company or others in Great Britain, realizing that it is of primary importance for the best interests of the world that the industrial population there should be kept employed as far as is possible. On the other hand, the department takes orders from any part of the world for any purchases, whether emergency or usual, which existing world conditions make it advisable to procure in the United States.

BION J. ARNOLD IN THE WAR ZONE

MR. ARNOLD RETURNS AFTER HAVING WITNESSED THREE ARMY MOBILIZATIONS—SOME OF HIS OBSERVATIONS ARE GIVEN BELOW.

Bion J. Arnold, chairman Board of Supervising Engineers, Chicago Traction, accompanied by Mrs. Arnold, returned from Europe on the *Campania* on Saturday, Sept. 12, after having had the remarkable experience of witnessing the mobilization of the armies of three countries within as many weeks. While awaiting the attention of the customs officers on the Cunard line pier, Mr. and Mrs. Arnold gave to a representative of the ELECTRIC RAILWAY JOURNAL a graphic picture of recent conditions in France, Belgium and the British Isles.

Mr. Arnold went to Europe about the middle of July as a member of the Chicago railway terminal commission, which is organized under the authority of the City Council of Chicago for the purpose of studying the important questions relating to railroad terminals in that city and recommending general policies and plans for the future development of these terminals. This study includes also the subject of docks and harbors as, on account of the location of Chicago, shipping and railroad terminals problems are closely related. The commission included, beside Mr. Arnold, John F. Wallace, chairman, Walter L. Fisher, Edward H. Bennett, Lawrence E. McGann, John W. Beckwith and Ellis Geiger. The commission was accompanied on the trip by a party of fourteen associates representing various civic interests.

The purpose of the European trip was to secure data from the experience of other countries in the problems connected with water and railroad terminals, especially as regards the relations of transportation interests to local interests and plans. The original itinerary included Liverpool, Manchester, London, Paris, Frankfurt, Vienna, Dresden, Berlin, Hamburg, Kiel, Copenhagen and Stockholm, with the possible addition of Budapest and Leipzig. As a result of the declaration of war while the party was in Paris, it was decided to postpone visiting Germany and to go to Brussels and Antwerp instead. The war developed so rapidly that the party returned to England Aug. 2 and disbanded in London on Aug. 3. Most of the members promptly returned as best they could, and Chairman Wallace and Mrs. Wallace sailed on Aug. 15. Mr. Arnold stayed until Sept. 5 in order to continue his investigations and to extend them into the electric traction field. As the readers of the ELECTRIC RAILWAY JOURNAL will be interested particularly in Mr. Arnold's experiences and observations, attention will be directed to these rather than to the interrupted work of the commission.

Mr. Arnold's first intimation of the impending international difficulties was received at a gathering at the American embassy in Paris held in honor of the visiting commission. Here Ambassador Herrick, who has since acquitted himself so creditably, announced the receipt of a telegram stating that Austria had declared war on Servia, which he feared and felt meant a general European war. The effect on the party, which was attended by leading officials of the French government, was most depressing, and it soon broke up in gloom. The visitors realized at once that the mission could go no further, and the retreat began. The members of the Chicago party, however, resolved to make the most of the opportunity by visiting in neutral Belgium and proceeded to Brussels after having witnessed the preliminary movements of the mobilization of the French army. On the evening of the arrival of the party in Antwerp they witnessed the reading of the mobilization order for the Belgium army and later saw the soldiers start for the front. Before learning that Germany had declared war on Russia the party left for England just in the nick of time, for two days later Liége was besieged and the invasion of Belgium begun. They arrived in England the day before England declared war on Germany and in time to witness a third army mobilization which was continued throughout Scotland and Wales.

Being in close touch with officials high in authority in the different countries, Mr. and Mrs. Arnold secured an unusually accurate picture of conditions. They agree that the stagnation of business in the important cities is complete, the endeavors of merchants and manufacturers being directed to conserving their stocks and capital until times improve.

In England and Scotland Mr. Arnold enjoyed excellent opportunities for his investigations. In addition to the terminal question he especially studied motor buses, underground rapid transit facilities and electrolysis, all of which are important matters in connection with present Chicago conditions. He found that there is no general complaint of electrolytic corrosion, as the Board of Trade rules are quite generally complied with and seem to be effective under traction conditions in England. This matter is of particular interest to Mr. Arnold at present as he is chairman of the joint national committee on electrolysis. In fact, he called a meeting of the committee for last Monday in New York by cable before sailing. In addition to the cities already mentioned Mr. Arnold visited Glasgow, Edinburgh, Newcastle, Leeds and Manchester, as well as several points in Wales.

He was much interested in the plans used in replacing the car crews lost temporarily through the war. Service had been furnished without serious interruption. Travel is, of course, much lighter than normal on account of the business depression.

RAILROADS AND SOUTH AMERICAN TRADE

A pamphlet has just been issued by the Lehigh Valley Railroad with a view to presenting to American manufacturers information on the subject of trade possibilities in South America. In condensed form the bulletin gives for ready reference statistics showing the volume of business in each commodity and the division of that business between the United States and Europe. It is stated that the names of South American firms engaged in the importing business are on file at the company's office and will be furnished on application. The pamphlet discusses in general the available and prospective banking facilities in South America, the effect of the Panama Canal, trade conditions, rules for procedure in reaching buyers and other points concerning all the countries. In connection with each a brief explanation is offered of the currency, weights and measures and postal systems used. An appendix contains a digest of steamship facilities, postal regulations and latest estimated population of South American cities.

Another interesting feature adopted by the Lehigh Valley Railroad is its "South American Special," which is to stop at the principal cities on its line and acquaint manufacturers with the details of the South American market. In addition to detailed information regarding the kind of products, the tariffs of the various countries and items of a similar nature, it is understood that the train will carry financial and commercial experts, who will be able to give the manufacturers first-hand information. As planned, the "South American Special" will stop at Easton, Allentown, Bethlehem, Scranton, Wilkes-Barre, Elmira, Ithaca, Geneva, Auburn, Rochester and Buffalo. At each of the cities conferences will be held with the Chamber of Commerce relative to trade prospects.

The New York Central Lines and the American Express Company have also taken steps to help along the movement for the development of closer trade relations between the United States and South American countries. It is reported that the companies, acting jointly, have arranged to send to South America James Thane and A. B. Howard, as special representatives. Mr. Thane will represent both companies, while Mr. Howard will act as the representative of the financial department of the American Express Company. They will visit the chief commercial centers of Brazil, Argentina, Uruguay, Chile and Peru and obtain information as to the best and quickest means of transportation, the markets for American goods and the kind of goods desired.

COMMERCIAL CONDITIONS IN BRAZIL

According to Consul General J. G. Lay at Rio de Janeiro, the economic prosperity enjoyed in Brazil during the last four years has been temporarily checked. Since September, 1913, the country has been suffering from a financial, industrial and commercial crisis which has completely paralyzed the import trade. The federal government with reduced revenues has been obliged to defer payment for supplies and contract work amounting to $25,000,000. The business outlook is not encouraging, and unless money becomes available in Europe within the next few months there will be a heavy fall in exchange in Brazil.

About 75 per cent of the imports in Brazil comes from the United States, Great Britain, Germany, France and Argentina. The relative position of each country in percentage of total importations during 1912 and 1913 was as follows: United States, 1912, 15.6 per cent, 1913, 15.7 per cent; Great Britain, 1912, 25.2 per cent, 1913, 24.5 per cent; Germany, 1912, 17.2 per cent, 1913, 17.5 per cent; France, 1912, 9 per cent, 1913, 9.8 per cent; Argentina, 1912, 7.5 per cent, 1913, 7.4 per cent. The important electrical articles imported into Brazil during 1912 and 1913 and the principal countries of origin are shown by the accompanying table.

TABLE SHOWING ELECTRICAL ARTICLES IMPORTED TO BRAZIL AND PRINCIPAL COUNTRIES OF ORIGIN FOR 1912 AND 1913

	1912	1913
Cable:		
Total	$579,885	$822,870
United States	250,047	162,317
Great Britain	241,369	408,002
Germany	49,997	166,578
Insulators:		
Total	$204,388	$198,059
Germany	125,502	103,972
United States	55,044	63,718
Machinery:		
Total	$4,811,052	$3,347,249
United States	2,060,944	1,595,849
Germany	1,375,764	788,725
Great Britain	569,562	674,399
France	537,636	126,512
Electric motors:		
Total	....	$597,428
United States	....	214,614
Germany	....	168,095
Great Britain	....	94,365
Switzerland	....	57,986
Rails, fishplates and other railway accessories:		
Total	$9,384,650	$11,230,845
France	2,071,438	3,672,825
Belgium	3,318,764	2,786,429
Germany	1,344,151	2,019,087
United States	1,868,840	1,957,579
Great Britain	751,474	718,431
Wire, copper:		
Total	$1,293,638	$166,390
United States	851,550	33,935
Germany	285,042	84,064
Great Britain	65,115	25,082

American Association News

Section Activity Begins in Newark—The Meeting of the National Joint Committee on Electrolysis Is Held—College Men Are Planning to Get Together—The Manufacturers' Association Is Growing

PUBLIC SERVICE SECTION MEETING

The first meeting of the A. E. R. A. section of the Public Service Railway for the season was held at Newark on Sept. 17 with a very large attendance, including a considerable delegation from the Brooklyn Rapid Transit Company. A paper was presented by H. D. Briggs, assistant claim agent, on "Reducing Accidents." After calling attention to the large aggregate sum spent as a direct result of accidents by a company the size of the Public Service Railway, he emphasized the point by stating the annual cost of these accidents in terms of fares, interest on the company's capital, etc. He then pointed out that while there are certain necessary operating expenses which cannot be reduced much this is not true with regard to the accident account. Mr. Briggs urged persistence in safety campaigns, stating that, while many of these are effective, the interest dies out after a time and they lose their force.

One of the most interesting parts of his paper dealt with the standardization of parts of car equipment affecting public safety, such as steps, grab handles, doors, etc. He showed that many accidents are due to surprises to passengers in these lines. He also described the work of the Public Service Railway safety committee, which is composed of the general claim agent, the assistant general manager, the general superintendent, the mechanical engineer and the engineer of maintenance of way. Statistical reports of accidents and their causes have proved to be very useful to this committee.

Mr. Briggs was followed by W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, who described in detail the Brooklyn center-entrance car. Mr. Gove explained the conditions which led up to the design of this car and gave an outline of the organization of the advisory council through which the president of the company keeps in touch with the requirements of the several departments. This organization, the center-entrance car and the safety movement are all closely related. The objects in view in the design of the new car were reduction of weight, large seating capacity and maximum possible length. By pushing all of these factors to the limit it was found possible to design a car which reduced the weight per seated passenger by nearly 40 per cent. At the same time the accidents, especially boarding and alighting, have been materially reduced. The design of the present car, of which 101 were constructed, began with studies made in 1910 and incorporates the ideas collected by the engineer of car equipment during an extensive tour made in 1912. While the construction of the car is familiar to readers of the ELECTRIC RAILWAY JOURNAL it may be interesting to note that the steel frame, which is riveted together, was built by an outside contractor but the rest of the work was done in the company's shops. The large seating capacity is not only obtained by means of large size but every possible nook and corner is utilized for seats.

In the discussion of Mr. Briggs' paper representatives of different departments of the company contributed valuable suggestions. W. B. Graham, of the Essex division, explained the results which had been secured by enforcing rigid discipline, rear-end collisions having been largely eliminated. One of the main difficulties in operating a railway is the violation of minor rules, and such violations must be promptly reported if discipline is to be maintained.

E. A. Palmer, central division, stated that the cost of accidents goes much further than the direct payments to injured persons, for equipment must be repaired. The Public Service Railway treats its employees so well that the company should have the co-operation of every employee in keeping down accidents.

Howard McSherry, attorney of the claim department, pointed out how this safety movement is getting down to first principles. He made an interesting observation as to the variation in degrees of carelessness in different parts of the country, pointing out one or more where people seemed to be unusually oblivious to their own safety. He aroused some amusement by pointing out the effect of present styles of women's dress on the safety movement.

C. H. Coe, chief instructor, explained how the "following up" movement in the instruction of motormen tends to reduce accidents. It is difficult to put brains into men, but good discipline with careful following up will accomplish wonders.

After the papers and discussion, A. J. Van Brunt, of the claims department, exhibited several safety moving-picture films which have just been completed. One of these was released this week by the Edison company for exhibition throughout the country. The name of the Public Service Railway appears on the screen announcements between scenes so that the company will get a wide publicity in its safety movement. The new films are the result of co-operation between the film manufacturers and the company, by which more economical results are possible than by any other plan so far used. A series of scenes in "The Life of a Motorman" are of particular interest, combining romance, business and safety propaganda in a unique manner. After witnessing the considerable number of thrilling accidents staged on real track and with real cars and familiar scenes the Public Service Railway section has a new stimulus to reduce the number of accidents.

JOINT NATIONAL COMMITTEE ON ELECTROLYSIS

A meeting of the joint committee was held at the American Electric Railway Association offices on Sept. 14. The meeting was called by cable from England by Chairman Arnold for the purpose of learning early in the season of the progress which had been made by the sub-committees appointed last spring. The make-up of these committees was given in the issue of the ELECTRIC RAILWAY JOURNAL for April 4, page 763. The progress of the work of the committees was informally discussed and another meeting was appointed for Nov. 12. At this date it is expected that the general committee will elaborate its plans. Those in attendance at the meeting were B. J. Arnold, representing American Institute of Electrical Engineers, chairman; E. B. Rosa, national bureau of standards, secretary; W. J. Broder, Natural Gas Association of America; A. S. Richey, Calvert Townley, American Electric Railway Association; E. B. Katté, American Railway Engineering Association; Philip Torchio, L. L. Elden, National Electric Light Association; A. P. Boeri, E. Miller, American Telephone & Telegraph Company; A. F. Ganz, J. A. Gould, American Gas Institute.

CORNELL A. E. R. A. REUNION

Cornell University men who expect to attend the Atlantic City convention are requested to send their names at once to H. H. Norris, ELECTRIC RAILWAY JOURNAL, 239 West Thirty-ninth Street, New York. A reunion similar to that held last year is being planned. Last year there were fifty Cornell men on the Pier, and one-half of these were able to get together for lunch. There was some complaint from the younger men that the lunch was unnecessarily expensive and this year arrangements will be made for a much less costly lunch. If men of other colleges want to get together and will send their names to Mr. Norris he will be pleased to put the men of each institution in touch with each other. A considerable number of college teachers are expected and it will be a fine chance for a reunion.

COMMITTEE ON LIFE OF RAILWAY PHYSICAL PROPERTY

The joint committee on the life of railway physical property held a meeting at the association headquarters in New York on Sept. 12. The committee went over the draft of the report for the Atlantic City convention and completed the work. The following were present: Robert N. Wallis, Fitchburg, Mass., and Martin Schreiber, Newark, N. J., co-chairmen; Edwin Gruhl, New York; William H. Forse, Jr., Anderson, Ind., and Robert B. Rifenberick, Detroit, Mich.

MANUFACTURERS' ASSOCIATION

The following new members have been secured to the Manufacturers' Association: Seymour Portable Rail Grinder, Waltham, Mass.; Lutz-Webster Engineering Company, Philadelphia, Pa.; Wasson Engineering & Supply Company, Milwaukee, Wis.; Grayson Railway & Supply Company, St. Louis, Mo.; Electric Car Waste Company, Philadelphia, Pa.; Burdett-Rowntree Manufacturing Company, Chicago, Ill.; Harrison Safety Boiler Works, Philadelphia, Pa.; James L. Howard & Company, Hartford, Conn.; Hauck Manufacturing Company, Brooklyn, N. Y.; Sauvage-Ward Brake Company, Inc., New York, N. Y.; American Creosoting Company, New York, N. Y.

Committee on Trade Expansion

Secretary of Commerce Redfield on Sept. 15 named the following men to act with a committee of the National Foreign Trade Council in working out plans to expand trade with Latin America: William A. Gaston, Boston, banker; Harry A. Wheeler, Chicago, banker; Alba B. Johnson, president Baldwin Locomotive Works, Philadelphia; Robert Dollar, San Francisco; John Barrett, director general Pan-American Union; W. D. Simmons, St. Louis; Fairfax Harrison, president Southern Railway; Lewis W. Parker, Greenville, S. C.; W. B. Campbell, Cincinnati, and Dr. Clarence W. Owens, of the Southern Commercial Congress. The committee of the National Foreign Trade Council, of which James A. Farrell is chairman, has been at work for several weeks with the Latin-American Consular delegation in New York. The entire committee now will confer with the diplomatic corps from South America.

Some of the material and equipment installed in the power plant of the Forest City Railway, the old 3-cent line in Cleveland fathered by the late Tom L. Johnson, is being used by the Fort Wayne Engineering Company, Fort Wayne, Ind., in the buildings which it is constructing in Fort Wayne for the Fort Wayne Rolling Mills. After the settlement in Cleveland the plant of the Forest City Railway was sold.

Dr. Rosa on Electrolysis

Dr. E. B. Rosa, chief physicist of the bureau of standards, Department of Commerce, Washington, D. C., addressed the New England Waterworks Association upon electrolysis at its convention in Boston, Mass., on Sept. 10. For about four years the bureau has been studying this subject and the results of its researches have been published in its technological papers. In his paper, Dr. Rosa outlined the investigations already completed and pointed out the interest of the bureau in seeking to remedy local conditions in conjunction with electric railway companies, municipalities, water companies and other owners of underground metallic structures. A résumé of the address follows:

The effect of electrolysis upon reinforced concrete has been investigated by the bureau, the results being printed in Technological Paper No. 18, a document of 136 pages, which contains an extended study of the destruction of the bond between reinforcing bars and concrete by electrical action. Technological Paper No. 25 deals with the electrolytic corrosion of iron in soils. This form of corrosion and self-corrosion, due to chemical action of soils, are mutually interactive. The efficiency of corrosion varies greatly in different soils and in different cities, striking differences being noted in the bureau's researches in St. Louis and Philadelphia. Soil resistance varies greatly with temperature, and electrolytic action is so much less in cold weather that electrolytic surveys should preferably be made during the warm season. A range of from 400 to 1800 ohms per centimeter cube was found between St. Louis and Philadelphia soil resistances. A discussion of the methods of making electrolytic investigations will shortly be published as Technological Paper No. 26.

Dr. Rosa said that the surface insulation of pipes as a preventive of electrolysis appears to be ineffective where the voltage conditions are severe, as the coatings tend to become weak in spots and to intensify the corrosion through localization. The bureau has tested a great number of paints, dipping compounds and wrappings for pipe service, and has reached the conclusion that these are of little value in positive areas near power stations. The tendency of such materials is to absorb moisture, with resultant formation of rust spots, gassing and ultimate rupture. Coverings are helpful in protecting pipes from self-corrosion where the current is negligible. Technological Paper No. 15 discusses surface insulation. Bitumastic enamel has not yet been tested by the bureau, but soon will be given a trial. Insulating joints in pipes are useful in reducing current flow, but where the potential gradient is high the joints must be spaced fairly close together. This method is economical and mechanically practicable as an auxiliary means of protection, and is specially useful in gas piping.

Of the two principal methods of electrolysis mitigation, carrying the current back to the station by conductors, or the so-called "track drainage system," is preferable to permitting current to flow into pipes and cable sheathing and then tapping from these to the station negative bus. The second method is generally used, but the bureau considers it complex, expensive and not easily maintained. The use of negative cables is simpler, more effective and far less expensive than is generally supposed. The second, or "pipe drainage system," is one which greatly increases the flow of current in pipes and cable sheaths, and often requires the use of jumpers around the joints of gas pipes. It is difficult to adjust the drainage effect and electrolysis is liable to result. The economy secured in power consumption and the improvement gained in voltage regulation, with its effects on car speed and car lighting, will often yield a fair return on the cost of an insulated return system, in the opinion of the bureau. At St. Louis, Mo., the adoption of insulated return feeders in place of pipe drainage cut the flow of current in the pipes from 844 to 85 amp. The investigation is fully described in Technological Paper No. 32. At Springfield, Ohio, insulated pressure wires have been installed in addition to the insulated negative cables, and the American Railways Company has decided to standardize this practice on its properties as a result, in part at least, of the work of the bureau.

CO-OPERATION BETWEEN BUREAU, COMPANIES AND CITIES

Dr. Rosa set forth the desire of the bureau to be of the utmost scientific service in the solution of electrolysis problems and said that it enters such cases, not as an advocate of any interested party but in a thoroughly impartial manner. There is room for much broader co-operation between all parties interested. At Los Angeles an engineer of the bureau investigated the electrolysis situation and secured the consent of the various parties to an unbiased investigation. Two electric railways and the water supply interests joined in the study instead of going to court as originally planned, and a comprehensive solution was developed. Dr. Rosa emphasized the importance of making adequate investigation before passing ordinances bearing on the electrolysis situation. In one instance it was found that by the installation of a moderate amount of negative copper, by the building of one new substation and the enlargement of another, the power distribution on the system was greatly improved and the territory safeguarded effectively against electrolytic troubles. Uniform requirements in this field established by law are undesirable, but a general law fixing responsibility is thoroughly defensible. The records of the bureau in these investigations are available to interested parties even before publication. At first the expense of the investigations was mainly borne by the bureau's appropriation from Congress, but as the work has expanded and the need of a campaign of education has become apparent, the larger portion of the cost has lately been borne by the water and railway companies. It is better to employ engineers to solve local electrolysis problem than to spend the money upon lawyers and experts retained to fix the responsibility for conditions without a constructive plan for their alleviation or rehabilitation.

DISCUSSION

Answering inquiries, Dr. Rosa said that a soil containing chemicals or the installation of pipes in cinder beds may result in self-corrosion as harmful as any that can be caused by electrolysis. Soluble salts and water are the principal factors in reducing soil resistance. The bureau favors the grounding of transformer secondaries as a safeguard to users of electric light and power in case of lightning trouble or a cross between the high and low tension windings. No danger from electrolysis should be apprehended in the practice of grounding secondaries. The bureau is most desirous of securing actual measurements of ground resistance, not only on transformer pipe and plate grounds, but also on lightning conductors. A direct current which frequently reverses is less effective in producing electrolysis than a continuous current. Concrete surrounding a pipe in earth will not protect it from electrolytic corrosion, but will protect it reasonably well against self-corrosion. A considerable current and comparatively high potential difference are required to produce electrolytic action where metal is imbedded in concrete. The elevated railways in New York no longer use the steel structure as a negative return.

COMMUNICATION

Municipal Ownership and Congress

THE BUREAU OF PUBLIC SERVICE ECONOMICS
NEW YORK, Sept. 11, 1914.

To the Editors:

Municipal ownership has again assumed national importance by the reporting to Congress of the bill for government purchase and operation of the street railways in Washington. The pending congressional election affords an opportunity to public utility representatives throughout the country to state their case fully and frankly to the men who will constitute the next Congress. It is a duty which the public utilities owe to themselves as well as to their associates, to take advantage of this opportunity. When they are seeking votes, candidates for Congress usually are glad to listen to their constituents. The public utilities in each congressional district from Maine to California and from Texas to Minnesota should arrange to present to the candidates of both parties, in definite and concise form, the facts about municipal ownership in general, the Washington situation and the bearing of the latter on local conditions. If the facts regarding municipal ownership were known by the representatives of the public the numbers of its adherents would wane. Now is a good time to get a hearing from the members of the next Congress. Public utilities should make the most of the opportunity. WILLIAM D. KERR, Director.

Valuation of Kansas City Light Company

In a case before the Public Service Commission of Missouri an interesting report was recently presented by P. J. Kealy, special representative in charge of appraisal, for the valuation of the Kansas City Electric Light Company and subsidiaries as of Feb. 1, 1914. The report is based upon an investigation of the cost of reproducing all the physical property actually in use on Feb. 1, 1914, and its depreciated value; of the investment and plant account, the gross and net return thereon; actual investment in superseded property and credits to plant account because of supersession, and of the complete history of the corporate, financial and physical development of the companies. Two bases of valuation were used: the cost of reproduction and the actual investment and net earnings thereon. In determining the first, the report places the cost to reproduce the physical property at $7,265,272, the cost of attaching business at $1,056,738, and the plant development expenses at $525,913, or a total of $8,847,922.

In determining the investment in the property the appraisers ascertained the actual investment year by year and added to or deducted therefrom the sum representing the surplus above or deficit below a fixed return made on this investment by the net returns from operations after payment of all ordinary expenses, including taxes, renewals and depreciation. The cost new of existing property was determined as $7,471,130 and the accrued loss thereon $1,851,491, or a total of $9,322,621. The return used in computing the above was 8 per cent. Taking into consideration the two valuations stated, the appraisers determined the fair market value of the Kansas City Electric Light Company and its subsidiaries as $9,000,000, exclusive of franchise value. It is stated that the franchise of the company is of great value, but necessarily conjectural, because the future rates to be paid have not been fixed and the value cannot be correctly estimated as in the case where an electric railway franchise authorizes the collection of a fixed fare.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Centers—Fastenings, Renewability, Shape and Groove

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

In Brooklyn we have in use eight babbitted fastenings. Fig. 1 shows the horizontal key applied to a 90-deg. crossing. This fastening is very effective when applied to the Harveyized steel center, as then it does not have to overcome the effect of cold rolling. When manganese is used the condition under which the force of the keys is directed down and inward tends to bow the center, pulling the ends away from and loosening up the keys.

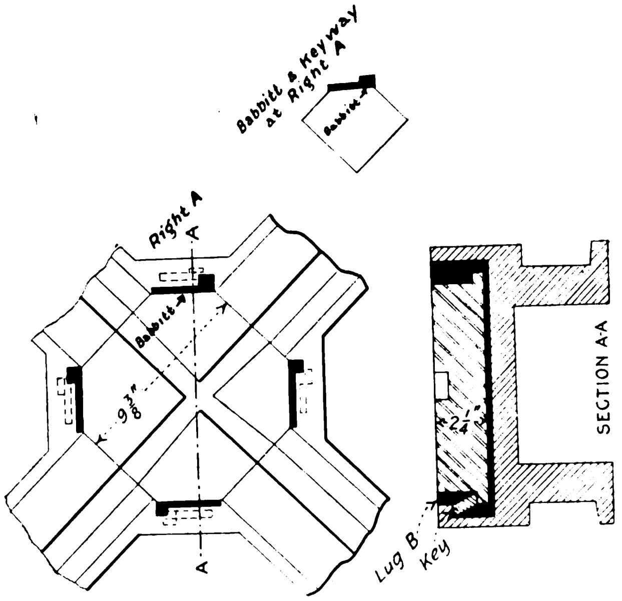


FIG. 1—HORIZONTAL KEY APPLIED TO A 90-DEG. BABBITTED CROSSING

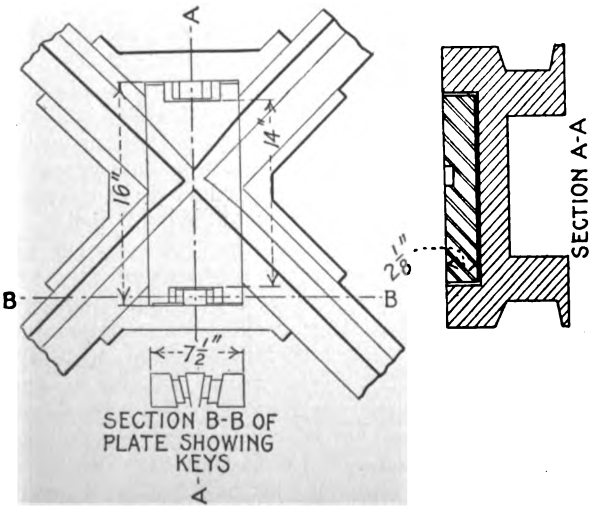


FIG. 3—VERTICAL KEY IN A 90-DEG. CROSSING

Fig. 2 shows the same style of key employed with the long narrow center in 90-deg. crossings. This is the fastening used in the crossing previously mentioned by the writer to illustrate the difference between hard and soft centers under traffic, and proves again that this fastening is not good for hard and soft steel. The other objections to this style of fastening are, first, the danger of breaking the retaining lug *B*, as shown in the sectional view of Fig. 1, and, second the great amount of babbitt chipping required to remove the center when it is used in branch-off frogs. The center is reversed in the latter case, the longer sides being used to key and generally having four keys to a side. Fig. 3 shows the vertical key. The remarks on Fig. 2 also apply to this center, except that it is easier to remove in branch-off frogs because of less chipping.

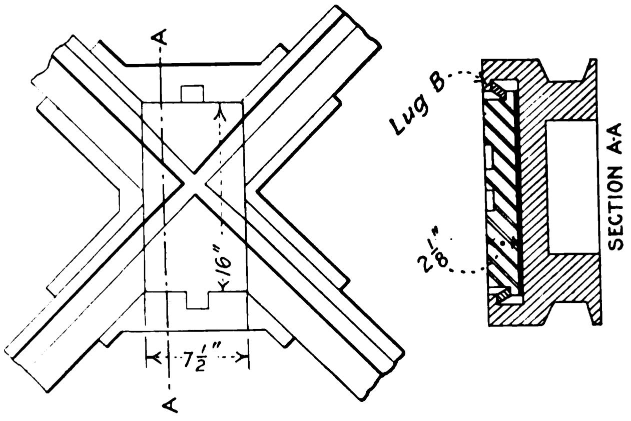
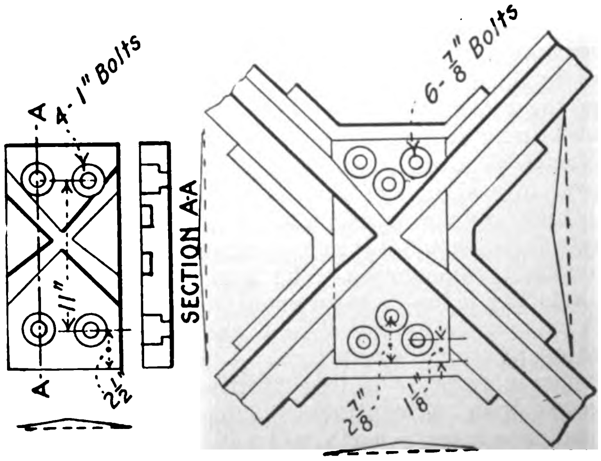


FIG. 2—HORIZONTAL KEY APPLIED TO LONG, NARROW CENTER OF 90-DEG. CROSSING

Turning now to the bolted fastenings and referring to the diagram at the bottom and side of Fig. 4, we will note particularly the action of cold rolling, as shown in full lines. Although all-manganese, the construction shown in Fig. 4 seldom loosens, while the fastenings of Fig. 5 rarely remain tight. The loosening action in Fig. 5 always begins with the two center bolts, which fact proves the necessity of equal downward pressure to resist cold rolling. For nearly three years we have been replacing the bolts of Fig. 5, in case of break, with open-



FIGS. 4 AND 5—TYPES OF BOLTED FASTENINGS

hearth steel. None of the new bolts have loosened up. In renewals of both of these types and in 25 per cent of the repairs the pavement must be removed.

Fig. 6 shows a type of center with bolts in compression. This type of fastening is effective in branch-off frogs or long centers, but great difficulty is experienced in 90-deg. crossings as they loosen very easily under the effect of cold rolling.

Fig. 7 shows the pendant lug. This is the most effective fastening now on the market to resist cold rolling, since, from its nature, it must become tight as the metal flows on the wearing surface. Its only fault is the difficulty, if not impossibility, of renewing the center without removing the piece. Fig. 8 shows a bolted center (patent applied for) which we are giving a thorough test, especially in 90-deg. crossings. The aim in this case has been to develop a center from which all of the objectionable features previously mentioned have been removed and all the good qualities retained. Time and car wheels will show if we have attained this end. So far the results are very good.

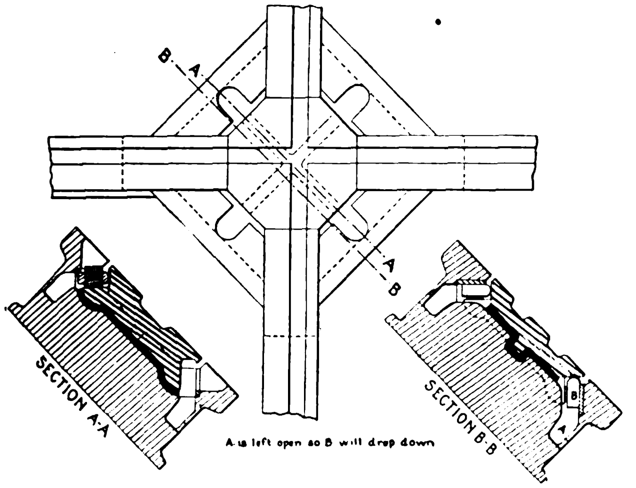


FIG. 6.—TYPE OF CENTER WITH BOLTS IN COMPRESSION

As to renewability: If you are the manufacturer of special work and can offer the consumer, under guarantee, "a center which will stay tight until it has reached a condition where repairs are made necessary, by a reasonable amount of traffic, at which time it may be removed without disturbing pavement, in a quick, safe and economical manner," you may safely count on receiving the order, for the only guarantee of getting the full value out of special work is to keep the intersections in serviceable condition. This can be done only by having the renewable features in the center. In case of noise complaint what is to be done where the renewable feature is not used? Grind the centers? If this is done the center, instead of increasing the life of the special work will diminish it. The late test of manganese in Chicago would have shown different results had a renewable center been used because a larger percentage of good inserts of manganese can be made than of large castings. Unless the intersection in manganese can be maintained the loss is proportionately greater than the same failures in ordinary insert work.

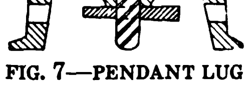


FIG. 7—PENDANT LUG

The material used in the center and the manner of fastening must be considered in determining its shape. Where steel, in which cold rolling takes place, is used, the fastening must be such as to give an equal downward pressure. This end cannot be attained in the long, narrow center so much used in 90-deg. crossings. As a result, instead of securing any benefit from the miter effect at the connecting edges of the insert and the abutting rail, the opposite is the case because when cold rolling raises the insert in the middle or loosens it, an unequal wear is set up between the hard and soft metals. The results are the breaking out of the rail ends which abut the hard center and the destruction of the crossing.

Groove width and depth have received too little attention from the user and the maker. No rigid rules can be laid down as to depth, but the tapers in floor levels and approaches could be uniform. In 90-deg. crossings, for instance, if ⅝-in. is given for floor level, the only portion of the groove floor left at that level should be the square of the narrowest part of the groove. The taper should end so as to deliver the wheel to the center, not to the abutting rail, while the portion remaining could be ground to the practical depth required in the field. The width of groove in all centers should be as small in the narrowest or crossing portion as the wheel flange will permit without binding or lifting the wheels.

It may be added that we are now trying treated centers and bolts of the "Mayari" type in three installations, one branch-off and two crossings.

If this matter of detail were drawn as fine as possible the results would more than justify the necessity for extra care.

The Return Circuit—Bonding Precautions

BY HOWARD H. GEORGE, ASSISTANT ENGINEER MAINTENANCE OF WAY, PUBLIC SERVICE RAILWAY, NEWARK, N. J.

Many faulty bond installations have been made, and the value of the bond as a conductor has been greatly impaired, due either to ignorance or to lack of attention to details on the part of the bonder. To reduce this trouble the following code of instructions, issued on one railway to aid those in charge of rail bonding, may prove of value to others.

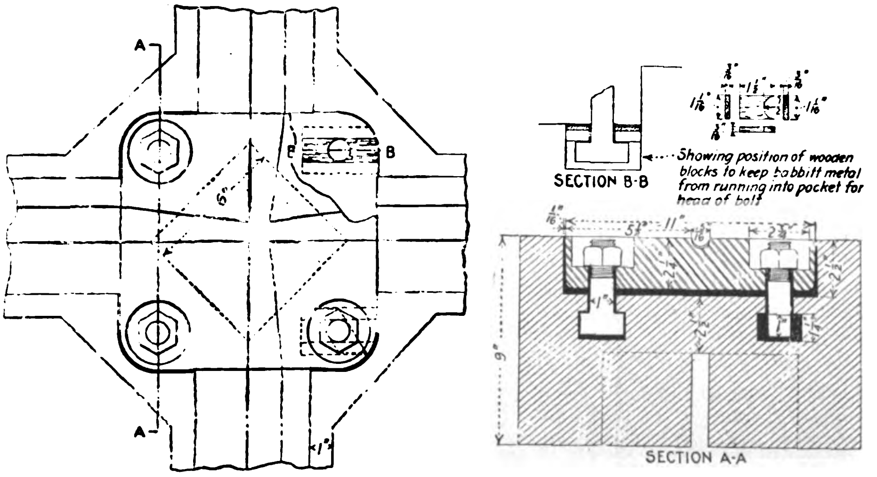

A
A
B
B
6"
1"
SECTION B-B
Showing position of wooden blocks to keep babbitt metal from running into pocket for head of bolt
11"
9"
1"
1"
SECTION A-A

FIG. 8—NEW FORM OF BOLTED CENTER NOW ON TRIAL

1. Every roadmaster and foreman should see that one or more men in each gang are taught the proper way of installing bonds, and should be sure that any bonding done thereafter is performed by these men.

2. When renewing rail or joint plates on single track in operation, care should be taken not to open or disconnect both rails at the same time, as this would open the return circuit by which the current returns from the cars to the power house. When it is absolutely

necessary to open both rails, a long copper jumper should be installed to connect the open ends so that the path of the return circuit shall not be interrupted. This applies more particularly to road ends and interurban lines.

3. Whenever any track is opened up and any ground wires for electric lights, lightning arrestors, or other electrical apparatus which should be connected to the rail, are found disconnected, they should be reported at once to the bond inspector or distribution department, so that they may be repaired before the track is closed up. This is very important and should receive careful attention.

4. No bond holes should be drilled until just before the bonds are ready to be put in. There are, of course, times when it is desirous to have the holes drilled before the rail is placed on the ties. When this occurs, it is necessary to place a tight-fitting plug in the hole as soon as it is drilled to avoid any possible introduction of moisture. To drill a hole a day or two before and not protect it from moisture means a film of rust in the hole, which will greatly increase the resistance of the joint. (An accompanying cut shows the machine used by the Public Service Railway for drilling bond holes.)

5. Old bonds should never be used again because they become battered up in driving them out. Then, when they are put in again they will not make good contact with the rail, which means a poor bond. Where a bond is removed from the rail it is not advisable to use the same hole in putting in a new bond, unless some precautionary methods are used. The proper way is to drill a new hole, but as this is not allowable in some types of rails ream out the old hole and use a bond with a special large-sized terminal.

RETURN CIRCUITS—MACHINE USED FOR DRILLING BOND HOLES

6. Great care should be taken with the drills used in making bond holes. If an improperly ground drill is used the hole will be irregular and oval shaped, thus giving a poor contact between the terminal and the rail. All dull and broken drills should be carefully boxed, labeled and sent to the shop to be reground, where the company has installed a special machine for the purpose to do the work perfectly and at much less expense than could possibly be done by hand.

7. In drilling bond holes never use oil to lubricate the drills. It is better not to use anything, but where it is absolutely necessary to use a lubricant, nothing more than a soda solution should be employed.

8. Holes, after being drilled, should be carefully cleaned of any chips, and wiped dry of any solution that may have been used to lubricate the drills. The holes must have a smooth and dry surface so that the bond terminal will make a good contact all around.

9. With a proper-sized hole, the bond terminal will make a very snug fit, not small enough to have to be driven with a heavy maul nor large enough to be put in easily with the hands. It should require a couple of taps with a hammer weighing about 3 lb. With a heavy hammer or spike maul, the head of the bond terminal is very liable to be battered, and the taper punch struck on the slant, causing it to split and bend the terminal.

10. After the bond terminals are in position, always drive the long steel taper punch entirely through the terminal, taking care to strike the punch squarely on the head. The small end of this punch should be dipped in some kind of heavy grease, such as track grease, just before it is driven through each terminal. The grease will lubricate the sides of the punch, thereby expanding the terminals and not drawing the copper with the punch.

11. Drive into each of the expanded terminals one of the short drift pins, thus expanding the copper a little more. This pin should be driven in until it is just flush with the head of the bond terminal.

12. The bond should then be shaped by straightening out the bond conductors, and forming them so that they will not be cut by either the track bolts or the splice bars. If it is a 36-in. bond, it should be so shaped that it will in no way interfere with the removal of the splice bars.

13. The bond, and particularly the bond terminals on both sides of the rail, are to be painted with some good weatherproof paint, care being taken to see that the paint fills the space back of the terminal heads.

Overhead Problems—Catenary Construction—III

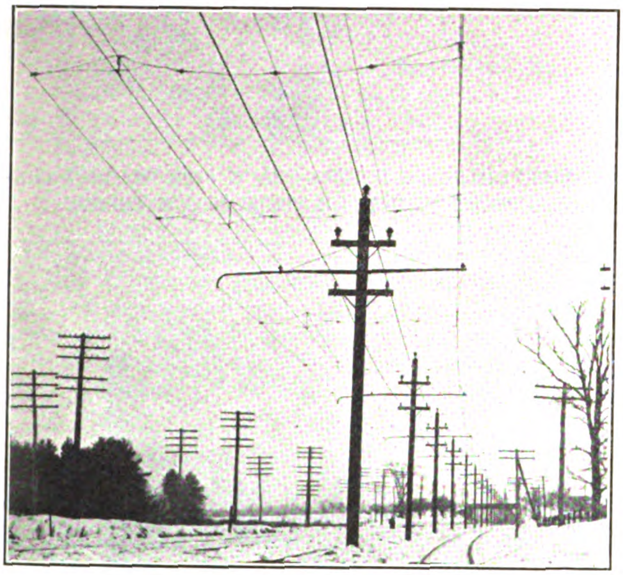
BY CHARLES RUFUS HARTE, CONSTRUCTION ENGINEER CONNECTICUT COMPANY

The different viewpoints of American and foreign engineers are again seen in the treatment of contact wire alignment; abroad the line is zigzagged from side to side, usually about 1 ft. each way, to distribute the wear over the top of the shoe; here, the line is almost always centered, as it is found that the natural side sway of the pantograph is ample to give all necessary side travel. Indeed even with center location it is essential that track and overhead departments maintain close co-operation lest a change in superelevation without a corresponding line shift results in the shoe being thrown entirely clear of the contact wire because of unavoidable side play.

The fear of fouling has been more in the hearts of our own designers than abroad. At turnouts the diverging wire is by all lifted above the level of that of the main line, but for pantograph operation early American catenaries used a gridiron of wires to fill in the space between to a point where the end of the shoe could by no chance go over the branch wire. Later designs follow the foreign practice of merely raising the branch wire, which, however, is rigidly held to that elevation throughout the fouling space by special double hangers.

Curve dressing is complicated, particularly on flexible, simple catenary. To prevent tipping there must be two attachments; if made to the hanger rod the friction on the messenger absorbs much of the flexibility; if one attachment is made to the hanger rod or contact wire and the other to the messenger the pull-together effect of paired strands is equally undesirable. The best solution is the use of a spreader which keeps the two parts parallel for at least 6 ft. or 8 ft. from the catenary, beyond which they come together in a common pull-off. On rigid hanger lines this is unnecessary and the strands are attached to the messenger and to the bottom of the hanger rod or to an attachment to the contact wire which, for pantograph work, is sufficiently offset to prevent fouling. Sharp curves with several pulls per span employ either a bridle between supports to which the pulls are run radially, or else the pulls are run to the supports in fans; light curves either use the bridle or fan methods, or on heavy construction use a special pull-off pole. On light work flat curves offer so little side pull that the weight of the strands and insulator causes heavy sag; in one instance this was partly obviated by using a light single strand, which a short distance from the catenary was divided into two groups or three wires each, the seventh being served on to prevent further unlaying. One group of three wires was then taken to the messenger, the other to the trolley while the insulator was cut in at the bridle. It is, however, always desirable to have the like portion of pulls and the like as short as possible.

Foreign lines and a few American employ the rigid. steady brace attached to the main support, and rarely to a pole specially set for it. The elimination of special pull-off poles is secured, and the disadvantage of the line loading by the steady brace is obviated by extending the bracket to form a hook to which a pull-off strand is attached. In case the pole is on the outside of the curve the attachment is made directly to it.

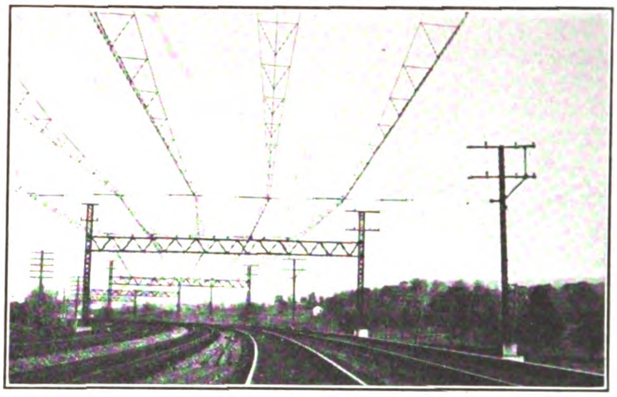


Note bent end bracket for pull-over.

CATENARY CONSTRUCTION—BRACKET SUPPORT, SARATOGA-BALLSTON SPA LINE, SHOWING DOUBLE-TRACK CENTER-POLE CONSTRUCTION

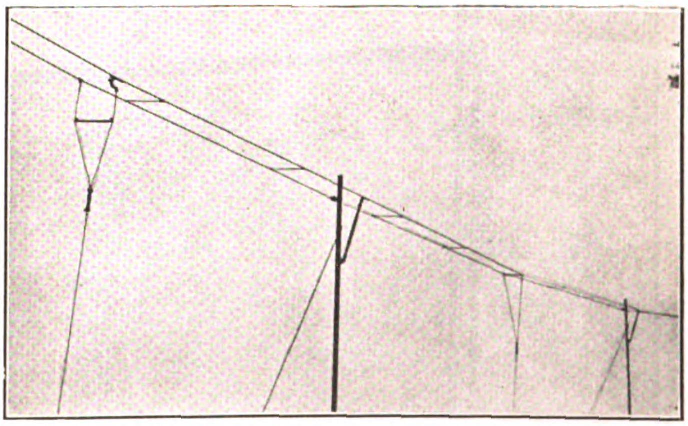
The use of cross-bents on the Harlem Branch electrification of the New Haven permitted the use of a bridle tied to these bents, pulling them partly to the desired offset from the chord of the messenger, a further shift of the insulators on the cross-bents bringing the contact wire over the track center. The most admirable device, however, is the Murray curve hanger, the head of which firmly grips the messenger holding the shank at an angle of approximately 45 deg. from the vertical while the lower end is a duplex clip, which is vertical. The lengths are such that the clips are true to line, making the chords but 10 ft., while the inclined shank permits the contact wire to yield to the pressure of the shoe against the torsion of the messenger and the pull of the contact wire. In connection with shortened support spacing to keep the hanger lengths within reasonable limits this scheme, employed on the recent New Haven work and to be used on the Pennsylvania, gives an almost perfectly true alignment.

Figures of cost, particularly of the heavier installations, do not abound. W. J. Wilgus has stated "on good authority" that the first New Haven electrification cost in excess of $50,000 per four-track mile. Whatever the cost, it could be duplicated at materially less, as much of the material had to be specially developed; for example, W. S. Murray mentions (*Transactions American Institute of Electrical Engineers*, Vol. XXX, page 1424) that strain insulators originally cost $61 each against $7 two or three years later for a device much better both mechanically and electrically. Figures for the latest work on this road have not been made public, but it is a safe guess that there has been a reduction of at least 30 per cent in the cost, and probably nearer 50 per cent. The entirely different labor and material conditions abroad demand extensive corrections to make the costs of foreign installations comparable to American work. The Siemens-Schuckert installation on the Seebach-Wettingen experimental line, with wood-pole support, is said to have cost $4,000 per single-track mile; the Hamburg-Altona, with steel bridges, is credited with $5,400 for the same unit; while the Rotterdam-Hague-Scheveningen, with steel bridges and messengers broken at each span, is reported as costing $5,900.



Compare this result with that shown in the view of the Murray curve hangers in preceding article

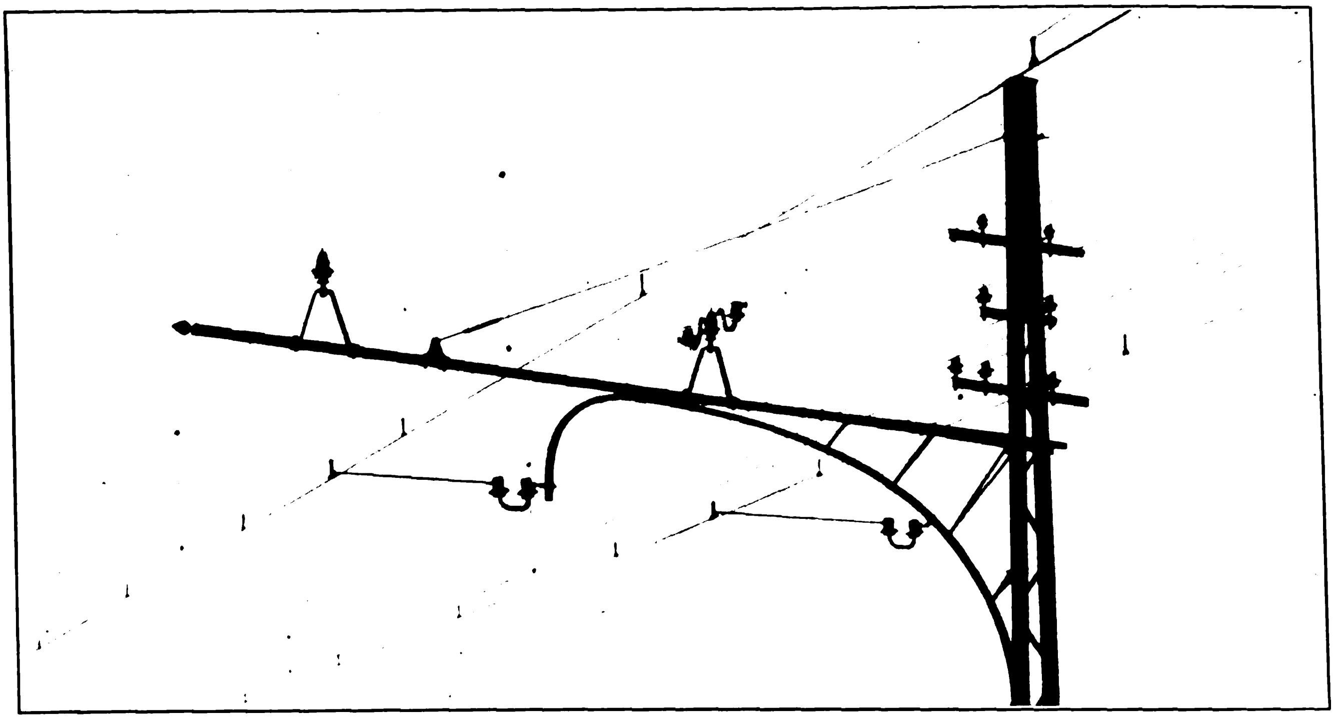
CATENARY CONSTRUCTION—CURVE DRESSING, SHOWING PULL-OVER ON THE PIONEER NEW HAVEN INSTALLATION



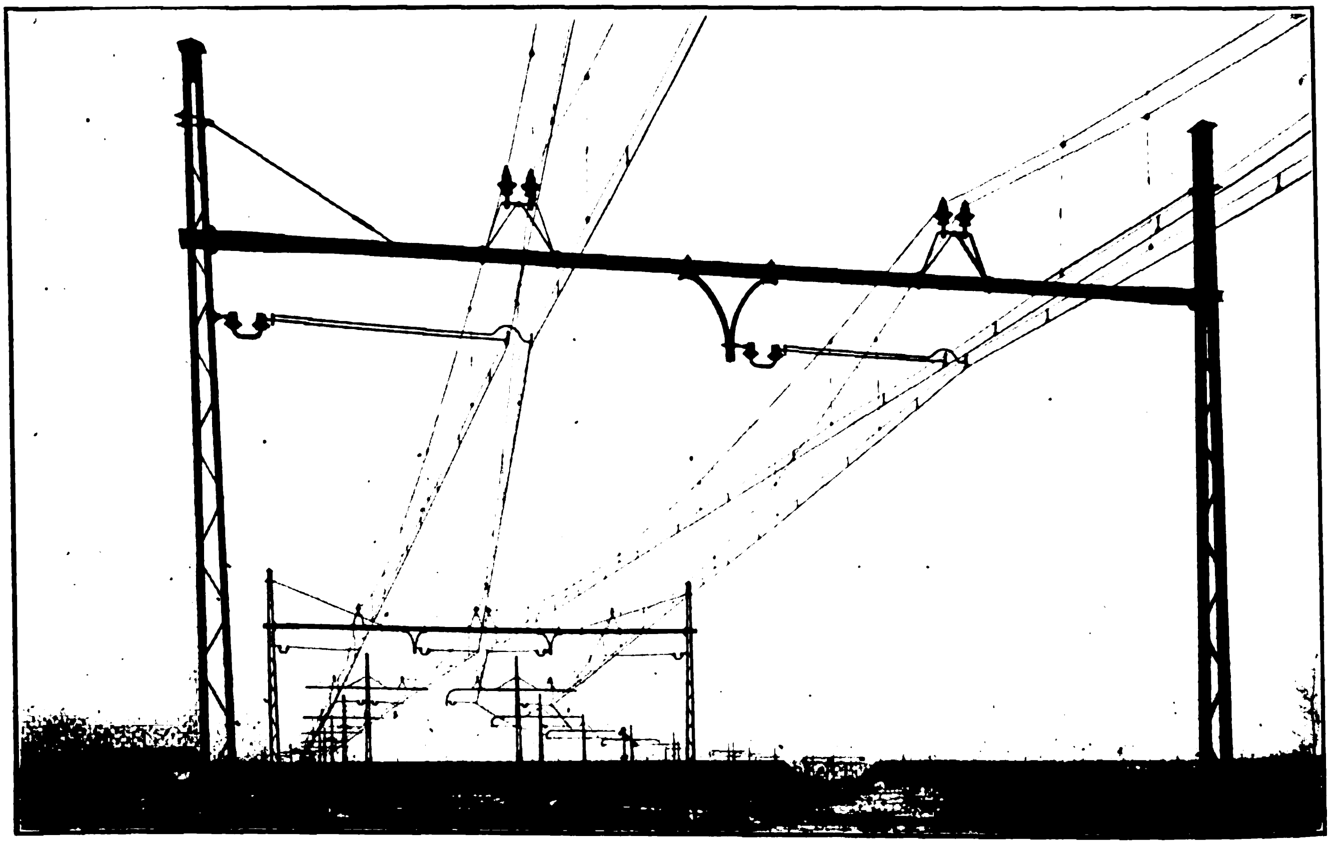
CATENARY CONSTRUCTION—FORM OF CURVE DRESSING, SHOWING PULL-OVER WITH SPREADER TO PREVENT PINCHING

Of the lighter types the Archbold-Brady construction on the Syracuse, Lake Shore & Northern cost $4,100 per double-track mile as against $3,325 for the standard wood-pole simple suspension, on which latter, however, the poles were on unusually short spacings.

On the Rochester, Syracuse & Eastern the 500,000 circ.-mil copper feeder cables were made to do duty as messengers as well, reducing the cost to $3,425, or but $100 more per double-track mile than for the customary forms of wooden pole construction.



CATENARY CONSTRUCTION—BRACKET SUPPORT BLANKANESE-HAMBURG-OHLSDORF DOUBLE-TRACK SIDE BRACKET CONSTRUCTION. NOTE THAT ONE MESSENGER IS CUT AT EACH SUPPORT WHILE THE OTHER IS CONTINUOUS



CATENARY CONSTRUCTION—LIGHT BRIDGE ROTTERDAM-HAGUE LINE, SHOWING STEADY BRACES IN FOREGROUND, AND CURVED END BRACKETS FOR PULLING TO LINE IN BACKGROUND

In considering the costs of installations it is of the utmost importance that all the facts be known. Differences in labor and material costs have very appreciable influence upon the final figures, but more than anything else are the conditions under which the work was done; the electrification of a line carrying traffic will take from two to four times as long, with corresponding higher cost, than if operation has not begun.

While experience has cleared up many until recently doubtful points there remain as yet unanswered two of particular importance in the case of heavy installations:

"What will occur when a serious track wreck involves the overhead?" That the troubles once feared from stray current are largely imaginary has been at least partially proved by wrecks on both third-rail and overhead systems; whether if on the latter one or more bridges are wrecked the catenary will constitute an added mechanical hazard is not yet clear, but the little evidence available indicates the probability that with one bridge partially wrecked the overhead will not seriously foul the unaffected tracks, and that such fouling as occurs can be readily cleared, while the probability of serious injury to move more than one bridge now seems quite remote.

The other question is: "What will be the effect of corrosion and other elements of depreciation?" While an authoritative answer as yet cannot be made as to the physical facts, it can be said that the roads that can finance a heavy electrification can and will give the installation such care in maintenance as to insure perfect safety of operation.

New Haven Construction Notes—Installing Hangers or Clipping-In

BY A FORMER INSPECTOR

The installation of hangers, called "clipping-in" by the erecting forces of the New York, New Haven & Hartford Railroad, was carried out on the main line with a work train composed of tower cars and tool cars. The trolley wires were hung to the ⅝-in. steel messenger with temporary hangers so that the wires would be in their approximate position and so that the ⅝-in. steel messenger would have its approximate load when raised.

The raising was accomplished by "Crosbying" to the ⅞-in. steel catenary cable a strap which had an eye for the attachment of a number of turnbuckles in series. These turnbuckles were either opened or closed all the way according to whether the ⅝-in. steel messenger was to be let out or taken in. A section of the construction train was sent ahead for this purpose so that the men on the clipping-in section lost very little time. The advance section was also provided with a dynamometer to pull the trolley wire to the proper tension. The hangers and intermediate clips were installed from the top of the tower cars which extended from one I-beam bent to the next. The hanger spacing was 10 ft. and the bent spacing 150 ft., plus or minus.

Fifteen men were employed on the tower cars from which the hangers and intermediate clips were installed, while two men were used to distribute the hangers. The inspector or foreman who measured the spacing for the hangers used a tape which extended from bent to bent, the hanger location being marked by him on the ⅝-in. steel messenger. The clips which joined the steel trolley or contact wire to the copper conductor were installed half way between the hangers. It may be added that the hangers came in standard sets and each was numbered according to the position where it was to be placed. One of the views shows one of the small tower cars in use for the installation of section insulators.

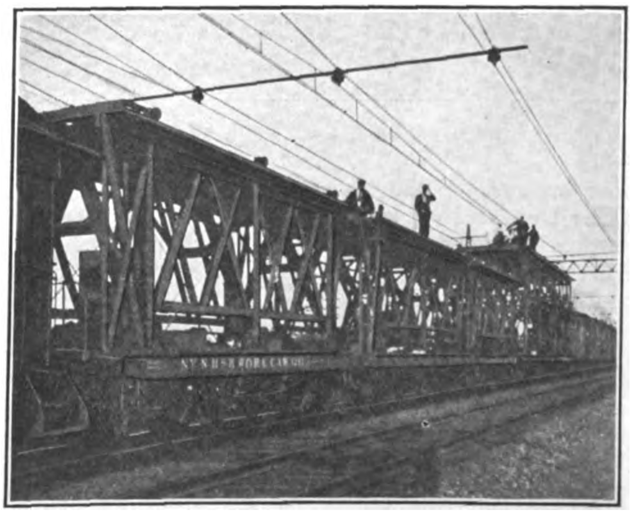
SMALL TOWER CAR FOR SECTION INSULATORS

TOP OF TOWER CAR WITH MEN CUTTING-IN TROLLEY SLEEVES

All of the work hereinbefore described was carried out under E. R. Gorman general foreman of the construction forces. Mr. Gorman had one of the best body of linemen with whom the writer was ever associated.

Reverser Handle Used as Key to Hand-Throw Signal Boxes

The Rhode Island Company, Providence, R. I., has developed a device which prevents the public from tampering with the hand-thrown signals used on its single-track city lines and which also forces the motorman to use his reverser to operate the signal, so that power cannot be applied when he is off the car. To make this possible, the company replaced the old knife switches in the signal boxes with snap switches. The ordinary rubber buttons were removed from these switches and a round piece of metal having a square hole in one end was substituted therefor. The switch is so mounted that the square hole is a fraction of an inch above an opening in the bottom of the box. Through this hole the motorman can insert his reverser, the end of which has been squared for use as a key. A twist of the wrist will throw the switch and operate the lights. While the motormen had always been ordered to remove the reverse handle on leaving the car, the new way is even more efficient as it makes unauthorized manipulation of both car and signal impossible.



CLIPPING-IN TRAIN WITH ONE TOWER CAR UP WITH TEMPORARILY-CLIPPED LINE AND COMPLETED LINE

Fifty Quadruple Traction Equipments for Providence Railways

Recently the Rhode Island Company, Providence, R. I., contracted with the General Electric Company for 200 type GE-200 motors, or fifty quadruple motor equipments, air-brake equipments and accessories to be installed on new, double-track cars which will be built for that company. The selection of this type of equipment was determined after a series of long-continued service tests of motors suitable for the operating conditions, made on the Broad Street line by the railway company.

The type GE-200 railway motor belongs to the line of newly designed standard motors of the General Electric Company. Under the A. I. E. E. standard, this motor has an hourly rating of 40 hp at 600 volts and 33 hp at 500 volts, but has a much greater service capacity than other designs of motors with the same hourly rating both for city and interurban service on account of its positive system of self-ventilation. The motors to be installed on these cars will be GE-200, Form E, of the box-frame type. They will be fully ventilated, are provided with commutating poles, and will be fitted with sixty-six-tooth, solid carbon steel gears and fifteen-tooth pinions.

The controllers to be installed on the cars will be double end type K-35-S-2, which are of the standard platform type manufactured by the company. Straight air-brake equipments will be employed with type CP-27 compressors. This compressor has a piston displacement of 15 cu. ft. of free air per minute when operating at 600 volts against a reservoir pressure of 90 lb. per square inch.

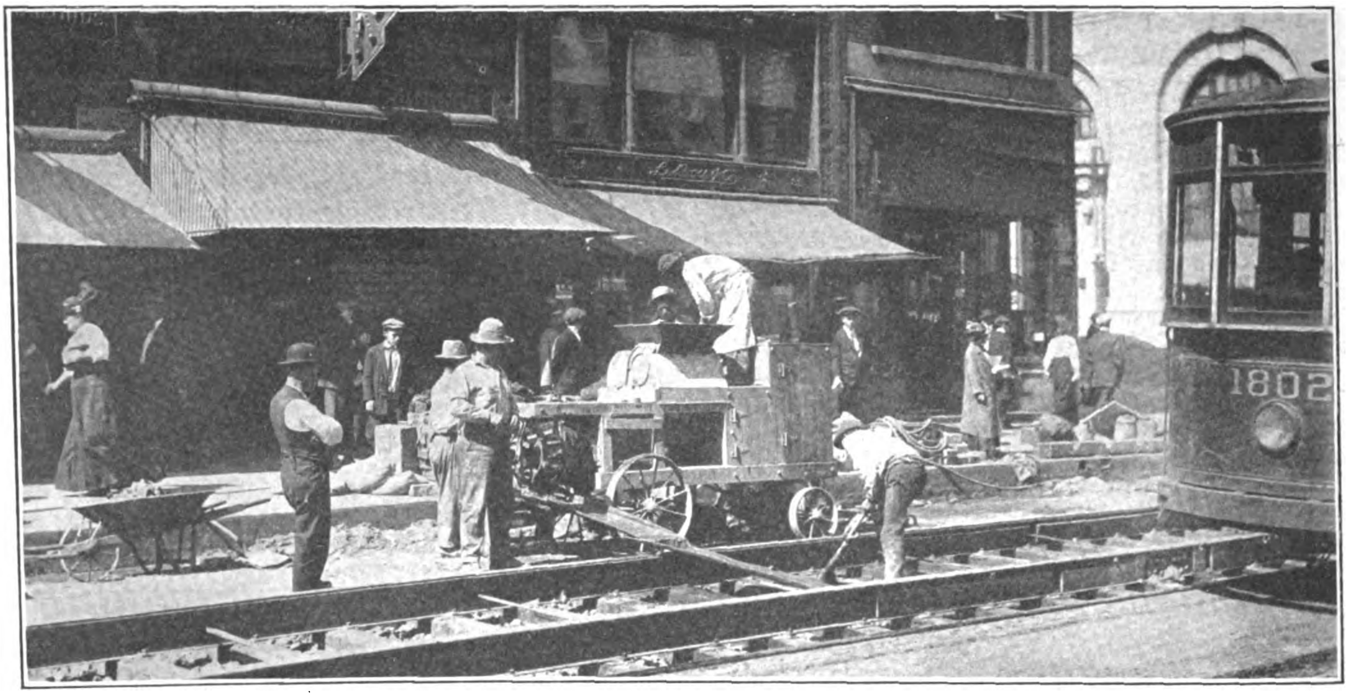
The service conditions on the Providence street railways will be indicated by characteristic runs taken on two lines, calculated on a basis of actual operation. On one line a representative average run may be taken at 8.6 m.p.h. with 8.2 effective stops per mile. The average duration of the stops is nine seconds and the average load for this run is thirty-six passengers. On another line a representative average run may be taken at 9.8 m.p.h. with 5.5 effective stops per mile. The average duration of the stops is ten seconds and the average load for this trip is thirty passengers. Completely equipped the new cars will weigh approximately 41,700 lb. They will run on 33-in. wheels and have a total seating capacity for forty-four passengers.

Raising Track under Two-Minute Headway

During the present summer the United Railways & Electric Company, Baltimore, Md., found it necessary to raise an existing track 7 in. along one of the principal trunk lines. Traffic conditions would not permit detouring cars, or even operating over a single line. Consequently the roadway department was forced to elevate the tracks, and at the same time not interrupt a two-minute headway street railway service over it. To accomplish this quickly and at the same time prepare a permanent foundation for the track, the pavement surface was removed and the track elevated to its permanent surface on crushed stone ballast.

After the track had been thoroughly tamped in position, all of which work was done between cars; the voids in the stone were filled with grout. At first the grout mixing and placing was done by hand, which required twenty-one men. Later this method was supplanted by a gasoline-driven, continuous concrete mixer of the Coltrin No. 9 type, which permitted a reduction of the gang to eight men.

Even during the grouting it was necessary to maintain car service over the track. In order to make the operation of the mixer continuous, a two-section, swivel spout was adopted. The grout in the two-section spout was deposited between the rails until a car approached, whereupon the outer section was removed and the inner section, or that connected to the mixer, deposited the grout in the space between the outer rail and the ties.

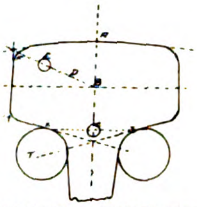


BALTIMORE TRACK ELEVATED TO PERMANENT SURFACE, AND CONCRETE MIXER IN OPERATION

In response to a query by a subscriber about London car construction, W. A. Agnew, mechanical engineer London (England) Electric Railway, advises that the "Sanit" composition flooring described on page 198 of the Aug. 1 issue of the ELECTRIC RAILWAY JOURNAL is secured to the 3/16-in. flat steel plate in some cases by cup washers riveted at intervals on the surface, and in other cases by strips of thin steel riveted to the floor and bent so as to anchor the material securely, thus ⊔ .

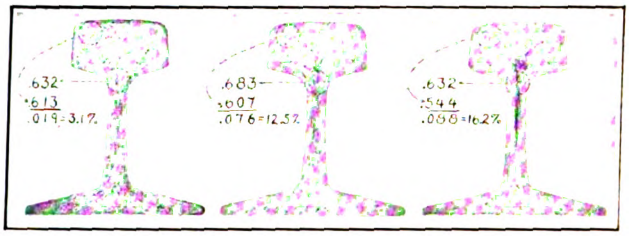
Comparative Tests of Treated and Untreated Rails

The fact that so large a company as the Brooklyn Rapid Transit Company has specified titanium for its 1914 rail work is another evidence of the popularity of the treatment originated by the Titanium Alloy Manufacturing Company, Niagara Falls, N. Y. A great many tests of these rails have been made in the past but that hereinafter described is of special interest, particularly as the total discard at the shear and hot saw from each of the twenty-four ingots tested was only 9 per cent of the steel made, whereas a discard of 30 per cent was recently necessitated by two mills in order to meet a heavy demand by a large Eastern railroad for steel, which embodied specifications set by the railroad.

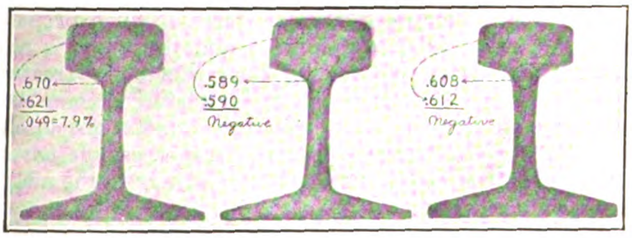


METHOD USED TO LOCATE DRILL HOLES

In view of a statement recently made by Mr. Wickhorst, the rail expert of the American Railway Association, that 50 per cent of the rail failures are due to segregation, these tests are noteworthy in showing the small variation of carbon in titanium-treated as compared with standard rails. Reproduced herewith are six out of twenty-four sulphur prints of standard and treated rail cross-sections taken from tests in which three of each kind of rails were tested at a Canadian mill and nine at a mill in the United States. The samples in each case were taken from consecutive heats of "A" rails, the sections from which they were made having been cut just below the discard of 9 per cent in each case. The dotted circles on the prints show the locations of the carbon analyses, of which the results are shown by arrows leading from the circles. The difference between the two results from each rail is given and also the percentage by which the carbon content of the lower circle exceeds that of the upper circle.



DIFFERENCES IN CARBON ANALYSES OF OPEN-HEARTH UNTREATED RAILS



DIFFERENCES IN CARBON ANALYSES IN TITANIUM-TREATED RAILS

Figures on each print show:

1. Analysis for carbon at top of web. (Exact location of ⅝ in. drill hole shown on each print.)
2. Analysis for carbon near top of head.
3. Difference between carbon analysis at each of these points.
4. Percentage such difference bears to carbon analysis for the point near top of head.

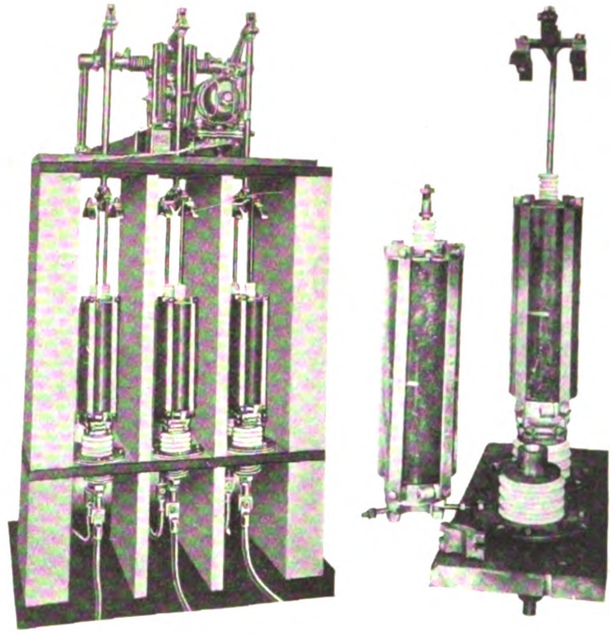
The general results from these tests show the following significant comparative data:

Standard open hearth "A" rails—Maximum variation of carbon in any one rail sample, 25.8 per cent; average variation of carbon for samples from twelve heats, 12.6 per cent.

Titanium treated open hearth "A" rails—Maximum variation of carbon in any one rail sample, 7.9 per cent; average variation of carbon for samples from twelve heats, 2.2 per cent.

Improved High-Capacity Motor-Operated Oil Switches

Recently the motor-operated type of oil switches manufactured by the General Electric Company has undergone some structural changes to make the circuit rupturing parts more accessible for inspection, adjustment or repair. The cap on the oil vessel, as well as the lower oil vessel clamp, has also been changed to allow bolting metal straps between the cap and clamp, as shown in the illustration. These straps have added great strength to the means for securing the cap in position, a valuable feature when the switch is called upon to open heavy overloads or short circuits.



15,000-VOLT 1200-AMP TRIPLE-POLE SINGLE-THROW OIL SWITCH; ALSO REMOVABLE OIL POTS AND CONTACT RODS OF SWITCH

For readily inspecting contacts and oil vessels, switches up to and including 3500 volts embody easily removable features. These are shown in the illustration of a single pole of the switch, with one of the oil vessels and movable secondary and fixed contacts removed. Any such unit can usually be removed and replaced in a short time. The operation of the renewal is as follows: Open the switch, remove the unit at the top of the contact rod, loosen the clamping nut on the cross-head and push the contact rod down into the oil vessel; then loosen one swing-bolt nut on the oil vessel lower clamp and remove the unit, consisting of the oil vessel and the fixed and secondary movable contacts.

Busbar Support with Mechanically-Cushioned Clamps

The General Devices & Fittings Company, Chicago, Ill., announces the introduction of a new line of busbar supports and porcelain fittings as hereinafter described. In developing the design special high-frequency equipment was used to determine where the porcelain should be reinforced at the voltage point and also where it should be weakened at the ground point. Further, many tests of the use of cement with porcelain led this company to adopt mechanically-cushioned clamps for its entire line because the dielectric change in porcelain due to the use of cement was considered to be a factor that causes the ageing and fatigue of porcelain carrying conductors with large currents.

This company's pyramid type porcelain bus supports are designed with small thin corrugations beginning at the voltage point and tapering wider and deeper to the ground point, primarily to reduce the electrostatic field. In view of the dependence placed on porcelain it is notable that this product is offered with a safety factor of four and a half to twelve, depending upon the service voltage impressed on the porcelain part, thus insuring low maintenance and greater security from interruptions. It is stated that busbar equipments in certain plants have shown that they are subject to a magnetic pull as high as 455 lb. per lineal foot of bus. It is therefore plain that proper bus supports should be specified to take care of these situations, since this magnetic pull would be increased tremendously through a short-circuit, inductive troubles, etc.

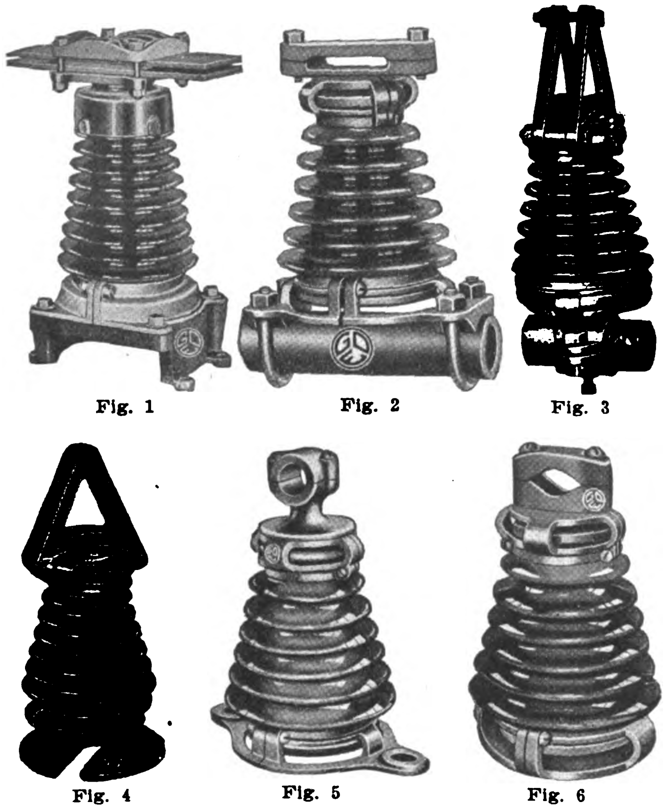


Fig. 1 Fig. 2 Fig. 3

Fig. 4 Fig. 5 Fig. 6

TYPES OF BUSBAR SUPPORTS

Referring to the accompanying cuts: Fig. 1 shows a busbar support for 22,000 volts with a guaranteed test, all assembled, of 112,000 volts. This support has a ceramic factor of 1.29, which is said to be more than 60 per cent greater than any other support on the market. An original feature is that the support is set on an insert designed to be molded into the concrete floor of the compartments. All hardware, excepting the insert itself, is made of hard bronze. This busbar support will hold a strain exceeding 1200 lb. per square inch. The cut shows two laminations of ¼-in. busbars with one filler. These supports are designed to hold any size or capacity of busbars.

Fig. 2 shows a standard busbar support equipped for holding flat buses on the horizontal and for mounting on pipe framing, this support having two U-bolts. Fig. 3 shows a busbar support for supporting buses in vertical position and for mounting on pipe framing. This pipe frame support has a set screw in the lower clamp to prevent the support from turning on the pipe and is used where supports like Fig. 2 are too wide for close work.

Fig. 4 shows a busbar support for mounting medium-sized busbar equipments in a vertical position with a flat base and center bolt clamping arrangement. It can be slipped over a bolt which has been imbedded in the concrete structure and turned in any position. Fig. 5 shows a busbar support carrying a round bus of any description. It is shown with a skeleton type base for mounting on flat surface. Fig. 6 shows a busbar support for holding large insulated cables or bare cables as the case may be, and is shown with a compartment type base. This inclosed base is hollow in the bottom and drops over a stud, which may be cemented in the compartment floor, and is widely used where height is limited.

All of the foregoing supports can be furnished with any of the bottoms or any of the tops, to suit conditions. The Fig. 1 support can be furnished either as a double support, three-way or four-way support and may be arranged to carry buses on vertical, horizontal or special tubular buses, and all supports can be adjusted to any angle simply by unloosening clamps.

A Gas Process for Cleaning Boilers

An entirely original method for the effective and total removal of scale from boilers is said to be embodied in the Pyro-Perolin process of the Perolin Company, New York and Chicago. The scale-removing system is described as consisting of an apparatus which generates and combines various gases in such proportions that when they are ignited and the flame is applied to the scale, which has been previously treated with "Perolin," the combination completely decomposes and disintegrates the scale, leaving the metal absolutely bare and free from scale even in all inaccessible parts. The combustion causes no danger of injury to the metal or tubes themselves.

After the boilers are cleaned, a liquid protective, heat-conducting film is applied to fill the pores of the metal and establish a smooth surface over the entire boiler to which scale-forming sediments cannot adhere so long as this film is maintained. This film is maintained and the boilers kept in this clean condition by a small daily feed of "Perolin" German boiler metal treatment, insuring full efficiency from the boilers at all times.

The boilers are cleaned and maintained at a definite cost per annum under a contract which includes the following provisions:

To clean any type or size of boiler within one to four days, according to the size and condition of the boiler.

To do no damage to the metal of the boiler or to its setting or attachments, subject to the inspection and approval of the boiler insurance companies.

To keep the boiler free from scale indefinitely, as long as the boiler metal treatment is used as directed. If the treatment does not do this, the company will reclean the boiler during the life of the agreement.

To protect the boiler metal against pitting, corrosion and galvanic action, regardless of the kind of water used.

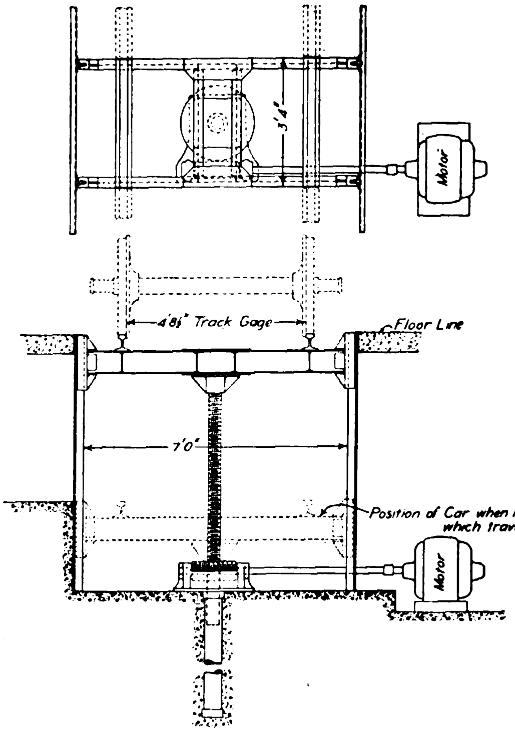
To correct troubles caused by the entrance of oil and grease into the boiler.

Motor Driven Car Hoist and Wheel-Changing Device

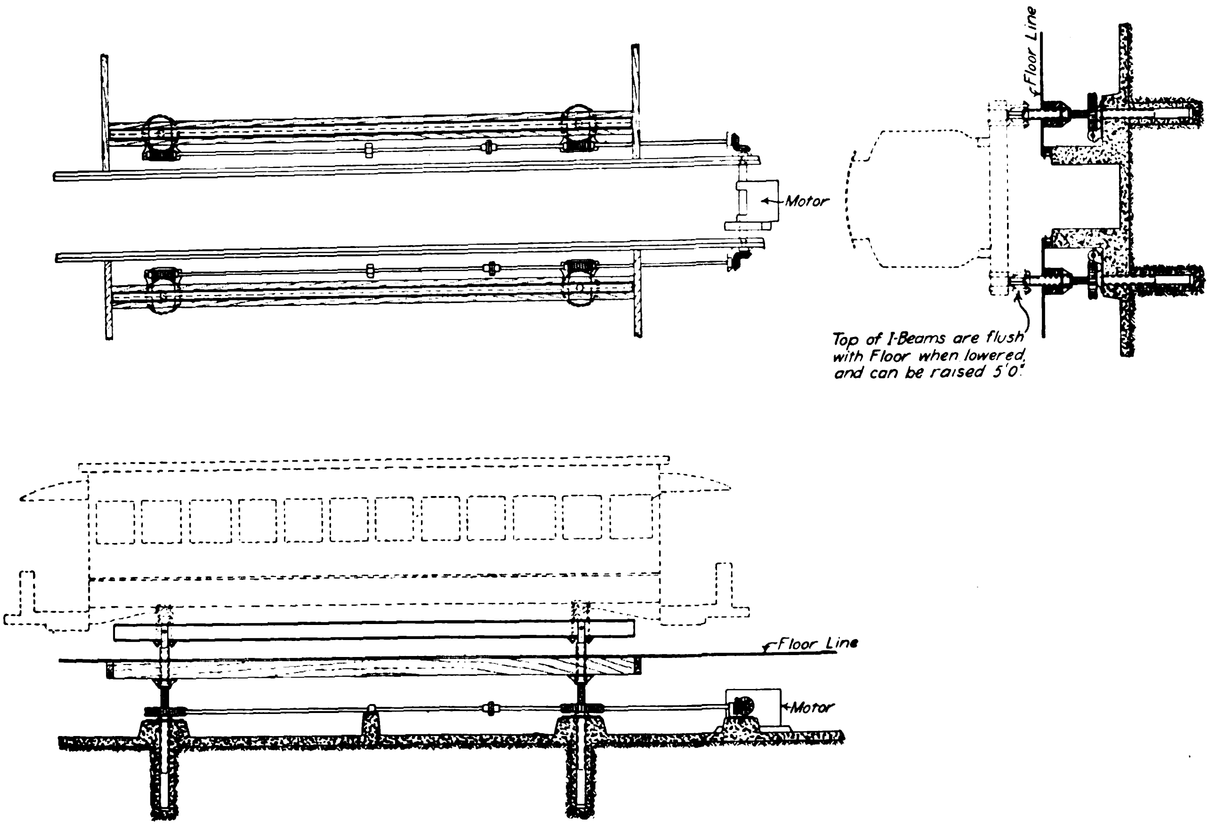
The motor-driven screw hoist of the Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., has been installed in a large number of electric railway shops, but its construction details have hitherto not been described. As the company, however, has recently patented some new features, the accompanying drawing and particulars should prove of interest. The car hoist is usually built for a longitudinal spacing of 24 ft. between the hoisting members, but it has been constructed for a spacing of 36 ft. and, in fact, can be made to handle city and interurban cars of any length. The standard form of drive is through the bevel-gear and worm transmission illustrated, and any old-time traction motor is of ample capacity for the work. Ordinarily a car may be raised at the rate of 1 ft. per minute. The worm wheel shafting is inside or outside as the user prefers.

One recent improvement is the support of each vertical screw by a bushing to give the screws a good bearing and prevent swaying as they go upward. Another change is the attachment of straps to the 12-in. I-beams above the lifting screws in order to support the wooden cross-beams on which the car body is raised and also for the purpose of adding strength to the I-beams.

The new patented car-wheel changing device shown in the other drawing is fitted with the same type of worm and screw lift as the car hoist except that one instead of four screws are required. The platform consists of two cross and four longitudinal 8-in. I-beams with top and bottom stiffening plates. The platform will readily carry 2000 lb., a weight far in excess of electric railway wheel sets. Long guides are provided at the sides to prevent tilting when a car is run on or off the wheel-changing track. The standard form of drive is by means of any small motor, but in a recent order this device was made for hand operation through chain and sprocket drive. The latter method, however, requires about five minutes in a case where the motor will do the work in one-half the time. The user can readily install automatic cutouts if he fears that a careless workman would permit a motor-driven screw to overrun in either direction.



MOTOR-DRIVEN WHEEL-CHANGING DEVICE


Motor
Floor Line
Top of I-Beams are flush with Floor when lowered and can be raised 5'0"
Floor Line
Motor

PLAN AND ELEVATIONS OF MOTOR-DRIVEN SCREW HOIST

News of Electric Railways

TOLEDO INJUNCTION GRANTED

Judge Killits Scores Previous City Administration, Holds Three-Cent Fare Confiscatory and Says Use of Police to Enforce Three-Cent Fare Would Have Been Misuse of Power—Political Trickery Charged

On Sept. 12 Federal Judge Killits at Toledo, Ohio, held that the Schreiber ordinance prescribing a 3-cent fare for the Toledo Railways & Light Company is unreasonable, unfair and confiscatory; that the ordinance should be declared invalid; that free riding, which began on March 27, should cease at noon on Sept. 15; that the company can remove cars from lines on which franchises have expired without interference from the city, and that the company can store its cars where it pleases. He issued an order temporarily restraining the city from enforcing the ordinance. The restraining injunction reads as follows:

"It is accordingly ordered by the court that the city of Toledo, its officials, agents, employees and all other parties and persons whomsoever, to whom notice hereof is or may be given, and each of them, are hereby enjoined and restrained, until the further order of this court, from asserting, enforcing or attempting to assert or enforce, the rates of fare, or any of the terms and provisions of a certain ordinance, passed by the Council of Toledo on Nov. 24, 1913, as set forth in paragraph eleven of the amended cross bill filed herein by the defendant, the Toledo Railways & Light Company, by which ordinance it was provided that the Toledo Railways & Light Company should not charge to exceed the sum of 3 cents for each passenger; and the said person and parties, and each of them, are hereby further enjoined and restrained, until the further order of the court, herein from interfering and attempting to interfere with the withdrawal by the defendant, the Toledo Railways & Light Company, should it attempt to do so, of its cars from the streets of the city of Toledo upon which its franchises have expired, and the storing of said cars by defendant, the Toledo Railways & Light Company, in such place as it may deem best. It is ordered that the foregoing injunction and restraining order shall go into effect at 12 o'clock noon on Sept. 15, 1914."

Judge Killits reviewed the previous hearing and called attention to a number of defects in the ordinance. He also criticised the former city administration for passing the ordinance. The decision rendered by him reads in full as follows:

"The first motions in this case for temporary injunctions to restrain the operations of the so-called Schreiber ordinance were denied because then the city was neither attempting to enforce it nor by its terms allowed to enforce it except through an order of a competent court before which the complainants could charge and prove, if possible, that it was confiscatory and consequently invalid. The consequence of this opportunity to the complainants to resist an order of enforcement left this court powerless to apply the extraordinary remedy of injunction. The court then had jurisdiction of the main case, to which the motions were plainly ancillary.

"It is unnecessary to cover again in full the discussion then had of the relative rights of the company on the streets without franchise, and the city. It is sufficient here to say only that the company might run its cars from day to day, until forbidden by the city, at such rate as it was able to collect, and that it had the right to charge a rate that would pay its operating expenses and leave a surplus equal to a fair return upon its real investment, and further, at any time the company might discontinue service, take its cars off the streets altogether, and remove its tracks. The city, on the other hand, might either forbid the company absolutely the use of the streets, or, permitting the use, impose therefor reasonable regulations respecting service and rates of fare.

"The ordinance in question never having been accepted by the company, the initiative for enforcing it was upon the city, and that fact was recognized by its author in the provision directing the city solicitor to go into court for an order on the company to observe it. It is not an ordinance which the city can enforce through its police power.

"Conditions have changed radically, however, since last March. During the intervening months the city's executive, neglecting the direct and only proper method of enforcement which the ordinance itself provided, but which involved a decision of the contention loudly urged by the company that it was oppressive and unreasonable, attempted indirectly its enforcement through an encouragement of reliance upon its terms by individuals.

"The uncontradicted evidence in this hearing shows that, taking the indefensible position that the measure was self-enforcing, the officers of the city assumed an attitude of sustaining private judgment, even to the extent of suggesting that the power of the city would be employed to assist any individual who attempted to enforce his opinion of his rights under it. This was a wholly indefensible position. To have placed a policeman at the call of any individual, to enforce his judgment that he should ride at 3 cents, would have been as flagrant an abuse of power as to have given the same individual police aid to enforce any other private right which he assumed to have without any other adjudication than his own consideration.

"By the ordinance itself, the company was given the right to question its obligations thereunder in a duly constituted general forum for the adjudication of responsibilities, and was not obliged to submit to the view of any person who chose to board its cars. The effect of the city's attitude, however, was practically an enforcement, and the company was faced with the alternatives of submitting without a test or of suffering innumerable annoyances and suits in the nature of damages, and, in all probability, violence. It is to deal with precisely these situations that courts of equity are open to suitors of any class, and this corporation, as is the case with any individual person, is under the protection of the guaranties of the federal constitution.

"We hold, therefore, that the court may now, as we could not before, inquire into the charge that the ordinance is confiscatory in its effect, and, if we find the facts clearly sustaining the charge, we may apply the extraordinary remedy of injunction.

"This ordinance, as in the case of any other legislation, is favored by every presumption. It is presumed that the public agencies concerned in its production acted intelligently, honestly and providently, and that its terms are reasonable and fair. The fact that a piece of legislation enjoys these presumptions does not, however, make it invulnerable. It may still be attacked in any of these particulars, the presumptions having the effect only of testimony of validity, wherefore clear evidence against it may be adduced to overcome them and to set it aside. The court also, while bound to indulge these presumptions, may look to the surroundings for a measure of their strength.

"The law of Ohio provides rules to secure deliberation in the passage of ordinances of this kind. Three readings on three different dates are required to precede the adoption of such a measure, unless some emergency or other proper reason impels a suspension of the rules by a three-fourths vote of the Council.

"This measure, not intended to go into effect for four months and not for three months after the incoming of a new Council and a new administration, was passed to adoption through three readings at one sitting by Council and urged by an administration whose friends had just suffered defeat at an election.

"These circumstances suffice to start speculation upon the value of the presumptions. When, however, we find, as the testimony here shows without dispute, that, at the time this ordinance was passed and signed, the executive of the city was not only possessed of statistical information in most illuminative detail from its trusted expert, which, properly considered, showed that a 3-cent fare was confiscatory, but that also the force of such statistics to this effect was pointed out in advice privately given in writing and orally by this expert to the executive, with reasons why a 3-cent ordinance should not be passed, and, further, that the city had, in November, 1913, no evidence or light whereon to base a fixing of rate except that given it by its own chosen expert to the above effect, it does not take a very acute mind to see that these vaunted presumptions descend nearly to the level of mere legal figments.

"However, the court on this hearing honored them to the full by requiring the movants to sustain the burden of their charge that the ordinance was unreasonable by clear evidence, and it was not until, through the testimony of the city's own expert, Mr. Nau, and a showing of the experience of the company, a volume of evidence was had which demanded that the city produce support for the failing presumptions upon which it relied, that the court required any action at all by the city. Every possible facility was afforded the city to support the ordinance, the court adjourning the hearing for five weeks for that purpose. The record now shows in evidence comprehensible to every intelligent man, and derived from testimony in which there is absolutely no dispute, that this ordinance is unfair and that to attempt to enforce it is to attempt confiscation.

"The city solicitor, after struggling against the inevitable as long as possible, finally, and commendably, confessed that it was impossible either to get any other evidence than that before the court or to draw any conclusion from the testimony, which he could not dispute, than that at the rate of 3 cents the company's revenue would do no more than barely pay running expenses, leaving nothing for a return upon the investment. There are some lines in the city on which a fare under 3 cents would pay operating expenses; there are lines on which 6 cents and even 7 cents would not even pay expenses. There is one line whose revenue does not meet one-third of its expenses, and others whose returns are but one-half to two-thirds of their outlays.

"Averaging all the lines, if the public insists upon the present routing, any man capable of doing sums in simple arithmetic can see that an average rate of 3 cents is too low. It is demonstrated from the record that if every person who has ridden on the cars since March 27 last, whether he had paid or not, had paid 3 cents, the income of the company would barely have equaled its expenses, and the months since March are the months of a year when traffic is the heaviest and expenses the lightest.

"It is beyond dispute from this record that this ordinance is unreasonable and unfair, wherefore it should be declared invalid, and an order to that effect may be entered."

Wesley S. Thurstin, Jr., city solicitor, issued a statement in regard to the decision. This statement he concluded as follows:

"While we inherited the Schreiber ordinance from Mr. Whitlock's administration, we maintained our position that it was a legal ordinance and that it was passed in good faith until we discovered, during the trial in the United States Court, that Mr. Whitlock and Mr. Merrill, then chairman of the railroad committee of Council, and various other gentlemen in the Whitlock administration, had been apprised of the impracticability of the measure and then we abandoned our contention that the ordinance had been passed in good faith, and became fully aware of the political trickery that fathered it.

"Some working arrangement or day to day agreement will have to be enacted, carrying in mind the result of the Nau and Clark reports, and furthering the placing of the traction system on a more businesslike basis, and this should be done with as little delay as possible; also bearing in mind that the citizens of Toledo are entitled to the best conscientious efforts of the officials to settle this grievous question and remove it from politics for as long a period as possible."

In the leading editorial, "Judge Killits Performs Invaluable Service," in its issue of Sept. 13, the Toledo *Times* said:

"Judge Killits, in enjoining the city of Toledo from enforcing the Schreiber 3-cent fare ordinance, has performed an invaluable service for the community. He has brought the traction question to an issue, which must of necessity lead to a speedy settlement. He has removed a political public bugaboo that has hampered the growth of Toledo for some ten years. And the judge has effectively silenced a political war-cry which has kept the city on the ragged edge of nowhere for the same length of time. The Schreiber ordinance has been proved unreasonable and confiscatory. The city solicitor, manfully, has admitted it. Judge Killits' decision must put Toledo on the upward trend. By bringing a prompt settlement of the traction question, it will re-establish the city in the eyes of many men at the head of big industries in other places, who have long been afraid to bring those industries here."

Former City Solicitor Schreiber issued a statement in part as follows:

"The 3-cent ordinance was passed after most mature and careful consideration, and in the highest degree of good faith, with certain vital and basic legal principles in mind. Not one of these fundamental principles was even mentioned in the trial of the cause. Had these points been earnestly presented to the court, doubtless a different result could have been expected. I cannot but feel that had the proper additional legal talent been employed, the city would to-day find itself in a far more advantageous position. I am quite convinced that the citizenship of Toledo is not satisfied with the solicitor's unconditional surrender and that it demands that the twelve years' fight shall not be given up without a more serious struggle."

The company prepared to post in its cars just before noon on Sept. 15 the following notice:

"Rates of fare: Cash fare, 5 cents; tickets good at all hours, six for 25 cents; tickets good only between 5:30 a. m. and 7:30 a. m. and 4:30 and 6:30 p. m., five for 15 cents, or three pennies; children eight years old or under, 1 cent; children in arms, free."

It was also proposed to hand each car rider a handbill bearing the same notice. President F. R. Coates said that, not anticipating any trouble on Sept. 15, he has issued no special instructions to the conductors other than to collect regular fare from all passengers.

The police department was instructed to see that there was no disorder on the cars when the change went into effect. On Sept. 15 Harry J. Howard, managing editor of the Toledo *News-Bee*, was cited for contempt of court by Judge Killits. In the order served upon him Mr. Howard was directed to appear on Sept. 16 to show cause why he should not be punished for certain utterances in the editions of the *News-Bee* of March 25 and Sept. 12, 1914, relative to the case then pending in the United States Court on the application of the company for a temporary injunction to prevent the enforcement of the Schreiber 3-cent fare ordinance. The court also objected to certain statements in the *News-Bee* regarding John Quinlivan, labor leader, and the contempt case against him in the United States Court. In an address Mr. Quinlivan referred to the court in such a way that he was cited to appear and explain the meaning of his remarks.

NEW SUBWAY STATION AT GRAND CENTRAL TERMINAL IN NEW YORK

The Public Service Commission for the First District of New York will open bids on Oct. 6 for the construction of the so-called diagonal station under Forty-second Street, in front of the Grand Central Station. This station will be built upon the line connecting the existing subway just south of Forty-second Street with the new Lexington Avenue subway just north of that street. Bidders will be required to deposit a certified check for $75,000 with their bids, and the contractor will be obliged to give a bond for $500,000 to the city and one of $250,000 to the Interborough Rapid Transit Company. The work of construction must be completed within twenty-eight months from the delivery of the contract. The station, which will occupy almost the whole length of the new line, will be one of the largest underground stations in the world. It will be more than 100 ft. wide, with two platforms serving four tracks, and the walls will be built to support a twenty-five story building on the site of the old Grand Union Hotel. A concourse will be built above the level of the station, and this concourse will connect with the Grand Central Station, the Steinway Tunnel, the Lexington Avenue subway, the existing subway and the Hudson & Manhattan Railroad tubes when extended to Madison Avenue. The connection with the Steinway tunnel, which is at a lower level, will be by elevators, and transfers will be given between the tunnel line and the old and new subways.

RESUMPTION OF SEATTLE PURCHASE NEGOTIATIONS LIKELY

By a vote of six to three, the City Council of Seattle, Wash., on Sept. 9 decided to open negotiations with the receivers for the purchase of that portion of the Seattle, Renton & Southern Railway lying within the city limits at a maximum price of $1,600,000. The plan proposed provides for an initial payment of $200,000 in municipal street railway bonds, bearing 4½ per cent interest, authorized several years ago and from which Division A of the present municipal railway was constructed, and an annual payment on the remaining $1,400,000 of 25 per cent of the gross earnings for a period of twenty-five years. In the event the $1,400,000 is paid before the expiration of the twenty-five years, title to the property immediately passes to the city without further payment. In the event the $1,400,000 has not been paid at the end of twenty-five years out of 25 per cent of the gross earnings, further payments are to cease and title to the property becomes absolute in the city.

When negotiations were conducted several months ago on a basis of the receivers accepting 25 per cent of the gross earnings for a period of twenty-five years, regardless of what amount that might be, the Mayor suggested that a maximum price for the property be fixed by the receivers beyond which the city should not be required to make payment. Receiver Scott Calhoun at that time announced that he was not in position to fix a maximum figure on such a basis. On Sept. 9 he announced his willingness to open such negotiations, explaining, however, that he would have to submit the proposition as finally agreed upon to the bondholders and the court for their acceptance or rejection.

In view of the possibility that the city may become the owner of the railway at the conclusion of these negotiations, Corporation Counsel James E. Bradford was directed by the Council to ask for a continuance of the Empire Way condemnation proceedings until Oct. 1. Purchase of the Seattle, Renton & Southern Railway would destroy the need for any such car line, and the Council is apparently in a mood to drop the condemnation proceedings if it is found possible successfully to negotiate the purchase of a going car line. It was proposed at one time to have the city experiment with motor buses or establish a competing line.

POWER CONTRACT OF NEW HAVEN RAILROAD

At the regular monthly meeting of the board of directors of the New York, New Haven & Hartford Railroad, held in New York on Sept. 17, the officers were authorized by the board to purchase power from the New York Edison Company. This purchased power, together with that now obtained from the power plant of the New York Central Railroad and of the New Haven Railroad at Cos Cob, will increase the number of trains handled electrically between New York and New Haven from 37 per cent to 70 per cent of the total. In order to have 100 per cent of electrical operation it will be necessary to purchase additional electrical equipment and additional power in the eastern section of the electric zone between New York and New Haven. The latter project is something which cannot be undertaken under present financial conditions.

It is expected that the contract for the purchased power will be signed within a few days.

EXTENSION OF SAFETY ZONES IN LOUISVILLE

The safety zones which have been used experimentally for the last few weeks at important intersections to protect persons boarding street cars in Louisville, Ky., has been found so successful that the zones will be established elsewhere in the city. The plan was first used at Fourth and Walnut Streets, where probably the greatest congestion occurs. It is now proposed to establish zones at Fourth and Green Streets and Fourth and Chestnut Streets and eventually to equip the entire downtown district in the same way. In order to keep the standards from blowing over, larger bases are to be used. The standard is placed in the street between the cartracks and the curb, and just back of the point where the rear of the car, after it stops, is located. At the entrance to Cave Hill Cemetery, at Baxter Avenue and Broadway, a barrier will be erected consisting of a hand rail supported by iron or wooden standards, behind which persons may walk with safety on their way to or from cars.

NEW MUNICIPAL LINE OPENED

The municipal railway from Van Ness Avenue along Market Street and Potrero Avenue to Twenty-fifth Street, San Francisco, Cal., has been completed. The line was formally opened for business on Sept. 7.

Referring to the plans for operating the line the San Francisco *Municipal Record* said:

"C. A. Cashin, superintendent of the city railways, will have every car of the system in operation on Sept. 7, and while the full complement has not as yet arrived, he hopes to be able to handle the throngs which it is expected will crowd the city lines on that day. Of the 125 new cars which have been ordered thirty-two will be ready for service on Sept. 7, which, with the forty-three built for the Geary road, will make a total of seventy-five cars in operation.

"The line to be opened and operated directly in connection with the Van Ness Avenue line to the north bay shore and the Exposition grounds extends from the foot of that line across Market Street and down Eleventh Street by way of Division Street and Potrero Avenue to Twenty-sixth Street, a distance of 2 miles.

"The cost of construction for installation of track, grading and paving was $126,000. This work has been completed, not including unavoidable delays, in less than ninety days' time. On Potrero Avenue, between Sixteenth and Mariposa Streets, the city has joint use of the tracks of the Ocean Shore Railroad, for it was one of the conditions when that corporation was given a franchise that the city should have the use of the tracks by paying its proportion of maintenance.

"Following the formal opening of the road Superintendent Cashin expects to maintain a five-minute headway until the arrival of more cars permits a headway which will be arranged to suit the demands of the traveling public."

LEASED COMPANIES SEEK RECOVERY OF FEDERAL INCOME TAX

Transcripts of the records of the cases of the Columbus, Newark & Zanesville Electric Railway, the Fort Wayne, Van Wert & Lima Traction Company, the Cincinnati Street Railway and the Indiana, Columbus & Eastern Traction Company against Andrew C. Gilligen, collector of internal revenue, and the Columbus, Newark & Zanesville Electric Railway and the Dayton & Western Railway against Bernhard Bettmann, former collector of internal revenue, were filed recently in the United States Court of Appeals at Cincinnati from the United States District Court. The appeals were taken on error from the judgment of United States District Judge John E. Sater, denying certain causes of action contained in the petition for the recovery of the excise taxes assessed and collected for the various years since the passage of the federal corporation income tax law and ruling that the companies had done business within the meaning of the law and were not entitled, therefore, to refunds of the taxes paid.

The properties of all of the companies concerned in these cases are leased to the Ohio Electric Railway and the latter companies sought the recovery of the taxes collected from them, on the ground that as lessor companies they were exempt from the excise tax. The government contended that, notwithstanding the fact that the properties were operated under lease, the companies had exercised corporate powers in the issuance of capital stock, sale of real estate, prosecution of suits, etc., and were, therefore, liable for the payment of the excise tax. The Court of Appeals will be called upon in these cases to decide what constitutes an act of business under Section 38 of the federal income tax law.

CLEVELAND STOCK INCREASE AND LABOR PROBLEMS

The application made recently by the Cleveland (Ohio) Railway for permission to add $1,068,500 to its capital stock was granted on Sept. 15 by the Ohio Public Utilities Commission.

A delegation of Kinsman Road citizens appeared before Council at a recent meeting to urge an extension of the new East Seventy-ninth Street line from Woodland Avenue to Kinsman Road. Peter Witt, street railway commissioner, said that the extension would be made next spring.

The street railway committee of the City Council has announced that hereafter Mr. Witt will be asked to furnish the committee with a tabulated statement showing the bids on any improvement to be made by the company, before expenditures of funds for such purposes are approved.

Members of the local branch of the Amalgamated Association of Street & Electric Railway Employees are uncertain as to the possible results of a difference that has arisen between P. J. Shea, chairman of the international executive committee, and George R. Davies, president of the local branch. Mr. Shea came to Cleveland to aid the local officials in their endeavor to secure a change in working hours and an advance in wages. As a result of his conferences with members of the union the idea has spread that an attempt was being made to oust Mr. Davies from office. W. D. Mahon, president, has been asked to visit Cleveland and assist in settling the differences in the local organization.

Boston's New Subway.—Sept. 26 has been set as the date for the opening of the new Boylston Street subway in Boston. Trial and instruction trips will be conducted from Sept. 21 until the regular opening date.

Progress of Norfolk & Western Electrification.—According to L. E. Johnson, president of the Norfolk & Western Railway, the work of electrifying the line between Bluefield, W. Va., and Vivian, W. Va., a distance of about 30 miles, is proceeding satisfactorily, and it is expected that the line will be ready for electric operation in January, 1915.

Pittsburgh's Subway Proposal.—The committee on public service and surveys of the Pittsburgh (Pa.) Council decided to meet each Monday to consider the pending subway proposals so as to dispose of the matter by Oct. 1 if possible. The Council has posted notices at the Exposition giving the reasons for the delay in connection with the subway grants.

Rehabilitation of Iowa Road Completed.—The Centerville, Albia & Southern Railway, formerly the Southern Iowa Traction Company, has completed the change in motive power from steam to electricity and is now operating six passenger trains and one freight train each day between Centerville and Albia, giving convenient connection with the Chicago, Burlington & Quincy Railway main line trains.

The St. Paul Electrification.—A. J. Earling, president of the Chicago, Milwaukee & St. Paul Railway, in the annual report of the company for the year ended June 30, 1914, refers to the electrification progress as follows: "Electrification of the Puget Sound line was started in April, 1914, and on June 30, 1914, 30 miles of poles were ready for wiring. It is expected that stringing wires from Three Forks to Deer Lodge will be completed by July 1, 1915."

Reconstruction Work Resumed.—Construction work has been resumed on the London & Port Stanley Railway. The Pere Marquette Railway, which has the contract for building the new roadbed, refused to assume responsibility for accidents, and was instructed by the committee to vacate the line. The company's representative later consented to go on with the work. All the new rails have been laid, but the company has yet to put in the new ties and the ballast.

Franchise Election Proposed in Des Moines.—The City Council of Des Moines, Ia., has adopted a resolution granting the Des Moines City Railway permission to place its franchise proposal before the voters. Emil G. Schmidt, president of the company, announced that the circulation of petitions would be taken at once with the idea of completing the preliminary canvass by Sept. 15. The matter will then be submitted to the Council, and if it acts promptly the date of the election will probably be set for some time in October. The expense of the election will be borne by the company.

Illinois Commission Sues Elevated Railways.—Last spring the Illinois Public Utilities Commission ordered the Chicago & Oak Park Elevated Railway to elevate its tracks in Oak Park, Ill. The attorneys for the railway contended that the company could not obey the order of the commission since it was in the hands of a receiver and subject to the order of Federal Judge Carpenter, of the United States Court. As the court has not issued instructions to the company regarding the order, the commission has arranged to file suit in the United States Court to force the company to comply with its ruling. In making the order the commission gave the company the option of stopping its cars at all grade crossings in Oak Park, or elevating its track.

The Kansas City Storm.—The Metropolitan Street Railway, Kansas City, Mo., was one of the heavy sufferers from the severe rainstorm of Sept. 7. Traffic on some lines was suspended for several hours in the morning because of power plant trouble and water and débris on the tracks. One carhouse was partly submerged. Motors of some of the cars that coasted through depressed areas where water was 2 or 3 ft. deep were put out of service, and it was a record day for "pull ins." Despite the obstacles, complete service was restored by evening, and by Sept. 10 all the equipment was ready for service again. There was little wind and few trolley wire troubles. The day after the storm the company used newspaper display space to announce the resumption of regular schedules.

Solano Project to be Revived.—It is stated that the Solano land project, which was taken up by the United Railroads of San Francisco during the connection of Patrick Calhoun with the company, will be revived. Jesse W. Lilienthal, now president of the United Railroads, is quoted as follows: "I believe that Solano will prove to be a great project if it can be handled properly. I have my heart set on reviving it and will bend every effort now to that end. I am convinced that Frederick Van Vorst, attorney for the United Railways Investment Company, who has made himself thoroughly familiar with the conditions in San Francisco, will be able to help us a great deal when he returns from the East. The plan would be to take a tract of, say, 15,000 acres and build up the project from this."

Storage Battery Service on Central Vermont.—It was announced that electric service on the Central Vermont Railroad would be established on Sept. 14 between Brattleboro, Vt., and Millers Falls, Mass., and Brattleboro and West Townsend with the storage battery cars which were tried out a few days ago. The proposed schedule is to leave Brattleboro at 5:20 a. m., arriving at Millers Falls in time to connect with the train which arrives at Boston at 9:30. The car will return to Brattleboro on the arrival of the train which leaves Boston at 6:30 in the morning and will arrive in Brattleboro at 11:20 a. m. The car will leave Brattleboro for West Townsend at 2:30 and arrive there at 3:50, and will start on the return trip at 4:20, arriving at Brattleboro at 5:40. The car will leave Newfane at 4:55. It is said unofficially that the electric service will probably be made permanent if the proposed experimental period of a month proves it successful.

Furthering Philadelphia's Transit Plans.—The finance committee of the Councils of Philadelphia, Pa., is reported to have reconsidered its position on the transit question and will grant $500,000 to Director of Transit Taylor for preliminary transit work. The appropriation, it was said, would be made by transferring the bulk or all of the amount needed from the item allowing $1,000,000 to a municipal art gallery. When Councils adjourned for the summer vacation they did so to meet again in October. This plan was abandoned, however, following Mayor Blankenburg's emphatic statement that the loan should be rushed through as quickly as possible. It is understood that Mayor Blankenburg will consider the matter of sending a special message to Councils urging upon them the necessity of including in the loan bill the item of $500,000 requested by Director Taylor for preliminary transit work. In a strong appeal to Councils, to the finance committee and the public in general, Director Taylor has again reviewed the transit situation and set forth clearly and concisely his plans for beginning the work at once. The director also announced new surface lines in various parts of the city. They include a crosstown line on Forty-sixth Street, additional lines above Frankford, a new line on Chew Street, extensions to the South Philadelphia north and south lines, additional lines north of Girard College, a direct line to Roxborough, a line on North Ninth Street and a direct line to Fox Chase.

Special Massachusetts Commission Appointed.—Governor Walsh of Massachusetts has appointed the commission "to consider the improvement of transportation facilities in the commonwealth, with especial reference to the five western counties," as provided for by a legislative act approved on July 2. Louis C. Hyde, chairman, William G. McKechnie, Samuel D. Sherwood and Richard J. Talbot, all of Springfield, and Henry J. Ryan, Pittsfield, will compose the commission. Politically the commission consists of one Republican, three Democrats and one Progressive. The field of operation of the commission is exceedingly broad. It is to consider the needs, possibilities and probable benefits, both to the commonwealth and the five western counties, of a development and extension of transportation facilities, and of the utilization of the agricultural, dairy and stock raising opportunities of these counties. It is to study also the causes and remedies for the diminution of population, and the decline of industries and agriculture. It is expected to determine the best method of securing transportation facilities, including the feasibility and probable cost of construction to the commonwealth of a system of railroads, electric railways or State highways to serve and promote the development of the five counties. The commission is obliged to give public hearings and to report its conclusions and recommendations to the Legislature not later than Jan. 15 next, together with drafts of such bills as it may deem expedient. The Legislature has authorized the expenditure of $10,000 for the purposes of the commission, including the compensation of its members.

PROGRAMS OF ASSOCIATION MEETINGS

Federation of Trade Press Associations

The ninth annual convention of the Federation of Trade Press Associations will be held at the Congress Hotel, Chicago, Ill., on Sept. 24, 25 and 26. The principal purpose of the convention is to develop a higher standard of efficiency in the management of business and in marketing methods. The session of the morning of Sept. 24 will be devoted to the address of welcome and to the regular business of the association. In the afternoon there will be an editorial symposium and a circulation symposium. On the morning of Sept. 25 there will be an advertising symposium and in the afternoon a subscribers' and advertisers' mass meeting. The annual banquet will be held in the gold room at the Congress Hotel at 6:30 p. m. on Sept. 25. On the morning of Sept. 26 there will be a publishers' symposium. Following this the convention will be concluded with the final business session.

Railway Signal Association

The program has been announced for the nineteenth annual convention of the Railway Signal Association to be held at the Hotel Champlain, Bluff Point, N. Y., on Sept. 22, 23 and 24. Committee reports will be presented as follows: committee one, signaling practice; committee two, mechanical interlocking; committee three, power interlocking; committee four, automatic block; committee five, manual block; committee six, standard designs, signal symbols and nomenclature; committee seven, subjects and definitions; committee eight, electric railways and a.c. signaling; committee nine, wires and cables; committee ten, storage battery and charging equipment. There will be special committee reports on methods of recording signal performance, signaling requirements of electric railways, and lightning protection.

The meeting will be opened at 10 a.m. on Sept. 22 with an address of welcome. The program calls for the presentation on that day of the reports of committees one, three, four, nine and ten, also the report of the special committee on methods of recording signal performance. On Sept. 23 the reports of committees six, seven and eight will be presented, and on Sept. 24 the reports of committees two and five will be presented, together with the report of the special committee on signaling requirements of electric railways.

An elaborate program of entertainment has been arranged. This includes tennis, croquet and golf competitions, a boat trip on Lake Champlain, a trip to Au Sable Chasm and a boat trip through Lake George.

Financial and Corporate

RECENT FINANCIAL TENDENCY

Trading in Bonds Resumed, New York City Loan Arranged and War Revenue Tax Bill Being Redrafted

On Sept. 10 the committee of seven bond dealers chosen to act for the investment bankers of New York during the suspension of business on the Stock Exchange decided to recommend the resumption of trading on a restricted scale. The committee said that the completion of arrangements for the New York City loan had improved conditions materially and that dealers were justified now in selling securities to their customers where this could be done without disturbing the collateral loan situation. Subsequently the committee emphasized its opinion that for the time being all dealings in bonds should be restricted to those owned by the houses making the sale, that sales should only be made to their private customers, and that all brokerage and semi-brokerage transactions between houses in an endeavor to fill any orders on bonds which they did not own should be strongly discouraged for the time being. Following the lead set in New York the matter of resuming bond trading was taken up in both Chicago and Philadelphia, but up to Sept. 16 the rules to govern transactions in these cities had not been formulated.

Cable advices from London dated Sept. 14 said that the opening of the exchange there would probably be effected within a month, and on Sept. 15 the Stock Exchange committee there fixed prices for nearly 1000 British, Indian and Colonial gilt-edged securities and other trustee securities. Sales are forbidden below the prices so fixed. Transactions must be for cash.

The Board of Estimate and Apportionment of New York has approved the contract with J. P. Morgan & Company and Kuhn, Loeb & Company, as syndicate managers, covering a loan of $100,000,000 by a syndicate of banks and trust companies to New York City on one, two and three-year securities at 6 per cent. The board also has adopted a resolution covering the method for refinancing these securities as they mature and improvement work up to Jan. 1, 1918. The amended plan provides that improvements authorized during 1915 which are not self-sustaining are to be paid for 25 per cent from taxes and 75 per cent by issue of one to fifteen-year corporate stock. Improvements authorized during 1916 will be met 50 per cent from the tax budget of the next year and 50 per cent by sale of serial stock; during 1917 they will be paid 75 per cent from the budget and 25 per cent by serial stock, and in 1918 the full cost will be met from taxes. Shipments of gold to Canada have already been made in connection with maturing obligations of New York City in Europe.

The Federal Reserve Board at its meeting on Sept. 12 renewed consideration of the report of the committee in favor of establishing a fund of $150,000,000 in gold for protection of the foreign exchange situation. In view of the announcement that New York City had completed arrangements for payment of its maturing obligations and for providing for the necessary gold remittances to Europe the board decided to await developments before giving the matter further consideration.

The war revenue bill was reframed on Sept. 16 to eliminate the freight tax and provide special levies. In addition to the taxes on wine, beer and gasolene already agreed upon, the plan is to tax banks with capital and surplus not exceeding $25,000 $50 a year and $2 for each additional $1,000; stock brokers, $50; pawnbrokers, $20; commercial brokers, $20; custom house brokers, $10; proprietors of theaters, museums and concert halls, $100; circuses, $100; public exhibitions, $10; bowling alleys and billiard halls, $5 per alley or table; dealers in leaf tobacco, $6 to $24, according to volume of business; dealers in tobacco, $12; manufacturers of tobacco or cigars, $6 to $24. The stamp taxes so far proposed are subject to probable revision by the committee.

The London *Economist* of Sept. 5 contained a review of industrial conditions in Germany written in London by the Berlin correspondent of that paper. Stagnation in practically all lines is reported, with grave danger pending of a depletion of the food supply.

ANNUAL REPORT

United Light & Railways Company

The comparative statement of income, profit and loss of the United Light & Railways Company, Grand Rapids, Mich., for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Earnings available on securities owned of subsidiary companies	$1,366,543	$1,234,736
Miscellaneous earnings	124,811	86,515
Gross earnings	$1,491,354	$1,321,251
Expenses and taxes	97,384	79,931
Net earnings	$1,393,970	$1,241,320
Interest charges	401,598	337,976
Net income available for depreciation and dividends	$992,372	$903,344
Pro-rata dividends—first preferred stock	458,367	362,741
	$534,005	$540,603
Pro-rata dividends—second preferred stock	69,565	89,930
Balance	$464,440	$450,673

According to the above statement the earnings on subsidiary securities increased $131,807 during the year, while miscellaneous earnings increased $38,296, or a gross increase of $170,103. Expenses and taxes rose $17,454, and interest charges $63,621, so the net income available for depreciation and dividends increased only $89,028. The dividends on the first preferred stock were increased $95,626, and those on the second preferred stock were decreased $20,364, giving a balance increase for the year of $13,767. It should be noted that the earnings given for the year ended June 30, 1914, are exclusive of $34,483 representing suspended earnings pending rate adjustments in progress. The addition of this item gives a total balance for the year of $48,250.

The comparative consolidated income statement of the subsidiaries for the twelve months ended June 30, 1913 and 1914, follows:

	1914	1913
Gross earnings	$6,199,421	$5,712,538
*Operating expenses, etc. (includes maintenance and federal income tax)	3,817,070	3,363,564
Net earnings	$2,382,351	$2,348,974

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*Operating expenses for 1914 as compared to 1913 include increased charges for maintenance reserves, general taxes and federal income tax.

AUGUSTA-AIKEN DIVIDEND SUSPENSION

The regular quarterly dividend of 1½ per cent on the cumulative preferred stock of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., will not be paid on Oct. 1. The directors have issued to stockholders a letter reading in part as follows:

"During the first six months of the current year the company's earnings showed a surplus of $61,170, an increase of $10,008, or 19.7 per cent, over that of the corresponding period of 1913. Careful estimates for the last six months of 1914 indicate a surplus of $25,000. The total surplus for the year, therefore, is expected to be about $90,000, which is the amount of the annual dividend on the preferred stock. It is estimated that the net earnings for the last six months of 1914 will be more by approximately $38,000 than for the corresponding period of 1913, but the surplus will decrease about $40,000. This decrease is caused by additional taxes and fixed charges of $78,612, owing to the taking over of the new hydroelectric plant of the Georgia-Carolina Power Company on the Savannah River.

"During the first six months of this year the company has expended for extensions and betterments $51,404, and further expenditures for the same purpose will be necessary during the last six months of this year. Ordinarily these would be in large part financed by the sale of bonds, but financial conditions render this impossible at present. For these reasons and because of the general disorganization occasioned by the unexpected outbreak of the war in Europe, the directors consider it necessary to suspend payments of preferred stock dividends until they can be resumed without weakening the company's cash position. In the judgment of the directors the expected development is only deferred, and it is only a question of time when the additional business will be secured for which the large investment in the new hydroelectric plant and other new business extensions was made."

RAILWAY FINANCES IN BIRMINGHAM

In connection with the default of interest on the first mortgage bonds of the Bessemer, Ensley & Birmingham Railroad, Birmingham, Ala., Sept. 1, as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12, an independent bondholders' protective committee has been formed, consisting of S. H. Cunningham, Boston; Oscar Dare, Philadelphia; Boyd McDowell, Elmira, N. Y.; J. N. H. Campbell, Hartford, Conn., and George T. Wood, Louisville, Ky. The new committee requests bondholders to make no deposits until a complete examination of books and finances has been made by its accountants and engineers. The examination was begun in Philadelphia and Birmingham on Sept. 14.

A receiver for the company, General Superintendent I. W. Ross, was appointed on Sept. 1. Mr. Ross has issued a statement in part as follows:

"The service will continue without interruption and every effort will be made to take care of the patrons of the line. The impossibility of completing the system and making necessary extensions which became certain in the spring, has made the reorganization of the property inevitable. The average passenger haul is in excess of 6 miles per passenger, and while the public has patronized the line liberally it has become more and more evident that the construction of laterals and extensions would be necessary to increase the revenue of the line sufficiently to take care of the high cost and long mileage haul of the trunk line. A complete financial statement brought down to Sept. 1 will be finished by the auditors immediately and made available to all parties interested. The company has taken care of all liquidated and undisputed liabilities outstanding to Sept. 1."

Babylon (N. Y.) Railroad.—The Babylon Railroad has been granted an extension of time in which to pay creditors' claims now outstanding. This road is in the hands of Receiver R. J. Hawkins. In denying the application to sell the road at public auction to settle the claims against it, Judge Chatfield made the following comment: "On the basis of statements made and the offer of the River Holding Company to pay one-half of the merchandise creditors by Oct. 16 in case the road should not be sold at that time and to present a proposition for the payment of the balance, the court will make no order to sell unless on further application before Oct. 16."

Boston Suburban Electric Companies, Newtonville, Mass.—Charles W. Leonard has been elected as trustee of the Boston Suburban Electric Companies to succeed Frank A. Day, deceased.

Brazilian Light & Traction Company, Toronto, Ont.—The directors of the Brazilian Light & Traction Company have declared a dividend of 1½ per cent on the issue of ordinary capital stock. A circular issued to the shareholders states that there is not the least foundation for uneasiness with reference to the company's affairs in South America. The company controls the Sao Paulo Tramway, Light & Power Company and the Rio de Janeiro Tramway, Light & Power Company.

Cleveland (Ohio) Railway.—The Ohio Public Utilities Commission on Sept. 15 authorized the Cleveland Railway to issue common capital stock amounting to $1,068,500 par value to be sold for not less than par. The application for this stock was noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12. The proceeds are to be used to reimburse the income account for moneys actually expended and to be applied to further payment for the construction of additions, extensions and improvements to the system and the acquisition of additional facilities as follows: Land for stations, terminals and yards, $50,000; shops, stations and other buildings, $542,000; fire protection, $90,000; rolling stock, $665,000; total, $1,347,000. The company is required to report semi-annually on Jan. 15 and July 15 regarding the disposition of the proceeds. It is said that the stock, which is part of the $1,460,000 first offering under the terms of the Taylor grant in 1910, of which only about $400,000 was taken by the stockholders, will not be again offered to the stockholders but will be sold in the open market at a premium or retained in the treasury for use as a basis for collateral loans.

Columbus Railway, Power & Light Company, Columbus, Ohio.—On Sept. 10 the directors of the Columbus Railway, Power & Light Company declared the regular quarterly dividend of 1½ per cent on the preferred stock, series A, payable on Oct. 1. The directors took no action toward financing proposed improvements. It is said, however, that improvements and extensions which are urgent will be financed out of earnings.

The Columbus, Urbana & Western Electric Railway, Columbus, Ohio.—Judge E. B. Kinkead on Sept. 5 granted permission to L. P. Stevens, receiver of the Columbus, Urbana & Western Electric Railway, to file his final accounting and terminate the receivership. Mr. Stevens stated in his application that the $438,000 of outstanding bonds of the company are held by the Columbus Railway & Light Company. The property, which embraces 7½ miles of track, went under receivership early in 1912.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—The final step in the absorption of the West Side Railroad of Elmira by the Elmira Water, Light & Railroad Company has been authorized by the Public Service Commission for the Second District of New York. The latter company at present owns all the capital stock of the former and leases its plant and equipment. The commission has now authorized the West Side Railroad to transfer to the controlling company all its railroad, equipment, property, rights, system and franchises for the consideration of $1 and the acceptance of the mortgages now existing on the property.

Kingston (N. Y.) Consolidated Railroad.—A dividend of 3 per cent was paid on Sept. 1 on the $200,000 of the 4 per cent cumulative preferred stock of the Kingston Consolidated Railroad. This was the first distribution since Jan. 1, 1911, when 4 per cent was paid. The full rate of 4 per cent was paid from the consolidation with the Colonial City Traction Company in December, 1901, until August, 1908.

Manaos Tramways & Light Company, Manaos, Brazil.—At a recent meeting of the Manaos Tramways & Light Company held in London, it was stated that finance and commerce are now disorganized and the future of the companies seems somewhat obscure. The efforts to collect the state debt for public lighting had not met with any success. The accounts for the last fiscal year showed tramway receipts of £87,029, as compared to £106,148 for the previous year, a decrease of £19,119. The lighting receipts increased from £44,148 to £44,395, giving a decrease in the gross income from £151,741 to £132,877. The total operating expenses decreased from £101,942 to £96,848, and the net surplus decreased from £28,107 to £14,426, or more than 48 per cent. The transferal of £8,000 to the contingencies and accident reserve account and of £6,000 to the renewals reserve was recommended, the balance of £3,861 being carried forward to surplus.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—The New York Stock Exchange has listed $1,305,000 of general and refunding mortgage 5 per cent bonds, due 1951, of The Milwaukee Electric Railway & Light Company. The Exchange has also authorized an additional $695,000 of these bonds to be listed on notice that they have been sold, making the total amount to be listed $2,000,000. The total expenditures on account of which the bonds listed have been used amounted to $2,281,625, from which was deducted $177,309 for property scrapped, displaced, sold, etc. Expenditures were divided as follows: Roadway and track, $322,617; electric transmission and distributing system, $434,152; building and improvements, $259,455; transformers, motors, lamps, etc., $246,454; miscellaneous, $191,222; power plant equipment, $403,749, and cars and electrical equipment of cars, $423,976.

New York (N. Y.) Railways.—A board of arbitration composed of H. H. Porter, James Marwick and W. G. Ross has been appointed to decide upon the rate of interest that is to be paid on the adjustment income bonds of the New York Railways for the six months ended June 30 last. The directors of the company at a meeting held recently decided that the rate would be 1.24 per cent for the six months, but as there were only three of the directors representing the bondholders present at the meeting who would sign the authorization, it became necessary to call for a board of adjusters. Mr. Porter and Mr. Marwick were chosen one each by the railway and the trustee of the mortgage and they in turn chose Mr. Ross. Mr. Ross was formerly managing director of the Montreal (Que.) Street Railway, but is now president of the Amalgamated Asbestos Company and chairman of the Montreal Harbor Commission. Mr. Porter is a member of the firm of Sanderson & Porter, and Mr. Marwick is a member of the firm of Marwick, Mitchell & Company.

Ogden (Utah) Rapid Transit Company.—It was recently reported that the stockholders of the Ogden Rapid Transit Company had approved a plan for the amalgamation of the company with the Logan Rapid Transit Company as the Ogden, Logan & Idaho Railway. It is said that the Ogden Rapid Transit Company in organizing the Ogden Logan & Idaho Railway has not yet perfected its plans and no securities have been issued up to the present time. The Ogden Rapid Transit Company operates 50 miles of electric track and 6 miles of steam track, while the Logan Rapid Transit Company, which is controlled by the Ogden Rapid Transit Company, operates 14¼ miles of track.

Portland, Railway, Light & Power Company, Portland, Ore.—The New York Stock Exchange has listed $1,064,000 of additional first and refunding 5 per cent sinking fund mortgage convertible coupon bonds, series A, of the Portland Railway, Light & Power Company. The total amount listed is now $17,064,000.

Reading (Pa.) Transit Company.—The Public Service Commission of Pennsylvania on Sept. 4 approved the transfer and purchase of the Lebanon Electric Light Company by the Reading Transit Company for a consideration of $41,000 in cash and $15,000 in securities. The latter amount represents the actual value of $75,000 of Eastern Light & Power Company stock. The company serves about 500 consumers in the various townships surrounding Lebanon.

San Francisco (Cal.) Municipal Railways.—The Board of Supervisors of San Francisco is in receipt of a communication from City Treasurer John E. McDougald stating that he has disposed of $150,000 of Geary Street Railroad 5 per cent bonds to Bond & Goodwin.

Second Avenue Railroad, New York, N. Y.—On Sept. 10 Judge Lacombe in the United States District Court signed an order allowing claims for $594,727 against the New York City Railway. Of this amount $275,391 is due for a special franchise tax from 1902 to 1906 with interest to Sept. 24, 1907, which it is said should have been paid by the New York City Railway as lessee of the Second Avenue line. The sum of $319,335 is due for damages because of the failure of the lessee to maintain the property in good condition between April, 1902, and October, 1907. The report of Special Master W. L. Turner was confirmed with the above modifications.

United Light & Railways Company, Grand Rapids, Mich.—The directors of the United Light & Railways Company have declared the usual quarterly dividend of 1½ per cent on the first preferred stock and three-quarters of 1 per cent on the second preferred stock, both payable on Oct. 1 to holders of record Sept. 15. No dividend on the common stock, however, is declared at this time. From April, 1913, to July, 1913, 1 per cent was paid quarterly, 1 per cent additional being paid in stock in April, 1914. Frank T. Hulswit, president of the company, says: "We have earned sufficient to pay the dividend on the common stock as we have in the past but prefer to take the conservative course now. We cannot say when the next common dividend will be declared."

West Penn Traction & Water Power Company, Pittsburgh, Pa.—The West Penn Traction Company, the operating subsidiary of the West Penn Traction & Water Power Company, has begun the work of improvements and extensions, to provide for which the company in April, 1914, sold $6,000,000 of notes, as mentioned in the ELECTRIC RAILWAY JOURNAL of May 9, 1914. The cost of carrying out the improvement program for 1914 and 1915 will be not less than $4,000,000, of which $700,000 will be provided out of income and the remainder from the proceeds of the note issue. The notes are secured by a pledge of $1,250 first mortgage 5 per cent bond for each $1,000 note, in addition to other collateral. Of the first mortgage bonds there are $5,465,500 outstanding, secured by a first lien on 38.89 miles of electric railway, 133 miles of single-circuit and 26 miles of double-circuit transmission line, thirteen substations, five steam-power generating stations and other property.

Youngstown & Sharon Street Railway, Youngstown, Ohio.—Formal protest has been lodged with the Public Utilities Commission of Ohio by the Youngstown & Sharon Street Railway against granting the application of the Mahoning County Electric Light Company for permission to issue $1,000,000 of capital stock. The former company is seeking to prevent competition from the Mahoning company at Youngstown, on the ground that there is not enough business for two companies.

DIVIDENDS DECLARED

Asheville Power & Light Company, Asheville, N. C., quarterly, 1¾ per cent, preferred.

California Railway & Power Company, San Francisco, Cal., quarterly, 1¾ per cent, prior preferred.

Carolina Light & Power Company, Raleigh, N. C., quarterly, 1¾ per cent, preferred.

Chicago City Railway, Chicago, Ill., quarterly 2½ per cent.

Elmira Water, Light & Railroad Company, Elmira, N. Y., quarterly, 1¾ per cent, first preferred; quarterly, 1¼ per cent, second preferred.

Lake Shore Electric Railway, Cleveland, Ohio, quarterly, 1½ per cent, first preferred.

Lincoln Traction Company, Lincoln, Neb., 1 per cent, common.

Manila Electric Railroad & Light Corporation, Manila, P. I., quarterly, 1¾ per cent.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1½ per cent, preferred.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred; quarterly, three-quarters of 1 per cent, second preferred.

Washington, Baltimore & Annapolis Electric Railroad, Baltimore, Md., quarterly, 1½ per cent, preferred.

West End Street Railway, Boston, Mass., $1.75, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.					
1m., July, '14	$97,764	*$80,929	$16,834	$16,921	†$87
1 " " '13	103,797	*73,390	30,407	14,675	15,732
CLEVELAND, PAINESVILLE & EASTERN RAILROAD, CLEVELAND, OHIO					
1m., July, '14	$46,696	*$22,825	$23,871	$11,095	$12,776
1 " " '13	46,002	*23,741	22,261	10,396	11,865
7 " " '14	242,989	*130,555	112,434	77,028	35,406
7 " " '13	234,541	*130,336	104,205	72,941	31,264
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., July, '14	$1,201,963	*$684,564	$517,399	$358,812	$158,587
1 " " '13	1,156,553	*684,425	472,128	321,685	150,443
12 " " '14	14,616,878	*8,345,584	6,271,294	4,055,815	2,215,479
12 " " '13	13,744,593	*7,887,880	5,856,713	3,726,604	2,130,109
CONNECTICUT COMPANY, NEW HAVEN, CONN.					
1m., July, '14	$820,653	*$571,741	$248,912	$97,330	$151,582
1 " " '13	856,844	*520,419	336,426	90,497	245,929
LAKE SHORE ELECTRIC RAILWAY, CLEVELAND, OHIO					
1m., July, '14	$151,999	*$79,221	$72,778	$35,768	$37,010
1 " " '13	154,483	*79,139	75,345	35,396	39,949
7 " " '14	810,105	*510,867	299,239	247,489	51,750
7 " " '13	788,183	*489,230	298,953	245,682	53,271
NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.					
1m., July, '14	$49,734	*$30,940	$18,794	$7,876	$10,918
1 " " '13	51,390	*29,937	21,453	7,554	13,899
NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.					
1m., July, '14	$40,208	*$42,357	$2,149	$9,025	†$11,174
1 " " '13	36,569	*47,445	10,876	10,802	†21,678
NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.					
1m., July, '14	$351,658	*$206,170	$145,489	$50,848	$94,641
1 " " '13	319,132	*185,187	133,946	47,589	86,357
7 " " '14	2,073,359	*1,265,805	807,555	352,683	454,871
7 " " '13	1,816,370	*1,113,645	702,725	318,313	384,412
RHODE ISLAND COMPANY, PROVIDENCE, R. I.					
1m., July, '14	$537,973	*$354,101	$183,872	$116,264	$67,608
1 " " '13	579,866	*329,786	250,080	105,306	144,774
WESTCHESTER STREET RAILROAD, MOUNT VERNON, N. Y.					
1m., July, '14	$27,209	*$23,456	$3,753	$1,199	$2,554
1 " " '13	26,106	*22,156	3,949	988	2,961

*Includes taxes.
†Deficit.

Traffic and Transportation

MIDDLESEX & BOSTON FARE HEARINGS

Company Requests 6-Cent Fares With 1 Cent More for Transfers—Increase Required by Greater Expenses and Reserve for Depreciation

The Massachusetts Public Service Commission is hearing the petition of the Middlesex & Boston Street Railway for authority to increase the fare unit on its entire system to 6 cents and to 7 cents for a ride including a transfer. The petition is opposed by residents of the municipalities served by the company. The road is largely a country property and extends through Newton and Waltham to Watertown, thence to Wellesley, Natick, Framingham and Hopkinton to Westboro. Nine different companies were consolidated into a single property. The total population tributary to the lines is 175,000. About 130 miles of track are operated.

The fare was originally 5 cents, but was increased to 6 cents in 1908 on portions of the system west of Newton Lower Falls and on the Lexington & Boston division. In Newton and Waltham the fare was left at 5 cents except on part of the old Newton & Boston system. A charge of 1 cent was made, however, in that district for each transfer. This institution of the 6-cent fare was covered in articles beginning in the ELECTRIC RAILWAY JOURNAL of Nov. 28, 1908, under the caption "Reasons for Increased Fares on Massachusetts Street Railways."

The change proposed essentially means a 6-cent fare applicable in Newton and Waltham, where a 5-cent fare is now paid, and on the route through Wellesley and Natick it involves giving up the present fifty-ride book under which it has been possible to ride for a nickel, and, as stated, imposes an additional charge of 1 cent for a transfer. The company appeals to the commission to grant the increase on the ground that its receipts are inadequate compensation for the service rendered. The petition was prompted by an award of a board of arbitration dated June 22, 1914, which increased the compensation of the men about 15 per cent, as noted in the ELECTRIC RAILWAY JOURNAL June 27, 1914, page 1472. In addition to the increase in wages the company must at once spend money for improvements which cannot be capitalized. The surplus after paying 4 per cent dividends in the last two years totals $1,200. The company has outstanding $1,987,000 of stock, $1,983,000 of bonds and $1,255,000 of notes.

Arthur A. Ballantine, counsel for the company, said that in 1901, before the properties were consolidated, the salaries of general officers and clerks totalled $52,000. For the year ending June 30, 1914, these totalled $16,000, although the traffic handled was much greater. Wages, on the other hand, increased from $150,000 in 1901 to $250,000 for the last year. Receipts per mile are 2 cents less than the average for companies elsewhere in Massachusetts. The total amount of the increase in wages occasioned by the arbitration award in the three-year period to which it applies is about $100,000. Adequate provision for depreciation would require more than $50,000 annually. If no shrinkage in travel occurs as a result of the increase in fares the revenue will be increased by about 106,000 a year.

George M. Cox, general manager, testified that the average cost of permanent property per mile of track is $23,440, compared with $37,294 for the State as a whole; equipment cost per mile is $9,867, against $12,270 on all other roads. The total capital investment per mile on the Middlesex & Boston is $43,265, compared with $68,623 on the Massachusetts lines as a whole. Passenger earnings per car mile on the thinly populated Needham line varied from 6.46 cents in 1904 to 9.28 cents in 1914. On the best lines of the company the earnings rose from 28.54 cents per car mile in 1904 to 32.62 cents in 1914. Gross earnings were 25.76 cents per car mile on the system in 1913, compared with 29.19 cents on all Massachusetts roads. In 1913 the company was operated for 1.56 cents less per car mile than the other roads, and its net earnings were 1.87 cents less. The company's fixed charges increased from $96,356 in 1901 to $201,905, or from 3.2 cents per car mile in 1901 to 5.42 cents in 1914. The company disbursed $29,690 in back pay for the year ending June 30, 1914, as a result of the award. Changes in the schedule resulting from agreement with the men will cost from $8,000 to $12,000 per year, assuming that only six extra crews are required. About $52,500 needs to be expended in rehabilitation. Mr. Cox described the arrangements by which power is purchased by the Middlesex & Boston from the Edison Electric Illuminating Company of Boston and said that the Edison service resulted in better power at less cost than the railway could furnish in its plants. The total power cost of the company is now about $150,000 a year.

Chairman McLeod questioned the retention of the equipment in these old plants as a basis upon which the rate of fare is in part to be figured and the witness rejoined that the possession of these plants serves the company as a possible emergency source of power and may in a measure affect the price offered in future contracts. He said that the absence of a depreciation provision in the past was not culpable, but that in any fare adjudication such an allowance must be made and that the rates must be fixed at such a point as will enable the reserve to be set aside to meet the depreciation that has accrued in the past.

Mr. Cox stated that the average fare received per passenger was 5.07 cents in the fiscal year 1914, including transfers. It is estimated that west of Newton Lower Falls the extension of the 1-cent transfer charge would yield the company $1,570 per year; that the abolition of the fifty-ride books would yield $7,392; that a transfer charge added to the existing 6-cent fare on the Newton and Boston division would yield $2,507; that the same charge on the Lexington and Boston division would yield $2,130, and that the establishment of a 6-cent fare in Newton and Waltham would add $58,719 to the company's income. The total passenger revenue for the fiscal year 1914 was $951,808, and it is estimated that if the proposed changes in rates are granted the income will be increased 12 per cent. Twenty-two per cent of the passengers in the Wellesley-Natick section of the road use the fifty-ride ticket books. The company operated 3,008,000 car miles in 1901 and 3,725,000 car miles in 1913, the number of passengers increasing from 12,000,000 to 19,000,000. Hearings were to be resumed on Sept. 17.

Booklet of Information for Trainmen.—The Holyoke (Mass.) Street Railway issued a twelve-page booklet covering the summer schedule of 1914 which is of particular interest in that it contained information for the guidance of motormen and conductors in running time, meeting and transfer points of cars on all lines, etc.

Peculiar Express Car Accident.—While rounding a sharp curve on the Ohio Electric Railway near West Liberty, Ohio, on Sept. 11, an express car left the track and crashed into a house. Fire started from the overturned stove and both car and house were soon ablaze. The fire was extinguished, however, before the blaze had done much damage.

Rehearing on Rear Platform Guard Order.—The Public Service Commission of the First District of New York has granted an application for a rehearing to be held on Sept. 22 on an order adopted some months ago requiring the New York Consolidated Railroad to maintain a guard on the rear platform of all Brooklyn elevated trains. This order was adopted after evidence had been produced showing that there had been considerable rowdyism.

Handling Express Between St. Thomas and Port Stanley.—The London & Lake Erie Railway & Transportation Company, London, Ont., Can., has arranged with the Canadian Express Company to carry express over the section of its line between St. Thomas and Port Stanley, Ont., and has applied to the St. Thomas City Council for permission to run over the city's line to the Grand Trunk Railway station on Talbot Street, in order to carry out the agreement.

Service on the Wellston & Jackson Belt Line.—The Ohio Public Utilities Commission refused a rehearing on the case of the Hocking Valley Railroad relative to the order of the commission to resume the operation of electric cars on the Wellston & Jackson Belt Line on Sept. 11. The case was at once appealed to the Ohio Supreme Court, on a petition in error. The company asserts that the findings of the commission are unlawful, unreasonable and beyond its jurisdiction in that they will operate to deprive it of its property without compensation and without due process of law. Operation of electric cars was suspended some weeks ago and the commission ordered the company to resume the service by Sept. 15.

New Traffic Regulations for Congested Brooklyn.—Upon recommendation of the Brooklyn committee of public safety and of Leon G. Godley, third deputy police commissioner, Police Commissioner Woods has ordered new traffic regulations in Fulton Street, Brooklyn, between Court Square and Bond Street. Under the new arrangement, vehicles are prohibited from crossing Fulton Street, except at the intersections of streets, between Court Square and Bond Street. The object of the change is to prevent indiscriminate driving back and forth across the street in this congested section of the street, and to avoid chances for collisions between cars and vehicles, collisions between vehicles and the pillars of the elevated railroad, and injury of pedestrians.

Combined Railway and Ferry Fare in Effect.—The new arrangement between New York City and the New York Railways has gone into effect whereby for a 5-cent fare northbound transfers will be issued by the municipal ferry at the Battery, New York, good for a continuous ride on the ferry from St. George, Staten Island, and from South Ferry, Manhattan, on the Broadway, Columbus, Sixth, Eighth and Amsterdam Avenue surface lines. Southbound conductors on the cars of these lines issue transfers to ferry boats to St. George. Under the contract between the city and the railway the former will receive 2 cents and the latter 3 cents of the 5-cent fare. This arrangement is in accordance with an agreement reached in connection with the new subway operating contracts, but as it was impracticable to embody this agreement in the dual system contracts a separate contract was prepared.

Electric Line Declines Offer to Join in Rate Application.—J. R. Harrigan, general manager of the Kansas City, Clay County & St. Joseph Railway, was invited to join the steam railroads of Missouri in filing with the Public Service Commission on Sept. 15 new passenger tariffs based on the 3 cents per mile which recent decisions have convinced the railroads that they have a chance of establishing. Mr. Harrigan declined to join. Negotiations are now pending between the Quincy, Omaha & Kansas City Railroad and the Kansas City, Clay County & St. Joseph Railway for the handling of the steam road's passenger service into Kansas City by the electric railway. It is said that the Quincy, Omaha & Kansas City Railroad is seeking a way to avoid entering the new union station, and arrangements for handling its traffic into and through Kansas City after Jan. 1 must be made soon. The steam road has its station at Avondale within a few feet of the electric line station. Avondale is about 5½ miles from the electric line's Kansas City station, and the first station on the Excelsior Springs division north of North Kansas City. The Quincy, Omaha & Kansas City Railroad runs between Kansas City and Quincy, Ill.

Co-operation Among Farmers Urged.—Farmers' co-operative societies, either for buying or for selling, are very much favored by Richard H. Wyatt, general freight and passenger agent of the lines of the Louisville & Interurban Railway and the Louisville & Eastern Railway. In his efforts to increase the amount of freight handled on these lines he urges co-operation among the farmers in the communities along the routes. According to Mr. Wyatt, the larger part of the in-bound business of the lines originates on the farms. As the farmer has found that it is greatly to his advantage to market his produce in person, he hauls it in by wagon. With an organization, however, he would be able to make advantageous marketing arrangements and could ship confidently and in large quantities. One of the successful organizations of the kind on the route of the lines Mr. Wyatt supervises is at Middletown, Ky., 15 miles east of Louisville. This organization has been in existence for three years and has been fostered by Mr. Wyatt, with a consequence that during the berry season the Louisville & Eastern Railway gets many a ton of high-class and profitable freight. This organization is cited to the farmers on whom he urges the formation of similar organizations as a sample of what might be done. In St. Matthews, also east of Louisville, the farmers have organized, while across the river in the vicinity of New Albany the Insull electric lines have taken away from the steam roads a very large proportion of the fruit business of the several fruit growers' organizations in that locality.

Personal Mention

Mr. W. H. Gardner has resigned as chief statistician of the Doherty Operating Company, New York, N. Y.

Mr. Frank L. Blackburn has been appointed chief statistician of the Doherty Operating Company, New York, N. Y., succeeding Mr. W. H. Gardner, recently resigned.

Mr. A. L. Adams, formerly with the Tacoma Railway & Power Company, Tacoma, Wash., is now connected with the Savannah (Ga.) Electric Company as assistant transportation superintendent.

Mr. W. B. Voth, who has been superintendent of light and power of the Sheboygan Railway & Electric Company, Sheboygan, Wis., for ten years, has been appointed chief engineer of the Empire United Railways, with headquarters at Syracuse, N. Y.

Mr. W. J. Gough has been elected vice-president and superintendent of the Los Angeles & San Diego Beach Railway, San Diego, Cal., succeeding Mr. R. B. Talbot, who has resigned to engage in other business. Mr. Gough is also acting as chief engineer of the company, which has under way the electrification of its line between San Diego and La Jolla.

Mr. Frederick C. Noble, division engineer of the Public Service Commission for the First District of New York in charge of subway construction in Brooklyn, has resigned, and will enter private practice. Mr. Noble was born in Michigan in 1872 and was graduated in civil engineering from the University of Michigan in 1894. He has been connected with the Public Service Commission and its predecessor, the Rapid Transit Commission, since 1900, being appointed division engineer in 1905.

Mr. J. H. Sanford has been appointed purchasing agent of the Connecticut Company, with headquarters in New Haven, Conn., reporting to Mr. L. S. Storrs, president. Mr. Sanford's jurisdiction will also include the Housatonic Power Company, Berkshire Street Railway, New York & Stamford Railway, Westchester Street Railroad and the Westport Water Company. He has also been appointed purchasing agent of the Rhode Island Company, Providence, R. I., reporting to Mr. A. E. Potter, president.

Mr. Frank Wert has been engaged by the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, to have charge of its department of public relations, with the title manager of public relations. In this position Mr. Wert will take over some of the work which fell previously to the lot of Mr. H. B. Manington, whose activities as assistant to the president necessitate his frequent absence from Youngstown. Mr. Wert was formerly connected with newspapers in Philadelphia, Baltimore and Harrisburg.

Mr. Paul C. Alford, chief clerk of the Piedmont & Northern Railway, has been appointed agent of the commercial office of the company with headquarters at Spartanburg, S. C. Since the opening of the Piedmont & Northern Railway between Anderson and Greenwood, Mr. Alford has acted as chief clerk to Mr. C. S. Allen, Jr. He had several years' experience in both the transportation and the traffic departments of the Southern Railway and the Seaboard Air Line in Atlanta. Mr. Alford resigned as chief rate clerk in the office of the assistant general freight agent of the latter company to become connected with the Piedmont & Northern Railway.

Mr. George A. Lewis has been appointed local manager of the Auburn & Syracuse Electric Railroad, which is included in the system of the Empire United Railways, Syracuse, N. Y. He will have charge of the operation of cars and also of track, carhouses, substations and everything else pertaining to the road. Mr. Lewis was born in 1876 on a farm in Ontario County, New York, and was educated at the district school in Orleans. Subsequently, he took a two-year commercial course at Elmira, N. Y. His first railroad experience was as timekeeper during the construction of the Rochester & Eastern Railway. When that road was opened for operation he was placed in charge of claims and similar matters. Later he was appointed superintendent of construction of the Milwaukee (Wis.) Northern Railway, serving the same interests that built the Rochester & Eastern Railway. When the Milwaukee Northern Railway was completed and placed in operation Mr. Lewis was made general agent of the company and later was appointed superintendent of operation.

Mr. Charles Craigmile, who has been assistant superintendent of the Lake Shore division of the Empire United Railways, Syracuse, N. Y., has been appointed local manager of the Syracuse & South Bay Electric Railroad, the Brewerton line and the Sagamore Navigation Company. He will also have charge of land and islands owned by the companies at South Bay and Oneida Lake. The appointment becomes effective on Oct. 1. Mr. Craigmile and all other employees on the lines will have headquarters at North Syracuse, where administration offices are being fitted up in the carhouse. This will make the Syracuse & South Bay road an independently operated company, subject, however, to direction from the office of Mr. Ernest Gonzenbach, the general manager of the Empire United Railways. Mr. Craigmile was born in Illinois twenty-nine years ago and was educated at Farnhamville, Ia. His first railroad experience was as a telegrapher on the Chicago & Northwestern Railroad. Later he was made station agent at different points of that line. While acting as station agent at Cleveland, Wis., he received an offer to be dispatcher of the Sheboygan Railway & Electric Company, Sheboygan, Wis. Last April he was appointed assistant superintendent of the Lake Shore & Northern Division of the Empire United Railways.

Mr. W. F. Raber, vice-president and general manager of the Arkansas Valley Railway, Light & Power Company, Pueblo, Col., has been elected president of the Colorado Electric Light, Power & Railway Association. Mr. Raber is a native of Ohio. He entered business with the Bell Telephone Company about twenty-five years ago, but soon took up street railway and electric light work. He managed lighting plants for some time and finally became general manager of the Mansfield Railway, Light & Power Company, Mansfield, Ohio. He next became connected with H. M. Byllesby & Company, Chicago, and served them for some time as manager of electric light, power and gas plants in Oklahoma. In 1906 he was appointed by Byllesby & Company as manager of the Ottumwa Railway & Light Company, Ottumwa, Ia., in which capacity he continued until 1911. He was then appointed general manager of the Pueblo & Suburban Traction Company, a Byllesby property, since succeeded by the Arkansas Valley Railway, Light & Power Company. The company at Pueblo controls 35 miles of electric railway and does a general lighting business.

W. F. Raber

OBITUARY

Henry M. Goll, one of the pioneers in the traction history of Chicago, died on Sept. 13 at the University Hospital in that city. Mr. Goll settled in Chicago in 1852 and became interested in one of the bus lines which plied on West Twelfth Street between Wentworth Avenue and Ashland Boulevard. Subsequently he was identified with the promotion and construction of the original street railway on Halsted Street.

William A. Stern, senior member of the firm of Stern & Silverman, Philadelphia, Pa., is dead. Mr. Stern was president and a director of the Atlantic City & Shore Railroad, treasurer and director of the Central Passenger Railway, Atlantic City, N. J., treasurer and director of the Atlantic City Construction Company, and president and director of the Philadelphia (Pa.) Railways, the successor to the Southwestern Street Railway. The firm of which he was a member owns a franchise for the construction of a tunnel under the Delaware River between Camden and Philadelphia. Mr. Stern was fifty-four years old. He is survived by a widow and three children.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Miami (Fla.) Traction Company.—Application for a charter has been made by this company in Florida to build an electric railway in Miami. Capital stock, $500,000. Officers: B. B. Tatum, president; J. H. Tatum, vice-president; J. R. Tatum, secretary, and S. M. Tatum, treasurer. [E. R. J., Aug. 29, '14.]

***Carolina Central Electric Railway, Florence, Ga.**—Incorporated in Georgia to build an electric railway in Florence. Capital stock, $5,000.

***Marble Creek Valley Railway, St. Maries, Idaho.**—Incorporated in Idaho to build an electric or steam railway from Clarpia to Pocono, 20 miles, and a line from the mouth of Buzwell Creek to Pierce City, 25 miles. Capital stock, $100,000. Frederick Herrick, Lac du Flambeau, Wis., is reported interested.

Joliet & Eastern Traction Company, Chicago, Ill.—Incorporated in Illinois to build an electric railway to connect Joliet, New Lennox, Frankfort, Matteson, Chicago Heights, Hammond and Chicago. Headquarters: Chicago. Capital stock, $1,000. The first board of directors is composed of Edmund J. Clausen, Irving J. Solomon, David F. Rosenthal, Leo S. Kosetcheck and Jacob Schwartz.

***East Village & Harbor Traction Company, Ashtabula, Ohio.**—Incorporated in Ohio to build electric railways to encircle the city of Ashtabula, ending at the Harbor. Capital stock, $10,000. Incorporators: Mark E. Copeland, Cleveland; C. Verbsky, M. Burge, W. S. Mitchell and others.

FRANCHISES

Los Angeles, Cal.—The Board of Public Utilities recently has recommended to the City Council that the application of the Pacific Electric Company for a twenty-one-year franchise to operate the outside tracks of its four-track system across certain public highways on its Long Beach line between Ninth Street and Slauson Avenue in Los Angeles be granted.

Los Angeles, Cal.—The Los Angeles Railway has received a ninety-day extension of time on its franchise in which to complete its Vernon Avenue crosstown line in Los Angeles.

New Haven, Conn.—The Connecticut Company has asked the Public Utilities Commission for approval of the method of reconstruction of double tracks in Church Street in New Haven.

Aurora, Ill.—The Aurora & Mendota Electric Railway will shortly ask the Council for a right-of-way in Aurora. The new line is to extend from Aurora through Yorkville, Plano and Sandwich to Mendota.

Lafayette, Ind.—The Lafayette & Northwestern Railroad has received a franchise from the County Commissioner to build its line through Benton County. This line will connect Lafayette and Chicago.

Muskegon, Mich.—The Muskegon Traction & Lighting Company will ask the Council for a franchise for an extension of its Allen Street line in Muskegon.

Collingswood, N. J.—The Public Service Railway has asked the Council for a franchise to make changes in its tracks through West Collingswood to shorten the line to Clementon.

Islip, N. Y.—The Suffolk Traction Company has received a year's extension of time on its franchise in which to extend its lines to West Sayville.

Westfield, N. Y.—The Jamestown, Westfield & Northwestern Railroad has asked the Council for a franchise to extend its line on the east side of South Portage Street, in Westfield, from Martin-Wright Road to Campbell Street, where the line will connect with the Chautauqua Traction Company's line.

London, Ont.—The London Street Railway has asked the Council for an extension of time on its franchise in which to complete its line on Wharncliffe Road in London.

Portland, Ore.—The Portland & Oregon City Railway has received a twenty-five-year franchise from the Council in Portland. Work is to be begun on the line within the city limits within sixty days. Other franchises are now pending to allow the company the use of the east side and the northeast section of the city of Portland.

Lynden, Wash.—The Blaine-Lynden Electric Railway has received a franchise from the Council in Lynden. The Council of Blaine has already granted the company a franchise over certain streets and a large terminal tract on the waterfront in Blaine. A greater part of the right-of-way between Lynden and Blaine has been secured and the preliminary work on the line will be done this fall. [E. R. J., Aug. 8, '14.]

Olympia, Wash.—The City Council at an early meeting will ask the Olympia Light & Power Company to extend its line from the present terminus on Fourth Street to the city limits of Olympia.

TRACK AND ROADWAY

***Los Angeles, Cal.**—Plans are being considered to build a crosstown electric railway from First Street and Evergreen Avenue, north on Evergreen Avenue to Wabash Avenue in Los Angeles. The Malabar Improvements Association and the residents of Boyle Heights are interested.

Connecticut Company, New Haven, Conn. — Plans are being made by this company to reconstruct and extend a number of its lines within the next few months.

Waterbury & Milldale Tramway, Waterbury, Conn.—Arrangements are being made by this company to begin work on the 3 miles of new track in Southington as soon as the company receives authority from the Public Utilities Commission for the construction of the line.

Jacksonville (Fla.) Traction Company.—Additional track on Hogan Street from Bay Street to Eagle Street, Cedar Street and Pearl Street in Jacksonville will soon be built by this company.

Miami (Fla.) Traction Company.—Bids are being asked by this company for the construction of its line on Avenue C between Tenth Street and Waddell Street in Miami, L. D. Llewellyn, 1107 Avenue C, Miami, chief engineer. [E. R. J., Aug. 29, '14.]

Waycross Street & Suburban Railway, Waycross, Ga.—Right-of-way has been secured and arrangements for the necessary material have been made by this company for its extension to Hebardville, a suburb just beyond the northern city limits of Waycross.

Twin Falls (Idaho) Railroad.—This company has placed in operation its extended line between Twin Falls and Shoshone Falls. Electric storage battery cars are operated.

Evansville & New Harmony Traction Company, Evansville, Ind.—Surveys have been completed by this company on its line between Evansville and New Harmony. [E. R. J., Aug. 15, '14.]

Evansville & Eastern Electric Railway, Evansville, Ind.—Plans have been contemplated by this company to extend its line from Henderson to Owensboro, Ky.

Richmond-Hamilton Traction Company, Richmond, Ind.—Plans are under consideration to build an electric railway from Hamilton, Ohio, to Richmond, Ind. [E. R. J., Aug. 15, '14.]

Orleans-Kenner Electric Railway, New Orleans, La.—This company has increased its capital stock to $3,000,000. Grading has been completed and, except for short gaps, the tracks have been laid from the protection levee, at Claiborne Avenue, in New Orleans to 1 mile beyond Shrewsbury, and from Kenner nearly to Harrahan. Arrangements have been made to operate the interurban cars into New Orleans as soon as the line in Jefferson parish is completed. The contract for this has been signed for some time. Construction of the trestle work across the Illinois Central yards will be begun soon. Henry K. Johnson, chief engineer. [E. R. J., July 18, '14.]

Winnipeg, Selkirk & Lake Winnipeg Railway, Winnipeg, Man.—A report on the condition of this railway, by B. S. Mackenzie, consulting engineer, has been laid before the Manitoba Public Utilities Commission. The report suggests that considerable improvement to the roadbed is necessary to bring it up to a proper condition, and points out that satisfactory progress is being made upon work for the betterment of the line.

Frederick & Brunswick Railway, Frederick, Md.—Preliminary arrangements are being made by this company to begin the construction of the 9-mile railway between Frederick and Brunswick on Nov. 1. Thomas H. Haller, Frederick is interested. [E. R. J., Aug. 29, '14.]

Northern Massachusetts Street Railway, Athol, Mass.—This company is asked to consider plans to extend its line between Winchendon and Winchendon Springs.

Laurel Light & Railway Company, Ellisville, Miss.—Another mile of electric railway has been placed in operation by this company. It extends to the new plant of the Wausau Southern Lumber Company in North Laurel.

Public Service Railway, Newark, N. J.—It is reported that this company plans to build an extension along the old Peapack Railroad bed from Newark, to join the spur of the Rahway Valley Railroad extended from Kenilworth to Morris Avenue.

New York, N. Y.—Bids are desired until Oct. 6 by Public Service Commission, 154 Nassau Street, New York, N. Y., for constructing Section 1 of Route 43, and Section 1 of Route 26, being the diagonal connection under Forty-second Street between the existing subway and the Lexington Avenue subway.

***Blenheim, Ont.**—An organization has been formed to inquire into the construction of a hydro-radial railway from St. Thomas to Amherstburg. A report will be asked from the Ontario Hydro-Electric Power Commission.

Brantford, Ont.—The City of Brantford has taken over the Brantford Street Railway and the Grand Valley Railway and is now in full charge of their operation. An announcement has been made by the Brantford Street Railway Commission stating that there will be no extension work on the Brantford Street Railway and the Grand Valley Railway during the fall and winter.

Port Arthur, Ont.—The ratepayers of Port Arthur have sanctioned six by-laws, which include: an issue of debentures for $12,000 for a double track "Y" at Arthur Street and Cumberland Street in Port Arthur; $2,600 to construct a side track on the Arthur Street line and $26,000 for the purchase of a right-of-way for the southern loop of the belt line in Port Arthur.

West Side Electric Street Railway, Charleroi, Pa.—This company placed in operation on Aug. 19 its 11-mile railway between Charleroi, Bentleyville and Ellsworth.

Du Bois (Pa.) Traction Company.—It is stated that the Jefferson Coal Company plans to build an electric railway from Coal Glen to Falls Creek, to connect at that point with the Du Bois Traction Company's lines.

Schuylkill County Railway, Girardville, Pa.—The new line between Shenandoah and Frackville along the Broad Mountain from Gilberton in the Mahanoy Valley has been placed in operation by this company.

Conestoga Traction Company, Lancaster, Pa.—This company is asked to consider plans to extend its Marietta line from Centre Square, Lancaster, to Maytown.

West Penn Railway, Pittsburgh, Pa.—This company has completed its line between Uniontown, Connellsville and Phillips and will soon place it in operation.

York (Pa.) Railways.—This company has placed in operation its new line which extends from the present terminus on Jackson Street to Virginia Avenue, then south to the Country Club road in York.

Ogden (Utah) Rapid Transit Company.—Work on the Logan extension will be completed within the next two weeks. The company is building extensions both ways from Logan, and the line extending from Wellsville on the south to Lewiston on the north will be in operation by Dec. 15.

Danville Traction & Power Company, Danville, Va.—Work will be begun at once by this company on an extension from its terminus on Lee Street to Berryman Avenue, Cabell Street, Lynn Street and Deboe Street to the railroad station on Craghead Street in Danville. J. F. Rison, president.

Olympia Light & Power Company, Olympia, Wash.—This company is asked to consider plans to extend its line from the present terminus on East Fourth Street to the city limits of Olympia.

Seattle, Wash.—Councilman Erickson, chairman of the City Utilities Committee of the Council, is making plans for the extension of the municipal railway in Seattle, Division "A," into Ballard, following the completion of the new bridge to span the Lake Washington canal at Fifteenth Avenue Northwest. The plan includes the purchase of the Loyal Heights line, operated by Harry Whitney Treat. Mr. Erickson proposes that the Division "A" line cross the Ballard bridge from Nickerson Avenue, follow Leary Avenue to Market Street, and continue on Market Street under a Treat franchise that has never been used to Twenty-eighth Avenue Northwest, and up Twenty-eighth Avenue to the city limits. The tracks now used by the Loyal Heights line on West Sixty-seventh Street and Twentieth Avenue Northwest can be taken up and laid on Twenty-eighth Avenue between West Sixty-seventh and Market Streets in Seattle.

Charleston, Parkersburg & Northern Railroad, Parkersburg, W. Va.—Contracts will be awarded this fall by this company to build part of its 75-mile electric line between Parkersburg and Charleston, via Ripley, Sissonville, Guthrie and intermediate towns. K. B. Stephenson, Parkersburg, secretary. [E. R. J., Dec. 13, '13.]

Monongahela Valley Traction Company, Fairmont, W. Va.—Right-of-way has been purchased by this company for an extension to Riversville.

SHOPS AND BUILDINGS

Savannah (Ga.) Electric Company.—This company is rebuilding its carhouse in Savannah.

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind.—This company announces that its new freight station at Bluffton has been opened.

Cleveland (Ohio) Railway.—This company has received the approval of the City Council for the expenditure of $128,000 for the construction of a new carhouse on Superior Avenue in Cleveland.

Wheeling (W. Va.) Traction Company.—Work has been begun on an addition to this company's carhouse at McMechen. R. G. Byrum's Sons & Company, Wheeling, have the contract for the construction of the building.

POWER HOUSES AND SUBSTATIONS

People's Railway, Wilmington, Del.—This company's auxiliary power house at Brandywine Springs Park was destroyed by fire on Sept. 14. The loss is estimated to be about $20,000.

Moncton Tramways, Electricity & Gas Company, Ltd., Moncton, N. B.—This company is installing at its power plant in Moncton three 200-hp boilers of high pressure, to replace four low-pressure boilers. A portion of the plant is already equipped with high-pressure boilers, and when the present installation is completed the entire plant will be so operated.

Public Service Railway, Newark, N. J.—Extensive alterations are being planned by this company for its power house at Lakeside Avenue in Newark. All generating machinery has been removed from the building, and the section where the boilers were located will be used as a storage house. The improvements, which will include new doors and windows, will cost about $6,000.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—Improvements will be made at once by this company at its Lowellville power house, and new equipment will be added to take the place of that recently destroyed by fire. Instead of rebuilding the separate substations, the company will install a new permanent substation at Lowellville and increase the rating of the plant. A large amount of machinery has already been delivered to the company.

Monongahela Valley Traction Company, Fairmont, W. Va.—The contract for the concrete piles in the foundation of this company's new power plant has been awarded to the Raymond Concrete Pile Company, 140 Cedar Street, New York City, N. Y. The Nicola Building Company is the general contractor.

Manufactures and Supplies

ROLLING STOCK

Empire United Railways, Syracuse, N. Y., noted in the ELECTRIC RAILWAY JOURNAL of Aug. 15 as having ordered twelve semi-steel prepayment passenger cars from the St. Louis Car Company, has specified the following details for this equipment:

Seating capacity	40
Weight (car body only)	15,500 tons
Length of body	26 ft. 6 in.
Length over vestibule	37 ft. 6 in.
Width of sills	8 ft. 2 in.
Width over all	8 ft. 6 in.
Body	semi-steel
Interior trim	mahogany
Headlining	Agasote
Underframe	steel
Roof	arch
Air brakes	G. E.
Bumpers	Hedley
Cables	in conduit
Car trimmings	St. Louis
Control	type K
Couplers	St. Louis, radiating
Curtain fixtures	Cur. Sup. Co.
Curtain material	Pantasote
Destination signs	Hunter
Door signals	Consol.
Fare boxes	Johnson
Fenders	Providence
Gongs	St. Louis
Hand brakes	St. Louis
Headlights	Golden Glow
Motors	G. E.
Registers	Int. R 5
Sanders	air
Sash fixtures	O. M. Edwards
Seats	St. Louis rattan
Step treads	Universal
Trolley catchers	Keystone
Trolley base	G. E.
Trucks	Baldwin
Ventilators	St. Louis

TRADE NOTES

McQuay-Norris Manufacturing Company, St. Louis, Mo., announces its removal to 2008-2010-2012 Locust Street, the location of its new factory.

Willard Doud announces the opening of offices at 538 South Dearborn Street, Chicago, for the handling of all matters pertaining to shop and factory design, construction, equipment and operation.

Asbestos Protected Metal Company, Beaver Falls, Pa., has established a new selling agency in the Chamber of Commerce Building at Detroit, Mich. James E. Walsh has been placed in charge.

Fonger Fender Company, Chicago, Ill., has received orders to equip with tip-tilting automatic fenders the entire system of the Great Falls (Mont.) Street Railway and the Union Electric Company, Dubuque, Ia.

Charles E. Young, formerly a director and advertising manager of the Ohio Brass Company, Mansfield, Ohio, has resigned and has opened an office, with H. W. Young, in the First National Bank Building, Chicago, to give technical advertising service. Mr. Young was a member of the class of 1901, Washington and Jefferson College. After leaving college he was employed first in the advertising department of the Western Electric Company and later in a similar capacity by Porter & Berg (Electric Service Supplies Company). For the last ten years he has been in charge of the advertising department of the Ohio Brass Company.

Esterline Company, Indianapolis, Ind., reports the sale of "Golden Glow" headlights to the following companies during the month of August: Tri-City Railway, Davenport, Ia.; Alton, Jacksonville & Peoria Railway, Alton, Ill.; Public Service Railway, Camden, N. J.; Seattle (Wash.) Municipal Railway; Savannah (Ga.) Electric Company; Elmira (N. Y.) Water, Light & Railroad Company; Springfield (Mass.) Street Railway; Muskegon (Mich.) Traction & Light Company; Detroit (Mich.) United Railway; Southern Traction Company, Dallas, Tex.; Windsor, Essex & Lake Shore Railway, Kingsville, Ont.; Des Moines (Ia.) City Railway; Aurora, Elgin & Chicago Railway, Wheaton, Ill.; Clinton (Ia.) Street Railway; Baldwin Locomotive Works, Philadelphia, Pa.; Galveston (Tex.) Electric Company; Jackson (Tenn.) Railway & Light Company.

ADVERTISING LITERATURE

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder outlining its system for attaining competitive efficiency in fare collecting by means of its monthly merit record bulletin.

Universal Handhole Scraper Company, Chicago, Ill., has issued a folder describing and explaining the operation of its handhole scrapers and handhole plate scrapers for all types of water tube boilers.

American Railway Supply Company, Chicago, Ill., has issued a catalog which describes the Parrigin rail-joint base plate, a device for strengthening the angle-bar rail joint. The construction of the base plate consists of only one piece of modified section of channel, the center portions of the sides of the plates being depressed to form a short truss between supports. The catalog contains views showing the application and installation of the base plate and explains its joint action with the rail joint.

National Tube Company, Pittsburgh, Pa., has issued "National" Bulletin 9-C, which contains a description of several special tests made on Kewanee unions, including the following: expansion test, with tabulated details; air test under water, to which every individual union is subjected before leaving the factory, with illustrations; service test of unions, including illustrations of two unions which were disconnected and reconnected more than 1000 times and which remained tight at the end of each test.

Street Railway Signal Company, Inc., Philadelphia, Pa., has issued a folder describing and illustrating its new type of contactor signal for use with single or double track. These signals, "Model E," are of the all-light trolley-contact operated type, having the three-position aspect for single track opposing protection, but permitting following movements, as recommended by the joint block signal committee of the American Electric Railway Association. The signals may be mounted either on individual iron poles or on existing trolley poles.

Tate, Jones & Company, Inc., Pittsburgh, Pa., have issued a catalog on the subject of their appliances for burning fuel oil in power plants and car shops. The catalog discusses the features of oil as a fuel for furnaces and describes its various types of burners for insuring complete combustion of oil by intimate mixture of air with the fuel. The last part of the catalog describes and illustrates its pumping, heating and regulating systems designed to bring the oil from the tank and furnish it to the burners at the proper pressure and in the right condition.

Prepayment Car Sales Company, New York, N. Y., has issued a folder entitled "Safety Last." The folder points out the neglect of safety, by women who get off slowly moving cars backwards, by men who board fast moving cars and by conductors who are apt to give motormen the bell without seeing whether or not the rear platform is clear. Accidents from these causes often result in payment by the railroad, since juries are prone to overlook the carelessness of the passenger. In this connection prepayment cars, together with the closed door, folding step and door control switch system prevent starting and stopping accidents.

Stone & Webster Construction Company, Boston, Mass., has issued an attractive booklet describing and illustrating, with the aid of a series of large and excellent photographs, the recent completion of the initial development at Big Creek, Cal., for the Pacific Light & Power Corporation, noteworthy because of the unusual natural conditions, engineering problems and commercial accomplishment involved. It is by far the largest high-head development in this country. The most powerful impulse wheels ever built drive the largest electric generators of their type. The transmission line is the longest "express" line in existence and will operate at 150,000 volts, the highest voltage ever used commercially. It carries power 240 miles from a remote spot in the mountains half way between San Francisco and Los Angeles to commercial use in the latter city and adjacent territory. The work included the making of a reservoir 7000 ft. above the sea, the erection of four concrete dams, the construction of two power houses and a substation, the boring of five miles of tunnel through granite, the setting of more than 3000 steel towers over the mountains and across the desert and the stringing of 5,000,000 lb. of aluminum cable. The Big Creek plants are producing at present 70 per cent of the company's total output. Of the power sold by the company 78 per cent is used by electric railway systems, namely, the Los Angeles Railway Corporation, operating 355 miles of street railways in the city of Los Angeles, and the Pacific Electric Railway, operating 868 miles of interurban lines in southern California.

Electric Railway Journal

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INTANGIBLE ASSETS OF RAILWAYS

A very popular charge against railways is that there is a great deal of water in the securities and that the extent of this inflation is represented by the difference between the par value of the securities and the value of the company's physical assets. The fact that the cost of developing a property is as legitimately a capital charge as an investment in physical property seems to some persons very difficult of comprehension. Even in official appraisals where an allowance is made for intangible assets it is often permitted grudgingly, as if it was something to which the railway was not entitled. It seems strange that this should be the case because the principle of intangible values is not one confined only to the public utility industry. It applies directly to many other lines of business, indeed to most of them, and it is recognized there as a legitimate charge against the cost of an article and as a factor in its value. In fact, if the extent to which the principle of intangible value is accepted in other lines of industry received some thought, we believe it will be found that the percentage claimed by the railway companies for this kind of asset is usually very moderate compared with that recognized as proper in other fields of trade.

INTANGIBLE ASSETS OF NEWSPAPERS

An example of this was shown this week in the recent appraisal of the estate of Joseph Pulitzer, publisher of the *New York World* and of the *St. Louis Post-Despatch.* The case is particularly interesting because the daily newspapers have usually been among the foremost to criticise the inclusion of intangible assets in appraisals of public utilities properties while they themselves form a conspicuous example of properties whose value consists very largely of intangibles. As a rule, a newspaper's tangible assets are few and inconsiderable, probably a printing office and possibly a building. Its chief asset is its reputation for supplying the news which a considerable body of readers want. This asset is purely intangible in character, but that it may be considerable in amount is shown by the Pulitzer appraisal and in the case of the *World* was placed at 24 per cent of the total value, and, in the case of the *Post-Despatch,* at 67 per cent of the total value. It would not be difficult to point out examples of intangible assets in other lines of business, but as the newspapers are fond of criticising the inclusion of intangible assets in railway valuations and as the principle involved is not different, this example is perhaps as good a one for them as any.

A DEPRECIATION RÉSUMÉ

Elsewhere in this issue we are publishing an extended analysis of the various kinds of public utility depreciation. Instead of spinning some new fine-drawn theories on depreciation, Mr. Fitting has endeavored to present the best thought on the subject, and the result is praiseworthy. While the student of depreciation problems will be interested chiefly in the clear-cut delineation of depreciation theory and practice, the value of the article to the layman lies mostly in the emphasis given to this point—that different reasons for calculating depreciation exist and therefore different methods of calculation may be used. Depreciation connected with appraisals involves the problem of the proper rate; depreciation as it concerns the financing of renewals deals with the creation and maintenance of adequate depreciation funds. In the latter case the use of a percentage of gross earnings to cover both maintenance and depreciation is eminently satisfactory. As long as it approximates the current and future expenditures, the discrepancy is not noticed. The chief point at issue in appraisal work, however, is that past and future depreciation should be determined as exactly as possible in order to give a sound basis for establishing the equity between capitalization and physical value, or for determining the basis of a "fair return."

METHOD TO BE USED

As to what scientific method of calculating depreciation should be used in appraisal work, we believe no general answer can be given. As Mr. Fitting says, the straight line, 50 per cent and mortality methods may all be sufficiently accurate, but engineers and accountants have not yet and probably will not in the future be unanimous in their support of any particular method. Difficulties or discrepancies under each method that seem negligible to one seem insuperable to others. As a matter of fact, the complexity of the general factors concerned in appraisal work and the dissimilarity of factors in individual cases make standardization of the subject seem impossible. Especially is this true in view of the uncertainty of estimating the life of property and the confusion regarding the very meaning of the term "depreciation." Each year, however, the question of calculating and accounting for depreciation is receiving greater attention, and two or three methods may finally be settled on to the exclusion of all others. In view of the present state of development of the question, as shown in Mr. Fitting's résumé, one can at least be optimistic in regard to such an outcome.

IMPORTANCE OF SPECIAL WORK MAINTENANCE

Unquestionably the most expensive part of track construction in paved streets is that contained in the special work. This is especially true when the traffic demands the best quality of materials, such as are used in hard center or solid manganese work. On the other hand, there is no single part of the railway equipment which receives so small a proportion of its proper attention and maintenance. Usually every precaution is taken at the time of purchase to secure good material and install it properly, but after it is installed the road department tries to forget about it. The track foreman does not call attention to defects until they have reached a point where they are dangerous, sometimes because his territory is too large for him to give proper attention to the initial stages and sometimes he is incompetent and not a close observer. In the solid work little or nothing can be done when a defect does occur, unless it is a question of joint or foundation trouble. Repairs can be made in insert work, and usually the first difficulty to arise is that of a loose insert. The insert does not become loose instantaneously; instead it becomes so gradually and in so doing reveals its condition before it reaches the danger point, or at least before it becomes so defective that it reflects its condition in the substructure, as well as in the rolling stock.

As a rule it may be said that with the larger companies, that is in cities of 100,000 or more, or on properties where the track mileage is of corresponding length, experienced gangs should be retained who can devote their entire time to insert repairs and renewals. If this is done not only is an increased life in a given layout insured, but many other defects dependent upon the excessive impact blows brought about by the loose insert are eliminated. With the smaller companies the question of special work maintenance is a difficult one to solve except where the traffic is so light that a loose insert is an extraordinary occurrence. On the other hand, many manufacturers now retain experts in this work, and are in a position to furnish them to railway companies when insert renewals or resetting is required.

If the substructure has been carefully prepared, the foundation properly installed, the right arrangement and lengths of ties used, and the proper type of special work employed, track special work maintenance even then is a problem of eternal vigilance and prompt repairs. Probably the mechanical joint is the weakest point in the special work layout structure. It has been suggested that this, too, could be improved if a riveted joint or some type of welded joint were employed in its place. While this would involve other complications, such as making renewals more difficult and not allowing for expansion or creeping at street intersections, the latter difficulties could be obviated in the tangent track. The elimination of the mechanical joint in a special work layout should so increase its life that the slight increased cost of renewals would be worth while. Moreover, if the welded, riveted or anything other than the mechanical joint is worth while in tangent track construction, it certainly should be economical in special work layouts where the amount of money invested per foot of length of track is many times that of straight track construction. Of course, in some instances it might be practically impossible to make the weld or apply the rivets owing to limited clearance, but in these cases treated bolts could be used in reamed holes with a driving fit. At the same time a perfect fit between the rail and the joint should be had to eliminate lost motion and thus insure a result equaling in a measure the more permanent types of joints.

POSSIBLE PIT PERFECTION

It is very gratifying to read in the office of the superintendent of equipment the thorough schedule of inspection duties set down for the instruction of the pitman, but it is rather disconcerting to find that working conditions at the pit make it a sheer impossibility to obey the schedule requirements. We regret to say that pit betterments have not kept pace with other improvements in shop layouts. That this neglect cannot be due to a lack of good models will be evident from the following consideration of what has been done by a few progressive railways during the last decade.

About ten years ago one of the large Eastern companies installed in several of its car shops the indirect or blower system for heating the pits. This system is still in operation to-day and is proclaimed by its users as far superior to any form of steam heating for the following reasons: First, the hot-air outlets can be adjusted to suit the convenience of the near-by workmen far more readily than a steam layout; second, unlike pipes or radiators, the outlet covers are almost flush with the pit walls so that maximum working space is obtained while all chance of burns or scalds is eliminated; third, in contrast to the unavoidable leakage of a steam system, the heat comes in the form of dry air which removes even the humidity due to dripping cars and general atmospheric conditions; fourth, the forced-draft system embodies also good ventilating qualities and so dissipates unpleasant odors; fifth, and best, it is reversible because it is just as available for furnishing cool drafts in summer as warm drafts in winter. The extra cost of the indirect system should therefore not deter the operator of closed pits from using a heating and ventilating system that so clearly promotes the work of the men to whom the most disagreeable yet most important part of car maintenance is assigned. The fact that a certain railway turned to steam after trying forced draft shows simply that a good installation is not to be obtained by guesswork but by scientific design.

In like manner, on most properties, the design of pits for the different purposes of inspection and repair leaves much to be desired. It is only too common to see a man obliged to work alongside a truck in the attitude of a Japanese contortionist when a properly located niche in the wall of the pit would allow him to work standing erect. Again, instead of kneeling alongside or bending over to pack a journal box, the same work could be done from a convenient sitting posture if the devil-strip was built with a wide gutter or depression alongside the rails. These suggestions, drawn as they are from the practice of alert railways, can be followed to good advantage by every railway which wants to get the best results possible from inspection and maintenance in closed pits.

RELIEVING TRAFFIC CONGESTION IN LARGE CITIES

Conspicuous efforts have been directed within the last few months toward improving vehicle, street railway and pedestrian traffic conditions at the main street intersections of large cities. Until lately, regulation of traffic has not received the attention in our Eastern cities which is commensurate with their density of transportation. It is encouraging, however, to note the recently increased number of experiments and the extension of old systems and adoption of new methods along these lines. These innovations fall roughly into two classes: first, systems designed primarily to protect the pedestrian while he is crossing streets and waiting for cars; and, secondly, systems designed primarily to facilitate the movements of cars and vehicles.

Experiments of the first-mentioned class, namely, those primarily affecting pedestrians, include mainly the establishment of various types of safety zones, where prospective passengers may await approaching cars without danger from automobiles and other vehicles. The success of the simple type of painted zone, as tentatively adopted on Broadway, New York City, depends largely on a more rigid police observation than has yet existed to enforce non-encroachment by vehicles and also upon more scrupulous street cleaning in winter to prevent the painted zones from becoming indistinguishable under snow.

The use of the more easily recognizable iron standards to mark off safety zones, in vogue in several cities and spreading in popularity, offers passengers more certain protection from vehicles, without requiring the close police supervision necessitated by ordinary painted zones. Raised isles of safety, though more expensive than movable standards, present a neater and more well-defined and permanent appearance, facilitate boarding and alighting from cars, and serve as convenient platforms for passengers transferring from urban to interurban service, as in the case of the Public Service Railway in Newark, N. J. The very permanence of raised isles of safety, however, may prove a hindrance in overcrowded cities where mobile traffic laws and conditions are likely to demand a relocation of the zones. The advantages claimed for safety zones in general, in that they protect car passengers and bunch them so that less time is lost in boarding and alighting from cars, is well justified by the results obtained by cities which have established them. With an eagle eye and stiff backbone on the part of the police the safe approach to zones may be increased, as in Detroit, by parallel painted lines at the crossing, outside of which pedestrians may not venture.

The second type of experiments, namely, those designed primarily to facilitate the movements of cars and vehicles, relates to the handling of traffic by policemen. Philadelphia's new semaphore signal system, erected at her busy Chestnut and Broad Street crossing, is a valuable improvement over the ordinary whistle-and-beckon method. Its easy operation simplifies the distracting work of the local traffic policeman and enables his signals to be made visible at a greater distance to the drivers in the rear. The "multiple-unit" traffic control system, tried on Fifth Avenue, New York, in which one officer flags orders to his comrades for some distance down the avenue, should prove a helpful suggestion for creating a more simultaneous movement of traffic and involve less frequent delays. This course seems to be a logical answer to the question, why, if two sections of an artery are severed, apply more than one tourniquet? This system has hardly yet had a chance to demonstrate its worth under the most severe conditions, since it was attempted only during light summer traffic. Another fresh development of efficient traffic control is Cleveland's ingenious electrically lighted signal controlled from a booth which also contains connections with the police and fire alarm circuits, so that the street may be cleared for the rapidly moving emergency vehicles. The very latest move in the right direction is Brooklyn's new regulation on Fulton Street which prohibits vehicles from crossing the streets except at street intersections, an especially wise provision for a busy surface car route which is flanked by elevated railroad pillars.

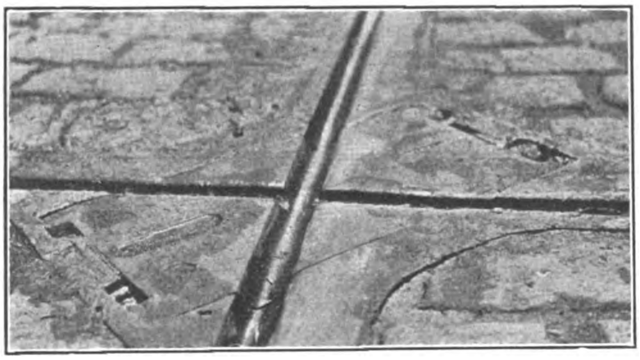
The two classes of traffic relief, outlined above, are dependent on each other and should be combined in so far as conditions of traffic density, pavement and location of tracks, width of streets and character of police service permit. For example, safety zones may facilitate interweaving of traffic by forming points around which vehicles should be made to turn in a counter-clockwise direction, branching to the right at the desired street. The counter-clockwise movement may be made even smoother by clipping off pointed curb corners, where feasible, as performed in Columbus Circle, New York, and at City Hall, Detroit. To show another illustration of interdependence: If safety zones for cars on narrow streets are to serve their purpose without merely obstructing the way, public parking and cab-stand privileges must be abolished. When the present embryonic attempts at systematizing traffic prove definitely practicable or abortive, the weeding out of useless systems through the natural law of survival will reduce their number to only a few of the tried-and-true type. A standardization of highway regulations would be of immense benefit to the safety of the stranger, as illustrated by the feeling of heart flutter experienced by the average American on crossing a "left-handed" London street for the first time.

At the present time this problem of traffic relief is being extensively investigated by safety committees, traffic committees, municipalities, police departments and other public-spirited individuals, and considering the zeal now directed toward loosening the Gordian traffic tangle it is hoped that the near future will see the congested and dangerous centers of our large cities rendered much more suitable pleasure haunts for the octogenarian.

Examples of Insert Special Work Failures

An Illustrated Presentation of the Various Typical Forms of Imperfections Discussed in the Article in the Issue of Sept. 19 Entitled, "A Study of Insert Special Work Failures"

Examples presented in the accompanying views are intended to be typical of the conditions found in various types of insert work under different traffic conditions. As mentioned in the article entitled "A Study of Insert Special Work Failures," published in the issue of this paper for Sept. 19, the most prominent form of defect developing in insert work is the loose insert plate. As a result of this study it is considered impossible to set any average length of time after which inserts will loosen under given traffic conditions. It may be stated that a large number of inserts become loose during their wear-life and must be renewed or reset periodically. Loose inserts may appear within a few weeks after installation, or it may be years before they do so.



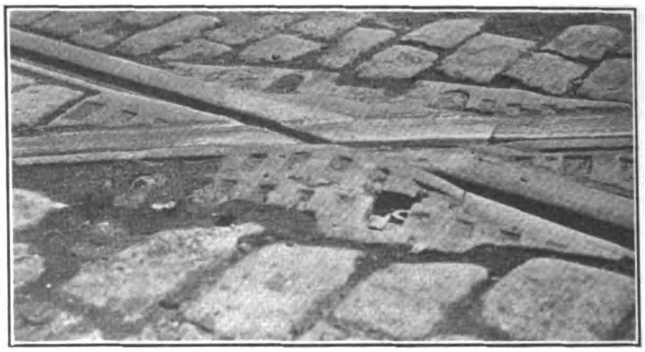
INSERT SPECIAL WORK—FIG. 1—INSERT WITH SPELTER BEARING AND KEYED-IN FASTENING, JUST BEGINNING TO LOOSEN

Installed September, 1910; traffic, fifty-five wheels per hour

EXAMPLES OF LOOSE INSERTS

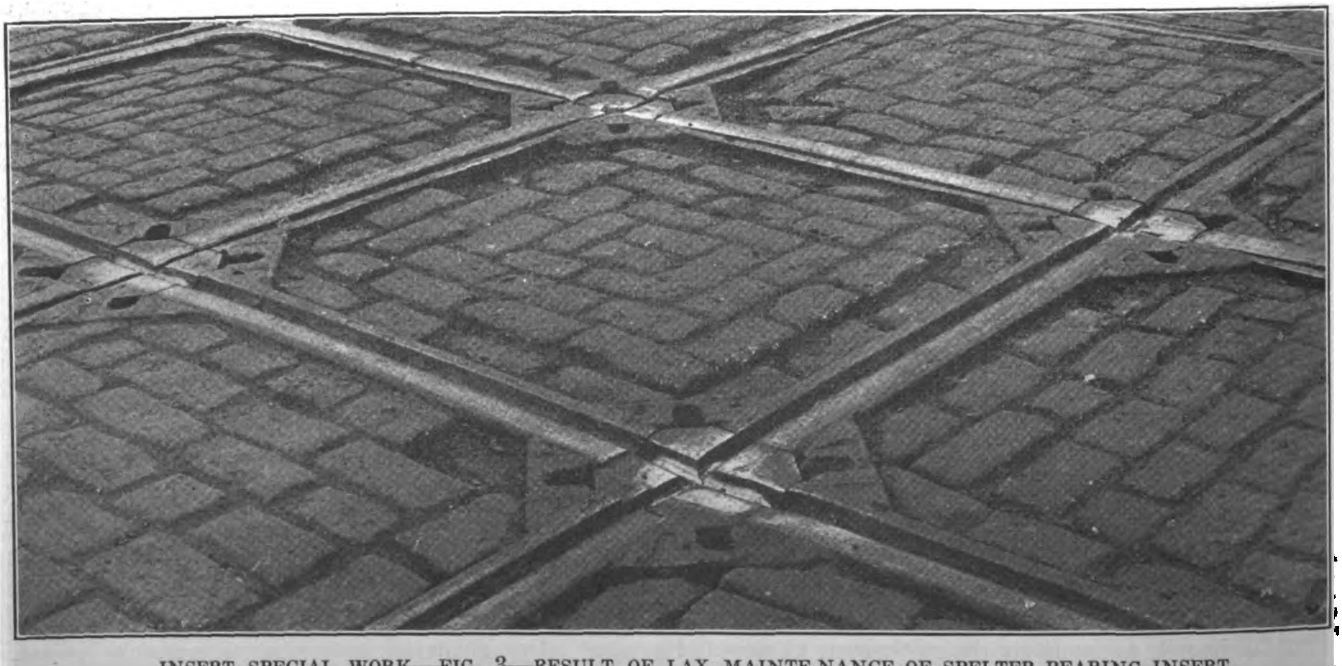
Fig. 1 shows an example of a keyed-in manganese insert supported on spelter which has just begun to loosen. The main casting is of steel, consequently this is about the only defect that will occur. The spelter has begun to loosen around the keyways, and the insert has begun to move under traffic. This particular frog is built of a 9-in. 129-lb. rail section, and has been down since September, 1910, with an average car service of 55 wheels per hour or 206 tons per hour over it during its life.

While it is believed that the acute-angle inserts do not loosen as often as those used in obtuse-angle frogs, they do occur. Fig. 2 shows an example of an insert, renewable from the pavement surface and set on a spelter bearing. The frog is built of 9-in. 129-lb. rail and was installed in March, 1911. One of the fastenings has become loose, and the insert is loosening in the pocket. Unquestionably, however, immediate attention would relieve this situation, or, at least, would postpone the necessity for resetting for some time. The fact however, that the insert has become loose in the pocket indicates that it must be reset ultimately. The average number of wheels passing per hour over this frog is 102 and the average tonnage per hour is 382.



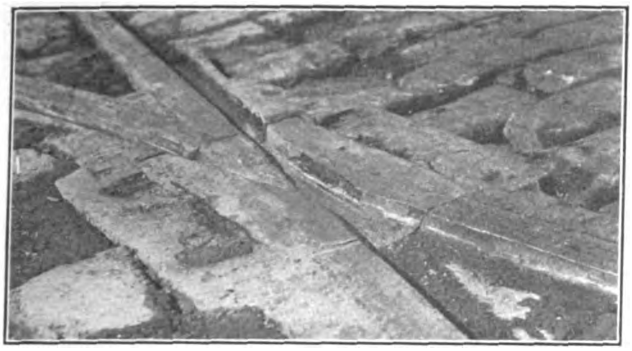
INSERT SPECIAL WORK—FIG. 2—INSERT WITH SPELTER BEARING AND LOOSE PATENTED, BOLTED FASTENING IN NEED OF RESETTING

Installed March, 1911; traffic, 102 wheels per hour



INSERT SPECIAL WORK—FIG. 3—RESULT OF LAX MAINTENANCE OF SPELTER BEARING INSERT

Installed September, 1907; traffic, 153 wheels per hour



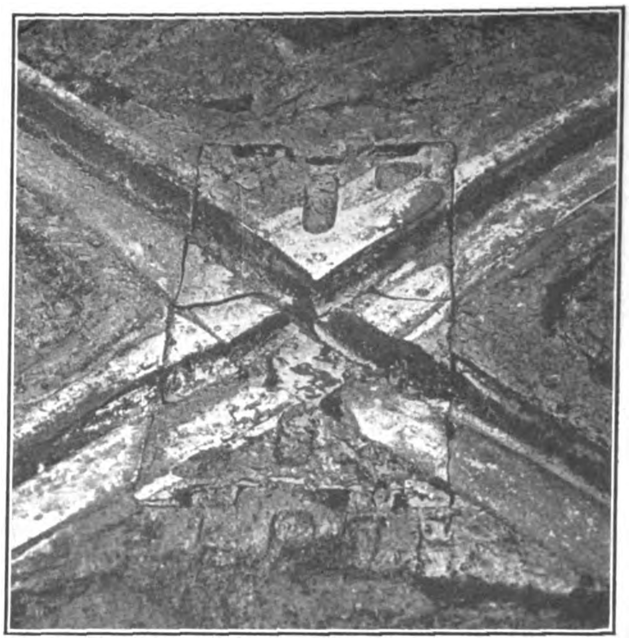
INSERT SPECIAL WORK—FIG. 4—STYLE, ACUTE-ANGLE SPELTER-BEARING INSERT WITH PATENTED BOLTED FASTENING, WITHOUT THROATWAY GUARD

Installed November, 1909; traffic, 150 wheels per hour

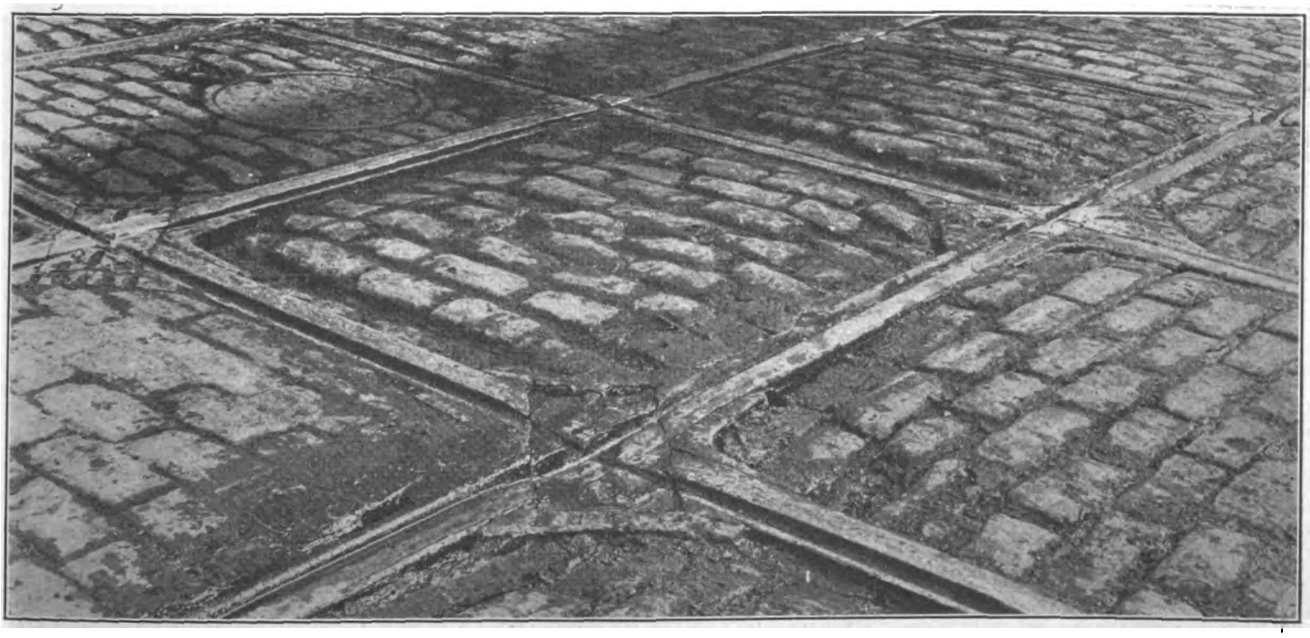
An excellent example of what may be expected from lax track maintenance, is shown in Fig. 3. This is a cast-iron-bound manganese, renewable insert crossing installed in November, 1909. These inserts are supported entirely on spelter and are fitted with fastenings so that they are renewable from the pavement surface. While the crossing shown has given excellent service, its wear-life limit would not have been reached at this time except for the loose inserts. Of course the loosening of the inserts is chargeable to the design rather than to the manner of installation, but the complications which were caused by the loose inserts were clearly chargeable to the roadway department. In this illustration it will be noted that the inserts at all four corners of the right-angle crossing are loose, the spelter is entirely gone around the edges, and the inserts have pounded down below the rail surface. Most of the inserts have dished under the severe impact blows, and the arms have rounded over to meet the surface of the inserts. Resetting or replacement of these inserts is practically impossible, although a fairly good job could be accomplished by resetting and grinding the running rail arms. The average traffic over this layout is 150 wheels, or 562 tons per hour.

Fig. 4 is an old-style, acute-angle, hard-center frog, renewable from the surface and set on a spelter bearing. There is no throatway guard, consequently there is clearly defined wear in the throatway at the point where a wheel enters the insert plate. Wheels in a canted truck strike this point and are righted before they pass through the insert throatway. This frog was installed in September, 1907. It is built of 7-in. 95-lb. T-rail. The insert has been reset several times, and it is probable that the loosening of the insert may be charged to failure to provide a guard to lead wheel flanges into the insert. Traffic moves over this frog in two directions at an average rate of 153 wheels per hour during the entire year.

Figs. 5 and 6 show typical examples of the complications arising as a result of loose inserts. In this installation, which was laid down in March, 1911, all of the inserts are loose, causing the wheels to pound over the intersecting flangeways. This forces the frog to pump on its foundation, and this pumping action, in the presence of water, forces the sand cushion from be-

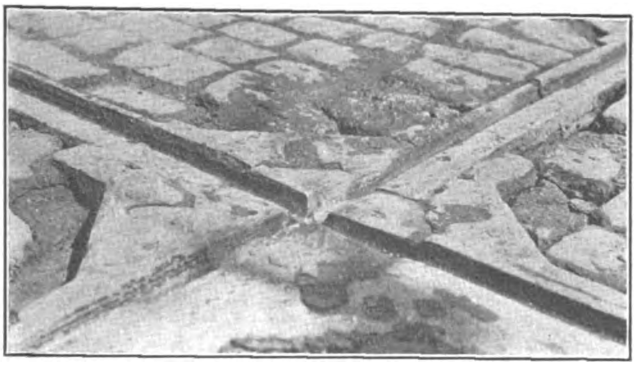


INSERT SPECIAL WORK—FIG. 6—CLOSER VIEW OF INSERT SHOWN IN FIG. 5

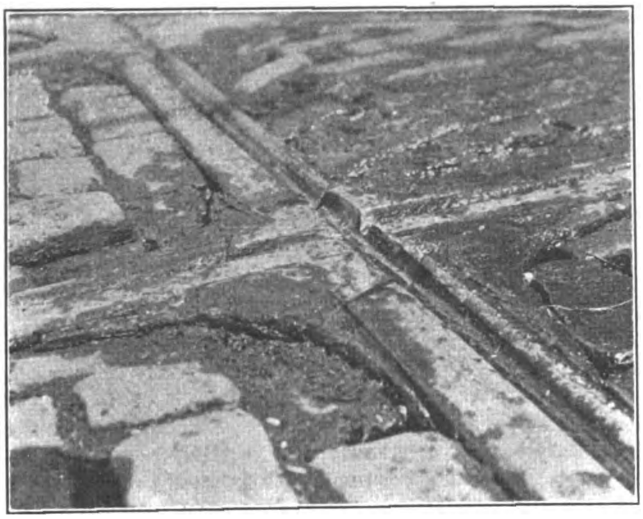


INSERT SPECIAL WORK—FIG. 5—ANOTHER EXAMPLE OF LAX MAINTENANCE WITH SPELTER BEARING INSERT

Installed March, 1911; traffic, 200 wheels per hour

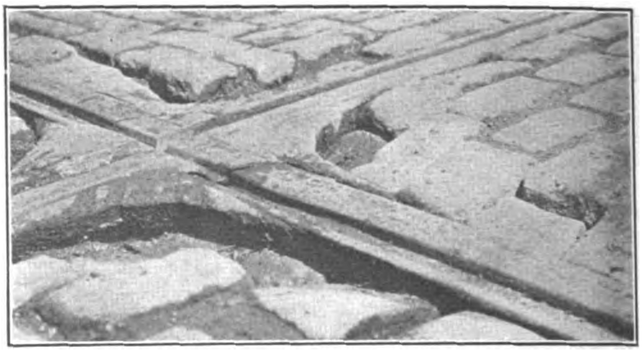


INSERT SPECIAL WORK—FIG. 7—SPELTER BEARING INSERT WITH ARM BEGINNING TO LOOSEN IN CASTING
Installed in April, 1908; traffic, 124 wheels per hour



INSERT SPECIAL WORK—FIG. 8—PARTIAL MACHINED BEARING INSERT WITH ARMS LOOSENED IN CASTING AND TIGHT INSERT
Installed November, 1910; traffic, 154 wheels per hour

neath the paving blocks and allows them to drop and form serious ruts. These inserts are of a keyed-down, spelter-supported type. The condition of the layout as well as the surrounding pavement is not chargeable to the manufacturer, but to the railway. The inserts are still in good condition and should have been reset as soon as they became loose.

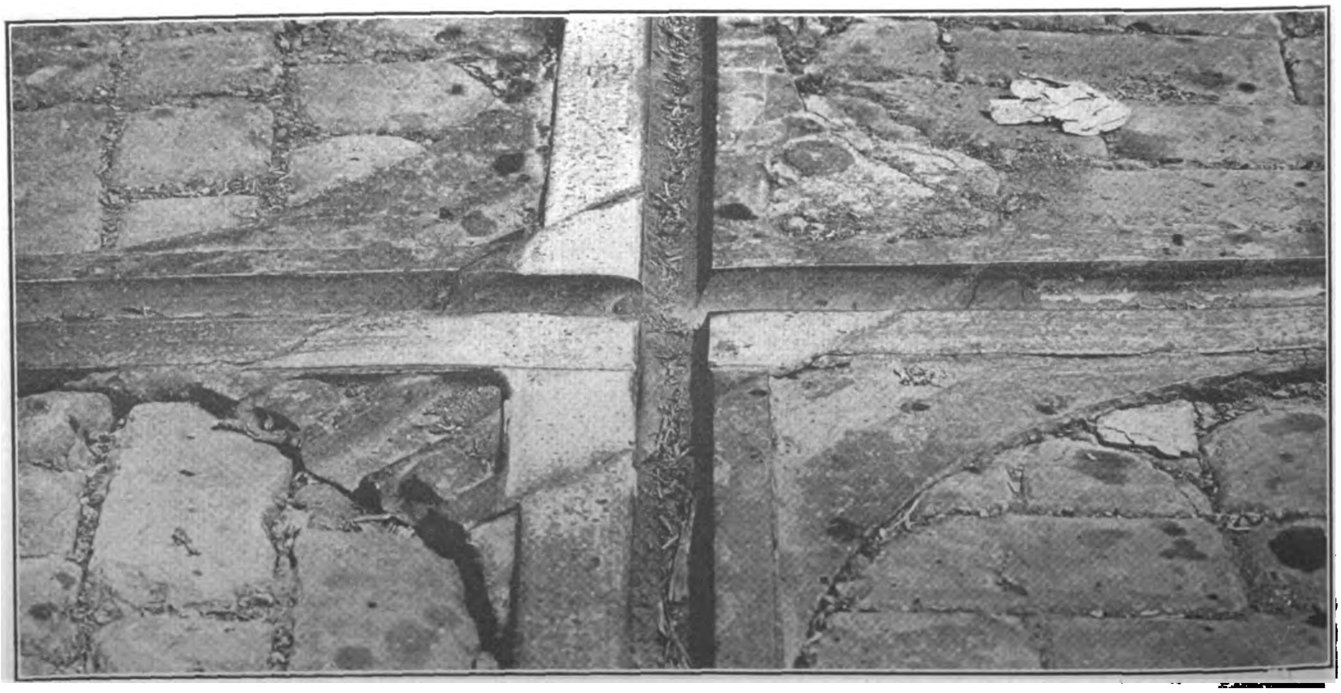


INSERT SPECIAL WORK—FIG. 9—RIGHT-ANGLE FROG IN SAME LAYOUT AS FIG. 8, LOOSE ARM FURTHER ADVANCED

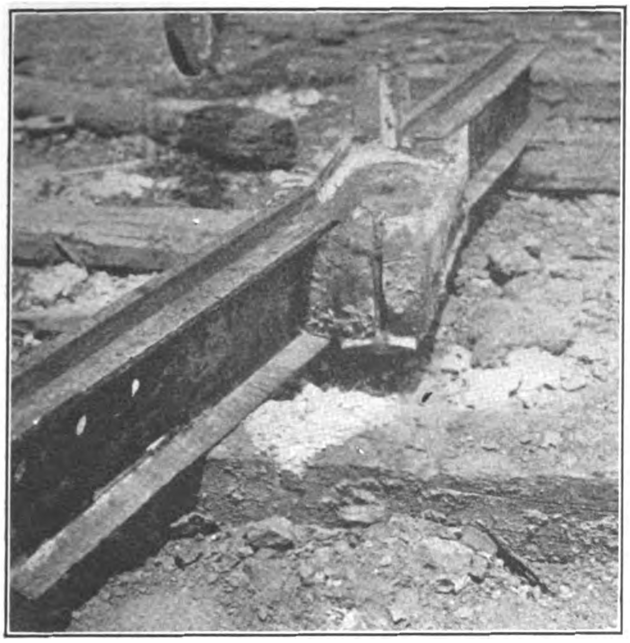
The insert plate in Fig. 6 became loose from one of two causes. Either the spelter around the edges broke away from that forming the bearing and was picked up by traffic, or the spelter bearing flowed, or became compressed, or did not properly fill the interstices betweeen the plate and the pocket floor. In either case the fastenings were partially released. As a result the wheel impact at the intersecting flangeway has dished the plate by depressing it into the space originally occupied by the spelter bearing, a condition which would not occur with a machined bearing. The effect of the dishing on the manganese steel plate was to break it, as shown in the illustration, and was due either to fatigue in the metal or because the plate was slightly brittle when it came from the annealing process.

Loose Rails in Casting

Loose and broken rail arms in the cast-iron-bound work are the second form of defect which is most common. Figs. 7, 8 and 9 are examples of the beginnings of loose arms. In Fig. 7 is shown a 6-in., 70-lb. T-rail, iron-bound, right-angle frog, installed in April, 1908. The insert in this is renewable from the pavement surface and is supported entirely on spelter. The

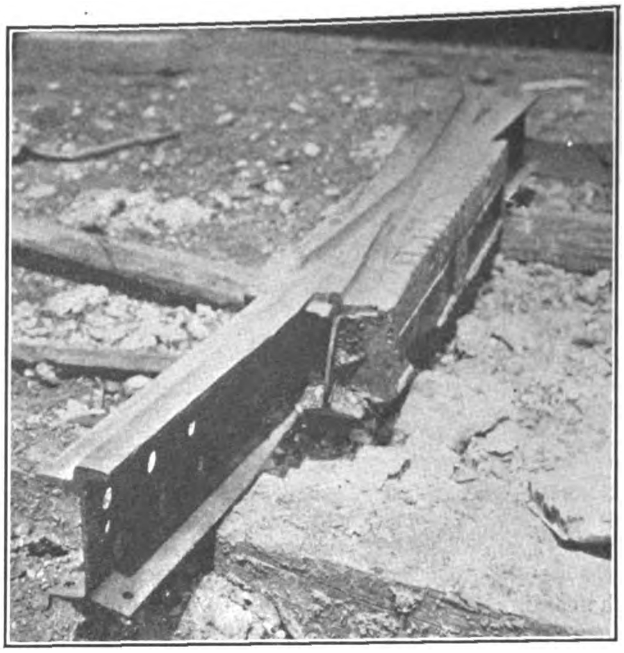


INSERT SPECIAL WORK—FIG. 10—BEGINNING OF LOOSE ARM IN MACHINED BEARING INSERT RIGHT-ANGLE FROG
Installed April, 1911; traffic, 142 wheels per hour



INSERT SPECIAL WORK—FIG. 11—BROKEN ARM IN CASTING WITH 9-IN. 117-LB. RAIL

Installed in 1905, removed 1914; traffic, combination, city and interurban



INSERT SPECIAL WORK—FIG. 12—BROKEN RAIL IN CASTING WITH 9-IN. 92-LB. RAIL

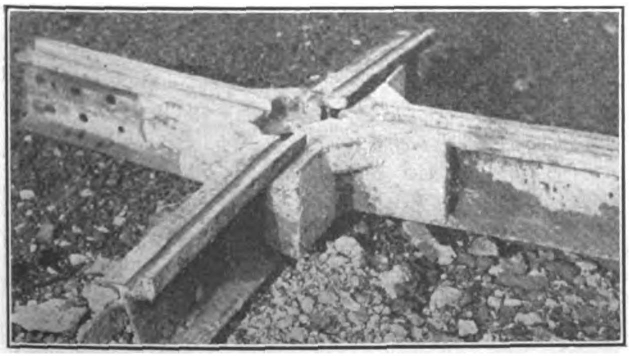
Installed 1905, removed 1914; traffic, combination city and interurban

insert is loose and one rolled rail arm has loosened in the main casting. An examination of this frog on the ground indicated that the arm is broken in the casting. The cause of this failure may be attributed to a settling of the foundation under the intersecting flangeways of this frog and the one adjoining. This brought a transverse breaking strain on the arm, when the load was applied, just at the edge of the insert plate. The defective pavement is the result of the pumping or springing movement of the frog. Traffic moves over this frog in two directions at an average rate of 124 wheels per hour.

Fig. 8 illustrates a manufacturer's problems, for not only are all of the arms in this frog loose, but a number of arms are also loose in other frogs in this layout. Fig. 9 shows one of these in which a loose arm has become more pronounced and, in pumping, has removed the sand cushion from beneath the pavement and produced ruts aroung the frog. It will be noted in Figs. 8 and 9 that the inserts are tight, although they have been in service since November, 1910. These are of iron-bound, rolled-rail-arm construction, with the inserts bolted down on a partially machined bed. The looseness of the arms is to be attributed to the use of a too small grip area between the casting and the rolled-rail arm. These frogs are constructed of 9-in., 129-lb. girder grooved rail. The average traffic over them is 154 wheels per hour.

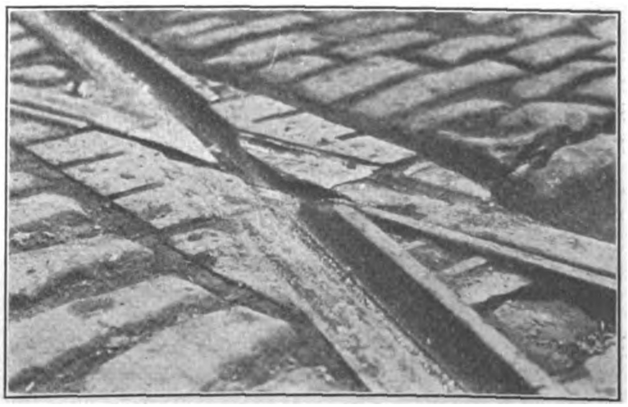
Fig. 10 shows still another example of the beginning of arm loosening in cast-iron-bound work. A crack has developed along the edge of one of the running-rail arms where it joins the binder casting. The trouble here appears to be due to unequal bearing on the foundation, bringing undue strains on the rolled-rail arm. This frog is of the machined-pocket type, and it is built up of 7-in. 108-lb. girder grooved rail. It was installed in April, 1911. Traffic moves two ways over this frog at an average of 142 wheels per hour.

Although loose arms occur under city traffic, as shown in Figs. 7, 8, 9 and 10, their occurrence is more frequent under interurban traffic, where the loads are greater. Typical defects of this kind under a combined interurban and city railway traffic are illustrated in Figs. 11 and 12. Fig. 11 shows an installation made in 1905 and removed in 1914. It was built up of 9-in. 117-lb. girder grooved rail and set on an 8-in. concrete slab foundation, with a 2-in. gravel ballast cushion. The break began in the base of the rail at the edge of



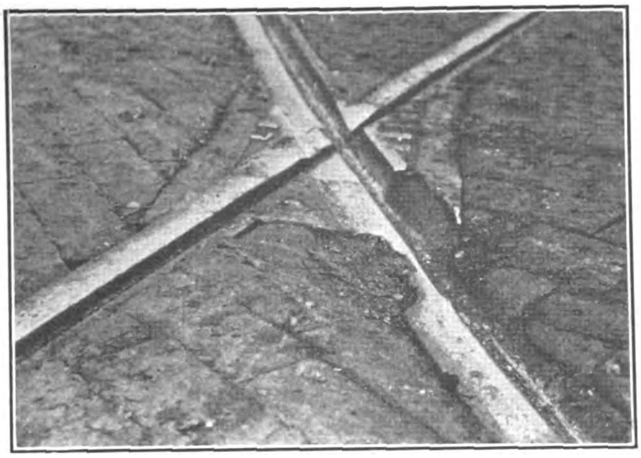
INSERT SPECIAL WORK—FIG. 13—LOOSE ARMS AND BROKEN CASTING WITH RIGHT-ANGLE FROG

Installed 1905, removed 1914; city and interurban traffic



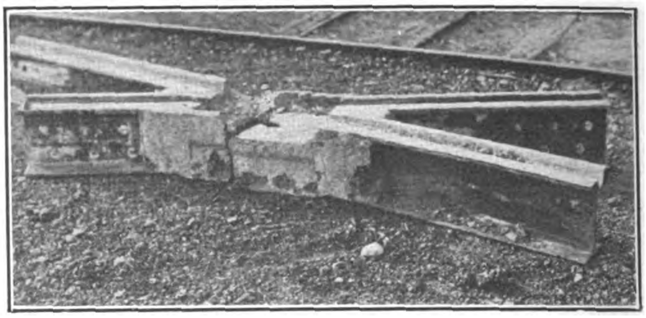
INSERT SPECIAL WORK—FIG. 14—CUPPED RAIL ARM IN ACUTE-ANGLE FROG

Installed July, 1914; traffic, 170 wheels per hour



INSERT SPECIAL WORK—FIG. 15—CUPPED RAIL ARM IN ACUTE-ANGLE FROG

Installed August, 1903; traffic, 335 wheels per hour



INSERT SPECIAL WORK—FIG. 16—BROKEN CASTING IN FROG WITH 9-IN. 117-LB. RAIL ARM

Installed 1905, removed 1914; traffic, combination city and interurban

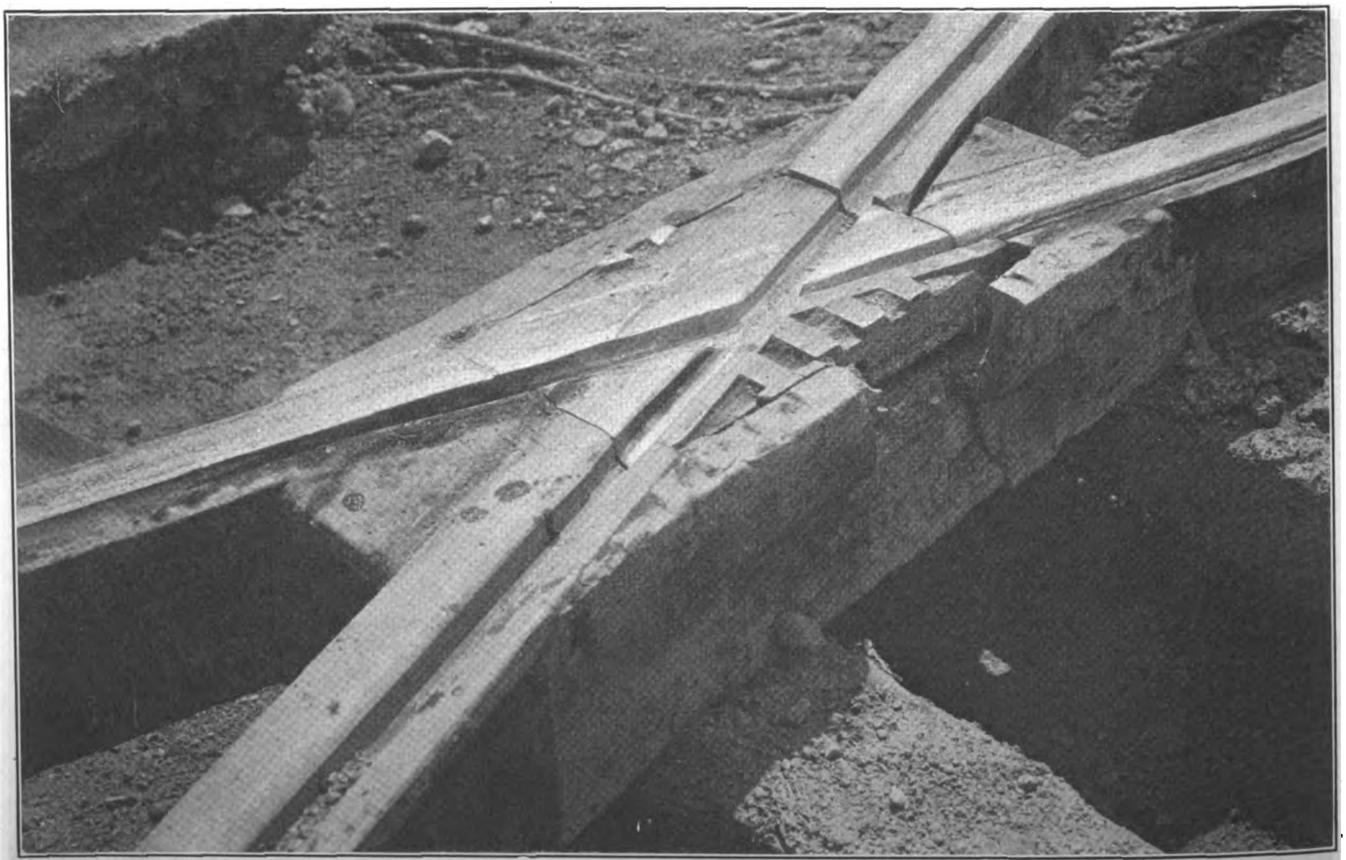
the casting, continuing through the web by way of the weakest section, and running out under the ball of the rail where it joins the insert pocket.

Fig. 12 shows a 9-in. 92-lb. rail, iron-bound, insert frog installed in 1905 and removed in 1914. Its failure was caused by a break in the rolled-rail arm at the edge of the binder casting. This break may have been due either to unequal foundation bearing or to the partial annealing effect on the rolled-rail arm when it was set in the casting. The frog in Fig. 12 undoubtedly would not have failed in this manner if a heavier girder grooved-rail section had been used.

In Fig. 13 is shown another example of loose arms, but, in connection with this frog, a broken casting has occurred. This right-angle frog was built up of 9-in. 117-lb. girder grooved rail. The character of the failure indicates that there was settling of the frog along the line of the break. This tended to elevate the rolled-rail arms which intersect the break tranversely, resulting in a fracture along the line of least resistance between the casting and the rolled-rail arms.

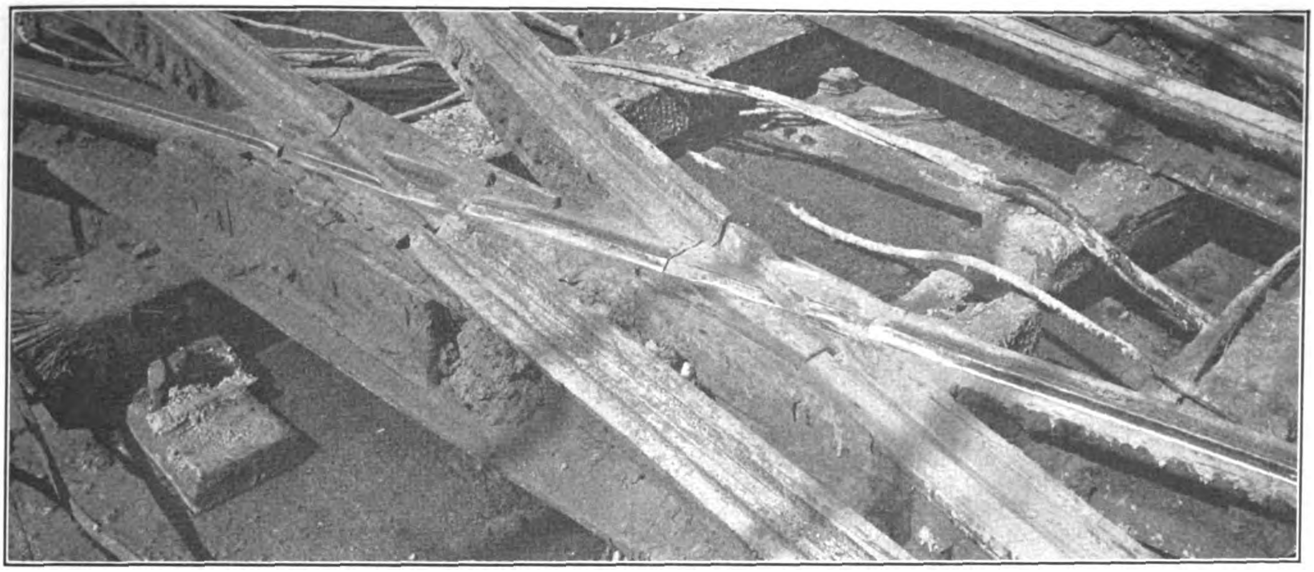
CUPPING IN THE FROG ARMS

A form of defect which is less common than the others mentioned, yet which is found in a few instances and in practically all classes of iron-bound work, is the cupping of what appears to be soft rail at the point where the rolled-rail arm joins the insert. Figs. 14 and 15 show typical examples of this. Fig. 14 shows a cast-iron-bound, 9-in., 125-lb. girder grooved rail, acute-angle frog with an insert supported on a machined pocket, which has been in service since July, 1904. While this example is not exactly typical, since the piece has given such excellent service, it does show the character of the failure in question. Fig. 15 shows a cast-iron-bound, manganese insert, acute-angle frog built of 9-in. 125-lb. girder grooved rail in which the insert is



INSERT SPECIAL WORK—FIG. 17—BROKEN CASTING IN FROG WITH 7-IN. 108-LB. RAIL

Installed 1905; traffic, two-minute headway with city cars



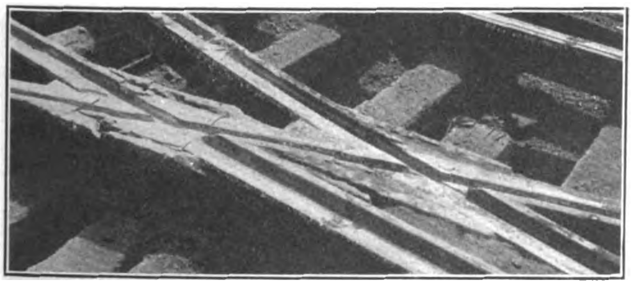
INSERT SPECIAL WORK—FIG. 18—BROKEN CASTING IN FROG REPAIRED TEMPORARILY, SAME LAYOUT AS FIG. 17
Traffic, combination city and interurban

entirely supported on spelter. This is also a very old frog which has been in service since August, 1903, but it serves to show the effect of cupping in the rolled-rail arm. In this particular instance the ball of the rail has been mashed down over the web.

EXAMPLES OF BROKEN CASTINGS

A type of failure more common to interurban railway than to city railway track special work, is the broken casting. In every instance noted in the large number of layouts inspected during the course of this study, the failures of this type were in the cast-iron-bound insert work rather than the cast-steel arm work. As a rule defects of this kind occur in acute-angle frogs and in switches and mates, and no doubt they are due to transverse bending strains applied to castings which are too small in section to withstand them.

As pointed out in last week's issue, the remote cause may be either the use of an improper foundation or of a casting inherently too light. The following examples illustrate the efforts of both of these sources of weakness.



INSERT SPECIAL WORK—FIG. 19—BROKEN CASTING IN FROG, WITH SAME LAYOUT AS FIG. 17; BEARING PLATE
Installed and repaired; traffic, combination city and interurban

Fig. 16 shows an example of an acute-angle frog in which the casting has broken through the center. This frog was built up of 9-in. 117-lb. girder grooved rail with the insert keyed down on a spelter bed. Traffic over this particular frog included 24-ton double-truck street railway cars and 45-ton double-truck interurban cars. It was installed in 1905 and removed in 1914. The installation was made on an 8-in. concrete slab with a 2-in. gravel ballast cushion beneath the ties. Special ties were not used, but standard ties were so spaced as to transmit the track loads to the foundation uniformly. While it is impossible to state the actual cause of this break, it is believed that the casting was too small for interurban traffic. Again the small size of this casting, in combination with an unequal bearing on the track foundation, either in the original installation or as a result of impact blows dealt in the intersecting flangeways, caused the casting to become a suspended point, and the break occurred under a heavy wheel load.

Figs. 17, 18 and 19 show three frogs in a single layout in which 7-in. girder grooved rail was used with a 7-in. 108-lb. guard rail. This layout was installed in 1905 and comprised cast-iron-bound work with renewable inserts supported on spelter. One rail in the frog, shown in Fig. 17, was not regularly operated, while the rail beginning at the bottom of the illustration and disappearing at the top, is used by street railway cars. The average service includes a two-minute headway with double-truck, 20-ton cars. This layout was installed on wooden ties with an 8-in. concrete slab foundation and a 2-in. gravel ballast cushion. Traffic over it has been light throughout its life, consequently it is believed that the shallow depth of the casting and the poor grade of the cast metal are real causes of the break in the casting. It is also possible that the non-uniform character of the foundation was a contributing cause.

Fig. 18 shows also a cast-iron-bound frog built of 7-in. 108-lb. guard rail. Neither the running rail nor the insert in this case shows unusual wear, yet this layout must be renewed because the casting has broken. An average two-minute headway with double-truck city cars in conjunction with 45-ton interurban cars every half hour, make up the traffic over this layout. The track was installed in 1905, and for the past four years the casting at the side of the insert has been broken. In an effort to repair the layout, plates have been bolted on the sides to hold the hard center in place, and a heavy plate inserted beneath the two frogs to give it additional support. The break in the casting may be attributed to the use of 7-in. rail in special work over which 45-ton interurban cars are operated. Fig. 19 is another view in the same layout and is similar to the one shown in Fig. 17, over which half-hourly interurban service and two-minute headway by double-truck city cars are maintained. The plate beneath the frog was inserted in making repairs in 1912.

Depreciation

An Extended Analysis of the Different Kinds of Depreciation Which May Occur in the Physical Property of a Public Utility Company, the Various Methods Evolved for Computing This Depreciation and a Comparison of Their Merits and Demerits

BY RALPH U. FITTING, WITH HARRIS, FORBES & COMPANY, NEW YORK

The physical property of an operating company which has been long in use will show loss in value and utility, no matter how well maintained. The earning power may not be diminished thereby, but inevitably a certain portion which cannot be replaced will have worn away and can only be brought to full value and utility by complete renewal. This may be a large or small part of the total value, depending on its characteristics.

Obviously, repairs cannot be continuously made to keep the investment to its full worth. For example, it is impossible to replace the wear on rails or overcome the ravages of chemical deterioration due to rust and decay. Therefore, admitting the gradual reduction in value of the physical property (not real estate), some method must be used to determine the loss in value.

The question arises as to what is "depreciation," and whether it is the: (1) deterioration of money value; (2) deterioration of utility value; (3) necessary amount to keep the investment in constructed property up to 100 per cent.

Depreciation is really definable by any of the above, depending on the particular use to which it is to be applied and point of view.

USES FOR CALCULATING DEPRECIATION

In general, there are three distinct uses for calculating depreciation, as follows: (1) equity for capitalization from estimated appraisal duplication value; (2) depreciated duplication value for rate-making purposes; (3) annual reserve which is to be taken from earnings to offset depreciation due to various losses in order to keep physical property up to 100 per cent.

In the first case, in determining value at the time of appraisal to indicate the equity between physical worth and capitalization, depreciation covers the loss of value due to past operations.

In the second case, it is not only necessary to determine depreciation due to past operations to find total investment on which to base "fair return" but also to estimate depreciation on future operations in order to safeguard owners.

In the third case, the application is somewhat different, since depreciation is represented by an accrued fund made up from earnings to offset the reduction in investment due to losses in value (and losses in utility in so far as worth is affected) to provide for renewals made necessary. These requirements may be brought on also by reason of age, obsolescence, inadequacy, changed demand, etc. Such funds by usual practice are accrued by monthly or yearly reserves to offset the original cost within the estimated life.

The depreciation fund so accrued may be used in any of the following ways:

1. A fund accrued against each piece of property and held as an invested fund during the life of such piece of property.
2. If the fund is general it can be used for replacements without particular reference to locality in order to maintain the physical property as nearly as possible to a constant value.
3. The fund can be kept in bank and used to purchase bonds of the company.
4. The fund can be reinvested in extensions of the company's property.
5. The fund can be used to purchase the securities of other companies.

If depreciation is not provided for by a reserve fund, then it must be considered to be provided in one of the following ways:

1. By current repairs and replacements all charged to maintenance as required.
2. By expenditures from surplus as required.
3. By distribution as dividends out of earnings to offset probable loss in investment.

Depreciation is not to be confused with bond sinking funds.

Bond sinking funds and depreciation accruals are more or less analogous in so far as they relate to the protection of the investment, and the tendency in modern financing seems to be away from the establishment of bond sinking funds as such and to establish in lieu a "sinking or renewal fund," in which case the company has the option of using such fund for purchasing its own bonds or using it for extensions. Obviously, against such extensions no further bonds can be issued, since the investment is increased purposely to protect the bonds outstanding.

The line of demarcation between maintenance and depreciation is not well drawn nor are the definitions by the commissions clear on the difference; in general, however, each may be determined by the effect on the life of the equipment concerned.

If the changes do not increase the life of the equipment, the expenditure may be considered as covered by maintenance; if the life is lengthened, then it is depreciation. The safest way, therefore, is to consider maintenance and depreciation as collated and to be provided out of the same fund.

It is plain, therefore, that depreciation is a loss of value which must be made to keep the investment uniform, in the case of a bonded debt, either by increasing the investment or reducing the bonds outstanding in order to keep the margin of security uniform; and for appraisal purposes find the reduction of the estimated duplication value from new value for the purpose of determining equity for capitalization or for rate-making purposes.

KINDS OF DEPRECIATION

The various kinds of depreciation, from the standpoint of loss of value, may be classified under two heads: (1) physical depreciation, and (2) functional depreciation.

Physical depreciation (or the natural) is the result of decay and begins immediately after installation.

Functional depreciation is the result of lack of fitness for function, as changed surroundings, growth of business, improvements in the art, etc. Functional depreciation is indeterminate for future conditions and may or may not be necessary in the lifetime of a particular piece of equipment.

The following constitute the various classes of depreciation:

1. Natural Depreciation—The loss of value due to

wear and tear, and to chemical changes in physical structure, as rust, decay, electrolysis and general natural deterioration.

2. Obsolescent Depreciation—The loss of value due to improvements in the art by improved design, inventions and discoveries. These are too numerous to mention all, but some are the advancements in arc lighting, steam turbines, high-voltage lines, electric railways, etc. However, these may not affect all companies alike, for what may be considered obsolete for one may be entirely suitable for another.

3. Inadequacy or Supersession Depreciation—The loss of value due to the necessity of replacing equipment before the expiration of its useful life because of extraordinary requirements or insufficient size or capacity. For example, the building of underground distribution systems to take the place of overhead wires, as required by municipal authorities; or the removal of generating units for installation of larger capacity units made necessary by growing business; or replacing of rails with heavier steel on account of increased traffic.

4. Price Depreciation—The loss due to reduction in unit prices may be on account of: (a) a temporary business depression, (b) improvements in manufacture, (c) reduction of transportation rates, or (d) tariff changes. If depreciation is calculated for an appraisal, consideration should be given to price depreciation if the replacement method is employed. If the historical method of appraisal is used, price depreciation will not enter.

5. Demand Depreciation—The loss due to decreasing demand for the product and therefore for the use of the plant. As for example, in the case of mining operations where in certain districts the ore or coal may become exhausted or in a timbered district where timber gradually becomes logged off.

6. Accident Depreciation—Some have advocated the necessity of classifying the losses due to accidents and destruction of property to depreciation. This seems beyond the scope of functional depreciation and enters into the field of insurance. The destruction of property, due to fire, floods, tornadoes and earthquakes, or the failure of structures, such as dams, bridges or buildings, due to improper design or the loss of property or life due to collisions, wrecks, boiler explosions or bursting of flywheels, do not seem rightly to belong within the scope of depreciation. Usually, in cases of accident losses which are extreme, the stockholders carry the burden by loss of dividends.

METHODS OF COMPUTING DEPRECIATION

Various rules and methods have been evolved for the determination of depreciation, some only for the purpose of appraisal and some for accruals as required in accountancy. Most of the methods can be used for either.

In general, all of the methods of computing depreciation of equipment, physical property, etc., begin with an assumption as to the probable life of the particular piece of apparatus to be depreciated, and some very elaborate formulas, on academic theories, have been derived. Many of the refinements introduced overlook the chances of great error which may be made by the necessity for estimating losses due to future uncertainties, and also overlook important points as to the practical structure of component parts of apparatus and equipment. For example:

There are very few things in present-day affairs with which we come in contact that are by themselves of simple elementary structure. Buildings are constructed of steel, stone, wood, brick, cement, etc. Though each of these are elemental in themselves, they are again made up of complex structure; each part of which when in a finished building is subject to stress and depreciation, and each part will have a definite life and may or may not on its failure cause the failure of the particular structure of which it is a part. This applies not only to buildings but to equipment, apparatus, machinery, distribution systems and all constructed parts of physical property.

The great number of factors, most of which have to be estimated, and which in no two problems will follow the same laws, have been the reason for the great difference in opinion as to the proper method of computing depreciation and have made possible the variety of ways and means as brought forth by authors on the subject.

The following summary covers some of the various methods of computing depreciation which have been used:

I. The Straight Line Method assumes a definite life and a uniform rate of depreciation within that time.

II. The Sinking Fund Method assumes a definite life, and by sinking fund formula with any percentage rate of accrual provides for a fixed sum yearly bearing interest which will offset the assumed value in that period.

The fund that will accumulate at the end of any number of years, through the annual laying aside of a uniform amount and putting that out at compound interest, is determined by the following formula:

$$F = \frac{(1+R)^N - 1}{R}$$

The sum to be laid aside annually at compound interest to accumulate a given amount at the end of a number of years is determined by the following formula:

$$D = \frac{FR}{(1+R)^N - 1}$$

Where F = the accumulated amount in dollars at the end of N years,

D = the annual amount of dollars laid aside at interest compounded every twelve months,

R = the annual rate of interest expressed as hundredths of a dollar and

N = the number of years the amount is annually laid aside.

III. The Arbitrary Method with Decreasing Payments Towards Maturity assumes the setting regularly into a reserve fund arbitrary amounts diminishing towards maturity. The total amount accumulated within the period will equal the total assumed value.

IV. The Arbitrary Method with Increasing Payments Towards Maturity. This is similar to No. 3, except that it assumes the setting into reserve of increasing payments yearly.

V. The Service-Output Method assumes a fixed percentage which will equal the value at the end of the period based on the output in units.

VI. The 50 Per Cent Method assumes in any system composed of like things which have been in service continuously and are replaced as they become worn out that the average remaining life of the entire is 50 per cent. Therefore the depreciated value is 50 per cent of new cost plus salvage value.

VII. The Insurance Method assumes a theoretical life, in that money will not be needed for depreciation until required and should be spent in the year created for replacement of parts of the equipment.

VIII. The Unit Cost-Depreciation Method assumes a definite life, and depreciation is determined from the increased cost of operation as compared with new equipment by a modification of the sinking fund formulas as follows:

$$c = \frac{y}{d+r}\left(\frac{Q+P+DC+rC}{Y} - \frac{q+p}{y}\right)$$

Where C = first cost of new plant unit.
c = depreciated value of old plant unit.
D = sinking fund annuity which will accumulate \$1 in life of new plant unit.
d = sinking fund annuity which will accumulate \$1 in the remaining life or n years.
P = annuity to provide for repairs to parts of the new plant unit during its life of N years.
p = annuity to provide for repairs to parts of the old plant unit during remaining n years.
Q = average annual operating expense, exclusive of repairs but including taxes, during N years.
q = average annual operating expense, exclusive of repairs but including taxes, during remaining life of n years.
r = rate of interest expressed as a decimal.
Y = average annual number of units of product during entire life of N years.
y = average annual number of units of product during remaining life n.

The value of D and d are to be found by the following sinking fund formulas:

$$D = \frac{r}{(1+r)^N - 1}$$

$$d = \frac{r}{(1+r)^n - 1}$$

Where N = number of years of life of new plant unit.
n = number of remaining years of life of old plant unit.

It frequently happens that $Y = y$ as in the case of fixed plant units, like buildings, railway ties, etc., that perform an unvarying service throughout their lives. Then the formulas resolve into:

$$c = \frac{(D+r)\,C}{d+r}$$

or

$$\frac{c}{C} = \frac{D+r}{d+r}$$

IX. The Annuity Method assumes a definite life, and equal annual amounts are set up sufficient to provide at the expiration of the estimated life an amount equal to the original cost, plus interest on the investment. The annual interest is computed on the unexpired part of the investment and is subtracted from the equal annual amounts so set up to obtain the annual depreciation charge. The sum of the annual depreciation so obtained will equal the original cost.

X. The Reducing Balance of Cost Method assumes a definite life and that the total depreciation will equal the original cost, which is divided into annual amounts obtained by a fixed percentage of the remaining residue of cost after subtracting depreciation of the previous years. At the end of the assumed life the entire original cost will have been written off.

XI. The Mortality Method assumes that depreciation follows the general curve of human mortality with slowly increasing rate during middle life and slowly decreasing rate toward later life.

XII. The Per Cent of Gross Earnings Method assumes that the depreciation and maintenance of physical property can be covered by a fixed percentage of gross earnings.

DISCUSSION OF METHODS

In the following discussion the above definitions will be amplified and their application further explained, as necessary, by examples:

I. Straight Line Method—This method perhaps has been longer in use than any of the others, and is preferred and adhered to by many on account of its simplicity, and the fact that the entire subject is so problematic and so intricate that the employment of more refined methods have not been shown to be justifiable. The principal argument against its employment is that during the first few years the amount of depreciation is in excess of what seems reasonable.

II. Sinking Fund Method—There are many advocates of the sinking fund method, especially among accountants, because of the fact that the form is in line with the accrual of monthly reserves, such as are generally used for taking care of lump payments on taxes, insurance, maintenance, etc., and appeals to accountants for this reason. It has the one advantage over the "straight line" method in that the accruals for the first few years are not large. The principal argument against the employment of this method is that the increase in the depreciation reserve towards the end of the life is very fast, and that after the assumed life of the aparatus is passed the same argument should hold against negative depreciation and a sum be accrued which should be credited to the value of the equipment beyond its assumed useful life.

The following example shows the application of the sinking fund formula:

Assume a plant worth \$60,000 which is to be set aside in annual depreciation charges by the sinking fund method at interest at 3 per cent:

Year	Annual Charges to Depreciation	Interest on Sinking Fund	Total Sinking Fund
1	\$5,230	....	\$5,230
2	5,230	\$160	5,390
3	5,230	320	5,550
4	5,230	490	5,720
5	5,230	660	5,890
6	5,230	840	6,070
7	5,230	1,020	6,250
8	5,230	1,210	6,440
9	5,230	1,400	6,630
10	5,230	1,600	6,830
	\$52,300	\$7,700	\$60,000

III and IV. Arbitrary Method—Although there are not many advocates of the method of using arbitrary amounts set aside for depreciation during the assumed life of the equipment, the simplicity of the method appeals to many who are not familiar with the application of formulas. The reasons against employment of such methods are obvious.

V. Service-Output Method—The application of this method for determining depreciation is not well conceived since matters of load conditions, power factor, load factor, kind of load, maximum demand, etc., have bearing on the question of output, any one of which may or may not be severe on the operating condition of the equipment. Also this method would be impossible to apply to all physical property, and for certain classes of property would make an unreasonable basis on which to compute depreciation. For certain classes of property in using this method of determining the rate at which the depreciation takes place, it is necessary that unit of service be used, for example, in the case of car wheels and cars on the basis of car miles operated, since it is plain that the wear and tear on these will be very much greater while in service. However, to apply a unit of service, say in kilowatt hours, on a transmission line is not a proper basis, since there is no wear and tear for the transmission of electricity except for accidents causing short-circuits and burnouts.

VI. 50 Per Cent Method—The 50 per cent method has a great many advocates among the engineers on appraisal work and has been used largely by Mr. Floy on the Third Avenue Railway estimates, by B. J. Arnold for the Public Service Commission of the First District of New York, by H. P. Gillette, railroad appraiser in the State of Washington, by Prof. M. E. Cooley in the Michigan State appraisal, and it is understood has been approved by the Master Car Builders' Association. Obviously, this method is only suitable for appraisal purposes and then only to certain classes of equipment, of which there are a large number of one kind; for example, the poles of a distribution system, or meters. This method requires caution in use and should be used in connection with personal inspection.

VII. Insurance Method—This method for computing depreciation is rarely used.

VIII. Unit Cost—Depreciation Method—In a paper published by H. P. Gillette in the *Electrical World*, Nov. 2, 1912, has been outlined this method of applying depreciation and it has been derived on the assumption that the increase in maintenance expense and the decrease in efficiency due to age should be compared with new equipment in order to determine depreciation. The only place where this method can be applied is to generating equipment which has sufficient measuring instruments to obtain the data as required by the formula. This narrows the application of it down to generators and motors. For other equipment or structures, it is the sinking fund method. Theoretically, this means of obtaining depreciation may be sound, and answers derived may be considered as an accurate measure of real depreciation on account of using factors which are important from a utility value standpoint, but the great number of factors and the character of information required narrows its use to a limited degree.

IX. Annuity Method—This way of determining depreciation is of English origin and is a means of distributing the interest on a sinking fund basis, so that the charges for depreciation increase towards the end of the life. The principal objection is the necessity of carrying a larger amount in the depreciation reserve than necessary and writing off this larger amount to offset the interest charged thereto. The following example will show its application:

Assume a company with an investment of $60,000 which is to be written off in ten years by the annuity method, charging interest at 3 per cent annually on diminishing balances. The constant annual amounts chargeable to depreciation for expired investment in ten years would total $70,300, and the diminishing amounts credited on account of interest would equal $10,300.

Year	Expired Investment Charged to Depreciation	Interest Credited to Depreciation	Actual Charge to Profit and Loss
1	$7,030	$1,800	$5,230
2	7,030	1,640	5,390
3	7,030	1,480	5,550
4	7,030	1,310	5,720
5	7,030	1,140	5,890
6	7,030	960	6,070
7	7,030	780	6,250
8	7,030	590	6,440
9	7,030	400	6,630
10	7,030	200	6,830
	$70,300	$10,300	$60,000

It is interesting to note that the actual charge to profit and loss by the annuity method and by the sinking fund method are exactly the same; but, in the first case, the interest is a fictitious item, while in the latter the interest may actually be received.

X. Reducing Balance of Cost Method—This method is also of English origin, and although it has an advantage over the annuity method, is open to the objection that the rate or per cent of decrease is very high for ordinary length of life of physical property, and the depreciation during early years is at greatest rate. For example, the rates per cent required on reducing balance of cost basis in order to set aside any given amount are as follows:

Years	Rate Per Cent	Years	Rate Per Cent
100	3	28	10
72	4	26	11
58	5	23	12
48	6	18	15
41	7	13	20
36	8	10	25
32	9		

XI. Mortality Method—In a paper presented by Edwin Gruhl before the American Electric Railway Association were shown a number of curves of depreciation as obtained from actual data in incandescent lamps, water works pumps, cast-iron car wheels and also human life. In general these curves have similar shape, being a form of one-half sine wave with the greatest rate of depreciation during the middle one-third of average life.

From the information at hand Mr. Gruhl draws the following conclusions as advantages of the mortality method over the straight line or sinking fund methods:

a. Every point is determined by experience, and where a large number of instances of replacement have been utilized to determine the character of the curve, additional data will make only slight modification. It is possible therefore to generalize with insufficient data.

b. It is not dependent upon an arithmetic average and is applicable to any age, whether or not the average life has been exceeded.

c. It measures the effect of all causes of depreciation affecting the property and the effect of those causes at any age upon the average unit.

d. When sufficient reliable data are available, it will permit by actuarial methods, the calculation of the annual reserves, which, with or without interest accumulations, as the case may be, will insure the replacement of the various elements of property at the end of their probable lifetime. That there is a substantial difference between the annual reserve required for a new property and that required for one badly depreciated, readily follows.

e. It draws the line sharply between what is the rate of depreciation, the appraisal problem, and the means of financing depreciation, the reserve problem.

The principal objection to the use of the mortality method is the lack of sufficient data at the present time to determine mortality curves for all kinds of physical property. However, the method seems better suited to actual conditions on account of taking the value from results of experience than by arbitrary arithmetical deductions, as shown in the above methods. It also gives a present value in excess of other methods, by taking into account the slight depreciation during early life.

It seems, therefore, that the mortality method gives us the nearest result to actual experience, but more information is required before it can be generally adopted, and in view of this limitation, the various engineering organizations would unquestionably find it of great value to select committees to collect such data and to provide mortality curves for various classes of apparatus, equipment and physical property. The results of experience so recorded, if adopted as standards for determining depreciation, would approach as near as possible to actual results.

XII. Gross Earnings Method—With the growing tendency toward equalization of return on the investment for companies doing business of the same kind, the gross earnings are a measure of earning power and on which all charges should be based. The growing favor of this method and the satisfactory results which it gives are the greatest arguments in its favor.

The following table shows the range of percentages for maintenance and depreciation as actually required by various kinds of characteristic public utility and railroad companies.

Maintenance and Depreciation

	Per Cent Gross Earnings	
	Maintenance	Maintenance and Depreciation
Steam railroad—the Pennsylvania Railroad Company	29.5	.....
Electric railroad—Interborough Rapid Transit Company	13.85	.....
City railroad—Milwaukee Electric Railway & Light Company	11.0	22.25
Gas—Peoples Gas Light & Coke Company	6.48	10.97
Electric—Union Electric Light & Power Company	4.55	18.5
Telephone—Chicago Telephone Company	15.85	31.90

Conclusions

Reviewing the various methods of determining depreciation. Because of (1) the complexity of the factors entering into the problem, (2) the same factors in any two problems being sometimes greatly dissimilar, (3) the necessity of estimating into future conditions, (4) the uncertainties of determining the probable length of life, and (5) the abrupt end of life of apparatus or equipment not being determinable, refinement of methods for most cases are not warranted.

The conclusions to be drawn seem to be

a. For appraisal purposes to determine either present value or future value by depreciation estimate from estimated duplication value any of the following methods are sufficiently accurate: (1) straight line method, (2) 50 per cent method (when used with caution), (3) mortality method (when sufficient data have been accumulated).

b. For determination of depreciation accruals which should be set up into a fund out of earnings and to be used for maintenance and depreciation, the per cent of gross earnings method best applies.

c. For accruing the depreciation reserve from a fixed percentage of gross earnings it is best to accrue into the account the difference between the amount expended for maintenance and this percentage. The depreciation reserve is then to be charged only when expenditures are made for improvements which extend life.

d. When such expenditures are made the plant account should be credited with the entire cost of the improvement and the depreciation reserve charged. Then the new cost of the apparatus or equipment replaced is written off except for such salvage as may be obtainable.

Efficiency Department With "Safety First" Features at Tacoma

BY O. C. MATHIS, SUPERINTENDENT OF EFFICIENCY PUGET SOUND ELECTRIC RAILWAY AND TACOMA RAILWAY & POWER COMPANY

The department of efficiency of the Puget Sound Electric Railway and the Tacoma Railway & Power Company has for its objects the promotion of efficiency among employees, harmony between departments and good will of the public. Efficiency among employees may be divided into loyalty, ability and industry, so we aim to produce efficiency by increasing these qualities.

Outline of Work, Etc.

The department is trying to increase loyalty among the men by welfare work and personal influence; ability is obtained by the selection of men and education. In selecting a man we are influenced by his health, personal appearance, past record and intelligence. Educational work consists in teaching the man to be careful of passengers, self and freight; proper use of power; proper care of equipment; proper care of track; rights of the public (courtesy); care of injured and reporting accidents; necessity of and obedience to rules; observation and report of defects in the cars, lines, tracks, signals and machinery. Written and oral examinations are had on these subjects. Industry is the quality that represents a man's cash value, and an attempt to increase this is made by example, development of pride in work, and especially by never overlooking an opportunity to show appreciation of good work, good conduct and the use of good judgment.

Harmony between departments is promoted by taking care of those matters where the duties of departments overlap, that is to say, the efficiency department is used as a clearing house for those matters that are of interest to more than one department. Promotion of safety furnishes the best example of this, so, from the standpoint of safety only, the efficiency department superintends the training of trainmen and the inspection of car equipment, track and overhead line.

It is hoped that the good will of the public will be increased by presenting the company's side of questions in which the public is interested by advertising in the newspapers, by the distribution of literature on the cars and in the stations, by giving the complaints of patrons courteous personal attention and by securing for the public more careful and courteous treatment from employees.

This briefly outlines the work. As it may be of interest as to how we do the work, the following is added:

How the Work Is Done

Our welfare work to date consists in furnishing free baths, pool tables, punching bags, piano and current periodicals in the trainmen's quarters. Personal influence consists in giving each man's suggestion for the prevention of accidents or betterment of the service, etc., respectful personal attention. If his suggestion is not adopted he is told why and is satisfied that the reason is a good one. Every man is known by name and is made to feel that he is recognized as an important member of the company's operating force. In this connection I might add that those who have difficulty in associating names and faces will find it helpful to have at hand, in convenient form, a list by numbers of all trainmen, to which one can refer during the conversation and not allow the man to go away without being called by name.

It promotes loyalty to keep the man informed on the problems of operation from the financial and managerial side. Our men are told where every nickel goes, and they know that they are getting all that the company's income allows. If a man gets in the habit of criticising the company's way of doing things, he is sought and in a friendly way, wholly lacking in an air of discipline, convinced of his error. It seems that this department can get closer to a man than can the department that necessarily must maintain an atmosphere that makes discipline possible.

As ability is the result of the development of the man's natural qualities, a proper instructor during the period a trainman is breaking in is all important. An instructor should be a practical car man with experience in the shops and power department and thoroughly loyal. We do not consider technical training necessary for car men but believe that every man has an innate respect for a thing of value, so we put special stress on this point. Certainly a man is likely to give more undivided attention to running a $7,000 car over a

$10,000 piece of special work than if he has no knowledge of their values. So the trainmen are told the costs of power, equipment, track, accidents, etc. When a motorman knows that he is saving the wages of two men when his car is coasting, he will coast more, and when the conductor knows that ½ cent of every nickel he takes in goes to pay for accidents, he becomes more interested in accident prevention.

As we believe that a thorough knowledge as to the why of rules is conducive to their obedience, the rules are painstakingly explained.

Our system of reporting defects has proved satisfactory. We have thirty boxes containing "safety first" cards located at as many places in the shops, carhouses, trainmen's quarters, track and line department headquarters, storeroom and general offices. Above each box is a notice to the employees explaining the use to be made of the cards, and instructions about what to do with them when they are made out. No information obtained in this way is used as a basis for disciplinary action. The receipt of each card is acknowledged and the substance of the information reported to the proper department, or the matter is attended to by the efficiency department direct, as the case requires. The person who makes the report is notified as to what action is taken. If the suggestion is impracticable or has other features which make its adoption impossible, this is fully explained and the party is satisfied.

The foregoing card system is supplemental to our safety committee, which consists of eighteen members, twelve of whom are trainmen, the others belonging to the shops, track and power departments. These men serve for a period of four months, the terms of one-half expiring each two months. This committee meets at noon on the first Tuesday of each month. We have a good lunch, and while the cigars are being smoked every man loses his reserve and gives up the best in him. A grouch simply cannot live through one of these meetings. When a man's term expires, he goes forth a more loyal man with a much broader view and a more sympathetic understanding of the difficulties of the business from the management's side.

This committee has been organized since February, 1913. In making up the report covering its first year's work last March, it was found that 90 per cent of its 244 recommendations had been adopted by the management, and it has received similar encouragement this year. Most of the recommendations are to remedy specific local conditions and would not be of general interest. This does not mean that a large percentage of the things recommended would not have been done in the old way without such a committee. It is certain, however, that many of them would not have been done. Moreover, there is a more cheerful and conscientious obedience to regulations when the trainmen have a hand in their adoption. For example, every superintendent knows how hard it is to get motormen to observe caution, slow and stop signs. At least 75 per cent of such signs on our system were placed by the suggestion of the trainmen, and they obey them because they know why they are there. They are also beginning to inquire on the outset of each recommendation, how much it costs and whether the advantage gained justifies the cost. In other words, their interest is becoming personal and intelligent and not simply routine. They are reaching a point where they can be called one of us and distinguished from the public, who seem to think that the company's cash bag has no bottom.

The idea that to develop pride in the work makes a man more industrious presupposes a spirit of contentment. A man to be contented must feel secure in his position and feel that it is worth while to make a success of it and that loyalty and industry will receive a reward. Trainmen are kept informed as to the earnings of men in other trades, and the men who have been in the service from ten to twenty years and are making it their life work are held up as examples of what a man can do as a trainman. Most of these older men own their homes, have good families and are citizens that would honor any trade. These things are referred to in our bi-weekly lectures at the trainmen's quarters. It seems that sober thought along these lines would develop professional pride. To take work well done as a matter of course and always to discipline for mistakes is, at most, only half right. An opportunity should never be missed to show that good service is appreciated. Our best men are the fellows of whom we see the least. They are never in trouble, never on the carpet. Therefore, to see these fellows, to let them know that they are not forgotten, and to encourage them by a show of appreciation is a good thing.

The promotion of harmony between departments does not mean the prevention of open hostility but the bringing about of a better understanding of the other fellow's problems. Within the last few years the claim departments have been especially aggressive in pushing their interests, and properly so; yet, while it should be nothing short of sacrilege to say a word against so manifest a humanitarian movement as "safety first," other departments have felt that in some instances extremes have been reached and expenditures have run up maintenance costs that results have failed to justify. Again, the transportation departments have felt that their province was being invaded by the attempt of the power, mechanical, track and claim departments to pass on the competency of the trainmen. The efficiency department is trying to overcome this friction by making a special study of accident prevention from all sides. It is influenced in recommending measures by the effect upon all departments concerned and by teaching the car men to be courteous, to avoid accidents, to care for the car equipment, to save power, to care for the track and overhead; in short, to produce men that are satisfactory to all.

To obtain the good will of the public it is necessary, first of all, to give good service. This we know we are doing by giving all the service that the patronage justifies. With this as a foundation, we continually keep our side of the question before the public in our column in the daily papers. It seems to be the simple matters that the public is ignorant of —things so patent that we make the mistake of concluding that everybody knows them. For example, the reason why cars are sometimes late, why everyone cannot always have a seat, why extensions and upkeep are regulated by income, and why rules and regulations are necessary for good service. It is from a misunderstanding of these small things that a great amount of popular prejudice comes. We have also become converted to the idea that we are not always right, and when a patron has a complaint this department gives it attention. If the company is at fault, we are not afraid to say so, to remedy the trouble, to apologize or do whatever else the occasion demands. Most of our enemies are made through the men on the cars. Since the public is influenced in the formation of its opinion of the company's policies by the impressions made by the car men, we are making a special effort to eliminate the discourteous car man.

The Worcester (Mass.) Consolidated Street Railway reports a decrease in the number of passengers carried recently. This it ascribes to disturbed industrial conditions, particularly in the suburban territory through which it operates.

Signals on the New York State Railways, Rochester Lines

A Remarkably Complete System of Track-Circuit Controlled Automatic Block Signals Has Been Recently Installed on the High-Speed Interurban Lines of This Company, Following Movements at Short Headway Being Permitted by Three-Position Intermediate Signals with Overlap Control

An automatic block signal system having many unusual features has been recently placed in service on both the Rochester & Eastern and Rochester & Sodus Bay lines, which are high-speed, single-track interurban railways operated by the New York State Railways. The same system of signaling is used on both lines and affords absolute blocking between passing sidings for opposing movements and protection for following movements at shorter intervals by means of intermediate signals. Three-position semaphore signals are used and overlaps are provided in all cases so that cars which may run past stop indications for the full braking distance are in no danger. Distant indications are provided throughout by having the semaphores take the clear position from the caution position of the signal in advance. Apparently nothing which will aid in providing for safe and rapid service has been omitted.

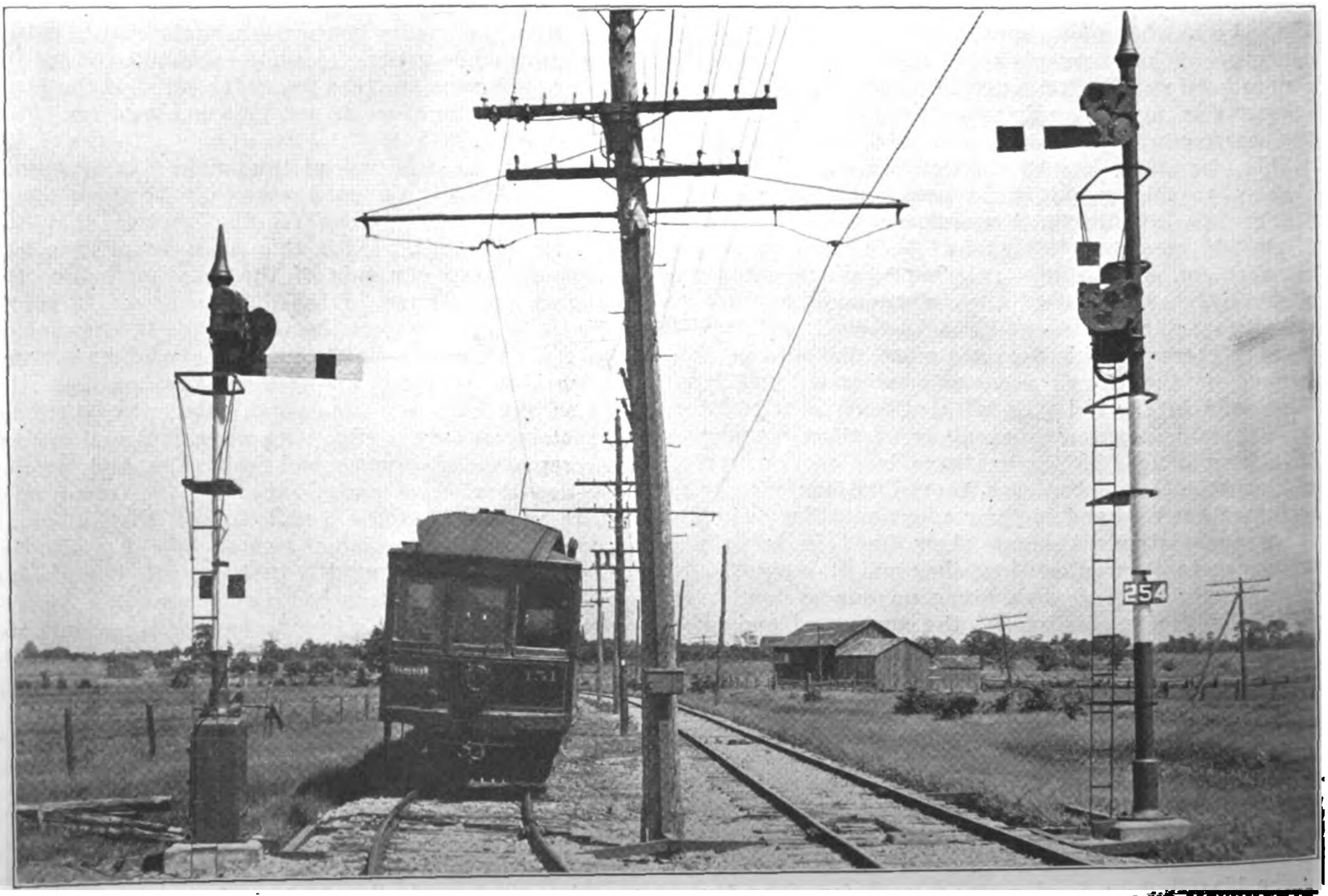
On the Rochester & Eastern line the daily traffic consists of thirty-four scheduled trains, of which four are freight trains, between Rochester and Geneva, and also nineteen scheduled trains between the terminals and several intermediate stations. The scheduled speed is 32 m.p.h. for limited trains and 22 m.p.h. for the local service. On the Rochester & Sodus Bay line the traffic consists of forty trains, including three for freight service. These trains have a scheduled speed of about 19 m.p.h. This traffic is nearly doubled on Saturdays, Sundays and holidays, when many of the trains are operated in as many as five or six sections.

Each line is about 40 miles long. In most cases the sidings are single-end, but there are several double-end sidings and several stretches of double track, varying in length from a quarter of a mile to a mile and one-half. The average distance between passing sidings is approximately 2 miles.

The switches of the single-end and double-end sidings are equipped with rigid or non-automatic switch stands and are normally locked in the main line position. It is the practice at these sidings for a car to run by, back in and head out or to head in, back out and proceed, depending on the direction of the train.

The switches at the ends of the double track stretches are equipped with spring or automatic switch operating mechanisms and the switch points are normally set for right hand movements—for the turnout at one end of the double track and for the main line at the other end, as it is the practice for cars to run through to the right on these stretches.

All switch lamps are equipped with two 12-volt, 5-watt tungsten electric lights, connected in multiple, which re-



ROCHESTER SIGNALS—VIEW OF SIGNALS INSTALLED AT END OF LONG SIDING TO PROVIDE FOR CLOSE-UP MOVEMENTS SHOWN ON RIGHT-HAND MAST ceive energy from a line transformer located at each switch.

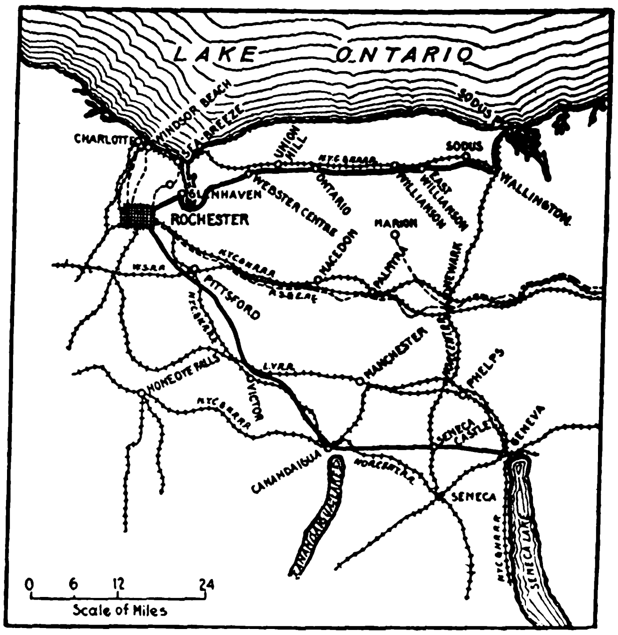
SIGNAL SYSTEM

The signals are arranged according to the General Railway Signal Company's absolute-permissive block system, so named because it affords absolute blocking between passing sidings for opposing train movements, in which case the block is the distance between adjacent passing sidings, and permissive or standard double track blocking for following movements, in which case the block is from signal to signal. This materially increases the factor of facility without diminishing the factor of safety.

The signal arrangement provides starting signals which are located at the passing sidings and govern train movements in their respective directions, with one or more pairs of intermediate signals between sidings. Signals governing movements in the same direction are approximately 4000 ft. apart. Overlaps were incorporated in the system in the interest of "safety first," and the starting signals are staggered accordingly. Signal indicators are located at stub-end passing-siding switches to repeat the indications of the signal in the rear. Switch indicators are also located at intermediate switches to indicate the condition of the blocks in both directions, and switch circuit controllers, through which the signal control circuits were broken, are located at the switches. Both rails are used for the return of the d.c. propulsion current.

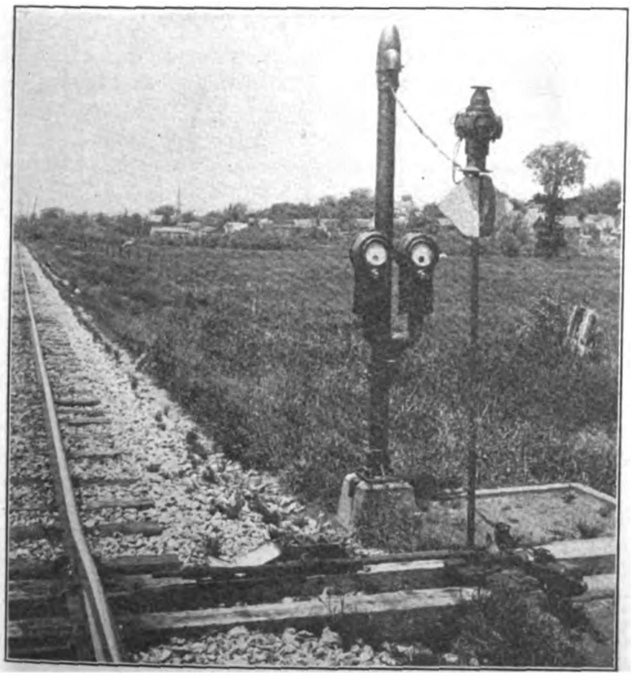
A typical signal arrangement was published in the ELECTRIC RAILWAY JOURNAL for Oct. 4, 1913, page 620. With two pairs of intermediate signals, the overlap is 800 ft., or the safe braking distance. The stop control of the intermediate signals extends to their respective, opposing, starting signals at the ends of the block. This arrangement makes the block for opposing movements from siding to siding and insures a stop indication at an intermediate signal if an opposing train has passed the opposite starting signal. For following movements the block is from signal to signal.

With only one pair of intermediate signals, the overlap at the intermediates is 1500 ft., which represents the safe braking distance for two opposing trains. If a condition occurred in which, for example, a west-bound train entered a block then occupied by an east-bound train, it would still be necessary for one or both trains to pass a stop indication at the intermediate signal before a collision could result, and, even if both trains simultaneously approached the signals at high speed but applied the brakes at the respective intermediate signals the trains would come to a stop before colliding.

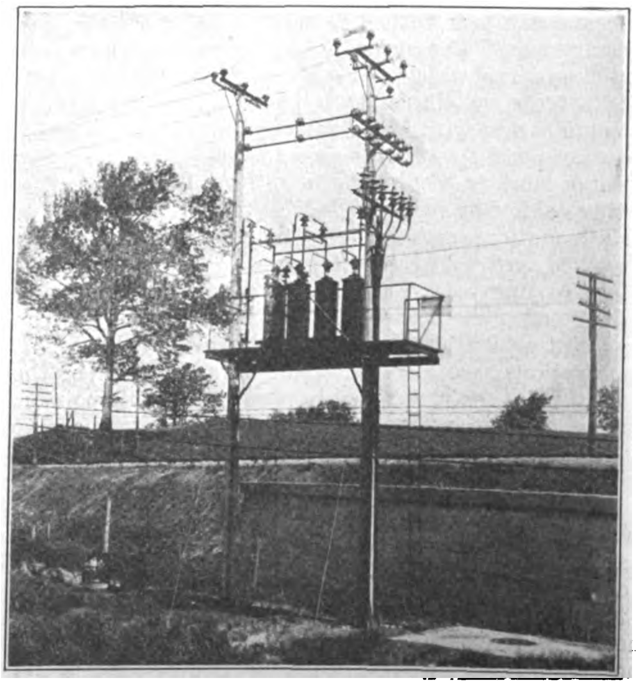

LAKE ONTARIO
CHARLOTTE
WINDSOR BEACH
SEA BREEZE
UNION HILL
N.Y.C.&H.R.R.R.
SODUS
SODUS
WALLINGTON
GLENHAVEN
ROCHESTER
WEBSTER CENTRE
ONTARIO
WILLIAMSON
EAST WILLIAMSON
MARION
MACEDON
PALMYRA
NEWARK
W.S.R.R.
N.Y.C.&H.R.R.R.
A.S.&E.R.R.
PITTSFORD
N.Y.C.&H.R.R.R.
HONEOYE FALLS
L.V.R.R.
MANCHESTER
PHELPS
VICTOR
N.Y.C.&H.R.R.R.
SENECA CASTLE
GENEVA
CANANDAIGUA
N.Y.C.&H.R.R.R.
SENECA
N.Y.C.&H.R.R.R.
SENECA LAKE
0 6 12 24
Scale of Miles

ROCHESTER SIGNALS—MAP OF ROCHESTER INTERURBAN LINES, NEW YORK STATE RAILWAYS

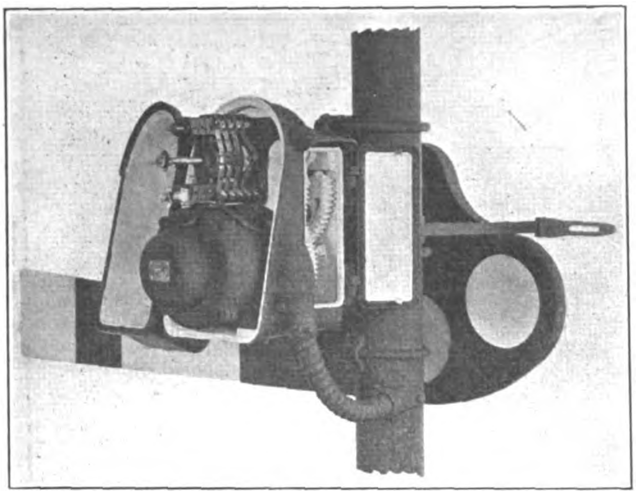
In the block at the beginning or end of a section of signalled territory there are no intermediate signals, and to maintain the high degree of safety the signal at the beginning of the signalled territory is so arranged that it normally indicates stop. The opposing signal normally indicates caution, as there is no signal in advance governing movements in the same direction. The control of the opposing signals is interlocked so that only one can display a proceed indication at one time. A train approaching the normal stop signal en-



ROCHESTER SIGNALS—VIEW OF SWITCH INDICATORS AND SWITCH CIRCUIT CONTROLLER



ROCHESTER SIGNALS—ELECTROLYTIC LIGHTING ARRESTERS ON 4400-VOLT SIGNAL TRANSMISSION LINE



ROCHESTER SIGNALS—SIGNAL MECHANISM

ters a short preliminary track section, which causes the operation of the normal-caution signal and the display of a proceed indication, provided the block is unoccupied and that the opposing signal is in the stop position.

USE OF THE TELEPHONE

Train orders, messages and miscellaneous company business are transmitted by means of the telephone, which also performs an important service in connection with the signal system, as trainmen can communicate with the dispatcher at each signal.

The rules prescribe that a stop signal must not be passed except under authority of a train order issued by the dispatcher. For communication with the dispatcher, a portable telephone set with flexible cord attachment is mounted in the motorman's compartment of each car, and connection to the telephone line is obtained by means of two jacks which are mounted on the first transmission line pole in the rear of each signal. These jacks connect with duplicate telephone circuits, one of which is ordinarily used as a dispatching circuit for the transmission of train orders and other orders affecting the movement of trains; the other circuit is ordinarily used for miscellaneous company business. The motorman can make a connection through the car door and can talk with dispatcher without leaving his compartment. The flexible cord when not in use is wound on a reel which forms a part of the telephone set.

If a train on single track meets a stop signal and communication with the dispatcher cannot be obtained the rules permit a train to pass the stop signal and flag through block in accordance with the old flagging rules. A time-table rule requires that all trains must report at certain stations and receive either a train order or a clearance card before proceeding.

The fouling point or end of track circuit at passing sidings and other turnouts is marked by a wrought-iron pipe post which stands back of the insulated joint so that trainmen can see that their cars are clear of the fouling point, as prescribed by the rules. This point is worthy of note as trainmen frequently allow cars to stand on the fouling section where there is no post or sign, and so-called signal failures result.

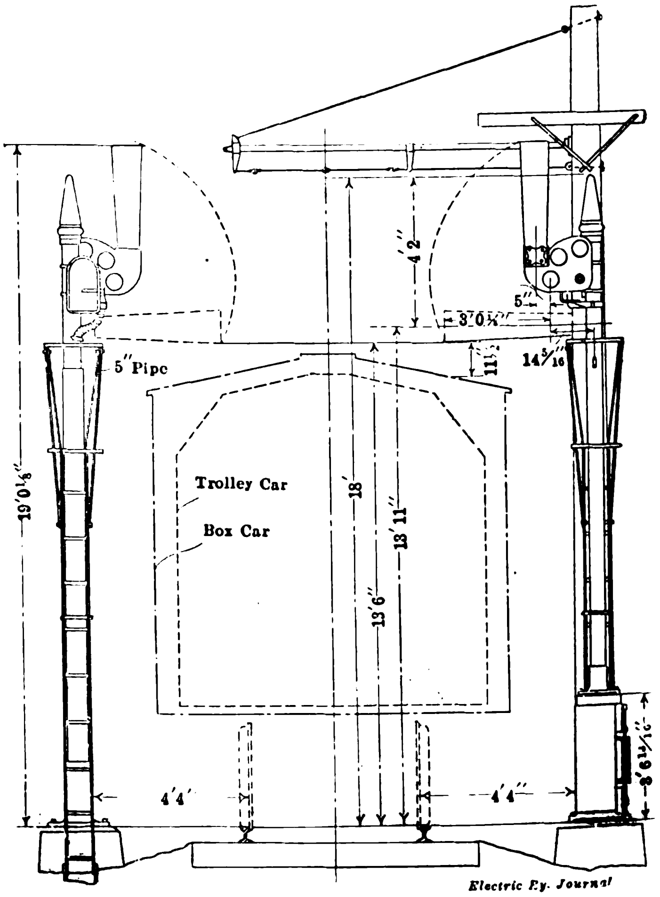
Signal indicators are installed at passing siding switches to repeat the indications of the signal in the rear. The signal indicator at a siding repeats the indications of the starting signal to the rear signal, and a train on the siding observes the indicator instead of the starting signal, which is approximately 900 ft. in the rear of the switch. Signal indicators are of the semaphore type and operate in two positions. The 45-deg. position indicates that signal is in the clear or caution position, and the horizontal position indicates that signal is in the stop position. Switch indicators are of the disc type and show a red disc when the block is not clear.

Normally, signal and switch indicators display proceed or clear indications, but the rules require the operation of a test push button on the indicator case before the indication can be accepted. If the push button is operated when block is clear the indicator arm or disc moves to stop position, but returns to normal position when released. If block is not clear, the indicator arm or disc remains in the stop position. The push button shows when indicator is in proper working order and thus materially increases the efficiency of the device. The word East or West is painted on each indicator case, according to the direction which the indicator governs.

All switches are equipped with switch circuit controllers. Circuits controlling operation of the signals are broken through the switch circuit controllers and, as the controller contacts are operated by a connection to the switch points, adjustments can be made so that a clear signal cannot be displayed unless the switch is in proper main-line position.

SIGNALS

The installation makes use of the General Railway Signal Company's Model 2A, top-of-mast, electric motor, semaphore signals, which operate in three positions and display the indications in the upper left-hand quadrant. There are also several light signals which were installed where the low hanging branches of trees would interfere with an operative semaphore signal. The signals are equipped with 110 volt, single-phase, twenty-five-cycle induction motors. This motor is in reality a two-phase motor arranged to operate on single-phase cur-



Electric Ry. Journal

ROCHESTER SIGNALS—LOCATION OF SIGNALS WITH CLEARANCES FOR STANDARD EQUIPMENT rent by means of an impedance which is connected in series with one of the windings in order to obtain the necessary phase displacement. Both windings are in service while the motor is operating, which eliminates the necessity of contacting devices such as are ordinarily used with single-phase motors to interrupt the current through the starting winding after motor has developed its normal speed.

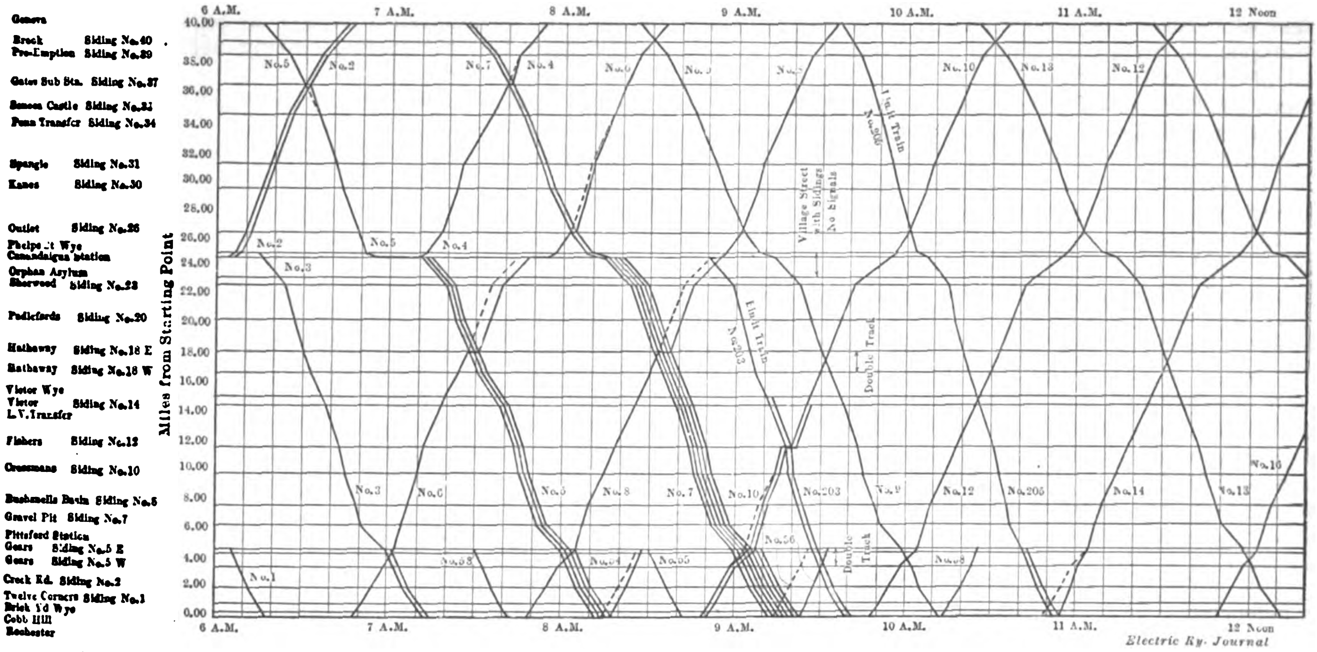
The semaphore arm is held in the caution and clear positions by means of a stator winding and a laminated iron core or rotor. The rotor is loosely mounted on the armature shaft and operates in connection with a clutch. The rotor does not revolve with armature shaft when the operating windings are energized, but when semaphore arm is moved to the caution or clear position the stator windings are energized, the clutch becomes effective, the magnetic attraction between the poles of rotor and stator prevents rotation of the armature shaft and holds the signal arm in the proper position. When the holding circuit is broken, the stator windings are de-energized which releases the rotor and the semaphore arm returns to the caution or stop position by gravity.

The standard signal has a square-end blade, the front of which is painted red with white stripe and the back white with black stripe. From foundation to top of relay box, the signal mast is painted black, from there to the mechanism case the mast is painted white, and above this point black. Each signal mechanism is equipped with two Veeder counters which register the number of semaphore movements. One registers the number of caution or 45-deg. movements, and the other the proceed or 90-deg. movements.

There are several stations where it is frequently necessary, in "closing up" trains, to permit two or more trains to occupy the same block in order to avoid delays. To provide for this condition, the management adopted a special two-arm signal of which the upper arm constitutes the main indication and a lower or calling-on arm the restricted indication. When used on double track stretches the upper arm is non-operative, being fixed in the horizontal or stop position. The lower arm operates in three positions and normally is vertical, indicating "proceed at medium speed," but when block is occupied, the lower arm is in the 45-deg. position, indicating "proceed at slow speed prepared to stop short of any obstruction." When switch is in wrong position the lower arm is horizontal, indicating stop.

When used on single track, the upper arm operates in three positions and the lower arm in two positions, horizontal or zero position to 45-deg. position. When the upper arm displays a proceed indication (clear or caution), the lower arm is in the horizontal position and a train proceeds on authority of the upper arm. When the block is occupied, the upper arm is in the horizontal position and lower arm is in the 45-deg. position, indicating "proceed at slow speed prepared to stop short by any obstruction," as on double track.

The semaphore signals are electrically lighted by two 12-volt, 5-watt tungsten lamps which are connected in multiple and receive energy from a 9-volt tap on the line transformer. The operation of the lamps below their rated voltage affords ample illumination and materially increases the life of the lamps. The light signals are electrically lighted by two 40-watt tungsten lamps which are connected in multiple and receive energy from a 55-volt tap on the line transformer. The electric lights require practically no attention and have been known to give good service for more than a year, thus reducing the cost of lamp maintenance and affording an efficient and economical method of signal lighting.



ROCHESTER SIGNALS—TRAIN SCHEDULE DIAGRAM SHOWING EFFECT OF SIGNAL ON ORIGINAL SERVICE

INSTALLATION

The signals and signaling appliances were manufactured and installed by the General Railway Signal Company, of Rochester, N. Y. Material for the transmission line, also the insulated joints and power bonding material, was furnished and installed by the railway company's forces. Material for insulating switches was furnished by the signal company and installed by the railway company. The installation work was performed under the supervision of C. L. Cadle, electrical engineer New York State Railways.

The government of the province of Mendoza, Argentina, has sent to the Legislature a sixty-year franchise which it proposes to grant to Anastasio Lopez & Company for the building of a rural tramway system, either steam or electric. Under the proposed franchise passenger and freight tariffs are subject to government approval, and provision is made for the government to acquire the lines after thirty years.

Convention of the Railway Signal Association

The Nineteenth Annual Convention Was Held at Bluff Point, N. Y., Sept. 22-24, 1914—Numerous Reports of Committees Were Presented and Discussed, Including Those on Electric Railway and Alternating Current Signaling and on Signaling Requirements for Electric Railways

The annual convention of the Railway Signal Association was held at Bluff Point, N. Y., on Lake Champlain, Sept. 22-24, 1914. At this meeting the reports from a number of committees were received and discussed, and several of these were of special interest to electric railways. Among them was the report of the committee on signaling practice, to which had been assigned the work of recommending an aspect for instructing trains to take siding at non-interlocked switches. The committee stated that the principle that the association was asked to pass upon was the display of a disc with the words "Take Siding" printed upon it when it was desired that a train should get into the clear at locations not controlled by interlocking plants. A suggested design which was reproduced in the *Journal* of the Railway Signal Association for June, 1914, pages 205-206, contemplated the illumination of the sign by reflected light because this had been found to be the most practicable method yet developed. However, there was nothing in the suggested aspect to prevent its illumination by transmitted light if a satisfactory way could be found to do this. Several aspects were now being used, but they differed from that suggested to the extent that sometimes a letter "S" and sometimes the word "Siding" was used. The suggested sign was to be displayed only when a train was to side-track and the device could be operated by any convenient means. Only one application of the principle was suggested, but the committee stated that, next year, if this aspect was approved other applications would be presented for the approval of the association. In conclusion it was recommended by the committee that the suggested aspect should be submitted to letter ballot as a standard of the association.

This committee also had been assigned the work of investigation and report on automatic train control, and the committee submitted in its report the findings of the American Railway Association at the meeting in May, 1914, as a revision of the requisites now included in the manual of the association. These findings were reported in abstract in the ELECTRIC RAILWAY JOURNAL for May 23, 1914, page 1150. The committee had been requested to confer with the special committee on signaling requirements of electric railroads, recommending modifications deemed necessary to meet the peculiar requirements and conditions for the signaling on electric railways. The committee reported progress in this work.

The special committee formed to develop a method of recording signal performance submitted several record forms. These included blanks for the use of trainmen in reporting signal interruptions, for the use of dispatchers in recording the information transmitted by this form, for the use of maintainers in reporting the causes of signal interruptions, for the use of signal inspectors or maintainers in recording and reporting monthly the number of signal operations and for the use of signal engineers and supervisors in making monthly and annual reports. Regarding the latter it was stated that any amount of detail could be incorporated and modifications made to cover special conditions without material deviations from the basic design. Details were suggested for guidance in printing this form, these to be modified to suit the requirements of systems as determined by existing conditions. This detailed information to be incorporated in the forms was as follows: Miles of road signaled; number of signals and types; signal movements; trains operated; trains delayed by signals; track department; power department; signal department; motive power department; transmission department; operating department; defective system or manufacture; miscellaneous; summary.

The committee's report also included some general instructions which were as follows:

1. Parts of apparatus broken on account of improper design or workmanship should be sent to .... office with full statement, stating serial number and manufacture.

2. Remarks column should be freely used to insure explanation.

3. Black ink, or, if typewritten, reversed carbon back of sheet, should be used, so that blueprints may be taken from the sheet.

4. Fifty per cent of interruptions, classified as unknown, may be charged to creditable stops.

5. When the counter reading of a signal, as compared with the readings of adjacent signals, seems to be in error and no reasonable cause can be attributed, the reading of adjacent signals will be substituted. A signal, however, protecting a number of switches, may make more movements than adjacent signals, in which case the readings shown should be used, as the signal has been making proper movements and should be so credited.

6. In the event of an interruption to a power supply or transmission line affecting a number of signals, only one interruption will be charged against maintenance, but an interruption for each signal affected will be charged against operation.

7. In computing efficiency, the following items may not be taken into account: Creditable interruptions; false proceed indications; lamps out.

The committee stated that a number of railroads were delaying the adoption of signal performance report forms pending the action of the Railway Signal Association toward the adoption of standards. The majority of replies in circular letters indicated that this report contained satisfactory material for their use and that they were willing to try it. The committee realized that the forms, if used, might be subject to further development as determined by service requirements and might be the means of harmonizing the present widely diversified practices. Therefore the members of the committee unanimously recommended the submitting of this report to letter ballot for adoption.

The standing committee on electric railway and alternating current signaling had been given the following assignments: *a*, Continued investigation of the various systems in operation; *b*, prepare specifications and requisites for apparatus and materials for a.c. block signal systems; *c*, investigate the inductive effects between the signal circuits and adjacent electric circuits and formulate recommendations; *d*, investigate the hazards due to the paralleling of high tension and low tension lines.

The committee, of which C. H. Morrison is chairman, presented under subject *a* a number of descriptions of various a.c. signal installations. In connection with assignment *b* a number of specifications on different classes of material were presented. It was stated that considerable time had been spent in investigating assignment *c*, but on account of the difficulty experienced in collecting information the committee could only report progress at this time. Progress was also reported on assignment *d*, and there were submitted specifications for overhead crossings of electric light and power lines which when complied with would greatly reduce the hazard of high-tension crossings.

A majority of the descriptions of existing a.c. installations on electric railways which were presented by the committee have already been published in previous issues of the ELECTRIC RAILWAY JOURNAL, the Piedmont Traction Company installation being the one exception. Regarding this the committee stated that the signaled section was between Charlotte, N. C., and Hoskins Yards, N. C., a distance of approximately 4½ miles. There were seventeen signals and six switch indicators, the material having been furnished by the Union Switch & Signal Company. The line was double tracked for 3½ miles and had a single track at one end approximately 1 mile in length. Indications were given by means of lights backed up by large hoods, the operation being controlled by track circuits with sixty-cycle, single-phase signaling current. Distant signals were generally used, being erected at points which ranged from 1200 ft. to 1600 ft. in the rear of home signals.

In the specifications submitted by this committee it was stated that the use of oil in impedence bonds could not be recommended. Petrolatum was recommended instead. This should be a pure mineral oil, free from acid, alkali and other chemicals, with a melting point between 120 deg. Fahr. and 130 deg. Fahr. Specifications for transformer oil and alternating-current electric generators were also submitted, as was a revision of the specifications for overhead crossings of electric light and power lines. In connection with revision of existing specifications the committee stated that track relays receiving all of their energy from the track rails should consume not more than 20 volt-amp with a power factor of 54 per cent at 3 volts. Relays receiving part of their energy from the track rails and part from another source with the two currents in quadrature relation should consume not more than 1.6 volt-amp with a power factor of 6 per cent at 1.3 volts from track, with not more than 11 volt-amp unity power factor at 110 volts taken from the other source.

The committee on wires and cables presented elaborate specifications for galvanized messenger wire, including a series of tables of recommended sags for messenger wires and showing sizes and strengths that should be used to support cables of various weights and spans. In connection with these tables the committee called attention to the apparently excessive sags required by the tables. As the correctness of the formulas and calculations were evident to the committee, it followed from an examination of sags of cables now in place that the method of erection used in the past (consisting principally of pulling the wire as tight as the line foreman deemed proper), had resulted in the wires being drawn too tight. Sufficient sag was not allowed to give a reasonable factor of safety if a man was required to ride the cable.

The committee on power interlocking presented specifications for incandescent lamps and for the installation of vitrified clay conduit systems. Progress was reported in the preparation of typical circuit plans for electric interlocking and in the investigation of the energy required for operating and holding signals. The report on the use of 30 volts or less for the control of electric interlocking apparatus as published in the June issue of the *Journal* of the Railway Signal Association was recommended for submission to the association by letter ballot. The standing committee on storage battery and charging equipment also presented several specifications and plans covering material required in connection with storage-battery work, and the committee on standard designs, signal symbols and nomenclature presented a number of drawings.

The latter committee's report stated that the return of the letter ballot of last year on the color of signal blades was inconclusive, recommending that a new ballot be submitted to provide a definite opportunity for decision between two color schemes for three-position signal blades. These suggested color schemes were red with a white stripe and yellow with a black stripe. The committee presented also an extended nomenclature for use with plans and apparatus.

The committee on automatic block submitted specifications for a primary battery and for a d.c. vibrating highway crossing bell, and reported progress on several other matters. A minority report of one of the subcommittees of this standing committee was also submitted. This minority report covered the matter of typical circuit plans for automatic block signals on single-track roads, and the sub-committee offered the following requisites for the circuits: Signals should be so located as to provide adequate spacing and head-on protection; and the control of signals should provide, 1, positive block indications against opposing trains between sidings; 2, stop, caution or clear indications for following movements, as on double track; 3, that two trains meeting at a passing siding shall each first receive a caution indication; 4, protection for switches and switching movements, as on double track; 5, protection against single crosses and any number of grounds causing false clear indications; 6, that opposing signals governing the same block shall not display simultaneous proceed indications, authorizing trains to proceed against each other, nor, 7, to move from passing sidings against each other.

The committee stated that to fulfill these requirements it was necessary to provide a larger number of relays and relay contacts than were required under present methods. Such additions were frequently referred to as added complications, but to the sub-committee were known to be added factors of safety, which had not heretofore been used but which would be indispensable in future.

The special committee on signaling requirements of electric railways submitted as information a report showing the aspects and rules that had been adopted by the American Electric Railway Association at its 1913 convention. The committee on subjects and definitions also presented a short list of terms with definitions for the consideration of the association.

PROCEEDINGS

The nineteenth annual convention of the Railway Signal Association, which was held at Bluff Point, N. Y., Sept. 22-24, proved to be the largest and most successful meeting in the history of the association. A total of 433 were in attendance, including 160 guests of the association. The meeting was opened at 10 a. m. on Tuesday, Sept. 22, with an address by F. P. Patenall, president of the association, and this was followed by the report of C. C. Rosenberg, secretary-treasurer. The report of the standing committee on signaling practice, of which an abstract is printed elsewhere, was then submitted. An extended discussion took place regarding the nature of the proposed aspect for instructing a train to take siding at a non-interlocked switch, objection being made to the suggested use of an illuminated sign instead of a standard semaphore arm. This objection, however, was overruled and the aspect as proposed, together with other recommendations of the committee, was approved for submission to the association by letter ballot.

The recommendations of the special committee which submitted proposed standard forms for recording interruptions to traffic by signals were approved, without discussion, for submission to letter ballot, and the reports of the several standing committees on storage-battery and charging equipment, on wires and cables, on power interlocking and on the automatic block, were also approved with minor changes, the report of the committee on lightning protection being referred back to the committee for further consideration and presentation at a later date.

At the session on Wednesday the recommendations of the committee on standard designs were approved for submission to letter ballot. The report of the committee on electric railways and a.c. signaling was also approved, the historical data accompanying the report being accepted as information. In connection with the report of the committee on definitions it was decided that because of the difficulty of obtaining unanimous opinion upon the various terms used in signaling the matter should be held in abeyance for the present time. At this session several amendments to the constitution were also passed.

On Thursday the meeting began with a report from the committee on mechanical interlocking, and a number of drawings for mechanical derail layouts and switches which were submitted were accepted by the association as being good practice. This was followed by a report from the committee on contracts giving a table of points to be assigned to different units used in interlocking plants for the purpose of establishing percentages of cost in joint construction. This table was approved with certain changes in nomenclature. The report of the committee on manual block was then approved and, following this, the report of the special committee on signaling requirements for electric railways was accepted without discussion as information.

At the conclusion of the meeting the result of the election of officers for the ensuing year was announced as follows: For president, T. S. Stevens, Atchison, Topeka & Santa Fé Railway; for second vice-president, C. A. Dunham, Great Northern Railway; for secretary-treasurer, C. C. Rosenberg; for directors, C. W. Parker, Canadian Pacific Railway, J. M. Waldron, Interborough Rapid Transit Company, F. B. Wiegand, Lake Shore & Michigan Southern Railway, and W. N. Manuel, Grand Rapids & Indiana Railway. The new first vice-president, who is W. J. Eck, Southern Railway, was elected as second vice-president a year ago and was advanced in accordance with the custom of the association, without election at this meeting.

The report of the committee on a location for the convention in 1915 recommended Salt Lake City, Utah, and this choice was supported unanimously by the association.

ENTERTAINMENTS

The entertainments provided for delegates and guests constituted a most enjoyable and important part of the meeting. These began with an informal dance on the evening of Monday, Sept. 21. On Tuesday afternoon there was a boat trip on Lake Champlain, and in the evening a mock-trial was held. On Wednesday contests at tennis and croquet were arranged and a golf tournament divided interest with a trip through the famous Au Sable Chasm. In the evening the annual dinner occurred. This was a remarkable success, although it was dry—a condition that by no means extended to exceptional speeches by A. H. Rudd, signal engineer Pennsylvania Railroad; C. S. Sims, vice-president Delaware & Hudson Company and T. S. Stevens, signal engineer Atchison, Topeka & Santa Fé Railroad. F. P. Patenall, retiring president of the association, acted ably as toastmaster. An interesting feature of the banquet was the presentation of a handsome silver loving cup to Mr. Patenall as a token of esteem by his subordinates in the signal department of the Baltimore & Ohio Railroad. The entertainments on Thursday consisted of the annual baseball game in the afternoon between the East and the West, in which the former team was successful, and, in the evening the annual dance. On Friday the delegates left by boat through Lake Champlain and Lake George, stopping for the evening at Fort William Henry, at the south end of the latter lake.

Large Attendance Expected at the Panama Exposition

According to President Charles C. Moore, of the Panama-Pacific International Exposition, the attendance at the San Francisco fair will probably be larger on account of the war. While the war will probably make a reduction in the attendance from Europe, it is believed there will be a larger attendance from South America and the Orient. It is thought also that people from these countries will come to establish business connections with American manufacturers and place orders for goods formerly bought in Europe. Moreover, many Americans who usually visit Europe in the summer will go to San Francisco instead.

Definite assurances have been received from France, Italy, Turkey and Japan that they will make the exhibits originally intended. Holland has added $300,000 to her original appropriation, Italy has ordered work on her building and exhibits rushed and Japan has asked for and received an increase of space. The Argentine Republic has increased its appropriation from $1,250,000 to $1,750,000.

The exposition is said to be 92 per cent ready to-day, and it will open on Feb. 20 as planned.

Taxation Valuations of Iowa Interurban Roads

The forty-third annual report of the executive council of Iowa fixing the taxation valuations as of July 21, 1914, gives the following mileage and taxable value per mile for the interurban roads in the State: Albia Interurban Railway, 10 miles, $2,500; Cedar Rapids & Marion City Railway, 20.97 miles, $8,500; Centerville Light & Traction Company, 7.84 miles, $3,000; Charles City Western Railway, 16.33 miles, $2,000; Davenport & Muscatine Railway, 25.27 miles, $3,000; Fort Dodge, Des Moines & Southern Railway, 117.97 miles, $3,000; Inter-Urban Railway, 64.18 miles, $3,500; Iowa & Illinois Railway, 33.05 miles, $3,700; Iowa Railway & Light Company, 46.38 miles, 3,700; Mason City & Clear Lake Traction Company, 14.16 miles, $4,500; Oskaloosa & Buxton Electric Railway, 2.3 miles, $3,700, and Waterloo, Cedar Falls & Northern Railway, 87.63 miles, $4,500. The total trackage represented amounts to 452.54 miles, with a taxable value of $1,676,301.

The Hamilton (Ont.) Street Railway donated the entire receipts for Sept. 10 to the Patriotic Fund.

War and the Electrical Industry

Abstract from English Paper Showing Effect of War on Tramways in Service and Receipts—Also Articles Describing Current United States Trade, Electrical Opportunities in South America and Slowness of South American Payments

PUBLIC TRANSPORTS AND THE WAR

According to *The Electric Railway and Tramway Journal* of Sept. 4, the full effects of the European war upon the public transportation services of the United Kingdom have not made themselves felt, but the tramways were affected during the first epoch of the war. One of the earliest results was the calling from almost every tramway system of a considerable number of motormen and conductors who were reservists or territorials. The effects of this sudden withdrawal of skilled men were naturally serious, but by canceling holiday leave and other obvious steps the managers for the most part kept all, or nearly all, of their services going. As to what may happen when the veteran reserves are called up, no prediction is ventured, but the managers have an eye to this contingency, and will undoubtedly be prepared to keep their cars moving.

In regard to traffic the paper says:

"So far the effects of the war upon tramway traffic have not been very serious, largely owing to the fact that a large proportion of the population has refrained from going to the seaside, and has spent its holidays at home, to some extent taking rides on the cars. As the usual holiday season declines, however, this influence will disappear and in view of all the conditions which obtain we must look forward to lower traffic receipts, with exceptions, perhaps, in the cases of cities or towns where war materials are produced on a large scale."

Of the special services rendered by the tramways to the authorities or to the community since war was declared, nothing is said in detail, but it is stated that the Bradford tramway cars hauled guns up the steep hills which lead out of that city, and in many towns working men were assisted by the extension of the hours during which tickets are issued at special workmen's fares. Many other services were rendered by the cars, while hundreds of motor buses from London and other places were commandeered for military purposes. It is expected that in the near future both these classes of vehicles may be fitted up as ambulances and sick wards.

CURRENT EXPORTS AND IMPORTS

According to the United States Department of Commerce, the exports for August fell off $77,572,475. The total August imports amounted to $110,337,545 as compared to $187,909,020 in August, 1913. For the first eight months of the year the exports were $1,311,319,707 as compared to $1,515,182,137 for the same period last year. The imports, which include raw material used for export goods, decreased from $137,651,553 in August, 1913, to $129,399,496 in August, 1914, a decrease of $8,252,057. For the eight months the figures were $1,156,300,228 for 1913 and $1,269,992,869 for 1914. Some of the import figures are affected by the tariff and not by the war, 61.8 per cent entering free of duty in August this year as compared to 50.9 per cent in August last year.

The Pan-American Union on Sept. 22 issued a statement cautioning American manufacturers against a belief in an immediate market for the sale of products in Latin America. It was stated that South American countries now need financial help, reasonable credits and markets for their raw products, more than American manufactured products and additional shipping facilities. The real Latin American opportunity is one for co-operation, investigation and preparation.

Secretary Redfield, Department of Commerce, has announced that the department will soon place in Rio de Janeiro, Buenos Aires, Santiago and Lima commercial attachés to make extended studies of all the markets. According to Mr. Redfield, the first and foremost need in South America is the re-establishment of her basis of credit. Without this credit merchants and manufacturers in this country cannot afford to sell and without it Latin America cannot buy.

SOUTH AMERICAN CREDITS

MR. MUCHNIC BEFORE PAN-AMERICAN DIPLOMATS EMPHASIZES SLOWNESS OF PAYMENTS AS CAUSE OF POOR CREDIT CONDITIONS IN SOUTH AMERICA

At a conference of Pan-American diplomats recently called in Washington by Secretary of State Bryan, Charles M. Muchnic, in charge of the foreign department, American Locomotive Company, New York, and representative of the National Foreign Trade Council, discussed the general credit condition in South America. Mr. Muchnic stated that as a matter of fact bankers do not generally extend credit in South America to the consumers direct, but rather to the middlemen. These as a rule add to the manufacturers' prices profits ranging from 20 per cent to 200 per cent. These middlemen make no stipulation with the ultimate purchaser as to when his payments are to be made, but rather encourage the accounts to run indefinitely so that the manufacturer who might be desirous of doing business direct with the South American consumer finds himself at a great disadvantage. South American representatives have criticised Americans as always exacting cash payments against documents and as not being willing to extend credit to South American merchants or governmental institutions. Such criticism is not just or correct, because most American manufacturers are more than willing to extend credit to the South American purchasers provided they can be given a reasonable assurance that payments will be made on maturity.

Some years ago Mr. Muchnic made a trip through South America and found in checking up the prices quoted by commission agents with those quoted directly by the American Locomotive Company, that a large discrepancy existed. When he remonstrated with the agents as to the exorbitant commission or profits they added to the regular prices, they invariably stated, "Well, we never know when we are going to get our money, so that we have to add large profits." Not believing such business conditions possible, the company arranged to extend credits to its South American clients on open account. This was done for the last five or six years, and although not a single dollar was lost on the principal of the transactions involved, the company had great difficulty in impressing upon its customers the necessity of meeting their obligations on the due dates. There were cases where payments of $200.000 or $300,000 that had become due were not paid for more than two years after their maturity and it was impossible to collect interest for the time elapsed between the dates payment was due and made. The invariable failure to pay on the due date cost the company many thousands of dollars in interest.

If South American diplomats would impress upon their governmental institutions and their people the desirability of meeting payments on the dates promised or could devise some means whereby they could give some reasonable assurance to American manufacturers that promises of deferred payments would be met on the dates agreed upon, Mr. Muchnic believes that South American countries could get all the credit desired. There is no unwillingness among bankers and manufacturers to grant credit to South Americans provided they can be certain that the obligations incurred will be paid off promptly. British banks in South America refuse to buy any bills of exchange on South America because, they state, they are not certain of being able to collect the amounts due.

SOUTH AMERICAN TRADE SPECIAL

As noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19, the Lehigh Valley Railroad on Sept. 24 started a South American trade special over its lines between New York and Buffalo. The three speakers on the train included Charles M. Pepper, Edward Albes and W. S. Kies. Mr. Pepper, who was for ten years a member of the foreign trade bureau at Washington, spoke of specific markets in South America. Mr. Albes went as the personal representative of Director-General Barrett of the Pan-American Union. Mr. Kies, who is in charge of the South American branches of the National City Bank of New York, discussed the financing of business enterprises with South Americans. Press representatives were invited to make the trip. Meetings, at which there was presented specific information applicable to the main industries of each town, were held at Easton, South Bethlehem, Allentown, Hazleton, Ithaca, Auburn, Geneva, Rochester and Buffalo.

CONDITIONS FOR SUCCESS IN SOUTH AMERICA

MR. KINLEY DISCUSSES NEED OF AMERICAN INVESTMENT IN SOUTH AMERICA AND BEST FIELDS FOR ENDEAVOR

According to a statement made by David Kinley, director of courses in commerce, University of Illinois, to a representative of the ELECTRIC RAILWAY JOURNAL, a considerable proportion of South American exports represents interest on indebtedness. In other words, England, France and Germany have built up their South American trade largely through financing South American enterprises. If the United States is to replace any or all of these countries it must furnish capital to South America. This is particularly true of the west coast, where mineral resources are awaiting a larger development than they have yet had. Mr. Kinley stated that if a group of American manufacturers should advance $50,000,000 for railroad or mining enterprises on this coast they would not send gold to South America. The proper persons in that continent would receive credit for the amount and would then purchase in this country the necessary materials and supplies, paying by drafts on the credits advanced. After the work was under way and successful, they would pay interest and capital from the proceeds of their exports to this and other countries.

Mr. Kinley believes that American manufacturers might build up their trade to a considerable degree without financing South America's projects, but that they could never get the bulk of the business. The more capital South Americans can secure the more they have to sell and the more, therefore, they are able to buy. This process accounts for the great hold of England and Germany in Argentina and Chile. There is a considerable field still open in these countries, but in Mr. Kinley's opinion American manufacturers could have an easier time in Peru, Ecuador or possibly Brazil. There has been, however, asserts Mr. Kinley, too much talk of government initiative in this matter. If any manufacturer in this country is in earnest about developing trade with South America he must proceed on his own initiative, sending responsible agents, meeting South American credit terms, and in general helping to build up what a recent manufacturer called "a network of intelligent agencies."

EXPORT ASSOCIATION LUNCHEON

The American Manufacturers' Export Association held a luncheon at the Whitehall Club, New York, on Sept. 18 to discuss foreign trade conditions. Charles E. Jennings, the president, presided. The first speaker was H. N. Douthitt, special agent of the Department of Commerce, who is soon to go to South America to investigate the trade possibilities for American electrical and other machinery. He said that while American prices were probably a little higher than the prices of European manufacturers, American products had a good reputation in South America and the establishment of markets was only a question of educating the people through branch houses.

Charles M. Muchnic, third vice-president American Locomotive Company, said that in view of the present deplorable financial conditions in South America, American manufacturers should now attempt only to lay the foundation for future returns. Trade with South America should be established on the basis of the quality of the goods. He also discussed some of the points mentioned in his address before the Pan-American diplomats in Washington, outlined in another column. William A. Graham Clarke, commercial agent in charge of the bureau of foreign commerce in New Orleans, discussed the serious conditions arising from the lack of cotton mills to use the raw cotton now without its regular market in Europe. Prof. Guy Edward Snider, of the College of the City of New York, who has just returned from South America, spoke of the acute financial situation there and of the harm done by some American manufacturers in sending goods below sample quality. J. J. Teal, of the Lehigh Valley Railroad, described the plan of that company to send a special train from New York to Buffalo to advertise the possibilities of export trade.

MR. STICHTER ON TEXAS TRADE

B. B. Stichter of Dallas, general manager Southern Traction Company, Dallas, Tex., recently urged Texans to make a campaign to capture the South American trade. "The merchants and business people of Dallas and other large Texas cities," he said, "should band together and come to Galveston and charter a steamer to go and make personal appeals for business. They should go prepared to give facts and figures about what can be expected from this country in the way of trade. The campaign should not stop with the Central American countries, and with the cities along the eastern coast of South America, but the gospel of trade should be carried to the Western cities. Now that the Panama Canal has been opened, there is no reason that Texas should not get her part of the trade from the Pacific part of the country." Concerning conditions reflected by the world conflict. Mr. Stichter declared that if all can hold their own for sixty days there will be a loosening of conditions and the country's business will again be on the boom.

American Association News

Complete Lists of Finance, Exhibits and Entertainment Committee Members and of Exhibitions (to Sept. 15) Are Given Below—A Preliminary Announcement of the Entertainment Plans Is Also Given

COMMITTEES OF THE MANUFACTURERS' ASSOCIATION

The full convention committees of the Manufacturers' Association have just been announced. The several departments of the work are under the general direction of vice-presidents of the association as follows:

FINANCE, Safford S. Colby, vice-president Allen & Peck, Inc.; **EXHIBITS**, Edwin H. Baker, second vice-president Galena Signal Oil Company, New York; **ENTERTAINMENT**, Charles R. Ellicott, assistant Eastern manager Westinghouse Traction Brake Company.

FINANCE COMMITTEE

Wylie Brown, Bridgeport Brass Company, chairman.
C. A. Babtiste, ELECTRIC RAILWAY JOURNAL, New York.
Merrill G. Baker, Cambria Steel Company, Johnstown, Pa.
G. A. Barden, Chicago Pneumatic Tool Company, Philadelphia, Pa.
A. K. Baylor, General Electric Company, New York.
C. P. Billings, Westinghouse Traction Brake Company, Pittsburgh, Pa.
L. L. Brinsmade, Westinghouse Machine Company, New York.
W. A. Brown, Waclark Wire Company, New York.
W. C. Dickerman, American Car & Foundry Company, New York.
S. A. Greer, Rail Joint Company, New York.
H. L. Hawley, Consolidated Car-Heating Company, New York.
Henderson W. Knott, Morgan Crucible Company, Ltd., New York.
C. E. Leach, New York Air Brake Company, New York.
M. A. Oberlander, Western Electric Company, New York.
H. E. Ross, Electric Traction, New York.
J. E. Slimp, Ohio Brass Company, New York.
H. J. Spalding, Aluminum Company of America, New York.
E. J. Waring, Pyrene Manufacturing Company, New York.
R. C. Wilson, Safety Insulated Wire & Cable Company, New York.
W. L. Wright, Wm. Wharton, Jr., & Company, Inc., Philadelphia, Pa.

EXHIBITS COMMITTEE

H. G. McConnaughy, Dearborn Chemical Company, director.
George Arnold, Cleveland Frog & Crossing Company, Cleveland, Ohio.
S. A. Bullock, Baldwin Locomotive Works, Philadelphia, Pa.
S. J. Cotsworth, Lorain Steel Company, Philadelphia, Pa.
N. M. Hench, Carnegie Steel Company, Pittsburgh, Pa.
William M. Henderson, Pennsylvania Steel Company, Steelton, Pa.
T. W. Illingworth, Midvale Steel Company, Philadelphia, Pa.
F. D. Killion, Western Electric Company, New York.
J. A. Kucera, ELECTRIC RAILWAY JOURNAL, New York.
R. C. McCloy, Wm. Wharton, Jr., & Company, Inc., Philadelphia, Pa.
J. R. McFarlin, Electric Service Supplies Company, Philadelphia, Pa.
J. C. McQuiston, Westinghouse Companies, East Pittsburgh, Pa.
Edwin B. Meissner, St. Louis Car Company, St. Louis, Mo.
J. W. Perry, H. W. Johns-Manville Company, New York.
A. L. Price, Ohio Brass Company, Mansfield, Ohio.
F. W. Sargent, American Brake Shoe & Foundry Company, Mahwah, N. J.
L. W. Shugg, General Electric Company, Schenectady, N. Y.
P. C. Snow, Globe Ticket Company, Philadelphia, Pa.
L. H. Snyder, Joseph Dixon Crucible Company, Jersey City, N. J.
Charles H. Thomas, Galena-Signal Oil Company, Franklin, Pa.
S. M. Wilson, The J. G. Brill Company, Philadelphia, Pa.

ENTERTAINMENT COMMITTEE

W. G. Kaylor, Westinghouse Traction Brake Company, chairman.
H. G. Barbee, Maryland Steel Company, Boston, Mass.
C. H. Beck, National Brake & Electric Company, St. Louis, Mo.
Walter Berry, Carnegie Steel Company, New York.
W. L. Boyer, Bemis Car Truck Company, Springfield, Mass.
R. M. Campbell, Detroit Graphite Company, New York.
Charles C. Castle, U. S. Metal & Manufacturing Company, New York.
E. F. Chaffee, O. M. Edwards Company, Syracuse, N. Y.
C. G. Chamberlin, F. W. Devoe & C. T. Raynolds Company, New York.
Thomas Cooper, Westinghouse Electric & Manufacturing Company, Philadelphia, Pa.
W. V. Dee, G. Drouve Company, Bridgeport, Conn.
J. H. Denton, Railway Utility Company, New York.
W. J. Fleming, Automatic Ventilator Company, New York.
N. M. Garland, Ohio Brass Company, New York.
L. E. Gould, ELECTRIC RAILWAY JOURNAL, Chicago, Ill.
F. O. Grayson, Grayson Railway Supply Company, St. Louis, Mo.
Alfred Green, Galena-Signal Oil Company, New York.
A. A. Hale, Griffin Wheel Company, Boston, Mass.
R. F. Hayes, Curtain Supply Company, New York.
H. A. Hegeman, U. S. Metal & Manufacturing Company, New York.
H. H. Helms, Aluminum Company of America, Philadelphia, Pa.
J. M. High, the Pantasote Company, New York.
A. P. Jenks, General Electric Company, Chicago, Ill.
F. E. Johnson, Ohio Brass Company, Chicago, Ill.
P. M. Kling, Laconia Car Company, Boston, Mass.
W. A. Lake, Pantasote Company, New York.
C. W. Laskay, Hale & Kilburn Company, New York.
E. R. Mason, E. R. Mason Company, New York.

T. F. McKenna, Electric Service Supplies Company, Philadelphia, Pa.

H. G. Pearce, Standard Steel Works Company, Philadelphia, Pa.

H. N. Ransom, Westinghouse Electric & Manufacturing Company, New York.

D. A. J. Sullivan, Galena-Signal Oil Company, Kansas City, Mo.

S. W. Trawick, General Electric Company, New York.

W. H. Trubee, Galena-Signal Oil Company, New York.

W. H. Wilkinson, Pressed Steel Car Company, New York.

PLANS OF THE ENTERTAINMENT COMMITTEE

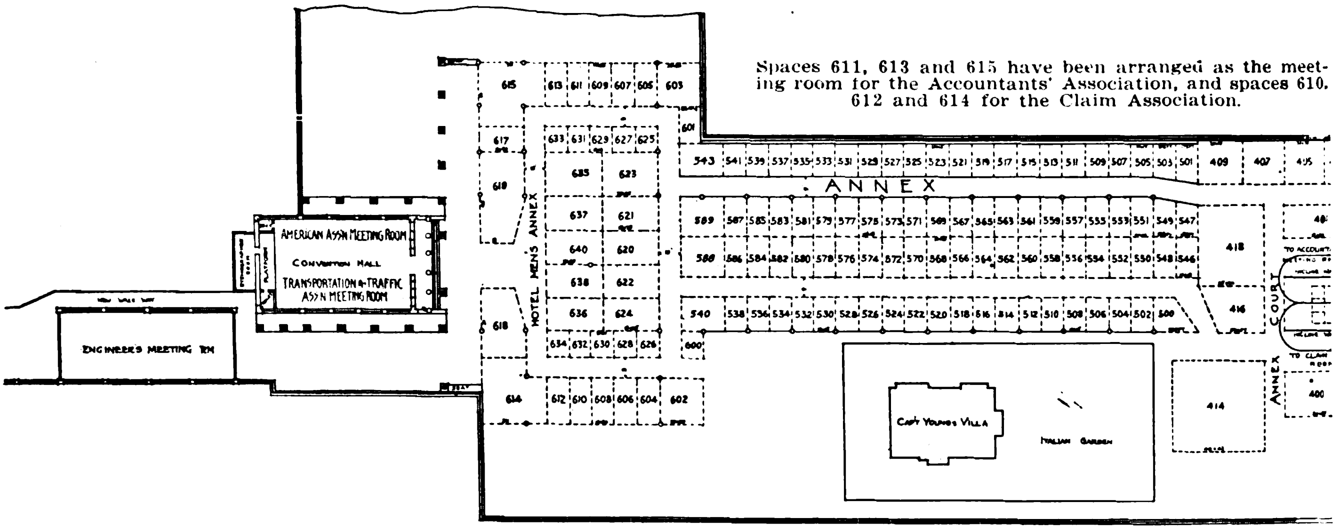
W. G. Kaylor, chairman of the entertainment committee, has announced several of the important features of the entertainment plans for the convention. One of the most novel is a trap shooting contest, which is expected to be an annual affair hereafter. The traps will be placed on the ocean end on the convention pier, and pigeons will be thrown out over the ocean. Prizes will be offered for the highest scores made by experienced contestants and by novices. All persons desiring to participate are requested to bring their own guns, although a few will be provided for the use of the novices. Arrangements have been made to supply contestants with standard trap shooting shells. A practice shoot will be held on Tuesday morning, and the contest will occur on Wednesday afternoon. The shooting should be interesting on account of its spectacular character, and a gallery at the side of the pier will afford a convenient location from which to view the sport. It has been found by test that the noise of the shooting will not interfere with the meetings because the traps will be located at a considerable distance from the hall, and the noise of the ocean will mask the sound of the guns. C. C. Castle, U. S. Metal & Manufacturing Company, is chairman of the sub-committee in charge of the trap shooting.

The entertainment committee has provided for an obstacle golf tournament on the lawn of the Marlborough-Blenheim Hotel. The course, which will comprise nine holes, will be laid out by an expert and will be artistically arranged. Two prizes will be offered for the ladies and two for the men. The chairman of the sub-committee in charge of this tournament is N. M. Garland, Ohio Brass Company.

On Monday evening the annual reception will be held on the convention pier, and it will be followed by informal dancing. On Tuesday evening there will also be informal dancing in the ballroom on the pier. Wednesday evening will be carnival night. There will be a number of special features, among which will be a dancing contest with prizes to be awarded to the leading three couples. This will be open to all members and guests. There will also be a Kee-no dance open to all. On Thursday night the grand ball will occur. On Monday afternoon a concert and dance will be given in Parisian Garden at the entrance lobby of the convention pier. On Tuesday afternoon a ladies' auction bridge tournament will be held in the Parisian Garden, which will be entirely rearranged for the occasion. Prizes will be given as usual for the highest scores. For all of the musical events a twenty-five piece orchestra will be provided.

In addition to the other attractions a skee-ball contest will continue during the entire convention. Five alleys for this sport will be provided in the aquarium court. Prizes will be offered for the highest scores made by men and by women.

The usual free roller-chair service between the hotels and the pier will be furnished.



Spaces 611, 613 and 615 have been arranged as the meeting room for the Accountants' Association, and spaces 610, 612 and 614 for the Claim Association.

PLAN OF OUTER END OF CONVENTION PIER

LIST OF EXHIBITORS AT THE CONVENTION

Following is a list of the exhibitors, with space numbers in parentheses.

Automatic Ventilator Company, (317); Albert & J. M. Anderson Manufacturing Company, (374 and 375); American Steel & Wire Company, (558, 559, 560, 561); American Engineering Company, (12); American Mason Safety Tread Company, (538); American Car & Foundry Company, (619); Atlas Railway Supply Company, (502 and 504); American Brake Shoe & Foundry Company, (416); Edgar Allen American Manganese Steel Company, (500); American Railway Supply Company, (526); Alloy Steel Forging Company, (569); American Lock-Nut Company, (512); S. Abrahams & Company, (323); Auto Utilities Manufacturing Company, (316).

Bemis Car Truck Company, (503); The Brookfield Glass Company, (331); L. S. Brach Supply Company, (141); The Blake Car Step Works, (600); The Buda Company, (311); The J. G. Brill Company, (8); Bayonet Trolley Harp Company, (541).

The Cooper Heater Company, (325); Cleveland Frog & Crossing Company, (585 and 587); Chicago Varnish Company, (574 and 575); Carnegie Steel Company, (546, 547, 548, 549, 550, 551, 552, 553); Chicago Pneumatic Tool Company, (101, 103, 105); The Curtain Supply Company, (638); Columbia Machine Works & Malleable Iron Company, (620); Cheatham Electric Switching Device Company, (159); Consolidated Car-Heating Company, (22); Consolidated Car Fender Company, (589).

Joseph Dixon Crucible Company, (16); The G. Drouve Company, (607); The Duff Manufacturing Company, (637); DuPont Fabrikoid Company, Inc., (307); The Dayton Fare Recorder Company, (386 and 387); Drew Electric & Manufacturing Company, (315).

Elastic Car Waste Company, (576); The Electro-Mechanical Brake Company, Ltd., (610); *Electric Traction*, (10); The Esterline Company, (318); The Ellcon Company, (534 and 536); The Eclipse Railway Supply Company, (571 and 573); The O. M. Edwards Company, Inc., (519 and 521); The Electric Railway Improvement Company, (570 and 572); Electric Service Supplies Company, (414); ELECTRIC RAILWAY JOURNAL, (7).

Flood & Conklin Company, (18); Fonger Fender Company, (330); Federal Signal Company, (131).

Globe Ticket Company, (380 and 382); General Railway Signal Company, (604 and 606); General Vehicle Company, Inc., (603); Griffin Wheel Company, (143, 145, 147, 149); General Electric Company, (20); Gold Car Heating & Lighting Company, (306 and 308); Galena-Signal Oil Company, (24); Goldschmidt Thermit Company, (13, 114, 116, 118 and 120).

Hauck Manufacturing Company, (200); Harrison Safety Boiler Works, (158 and 160); Hale & Kilburn Company, (407 and 409); Heywood Brothers and Wakefield Company, (566); Hubbard & Company, (618); The Hunter Illuminated Car Sign Company, (36 and 38).

Index Visible, Inc., (523); The International Register Company, (300, 302, 304); The Indianapolis Switch & Frog Company, (173); Independent Lamp & Wire Company, (527); The International Steel Tie Company, (148).

Jennison-Wright Company, (110); H. W. Johns-Manville Company, (336); J. N. Johns Manufacturing Company, (371); Johnson Fare Box Company, (320, 322 and 324).

Lutz-Webster Engineering Company, Inc., (509); Lord Manufacturing Company, (577); Laconia Car Company, (Track Exhibit Space); The Lorain Steel Company, (418).

McQuay-Norris Manufacturing Company, (319); The Midvale Steel Company, (640); MacRae's Blue Book Company, (10B); The Morgan Crucible Company, Ltd., (104 and 106); Mark Manufacturing Company, (617); Maryland Steel Company, (23); McGraw Publishing Co., (7).

National Car Wheel Company, (578 and 579); National Brake Company, Inc., (368 and 369); The National Lock Washer Company, (539); R. D. Nuttall Company, (140, 142 and 144); Nachod Signal Company, Inc., (124); National Brake & Electric Company, (15); National Tube Company, (554, 555, 556, 557); Nelson Valve Company, (126); The Nungesser Carbon & Battery Company, (513); Naugle Pole & Tie Company, (332 and 334); New York Switch & Crossing Company, (562 and 563); National Carbon Company, (326).

Ohio Brass Company, (358, 359, 360, 361, 362, 363, 364, 365); Ohmer Fare Register Company, (301, 303, 305); Okonite Company, (168).

Pyrene Manufacturing Company, (215, Aquarium Court); The Pantasote Company, (400); The Pennsylvania Steel Company, (23); Prepayment Car Sales Company, (414); Pittsburgh Steel Company, (162 and 164); The Prest-O-Lite Company, Inc., (543); The Prince-Groff Company, (384) and 385).

The Rail Joint Company, (350, 351, 352, 353, 354, 355, 356, 357); Railway Track-work Company, (161 and 163); Railway Roller Bearing Company, (134); Rooke Automatic Register Company, (321); Railway & Industrial Engineering Company, (609 and space near Greek Temple); The Railway Materials Company, (535); Railway Improvement Company, (584 and 586); John A. Roebling's Sons Company, (17 and 19); Railway Utility Company, (372 and 373).

Simmen Automatic Railway Signal Company, (153 and 155); Standard Corporation, (10C); The Seymour Portable Rail Grinder, (138); Sauvage-Ward Brake Company, Inc., (501); Schutte & Koerting Company, (154 and 156); The S. K. F. Ball Bearing Company, (532); Sterling Fare Register Company, (328); Simmons-Boardman Publishing Company, (10A); The Standard Paint Company, (507); St. Louis Car Company, (588); The Peter Smith Heater Company, (376 and 377); St. Louis Steel Foundry, (14); Standard Underground Cable Company, (388); Star Brass Works, (506); Sattley Manufacturing Company, (378 and 379); The Sterling Varnish Company, (567); Street Railway Signal Company, (117 and 119).

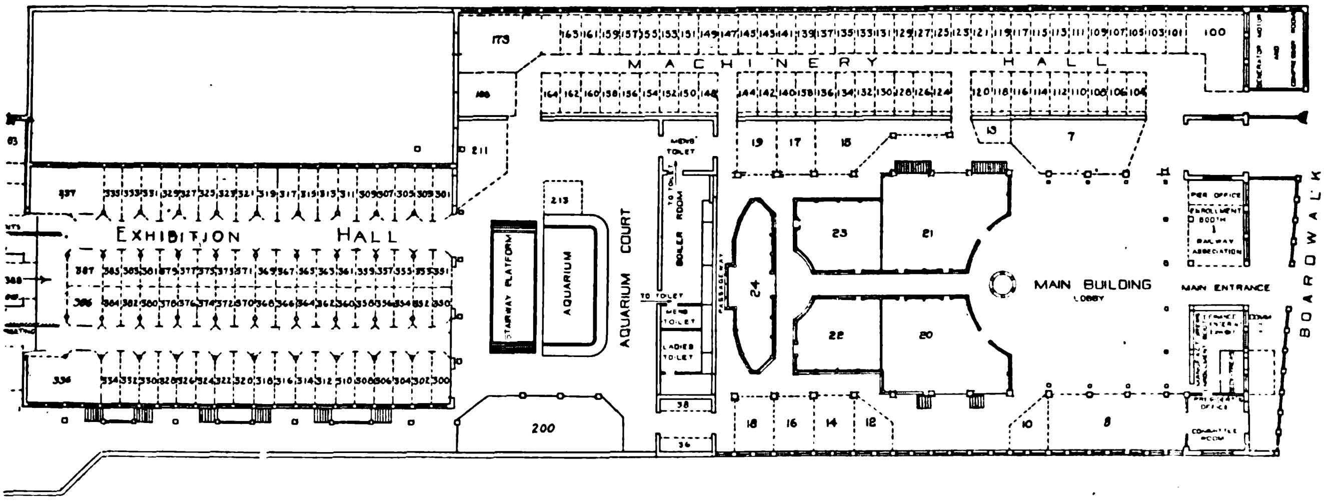
The Thew Automatic Shovel Company, (309); Tool Steel Gear & Pinion Company, (624); Templeton, Kenly & Company, Ltd., (636); Taylor Electric Truck Company, (109, 111, 113, 115); Transportation Utilities Company, (582 and 583); Thayer & Company, Inc., (511); Trigger-Lock Reversible Controller Finger, (151); The Trolley Supply Company, (366 and 367); Ernest H. Thompson, (314).

U. S. Metal & Manufacturing Company, (622); The Union Switch & Signal Company, (133, 135, 137 and 139); United States Electric Signal Company, (401); United States Wood Preserving Company, (107); The Universal Lubricating Company, (370); Universal Safety Tread Company, (568).

Van Dorn Coupler Company, (531 and 533); Valentine & Company, (580 and 581).

Wasson Engineering & Supply Company, (613); The Watson Stillman Company, (611); The Wyoming Shovel Works, (608); The Whitmore Manufacturing Company, (121, 123 and 125); Charles N. Wood Company, (129); The Waclark Wire Company, (381 and 383); Western Electric Company, (337); Walpole Tire & Rubber Company, (333); Wilson Remover Company, (213); Whittier Mills Company, (313); Westinghouse Electric & Manufacturing Company, (21); Westinghouse Traction Brake Company, (21); Westinghouse Machine Company, (21); Edwin S. Woods & Company, (537); Wheel Truing Brake Shoe Company, (505); Wm. Wharton, Jr., & Company, Inc., (621 and 623).

Yarnall-Waring Company, (128).



PLAN OF INNER END OF CONVENTION PIER

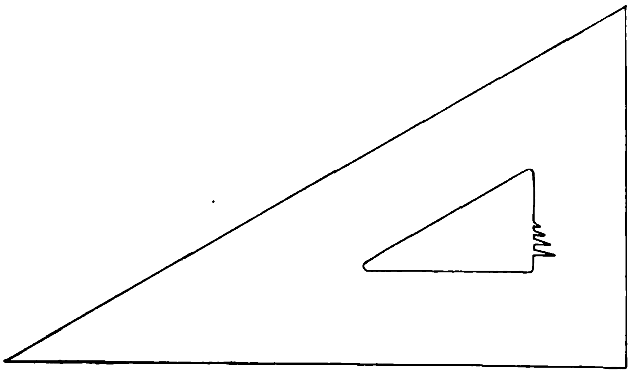
Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Notched Triangle to Aid Good Lettering

BY G. H. MC KELWAY, ENGINEER OF DISTRIBUTION BROOKLYN RAPID TRANSIT SYSTEM



NOTCHED TRIANGLE FOR EVEN LETTERING

The appearance of a drawing is always greatly improved if the lettering has been done in a neat manner, but many draftsmen object to taking the time required to make the letters carefully and therefore turn out much poorer looking work than they should. A few days ago the writer noticed a draftsman using a triangle with a number of notches of different depths cut into it, as shown in the drawing, and inquiry revealed the fact that they were used to aid in the drawing of lines to insure that all letters of the words on the drawings were of the proper height.

When ruling such lines the average draftsman must first mark off with a rule a number of points the required distance apart and then draw the lines through those points with his T-square to get them parallel to each other, shifting the T-square down to the next point each time after drawing a line through the one above. All of this takes time, whereas the plan observed was so much simpler and quicker that it may be of value to others.

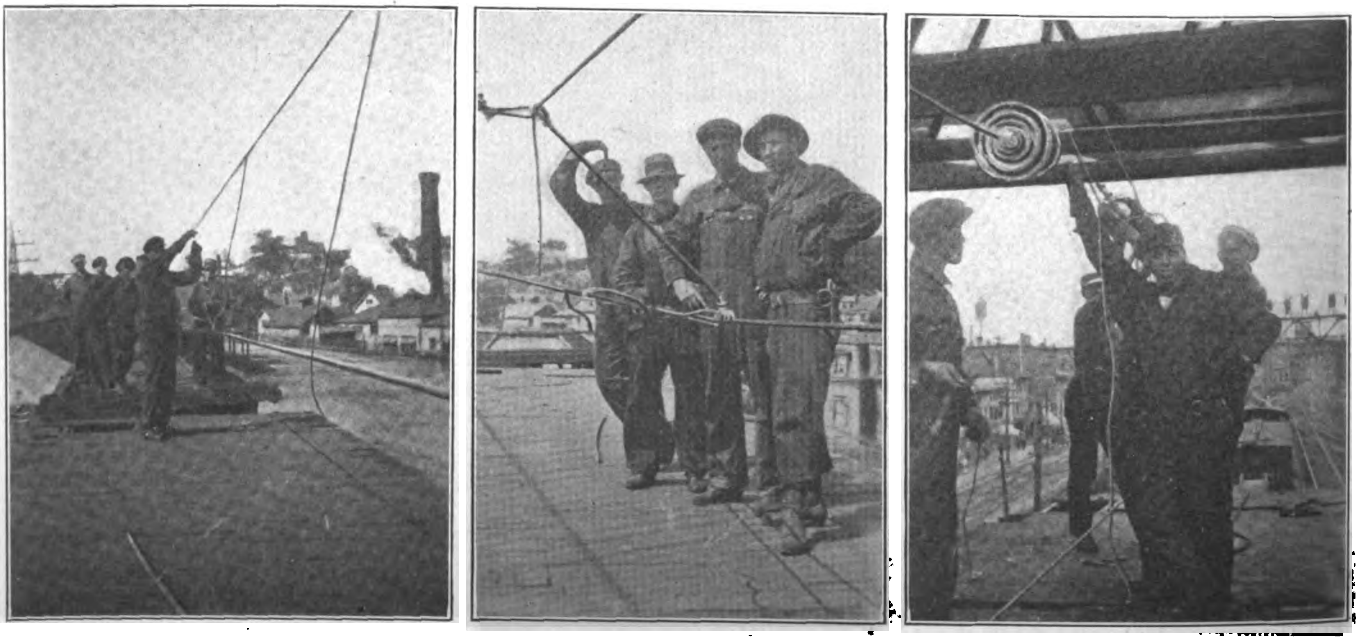
With the triangle notched as illustrated there is no marking of the distance apart that the lines are to come, or of shifting the T-square from one point to another. The bottoms of the notches are each a certain distance below the one next to it, so that all that the draftsman has to do is to set his T-square once, put the pencil point in one of the notches, move pencil and triangle across the paper, making one line, then shift the pencil to another notch, depending upon the size of the letter to be made, and draw another line, always without moving the T-square. This can be repeated again if a third line is desired to make the letters, the pencil being moved to still another notch. The result is a number of parallel lines made so quickly and easily that the draftsman has no excuse for not using them and thus securing a great improvement in the appearance of his drawings.

New Haven Construction Notes—Yards and Sidings

BY A FORMER INSPECTOR

In electrifying the yards and sidings of the New York, New Haven & Hartford Railroad most of the wire was pulled by hand. A few of the sidings were equipped by means of work trains, while in other cases we used small tower cars. The accompanying illustrations will show the variety of conditions and methods which were applied better than any extensive descriptions.

Fig. 1 shows the messenger and trolley wires being lined up before measurements were taken for the



NEW HAVEN CONSTRUCTION NOTES—FIG. 1—LINING UP MESSENGER AND TROLLEY WIRE: FIG. 2—PULL-OFF HANGER TIED TEMPORARILY IN PLACE ON A CURVE; FIG. 3—INSULATOR FOR STEEL MESSENGER WIRE AT BRIDGES

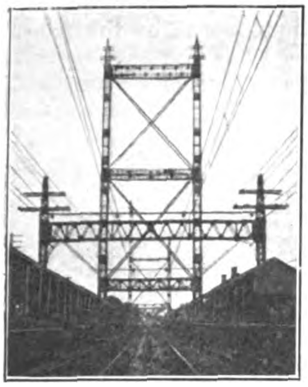
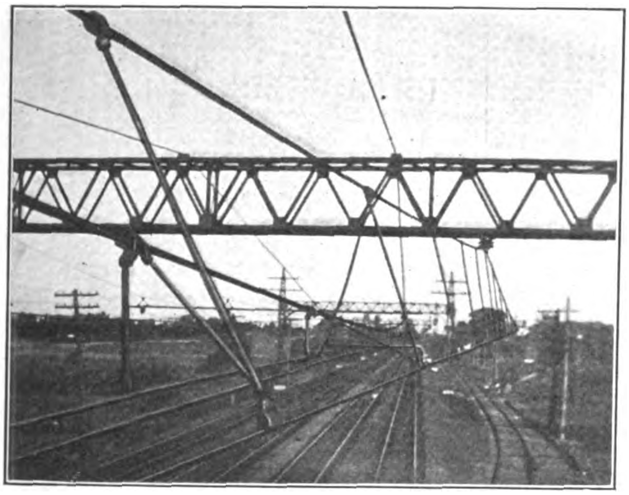


FIG. 6—STEEL TOWER AT NAVIGABLE WATER

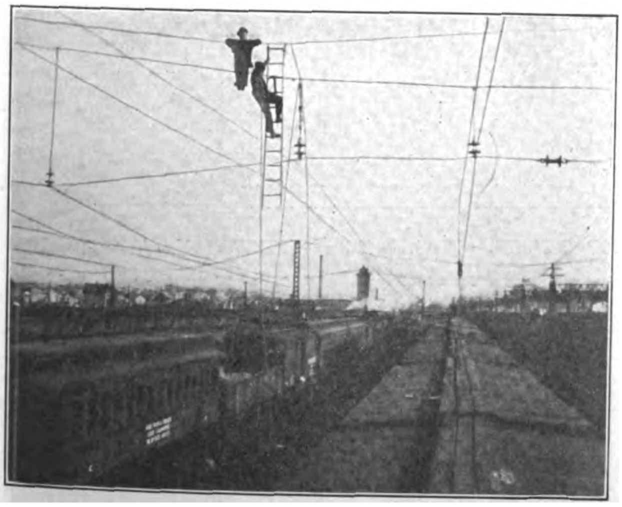
hanger rods. A tie wire was used wherever a hanger was to go. The measurement for the hanger spacing was 10 ft., plus or minus. The hanger rods were measured with a scale which showed the correct length of rod required, with due allowance, of course, for the trolley clip and the hook over the messenger.

In a number of places we found it possible to use standard hangers. Thus Fig. 2 shows a pull-off hanger temporarily tied in place on a curve. Fig. 3 illustrates the form of insulator used with the 3/8-in. steel messenger at catenary bridges. Fig. 4 shows a typical passage at a switch point from the bridge type construction of the main line to the pole type construction at sidings.



NEW HAVEN CONSTRUCTION NOTES—FIG. 4—PASSAGE FROM MAIN LINE TO A SIDING

Cross-span work under way in a large yard is shown in Fig. 5. The ladder was hung on what we termed a riding wire. This wire was put up between the poles or span supports so that the men could go up the poles and ride out on a ladder or safety belt to any wire on which they had to work. Those who saw the linemen on wires commonly remarked that they were human spiders.



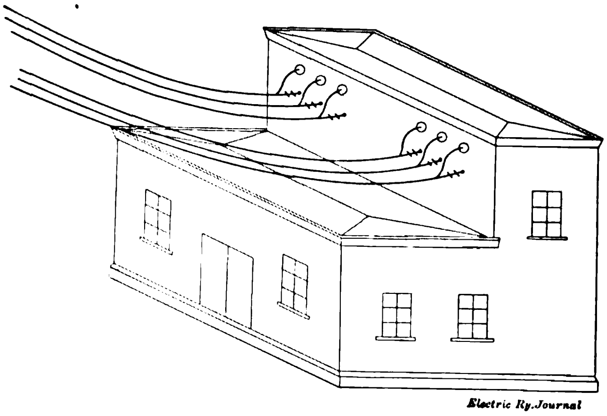
NEW HAVEN CONSTRUCTION NOTES—FIG. 5—CROSS-SPAN WORK IN A LARGE YARD

The final view, Fig. 6, is an interesting variation from the general construction inasmuch as it shows the steel towers which were erected on the shores of navigable waters in accordance with the clearance provisions of the United States War Department.

Safe Substation Design for Incoming Wires

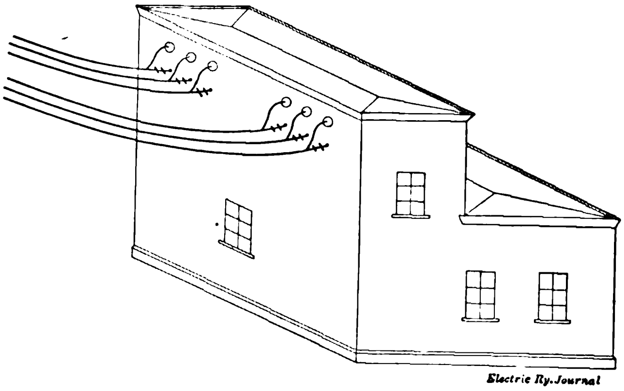
BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

Much has been done to raise the standard of substation equipment, but very little is heard about the design of the substation building. Sometimes the station is designed by a man who knows so little about the conditions that work in or around it is positively dangerous. Thus Fig. 1 shows a substation for stepping down the incoming voltage from 24,000 volts alternating to 600 volts direct current, as actually designed by a well-known engineering company. At first sight nothing may seem wrong with the design, but this is not the case, as will soon appear.



Electric Ry. Journal

FIG. 1—UNSAFE SUBSTATION BECAUSE THE INCOMING HIGH-TENSION WIRES PASS OVER THE LOWER ROOF



Electric Ry. Journal

FIG. 2—SAFE SUBSTATION BECAUSE THE INCOMING HIGH-TENSION WIRES GO DIRECTLY INTO THE MAIN BUILDING.

In my seven years' experience as a construction man in various parts of the United States and Canada I have known three cases where fellow-workmen were electrocuted because the incoming high-tension wires were carried across an adjacent structure or lean-to where the clearance between the roof of the lean-to and the wires was as low as 10 ft. and even less. In the first case the roof was leaking and a man was sent up to correct the trouble. When he had climbed to the roof he asked for a short ladder to enable him to go from the lean-to roof to the tower roof. A 15-ft. ladder was handed to him. He was warned to be careful, that the wires were alive and that the clearance between the wires and the roof was only 11 ft. But through failure to realize the danger from highly-charged wires he struck one of them with the ladder and was killed. The second case occurred at a substation of like design where the wires were only 6 ft. above the roof of the lean-to. A man who was painting the windows above the roof struck a wire accidentally and was killed. The third case was similar to the second.

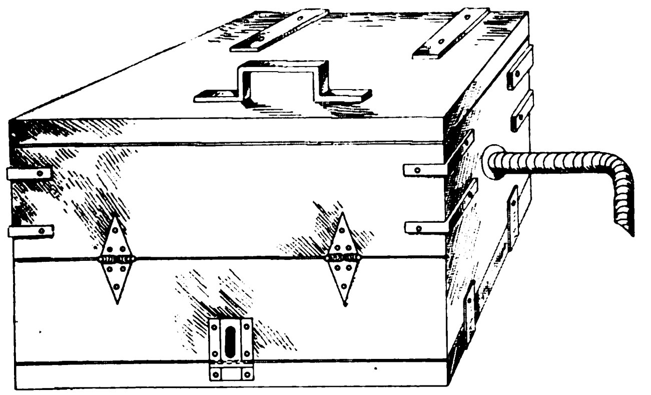
These experiences indicate that to avoid clearance accidents the design of Fig. 1 should be turned around, as shown in Fig. 2. Furthermore, the code issued by the American Institute of Electrical Engineers, which prohibits the running of incoming wires over the roofs of adjoining buildings or lean-tos, should be strictly enforced. In this way "safety first" for the substation worker will become a reality in this respect at least.

Heater for Melting Paraffine, Etc.

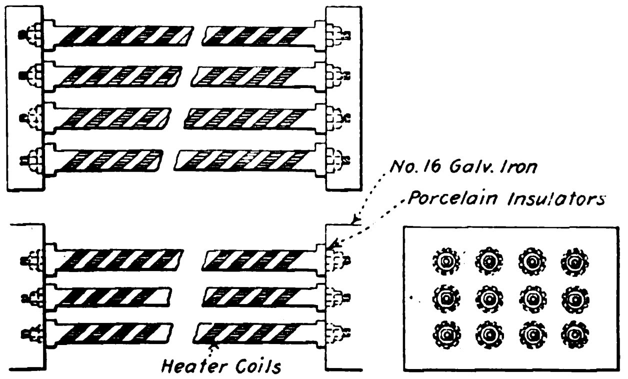
BY R. H. PARSONS, ELECTRICAL FOREMAN

The accompanying six sketches illustrate a heater which is used for melting paraffine, for heating oil and for baking small coils. It is not only efficient in operation, but it is approved by the fire underwriters as well.

This heater consists of a box constructed of 1½-in. soapstone, with cover, divided into an upper compartment for the material to be heated and a lower compartment for the oven. Dimensions are given on the sketches, but the heater can be constructed, of course, to any desired size according to shop conditions. The sides are made with squared ends which after being placed flush together are held in position by angle corner brackets bolted to each section. The joints or seams of the box illustrated are sealed with plaster of paris, but cement would also serve.



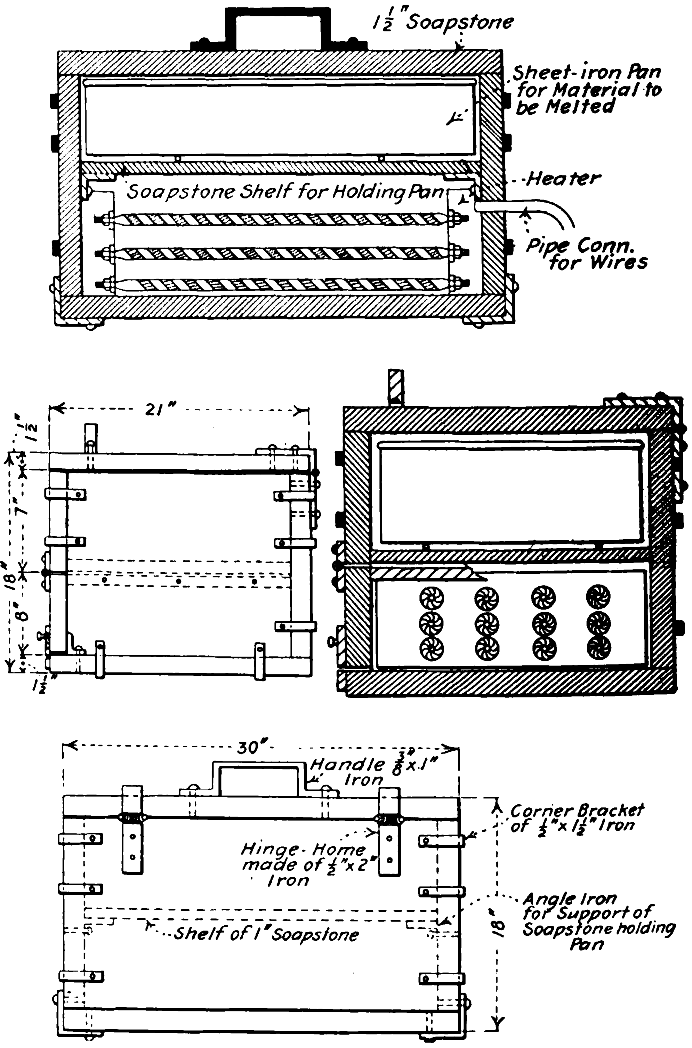
SHOP HEATER—FIG. 1—HEATER COMPLETE



SHOP HEATER—FIG. 2—HEATER COILS ON PORCELAIN SPINDLES

Fig. 1 is a general view of the box as it stands, while Figs. 3 and 4 are sectional views of the front and ends. These sketches also show the shelf which separates the heater from the oven proper. This shelf is supported on angle irons. Below the shelf is a heater and above it is a galvanized iron pan, fitted to the compartment, into which the paraffine is placed for melting. Like the other parts of the box the shelf is made of soapstone so that it will retain heat. The value of soapstone is proved by the fact that the heated paraffine will remain fluid for five hours after the heat has been turned off. Figs. 5 and 6 give details of the construction of the box.

The heater itself, as shown in Fig. 2, consists of twelve former car heater coils wound on porcelain spindles. The coils are bolted into two galvanized iron frames which are constructed to fit into the lower compartment of the box but they can be drawn in and out when it is necessary to make any repairs to the heater coils. Each heating unit has a resistance of 2 ohms, making a total of 24 ohms or the approximate equivalent of 23 amp at 550 volts. This amount of current gives a good margin of heat for the purposes mentioned.


1½" Soapstone
Sheet-iron Pan for Material to be Melted
Heater
Soapstone Shelf for Holding Pan
Pipe Conn. for Wires
21"
1½"
7"
18"
8"
1½"
30"
Handle ⅛x1" Iron
Corner Bracket of ¼"x1½" Iron
Hinge-Home made of ½"x2" Iron
Angle Iron for Support of Soapstone holding Pan
Shelf of 1" Soapstone
18"

SHOP HEATER—FIGS. 3 TO 6—ELEVATIONS AND SECTIONS

In connection with the outfit there is used a tray constructed of mesh on which the material to be treated is placed, the whole then being immersed in the hot paraffine. When the treatment has been continued long enough the tray is picked up, the hot paraffine draining through the mesh while the treated material is left to cool and dry.

Calculating Machines and Dictaphones at Portland, Ore.

BY C. N. HUGGINS, TREASURER PORTLAND RAILWAY, LIGHT & POWER COMPANY

The Portland Railway, Light & Power Company, Portland, Ore., makes such extensive use of calculating machines and similar devices in its accounting and receiving departments, that the following data may be of interest to others who are concerned with efficiency and economy in the offices of electric railways.

The "Marchant" calculating machine, manufactured by Marchant Bros., Oakland, Cal., is used in the statistical department. It is particularly desirable for the figuring of car mileage, percentages and other statistical data. In the hands of a competent operator this machine will easily save one-half the time required for mental calculation. The "Millionaire" calculating machine, manufactured by W. A. Marschauser, agent, New York, is intended for the same work as the "Marchant," but is of an earlier type, and it is not considered particularly desirable for the work described.

At the carhouses the local cashiers use a special cash register manufactured by the National Cash Register Company, Dayton, Ohio. These machines are arranged for operation by three different teller clerks, and serve to make record of all turn-ins by conductors and to give a printed receipt to the conductors for the amount of same. The records as made by each teller are locked in the machine and are totaled by the general office clerk when the record tape is removed at the end of the day. There is no special saving of time in the use of these registers, but the check against the conductors' reports is invaluable, as is also the positive feature of the receipt and turn-in.

In the accounting room the company uses several coin-counting machines manufactured by the Johnson Coin Counting Machine Company, New York and Chicago. These machines count all of the coins of the various denominations, which are put up in sacks ready for delivery to the banks. The company also uses four "Comptometers," manufactured by Felt & Tarrant, and two Burroughs machines of similar type, all of which are used in multiplying and division work where no listing is required. In addition to these adding machines, the company has the usual complement of motor-operated listing adding machines of the Burroughs type and a few of the Daltons.

In the light and power department, two "National" cash registers are used. These registers clip the office coupon from the light and power bills, receipt the original invoice and the coupon, and at the same time record the amount of collection. These machines are also motor-operated.

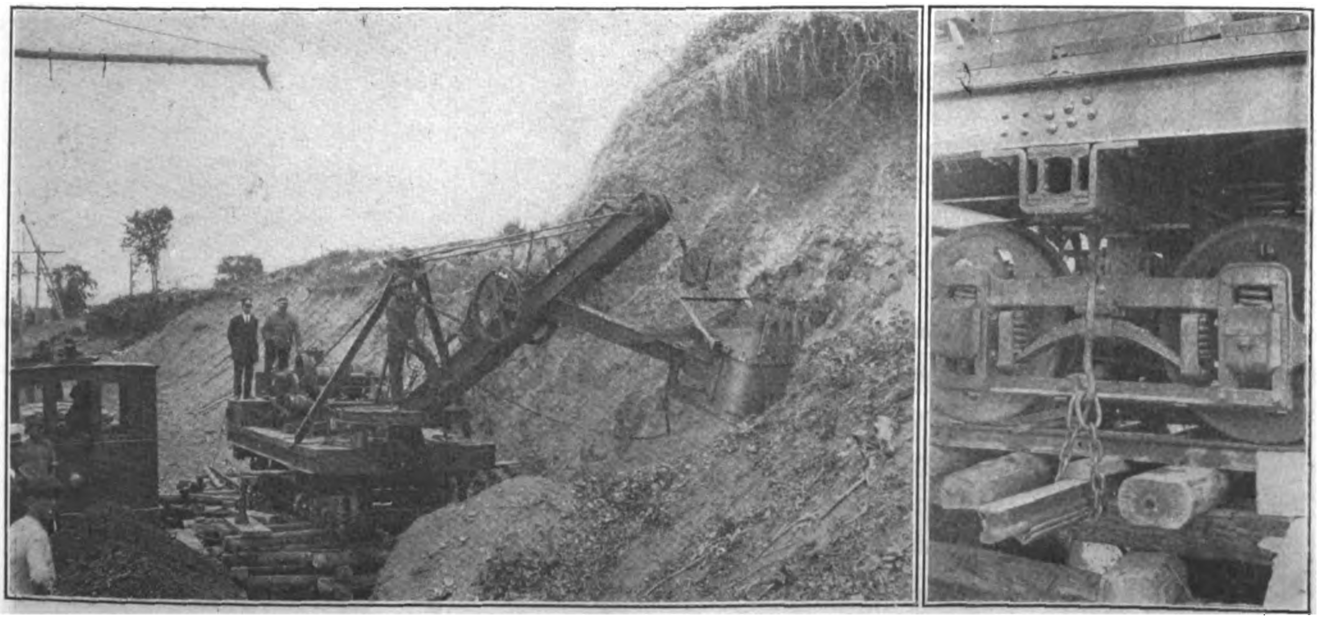
The company also uses with very beneficial results a Hollerith sorting and tabulating outfit made by the Tabulating Machine Company, Washington, D. C.

The Portland Company also uses about three dozen dictating machines of Edison manufacture. It finds a material saving from their use in connection with the central stenographic and transcribing service which is maintained for all departments.

Electric Shovel Made at Bangor, Maine

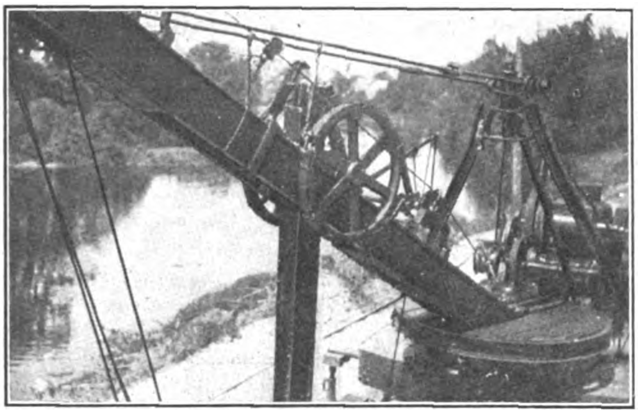
The Bangor (Maine) Railway & Electric Company recently built an electric shovel for service at gravel pits on its lines, the equipment being designed by M. E. McCormick, assistant general manager. With the exception of a Lidgerwood electric hoist which was purchased for the outfit, practically the entire apparatus was built from material of second-hand or scrap value already in the hands of the company. Fig. 1 is a general view of the shovel at work in a gravel pit on the banks of the Kenduskeag River. It is mounted on a flat car 22 ft. long x 9 ft. wide, the car being mounted on a pair of formerly discarded trucks fitted with 33-in. wheels. When in service the flat car is anchored to cribwork upon which the track is laid, as illustrated in Fig. 2.

The boom, which is 18 ft. long, is built of two 12-in., 25-lb. channel irons, these being tied to a tripod by 1¼-in. steel rods equipped with turn-buckles. The boom is stiffened by plates made from an old spring frog, these being 16½ in. wide, 4 ft. long and ⅝ in. thick. The dipper handle, composed of 8-in. 13-lb. channels, is 9 ft. long, and is mounted on a shaft, at the ends of which are wheels fitted with band brakes, the shaft being made from a discarded car axle. The boom is fastened to the bull wheel by a 3-in. pin turned from a 3¾-in. car axle and the main pin of the bull wheel was also made from an old axle. The bull wheel rests on a casting 12 in. high x 30 in. in diameter, which

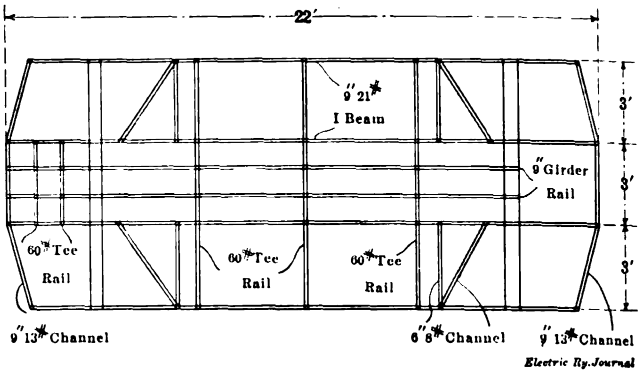


ELECTRIC SHOVEL, BANGOR—FIG. 1—GENERAL VIEW OF SHOVEL; FIG. 2—METHOD OF ANCHORING ELECTRIC SHOVEL CAR, REAR TRUCK, SHOWING ALSO THE REINFORCEMENT OF THE CAR UNDERFRAME is bolted to the framing of the car. The bull wheel is 6 ft. in diameter and the capacity of the bucket is ¾ cu. yd. The hoist is operated by a GE-800 motor and the rear truck is equipped with two similar motors to move the entire car back and forth as required, contact being made with the trolley wire by a flexible cable run from a circuit breaker on the side of the operating platform to a pole or "bug" shown in Fig. 4. Two controllers are mounted on the platform, one for the hoist and the other for the car motors.

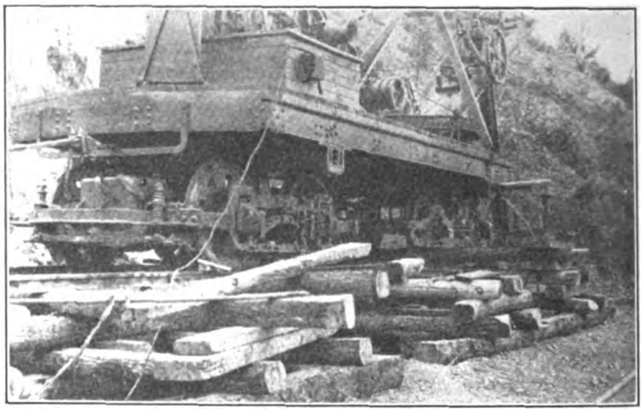
The underfranming includes two central longitudinal 9-in. I-beam and two 9-in. girder rails run from end to end, with 9-in. I-beam side sills. The cross members are built up from discarded 4-in. T-rails, angle-irons and plates, forming U-shaped channels 6 in. high reinforced by the rails. A 6-in. channel iron connects the side and central members at the middle of the car and above this, as well as above the lateral members above mentioned, T-rails are riveted to the side sills, as shown in Fig. 2. The end sills are 9-in. channels and the central I-beams are spaced 9½ in. and 12 in. on centers. Diagonal channels 6 in. high are run at four points in the side sills to the cross bracing. Extra reinforcement under the platform below the bull wheel location is provided in the shape of rail, channels, and a plate, as indicated in the accompanying sketch of the underframing, Fig. 5. Two 4-in. T-rails are also provided for longitudinal reinforcement. The forward and rear ends of the car can be jacked up as required, as shown in Fig. 6, a 4-in. axle shaft being seated on wooden blocks carried by 2½-in. jacks, the shaft being run through the built-up channel crossing



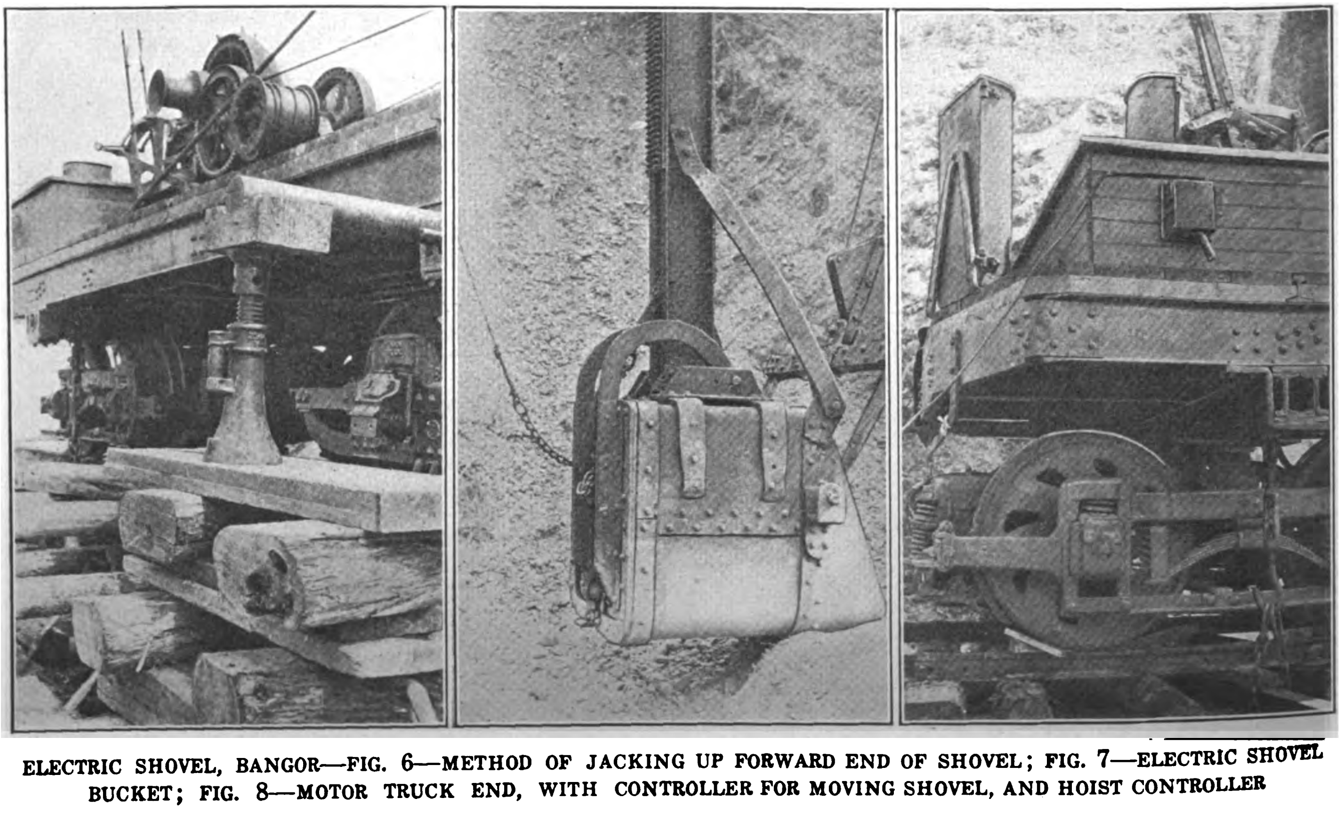
ELECTRIC SHOVEL, BANGOR—FIG. 3—SHOWING BOOM, BULL WHEEL AND FRAMING



ELECTRIC SHOVEL, BANGOR—FIG. 5—UNDERFRAMING



ELECTRIC SHOVEL, BANGOR—FIG. 4—CAR FLOORING, TRUCKS AND "BUG" CONTACT POLE



ELECTRIC SHOVEL, BANGOR—FIG. 6—METHOD OF JACKING UP FORWARD END OF SHOVEL; FIG. 7—ELECTRIC SHOVEL BUCKET; FIG. 8—MOTOR TRUCK END, WITH CONTROLLER FOR MOVING SHOVEL, AND HOIST CONTROLLER the underside of the car at right angles to the sides. The body bolster shown in Fig. 2 is fastened to the rail and plates in the cribwork by a 1¼-in. hook bolt, with chain as illustrated. The tripod above the bull wheel is built of T-rails and is braced by two 1¼-in. tie rods, the outer rails being clamped and riveted to the side sills. The cost of the shovel complete was about $2,000, compared with bids of about $6,000 for an outfit on the open market. In service it is operated by three men, two of whom are required to handle the shovel while the third trims the load. These men also operate gravel trains as required, and recently the company loaded and hauled 1500 cu. yd. of gravel 13 miles, making the round trip of 26 miles with the gravel train at a labor cost of only 16 cents per cubic yard.

Typical Fireproof Bus and Switch Compartments

BY EMIL G. BERN, ENGINEER IN SWITCHBOARD DEPARTMENT GENERAL ELECTRIC COMPANY

In power stations employing electrically operated switches for medium high voltages and heavy currents, the buses, connections and switches are usually installed in concrete or brick compartments. Concrete is used in most cases. Sometimes complete forms are made, usually of wood, and the whole compartment poured.

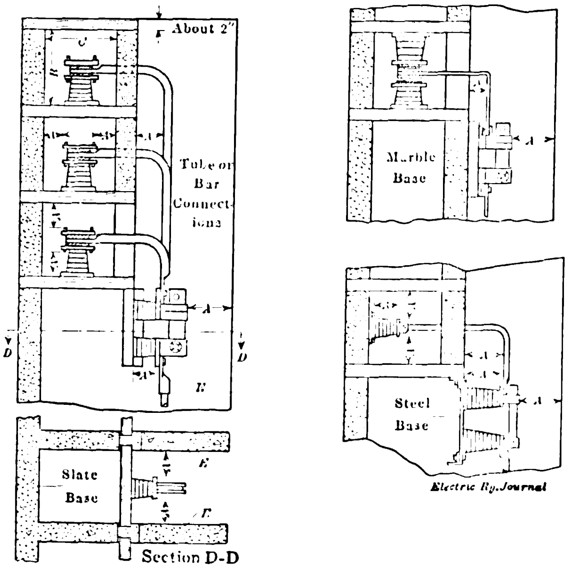


FIG. 1—SECTIONS OF TYPICAL BUS COMPARTMENTS

Although this gives the best construction, it is comparatively expensive. More often the compartment is built of various sizes of concrete slabs set in cement, in which case construction is cheaper, though fairly accurate results can be obtained.

Fireproof bus compartments usually inclose or separate the different phases of the buses and connections by masonry. As this masonry must be considered at ground potential, the general dimensions of the compartments are determined primarily by the allowable distance between live parts and ground for different voltages.

Fig. 1 shows sections of typical bus compartments, with fundamental dimensions for different voltages based on average capacities and conditions. With the help of the table, the bus compartment can easily be designed. It is, of course, necessary to determine, first, the dimensions of the switches, busbar supports, buses, connections and the clamps for attaching the connections to the buses, and also to take into account mechanical clearance and convenience in installing the material.

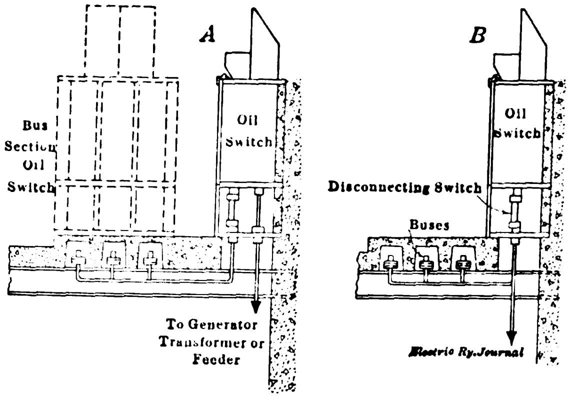


FIG. 2—FIREPROOF BUS AND SWITCH COMPARTMENTS—BUSES IN FLOOR

The compartment shelves are usually about 2 in. thick, but are sometimes thicker when of concrete for large compartments. The thickness of the barriers between phases is determined by the mechanical strength of the structure. This also applies to the thickness of the compartment walls. In brick compartments the dimensions of the brick usually predetermine the thickness of the walls; in concrete structures the thickness of the walls and barriers is generally from 3 in. to 4 in.

For voltages up to 3300 disconnecting switches are mounted on marble bases without insulators. When provided with insulators, they are usually mounted on steel bases, which have the advantage of occupying small space. The latter method also preserves the adjustment of the switch, and it is less liable to injury during shipment and construction work. Fig. 1 shows several methods of mounting disconnecting switches in compartments.

Disconnecting switches are occasionally used for isolating horizontal sections of the bus and are then located in the compartments in a straight line with the bus, the insulators being secured either to the shelf or the back wall of the compartment. If the bus is heavy enough and securely anchored it can serve as hinges and

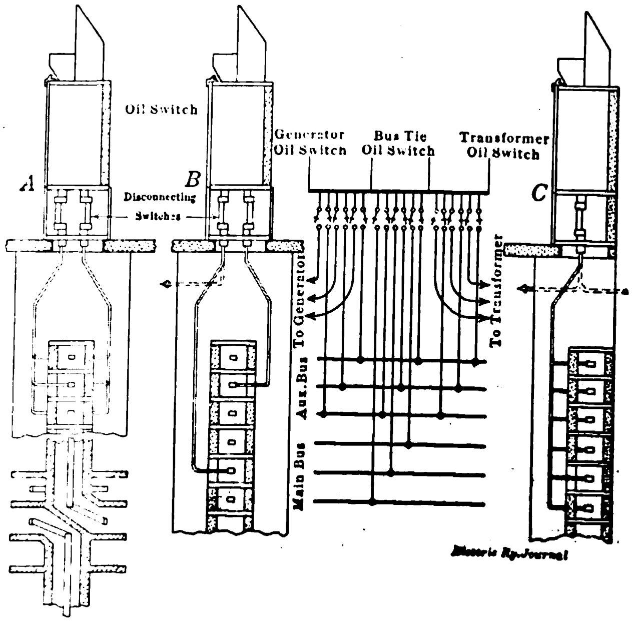
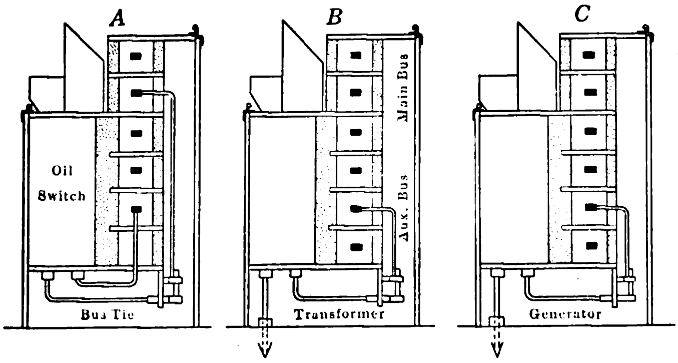


FIG. 3—FIREPROOF BUS AND SWITCH COMPARTMENTS—DISCONNECTING SWITCHES MOUNTED IN SUB-COMPARTMENTS OF OIL SWITCH

clips for the switch, thus somewhat simplifying the construction. Whatever type of switch is used, care must be taken to see that proper ground clearance is obtained from the blade in any position.


A
B
C
Oil Switch
Main Bus
Aux. Bus
Bus Tie
Transformer
Generator

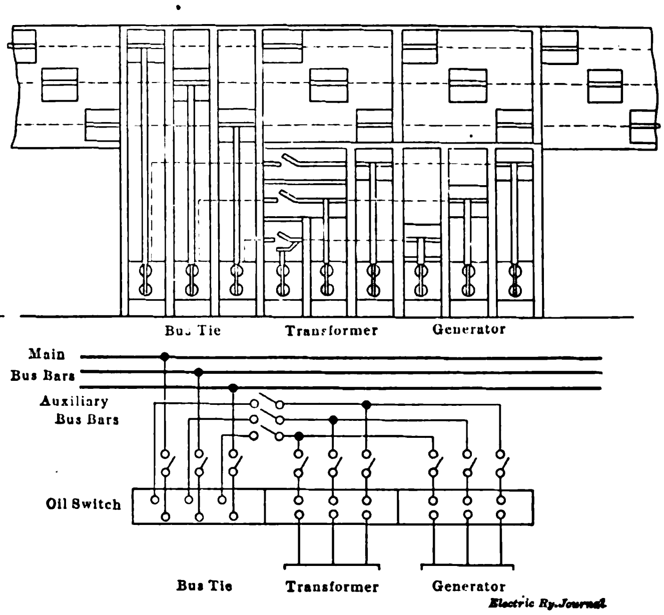

Bus Tie
Transformer
Generator
Main Bus Bars
Auxiliary Bus Bars
Oil Switch
Bus Tie
Transformer
Generator
Electric Ry. Journal

FIG. 4—FIREPROOF BUS AND SWITCH COMPARTMENTS ON SAME FLOOR

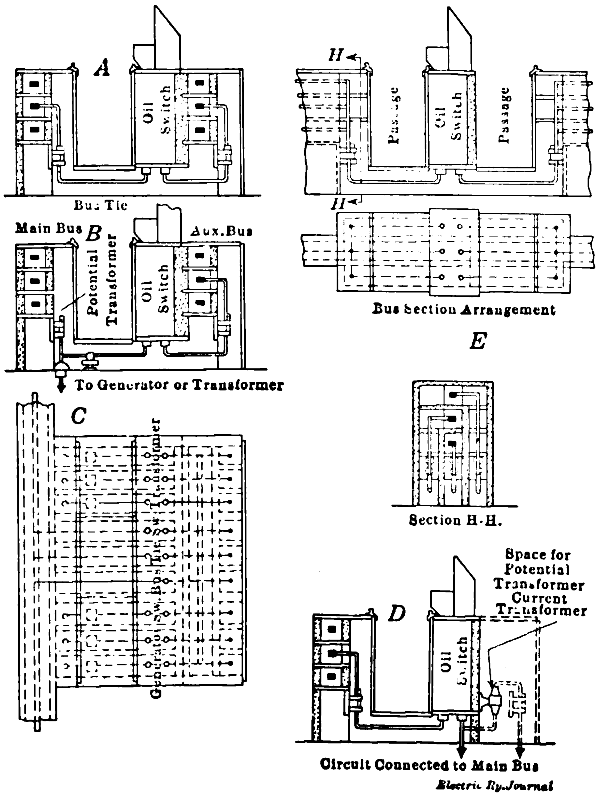

A
Oil Switch
Bus Tie
Main Bus
B
Aux. Bus
Potential Transformer
Oil Switch
To Generator or Transformer
C
Generator Sw. Bus Tie Sw. Transformer
H
Passage
Oil Switch
Passage
H
Bus Section Arrangement
E
Section H-H.
Space for Potential Transformer
Current Transformer
D
Oil Switch
Circuit Connected to Main Bus
Electric Ry. Journal

FIG. 5—FIREPROOF BUS AND SWITCH COMPARTMENTS—ALL SWITCHES ON ONE FLOOR

To withstand mechanical stresses incidental to momentary short-circuits and heavy overloads, it is necessary that the buses and connections should be securely anchored, while at the same time provision must be made for expansion and contraction of long buses due to temperature changes. The bus supports may be secured either to the shelves or the back wall of the compartment, but must be located near openings so as to be accessible for cleaning and inspection. For convenience in joining connections to the bus the busbars are usually laid on side. The space available for the switching equipment largely determines the design of the compartments.

Sometimes the buses are located on the floor below the oil switches, which construction is very desirable when using bottom connected switches, provided the disconnecting switches between the oil switches and the bus are located so that a person operating them can see whether the oil switch is open or closed. To meet this condition and thus eliminate the danger of operating the wrong disconnecting switch, they may be installed in a sub-compartment in the oil-switch cell just above the floor. A door for this sub-compartment, of the same width as the oil switch, helps to determine without question which disconnecting switches belong to a certain oil switch.

The remainder of the information will refer only to bottom connected electrically operated switches, either with the oil vessels in one or two rows, tandem or parallel, as indicated by *B* and *A*, respectively, of Fig. 2. Fig. 2 shows an arrangement of oil switches with the sub-compartments, disconnecting switches and buses installed in the floor. The buses are supported and accessible from below. Barriers of asbestos lumber or similar material may be provided between connections of different phases, if considered necessary.

If disconnecting switches are required on one side of the oil switch only, the parallel-arranged oil switch may be used and installed against the wall, as shown in *A*. With disconnecting switches on both sides of the oil switch it is possible to arrange all of them in the sub-compartments by providing space back of the oil switch for operating them, or by using the tandem-arranged switch as shown at *B*. With the first arrangement a bus-section oil switch may be installed directly over the buses; while with tandem-arranged switches the construction can be materially improved and made more compact by locating the bus-section oil switch in line with the other switches.

Fig. 3 shows bus compartments on the floor below the oil switches, the disconnecting switches being arranged in sub-compartments. *A* represents a bus-section switch; *B* a bus tie, generator or transformer switch connected according to the diagram. *C* shows the application of the tandem-arranged oil switch to the same conditions as *A* and *B*. If the room containing the bus compartments is also used for other purposes, it is advisable to provide doors between the barriers to guard against accidental contact with the connections.

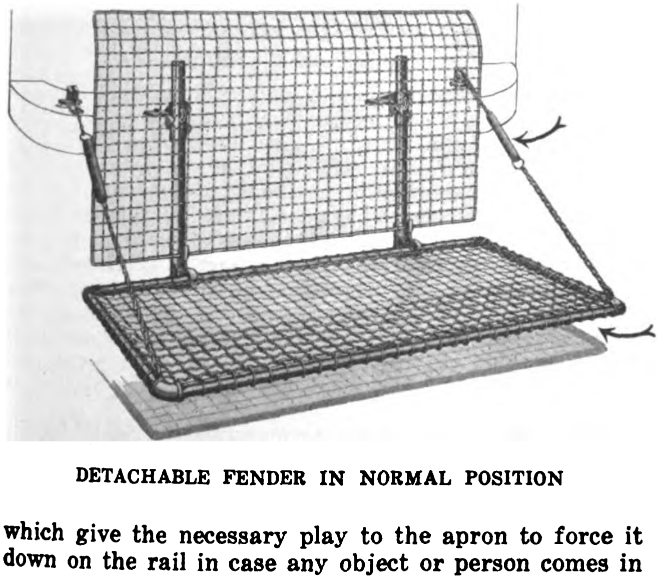
It is often necessary to install the bus and switch compartments on the same floor; and in some cases this floor is immediately above the transformer compartments, so that the connections between the different elements cannot be made under the floor. A compact construction of this kind is shown in Fig. 4, which provides for bus tie, transformer and generator switches connected in the same manner as in Fig. 3. This construction requires, however, a set of disconnecting switches, arranged horizontally in the buses. Passages through the compartments can easily be provided under the main bus, as indicated in the figure.

Another construction furnishing the same electrical connections is shown in Fig. 5. Here false floors must be provided over the connections, unless these can be carried through and under the floor. This false floor over the connections between the oil switches and the compartments consists of removable slate slabs resting on vertical brick or concrete barriers between the connections. With this construction it is necessary to provide doors for the compartments as well as for the oil switches.

Section *A* shows the construction of a bus tie connection; section *B*, a generator or transformer connection; and the plan view *C*, a combination of the above for connecting a generator to its transformer or to the main bus in the same manner as indicated in the diagram of Fig. 4. Section *D* shows how a feeder circuit may be connected to the main bus and how the instrument transformers may be installed in line with the auxiliary bus compartment if desired. Disconnecting switches may also be accommodated in this compartment for isolating the instrument transformers from the line when energized from the other end. The bus section oil switch with disconnecting switches may be installed as illustrated at *E*. The oil switch must, however, be placed at right angles to the main compartment.

A Simple Detachable and Folding Fender

For conditions that demand an extremely simple yet effective fender, the Trolley Supply Company, Canton, Ohio, has devised the No. 3 detachable type which is here illustrated in its normal position. The construction of this fender permits the apron or cushion to be instantly removed in case either becomes damaged or in case of the coupling of cars for train service. The fender is connected to the car by means of two heavy pieces of wrought-iron pipe fastened to the bumper, and the apron is supported by two chains in the middle of which are suspended strong crucible steel springs, which give the necessary play to the apron to force it down on the rail in case any object or person comes in contact with the fender.

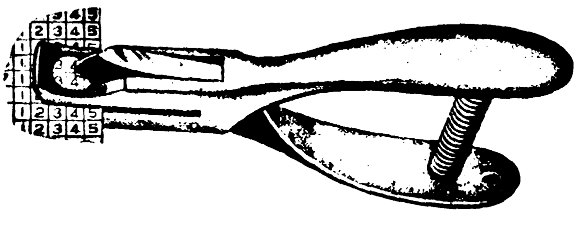


DETACHABLE FENDER IN NORMAL POSITION

The apron is made with a frame of wrought-iron pipe, and the apron proper as well as the cushion consists of woven wire with 1-in. diamond mesh. The frame of the cushion consists of 1-in. iron rod. To remove the apron a cotter pin is withdrawn from the fixture at the bottom of the supporting pipes. This fixture opens up and the apron is lifted out. The cushion is supported by a metal lug in the fixture at the bottom of the supporting pipes and by a metal lug in a second fixture placed at about the same height as the bumper; hence it may be lifted out at any time desired.

Non-Clogging Open Sight Punch

The conductor's ticket punch may not bulk as large in the eyes of the electric railway operator as other items of equipment, but the conductor himself knows how helpful a well-made punch can be when transfers must be perforated in large quantities. Again, a clear-cut time perforation is a good aid against the misuse of transfers by the public. The standard electric railway punch of the Busby Manufacturing Company, Boston, Mass., illustrated herewith, is an example of specialization in this class of tools. One of its principal merits is the reinforced cutting edge, which greatly increases the life of the punch. Both the upper and lower dies are of exceptionally hard steel instead of being merely case-hardened. Furthermore, all pins are of steel. All spots to be perforated are visible from both sides of the punch, thus insuring accurate work in addition to clear cutting, while it is practically impossible to clog the mechanism.



AN OPEN-SIGHT PUNCH

Panels for Headlining in Cars

"Nevasplit" is the name of a well-known panel material which has been prepared by the Keyes Products Company, New York, for headlinings, roofs, insulation, interlining and wainscoting under windows of electric railway cars. It is composed of a wood fiber base but is free from knots, sap and all resinous matter, so that it presents an entirely uniform surface. This material is said to have practically no shrinkage or expansion, and as it is grainless, splitting or cracking is impossible. The liability of air leakage is thus eliminated. No dependence whatever is placed upon glues or excessive pressure as a means of solidifying, stiffening or strengthening the panels, but the fibers of thousands of tissue-like layers are mechanically felted together to produce a board of absolute uniformity, great strength and lightness and of better insulating qualities against heat or cold than a mere dense sheet could possibly be.

This material may be formed either in curved shapes or practically straight ceilings without fear of laminating or blistering even after long exposure to moisture. The weight of 3/16-in. thickness of this material is 75 lb. per 100 sq. ft.; ¼ in., 90 lb.; ⅜ in., 130 lb. In other words, 300 ft. of 3/16-in. headlining, as used in the average car, would weigh only about 225 lb.

The Chilean commission which was appointed to report on the proposed railway from Santiago to Valparaiso via Casa Blanca has advised the construction of an electric railway of the same gage as the State line now connecting the capital with Valparaiso, and also suggests that several branch lines be constructed to link the existing systems.

News of Electric Railways

THE TOLEDO INJUNCTION

Former City Solicitor Replies to Court—Detroit Decision Quoted—Contempt Cases

Following a statement made by Cornell Schreiber, former city solicitor of Toledo, Ohio, relative to the injunction granted against the 3-cent fare ordinance by the United States District Court, Judge John M. Killits sent him a communication suggesting that he present law and facts sufficient to sustain the ordinance, of which he is the author, or prove bad faith on the part of City Solicitor Thurstin. In his reply to the court Mr. Schreiber explained that the theory upon which he based his opinion was that all rights of the company ceased when its franchises expired, that the ordinance could not be confiscatory unless there was something to confiscate and that the city was the sole judge of the terms upon which the company could continue to operate. Judge Killits said that this theory had been presented to the court by both Solicitor Thurstin and the attorneys for the Toledo Railways & Light Company. Mr. Schreiber asserted he did not intend to insinuate bad faith on the part of the legal department, but believed the case was not properly presented.

In his letter to Judge Killits Mr. Schreiber mentioned the case of the city of Detroit against the Detroit United Railway and cited those clauses from the decision of the Supreme Court of Michigan which seemingly support the contention that he makes in favor of his ordinance. The court in this case said that the operation of a street railway after its franchises had expired was a continuing trespass for the restraint of which the municipality is entitled to a writ of injunction, as well as for its removal. Again, a franchise granted to a street railroad and accepted by it constituted a contract mutually binding on both parties and terminated by the limitation expressed therein. The decision quoted also stated that a street railroad was not bound to continue operation after its franchise had expired, on the theory that there is no implied obligation on the part of both the company and the municipality to keep the road in operation for the benefit of the public.

Judge Killits made a statement on Sept. 19. He agreed with practically all that Mr. Schreiber had said, but said that his decision was based not upon the portions of the Detroit case quoted, but upon the entire syllabus as well as on other cases. Briefly stated these decisions provided also that a company may operate its cars from day to day, after its franchise had expired, without the city's consent and charge fare, because its service is a public necessity. It may charge a rate that will pay expenses of operation, including a return on the investment for the time it is so operated. Out of any revenues that remain it must compensate the city, if the city so desires. The city through the Council may fix terms for the operation of the road which will become binding on the company only if they are reasonable, having regard to the circumstances which are peculiar to the local situation. However, the city may summarily deprive the company of the use of the streets except to salvage its property, and the company may stop its cars at any time it may be deemed profitable for it to do so.

Motions were filed in the Federal Court on Sept. 19 asking for the vacation of the order citing the editors of the Toledo *News-Bee* and the Toledo Newspaper Company for contempt in connection with articles that appeared in the paper relative to the railway injunction suit. Judge Killits notified the respondents that he would file a supplemental order on that day, elaborating the original order. The motions allege that the acts of the respondents do not constitute contempt; that the court does not have jurisdiction in the matter; that the charges are not based upon affidavits or other competent proof; that no affidavit or other affirmation in writing has been filed in court or presented to the judge and that the order is uncertain and indefinite. At a hearing in the afternoon of the same day Harry J. Howard, managing editor, was released, while Negley D. Cochran, editor, and E. B. Conliss, business manager, were held.

NEW ORGANIZATION OF EMPIRE UNITED

The Beebe Lines Adopt a Divisional Organization with "General Staff" at Syracuse

A change in the operating organization of the Empire United Railways, known popularly as the Beebe lines, of Syracuse, N. Y., has recently been put in force by Ernest Gonzenbach, general manager. Briefly, the plan is similar to that followed on the Pennsylvania Railroad and other steam roads which have a divisional organization as distinguished from the plan of departmental organization followed on other railways. In practice each operating division of the company will be in charge of a local manager who will have complete charge of that division, including operation, mechanical and electrical departments and public relations. In addition, there will be a central organization at Syracuse. This central organization will consist of an engineering department, having consulting relations only with the various divisions; a claims and legal department, which will co-operate with the local managers in the settling of claims and all legal matters; a business getting department, which will make rates and co-operate with the managers in developing new business, and, of course, a central auditing department. To use a military expression, the various divisional officers are the "line," and the central organization will be the "general staff."

Altogether the property will be divided into four operating divisions as follows:

Auburn & Syracuse division, George A. Lewis, manager, including city lines in Auburn. The total trackage operated of this division is 67 miles. This division also includes a steamboat line on Skaneateles Lake.

Rochester-Syracuse division, H. C. Prather, manager. This division includes the interurban line between Rochester and Syracuse and that between Port Byron and Auburn. The total trackage operated on this division is 186 miles.

Syracuse-Oswego division, P. E. Emerson, manager. This division includes the Oswego City lines. Its total trackage is 75 miles.

Syracuse and South Bay division, Charles Craigmile, manager. The total trackage operated by this division is 33 miles, and it includes a steamboat line on Oneida Lake.

TRANSIT PROGRESS IN BROOKLYN

A Summary is Presented of Progress in Brooklyn Under the Dual Rapid Transit Contracts

The progress report of the New York Municipal Railway on construction work under the dual rapid transit contracts to Sept. 1 shows very rapid progress on the Sea Beach line. On this line a total of 750,000 cu. yd. of excavated material have been removed since the beginning of this work. About 62,000 cu. yd. of concrete have been placed on the Sea Beach line; 45 per cent of the steel has been fabricated and delivered and 30 per cent erected. Sections of reinforced concrete bridges have been constructed at different street crossings. The installation of track and line equipment on the Sea Beach route is under way. Contracts have been awarded for the erection of a substation at Sixty-fourth Street and Fourth Avenue and for the enlargement of the station at New Utrecht Avenue.

Important work required in connecting the South Brooklyn line with the Fourth Avenue subway, so as to enable operation at the earliest possible time, has been progressing rapidly. Plans and specifications have been prepared and bids have been received covering the installation of lighting, track and line equipment in the Fourth Avenue subway between the Manhattan Bridge and Fortieth Street. Work on the installation of line equipment has begun and the installation of lighting and track equipment will be started at an early date.

Plans and specifications have been prepared covering the installation of the latest and most approved type of block signaling and interlocking devices on several sections of the Broadway-Fourth Avenue line, Sea Beach line and the Broadway and Fulton Street additional tracks.

In the Centre Street loop the work of completing the two remaining tracks is progressing satisfactorily. The contract has been awarded for the installation of station and tunnel lighting and ventilation and work in connection with this installation has begun. The contract has been awarded for the installation of safety interlocking and block signaling plants for the Centre Street loop.

With respect to the third tracking of the Broadway Elevated line, the contract for the fabrication of the steel required in connection with the strengthening of the structure so as to permit the additional tracks between Havemeyer Street and Myrtle Avenue has been let and work on this third tracking will be under way in the near future.

On the reconstruction of the Lutheran line, the steel work of the first section as far as Fresh Pond Road has been completed and on the second section between Fresh Pond Road and Metropolitan Avenue 94 per cent of the steel required has been delivered and 63 per cent erected. The column foundations have all been completed on the second section, as well as the retaining wall and the abutment at the end of the section.. The installation of interlocking plants and erection of terminal buildings is under way and bids have been opened for the installation of track and line equipment and a recommendation has been made as to the award covering that work.

The third tracking of the Fulton Street line between Nostrand Avenue and Sackman Street has been progressing satisfactorily, 67 per cent of the total number of foundations to be reinforced has been completed.

On the Liberty Avenue line, which carries the Fulton Street elevated from the city line as far as Lefferts Avenue in Queens Borough, the column foundations are practically completed; 36 per cent of the steel has been fabricated and delivered and 32 per cent of it is erected. From the city line to Amber Street 65 per cent of the structure has been completed.

SUBWAY CONSTRUCTION CONTRACTS IN NEW YORK

The last section of the Harlem River tunnel on the new Lexington Avenue subway has been sunk. This tunnel connects the tracks in Lexington Avenue, Manhattan, with those on the Bronx side of the river. It consists of four steel tubes laid in concrete. The tubes were built by the Arthur McMullen & Hoff Company, the contractor for this work, in five separate sections, each section being sunk to its proper place in the river at a different time. The five sections have now been placed under water without serious accident. The four sections previously placed have been encased in concrete, the water withdrawn, and the work of lining the interior with concrete is under way. The contract for this part of the subway was delivered on July 23, 1912, the time limit for its completion expires early in 1916. It is now about 67 per cent completed.

The Public Service Commission for the First District has advertised for bids, to be opened on Oct. 9, for the construction of Section No. 1 of Route No. 48, the Park Place, William and Clark Street subway, to be operated by the Interborough Rapid Transit Company. This line diverges from the Seventh Avenue subway in West Broadway between Park Place and Murray Street, curves southeasterly under the corner of Park Place and West Broadway and runs easterly under Park Place, the United States Post-office Building and Beekman Street to William Street and southerly under William Street to the tunnel to Brooklyn at Old Slip.

Bids were opened on Sept. 15 by the commission for the construction of Section No. 2 of Route No. 48, the William Street part of the Park Place, William and Clark Street subway, to be operated by the Interborough Rapid Transit Company. The following are the official totals of the bids: Smith, Hauser & McIsaac, Inc., $2,254,670; Rapid Transit Subway Construction Company, $2,268,858; Frederick L. Cranford, Inc., $2,325.108; The Underpinning & Foundation Company, $2,369,826; Holbrook, Cabot & Rollins Corporation, $2,466,477; Oscar Daniels Company, $3,378,588.

The commission has approved a contract made by the New York Municipal Railway Corporation with the Empire Construction Company for the installation of tracks and line equipment on the Liberty Avenue extension of the elevated railroad in Brooklyn and on the elevated connection between the Lutheran Cemetery line and the Myrtle Avenue elevated railroads. The Empire Construction Company was the lowest bidder at $115,987.

INTERBOROUGH BASEBALL LEAGUE

Season Concluded with Game Between Interborough Company and Pennsylvania Railroad—Pennant and Medals Awarded

The season of the Interborough Rapid Transit Baseball League, composed of seven teams of employees of the Interborough Rapid Transit Company, New York, was brought to a close on Sept. 19, with a baseball game between the champions of that company and the champions of the Pennsylvania Railroad. After the game a shore dinner was served at Brighton Beach. The teams composing the league were recruited from the car shops, the signal department, subway trainmen, car equipment department, chief engineer's department, transportation department of the Manhattan division and the general office. They finished in this order, the percentage of the winner, the car shop team, being 0.833 with fifteen games won and three lost.

The game between this team and the champions of the Pennsylvania Railroad, representing the purchasing department of that company, was played at Hedley Field at the terminus of the Van Cortland Park branch of the subway. It was witnessed by about 8000 people, including many ladies and 1000 employees of the Pennsylvania Railroad, who traveled from Philadelphia in a special train. The bands composed of employees of both companies were present. Practically all the officers and department heads of the Interborough Rapid Transit Company were at the game and the dinner. The Pennsylvania team, with Morgan pitching and McQuillan catching, beat the Interborough team, with Woods and Smith pitching and Tobin catching. The score was five to four. Pennsylvania scored two each in the first and second innings and one in the fifth, while the Interborough team did all its scoring in the third inning. Three errors were charged against Pennsylvania and four against Interborough. Woods, who started the game for Interborough, was spiked in the first inning in covering the home plate, and retired in favor of Smith. The fielding features were a snappy double play unassisted by the Interborough shortstop in the sixth inning, and a brilliant put out and an assist by the Pennsylvania pitcher in the eighth. Pennsylvania got ten hits and the Interborough seven, with eight and nine strike-outs respectively.

After the game the members of the various Interborough teams and the Pennsylvania team were conveyed by special train to the Atlantic Avenue terminus of the subway in Brooklyn. Here omnibuses were in waiting and carried the party to Brighton Beach, where dinner was served. Theodore P. Shonts, president of the company, acted as toastmaster. He introduced as the first speaker, James A. Farrell, president of the United States Steel Corporation, who took for his subject, "Welfare." Mr. Farrell explained the work of his company along this line. He referred to the protest of 200,000 of the company's men against unjust legislation and said that the ambition of the company was to have the employees take such an interest in the company that all of them would protest against legislative acts detrimental to themselves and to the company.

Luke D. Stapleton, Justice of the Supreme Court of New York, said that it was a refreshing experience to meet men engaged in doing serviceable, vital things for the comfort of the people. He referred to the great industrial growth of the country, but lamented the present journalistic irresponsibility and political chicanery. The future depended upon active, contented men engaged in productive enterprise. Efficiency was not a matter of declaration. He complimented Messrs. Shonts, Hedley, Farrell and Vreeland on their rise, and said that self-made men had no use for the agitator who insisted that opportunities for advancement had vanished.

Simon C. Long, general manager of the Pennsylvania Railroad, reviewed briefly the welfare activities of that company. He said that the Interborough gathering was in itself an evidence of the generosity of the company. H. H. Vreeland, in charge of welfare work of the Interborough Company, referred to his activity in behalf of the employees of the Metropolitan Street Railway, New York, when he was president of that property, and told how it came about that he was selected to direct such work for the Interborough. Athletic sports taught men to be resourceful, a quality much needed in the emergencies of railway work. Men who recognized athletic prowess were likely also to have a keener appreciation of difference in mentality between men than those who had not had the lesson of physical inferiority driven home in athletic competition. Frank Hedley, vice-president and general manager of the company, said that the most perplexing problem of the manager was to obtain men willing to assume responsibility. Daniel M. Brady, of the Brady Brass Company, addressed a few remarks to the athletes. Mr. Shonts concluded the program by presenting the pennant to the winning Interborough team and by pinning the medals on the individual members of the team. He announced that Mr. Hempstead, president of the New York Giants, had signified his willingness to offer special prizes next year to the best individual players on the teams forming the Interborough league.

In addition to those already mentioned, the following gentlemen were among those present at the game and at the dinner: B. A. Hegeman and Charles C. Castle, of the U. S. Metal & Manufacturing Company; Edward A. Maher, vice-president and general manager of the Third Avenue Railway; J. S. Doyle, superintendent of car equipment; George Keegan, assistant to the vice-president and general manager; W. Leon Pepperman, assistant to the president; James L. Quackenbush, general attorney; George H. Pegram, chief engineer, and H. P. Waugh, executive assistant of the Interborough Rapid Transit Company; F. T. Wood, assistant to the vice-president and general manager of the New York Railways, and W. O. Wood, president and general manager of the New York & Queens County Railway.

RAILWAY BUSINESS ASSOCIATION STATEMENT

A statement was authorized by the general executive committee of the Railway Business Association at a meeting held in Chicago on Sept. 16, dealing with the financial emergency urged upon President Wilson by a committee of railway executives and responsively urged by the President in his reply. With this statement has been sent a letter of transmittal to the President, to each Interstate Commerce Commissioner and to members of Congress, especial attention of Senators and Representatives being invited to the following reference to mail pay:

"We would respectfully urge upon Congress that in consideration of railway mail pay the recommendation of the Congressional joint committee points a way whereby the railways may be dealt with in a spirit of greater liberality than is provided in the House bill now under consideration in the Senate. This is surely a time when the government should be actuated by a desire to pay adequately for an important public service rather than to drive a hard bargain with the carriers because it has the power to do so.

"We earnestly hope that the prayer of the railway executives that the roads be relieved as far as possible of further immediate burdens involving additional expense will be heeded by legislative and regulatory bodies and that railway employees will refrain from pressing at this time demands which, if granted, or awarded, would result in higher labor cost."

FAILURE TO ARBITRATE KANSAS STRIKE

The proposition to arbitrate made by officials of the Joplin & Pittsburg Railway, Joplin, Mo., to its striking carmen on Sept. 16, following a decision by the union to break off negotiations looking to a settlement, has been made public by the company. In its proposal the company agreed to leave all points in dispute to an arbitration board comprised of three members, one to be picked by the company from the members of the Public Utilities Commission of Kansas and the Public Service Commission of Missouri, one to be chosen by the union from among the members of the same two bodies and the two thus chosen to select a third. The points in dispute which the company agreed to settle by arbitration are: (a) Section 10, wage scale; (b) Sections 11 and 12, discharge of employees; (c) Section 16, verbal agreements; (d) Section 23, duration of contract; (e) Section 24, agreements on part of the association for protection of the public; (f) Section 25, settlement of disputes.

The proposal contained a provision to embody in the contract all other sections that have been agreed on by the company and the union.

On Sept. 23 suit for receivers for the company was transferred from the District Court of Bramford County, Kansas, to the United States Court at Fort Scott, Kansas. The differences between the company and the men appear to be practically adjusted as a result of conferences on Sept. 23, at which a basis of friendly negotiation was reached.

CLEVELAND EXPENDITURES CRITICISED

Councilman William Stolte has been endeavoring to induce Mayor Newton D. Baker to veto a resolution providing for the installation of fire protection apparatus for the new buildings of the Cleveland (Ohio) Railway at Superior Avenue and East 123d Street. Mr. Stolte said that the buildings will be of fireproof construction and that insurance is provided for, so that there is no need of spending $22,781 for sprinklers.

An ordinance has been prepared for introduction in the East Cleveland Council instructing City Solicitor Binyon to compel the Cleveland Railway to give better service in that village or observe the ordinance which calls for through service to West Ninth Street in the city, with eight-minute service through the day and four-minute service during the rush hours. The village agreed to waive some of the conditions of its contract temporarily in order to allow the city to arrange its schedules satisfactorily, but of late the city has ordered the East Cleveland service greatly reduced. It is intended that the ordinance shall contain a clause forbidding the switching of cars on the street at the Windermere carhouse.

CHANGED POLICY MAY AFFECT OTHER RAILWAYS

The Public Utilities Commission of the District of Columbia has issued an order which is a departure from a previously announced policy of the Interstate Commerce Commission, and which, if followed by the Interstate Commerce Commission in other localities where interurban cars are operated under interstate rules, may affect the latter.

Until a year ago the street railways of Washington were directly under the control of the Interstate Commerce Commission. The Public Utilities Commission then came into existence. It had been the policy of the Interstate Commerce Commission to operate cars under specific schedules during rush hours, and not to require that enough cars should be run to provide all passengers with seats. The Public Utilities Commission on Sept. 15 issued an order suspending existing orders as to headway on the lines of the Capital Traction Company and the Washington Railway & Electric Company from Sept. 16 to Oct. 15, inclusive, with the idea of putting into effect an entirely new plan for controlling service. During the month named the companies will be allowed to fit the service to the traffic under observation of the commission. This observation is to result, it is stated, in the replacing of the old headway regulations for rush hours, with a new order that during non-rush hours a sufficient number of cars be operated to furnish a seat for each passenger and that during rush hours the service shall be such that not more than a specified percentage of passengers shall stand for a limited time.

RAILWAY EXTENSIONS IN WASHINGTON

The Public Utilities Commission of the District of Columbia held a hearing Sept. 15 on a proposal to extend the Fourteenth Street line of the Washington Railway & Electric Company, from the corner of Fourteenth Street and Pennsylvania Avenue, where it now turns into E Street, up Fourteenth Street hill, past the New Willard Hotel, to Fourteenth and F Street, to connect with the Georgetown and Mt. Pleasant lines of the company. This extension is advocated by citizens of Washington employed in the new bureau of printing and engraving on Fourteenth Street Southwest. It was brought out at the hearing, also, that there is need for a loop which will carry the southern terminus of the tracks to the new building of the printing and engraving bureau. It is also advocated that the line be extended east on C Street, north on Linwood Place and west on D Street to Fourteenth, where it will close on itself. It was suggested that if the commission does not allow the extension up Fourteenth Street hill the company be ordered to issue transfers, good a block away. The commission discussed with the railway officials the possibility of removing some of the tracks on E Street, as congestion is charged in consequence of the presence of these tracks. The commission indicated that it will permit the extensions if the tracks on E Street are removed. It is estimated that the proposed extensions will cost about $100,000.

The commission has ordered the Washington Railway & Electric Company to extend its Anacostia or Eleventh Street line from Nichols Avenue and Fourth Street, Anacostia, Washington, along Nichols Avenue to Upsal Street, a distance of half a mile, to be completed and in operation by June 30, 1915, at an approximate cost of $80,000. The company contended that the expense is not justified by the traffic expected, but the commission declared "it is a reasonable extension which promises to be compensatory within a reasonable time."

LOS ANGELES COMMISSION REPORT

Summary of Contents of the Report of the Board of Public Utility Commissioners of Los Angeles for the Year.

The Board of Public Utility Commissioners of Los Angeles, Cal., has issued its fourth annual report covering the period from July 1, 1912, to June 30, 1913. The aim of the report was to give a brief account of the work accomplished and to present the results of preliminary studies and conclusions on questions of importance with which the commission is concerned. The work is divided into four main divisions, namely, work of the department; railroads and carriers, including statistics, finance and operation; other public utilities, including statistics, finance and operation, and applications and complaints. The section covering the operations of the board in regard to electric railways contains operating statistics of the companies within the city and data regarding smoking on cars in other cities, operating statistics of companies in Baltimore, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Indianapolis, Kansas City, Louisville, Milwaukee and other cities. A section of the report is devoted to the interurban electric railways which operate in Los Angeles. This contains a summary of the miles of track and data regarding service and routing, types of cars, car signs, fares, transfers, accidents, grade crossings, etc. Regarding the prospect for rapid transit in Los Angeles, the board says in part:

"There is no real rapid transit in the city at present. The interurban lines, even when on private right-of-way, are limited to a moderate speed on account of the many street grade crossings, while all lines use the street in the central portion of the city and some for a considerable distance out. The density of population will hardly warrant the construction of a rapid transit system of elevated lines or subways within the city limits.

"At present the development of rapid transit is left entirely to the Pacific Electric Railway, under regulation by the city. The first step toward construction of a system has been the railway's proposal to build an elevated road east from the rear of Main Street depot to San Julian Street and from there connect with the Municipal Railroad on San Pedro Street by means of a temporary incline. This elevated road will be on private right-of-way. It is the purpose of the board, before recommending any franchise, to have the railway so design the structure that it will be unobjectionable both as regards noise and appearance. It is the intention of the Pacific Electric Railway ultimately to extend this elevated road farther east to connect with the Long Beach line when the latter is elevated, and, though no details have been obtained from the railway, it is assumed that a similar connection will be made with the Pasadena line. Provision should also be made for direct transfer from the steam railroads to the interurban rapid transit system.

"The board has received no official information as to the proposed subway to serve the western beach lines. Newspaper reports indicate that this is to be a combined subway (or tunnel) and elevated, extending from Hill Street, near the location of the present depot between Fourth and Fifth Streets, to Vineyard Junction at the west city limits. No mention has been made of any connection between this proposed subway and the Main Street terminal. The flexibility and efficiency of service obtainable by through routing could thereby be secured. Both this project and the elevated road before mentioned are unsatisfactory in so far as they are based on no general city plan prepared with reference to the present and future needs of the community as a whole.

"There seems to be a popular impression that subways are the ideal means for rapid transit. As a matter of fact instead of being the ideal they should be adopted only as a last resort. In the older cities, laid out before the realization of great centers of population was made possible by modern methods of transportaiton, there is excuse enough for failure to provide ample street space for furnishing facilities to meet the modern demands. We have been entirely too slow in appreciating the conditions made possible through cheap transportation for handling large numbers of people and transporting them long distances, more or less rapidly. The result has been the construction of skyscrapers in the business district with the attendant congestion and then more congestion until the capacity of the streets is thoroughly over-taxed and we are simply submerged. The popular notion is that we will eventually dig ourselves out by way of subways.

"Instead of recognizing the fact that the modern city is absolutely dependent on transportation for its existence, we simply continue in the same old haphazard way, laying out new streets with little or no regard for future requirements. Few, if any, American cities have undertaken in an intelligent and determined way, to study and replan old street systems so that the growing demands for transportation can be met. When it is recognized that a street should be widened in the future an ordinance should be passed at once establishing new street lines to which all future improvements would have to conform, even though it were not actually widened for a number of years."

Compulsory Electrification Measure at Toronto.—The Board of Control of Toronto, Ont., has passed a resolution instructing the corporation counsel to apply to the Dominion Railway Board for an order compelling all railways to electrify their systems within the city limits and 2 miles from the limits.

Electricity Proposed for Harbor-Front Line.—The engineering staff of the harbor board of Montreal, Que., is engaged on plans for an electric railway to replace the present steam line which runs along the harbor front. The plan is to elevate the line. Construction work will not be commenced until next season.

Court Annuls Order of Illinois Utilities Commission—As a result of a suit brought by the Public Utilities Commission of Illinois in the Federal Court to enforce its order to compel the Chicago & Oak Park Elevated Railroad to elevate its tracks in Oak Park, Ill., Federal Judge Kohlsaat has entered a temporarily restraining order.

Providing for Transit Work in Philadelphia.—On Sept. 17 the finance committee of the Councils of Philadelphia inserted in an entirely reconstructed permanent loan bill of $11,300,000 an item of $500,000 for preliminary transit work. The Common Council later received the amended loan ordinance and placed it upon the calendar for final action on Sept. 24.

Boylston Street Subway Opening.—The Boston (Mass.) Elevated Railway is planning to open the Boylston Street subway for service on Saturday, Oct. 3. The subway will be used by single car units operated between the Park Street station and points in the western suburbs of Boston and will relieve the streets of the Back Bay of a highly congested traffic.

Pekin Bond Issue Not Taken.—It now seems very unlikely that the City of Pekin, Ill., will be able to dispose at this time of the issue of 4½ per cent bonds recently voted by the electors to provide funds to take over and extend the Pekin & Petersburg Railway in Pekin as a municipal undertaking. Replies from some of the bond houses solicited indicate that the return proposed is insufficient in view of present financial conditions.

Suit for Paving Tax.—Briefs have been filed with the Illinois Public Utilities Commission by W. E. Orvis, commissioner of the city of Waukegan, Ill., and by representatives of the Chicago & Milwaukee Electric Railroad and Waukegan, Fox Lake & Western Electric Railroad regarding an attempt to inforce the payment of a special paving tax. It is complained that the railways have failed to pay special assessments for paving along the right-of-way and that the waiting rooms are insufficient to accommodate passengers.

Another Storm in Kansas City.—Scarcely had the motors and the substation equipment of the Metropolitan Street Railway, Kansas City, Mo., been dried out after the rain of Sept. 7 when there was another cloudburst. The first rain washed down part of a hill of crushed rock into sewers and into the street near the main station at Fifteenth Street and Grand Avenue. The second rain flooded this station, stopping all the cars in a large district centering in the business section. The station was flooded to a depth of nearly 2 ft. The men worked, at night especially, in drying out and repairing and no accident resulted from the extraordinary strain on the equipment. There was also trouble at the station at Second Street and Grand Avenue, where flood waters shifted the sand which plugged the intake.

Pittsburgh Subway Action.—On Sept. 15 the public service and surveys committee of the Pittsburgh City Council authorized the city law department and A. E. Anderson, attorney representing the Pittsburgh District Railways, to prepare an ordinance for a passenger and freight subway for Pittsburgh, to be presented to the committee. The resolution will then be formally taken before Council. The committee received and filed a communication from the Pittsburgh Subway Company, in which it was stated that that company could not consider competition in building a subway, and requesting permission to build the subway only as a business proposition. Mr. Anderson said his company proposed to develop a freight and passenger subway system in connection with existing transportation lines, at a cost of $32,500,000 for 15 miles of line and equipment.

Recruiting by Electric Car.—The *Electric Railway & Tramway Journal* of Sept. 11, published in London, contained the following interesting item: "The Lord Mayor of Leeds and his colleagues are utilizing the Corporation cars for recruiting purposes. Every night a procession of cars sets out on a recruiting trip, the passengers being the Lord Mayor, the other members of the Corporation, and prominent local citizens, and they are accompanied by the Corporation bandsmen, playing local airs. At certain points of the system speeches are made calling on men to enlist themselves in Lord Kitchener's army. Accommodation is provided on the cars for recruits, who are taken by this means to the recruiting office. The illuminated car which leads the procession bears, as the destination, the name 'Berlin,' and these are the inscriptions which meet the eye: 'Wanted at once, 5000 recruits from Leeds, British Bulldogs, Airedale and Yorkshire Terriers'; and 'Come now, don't have to be fetched. The people of Leeds will look after your homes.'"

Seattle Purchase Negotiations.—The proposed terms for the purchase by the city of Seattle, Wash., of that portion of the Seattle, Renton & Southern Railway within the city limits were discussed at a conference on Sept. 12 between the members of the City Council and William R. Crawford and Scott Calhoun, receivers of the company. The most recent plan provided for an initial payment of $200,000 in municipal street railway bonds, bearing 4½ per cent interest, and an annual payment of 25 per cent of the gross earnings for twenty-five years on the remaining $1,400,000 of the purchase price, the title to the property to pass to the city whether or not such payment liquidated the remaining indebtedness. A change has been made in the terms by which the receivers will accept 20 per cent of the gross receipts for twenty-eight years instead of 25 per cent for twenty-five years. The receivers will apply to the court for permission to accept these terms. An ordinance providing for the purchase will then be drawn and offered in the Council, and it is expected that the question will be submitted to the voters at the election on Nov. 3.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The improvement in financial conditions during the last week has been general but not marked. The exports of merchandise from New York for the week ended Sept. 19 amounted to $17,208,199, against $13,906,351 the previous week. The success of the New York City loan also had a stabilizing effect. The situation in London is better. The stock exchange committee there has fixed special settlements in thirty-eight new securities for Oct. 14 and it has been decided that there shall be no further extension of the moratorium as it applies to certain debts. These last factors in particular are taken to augur well for the opening of the exchange in London about the middle of October. The committee of seven bond dealers in New York has modified the restriction previously imposed upon bond trading. It is now possible to trade in bonds at lower prices than the last quotations of the stock exchange, but in the case of listed bonds, trades at reduction in prices from those of July 31 have to be made subject to the approval of the Stock Exchange committee. Brokers are making every effort to obtain larger margins from their customers with the result that the margin accounts are being gradually lessened and the bank loans reduced. On Sept. 22 the committee of the clearing house of the Stock Exchange announced the settlement of all contracts which were entered on the clearing house sheets dated July 31, 1914, with the exception of those made by the three firms whose affairs were placed in the hands of receivers when the Exchange closed. The question of opening the Exchange continues to be discussed, but nothing has developed which would indicate that the governors have in any way changed their views toward opening. The war tax revenue bill as agreed upon by the democrats of the ways and means committee was introduced in the House on Sept. 21 by Representative Underwood, the majority party leader. It is estimated that in the first year of operation $105,000,000 in revenues will accrue to the treasury under this measure. The bill reimposes most of the stamp taxes of the Spanish-American war and increases the tax on beer and wines.

PROTECTIVE COMMITTEE IN BIRMINGHAM

On account of the default in the payment of interest due Sept. 1 on the $2,650,000 of first mortgage 5's of the Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala., as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12, a protective committee has been formed as follows: C. H. Zehnder, S. D. Vrooman, J. D. Kirkpatrick and F. H. Hack. This committee urges the deposit of bonds with the Empire Trust Company, New York, depositary, under an agreement dated Sept. 15. In case the committee adopts any plan of reorganization the depositors will be allowed three weeks in which to withdraw on payment of their pro rata share in the expenses, not exceeding 2½ per cent per bond. If the reorganization plan calls for the issue of mortgage bonds, the depositors are to receive not less than $700 for each $1,000 bond deposited.

As noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19, an independent committee has also been formed, consisting of the following: S. H. Cunningham, investment banker, Boston; Oscar Dare, bond broker, Philadelphia; Boyd McDowell, corporation counsel for the city of Elmira, N. Y.; J. H. N. Campbell, of H. K. Taylor & Company, investment bankers, Hartford, Conn., and George T. Wood, of Wood & Johnson, investment bankers, Louisville, Ky. This committee requests that bondholders take no action in regard to depositing bonds until its investigations are completed.

According to a circular recently sent out by the Cunningham committee, a meeting of bondholders was held in New York on Sept. 11. The action of Mr. Cunningham in employing Stone & Webster to make an examination of the books and accounts of the company with reference to the disposition of the proceeds of security issues was approved. It was also voted to authorize this independent bondholders' committee to examine the road's finances, to endeavor to ascertain the causes of the receivership and to employ counsel to protect the rights of the owners. As stated in last week's issue, the company is now in the hands of General Superintendent I. W. Ross as receiver.

ANNUAL REPORT

Interborough-Metropolitan Company

The income statement of the Interborough-Metropolitan Company, New York, for the year ended June 30 follows:

Surplus income June 30, 1913	$3,595,321
Income:	
Dividends on Interborough Rapid Transit Company capital stock, viz.:	
2½ per cent for three months ended Sept. 30, 1913	$847,820
2½ per cent for three months ended Dec. 31, 1913	847,820
2½ per cent for three months ended March 31, 1914	847,820
2½ per cent for three months ended June 30, 1914	847,820
5 per cent extra paid July 1, 1914	1,695,640
Total	$5,086,920
Interest and dividends on other securities owned	$2,081
Interest on loans and advances to Metropolitan Securities Company	353,328
Interest on loans and bank balances	20,573
Total	$375,982
Total income	$5,462,902
	$9,058,223
Disbursements:	
Interest on $67,825,000 of Interborough-Metropolitan Company 4½ per cent collateral trust bonds, for the year ended June 30, 1914	$3,052,125
Administration and general expense account	55,801
Taxes	40,085
Interest on 6 per cent registered notes to June 30, 1914	116,216
Interest on five-year 6 per cent notes	240,000
Interest on two-year 6 per cent secured gold notes to Dec. 22, 1913	51,785
Interest on six months' 6 per cent secured gold notes to June 22, 1914	45,000
Interest on loans	1,125
Total	$3,602,137
Surplus income	$5,456,086

The report states that the surplus from operations of the Interborough Rapid Transit Company, of whose capital stock the Interborough-Metropolitan Company owns 339,128 shares out of a total of 350,000, was $8,024,580 for the year ended June 30, an increase of $1,487,512. There has been a continued increase in the earnings of this property, the net corporate income for 1914 being equivalent to 22.92 per cent on the capital stock, as compared to 16.68 for 1913, 16.07 for 1912 and 14.68 for 1911.

The net corporate income of the New York Railways, which is also controlled by the Interborough-Metropolitan Company, has not yet been sufficient to enable the payment of the full interest on the company's 5 per cent adjustment bonds. It is stated that the earnings during the year were adversely affected by the severe weather conditions of February and March and by the lower temperatures prevailing from April to June. Added to this was the general business depression and the many interruptions to service caused by the new subway construction. The expenditures for maintenance during the year, however, were $2,444,395, an increase of $336,071 over those of the preceding year.

The $2,039,520 of six months' 6 per cent registered notes dated Jan. 1, 1913, were extended and reduced during 1914 to $1,936,942, and the funds necessary for the retirement of the full amount on July 1 were on deposit at the close of the fiscal year. The indebtedness represented by the two-year 6 per cent secured notes dated Dec. 22, 1911, amounting on June 30, 1913, to $1,817,000, was reduced to $1,500,000. Arrangements have been made whereby this sum will be further decreased to $500,000 as of July 1, 1914, thus reducing the funded debt from $7,856,520 to $4,500,000. The report states that consideration is also being given to a plan for refunding this latter amount.

CHICAGO RAILWAY STATISTICS

Report of Board of Supervising Engineers Chicago Traction, Showing Progress of Surface Lines for 1911

According to the fifth annual report of the Board of Supervising Engineers Chicago Traction, covering the fiscal year ended Jan. 31, 1912, the gross receipts of the city surface lines totaled $28,743,167, an increase of about $3,710,452, or 14.7 per cent. In the assignment of the total income to the various accounts, the proportion of operating expenses proper, 62.46 per cent; the total return to the company (interest and profit), 26.28 per cent; and the total return to the public (taxes and profit), 11.26 per cent, remained practically constant from the preceding year, in spite of the large increase in the reserve for renewals and some increase in taxes. For the fiscal year the operating ratio and taxes (based upon earnings from operation) was 68.2 per cent, leaving 31.8 per cent net earnings, or $9,007,441. Expenditures for maintenance of way and equipment remained practically the same as in 1910, but decreased in percentage 9.07 per cent. The decrease, however, was more than offset by the increase in the reserve for renewals from 2.47 per cent in 1910 to 8.05 per cent in 1911, thus increasing the total appropriation for upkeep from 12.73 per cent to 17.1 per cent of the earnings from operation.

The expenditures for damages showed a decrease averaging 6.03 per cent for all companies. Taxes and interest were fairly constant in percentage. The company's share in the profits, including interest, remained at about 26.75 per cent of the gross earnings for the last two years. The total cash income to the public represented $3,235,592, or 11.42 per cent of the operating revenue. The value of the property increased $8,866,566 during the year to a total of $127,492,398. The properties have earned under the 1907 ordinances a total of $116,130,142, or an average of $23,230,000 per year. The investment ratio between capital and receipts during the past five years' operation increased from 3.28 per cent in 1907 to 4.47 in 1910, but during the last fiscal year decreased from 4.74 per cent to 4.44 per cent. The old mileage of the system, 907.32 miles of single track, has increased 189.23 miles, of which 59.47 represents new extensions. The extensions of mileage in sparsely settled territory, even in the face of rapidly increasing returns, has reduced the average per mile to about $31,800, or 13.8 per cent lower than in 1907. It also resulted in a decrease of 21.9 per cent in density of car operation (car miles per mile of track) over the entire system.

The revenue fare averaged 4.84 cents for the year. The service factor increased to 9.66 total passengers per car mile, while the operating revenue per car mile rose to 28.36 cents. Wages of train crews increased from 52.1 cents per car hour in 1907 to 59.25 cents in 1911, an increase of 13.7 per cent. In per cent of total operating expenses, however, the relative cost has remained almost constant at 39 per cent, largely owing to a gradual increase in the schedule speed to 8.9 miles per hour by improved equipment. On a car mile basis, maintenance of equipment remained constant for the last two years at 1.49 per cent per car mile. The total upkeep of the system, excluding the reserve for renewals, has increased to 4.85 cents per car mile. Maintenance of way and structures is about $1,200 per mile of track, or, including both maintenance and renewals, $5,355.

COMPLETION OF UTAH MERGER

On Sept. 18 the stockholders of the Utah Light & Railway Company, Salt Lake City, Utah, approved the sale of the properties of the company to the Utah Light & Traction Company, incorporated by officials of the Utah Power & Light Company. The Utah Light & Traction Company becomes the owner of the 98 per cent interest in the common and the preferred stocks of the Utah Light & Railway Company owned by the Union Pacific interests through the Oregon Short Line. The acquisition gives control of the electric power business in both Salt Lake City and Ogden to the Utah Power & Light Company. The new company, the Utah Light & Traction Company, has elected officers as follows: O. J. Salisbury, president; C. W. Johnson, Salt Lake City, R. C. Gemmell, Salt Lake City, and C. E. Groesbeck, New York City, vice-presidents; S. A. Whitney, Salt Lake City, treasurer; E. O. Howard, Salt Lake City, assistant treasurer; E. R. Summerson, New York, assistant treasurer; A. H. Parsons, Salt Lake City, secretary; J. N. Bidwell, Salt Lake City, assistant secretary; L. W. Osborne, New York, assistant secretary. The directors of the new company are O. J. Salisbury, S. A. Whitney, A. H. Parsons, C. W. Johnson, R. C. Gemmell, J. N. Bidwell, E. O. Howard, J. Frank Judge and Joseph S. Wells, the general manager of the Utah Light & Railway Company. It is said that the lighting, street railway and power interests of the Utah Light & Traction Company will be separated. The lighting end will probably remain with the present company and the power business will be taken over by the Utah Power & Light Company, which will contract to furnish current for lighting and for the operation of the street railway system. It is also stated unofficially that P. B. Sawyer, the present general manager of the Utah Power & Light Company, will be named as general manager of the Utah Light & Traction Company and will become the active operating head of the new company. The Utah Light & Traction Company, the new company, is capitalized at $10,000,000. The stock is divided into 400,000 shares with a par value of $25 each.

Alabama Traction, Light & Power Company, Ltd., New York, N. Y.—The directors of the Alabama Traction Light & Power Company recently announced in London that prior to the outbreak of European hostilities arrangements had been made for the payment of interest due on Sept. 1 on the first mortgage 5 per cent bonds, of which $10,914,000 is said to be outstanding. Under present stock exchange and moratorium conditions, however, the board is compelled to defer this interest payment. Bondholders are assured that the step taken is only temporary and is dictated by the necessity for most carefully conserving the cash resources of the company.

Capital Traction Company, Washington, D. C.—A quarterly dividend of 1¼ per cent has been declared on the $12,000,000 of capital stock of the Capital Traction Company, payable on Oct. 1. This compares with a 1½ per cent quarterly dividend from April, 1905, to July, 1914, inclusive. According to a notice to the stockholders, during the last three years there has been a large increase in fixed charges through compulsory extensions and complete new equipment for cars which, while giving proper comfort and convenience to the public, brought no commensurate increase in the receipts. During the present year the passenger receipts decreased on account of the general business depression. In view of these facts, the directors decided upon a reduction in the rate of dividend, although with the improvement in general conditions now foreshadowed, the return to a 6 per cent basis is confidently expected.

City Light & Traction Company, Sedalia, Mo.—The Public Service Commission of Missouri recently authorized the City Light & Traction Company to issue $91,600 of first mortgage sinking fund gold bonds maturing June 1, 1952, but redeemable any June 1 or Dec. 1 at 105 and interest. These bonds bear 5 per cent interest, payable semi-annually. The proceeds are to be used in partial reimbursement for moneys already expended for improvements.

Elmira Water, Light & Railroad Company, Elmira, N. Y.—Bertron, Griscom & Company, New York, recently sold $284,000 of five-year 6 per cent collateral trust bonds of the Elmira Water, Light & Railroad Company, which are secured by $355,000 of consolidated mortgage 5's, due 1956. The proceeds of this issue and $85,000 of 7 per cent first preferred stock will be used chiefly to pay off $355,000 of West Side Railroad first 5's, due Oct. 1. All the stockholders of record Sept. 15 are offered the right to subscribe at par for $425,000 of additional first preferred stock to be issued Oct. 1, of which the above mentioned $85,000 is a part.

Houghton County Traction Company, Houghton, Mich.—The directors of the Houghton County Traction Company have voted to omit the semi-annual dividend on the $750,000 of common stock payable on Oct. 1. From April, 1910, to April, 1914, 2½ per cent was paid semi-annually and in October, 1909, 2 per cent.

Hudson & Manhattan Railroad, New York, N. Y.—The Board of Public Utility Commissioners of New Jersey has authorized the Hudson & Manhattan Railroad to issue $202,500 of first lien and refunding mortgage bonds. These bonds were previously authorized by the Public Service Commission for the First District of New York, as noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8.

Kansas City (Mo.) Railways.—Robert J. Dunham, vice-president Armour & Company, has been elected president of the Kansas City Railways, the successor of the Metropolitan Street Railway, Kansas City, Mo. Ford Harvey and E. E. Ball, of Kansas City, were elected vice-president and secretary and treasurer respectively. The completion of the company's reorganization still remains in abeyance pending a final settlement as to the valuation of the properties and a return of better financial conditions. It is understood that the company's reorganization plan will at the proper time be brought out by the holders of the Kansas City Railway & Light Company 6 per cent notes, with the co-operation of interests representing the bondholders. A statement outlining the situation will be sent to the noteholders within the next month.

New York State Railways, Rochester, N. Y.—The directors of the New York State Railways have declared the regular quarterly dividend of 1¼ per cent on the preferred stock and a quarterly dividend of 1 per cent on the common stock, payable on Oct. 1, to stockholders of record Sept. 22. This is a reduction of one-half of 1 per cent from the last quarterly payment on the common stock.

Pacific Gas & Electric Company, San Francisco, Cal.—The California Railroad Commission on Sept. 10 authorized the Pacific Gas & Electric Company to issue $1,000,000 of general and refunding mortgage bonds. The company proposes to pledge the bonds to secure its securities on two bonds which it must file in the Federal Court in connection with suits brought to enjoin the enforcement of the gas and electric rates fixed by the San Francisco Board of Supervisors for the year ended June 30.

Philadelphia Company, Pittsburgh, Pa.—The Philadelphia Company has declared its regular semi-annual dividend of 3 per cent on the preferred stock and the regular quarterly dividend of 1¾ per cent on the common stock. These dividends are payable in script Nov. 2 to stock of record Oct. 1. The script will be redeemable at the option of the company on or before May 1, 1916, and will bear 7 per cent interest.

Public Service Corporation of New Jersey, Newark, N. J.—At a recent meeting of the board of directors of the Public Service Corporation of New Jersey, President Thomas N. McCarter stated that while a large number of steam railroads and utilities showed decreases in gross earnings the Public Service Corporation for the first eight months of 1914 made actual increases. Although not so large as normally, they were very gratifying when compared with the results obtained from similar properties. The way the company stood up during this year and also during the period of depression in 1907 evidences the inherent strength of the properties and also indicates that its securities will make a greater appeal than ever to the investing public when business conditions reach a normal state.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—George K. Weeks, manager of the San Francisco branch of N. W. Halsey & Company, has been elected president of the San Francisco-Oakland Terminal Railways to succeed W. A. Bissell. This election leaves the control of the property in the hands of the bankers who held the $2,500,000 of Oakland Railways 6's of 1912, originally due in June, 1913, but extended to Sept. 14. It is reported that the further extension of these bonds has been refused.

Sherbrook Railway & Power Company, Sherbrook, Que.—The gross income of the Sherbrook Railway & Power Company for 1914 showed a gain of $15,344, or 12.13 per cent, while the net earnings gained only $2,093, or 4.3 per cent. This was due to the fact that the operating expenses amounted to $87,970, an increase of $13,251, or 17.7 per cent. A small deficit was shown on the year's operation. C. J. McCuaig, president, says: "The industrial depression in the Dominion of Canada during the last eighteen months has affected both the street railway earnings and the power revenue. The prospects, however, for increased earnings in 1915 are as favorable as can be expected."

Tidewater Southern Railway, Stockton, Cal.—L. M. Rosenbaum, New York, is offering at 85 and interest the unsold portion of $750,000 of first mortgage thirty-year 5 per cent sinking fund gold bonds of the Tidewater Southern Railway, dated 1912 and due April 15, 1942, but redeemable on any interest date at 103 and interest. This is a projected road from Stockton to Fresno, 227 miles in length, of which 33 miles from Stockton to Atlanta, Escalon and Modesto were completed and in operation in May, 1914.

United Gas & Electric Corporation, New York, N. Y.—The United Gas & Electric Corporation has passed the October dividend on its first preferred stock owing to present financial depression, although it is stated that the dividend has been fully earned.

Union Traction Company, Philadelphia, Pa.—According to the report presented by Jeremiah J. Sullivan, president, at the annual meeting of the Union Traction Company on Sept. 16, the board of directors on June 1 consented to the immediate circulation and issue of $2,000,000 of the bonds secured by the deed of trust of March 1, 1912, between the Philadelphia Rapid Transit Company, the Union Trust Company and the Commercial Trust Company, trustee. A total of $8,000,000 of bonds has now been issued under this deed of trust.

Washington Water Power Company, Spokane, Wash.—The directors of the Washington Water Power Company have declared a quarterly dividend of 1¾ per cent on the $14,081,900 of stock, payable on Oct. 1 to holders of record Sept. 12. This compares with 2 per cent paid from April, 1911, to July, 1914, inclusive.

DIVIDENDS DECLARED

Bangor Railway & Electric Company, Bangor, Maine, quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, 1½ per cent, preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1½ per cent, preferred.

Dallas (Tex.) Electric Company, semi-annual, $3, first preferred; semi-annual, $2.50, second preferred.

Germantown Passenger Railway, Philadelphia, Pa., quarterly, $1.31¼.

Houghton County Traction Company, Houghton, Mich., 3 per cent, preferred.

Illinois Traction System, Peoria, Ill., quarterly, 1½ per cent, preferred.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred.

New York State Railways, Rochester, N. Y., quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Omaha & Council Bluffs Street Railway, Omaha, Neb., quarterly, 1¼ per cent, common and preferred.

Philadelphia (Pa.) Traction Company, $2.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 1½ per cent.

Republic Railway & Light Company, New York, N. Y., quarterly, 1½ per cent, preferred.

Stark Electric Railroad, Alliance, Ohio, quarterly, three-quarters of 1 per cent.

Toronto (Ont.) Railway, quarterly, 2 per cent.

Washington Water Power Company, Spokane, Wash., quarterly, 1¾ per cent.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$492,895	......	......	......	......
1 " " '13	506,833	......	......	......	......
2 " " '14	1,015,008	......	......	......	......
2 " " '13	1,016,504	......	......	......	......

ATLANTIC SHORE RAILWAY, SANFORD, MAINE

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$53,357	$29,733	$23,624	$650	$22,974
1 " " '13	60,233	30,403	29,830	654	29,176

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$179,055	$83,421	$95,634	$58,429	$37,205
1 " " '13	175,964	85,797	90,167	46,873	43,294
12 " " '14	1,854,221	896,458	957,762	679,039	278,723
12 " " '13	1,711,309	850,436	860,873	543,575	317,298

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$1,912,971	$1,111,018	$801,953	$808,764	†$6,811
1 " " '13	1,970,032	1,155,959	814,073	799,955	14,119
3 " " '14	3,864,237	2,248,719	1,615,517	1,618,129	†2,612
2 " " '13	3,966,645	2,348,490	1,618,155	1,597,645	20,510

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*Includes taxes.
†Deficit.

Traffic and Transportation

NEW YORK SUBWAY PASSENGER DETAILS

From official figures made public by the Public Service Commission of the First District of New York as to the number of passengers carried by the subway in the year ended June 30, it appears that for the first time the Interborough Rapid Transit Company has handled on the average 1,000,000 passengers a day. Taking Sundays as half days and reckoning 340 days to the year, the company carried 340,413,103 passengers, an increase over 1913 of 12,941,593, or an average of 1,001,215. The details of the passenger traffic, as indicated by the number of tickets sold at each station of the subway in the year ended June 30, 1914, follow:

Stations	Total	Year's increase	Daily average* 1914	1913	1912
Lenox Branch—Total	66,471,446	2,962,849	195,504	186,790	171,075
180th St., Bronx Park	2,802,957	124,056	8,244	7,879	6,211
177th St.	2,902,637	9,392	8,537	8,510	8,317
174th St.	2,202,105	561,528	6,477	4,825	3,170
Freeman St. ..	5,287,513	304,410	15,552	14,656	12,866
Simpson St. ...	5,532,173	784,219	16,271	13,965	11,645
Intervale Ave..	3,357,075	446,236	9,874	8,561	6,972
Prospect Ave...	6,237,374	108,274	18,345	18,027	16,606
Jackson Ave...	4,263,124	161,795	12,539	12,063	11,277
Third Ave......	5,117,467	74,683	15,051	14,832	14,034
Mott Ave......	782,258	†41,645	2,301	2,423	2,467
145th St., Lenox	1,442,800	33,100	4,244	4,146	4,179
135th St., Lenox	6,013,361	†8,457	17,686	17,711	17,381
125th St., Lenox	6,236,990	†105,622	18,344	18,655	18,170
116th St., Lenox	8,015,511	225,807	23,575	22,911	21,333
110th St., Lenox	6,278,161	285,073	18,465	17,627	16,447
Broadway Branch—Total	44,063,199	1,945,545	129,598	123,875	112,106
242d St.........	3,170,827	55,043	9,326	9,164	8,933
238th St.........	81,876	†18,321	241	295	325
231st St.........	487,699	88,222	1,434	1,175	1,007
225th St.........	425,704	60,368	1,252	1,075	982
215th St.........	163,201	25,709	480	404	323
207th St.........	1,107,177	224,416	3,256	2,596	1,734
Dyckman St....	923,785	308,135	2,717	1,811	1,144
191st St........	546,447	95,224	1,607	1,327	951
181st St.........	6,133,256	385,352	18,039	16,906	14,691
168th St.........	2,928,458	156,416	8,613	8,153	7,442
157th St.........	4,361,835	197,373	12,829	12,248	11,133
145th St.........	4,753,428	197,987	13,981	13,398	12,391
137th St.........	4,355,160	†1,318	12,809	12,813	11,961
Manhattan (129th) St...	4,191,795	33,950	12,329	12,229	11.404
Columbia University (116th)	3,374,313	73,207	9,924	9,709	8,403
Cathedral Parkway (110th).	3,586,954	4,314	10,550	10,537	9,905
103d St........	3,471,284	59,468	10,210	10,035	9,377
96th St. to South Ferry—Total.	185,731,205	6,763,357	546,268	526,376	493,094
96th St.........	5,558,385	69,574	16,348	16,144	15,023
91st St.........	1,667,390	42,404	4,904	4,779	4,641
86th St.........	3,185,790	99,279	9,370	9,078	8,914
79th St.........	2,839,600	48,475	8,352	8,209	7,897
72d St.........	4,534,330	†19,984	13,336	13,395	12,701
66th St.........	3,149,653	†25,369	9,264	9,338	8,974
Columbus Circle	6,778,410	163,003	19,937	19,457	18,566
50th St.........	6,123,949	344,225	18,012	16,999	15,151
Times Square..	13,664.628	452,671	40,190	38,859	37,380
Grand Central..	19,551,405	2,612,167	57,504	49,821	44,104
33d St.........	8,177,755	593,180	24,052	22,308	19,783
28th St.........	6,763,557	488,704	19,893	18,455	16,707
23d St.........	10,471,387	†36,922	30,798	30,907	28,482
18th St.........	4,652,122	†29,591	13,683	13,770	13,426
14th St.........	14,217,527	130,839	41,816	41,431	38,265
Astor Place....	7,131,309	116,849	20,974	20,631	19,744
Bleecker St.....	4,745,676	†16,484	13,958	14,006	13,287
Spring St......	5,181,643	21,934	15,240	15,176	14,648
Canal St.......	5,018,237	1,408,232	14,760	10,618	10,162
Worth St......	2,114,581	†78,908	6,219	6,451	6,292
Brooklyn Bridge.	17,657,248	†431,701	51,933	53,203	52,081
City Hall......	553,863	23,654	1,629	1,559	1,585
Fulton St......	16,381,746	481,880	48,182	46,764	43,174
Wall St.......	7,978,878	5,240	23,467	23,452	22,158
Bowling Green.	5,731,652	156,145	16,858	16,399	15,124
South Ferry....	1,900,484	143,861	5,590	5,167	4,825
Brooklyn—Total..	43,941,018	1,276,565	129,238	125,484	114,280
Borough Hall...	8,963,677	21,450	26,364	26,301	24,878
Hoyt St........	7,728,747	89,227	22,732	22,469	20,540
Nevins St......	4,690,821	†129,745	13,797	14,178	13,198
Atlantic Ave...	22,557,773	1,295,633	66,346	62,536	55,664
Miscellaneous	206,235	†6,723	607	626	544
Grand total..	340,413,103	12,941,593	1,001,215	963,152	891,099

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*Treating Sundays as half days (340 days to the year).
†Decrease.

MIDDLESEX & BOSTON FARE HEARING

At a continued hearing before the Massachusetts Public Service Commission on the petition of the Middlesex & Boston Street Railway for authority to increase existing 5-cent fares to 6 cents and to impose a further 1-cent charge for transfers, C. B. Breed, professor of civil engineering at the Massachusetts Institute of Technology, Boston, appeared on behalf of the remonstrants. Professor Breed

contended that by capitalizing floating debts and by rehabilitating its power plants in Lexington and Newton and discontinuing the purchase of energy at these points from the Edison Electric Illuminating Company of Boston, the railway company could save 0.5 cent per kw-hr. In response to an inquiry by Commissioner Anderson as to whether it was advisable for the railway company to invest $250,000 in plant improvements many miles from tidewater, Professor Breed said that he had not studied the situation sufficiently to give an answer. Commissioner Anderson said that a company with a floating debt of $1,500,000 is in no position to invest in plant restoration.

Before the final arguments, a protracted discussion of the transfer situation occurred. George M. Cox, general manager of the company, emphasized the evils of giving a transfer on a transfer and said that it had never been done on the Newton lines and never would be if it could be helped. Chairman McLeod said that in cases where a through service is rendered during a portion of the day for a single fare, the company should provide for a ride between such points at other hours by the use of transfers when cars are not operated to the former terminals. The benefits of operating through cars at reduced rates to and from factories were also touched upon.

In his closing argument, Attorney Ballantine reiterated the company's inability to pay any dividends in case its revenue is not increased. He urged that 5-cent fare restrictions made twenty or more years ago in connection with the granting of local franchises are not binding upon the commission and pointed out that it would be contrary to the policy and laws of the State to require the stockholders to bear losses upon property formerly necessary for service but later abandoned, as in the case of the old power plants. Such a policy would result in a continued use of inadequate or unsuitable equipment and would militate against good service. The total investment in the property, every dollar of which has been under commission authorization, is $4,781,521. The board took the case under advisement.

EXTENSION OF TRANSFER PRIVILEGES AT BOSTON

The Massachusetts Public Service Commission has issued an order approving various extensions of transfer privileges on the Boston Elevated Railway in connection with the forthcoming opening of the Boylston Street subway. In general, these facilities provide for a free interchange of passengers between inward cars and a corresponding interchange between outward cars and for the articulation of surface and subway routes to give a continuous ride in the same general direction for a single fare. The most important transfer point in the new subway will be the Massachusetts station, in the outer Back Bay. This station is located substantially at the intersection of Massachusetts Avenue and Boylston Street, one of the most important intersection points on the system, with liberal transfer facilities prevailing between east and west and north and south lines of surface cars. With the opening of the subway this fall transfer checks will be issued from inward bound Ipswich Street, Harvard Bridge, Cambridge-Cottage Farm Bridge and Commonwealth Avenue surface cars to inward-bound subway cars. Transfers will also be issued on outward-bound surface cars to outward-bound subway cars, west of the Public Garden. Checks will also be issued from outward-bound cars in the subway to outward-bound surface cars and from inward-bound subway cars to crosstown and inward Copley Square surface cars. At various points in Allston, Brighton and Brookline transfers will be issued to permit interchange of traffic between various intersecting or coinciding suburban routes, with special reference to the use of the trunk lines leading in and out of the Boylston Street subway by passengers whose origins or destinations are located on branch lines or lateral routes. At the Watertown carhouse a system of transfers will be instituted between Cambridge and Newton surface cars which will enable the company to eliminate an overlapping service on about 1 mile of track on Galen Street and also to reduce congestion in Nonantum Square, Newton. It is expected that the running time from Nonantum Square to Park Street, Boston, via the Boylston Street subway, will be about twenty-five minutes, compared with about thirty-five minutes under present light-hour conditions. The subway will probably save about ten minutes per trip for inward and outward Back Bay passengers traveling to or from the Park Street station.

Reduction in Fare Refused.—C. H. Rinker, superintendent of the St. Paul (Minn.) City Railway, has informed Councilman Oscar E. Keller, commissioner of public utilities, that the Twin City Rapid Transit Company will not agree to make a 5-cent fare from St. Paul to the Soldiers' home.

Accident Fakir Sentenced.—Frank J. Marter, Shermansdale, Pa., arrested on Sept. 5 for faking a claim of $1,500 for alleged personal injuries while alighting from a subway train of the Philadelphia Rapid Transit Company, pleaded guilty of perjury and was sentenced to nine months in the county prison by Judge Searle in Philadelphia on Sept. 17. The apprehension of Marter was noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12, page 503.

Increase in Fare on Municipal Line Proposed.—J. J. Hackney, commissioner for Port Arthur, and A. McNaughton, superintendent of light, power and railways for Fort William, Ont., have been appointed a committee to consider the advisability of increasing the rate of ordinary tickets of the municipal street railway system from six for 25 cents to 5 cents straight. This would not interfere with children's or workmen's tickets, and, it is calculated, would result in a 20 per cent increase in revenue.

Steam Service Discontinued on Account of Trolley Competition.—The Massachusetts Public Service Commission has issued an order authorizing the discontinuance of passenger train service between Milford, Hopkinton and Ashland by the New York, New Haven & Hartford Railroad. A trial service of one train a day in each direction since June 8 resulted in an average patronage of only one passenger a train, yielding a revenue of $6 a month against an operating cost of $660. The small patronage is due to the fact that the Middlesex & Boston Street Railway and the Milford & Uxbridge Street Railway furnish a more convenient and cheaper service between the points at issue.

Citizens' Hand Book of Safety.—On July 4 the Boy Scouts of Akron distributed to every home in Akron, Ohio, a booklet on "safety first" called the "Citizens' Hand-Book of Safety." This booklet contained thirty-two pages, including the cover, and took up the safety movement in all its phases. References were made to safety on the streets, safety to the children in the home, safety in the workshop, etc. The Northern Ohio Traction & Light Company was represented in the pamphlet by two pages, one headed, "Six for a Quarter" and the other "Ninety-three Per Cent of All Trolley Accidents Are Due to Failure of the Human Element." On the page headed "Six for a Quarter" half-tone illustrations were used to show accidents to passengers who get off a car backward, walk blindly past the rear of the car, jump from a moving car, sit with their feet out of the window or expectorate on the floor. The publication contained advertisements of manufacturers and others in Akron who carry in stock goods helpful in preventing accidents and in dealing with those that have occurred.

New Company Publication.—The publication of *Transit*, a monthly magazine, has been begun in the interest of the Lehigh Valley Transit Company, Allentown, Pa., and the Philadelphia & Western Railway, Upper Darby, Pa. Each month it is planned to feature one of the cities or towns along the lines, having in mind the location of factories and residences. Company departments and the work they are doing will also be featured each month. The magazine will also contain such other matters as the companies desire to bring before the public. The circulation will be 50,000 copies each month. The paper will be distributed in Philadelphia and for a distance of 100 miles north. The magazine is being issued by the publisher without expense to the companies, but the advisory committee has agreed to furnish the reading matter. It will contain the complete operating schedules of both companies corrected each month. The companies expect to cut down materially their time-table expense and their advertising account in the daily papers. The idea of publishing the magazine was perfected by Edward C. Spring, manager of the Philadelphia Division of the Lehigh Valley Transit Company.

Personal Mention

Mr. John L. Terry has resigned as general manager of the Denver, Laramie & Northwestern Railroad, effective on Oct. 1, to become connected with the Denver office of the Rail Joint Company, New York.

Mr. G. K. Weeks has been elected president of the San Francisco-Oakland Terminal Railways, Oakland, Cal., succeeding Mr. W. A. Bissell, resigned. Mr. Mortimer Fleishacker has been elected a director of the company to succeed Mr. Bissell.

Mr. David Van Alstyne has been appointed assistant to the vice-president of operation of the New York, New Haven & Hartford Railroad, with headquarters in New York, in charge of the test and store departments, and of handling scrap. Mr. Van Alstyne will also have supervisory authority over the mechanical department in regard to organization, shop practice, approval of design, standards and requisitions.

Mr. W. B. Voth, whose appointment as chief engineer of the Empire United Railways with headquarters at Syracuse, N. Y., was noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19, was graduated from the engineering department of the University of Wisconsin in 1897. He engaged in civil engineering work in Milwaukee and later in light and power work in Baraboo, Wis., and in railway construction in Madison, Wis. He also erected and operated a number of small lighting plants elsewhere in that State. Subsequently Mr. Voth became connected with the Sheboygan Railway & Electric Company, Sheboygan, Wis., and while with that company supervised the construction of a new power house and 10 miles of railway extensions and rebuilt the light and power lines, changing the system from 133 to sixty cycles. After completing this work he continued with the company as superintendent of the light and power department and as engineer for the system.

Mr. J. W. Macdonald, who since the formation of the Board of Supervising Engineers, Chicago Traction, has served as inspector of cars under construction and being rehabilitated, has resigned to become assistant to Mr. R. F. Kelker, Jr., supervising expert in charge of the traction bureau of Chicago's department of public service. Mr. Macdonald received his electrical engineering education in the International Correspondence Schools, the Bliss Electrical School, Washington, D. C., and the Brooklyn Polytechnic Institute. His experience includes service with the New York Edison Company, in the meter and testing department, the Union Terminal Company, New York, in the mechanical design department, the Manhattan Elevated Railroad, New York, for which he supervised the work of equipping of the subway cars, and later with the Interborough Rapid Transit's mechanical department. At the commencement of the electrification of the New York Central & Hudson River Railroad terminals in New York he accepted a position with that company, in charge of equipping its new steel cars. He resigned from the New York Central in 1907 to become chief car inspector with the Board of Supervising Engineers, Chicago Traction.

OBITUARY

William H. McClure, purchasing agent of the Louisville (Ky.) Railway, died at his home in that city Sept. 17 after a long illness, dating from a nervous breakdown several years ago. Mr. McClure was sixty-three years of age. He was born in Martinsville, Ind., and twenty-five years ago became secretary to Mr. T. J. Minary, president of the Louisville Railway. A few years later he was made purchasing agent of the company. One daughter, Mrs. Katherine McClure James, and one son, Tarleton McClure, St. Louis, survive.

James Arthur Noble, president of the Ackley Brake & Supply Company, New York, N. Y., was drowned at Yardley, Pa., on Sept. 5. Mr. Noble was twenty-four years old. He was graduated from the University of Chicago, studied at Columbia University and matriculated at Oxford. He became connected with the Ackley Brake & Supply Company as treasurer, and in 1913 was elected president. In November last he was married to Miss Ethel Louise Ackley, only daughter of Mr. G. S. Ackley, formerly president of the company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Florence & Huntsville Interurban Railway, Florence, Ala.**—Incorporated in Alabama to build a 60-mile electric railway from Florence to Huntsville. There will be a branch line from Killen via Arkdale to Lexington, with the ultimate intention of extending to Pulaski, Tenn. Officers: Thurston H. Allen, president; T. W. Pratt, vice-president, and N. F. Thompson, secretary-treasurer. The directors are the same as those of the Allentown Power Company.

***Mountain Central Railroad, Clay City, Ky.**—Application for a charter has been made by this company in Kentucky to build an electric or steam 12½-mile railway from Campton Junction to Campton. Capital stock, $25,000. Incorporators: Floyd Day and J. C. M. Day, Winchester, Ky.; E. B. McGlone, J. Harrison O'Rear, C. M. Clark and Luther Loving.

***Hamlin & Guyandotte Railroad, Charleston, W. Va.**—Chartered in West Virginia to build an interurban railway from a point at or near Hamlin, W. Va., to a point near West Hamilton, Lincoln County, on the Guyandotte River. Capital stock, $50,000. Incorporators: L. R. Sweetland, Hamlin, and J. W. Dingess, Huntington.

FRANCHISES

Clovis, Cal.—The Fresno Interurban Railway has received a franchise from the Council in Clovis.

Fresno, Cal.—J. B. Rogers, representing the Fresno Interurban Railway, has asked the Board of Supervisors for a franchise to build a 1½-mile extension in Fresno from Fresno Avenue to the Normal School. Right-of-way is being secured and a portion of the bonus desired has been subscribed.

Los Angeles, Cal.—The Pacific Electric Railway has received a franchise from the Council to build three spur tracks in Los Angeles.

Los Angeles, Cal.—W. E. Dunn, vice-president of the Los Angeles Railway, has assured the committee of the Malabar Improvement Association that he will accept the franchise from them and build the electric line on North Evergreen Street, from East First to Wabash; thence through the Hills to Eastlake Park in Los Angeles.

Murphysboro, Ill.—The Murphysboro & Southern Illinois Railway has received a franchise from the Council to operate over the local lines in Murphysboro. This is part of a plan to build an electric railway between Murphysboro and Carbondale, a distance of 7 miles. A. B. Minton, Murphysboro, president. [E. R. J., Sept. 21, '14.]

Middlesboro, Ky.—Godfrey Hunter has secured a franchise from the Council to build a 5½-mile electric railway to connect Middlesboro and adjoining towns. [E. R. J., July 11, '14.]

Pittsfield, Mass.—The Berkshire Street Railway has asked the Council for a franchise to relay its tracks from White Terrace to a point south of St. Joseph's church in Pittsfield. Work will be begun at once.

Winchendon Springs, Mass.—The Northern Massachusetts Street Railway has asked the Council for a franchise for an extension to Winchendon Springs.

North Tonawanda, N. Y.—The International Railway has received a franchise from the Councils in Tonawanda and North Tonawanda.

Albany, N. Y.—The United Traction Company has received a franchise from the Council for a line from North Pearl Street in Sheridan Avenue to the site of the proposed new transformer station at Sheridan Avenue and Chapel Street in Albany.

Islip, N. Y.—The Public Service Commission has authorized the Suffolk Traction Company to exercise franchises to build four electric lines in Islip, Sayville and West Sayville.

Berlin, Ont.—The special committee of the City Council and the Light Commission has decided on what the city will request of the Galt, Preston & Hespeler Electric Railway before the new franchise for running rights over Berlin streets is granted. The present franchise expires in October. After that the city will grant a five-year franchise at $75 monthly for a half-hourly service during the afternoon for two years, and after that time half-hourly service all day. The city also wants running rights over the company's tracks in the east end for the local railway.

Toronto, Ont.—The Toronto Railway has asked the Council for a franchise for a line on Bloor Street west from Dundas Street to Pacific Avenue in Toronto.

***Corpus Christi, Tex.**—J. H. Caswell, Corpus Christi, has received a thirty-year franchise from the Council to build a 7-mile electric railway from Corpus Christi to Ward Island.

Olympia, Wash.—The Washington Public Service Commission will hold an important session in Seattle beginning with Sept. 30, to take up various matters as follows: Twenty-first Avenue service; arrangements of transfer exchanges between the Seattle Municipal lines, the Seattle, Renton & Southern Railway and the Puget Sound Traction, Light & Power Company.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company has asked the City Council for the right to discontinue operating on Stewart Street, from Sixth Avenue to Eighth Avenue; on Eighth, from Stewart to Lenora, and on Seventh, from Olive to Stewart Street. The company does not operate a regular schedule on the above mentioned streets. Contracts for improving the streets with paving have been let by the city, and it is the company's desire to remove its rails. When an electric railway right-of-way is paved it is necessary for the company, under the terms of its franchise, to pay for the work.

Wenatchee, Wash.—Hyman Harris, who recently received a franchise for the construction of an electric railway in Chelan County, between Leavenworth and Malaga, has been granted an extension of one year's time before beginning operations, it having been explained to the County Commissioners that financial conditions were temporarily blocking the plans for carrying out the terms of the franchise. Authorities in touch with the project assert active operations will most likely start in the early spring. [E. R. J., March 14, '14.]

Madison, Wis.—The Chicago & Wisconsin Valley Railroad has asked for a certificate of necessity to build a line from Madison to Prairie du Sac.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—Surveys have been made and all grade has been built and fenced culverts, etc., laid and plans are being made to lay ties soon on this 37-mile line to connect Lacombe, Bentley and Rimbey in the near future. The Middle West Construction Company, Lacombe, has the contract for the construction of the line. J. C. Gibson, 56 King Street, West, Toronto, president. [E. R. J., July 25, '14.]

Southwestern Traction Company, Lacombe, Alta.—Within the next sixty days work will be begun by this company on the 1-mile extension to Bentley Hill.

Salt River Valley Electric Railway, Phoenix, Ariz.—All matters in temporary dispute between the city manager and this company have been satisfactorily adjusted and active work is being pushed on the construction of the line east on Monroe Street in Phoenix. The first line will be built from Phoenix to Scottsdale and probably extended south across the Salt River to Tempe, Mesa and Chandler. It is the purpose of the company to build its own bridge across the Salt River. C. C. Lewis, Phoenix, president. [E. R. J., May 16, '14.]

British Columbia Electric Railway, Vancouver, B. C.—An agreement has been made between the Canadian Pacific Railway and the British Columbia Electric Railway whereby the latter company will construct an electric line on South Cambie Street as far south as King Edward Avenue and from there to Main Street and Oak Street to connect with existing lines. Work will begin early next spring, it is reported by officials of the company. British Columbia ratepayers of Ward 11 are agitating for the extension of the electric line on Bodwell Road from Fraser Avenue to Victoria Road. A petition has been signed asking the British Electric Railway to build this proposed line at once.

San Francisco, Cal.—Detailed surveys and drawings of the proposed municipal electric railway through Golden Gate Park in San Francisco have just been completed by City Engineer O'Shaughnessy. Owing to obstructions it will be impossible to extend the railway in a straight line and to make it conform to the general surroundings. The plan is to begin at Tenth Avenue on the northern side of the park and come out at Fourteenth Avenue on the southern side. Tenth Avenue is the present terminus of a branch of the Geary Street road and the proposed extension it is believed will add to the municipal line.

Pacific Electric Railway, Los Angeles, Cal.—Work will be begun at once by this company on its lines from Corona to Riverside. Construction will be begun at Riverside on the new Magnolia Avenue line to connect with the present line at the head of Magnolia Avenue. There remains 8 miles of track to be built from a point south of Arlington to Corona. It is estimated that this new line will be in operation by the end of November.

Connecticut Company, New Haven, Conn—This company is asked to consider plans to build an electric line through East Street from State Street to Water Street in New Haven.

Washington Railway & Electric Railway, Washington, D. C.—The Public Utilities Commission has formally ordered this company to extend its Anacostia line from the present terminus, at Nichols Avenue and Fourth Street, in Anacostia, to Upsal Street, a distance of less than a mile. The commission directs that the work be completed before June 30 next. Although the company opposed the improvement, it favors the plan now being considered by the commission for an extension of its lines to the new bureau of engraving and printing building. If this project is ordered the commission may authorize the company to issue bonds to the extent of $200,000, in order to meet the cost of both extensions.

Evansville, Chrisney & Eastern Railway, Evansville, Ind.—Surveys have been completed, part of the grading has been done, right-of-way secured and plans are being made to begin grading the remainder of the line within the next sixty days on this 24-mile electric line to connect Boonville, Lynnville, Chrisney, Bloomfield and other smaller towns. Capital stock, authorized, $50,000. Bonds, authorized, $400,000. The company will be ready within two weeks for bids on as many bonds as will be necessary to complete the line. The estimated cost is $300,000. J. P. Chrisney, Chrisney, president. [E. R. J., Sept. 12, '14.]

Terre Haute, Indianapolis & Eastern Company, Indianapolis, Ind.—Plans are being considered by this company to build its South Eighth Street line in Indianapolis during the fall.

Waterloo, Cedar Falls & Northern Railroad, Waterloo, Ia.—The 60-mile line between Waterloo and Cedar Rapids has been placed in operation by this company.

Erlanger, Ky.—Plans are being considered by the citizens of Erlanger to build an electric railway in Erlanger.

***Paducah, Ky.**—A company is being formed in Paducah to build an electric railway from Paducah to Henderson to connect with the lines of the Evansville, Henderson & Owensboro Railway. No names are yet given of those interested in the project.

North Louisiana Electric Railway, Shreveport, La.—Contracts have been awarded by this company to build a 97-mile interurban electric railway to connect Shreveport and Monroe via Haughton, Doyline, Sibley, Dubberly, Gibsland, Arcadia, Sinsboro, Ruston, Choudrant and West Monroe. A. B. Blevins, Shreveport, president. [E. R. J., July 18, '14.]

Bay State Street Railway, Boston, Mass.—Plans are being made by this company to double-track Main Street in the Bradford district for such a distance as will relieve all congestion on this end of the division.

Salisbury (Md.) Interurban Railway.—Preliminary arrangements are being made by this company to build its 40-mile electric railway from Nanticoke Point to Willards via

Bivalve, Tyaskin, Heron and Salisbury. W. H. Bedsworth is interested. [E. R. J., Aug. 29, '14.]

Mississippi Electric Railway, Columbus, Miss.—The citizens of West Point have consented to raise a bonus to secure the construction of this proposed electric railway through West Point. This line will connect Memphis, Tenn., and Columbus, Miss., and eventually extend through Pickens County, Ala., with Aliceville as the terminus. F. W. Crisby, Columbus, Miss., is interested. [E. R. J., Aug. 22, '14.]

***Fulton, Mo.**—Plans are being considered to build an electric railway between Keokuk, Ia., and Jefferson City, Mo., via Wayland, Williamtown, Labell, Newark, Bethel, Shelbyville, Shelbina, Paris, Mexico and Fulton. H. W. Knight, Chicago, is interested.

Middletown, Reading & Cincinnati Interurban Railway, Middletown, Ohio.—This company, which plans to build a 30-mile electric line between Middletown and Cincinnati, is having surveys made to have this line extend to Germantown and Dayton. Owing to unsettled financial conditions, it is not known when actual work on the railway will begin. Michael Klaiber, Jr., Reading, is interested. [E. R. J., Oct. 11, '13.]

***Dewey, Okla.**—Plans are being considered to build an electric railway from Dewey to extend northeast from Dewey to intersect with the network of electric lines in Kansas. Another line contemplated will extend along the high ridge from Dewey to Nowata. No names are yet given of those interested in the project.

Port William (Ont.) Electric Railway.—The contract has been awarded by the City Council of Fort William in connection with its electric railway extension to John Millen & Sons, Toronto, for the supply of poles, fittings and cast-iron ornamental lamp standards.

Peterborough (Ont.) Radial Railway.—Plans are being considered by this company to build an entirely new roadbed on Charlotte Street in Peterborough this fall.

Lehigh Valley Traction Company, Allentown, Pa.—Work has been begun by this company on Union Street to lay the track to connect the Sixth Street line with the line on Eighth Street, in Allentown.

***East Berlin, Pa.**—Plans are being considered to build an electric railway from East Berlin to New Oxford, to follow the line of Beaver Creek from East Berlin to Abbottstown, thence to New Oxford in a direct line. It is pointed out that very little grading will be required along the route of the proposed line. No names are yet given of those interested in the project.

Lewisburg, Milton & Watsontown Passenger Railway, Milton, Pa.—This company will extend its tracks at Watsontown from the present terminus at Ninth Street to the borough line.

Chattanooga Railway & Light Company, Chattanooga, Tenn.—The Vance Avenue line of this railway, work on which was begun early in the spring, is nearing completion. The track has been laid within a short distance of Lyerly Street, the terminus of the line in Chattanooga.

Castroville, Tex.—Citizens of Castroville have subscribed more than $20,000 as a bonus for an interurban railway through Castroville to the Medina dam. This is part of a plan to build an electric railway to connect Castroville, San Antonio and Medina Lake. John G. Fitzsimon, Castroville, is interested. [E. R. J., Sept. 2, '14.]

Dallas (Tex.) Consolidated Electric Railway.—Work has been begun by this company double tracking its line in Dallas.

Gulf, Freeport & Northern Railway, Freeport, Tex.—Surveys have been completed by this company into Rosenberg. This line will connect Freeport, Sealy, Brazoria and West Columbia. C. L. Sharp, Marshall, is interested. [E. R. J., Oct. 11, '13.]

San Antonio, San Jose & Medina Interurban Railway, San Antonio, Tex.—This company has 5 miles of its proposed line now in operation from San Antonio to San Jose, Tex. The remainder of the route is via Kirk, La Coste and Castroville to Medina Lake, a total distance of 42 miles from San Antonio. There will be two steel bridges, one of 100 feet over the Medina River near Kirk, and the other over Leon Creek. It is not yet announced when bids will be received for construction and equipment. The route is mostly level, but about 6 miles of it nearest the lake is through rough country. Connections with other lines are to be made as follows: International & Great Northern Railroad at Kirk; San Antonio, Uvalde & Gulf Railway at San Jose; Southern Pacific Railway at La Coste. J. G. Miller, 400 Swearingen Building, San Antonio, Tex., general manager. [E. R. J., July 18, '14.]

San Antonio (Tex.) Traction Company.—Work has been begun by this company laying new track on Commerce Street and Alamo Street in San Antonio.

***St. George, Utah.**—Surveys are reported to have been begun for an electric railway from Lund to St. George. A. B. Christensen, Salt Lake City, is interested.

***West Virginia Electrical Company, Parkersburg, W. Va.**—This company will soon apply for a charter to build an electric railway from Weston to the terminus of the Little Kanawha Railway. The plans are to use the tracks of the Little Kanawha Railway into Parkersburg. Plans are also being considered for the purpose of making agreement with the Charleston, Parkersburg & Northern Railway by which the West Virginia Electrical Company would use the lines of that company coming around Fort Boreman and into Parkersburg over the Juliana Street bridge. Some further developments in the plans are expected in a few days. No names are yet given of those interested in the project.

SHOPS AND BUILDINGS

Illinois Traction System, Peoria, Ill.—The steel skeleton of the new station and office building of this company is being erected at the corner of Jefferson Avenue and Hamilton Boulevard in Peoria. The foundation was completed some time ago and the contractors have been waiting for the delivery of the steel. The structure will now be pushed forward to completion as rapidly as possible. The building will be seven stories in height and will cost $300,000.

Centerville Light & Traction Company, Centerville, Ia.—A few changes and improvements are being made in this company's offices in Centerville.

New York, N. Y.—The Public Service Commission has authorized the advertising for bids for the diagonal station, at Park Avenue and Forty-second Street, in New York, to connect the existing subway with the new Lexington Avenue line. The bids will be opened Oct. 6. Besides the connection with the Lexington Avenue subway there will also be a connection with the Steinway Tunnel. Most of the excavation will be in solid rock and the work will have to be done without interrupting the service in the existing subway.

POWER HOUSES AND SUBSTATIONS

Water, Light & Transit Company, Carrollton, Mo.—During the next few weeks this company plans to purchase one 300-hp water tube boiler for its power house in Carrollton.

Metropolitan Street Railway, Kansas City, Mo.—This company is arranging foundations and other accessories, condensers, etc., at the Second and Grand Street Station in Kansas City for the 12,000-kw turbine which is to be installed next month.

Hershey (Pa.) Transit Company.—This company's power house near Lebanon is rapidly nearing completion and the company will soon install the new generators and necessary machinery to operate the line between Lebanon and Hummelstown. The power plant is built of cut stone and is along the Hershey right-of-way about 3 miles southwest of Lebanon.

Norfolk & Western Railway, Bluestone, W. Va.—Construction is well advanced upon this company's power plant at Bluestone, W. Va., which will furnish current for the electric operation of 30 miles of railroad between Bluefield and Vivian, and it is expected that the entire section will be ready for use by January. Work on the building proper is about 95 per cent completed, and considerable of the mechanical and electrical equipment has been received and partly erected. Gibbs & Hill, Pennsylvania Station, New York, are the engineers in charge.

Manufactures and Supplies

ROLLING STOCK

Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., has assured the City Council that ten new cars will be added each year to those now in service until all old type cars are replaced.

TRADE NOTES

Indianapolis Switch & Frog Company, Springfield, Ohio, has appointed A. H. Hoffman, president of the Wimo Supply Company, as its Northwestern representative with office at 304 Oriental Building, Seattle, Wash.

Graphite Lubricating Company, Bound Brook, N. J., announces the following reappointments of officers caused by the recent death of Charles H. Libbey, president of the company: William W. Smalley, president and treasurer; Leigh S. Bache, first vice-president and general manager; Spencer Weart, second vice-president and secretary; George O. Smalley, assistant treasurer and assistant manager.

U. S. Metal & Manufacturing Company, New York, N. Y., has been appointed resident purchasing agent in America for the Underground Electric Railways, Ltd., London, Eng., and its allied lines, the London General Omnibus Company, Ltd., Metropolitan District Railway, London Electric Railway, Central London Railway, and City & South London Railway. Conditions abroad, involving the shutting down of Continental foundries in the war zone have necessitated obtaining various iron and steel electrical and mechanical materials in this country.

Gun-crete Company, Chicago, Ill., the announcement of whose organization appeared in the ELECTRIC RAILWAY JOURNAL on May 23, 1914, has purchased all the rights, titles, contracts and interests of the Cement-Gun Construction Company, and has also taken over the construction department of the General Cement-Gun Company. In future the combined business will be conducted under the firm name of Cement-Gun Construction Company, with offices at 914 South Michigan Avenue. The officers of the company are: President, Carl Webber; secretary and treasurer, John D. Schaefer; construction manager, C. L. Dewey. In addition to doing all forms of cement-gun construction work, this company will also sell and lease complete cement-gun equipments.

Niles-Bement-Pond Company, New York, N. Y., has recently completed at the Brooklyn Navy Yard the installation of the largest boring mill ever built in this country. This mill was made at the Niles works, Hamilton, Ohio. It swings 36 ft. in diameter and has 12 ft. under tools. The great swing of this machine is required for finishing the tracks of the immense turrets carrying the 14 and 16-in. guns of the new battleships. The mill will also be used for boring cylinders and machining casings of the giant steam turbines for our war vessels. The significant feature about the size of this mill is that it is not of the so-called "extension" type, but it is a regular cross-rail machine with an actual swing of 36 ft. 2 in. with the housings in a fixed position. An idea of the size and massiveness can be gained from the fact that the total net weight, including motors, is 665,000 lb., or more than 330 tons. The table is designed to carry a weight of more than 200,000 lb. The extreme size of the table, 34 ft. diameter, made it necessary to be cast in three parts. The three sections of table weighed 225,000 lb.

Prepayment Car Sales Company, New York, N. Y., announces that since July 1 it has booked the following orders for material for new cars or old ones to be changed or converted for prepayment service: Auburn & Syracuse Electric Railroad, twelve cars; Boston (Mass.) Elevated Railway, forty-three cars; Buffalo & Williamsville Electric Railroad, two cars; City Railway, Dayton, Ohio, one car; Cleveland (Ohio) Railway, 100 cars; Cumberland Electric Railway, ten cars; Dayton, Springfield & Xenia Southern Railway, three cars; Easton (Pa.) Transit Company, nine cars; Fort Smith Light & Traction Company, three cars; Harrisburg (Pa.) Railways, fifteen cars; Holyoke Street Railway, one car; Hutchinson (Kans.) Interurban Railway, one car; New Orleans (La.) Railway & Light Company, fifty cars; Northern Ohio Traction & Light Company, eight cars; Parkersburg, Marietta & Interurban Railway, two cars; San Antonio (Tex.) Traction Company, eleven cars; Second Avenue Railroad, ten cars; Sheboygan Railway & Electric Company, two cars; Springfield (Mass.) Street Railway, ten cars; Springfield (Ohio) Railway, ten cars; Third Avenue Railway, twenty-five cars; Toledo Railways & Light Company, ten cars; Trenton & Mercer County Traction Corporation, thirty-cars; Worcester (Mass.) Consolidated Street Railway, ten cars.

ADVERTISING LITERATURE

National Tube Company, Pittsburgh, Pa., has issued an advertising blotter in regard to its "National" pipe.

Vulcanite Portland Cement Company, Philadelphia, Pa., has issued a reprint of a paper from the 1914 Proceedings of the American Society for Testing Materials, entitled "Proportioning Aggregates for Portland Cement Concrete," by Albert Moyer.

Union Electric Company, Pittsburgh, Pa., has issued a folder describing its sand drying stove for trolley lines. The main body of the drier is surrounded by upright cast-iron grating to prevent the wet sand from coming into immediate contact with the hot furnace. As soon as the sand is dry it runs through this grating into the hot-air space and then out through the perforated ring on which the skirting rests. This permits the wet sand to dry much more rapidly than when it comes into immediate contact with the hot stove.

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder describing its totalizing register for street railway service. This register prints the hour and the minute each half trip is begun, date, register number, division or line number, direction and the number of fares registered in each class. No deduction between imprints are necessary. The total amount of cash collected is also printed on the sheet so that no multiplications are needed to arrive at the total. At the completion of each conductor's run all printing counters are turned back to zero with the exception of the total passenger counter. This provides a check between records of successive conductors and between the closing figures of one day and the opening figures of the next.

American Lock Nut Company, Chicago, Ill., has issued a catalog describing its absolute lock-nuts for electric railway crossings, frogs, switches, insulated joints, signal devices, interlocking systems, rails, cars, shop machinery and motors. A recess is cut into the thread surface of the nut, through its width. The floor of this recess is slightly sloped. A spool-like locking pin is inserted automatically in the recess and this pin rolls with the bolt. When the nut is being applied the pin rests in the deeper part of the recess and rolls with the bolt. It immediately wedges itself, however, between the sloping floor of the recess and the threaded faces of the bolt, resisting any backward motion. The greater the force tending to back the nut off the bolt the tighter it locks. The pin cannot injure the threads since the pressure is against their flat surfaces. The catalog contains illustrations showing nuts covered with rust accumulation after two years' service on an electric car, which were easily removed. On cars these nuts are especially suited for motor brackets, split gears, brake beams and trucks.

Protective Signal Manufacturing Company, Denver, Col., has issued through William K. Garton, general sales manager and associate engineer, 299 Broadway, New York, a catalog containing illustrations and detailed description of its protective signal system and signal devices for electric and steam railroads. In this signal system an oscillator acts on the button principle in opening or closing an electric circuit. The movement of the passing train or car imparts a vibration to the rail, and when the train moves over the point where the oscillator is placed starts the vibrating bob of the oscillator moving up and down and breaks the contact between the contact bob and upper contact spring, opening the line circuit to the relay, which in turn closes the local or signal circuit and operates the signal. This signal system has been used successfully for highway crossing signals, annunciators, time relays, interlocking relays, tower and station calls, car counters, tunnel signals and light signals. The catalog contains illustrations showing instalments of this system of crossing protection on the Petaluma & Santa Rosa Railway and on a number of steam lines.

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DEATH OF CAPTAIN McCULLOCH

In the death of Captain McCulloch the electric railway industry loses one of its most prominent figures, and the event will be felt as a personal bereavement by many, especially by those who have long been engaged in the industry. Captain McCulloch's career was unique and is convincing testimony of his great ability and strong personality. It is rare in these days for any railway manager to be connected with the same railway property for a period of two decades. But in the case of Captain McCulloch and the St. Louis railway system, the connection extended for practically twice that length of time with the exception of a short period during 1901 and 1904 when he was general manager of the Chicago City Railway. He knew and loved the city where his life's work was laid, and St. Louis knew, loved and trusted him—an ideal condition. If this was the general case there would be no such problem of public relations before the electric railways of this country. But Captain McCulloch's activities and sympathies were not confined to any one city. No one felt a keener concern for the progress of the art or was more generous of his time and energy in helping brother managers when they came to him for advice, or was more loyal to the call of duty. Powerful in physique and intellectual power, yet possessing in a marked degree the characteristic Southern qualities of courtesy, chivalry and devotion to ideals, Captain McCulloch has left a memory which will long remain in the hearts of those who enjoyed the privilege of acquaintanceship and friendship with him.

WAR'S EFFECT ON FIRE INSURANCE

Another instance of the far-reaching effect of the European war upon every phase of our every-day life has recently been called to our attention. Fire insurance companies are endeavoring to impress upon the public the importance of special care in the matter of fire prevention at this particular time. They advise that normal losses have been heavy during the present year, and if a serious conflagration should occur now, it, in combination with the existing financial and banking conditions, would produce a most serious result. It would be necessary for the insurance companies to sell large amounts of their securities to pay a loss of great magnitude, and with the stock exchanges closed this would be practically impossible no matter how great sacrifices they might be willing to make in order to meet their obligations promptly. Such a sacrifice, with its destruction of values and its disturbance of financial conditions, would be very serious indeed. As a result of circulars and other information which is being sent out by the various fire insurance companies throughout the country many large industrial and mercantile companies have taken rigid measures to prevent fire. Most electric roads have already reduced their fire hazards by the installation of various types of fire-protective systems. Carhouses and shops, however, are looked upon as being more or less of a special hazard. Bulletins issued by the managers of railway companies at this time, calling attention to the urgent need of fire prevention which not only means loss of property but loss of income to the company and the employees as well, should be productive of good results in the reduction of fire hazard.

PROVOKING DISCUSSION AT ATLANTIC CITY

We do not wish to be accused of reiterating the obvious, but we shall run the risk of doing so by making the following remarks in regard to the advance copies of the Atlantic City papers and committee reports which have recently come to hand. Only those who have been actively engaged in getting out such preprints can realize the amount of steady effort which has been required on the part of Secretary Burritt and his associates during the past few weeks. We have already called attention to the benefit to be obtained by advance study of these pamphlets. A concrete suggestion which, if acted on, would insure lively discussion is that each man come to the convention armed with some practical question suggested by each report in which he is interested and which is not answered in the report or in previous reports on the same subject. The old adage that "any fool can ask questions" is a fallacy if any but "fool questions" were meant. A well-placed question is one of the best contributions that can be made to any discussion. It involves an all-around knowledge of the subject. If we had to choose between a good question or a good definite contribution of data we should take the question. To paraphrase a well-known proverb—"Take care of the questions, and the answers will take care of themselves." We hazard the guess that fifty men can be found to answer a question to five who will ask one. There is a natural and just prejudice against "cut-and-dried" discussion, all nicely fixed up in advance and necessarily prepared in ignorance of the spirit of the meeting and possibly, therefore, out of harmony with the trend of the discussion. No such prejudice can exist in regard to the question scheme suggested above.

THE PROPOSED INCREASE IN A. E. R. A. DUES

There will go before the American Electric Railway Association at the Atlantic City meeting a plan for increasing the dues of the company members. This was considered at the midwinter meeting and has been placed before the members recently in a circular letter. The tremendous expansion of the association's work has made the increase necessary. The decision to lay this matter before the association was reached before the present critical financial depression so that a question will naturally arise as to the wisdom of bringing it to vote until after the effects of the war have begun to wear off. If the amount of money concerned in the increase were large in proportion to the interests involved, this question would deserve consideration. The reverse, however, is the case. A light snowfall, a rainy day for the baseball game, a slight car collision, a minor accident to a passenger, or some such trivial incident will cut down the income more than the increase in dues and will be charged to profit and loss, to providence, or human frailty. It is evident then that a decision as to the increase in dues must be reached on a qualitative rather than a quantitative basis.

Qualitatively the following points must be considered. When the present scale of dues was adopted it was necessarily tentative. No one man or body of men could estimate accurately what it would cost to run the association ten years later. No one could anticipate that an office staff of sixteen members would be required; that the association would be publishing a monthly magazine, maintaining a fare research bureau, keeping a representative at Washington, etc., beside financing committee work involving the co-operation of more than 400 members. It might be argued that the income can be increased by getting in more members. The fact is, however, that most of the important companies are now in the membership, and while the others should be induced to join at once they will not greatly augment the income. The individual membership can and should be increased also, but again, with the nominal fee required of individuals, no great income can be expected from this source. If a further argument is advanced to the effect that retrenchment is in order it can be answered with equal ease. The industry and the economic problems confronting it have forced certain work on the association. This work must be done. Failure to supply the necessary means would be like sending an army into the field and then refusing it the necessary support.

The association is doing a great work and it is a vital part of the electric railway industry, a necessary adjunct to the individual railway. Its facilities are utilized to an increasing extent, particularly by the small company. The increase is urged to care for existing activities not to permit a branching out into new fields. The executive committee of the association has the confidence of the industry. It spends none of the money entrusted to its care without most careful consideration. If it says more money is required there is but one thing to do.

TIMBER PRESERVATION AND THE EUROPEAN WAR

The necessity of taking immediate steps to conserve the supply of timber preservatives in this country, as well as to seek other sources of supply, is impressing the American users of timber more and more as the European war continues. At first the interruption of 50 to 70 per cent of our supply of creosote was looked upon as temporary, but now a month and a half has passed with new evidence each day that the countries at war have engaged in what will probably be a prolonged conflict. While many American enterprises were retarded by the early depressing effect of the war, they now have begun to adjust themselves to existing conditions. Though the amount of new railway construction undertaken in this country affects to some extent the quantity of treated timber used, that employed by both steam and electric railroads here is largely for renewals. For this reason, there must continue to be a large demand each year for treated timber if the roads expect to continue economical operation. This means that it will be necessary for them to use either untreated timber, a substitute preservative, or reduce the quantity of creosote now required in practically every creosote treatment specification.

Of course the substitution of the zinc chloride treatment for the creosote is possible on electric roads, but it is not advisable. Past experience has shown that the combination of moisture, zinc-treated timber and the electric current results in the rapid electrolytic corrosion of the spikes and the rail base, and this has favored the use of creosote or some other substitute for zinc chloride in electric railway work. Treatment by the empty cell as against the full cell process seems to offer an immediate means of conserving the supply of creosote. Experience has demonstrated that the maximum life has been obtained by both processes, hence the empty-cell treatment furnishes a means of reducing the quantity of this preservative used from 25 to 50 per cent.

Another means of conserving the amount of creosote used is by its adulteration with a refined coal tar. This tends to reduce the evaporation of creosote from the timber so treated without detrimental effect. Since the creosote originally is a distillate of coal tar, the claim seems reasonable that the coal tar is a weak preservative containing toxic properties. While the ideal of the wood preservation engineer has been to have a stick of timber thoroughly saturated with a grade 1 creosote, a continued interruption in the supply will force the industry to accept something other than the ideal.

Experience also has shown that it is unnecessary to use as much creosote as is at present considered good practice to produce a condition in which decay is prevented. The difficulty in the past, however, has been to maintain this condition in the timber throughout its mechanical life. If one can believe the arguments presented by experts, it appears that the use of refined tar prevents evaporation, hence the conclusion may be drawn that a smaller quantity of creosote may be used and at the same time accomplish the desired result.

REVIVAL OF THE FLAGGING RULE

Elsewhere in this issue is a communication from F. A. Boutelle in support of the erstwhile rule permitting trains to proceed "protected by flag." As Mr. Boutelle, himself, was a member of the 1911 committee which abolished the old rule on the ground that it "was not good practice" it begins to be apparent that the whole question is in very much of a tangle. That this should be unravelled at the earliest possible moment is hardly open to argument. Certainly, it is no logical condition that results in a number of member companies including in their codes a rule which has received the stamp of disapproval of the association.

Manifestly, the elimination of the flagging rule has worked a hardship upon operation. However, that this hardship was more than counterbalanced by a greater degree of safety was evidently the opinion of the committee on rules in 1911, although it is true, as John Leisenring pointed out in our issue of Sept. 12, that conditions have changed since that time through the more general use of signals. Whether or not these changed conditions warrant the revival of the flagging rule seems, in effect, to be the point upon which opinion splits. Mr. Boutelle is in favor of it, and he is supported by Mr. Leisenring. On the other side of the question we have published the directly contrary views of three members of the 1913 committee on rules. We, ourselves, are strongly against the revival of any such necessarily indefinite rule, which depends for its degree of observance upon the discretion of the trainmen, and which is certain to be as carelessly followed as the present rear-end-protection rule. As we have said before, a general permission to proceed past a stop signal is dangerous, and it is unnecessary, as well, when safety can be assured by the comparatively small loss of time involved by holding the car until one of the crew goes forward with torpedoes to the next signal, siding or telephone, and returns.

There may, however, be other methods of proceedure preferable to this, and perhaps the most satisfactory solution of the whole problem would be the preparation by the association of a new rule which would eliminate the obviously weak features of the old one without opening the way for an exaggerated interpretation of the present code, or rather of the present absence of specific instructions. It is, of course, futile to expect a train to wait indefinitely at a deranged signal, thereby holding up traffic over the entire road. On the other hand, it is infinitely more undesirable for roads to have, within their codes of rules, a printed permission for trainmen to do something which has been condemned by a body of highest authority.

If, as is indicated by Mr. Boutelle's communication, the complete elimination of all provision for the irregular movement of trains under extraordinary circumstances was not intended by the 1911 committee, by all means let some suitable procedure for trainmen, who may be unable to reach the dispatcher, be incorporated in the standard code. Should this be considered the best way out of the present *impasse* the association can hardly take up any more urgent work, for by it those interurban roads which have adopted the flagging rule—despite its condemnation—may be relieved from their present anomalous position. If the matter cannot be considered at the coming convention, the drafting of a compromise rule might well be assigned to next year's committee on rules.

A NEW SCHEME FOR ACCELERATING TRAFFIC

It is by no means uncommon to hear statements made in all seriousness that installations of block signals on single tracks result in speeding-up the service. Details as to how and where this beautiful dream is made a reality are invariably lacking—probably with good reason—because, under the operating methods now customary, it is difficult, to the point of impossibility, to see wherein the ability of the block signal is utilized to accelerate high-speed traffic. As a matter of fact, in most cases the signal seems to have less of an accelerating than a retarding effect. Indeed, it has been so surrounded by and subordinated to the old standard scheme of operation and the use of train orders that the statement that block signals comprise merely a safeguard superimposed upon the structure of operating rules is quite in line with actual conditions.

Such conservative operation may be necessary. But, on the other hand, no actual evidence to this effect has ever been produced, and, until very recently, there has been no one yet prepared to let the high-speed signal, with all its refinements, really show what it could do. For some time past, however, the Scranton & Binghamton Railroad has been doing just this. This line is using its block-signal system, not merely as a safeguard, but as a traffic accelerator as well, and a description of the methods introduced to attain this end will be found elsewhere in this issue.

Briefly stated, these methods are simple. They are based upon the acceptance of signal indications at their face value. When a train finds a proceed signal it proceeds, practically regardless of time-card meets and absolutely independent of train orders, for none of these are issued except in the most extraordinary emergencies. When a stop signal is encountered the train waits, because another train in the opposite direction will soon arrive. This, in a nutshell, covers the scheme of operation, which permits the running of multiple-unit trains, sometimes with sections, on a fifteen-minute headway in both directions. This rapidity of movement, according to the railway management, would be impossible if time was taken for the delivery and receipt of train orders.

Naturally, consideration of this radical innovation brings up, at once, the influence of a delayed train on the schedule as a whole, and under comparison with the train-order system the advantage seems to lie altogether with the new plan. On the line in question each block averages about 1 mile in length and requires somewhat less than three minutes for a train to run through it. Hence a train that is just too late to hold the block will have the meeting point advanced against it and will be delayed some three minutes in addition to its original delay. On the other hand, if the delayed train is six minutes late it will arrive at the advanced meeting point just in time to meet the opposing train and hence will lose no further time. In neither case is there any delay to the train that is on time. Under the train-order or time-card systems of operation not only would there be delay to the train that was on time, but, unless the lost time was made up at once, or a new set of meet orders issued, every other train on the road would eventually suffer the same delay. For a train that is considerably delayed the matter of further loss of time depends simply upon whether the actual delay is just over or just under a multiple of the time required to run through a block, in this case about three minutes. Under no ordinary circumstances can the added delay be greater than three minutes, and under none can there be more delay than this for opposing trains.

Certainly such a time-saver as this innovation ought to be considered very seriously. While it has been forced, by a dense traffic, upon the Scranton & Binghamton Railroad its benefits seem to be equally available for interurban roads in general, although, of necessity, its ability to save time is limited in the case of extremely long blocks. Of course, there may be objections to it that are not now readily apparent. On the other hand, the fact that it is actually in successful operation as a logical advance step in the use of block signals is a strong point in its favor. Indeed, since signals are already in place on many railways a very natural question arises as to whether or not these are really being utilized to their full value under the customary operating methods. We would welcome a general discussion upon this point.

TRUSS RODS FOR STEEL CARS—A PARADOX

A supporting device which assists a wooden structure to carry its load but which has the contrary effect on a structure that is made of steel may seem to be an impossibility. If so, the truss rod constitutes an interesting paradox. When it is installed on an all-steel car that is, presumably, constructed in accordance with the well-established principles of the truss-side or, at least, the side-girder type of construction, its effect may actually be harmful, although the reverse is true in the case of wooden cars. The apparent paradox is, of course, due to the different principles of design that apply to the two materials, and, when these are analyzed there is furnished an obvious reason why the truss rod has no place whatsoever in steel car construction.

Inherently, the truss rod can only support a load through the establishment of a tensile stress in the rod. This stress is from six to eight times as great as the lifting effect because of the limited depth of the queen post in comparison to the distance between the post and the truss-rod anchor, and the consequent flatness of the angle at which the pull of the rod is transformed to vertical thrust at the queen post. Therefore the presence of only a small load upon the posts requires a large tensile stress in the rod, and this, in turn, must be offset by an equivalent compressive stress in the side girder to which the truss rod is anchored. This force divides between the top and bottom members of the girder, of which one is under additional compression on account of the bending moment that exists except at the instant of reversal. The two forces, when added, combine to form the total force producing stress in the member. In consequence, as the truss rod is tightened up the net result may be, under easily conceivable circumstances, that the maximum stress is greater than it would be if the truss rod was not applied.

Historically the truss rod is a makeshift in car construction. It was introduced in the days when the sills of all-wood steam-railroad cars became too long between truck centers to carry their own weight. An increase in the depth of the sill to provide the necessary stiffness was prevented by the practically fixed distance between the wheels and the car floor, and, as we have remarked before, the then prevalent idea of car design was to build a house on a flat car. The truss rod furnished an equivalent of the desired additional depth of sill by changing the underframe members from beams to the compression members of trusses. In consequence, the truss rod came into general use, although to be effective, as above mentioned, it had to impose a normal compressive force in the sill several times as great as its supporting effort. With wooden cars, however, this compression was easily absorbed owing to the large cross-section of the sills.

When steel was not available the idea was excellent. The turn-buckles with which the truss rods were equipped furnished a flexibility eminently suited to the rough-and-ready methods of wooden car construction. By setting up the turn-buckles the sills could be straightened up when they sagged from age or use, and some master car builders even advocated a strong camber or upward bulge at the center of the car when it left the shop. The advantages of a tension member of metal that could be located to give the equivalent of a beam of very considerable depth were obvious, and the truss rod was used so often that it probably became identified as an essential part in the appearance of the car.

Perhaps this feature may seem to some a point in favor of truss rods on steel cars. Unfortunately, the "looks" of a thing play a large part in design—witness the general use in an open car of glass deck-lights, which are even less useful than the proverbial fifth wheel on a wagon. Certainly there seems to be no better reason for advisedly installing truss rods underneath the side of a newly-built steel car, which, in itself, constitutes a steel beam or truss of such great depth that but a small part of its inherent vertical strength can be utilized. On the other hand, the turnbuckles on the truss rods impose an actual element of danger, as a car repairer, by setting them up strongly with the mistaken idea that a camber can be put into an all-steel car side, may develop abnormal strains sufficient to buckle plates or start rivets.

In the light of this possibility it is difficult to see wherein the use of truss rods is warranted even in the case where additions to the estimated load on an all-steel car have been made after it has been completed. When such a contingency arises, and when the additional load amounts to more than the 15 per cent or 20 per cent of the total car-body weight which can properly be taken care of by the factor of safety, the logical course would seem to be to rivet additional metal to the outer members of the girder. Such a procedure would be directly productive of results and would not involve, as might the truss rod, the paradox of adding metal that weakens the structure instead of strengthening it.

BRITISH TRAMWAYS AND SUPPLY HOUSES IN WAR TIME

Not a little curiosity has been expressed among American electric railway operators and manufacturers as to the effect of the present European conflict upon British and Continental tramways and supply houses. As yet, however, owing to the activities of the censors, the delays to which the mails have been subjected, the partial suspension of the cable service and the abandonment of the editorial pen for the sword, communications from the warring nations have been scarce. In fact, reports concerning electric tramways in Germany, France, Belgium, Austria and Russia are almost entirely missing, and only this week has any real information concerning British tramway conditions become available. Whether the electric railway situation in Great Britain, as described elsewhere in this issue, is better or worse than that in the other belligerent states must as yet be a matter of individual opinion, but the effects of the war on British tramway operation and receipts may at least be taken as a working basis for forming judgments concerning the conditions elsewhere.

The available evidence tends to show that the declaration of war in Great Britain resulted in a temporary feeling of panic in industrial and transportation circles, but that matters are now tending toward the resumption of a more normal state. As regards the tramways, the chief drain has been the decrease in the number of employees on account of the reservists and territorials being called into service. Up to Aug. 31, 1682 motormen, 2174 conductors and 2101 other employees, representing practically every undertaking, had joined the colors. The way in which the public corporations and the private companies co-operated in mobilizing the troops is well illustrated in the case of the Glasgow Corporation Tramways, which has been devoting its utmost energy to the formation of an entire battalion of 1100 men from among its own employees. The tramway systems have all protected their reservists and territorials and also encouraged volunteers to enlist, through promising monetary assistance to dependents and also a certain resumption of civil occupation without delay upon the return from the war. To be sure, this corporate patriotism has not been without its restricting effect on tramway service, but through rearrangements of the staffs, the elimination of holidays and a general advancement of all employees, the necessary steps have been taken to insure the efficiency of the service.

The full effect of the war on tramway receipts is as yet undeterminable, although it is certain that the revenues of tramways have been less affected than those of many other industries. In some instances, as in Manchester and Salford, definite figures of losses are available, but in general no startling decreases are reported. In a few cases there have been reductions in service, but as much on account of the absence of efficient operating men as on account of a desire to curtail operating expenses. The fact that the cost of coal and tramway supplies in general has not risen appreciably is a fortunate factor. As a rule, employers of all classes are looking at the situation more sanely, and it is likely that both tramway employment and revenues will now begin to make up the slight losses they have experienced.

It would rather be expected that tramway extensions and new construction would be at least temporarily postponed and that only the maintenance work necessary to the continuation of operating efficiency would be undertaken. Some lines having improvements under consideration may not take decisive action until the final effects of the war are better known, but in view of the optimistic outlook regarding revenues and expenses, most companies are likely to pursue their customary path of development. Another reason for this may be found in the attitude that the corporations and private companies have assumed toward the question of unemployment. Wherever there seems to be a prospect of many men being turned out of work, tramway authorities have expressed a willingness to undertake pending renewals and new construction in order to provide as much work as possible. This movement is only another outcropping of the general "business going on as usual" spirit that seems to pervade the entire British traction field.

The brightest exhibition of optimism is on the part of the British electric railway manufacturers, who, according to the *Tramway and Railway World*, are unanimous in declaring that the industry is unaffected by Continental conditions and that domestic and overseas buyers can be promptly supplied by British firms. Items of information are sifting through regarding the cancellation of contracts made by British companies with German firms in favor of British manufacturers. The British boards of trade are endeavoring to supply information and advice concerning openings for tramway materials, and it is stated that British banks are recovering from their period of reluctance in regard to furnishing capital for the extension of the trade. It does not require a very close examination of British reports to discern strong signs that the British, full of confidence in the maintenance of their naval supremacy, are looking toward a vigorous competition with American manufacturers for the great world electrical trade that now seems available.

A New Method of Traffic Acceleration on the Scranton & Binghamton

This Interurban Line, Which Maintains During the Rush Hours a Service of Multiple-Unit Trains Under Fifteen-Minute Headway in Both Directions on a Single Track, Depends Largely Upon Its Signal System to Keep This Extremely Heavy Traffic in Motion, and a Description of the Operating Methods Is Given

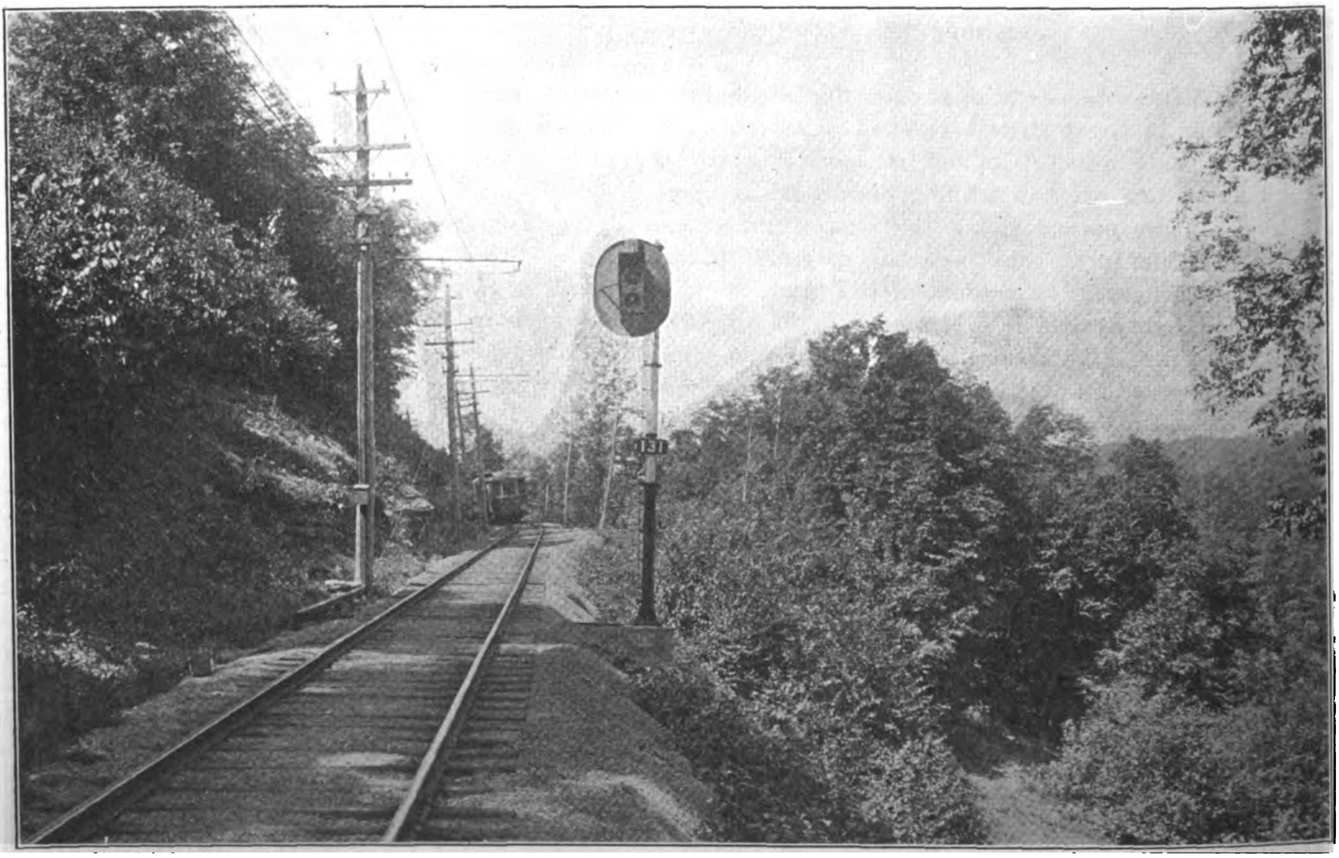
The Scranton & Binghamton Railroad, an interurban line which is being constructed to connect the two cities from which it takes its name, has at the present time, 26 miles of track in operation between Scranton, Pa., and several prosperous farming centers in the northern foothills of the Allegheny Mountains, among which the one best known to fame is Factoryville, the birthplace of the immortal Christy Mathewson. As fast as each section of the line has been completed it has produced a traffic of considerable volume until, at the present time, the service at the Scranton end of the line during the daily four-hour rush and for eighteen hours on holidays requires the operation of multiple-unit trains at fifteen-minute intervals in both directions. The average schedule speed is 19 m.p.h. with 2.2 stops per mile. The maximum running speed approximates 45 m.p.h.

As the right of way extends in several places along the banks of mountain streams and upon steep hillsides, the cost of double-tracking would be very great, and in order to handle a service of such extreme frequency on a single track a number of radical operating methods have been introduced. Foremost among them is the complete elimination of train orders. Trains are operated according to time-card under normal conditions, but, when these do not obtain, complete dependence is placed upon the train crews under the guidance of an automatic signal system of the Union Switch & Signal Company's "T.D.B." type, to get the cars over the road with safety and dispatch.

OPERATING METHODS

Extras are run whenever necessary and a number of milk and express cars are sandwiched in as second-class trains. The latter have places upon the time-card and the crews are trained to do such rapid handling of shipments that the time is practically that of first-class trains but they, of course, have no rights over the passenger service, and, like the extras, they are obliged to work their own way over the road by the signals if they drop behind their places on the schedule. Judged by the methods now in vogue on interurban lines throughout the country, such conditions as these might be considered to demand the presence of a dispatcher, but it is the expectation of the management that this may not be the case, even when the complete line to Binghamton is in operation.

The basic principle which permits this radical innovation is the acceptance of signal indications at their face value. The time-card serves as a means for preventing delays of first-class trains by those with inferior rights



SCRANTON & BINGHAMTON TRAFFIC—TYPICAL VIEW ALONG LINE, SHOWING DIFFICULTIES OF DOUBLE-TRACKING—LIGHT SIGNAL IS SHOWN IN THE FOREGROUND but its importance extends but little beyond that. South-bound first-class trains have directional rights over other first-class trains, and if a south-bound train reaches a scheduled meeting point and finds a clear signal for the block in advance it proceeds at once, holding the opposing train and making the meet at the siding in advance. In case a north-bound train makes a scheduled meeting point and finds a clear signal it waits for two minutes past the meeting time and then, if the signal has not in the meantime moved to stop position, indicating that the opposing train has entered the block in advance, it is entitled to proceed. In other words, first-class trains are privileged to advance meeting points against opposing trains whenever the latter are late.

Milk and express trains are not entitled to advance meeting points against first-class trains but must await their arrival at scheduled meeting points, and in case they drop behind to the time of following first-class trains, they must let these trains pass them. Work and other extra trains have no rights of any kind and must dodge over the line as best they can. They are not, however, required to clear the time of scheduled trains with the customary three or five-minute margin.

Extra first-class trains, when necessary, are given full time-card rights by posting bulletins to that effect two or three days in advance. Notice regarding work trains and track gangs are also given by bulletin in the usual manner, but extras may be run out at any time without notification. Indeed, on days of heavy travel, an extra car and crew is kept ready at Dalton, the middle point of the line, to take the place of any train that drops badly behind its schedule. The extra takes the time and rights of the delayed train and the latter completes its run from Dalton to the end of the line as an extra and is taken off when it gets back to Dalton.

The time-saving influence of this scheme and its steadying effect on the schedule are obvious. However, in case train orders and notifications for other trains had to be issued before the extra could be sent out it is also obvious that a considerable complication would be involved—enough perhaps to offset the advantages. In fact, the management of the railway considers that with fifteen-minute service in each direction train crews do not have enough time to receive train orders properly and that the time spent in telephoning to a dispatcher when there is necessity for haste is of questionable value. Of course, telephones are used on the line to a limited extent, being installed at a few stations, but they are intended for emergency only.

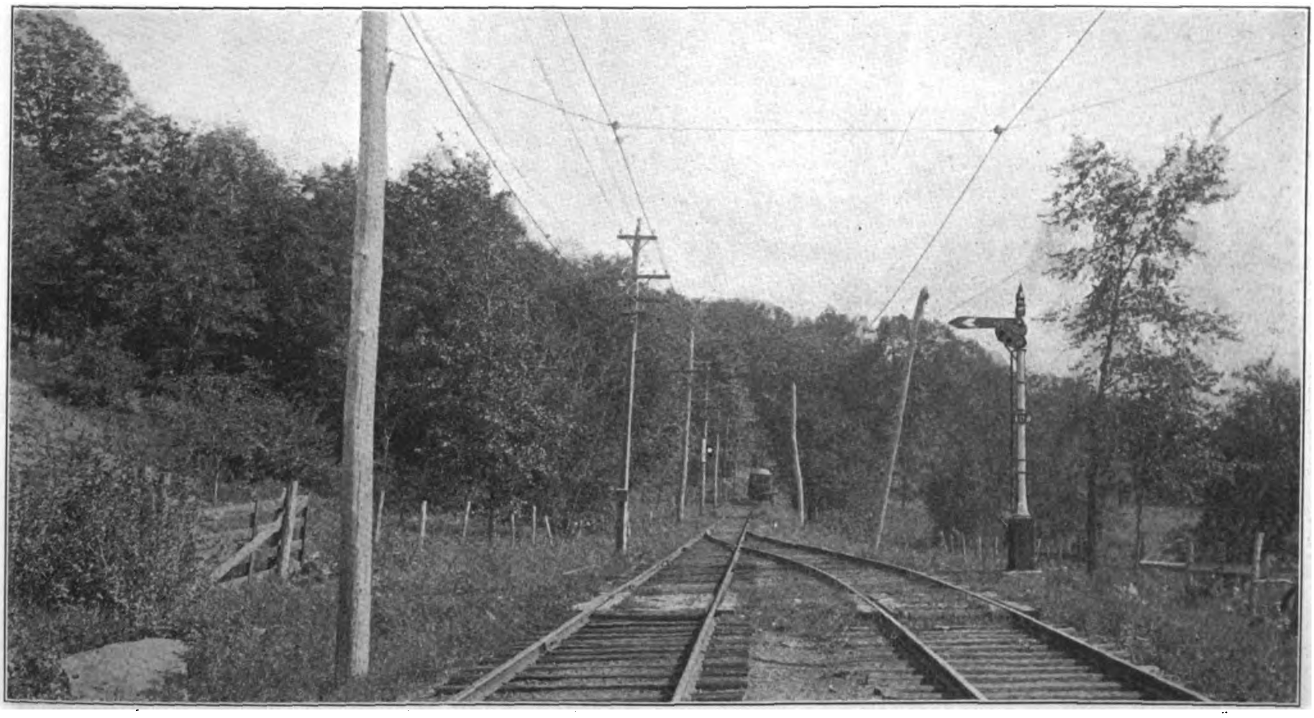
It is a rule of the company never to send out more than one green man on a car, but, as a matter of fact, since the automatic signals have been installed the operations on the road have been reduced to the simple formula that a horizontal semaphore or red light means "stop" and an inclined semaphore or green light means "proceed."

To the automatic signal system, therefore, has been assigned the vitally important duty of traffic acceleration in addition to its other features of (*a*) protection, (*b*) publicity and advertising effect, (*c*) a cost of about 10 per cent of that of double-tracking, (*d*) signal apparatus which can be used on future double track, and (*e*) provision of current at a voltage suitable for switch and station lighting.

SIGNAL SYSTEM

In the determination of the general style of signaling the adoption of the absolute (one car to a block) principle and control by continuous a.c. track circuits was considered necessary by the railway company, and a contract was given to the Union Switch & Signal Company for an installation of the "T.D.B." (Traffic Direction Block) system, which provides two absolute blocks between sidings for following cars and holds all opposing cars at the siding in advance. The fact that this system of signaling has been installed with 368 signals protecting 198 miles of track on eight different roads since its introduction early in 1913 was stated to have largely influenced this decision.

This scheme does not employ preliminaries, hence each block from siding to siding is a unit, and cars in one block or at one siding do not affect the movement of opposing cars in or approaching the adjoining block. Consideration of the two types of signals, semaphore and light resulted in placing semaphore signals at the

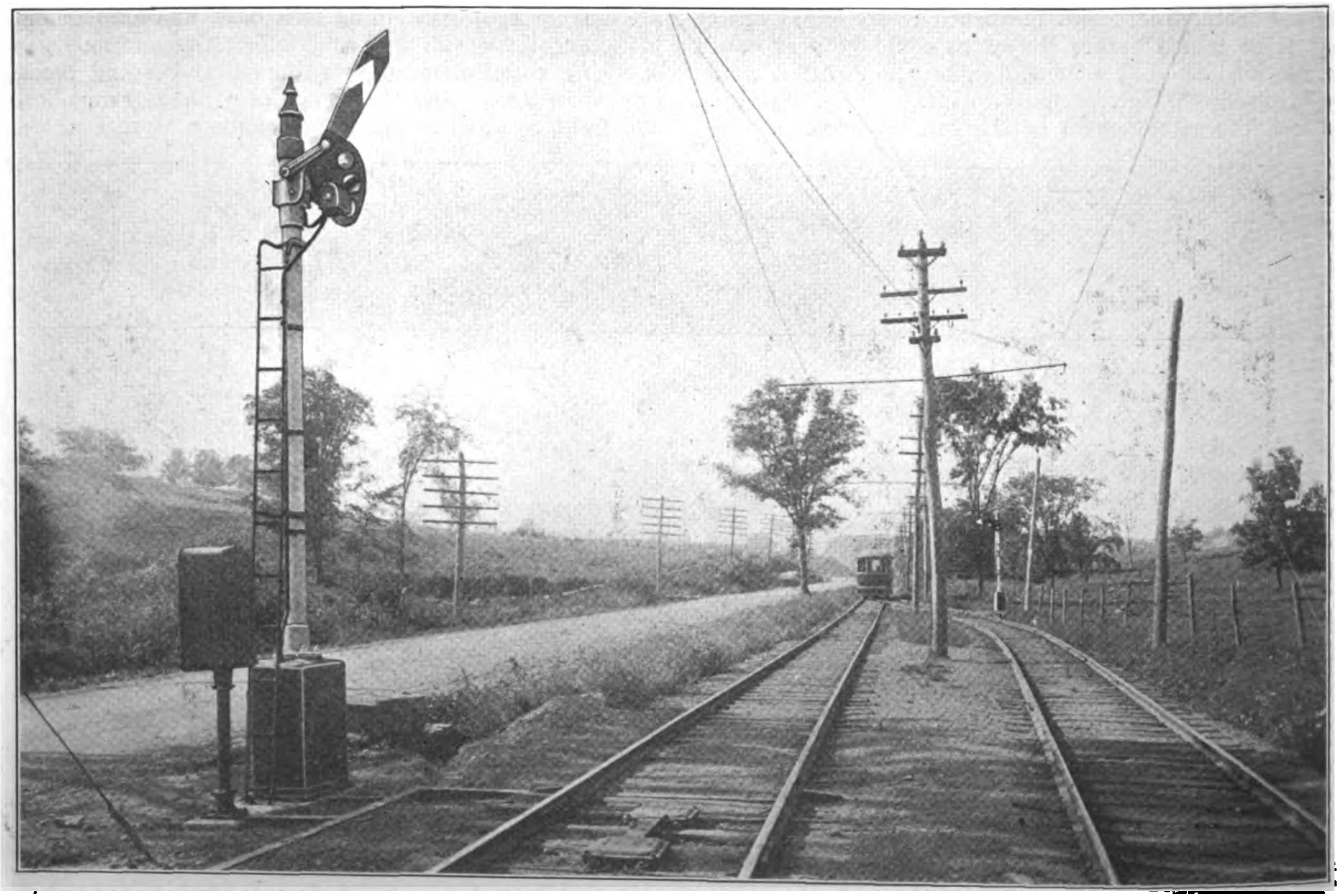


SCRANTON & BINGHAMTON TRAFFIC—VIEW OF SEMAPHORE SIGNAL IN STOP POSITION, SHOWING ALSO DIRECTION INDICATOR ON POLE BEYOND SWITCH sidings and light signals intermediate to the sidings. Semaphores were placed at sidings because their indications could be seen from any point in the vicinity of the siding, because they were standard in steam road signaling, thus inspiring confidence on the part of the public, and because of their advertising value. Light signals were used as intermediates between sidings because they could be viewed from the front only and because they could be secured at a slightly lower cost. Automatic signal construction at the present time has been completed for a distance of about ten miles of track in the zone of heaviest traffic, hand-throw signals being used on the outlying sections of the line. The territory protected by automatic signals is divided into ten blocks, siding to siding, with a total of forty signals, twenty of the semaphore type and twenty of the light type. The distances between sidings are from 3600 ft. to 6800 ft. and the blocks for following cars are from 2500 ft. to 4400 ft. in length. All passing sidings are double ended and have spring switches that make cars take the right-hand track in all cases. This plan was adopted to reduce time spent in making meets.

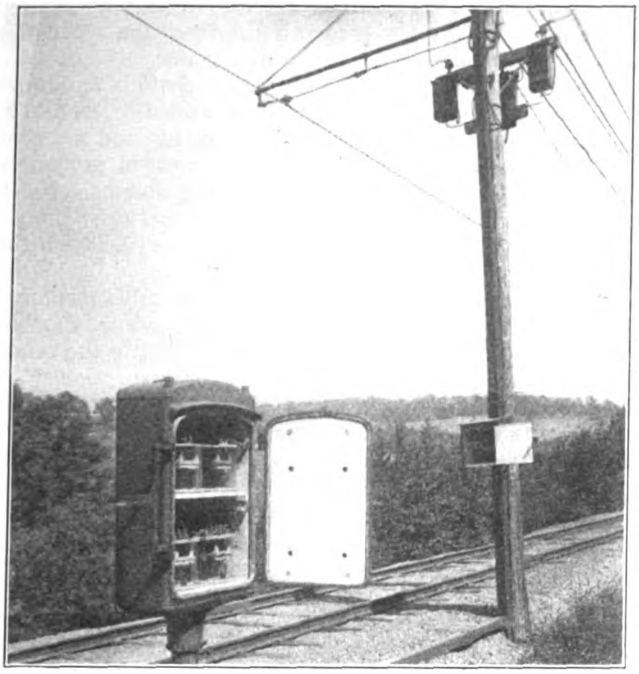
The semaphore signals at the sidings are generally located at the fouling points, but in some cases it was found necessary to place the signals beyond the sidings because of local traffic and track conditions. Several signals had to be placed on the left-hand side of the track because of the highway or restricted right-of-way.

Each signal, semaphore or light, has but two indications, "stop" and "proceed," and they are controlled, briefly stated, as follows: A siding or semaphore signal, north bound, for instance, is controlled to the next siding north by all south-bound cars and to a point just beyond the center of this distance by all north-bound cars. This permits a spacing between following cars equal to a little more than one-half the distance between sidings. Intermediate or light signals are controlled to the next siding by all cars, north or south bound. When two cars are between sidings one is protected in the rear by the siding semaphore signal, the other by the intermediate light signal and both are protected head on by the opposing signal at the siding in advance. The apparatus of any block of this system becomes normal as soon as all cars are out of the block and does not require any sequence of movement to operate properly.

A new feature, peculiar to and adapted to expedite operation as conducted on this road is the employment of direction indicators, which are located about 200 ft. beyond the siding semaphore signals, to show a motorman who has just passed a siding signal whether an opposing train has simultaneously entered the block at the siding in advance. These indicators are of the light type with one white lens normally dark, or unlighted, but displaying a white light as a car passes the semaphore, or siding signal, if an opposing car has not entered the block at the advance siding. The two indicators, one at each end of each block, are so controlled that but one of the two will be lighted at any one time, this being determined by the first car entering the block. When a car enters a block and finds that the direction indicator does not light up it backs out and if bound south tries to enter the block a second time. If the train is bound north and has inferior directional rights it waits in the clear until the opposing train arrives. It is to be understood that without direction indicators, or if they are not observed, two opposing cars, leaving adjacent sidings at the same time, would proceed until stopped a safe distance apart by the intermediate light signals, the direction indicators serving mainly to prevent the delay that would be caused if a car had to back from an intermediate signal to the siding at the rear. The direction indicator, however, does not merely repeat the indication of the intermediate signal but takes its indication from



SCRANTON & BINGHAMTON TRAFFIC—SEMAPHORE SIGNALS IN PROCEED AND STOP POSITIONS, IMPEDANCE BONDS AND TWO-WAY RELAY BOX—BACK LIGHT SHOWN ON SEMAPHORE IN FOREGROUND



SCRANTON & BINGHAMTON TRAFFIC—VANE TYPE LINE RELAYS IN FOUR-WAY RELAY BOX; SPARK-GAP LIGHTNING ARRESTERS ON POLE

a line relay controlled by the track relay at the opposite end of the block, a circuit breaker being mounted on the rear semaphore to put the indicator light out when this arm is in proceed position.

The signals installed on the south end of the line have been in service since July 1, 1914, and their performance to date has fully justified the confidence placed in the installation. Holidays and the heavy summer business have passed with exceptionally few failures really chargeable to the signal system or maintenance, and most of these failures have been incidental to a new system. Under the fifteen-minute service the twenty semaphore signals make 2940 movements per day of twenty hours, and on July 4, 1914, the twenty semaphores made 2980 movements. Provision for signal failures is made by inserting a flagging rule in the code.

SIGNAL CIRCUITS

The signal system is operated by 2300-volt, single-phase, twenty-five-cycle current transmitted over two No. 10, bare copper line wires extending the length of the signalled territory. Current is supplied these wires from the railway power house, where there is available 370 volts which is stepped up through suitable transformers to 2300 volts. A one-panel switchboard with switches and an ammeter is used for control of this supply.

Each section of track from one siding to the next siding is one track circuit with a track relay at each siding and in the center, a transformer, stepping down from the 2300 volts to from 6 volts to 10 volts. Each track relay is controlled by the territory between the relay and the transformer plus about 10 per cent or 15 per cent of the distance between the transformer and the next siding, this making a section of track each side of the transformer which controls both track relays. The track circuit current supply is adjusted by means of taps on the transformers and a reactance coil located in a box mounted on the same trolley pole about 5 ft. above the ground.

The track relays are of the Union Switch & Signal Company's galvanometer type having an armature consisting of a coil energized by the a.c. track circuit current received via the rails from the track transformers. The armature coil is in the field of a coil that is energized by a 110-volt current from a 0.6-kva transformer located at the siding, and the inductive action holds the armature in a position to close the signal circuit when current is flowing through both coils. The armature is mounted on centers and its movement is rotary.

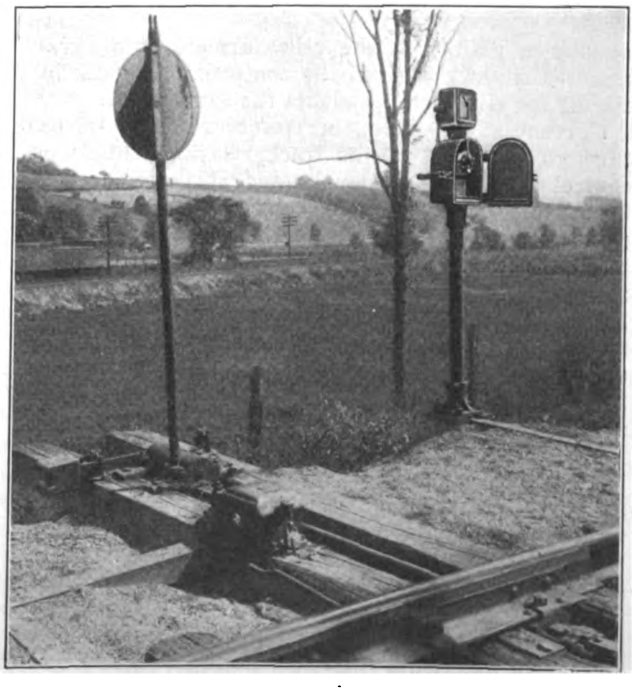
All circuits are fused and resistances are employed in connection with certain of the track relays in order to better meet ballast and other conditions of the track circuits, the fuses and resistances being placed in the relay boxes. The impedance bonds used at the ends of the track circuit have a normal capacity of 500 amp per rail and an overload capacity of 750 amp for one hour without undue heating. The track circuits are carried to the fouling point of all switches in the track sections, so that cars must be in clear before the signals will show a clear block.

Keystone insulated rail joints, manufactured by the Union Switch & Signal Company, are used to limit the track circuits at sidings, and insulations in the switch roads provide a means for extending the track circuits through the switches. All track circuits are of the "double rail" type, which permits the use of both rails for the propulsion current return.

SIGNALS

The semaphore signals are the Union Switch & Signal Company's Style "B," bottom-post mechanism, two position 0 deg. to 60 deg., operating the arm in the upper, left-hand quadrant. The mechanism is operated by a 110-volt induction motor and the slot magnet, or holding-clear coil, operates a contact controlling the motor circuit, thus eliminating the use of the line relay ordinarily required for the light signals. The signal is illuminated by two 110-volt, 2-cp lamps.

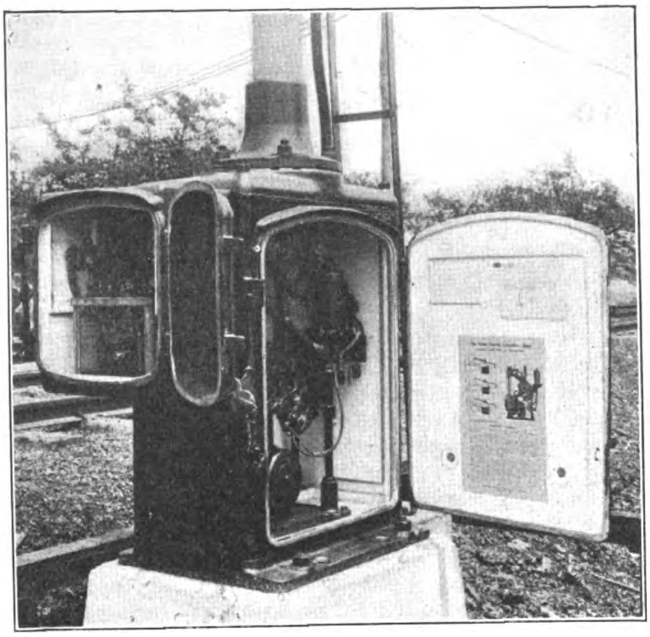
The light signals are Union Switch & Signal Company's "Model 13" having two 8-in. lenses, one red and one green, with a hood and an artificial background. Each is mounted on a 5-in. pipe post and has a concrete foundation. Behind each lens are two 110-volt, 25-watt tungsten lamps wired in multiple, so that if one burns out the other will provide an indication discernible at



SCRANTON & BINGHAMTON TRAFFIC—VIEW SHOWING SWITCH CONTROLLER AND SWITCH INDICATOR WITH TIME RELEASE AT INDUSTRIAL SIDING short range. With both lights burning this signal will provide an indication visible from 2000 ft. to 2500 ft. away under the most severe daylight conditions. The signal posts are painted white, thereby making them distinctive at night even though the lights may be out.

LINE CIRCUITS AND CONTROL

All circuits and apparatus are designed so that a break in a wire or rail or a failure in the supply of current will result in the display of stop, or safe, signals. Gravity is employed to move all relays and signals to the stop position and power is used only to move them to the clear or proceed position. When both coils of a track relay are properly energized its contacts, controlling the line and signal circuits, are closed. The entrance of a pair of wheels on the track circuit shunts the current from the track-relay coil, due to a lower resistance path, and the relay armature, by gravity, revolves slightly to open the contacts. A break in the circuit for either coil produces the same effect.



SCRANTON & BINGHAMTON TRAFFIC—VIEW SHOWING SEMAPHORE SIGNAL MECHANISM, WITH TRACK RELAY IN BOX MOUNTED ON SIGNAL MECHANISM CASE

Current at 110 volts, heretofore referred to, passes through a contact of the track relay and line wire to control a vane-type relay located at the center of the block, this relay, when energized, closing through its contact the current supply for the green light indication of the intermediate light signal, and when de-energized closing another contact to establish a circuit for the red light indication of the same signal. The semaphore signal is controlled by this vane relay and a contact on the other relay, located at this semaphore signal. A second vane relay and a similar circuit is employed to control the other intermediate signal.

As previously described, each siding semaphore signal is controlled to the advance siding by opposing cars and to a point just beyond the center of this territory by following cars, and this double control is secured by the use of two more vane relays for each block which act to limit or extend the control of the semaphore signals according to the direction of traffic established as a car enters the block at a siding. These relays are similar to the relays used for the light signals and are also located in the center of the block. Switch circuit controllers are connected to the points of all rigid switches, that is, all that are not trailed through. These controllers are arranged to set all signals governing traffic over the switches to the stop position when the points are not closed for main-line traffic.

Lightning arresters of the Union Switch & Signal Company's new spark-gap type are tapped to each 110-volt wire between the lines and apparatus and are connected to deep grounds. These have proven protective through the numerous heavy lightning storms. No. 9 soft-drawn, insulated wire is employed between the relays and the rails, and No. 14 wire is used between the line wire and apparatus, both being protected by 1¼-in. grooved lumber. All wires are run to suitable terminals or fuses in the relay boxes and signals and are flexible. No. 14 electric-light cord is used to connect to the relays so that they can be readily moved for inspection.

Several of the switches require indicators to govern movements on to the main track. These indicators are of the semaphore type, a horizontal arm indicating "Stop, stay in siding." The indicator is cleared to permit movements when the conductor starts a time release switch, after the lapse of about fifteen seconds, will produce a clear indication if the block is unoccupied. The time-release control is used instead of the usual control by track circuit preliminaries, thereby reducing to a minimum possible delays by trains which might be in the preliminaries.

R. W. Day, general manager Scranton & Binghamton Railroad; R. L. Koehler, general superintendent, and J. C. Meixel, superintendent of transportation, selected the signal system, supervised its installation by the manufacturer, and developed the operating methods which are now in effect on the railway.

United States Railway Statistics

The bureau of railway economics has just published a 75-page pamphlet giving statistics of railways in the United States for the period from 1900 to 1912, inclusive. The railroad tabulations are based upon official data published by the Interstate Commerce Commission for each fiscal year from 1900 to 1912, the latest year for which such data is available. Tabulations concerning population and area are based upon the reports of the bureau of the census. The tables appearing in the book are grouped under the following headings: Population and area; railroad mileage; capital, securities and dividends; revenues, expenses and taxes; employees and compensation; equipment; freight traffic statistics and passenger traffic statistics. It is stated that during the years covered by the statistics the commission prescribed certain changes in accounting regulations and statistical methods, but that these do not seriously impair the value of the statistics for comparative purposes or disturb their general trend.

Thirty-fifth Anniversary of Electric Lighting

On Wednesday, Oct. 21, will occur the thirty-fifth anniversary of the invention of the electric incandescent lamp by Thomas A. Edison. This day in 1879 may be said to mark the birth of electric lighting. Certainly it marked the birth of the general and popular use of electric lamps. Arc lamps had been in use some years previous to this time, but only a few of these were then employed for searchlights, to light theatres, parks, street corners and similar public places. The universal lighting of both public buildings of all kinds as well as private dwellings by electricity through small units became a dream realized only when Edison first successfully made his electric filament bulb glow in his laboratory at Menlo Park, N. J.

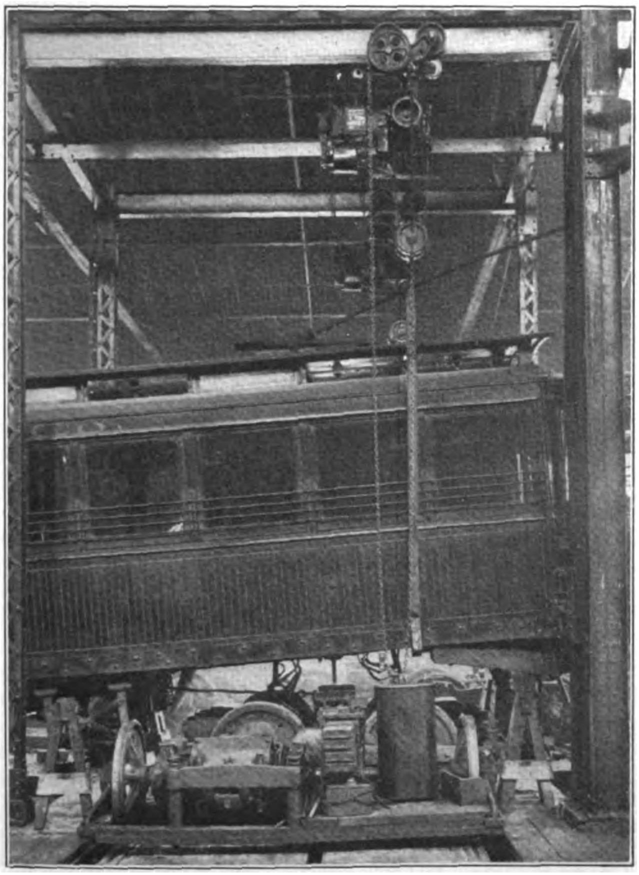
Labor Saving Devices at Pittsburgh

Several Novel Labor and Time-Saving Devices in the Pittsburgh Railways Company's Shops Are Described in Detail, Most of Them Being Peculiarly Adaptable to Electric Railway Shops Where a Considerable Degree of Congestion Exists

A large part of the heavy repair work for the Pittsburgh Railways Company, which operates about 1000 passenger cars, is done at its Homewood shops, and as these shops are somewhat restricted in size the necessity for saving space and for quick handling of cars is an exceedingly important feature. The company has, in consequence, installed in the shops a number of novel pieces of apparatus which have been developed by F. R. Phillips, superintendent of equipment Pittsburgh Railways, for the purpose of saving time and labor in the work of overhauling cars.

Probably the most important of these devices is a home-made car hoist which is used for making truck repairs upon cars which do not need any repairs to the body. This is shown in one of the accompanying illustrations. The hoist has been constructed by attaching to two roof trusses of the shop a pair of I-beams spaced about 10 ft. apart. These I-beams are carried upon latticed columns, and each supports an electric hoist from which is hung a flat hook that catches under the side sill on either side of the car.

The electric hoists, which are of the standard Sprague electric type and which are of two tons capacity each, run upon the lower flanges of each of the I-beams. They are moved in a transverse direction as desired by means of pendant chains attached to a geared drive for the supporting wheels and the transverse movement is effected by hand. Hoisting is effected by a motor-driven drum upon which is wound a cable that carries in a double loop a sheaveblock of the usual type. From the blocks depend the hooks for hoisting the car. The electric-hoist motors are operated from the lighting circuit for the shops, and controllers are mounted in a suitable manner over the hoist framing and are operated together by a single shaft. Sheaves are keyed to the shaft and operated by pendant cords. The current is supplied to the hoist motors by flexible cables which are provided with ample loops to permit transverse longitudinal movement of the hoist along the I-beam support, so that the best point of support on the car sill can be selected. The two hoists are operated in unison by means of a common shaft for both controllers, as described above.



PITTSBURGH SHOPS—ELECTRIC CAR-BODY HOIST FOR REPLACING CAR TRUCKS

In operation, a flush transfer table is centered on the track that is spanned by the structure, and the car which is to have its truck removed is run over the transfer table. The hooks for the hoist are then caught underneath the side-sills of the car, and the car body is raised when current is supplied to the electric hoist motors. The car is thus raised clear from its truck. The leads to the motors and the connection to the brake rigging are then disconnected. The transfer table, which is operated by electricity, is then moved out to one side, and the truck is either shoved off upon some other track or else handled by an overhead crane which spans the shop bay running alongside of the car hoist track.

When the truck is replaced, the reverse of this process is carried out, the new truck being run under the flush transfer table, moved underneath the car and the hoist motors reversed, letting the car down into place. Two men do all the necessary shifting of cars and trucks and the hoisting of the cars off their trucks and the disconnecting of the motor leads. With the help of the car hoist these two men may easily change trucks upon twenty cars each day, including the shifting of cars and trucks in and out of the shops and yards.

The average time required for the complete operation of moving the car under the hoist, disconnecting the leads, removing and replacing the truck and again connecting the leads is from four to six minutes. A large stock of spare trucks is kept on hand in the shops, and when anything more than very light repairs is required for the truck a substitution is made so that the car is not held for any length of time.

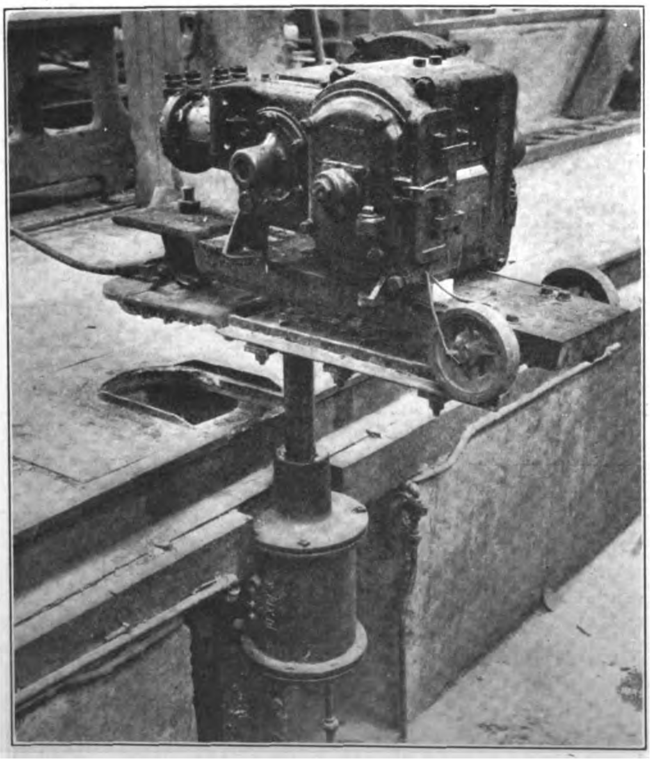
The accompanying illustration shows a car body in raised position and ready for the truck to be moved out sidewise by the flush transfer table. It will be seen that one of the building columns has been used as a support for the overhead structure of the hoist, and this, together with the tie rods and the roof trusses, makes the whole construction a thoroughly rigid one. The line switches and circuit breakers for the hoists are shown mounted upon this column at about the same elevation as the sills of the car body.

The cost of this home-made hoist complete was $600, exclusive of the cost of the flush transfer table, which has been in use in the shops for some time. This includes the cost of the two 2-ton hoists with their controllers, the longitudinal I-beams upon which the hoists travel and the vertical columns, each of the latter being built up from two channels set back to back and spaced by lattice work. The clear length between columns is 12 ft., and the longitudinal movement of the hoist overhead along the I-beams is 8 ft., thus permitting considerable variation in the position on the side-sills of the car at which the hoisting hooks are engaged.

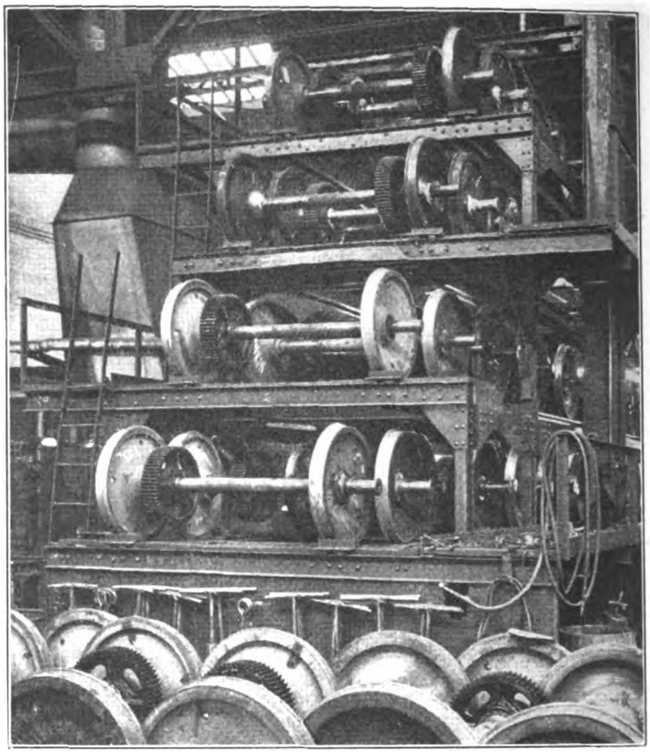
AIR COMPRESSOR HOIST

Another one of the home-made devices is a compressor hoist which has been developed so that defective compressors may be removed from cars and replaced by new ones with the minimum expense of time and labor. The hoist is made up from a 10-in. x 12-in. air-brake cylinder mounted at the side of one of the shop pits upon strap-iron supports. The cylinder is operated by compressed air from the shop system, a two-way valve being used for controlling it. Upon the end of the brake cylinder piston is attached a table, and at the edges of this table are supported a pair of tracks made from angle irons. Upon these tracks runs a small truck specially built for handling air compressors. This is furnished with flangeless wheels, of which two are fixed at one end. A swiveling wheel and handle are provided at the other end so that the truck can be drawn about the shop floor as desired.

In operation, when a car comes in to have the air compressor changed, the car is so placed that the air compressor is directly over the cylinder of the compressor hoist. The small truck is then shoved on to the table and air is admitted to the hoisting cylinder, thus raising the truck until it touches the compressor. When the weight of the compressor is carried by the table the keys attaching the compressor to the cradle supports are removed and the table with the compressor upon the truck is lowered to the floor level. The truck is then drawn from the table and taken to any part of the shop desired. The reverse of the process is then carried out and the new compressor is keyed into place, the whole procedure generally taking not more than from three to four minutes. A number of these small trucks are in use in the shop for transporting air compressors from place to place.



PITTSBURGH SHOPS—HOME-MADE HOIST FOR REMOVING AND REPLACING AIR COMPRESSORS; HOIST CARRYING COMPRESSOR AND TRUCK



PITTSBURGH SHOPS—FOUR-DECK STRUCTURE FOR STORING WHEELS INSIDE OF TRUCK SHOP

It will be noticed from an accompanying illustration that the head of the rail opposite the hoist cylinder has been cut away. Into this space fits a part of the table top which is grooved transversely so that the car wheel in passing over the table travels along this groove. The portion of the table outside of the groove sets in a space that has been cut out of the floor, leaving the floor flush when the table is in its lowest position. This arrangement provides a continuous track at floor level, so that there is no difficulty in pulling the truck off the table or pushing it on to the table when it is carrying a compressor. The cost of this device was practically negligible, the material used in it being taken from scrap stock at the shops, but it is obviously a very great time saver.

WHEEL-STORAGE STRUCTURE

One of the accompanying illustrations shows a four-deck, wheel-storage structure that has been installed in the shops not only on account of the opportunity which it affords to save labor but also because of the high cost of the land in the vicinity in which the shops now stand. As will be seen from the illustration, the wheel storage is built of structural steel and it has double tracks on each of the four levels, so that the wheels on each level can be staggered. At one side of each level there is a platform for use by the men who move the wheels about on the various decks. The structure extends out into the main bay of the machine shop which is served by a traveling electric crane, so that the crane can be used to pick up the end pair of wheels from any one of the decks, the four decks being arranged so that each one extends out beyond the one immediately above it.

This wheel storage scheme cost, completely erected, about $1,400. The advantages, in addition to providing an easy method of handling wheels in connection with a traveling electric crane, consist in the fact that the wheels and axles are always under cover and in consequence are not as subject to rust as they would be if kept outside. In addition the stored wheels are kept convenient to the truck shop at all times, and are available at once in accordance with the needs of the work.

ARMATURE CAR

All of the armature repairs for the system are made at the Homewood shop, and from this point the repaired armatures are shipped to the various other shops and carhouses on the system. To facilitate the work of transportation an old car has been arranged specially for this work. A center door has been cut in each side, and just inside and at the front of each doorway is a jib crane having a lifting capacity of 2000 lb. Both of the cranes are operated by means of an air cylinder supplied from the air-brake system. A pulley block is installed at the end of the piston, and the cable to the crane hook is led over this to give a 2:1 increase in motion of the hook that hangs from the end of the jib. The hook is made double and hangs from a yoke in accordance with the usual scheme for handling armatures, one of the hooks engaging with the armature shaft on either side of the armature. As the cranes swing over the car floor and out of the doorways the armatures can be handled with a minimum of lost time between the level of the armature-car floor and the ground, and in addition no skids or rollers are required.

Meeting of Federation of Trade Press Associations

Publishers, editors, circulation managers and advertising men to the number of more than 400 attended the ninth annual convention of the Federation of Trade Press Associations at Congress Hotel, Chicago, on Sept. 24, 25 and 26. F. B. Porter, Chicago, *National Builder*, president of the federation, called the meeting to order, and A. A. Gray, *Electrical Review and Western Electrician*, president of the Chicago Trade Press Association, delivered the address of welcome. Mr. Porter recommended the appointment of a permanent secretary. Secretary E. E. Haight, Chicago, *Motor Age*, reported that the federation had 216 members. Charles T. Root, New York, presented the report on the reorganization of the association.

Arthur L. Rice, Chicago, *Practical Engineer*, was chairman at the editorial symposium of Sept. 24. David Beecroft, New York, Class Journal Company, read a paper on "Feature Articles." He said that he had examined sixty trade papers and fifty had no feature articles. Dr. William A. Colledge, of the Redpath Lyceum Bureau, Chicago, made the point that there is as much "human interest" in the average trade paper as in the average general magazine. James H. McGraw, president of the McGraw Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, New York, declared that editors must write out of the fullness of knowledge, and that technical papers should be edited from the field and not from the desk.

At the circulation symposium, S. T. Henry, New York, McGraw Publishing Company, Inc., urged co-operation between editors and circulation managers. The speaker told how the list of circulation "prospects" should be made up. Every prospect must be a potential reader and not merely a possible subscriber and each new subscriber should be told how to get the most out of the paper. Mr. McGraw averred that the circulation department is the most important on the paper. If every man in the organization is studying the problems of this department, there will be no publisher who will be averse to emblazoning his circulation figures on all the dead walls of the country. A. H. McQuilkin, Chicago, *Business Equipment Journal*, declared that editors should be permeated with the idea of service.

A. A. Gray in the absence of the author read a paper "How Trade Paper Advertising Should Be Sold," written by William H. Ukers, New York, *Tea and Coffee Trade Journal*. Mr. Ukers contended that if advertising were bought more intelligently it would stay sold more often. Advertising in a trade paper should be a quality purchase. Charles L. Benjamin, Milwaukee, advertising manager for the Cutler-Hammer Manufacturing Company, argued that advertising of some kind is necessary in order to sell any product. He described the mental processes of creating desire, overcoming inertia and instilling a preference for the thing advertised.

The subscriber's point of view was considered in three papers or addresses on the afternoon of Sept. 25. John W. Alvord, Chicago, sanitary engineer, read a paper "The Importance of the Technical Press to Engineers." This paper is abstracted at length in this issue. Mr. Alvord said that the chief value of technical journal matter lies in the fund of small bits of information it provides in relation to every-day jobs rather than in longer articles on unusual undertakings. The speaker described his method of indexing articles in loose-leaf working notebooks. R. R. Shuman, Chicago, Shuman-Booth Company, advertising agent, voiced the belief that the engineering paper "ad" of the future will be reading-matter advertising; that is, advertising that will resemble the text pages in sincerity, in restraint and somewhat in appearance.

At the publishers' symposium of Sept. 26 John Lee Mahin, Chicago, Mahin Advertising Company, declared that the good trade paper is the most powerful advertising influence per unit of circulation that exists. Mr. Mahin bespoke a better understanding between the agency and the trade press. The whole problem should be worked out on the basis of what is best for the advertiser, and, more than that, what is best for the advertiser's customer.

At the concluding session the question was debated of making circulations known. Mr. McGraw said that he believed no one act has contributed so much to the success of the McGraw papers as the printing of the exact circulation in each issue.

Officers were elected as follows: President, John Clyde Oswald, New York, *American Printer;* vice-president, A. A. Gray, Chicago, *Electrical Review and Western Electrician;* secretary and treasurer, Grant Wright, Philadelphia, *Eastern Dealer in Implements and Vehicles.*

Night Courses in Valuation of Utilities at the University of Pittsburgh

A unique feature has just been introduced to the University of Pittsburgh through the beginning of night graduate courses. This is said to be the first time that such work has been attempted in this country. The courses will be offered in several branches of engineering and will include work in the valuation of public utilities. Professors Morris Knowles, director of the department of sanitary engineering, and G. W. Case, both of the faculty of the University of Pittsburgh, and William S. Moorehead will give the instruction in "valuation." The faculty also includes Paul M. Lincoln, consulting engineer of the Westinghouse Electric & Manufacturing Company; D. S. Crawford, general superintendent of motive power of the Pennsylvania Railroad lines west of Pittsburgh; Professors L. E. Endsley, R. T. Stewart, J. Hammond Smith and others. The work is under the general direction of the dean of the engineering college, F. L. Bishop.

How to Use the Technical Journal*

Value to Different Classes of Readers—Discussion of Card Catalogs and Other Forms of Indexing—How to Get the Most Out of a Paper.

In 1880, the engineer treasured and indexed almost every scrap of printed matter on any engineering subject that came his way. To-day his task is to sort out, discard and eliminate that which he can no longer use, and limit himself to the inspection and reading of that which bears principally on his selected professional specialty.

That we cannot keep abreast of the times without reading the engineering journals is obvious. That if we carefully read all the engineering journals in our chosen specialty we would have no time left to earn a living is easily capable of demonstration. What, then, is the proper attitude to adopt toward this ever-increasing flood of information that pours in upon us so relentlessly?

SUBSCRIBERS' ATTITUDE TOWARD PAPER

If we look about us to see how our fellow engineers solve this matter we shall find a great variety of attitude toward the problem. Some engineers simply do not take engineering journals, reading one occasionally here and there as opportunity offers. Others take all they can afford to take and let them pile up around the office, often unopened and unused. Others still limit themselves to a select few, which they carefully bind and shelve. Still others read journals when they can, and throw them away when they move on. As a rule, however, the engineer prizes his technical paper, and endeavors in some ill-defined and formless sort of fashion to preserve its information for future use. Generally he fails to find any practical scheme which makes his rapidly accumulating material of much value to him after it has once passed under his eye, and for a large number of engineers technical journals are only professional newspapers with which to idle away an hour or so and satisfy their curiosity. That their value is something much more than this, or should be more than this, is so apparent as to need no denial.

The problem of the engineer with his technical paper is much affected by his age, station and aim in life. To the man who is engineering only to get money and more money, the engineering journal is a newspaper, in which he may notice mainly where there are better jobs than his own that may be sought after and perhaps obtained. To the man who is anxious to fit himself every year of his life for something better it is an opportunity, quite unequaled many years ago, for a great variety of study. To the young engineer the engineering journal, properly read and noted, is a part of a post-graduate course in engineering. To the middle-aged man it is a mine of data, bearing in all sorts of ways on his work; and to the mature specialist only does it begin to become burdensome by its repetition of experience, and its volume of matter on subject which has already, to him at least, been well digested. Let us see if we can outline how each of these classes can get more profit out of the matter contained in the engineering journals than do the careless or the indifferent, who, after their journal is once looked over, let it go to waste or idleness.

PROBLEM OF YOUNG ENGINEER

The young engineer and the college graduate need, most of all, practical experience. It is safe to say that engineering literature will never have any proper perspective for him until he has been connected in some capacity with engineering work himself, be it in ever so modest a capacity. With the actual doing of engineering work, however, should come contemporaneously the reading of technical journals, particularly along the lines in which he is working. Nothing can be more instructive, broadening, and enlightening to a man doing a particular kind of work than reading about similar work at the same time. It follows, therefore, that the young engineer should, as early as possible, take at least one first-class engineering journal and own it himself; bind it if he can afford to, but lay it away in an orderly manner, in any event. If he can afford two journals so much the better.

It is to be doubted if laborious reading of all kinds of engineering articles all the time is advisable for anyone. Mere quantity of reading is mentally detrimental. If one might advise, it would be to suggest enforced systematic reading of all articles particularly bearing on the line of work the reader is immediately engaged upon, and the optional reading only of such other articles as interest him. This ought not to be much of a task. In course of time as his experience broadens, engineering reading will become less burdensome and more interesting because its relation to practical matters will be more and more appreciated, and the discriminating use of engineering literature better understood. Of course, all this applies to engineering societies as well; but that is another story.

It is probably not wise for the young engineer to indulge extensively in card indexes, filing systems, and the like, for topically arranging his available engineering journal articles. Few men know very early in life where fate and interest will land their future attention, and filing systems and special indexes are expensive and time consuming, and when indulged in without definite aim nearly always quickly become too voluminous and thereby useless. If any suggestions are made along this line, it would be to start a loose leaf, letter size ($8\frac{1}{2}$-in. x 11-in. page) notebook and note in it (separate pages for separate subjects) only what appears to be extremely useful, either in exceedingly brief abstracts from articles, or diagrams and costs.

The young engineer is tempted to read much about large enterprises—the Panama Canal, big bridges, astonishing tunnels, great dams. This does no harm, and probably holds his interest for the time being. Gradually he learns that, for him at least, the chief value of the technical journal does not lie in its dramatic side, necessary as that may be for our general information, interest and pleasure, but its chief value lies in a fund of small things, which make up routine work of the ordinary every-day job. These are to be watched for, and noted, as practically useful to the average man.

THE MIDDLE-AGED READER

We next come to the man in early middle life, actively engaged in his profession, and note at once that his problem with the technical journal is the absence of "time." Absorbed in a multitude of responsibilities, harassed with unexpected difficulties, worn out at night with the long day of strain, how shall he derive any useful good from the multitude of journals which his more ample income can readily afford, but which pile high on his table after every brief absence from the office? Whether or no such an engineer shall make any effort systematically to assimilate, file, and study current technical journals depends in part upon the nature of his routine. If he is largely engaged in administrative work, or is a salaried officer in a large enterprise with a comparatively limited range of problem or a limited call for miscellaneous data, he may generally be content with a cursory examination of the engineering journal such as will keep him qualified on his undertaking, and the preservation of such journals in bound form, with the standard published indexes. If, however, he is entering upon novel work, or work presenting a great variety of problems, overlapping into a great variety of fields, ambition will compel him to do more than this, and some form of special indexing will appeal to him more or less strongly as he feels the need more often for research in up-to-date material.

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*Abstract of a paper presented by John W. Alvord, consulting engineer, Chicago, at the Convention of the Federation of Trade Press Associations, Chicago, September 24-26.

The average editor can judge of a technical article with only a brief inspection—a sentence here and there, a headline, and a moment's reading of the summary and conclusion. Long familiarity with matter of a similar character gives him the assurance that he can detect in this rapid review anything novel, new, or original, and can fairly pass judgment upon it in a general way. The working engineer who has had some experience with technical literature can form the same habit, and save much time. It is really wonderful how much repetition there is in engineering writing and in the production of engineering papers. It thus happens that we are under the necessity of seeing much the same facts and principles repeatedly published in varying form, for some one is always attracted to really read them, with consequent benefit to himself, under the belief that they are new and novel.

The mature engineer notes that a large amount of engineering literature is of the purely descriptive order, merely giving outline of work that has been accomplished without going into reasons or principles. All this kind of writing is valuable and useful, and has its proper place, but all of this class of literature has its limitations. One of the most severe of its limitations is that it rarely describes mistakes, errors of judgment, or failures, and in these lie the most valuable lessons to the seeker after truth. One is obliged to read between the lines or read with reservation, much as one does in reading accounts of battles in the daily press. It is always wise to look back and note the origin of the despatches in such cases.

A tremendous lot of engineering literature is written which is of little permanent value. Often it represents the writer's struggles to understand a subject. Often it is compiled largely from a desire for publicity. Fortunately the editors of the technical papers can limit this kind of reading by care in selection.

SEPARATING WHEAT FROM CHAFF

But amid all these drawbacks a discriminating mind will always find a great deal of wheat amid the chaff, and the wheat that will be gleaned will be of differing kind and amount, depending upon the type of mind of the reader, his present problem, and his desire to systematize his information. What, therefore, shall he do with his special selection when once he thinks he has separated it from the flood of raw material?

Several courses are open to him:

First, he may rely on his memory and the published index to his bound volumes. It is safe to say, however, that few engineers really make much practical use of this method. The intervening index and the bother of a search prove to be discouraging to that degree that a proposed reference search is abandoned in about one-half the suggested attempts. The ideal filing system is one in which, with the least amount of effort, one can put his hand immediately and accurately on the thing itself, be it a book, pamphlet, or a data sheet.

Second, he may keep a special card index of important data and reference to valuable articles. This at once involves labor and attention which few busy men can give and which, if done by assistants or librarians, largely loses its personal value to the one who needs it. The same objection as to the discouraging effect of intervening indexes holds good here, too, and it is further safe to say that of all the contrivances for indexing the most difficult to handle readily and examine rapidly is the card index system.

Third, he may abstract important data in a limited way on loose-leaf transparent paper, standard letter-size, and he may remove or detach articles of special value from out his journals, to be filed in regular office file system, like correspondence.

The writer has tried all of the above methods at considerable cost in time and patience, and has, for many years, settled upon the third method. With all its admitted limitations it seems to be the best for an office which is expected to find out information on a great variety of subjects in a limited time, and with the least amount of effort.

THE MATURE ENGINEER

We come finally to the mature and experienced engineer of advancing years. How can he make engineering and technical literature of use? It is safe to say that when an engineer has much passed fifty or sixty years of age and has led an active life, his need for engineering literature lessens. Out of the mass of detail which seemed to him so overwhelming and endless in his youth and early manhood, fundamental principles emerge like peaks out of the clouds, and upon these as foundation all detail classifies itself simply and naturally, and therefore he feels less need for accumulated data or particular description. Probably no one enjoys engineering reading as does the mature engineer, for he can read between the lines and find much to instruct as well as interest, and yet while he is probably the most interested and intelligent reader of engineering literature that the journals have, his ambition as a collector is gone and filing systems no longer appeal to him.

If his acquaintance is wide, he reads with interest the accomplishments of his friends, and the addresses of society presidents and articles on the ethics of the profession. Of failures he is the keen student. The personal column appeals to him, and if he is of right-mindedness he is conscious of more pleasure than formerly in the accomplishments of those who have succeeded and succeeded well in dire and burdensome responsibility. More often than the young man he will turn back for his satisfaction to papers that served him well in times past, and perhaps smile at the lack of improvement that later attempts to deal with their subject often show.

Technical papers, along with the technical societies and their proceedings, form the repository of the professions; they are the interchange of experience, the common store upon which we all draw. Without them we would be strangely helpless. We are more or less indebted to everyone who records his experience for the common use, and that debt we should endeavor to helpfully repay in kind, but wisely, concisely and thoughtfully.

Dr. E. B. Rosa, secretary of the joint committee on electrolysis, states that the next meeting will be held about Nov. 15 and that in the meantime the several subcommittees are expected to prepare reports which are to be sent out to all members of the committee by Nov. 1 in order to give an opportunity for study of the topics to be taken up at the next meeting of the general committee.

LIBRARY OF THE UNIVERSITY

British and German Electrical Situation

According to British Tramway Managers, Greatest Effect of European War Is Drain on Employees—Abstracts from German Papers Showing Disturbances in Electric Industry and Advance in Prices of Electrical Machinery

ELECTRICAL CONDITIONS IN GERMANY

GERMAN TECHNICAL PAPERS FEEL EFFECTS OF WAR—10 PER CENT ADVANCE IN PRICE OF ELECTRICAL MACHINERY

After a long period of interruption the German technical papers are beginning to reach the United States, and from their contents the present great industrial disturbances in Germany are apparent. The journals themselves appear with a greatly reduced number of pages and are usually accompanied by publishers' announcements that regular publication cannot be promised at present. The levies made include not only the younger members of the editorial and business staffs, but the enrollments have also evidently deeply affected the printing, engraving and other trades connected with magazine publication.

The technical papers and engineering societies are doing their best to ameliorate conditions by urging engineers who are out of work in their usual line to offer their services, even at "existence" wages, in those industries which are exceptionally active on account of the war. Employment bureaus have already been established for this purpose. The publishers of *Electrische Kraftbetriebe und Bahnen* have issued an appeal to their readers that this is the opportune time to carry out maintenance work on the most liberal scale possible in order to give employment to men who have lost their positions because of the present disturbances. Many papers are also giving free space to appeals for Red Cross funds.

Most of the electrical manufacturers in Germany have cancelled all previous prices for equipment. Thus an advance of 10 per cent has been made in the price of electrical machinery, including the principal railway materials, exclusive of an advance of 20 per cent in the price of transformers and automatic switches. All quotations on motors and generators exceeding 100-kw capacity and on transformers exceeding 500-kva capacity have been withdrawn. Storage-battery quotations also have been withdrawn owing to the shortage of lead.

An article in the *Electrotechnische Zeitschrift* of Aug. 27 shows that in the middle of August the eight countries at war had a population of 350,000,000. Of the business done in 1913 by Germany with this population, 3¼ per cent comprised electrical equipment. Exclusive of Montenegro, the German manufacturers in 1913 did a total business of $5,832,250 with Austria-Hungary, $5,436,250 with Belgium, $4,597,750 with France, $8,605,250 with England, $9,900,250 with Russia and $73,000 with Servia. Of Germany's electrical exports, 34.62 per cent were with its present European opponents. No figures are given on the loss of business with other countries, which, of course, are now shut off from Germany, except Austria-Hungary, which took 7.06 per cent of German electrical exports.

Stahl und Eisen for Sept. 3 discusses the possibility of American iron founders capturing German business from South America and other countries. It points out that even if American manufacturers do secure orders they will be greatly handicapped because of the small number of American ships. Thus, reference is made to orders for 10,000 tons of iron for Chili and 28,000 tons for Australia which cannot go forward for this reason.

As practically all German electric railway employees are former soldiers, the railway service in many cities had to be cut down very largely during the mobilization period. In many cases women acted as conductors, 600 being so employed on the Great Berlin Street Railway alone. By the first week of September, however, conditions had improved to such a degree that it was not necessary to employ the women more than five hours a day, and it was expected that within the next two or three weeks their number would be greatly reduced. The Berlin company also announced that it would carry free of charge all enlisted soldiers, volunteers and reservists unless such traffic interferred too heavily with the regular service.

BRITISH TRAMWAY SITUATION

ACCORDING TO GENERAL MANAGERS OF LEADING SYSTEMS, EUROPEAN WAR HAS NOT MATERIALLY AFFECTED BRITISH TRAMWAYS EXCEPT AS TO DECREASE IN EMPLOYEES

Through the courtesy of the managers of several of the leading tramway systems in England, the London representative of the ELECTRIC RAILWAY JOURNAL has secured statements showing the general effect of the present European war upon the operating and financial conditions of their companies. These opinions are published below in part.

According to C. W. Mallins, general manager of the Liverpool Corporation Tramways, the tramway service in that city has not yet been appreciably affected as to receipts. The ordinary service has gone on without interruption, owing to the fact that the system had a large number of men engaged on holiday duty, which has for the present been suspended. There was also a large number of eligible men on the books for engagement who have now been brought into service. The corporation is paying the difference between the government pay and the ordinary railway wages of the 600 employees who have joined the army, so that their families will not suffer from the enlistment. Moreover, each employee is to be reinstated on return without loss of position or emolument. A large number of reservists and territorials stationed in and passing through the city are allowed to ride free on the cars. In order to maintain a proper check tickets were printed and given to the officers for distribution among the men. Each ticket is a pass good for one ride to any member of the territorial, military or naval reserve forces in uniform upon the date endorsed thereon. Mr. Mallins states that the system has worked admirably and the tickets have not been abused.

Advices from the chief office of the London County Council Tramways are to the effect that between 1100 and 1200 men of all grades have been called upon or have volunteered since the declaration of war. These men have been temporarily replaced as far as possible by men of more than thirty-five years of age. The council has granted under certain conditions full civil pay less naval or army pay and army separation allowance to enlisted men. Owing to the large number of men joining the forces some reduction in the service of the tramways was inevitable, but the Board of Trade and police authorities sanctioned the extension of the use of the by-law as to the carrying of excess passengers in the lower saloons of the cars, which materially assisted in relieving inconvenience to the traveling public. The receipts of the lines have been well maintained, but what the ultimate effect of the war will be in this regard it is difficult to estimate. Immediately after the declaration of war the council granted free transportation to the military and naval forces, ambulance corps and red cross nurses in uniform and subsequently to special constables to and from duty.

James Dalrymple, general manager of the Glasgow Corporation Tramways, states that during the month of August the lines lost 751 men, half of which were reservists and the other half territorials. During the week of Sept. 15, the company had been endeavoring to raise a full battalion of 1100 men out of the tramway department, and by the end of the week the company expected to send off to camp about 800 men. In regard to service and receipts, Mr. Dalrymple says: "We have to a certain extent reduced our service as we have not been able to fill places of all the men on account of the insufficient time to train men for the work. We expect, however, that in about a fortnight's time the staff will be up to the full strength. The men being taken on are, of course, only temporarily engaged, and we are not so particular in regard to their fitness for the work. The revenue is keeping up to last year, as the citizens of Glasgow are going about their work as usual. The employees of the company have agreed to contribute £3,100 to the Prince of Wales' relief fund. This contribution is being spread over a period of six months, weekly amounts being deducted from wages."

Out of the staff of 1800 men of the Sheffield Tramways 200 have joined the army and navy, according to a statement from A. R. Fearnley, general manager. This shortage of men has been made up by stopping holiday leave and reducing the number of men allowed a weekly holiday. The traffic receipts have thus far shown only a slight decrease and the only limitation to the service has been the withdrawal of a few part-day cars which, even at the busiest time, do not always show a profit in working. A number of the large plants in the east end of Sheffield are working overtime so that the workmen's traffic in that direction has not shown any perceptible decrease. As regards general conditions, Mr. Fearnley concludes as follows: "There is no evidence to indicate to a stranger in Sheffield that the European war has made any difference in the ordinary business or daily life of the inhabitants."

J. M. McElroy, general manager Manchester Corporation Tramways, places the number of employees who have been called or who have volunteered for active service at 700 out of a total of 5203 employees, or 13.45 per cent. The vacancies are gradually being filled by temporary engagements. The corporation is allowing half wages to army and navy reservists and territorials during the period when they are absent from work on naval or military duties, and no employee who volunteers for active service is in a worse monetary position by reason of his enlistment. Assurance has been given to all enlisted employees that their places will be held open for them. The amount the department is now paying out in allowances to families of employees at war exceeds £400 per week. The number of families in receipt of the allowance is 566 and the amount paid to Sept. 12 was £1,261. According to Mr. McElroy, the morning and evening rush traffic in Manchester has decreased. The receipts for the last four weeks and the corresponding period for the previous year were as follows: Week ended Aug. 15, 1914, £17,938; 1913, £15,140; Aug. 22, 1914, £16,434; 1913, £18,809; Aug. 29, 1914, £15,848; 1913, £17,413; Sept. 5, 1914, £17,537; 1913, £17,925; Sept. 12, 1914, £16,747; 1913, £17,761. The figures show a drop of £1,000 in the receipts for the week ended Sept. 12 as compared to the corresponding period the year before. A relief fund is being established by the City of Manchester from contributions made by the employees of the various departments. The contribution of the tramway officials and employees averages about £100 per week, the total contributions to Sept. 12 being £300. On Aug. 31 the corporation instituted a system of collections on the tramway cars to aid this fund. The "used" ticket boxes, one of which is fixed at each end of every car, have been converted into a receptacle for coppers and notices posted in the cars. The collection is purely voluntary on the part of the passengers, but during the two weeks ended Sept. 12, £463 and £471 were collected.

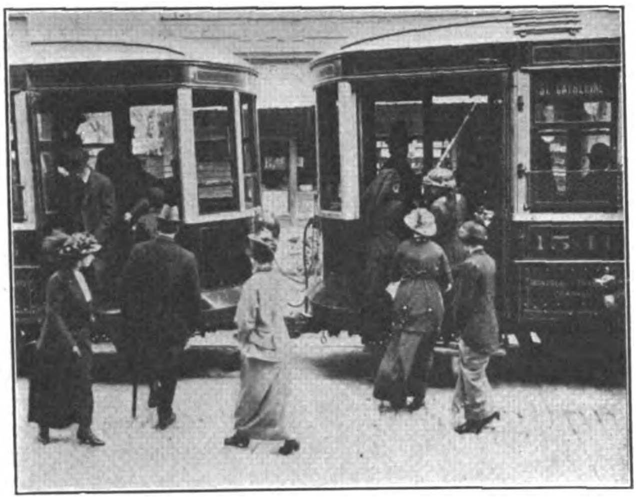
The Salford Tramways Department has already lost 198 out of its 1239 employees. G. W. Halford, general manager, explained to the representative of the ELECTRIC RAILWAY JOURNAL that the difficulty occasioned by this temporary reduction of its staff was being met by rearrangements rather than by a temporary engagement of new men who would have to give way when the old employees returned. The men who have left the service have been guaranteed re-employment, and while away will receive their usual wages, less the army pay and allowances to wives. The decrease in the number of employees have been met by stopping holidays and granting pay in lieu thereof and also by utilizing the service of the older trolley boys as temporary conductors, thus releasing a number of conductors who readily responded to the request of the general manager that they be trained as temporary motormen. The chief difficulty is in the shortage of the motormen, for it takes from three to four weeks to train men for such service. Mr. Halford states that the most marked falling off in receipts has been in regard to week-end traffic, showing that people were not taking their Saturday and Sunday afternoon outings as usual. Added to this was the fact that more than 30,000 had left the city in the last two weeks. The receipts in Salford for the five weeks ended Sept. 7, as compared to the previous year, follow: Aug. 10, 1914, £4,774; 1913, £4,949; Aug. 17, 1914, £5,179; 1913, £5,104; Aug. 24, 1914, £4,669; 1913, £5,041; Aug. 31, 1914, £4,695; 1913, £5,267; Sept. 7, 1914, £5,357; 1913, £5,603.

BRITISH SUPPLY HOUSES OPTIMISTIC

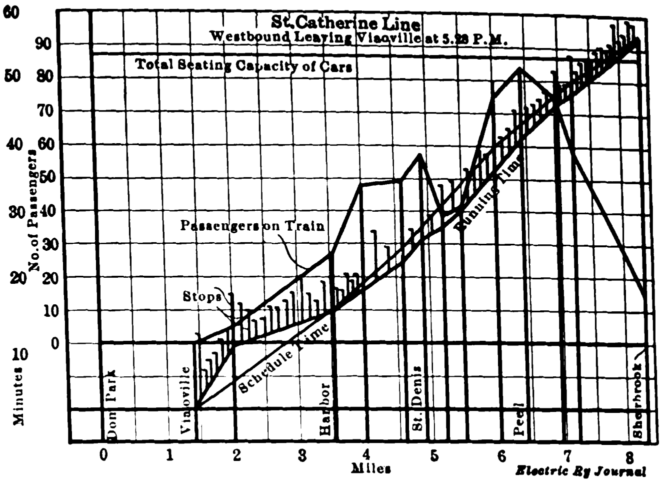
The *Tramway and Railway World* of Sept. 10 contains a digest of the opinions of electric railway manufacturers regarding the trade conditions in the British Isles. British manufacturers believe that neither home nor oversea buyers need anticipate any difficulty in having their requirements fully met, and state that orders from foreign buyers will receive the most prompt attention. The present time is looked upon as an unparalleled opportunity to British manufacturers to extend their markets on account of the cutting off of supplies from Germany, orders for which must now be cancelled. The electricity committee of Bradford has already cancelled a contract for a 5000-kw turbo-generator with the Bergmann Electricitäts-Werke A. G., Berlin. The contract has been given to the British Westinghouse Electric Company. The German generator, which was almost completed, was to cost £9,370. Many other electrical stations, municipal and private, have been forced to cancel German orders and start afresh with British firms. It is reported that one or two of the large trunk lines in England have had their supplies of German electrification material cut off.

Trailer Operation on St. Catherine Street, Montreal

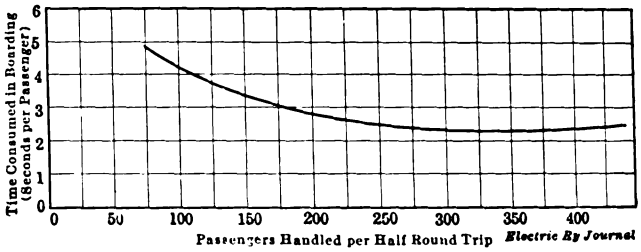
Since Feb. 1, 1914, the Montreal Tramways Company, operating all the electric railway lines in the Canadian metropolis, has been conducting trailer service on St. Catherine Street, the principal east and west thoroughfare of the city. Twenty-five trains are in regular operation on weekdays and Sundays for a period of eighteen hours each. The normal headway between trains is four minutes, and the route extends between Viauville and the intersection of Victoria and Sherbrooke Streets, the round trip distance being fifteen miles. Other lines serve portions of the route, branching off at various intersection points, and a single-car service on a four-minute headway alternates with the train service, the former being carried over a somewhat longer route than the latter. The frequency of service afforded on the greater part of St. Catherine Street has tended, heretofore, to withhold from the trains a patronage which would test their capacity to the limit over a long period, but the public has correspondingly benefited by the increased amount of service accommodations rendered.


MONTREAL TRAILERS—BOARDING AND ALIGHTING PASSENGERS AT NORMALLY CONGESTED POINT

Each train consists of a double-truck motor car hauling a double-truck trailer, the cars being 42 ft. 6 in. long. The motor equipment consists of four Westinghouse No. 533 commutating-pole motors, rated at 50 hp each. The motor car seats forty-two passengers and the trailers forty-eight. Both of these cars have been fully described in previous issues of this journal. They are designed for single-end operation, with folding steps and doors, the latter being 26 in. wide between posts. Simultaneous entrances and exits are easily made at the middle doors of the trains, and, as shown in one of the accompanying cuts, the duration of stop per passenger boarding, deduced from 117 trips, has a minimum value of 2.3 seconds. With a low volume of traffic the time per passenger rises to a maximum of about five seconds, but between the limits of 225 and 450 passengers boarding per half round trip little change occurs in the unit time.



MONTREAL TRAILERS—TYPICAL DIAGRAM USED TO RECORD TEST RESULTS



MONTREAL TRAILERS—AVERAGE BOARDING TIME FOR PASSENGERS

A large number of observations have been made by the company upon the performance of these trains, including comparisons with single car service, and the results have been plotted on diagrams. These diagrams record the running time between streets, passengers on the train, schedule time, length and location of stops, seating capacity and other data.

A summary of various tests with these trains is shown in the accompanying table in which trips at different times of day are recorded under four classifications. The company's officials feel that too few so-called 6 p. m. trips were observed to make the average data tabulated conclusive, but those that are given indicate that the schedules are on the whole closely maintained. Throughout the entire day the stops average close to eight per mile, and it appears easily possible for these trains to make schedule speed, including stops, of 7.5 m.p.h., even in the most congested district of the city, and for half trips there is every indication that a maximum schedule speed of 9 m.p.h. could be maintained throughout the greater part of the day. The local ordinances, however, limit this speed to 8 m.p.h.

TWO-CAR TRAIN OPERATION ON ST. CATHERINE SHORT LINE. AVERAGE RESULTS, MARCH 2-25, 1914

	Eastbound							Westbound						
	Number of Trips	Number of Stops	Passengers Handled	Time of Stop, Seconds	Time at Rest, Minutes	Running Time, Minutes	Schedule Time, Minutes	Number of Trips	Number of Stops	Passengers Handled	Time of Stop, Seconds	Time at Rest, Minutes	Running Time, Minutes	Schedule Time, Minutes
A.M. Trips: Till 11.30 a.m.	18	52	124	11.4	9.9	49.5	51.0	28	52	130	10.6	8.9	49.8	51.0
Noon Trips: 11.30 a.m. to 2.00 p.m.	16	56	189	10.9	10.4	50.2	51.4	18	62	206	12.1	12.0	52.7	53.3
P.M. Trips: 2.00 p.m. to 4.30 p.m.	11	58	169	12.0	11.6	54.9	54.0	10	53	157	12.3	10.8	53.2	54.0
6 o'Clock: 4.30 p.m. to 7.00 p.m.	8	64	304	14.1	15.3	58.5	57.0	9	52	159	11.2	11.4	55.9	56.0

General Averages:	Eastbound	Westbound
Number of stops	56	55
Distance between stops	652 ft.	653 ft.
Stops per mile	8.1	8.1
Distance between stop signs	410 ft.	418 ft.
Stop signs per mile	12.9	12.7

On the trains the starting signal is given to the train motorman by a signal lamp housed in a small case in front of his position, the closing of the doors completing the circuit. Energy is supplied for this purpose from the trolley lead, through an appropriate resistance, and an extra lamp is provided in case the first burns out at any time. The trains are also equipped with emergency valves controlled by ¼-in. pins mounted on the radius bars of the cars, to guard against splitting switches. In case the radius bar exceeds a maximum swing of 58 deg. the pin is sheared off, opening the emergency valve and applying the brakes before the car has time to damage itself. Without the use of these automatic valves and pins the swing of the radius bar beyond 65 deg. would damage the car. The cost of application is only about $2.50 per car.

Death of Captain McCulloch

Capt. Robert McCulloch, president of the United Railways of St. Louis, died at his home in that city on the morning of Sept. 28. The funeral was held on Sept. 30, and out of respect to him the electric cars on the United Railways system ceased operation for five minutes during the funeral.

CAPT. ROBERT M'CULLOCH

Captain McCulloch was in excellent health up to the day before he died. He was at his desk all of Saturday, Sept. 26, and when he retired that evening gave no intimation that he was not entirely well. He was found unconscious the next morning and passed away about twenty-four hours later. The cause was cerebral hemorrhage.

Captain McCulloch had been connected with the street railway interests in St. Louis practically continuously for the past forty years. He was born in Osceola, Mo., Sept. 15, 1841. At the age of five years he became an orphan and then went to live with a cousin whose home was near Lexington, Va. He was in the military school at Lexington at the time of the outbreak of the Civil War, and, with practically all of the other students in that academy, enlisted in the Confederate service. Because of his training he was appointed an adjutant and two years later was promoted to be captain. He was wounded five times, twice in the Battle of Gettysburg, where he was left for dead on the field, but was captured by the federal troops and nursed to life. He remained a prisoner for one year but was then exchanged, rejoined the army and served under General Lee until the surrender at Appomattox. He revisited Gettysburg at the time of the fiftieth anniversary of that battle a little more than a year ago. On his return he wrote a most interesting description of the battle, which was read in St. Louis at a meeting of the City Club, where he was the guest of honor.

At the close of the Civil War, Captain McCulloch returned to Missouri and in the early seventies was appointed superintendent of the Bellefontaine Street Railway, of which his cousin, Colonel Shackleford, was one of the principal owners. When a number of St. Louis railways were merged in 1899 Captain McCulloch was made general manager of the system and remained at its head until all of the railways in the city were consolidated into the present United Railways System. For a period in 1901-1904 he was general manager of the Chicago City Railway, which was controlled by the same syndicate which owned the lines in St. Louis, but he returned to St. Louis just before the World's Fair in that city and was placed in active control of the St. Louis lines with the title of vice-president and general manager. A short time later he was made president and general manager, a position which he has held actively until the day of his death. Captain McCulloch always took a keen interest in the affairs of the American Street Railway Association and its successors and was president of the association in 1896-1897.

Captain McCulloch abhorred red tape in the conduct of his business. His office was always accessible to those who had business to conduct there. Its style of furnishing was simple, and even the word "president" was not painted on the door. He kept in close touch with all of the phases of the work but his interest was in the welfare of the employees. Virtually his last official act was to approve a plan for the organization of a building and loan association, of which the stockholders were to be confined exclusively to the employees on the system, and by this plan he hoped that many of the employees would be able to own their own homes. The editorials in the daily papers of St. Louis and the expressions of opinion by representative citizens of that city following his death show the high esteem in which Captain McCulloch was held by all classes.

National Conference on Taxation

The eighth annual conference on taxation in Denver, Colo., on Sept. 8 to 11 was attended by representatives of state commissions, economists and citizens from thirty-eight states and the District of Columbia. The subjects discussed that were of most interest to electric railways dealt with the taxation of foreign corporations and securities, the federal income tax law and public expenditures.

J. F. Zoller, tax attorney of the General Electric Company, gave an exhaustive account of the discrimination and special treatment shown to foreign corporations in the revenue legislation of the various states. His main complaint was directed against the confusion caused by the imposition of a tax upon the entire authorized capital stock regardless of the issued stock and of the capital stock employed in the particular state. Mr. Zoller believed that property should be taxed once where located whether by property tax or by franchise tax, that the latter should be levied only upon the capital employed in the state and that shares in the hands of the holders should be exempted. W. Hastings Lyon, counsel to committees of the Investment Bankers' Association of America, stated that a tax on mortgages or securities should be paid to the community of residence of the owners. According to Mr. Lyon, the taxation of bonds without the taxation of stock in the hands of its owners tends to force investments in equities and is unfair to the citizens of a state, and to tax a stockholder is no more double taxation than to tax a bond holder.

A. C. Rearick, counsel to the committee of railroad counsel on the federal income tax law, criticised the ambiguity and contradictions in the law and particularly the complications arising from the plan of collection at the source. These occur in connection with the obligations of corporations payable to bearer and even more so with the obligations containing the "tax free" clause. The effect of the plan of collection at the source, Mr. Rearick believed, should be abandoned and the tax based upon a personal return of the tax payer. The danger of evasion under this method has probably been exaggerated and at any rate could be avoided by securing information at the source. Luther F. Steer, deputy commissioner of internal revenue, described in detail various administrative problems of the income tax law. Charles A. Bullock, professor of economics, Harvard University, gave a comprehensive inquiry into the disadvantages of the collection-at-the-source method.

One of the most interesting subjects of discussion before the convention was the report of the committee on the increase in public expenditures. The substance of this was that enormous savings may be accomplished within the limits of government as now organized and that further extensions of governmental activities should for some time be financed out of savings. To this end it was recommended that the National Tax Association adopt a resolution urging Congress and state legislatures to direct the annual publication of statistics regarding expenditures, taxation, public debt and wealth for the various governmental units. Furthermore, the national and state governments should establish bureaus of efficiency to ascertain where economies might be introduced, and to make such bureaus effective the government should be simplified through the introduction of the short ballot, a single legislative chamber, a reduction in the number of elective executive officers, a closer relationship between the legislative and executive departments and a fiscal budget. To get such movements under way the committee recommended the resumption of the work by the National Tax Association or the organization of a national taxpayers' efficiency association.

The report of the committee on double taxation was to the effect that interstate comity can be established only by mutual agreement among the states as to what classes of property have a taxable situs in each. The above mentioned papers and reports, as well as others delivered at the conference, will be printed in the proceedings of the National Tax Association, to be issued prior to Jan. 1, 1915. The sale of this volume to nonmembers and the details of membership are in charge of the treasurer, A. E. Holcomb, 15 Dey Street, New York.

Record Storm in Kansas City

The section extending along the Southwest Boulevard from Bell's Hill in Rosedale to Twenty-fourth Street in Kansas City, Mo., a distance of about 1 mile, was visited on Sept. 7 by the worst rainstorm in the history of that city. At some points the flood reached a depth of 10 ft. in a period of two hours. A portion of the Kansas City Railway's Southwest Boulevard Division was out of service for a short time and damage was done to other lines in the city.

The deluge was so sudden that before the workers at the carhouses, officials and trainmen who had been called at the first indication of danger had completed their work of rescuing cars they were obliged to swim several blocks to places of safety. Fortunately only six out of a total of thirty-six cars in the carhouse were put out of commission, and these had their armatures soaked; loss of much property and office equipment was experienced, however, and at one time the water reached a level of 11 ft. in the carhouse offices. The men on duty managed to save the records and papers by placing them on the top of the cashier's cage out of reach of the water. At five o'clock on the morning of the storm the flooded district extended for a mile along the right-of-way with the carhouse as a center and was nearly three-quarters of a mile wide. At no time during the fifteen hours that the tracks were under water was the line entirely out of commission; regular schedule service was continued east and north of the flooded section and a fair service was rendered from the west line of the flood to the terminal. At six o'clock the water had receded to an extent which made it possible to clear the tracks of a large amount of wreckage and débris panying illustration, and forty-five minutes later the entire line was in operation.

KANSAS CITY FLOOD—FURNITURE SAVED FROM OFFICE OF SOUTHWEST BOULEVARD DIVISION

KANSAS CITY FLOOD—WRECKAGE OPPOSITE SOUTHWEST BOULEVARD CARHOUSE

The company's asphalt repair plant, which is located in the rear of the Boulevard carhouses, was greatly damaged, as were the supplies for the plant which were stacked near by. Several other lines of the system were also badly affected by the cloudburst. In addition to this all the basements of the substations were filled with water. The loss to the company is said to be about $50,000.

Advancement of American Commerce

Secretary of Commerce Redfield has appointed seven commercial attachés who will be connected with various United States embassies and legations and who will devote their time solely to the advancement of American commerce. They are as follows: C. W. A. Veditz, of Philadelphia, to be at Paris; Lincoln Hutchinson, University of California, at Rio de Janeiro; Julian H. Arnold, now consul-general at Hong Kong, at Pekin; Irvin W. Thompson, of North Carolina, at Berlin; Albert Hale, of Indiana, at Buenos Aires; A. H. Baldwin, former chief of the Bureau of Foreign and Domestic Commerce, at London, and A. I. Harrington, of Ohio, at Lima, Peru.

The National Association of Manufacturers announces that President Yuan Shih Kai of China has asked it to nominate a commercial adviser to the Chinese Republic. At a proposed meeting in October the Foreign Trade Commission of the association will present a tentative agreement which it has made with the Chinese Republic for closer trade relations.

COMMUNICATIONS

Insert Special Work Failures

MONTREAL TRAMWAYS COMPANY
MONTREAL, P. Q., Sept. 22, 1914.

To the Editors:

The article in the ELECTRIC RAILWAY JOURNAL of Sept. 19, on "Insert Special Work Failures" is worthy of thorough consideration by both engineers and manufacturers. Improper installation, improper spacing of ties, improper design of tie layout even with the use of special ties, causing non-uniformity of tamping and thus resulting in undue stress on the castings, no doubt contribute their portions to failure of any special work. But the track engineers of many of the larger companies have in recent years become specialists in the installation of special work, and are giving more and more attention to the details of installation. Particularly the foundation, as a contributing cause of failure, is much less of an offender than is generally supposed. The managements of the larger companies, realizing that practically one-third of the cost of the entire property is invested in track work and a large percentage of this in special work, are now interested in obtaining the best design and workmanship, hence large costs are not thought extravagant in this particular part of track work.

As to lax maintenance, your statement is more or less true. The life of most insert work, if failure becomes slightly apparent and is taken in time, can be much prolonged by slight repairs. But with properties having 600 to 1000 special-work layouts, and where after several years of service a large number of inserts need attention, the maintenance at low cost is quite a problem. That fastening of inserts which is simplest of adjustment is the least expensive to maintain and the most practicable. In my opinion, this character of fastening should be the accessible bolted type that can be adjusted without removing adjacent pavement, and which rests partly on a machined bed and partly on spelter. This would eliminate what you term "experts" to maintain them, except in unusual cases. Moreover, this duty may be detailed to the section men under whose daily inspection the layouts come.

In my experience the most common failure in insert work is the loose center. The breaking or loosening of arms in the cast-iron-bound type has been rare, and due mostly to the fact that the iron binding is not carried far enough along the rail arms. Usually some allowance must also be made for unequal bearing on the foundations,. this being a mechanical possibility in manufacture, and not due to foundation installation.

The flange bearing approach to the intersection of the gage lines is not long enough in most special work. Unless a much larger plate is provided, which very materially increases the cost of the casting, this cannot be had. As a rule no specific length of incline is required, this being left largely to the manufacturer. The throatway should also have a long guiding taper to enable flanges to enter the narrow portion gradually, as the side thrust from this source tends to disturb the plate as much as impact. This also would involve larger plates. In my opinion the floor of the throatway should be as nearly as possible the depth of the flange. While it is desirable to have the intersection of the gage lines entirely flange ridden, this is impossible to maintain, but the simultaneous bearing of the tread and flange, which we always have after some wear, tends very materially to reduce the impact. The practice of allowing inserts to become quite loose before adjustment is very bad. In insert work it is very important to make the "stitch in time," hence preference for simplicity and accessibility of fastening.

I do not agree with your statement relative to the use of the 9-in. rail, even in case of the operation of interurban cars. I believe that a 7-in. rail, either T or girder type, answers the requirements of our heaviest traffic, and the increased cost of the high-rail special work is very considerable. The tendency at the present time is to use shallower and smaller blocks for paving purposes, which, in my opinion, eliminates the necessity of any higher class of construction than 7-in. rail provides.

Next to loose centers, the most serious failure is cupping adjacent to the insert. This, I believe, can be overcome partially by making a larger plate, longer runoff and long tapering throatway and by special care by the manufacturer in casting. The use of small hand grinders or hand files in maintenance to remove the cause of this difficulty has been very effective. The use of grinders either in solid or insert work is, in my opinion, a vital necessity and particularly to delay the cupping difficulty until more reasonable life is had.

As a rule, manufacturers are quite willing to make good any cases of loose or broken arms, unless caused by rough handling in yards. They will also adjust centers when they become loose in an unreasonably short time, particularly when the company has no facilities for adjusting the more complex fastenings of inserts. To meet this latter difficulty, however, I again advocate simplicity and accessibility, as the best of fastenings become loose. W. F. GRAVES, Chief Engineer.

NEW YORK STATE RAILWAYS
ROCHESTER, N. Y., Sept. 29, 1914.

To the Editors:

Your article in the issues of Sept. 19 and 26 regarding special-work failures is most interesting and instructive. The idea of sending a competent man over such a territory for the purpose of getting this valuable data is most commendable and is only another illustration of the value of a technical periodical.

There is one matter, however, as regards the life and wear of the special work, particularly the hard centers or insert, which seems to have been overlooked and this is the effect of the narrow tread of the wheels. In a case of a right-angle crossing the bearing area is directly increased as the tread of the wheel is increased so that the blow struck by the wheel as it jumps the gap or flangeway (assuming that there were no flange contact) would be distributed over a larger area in case of a wide tread than with the narrow one.

The wide-tread wheel also has a distinct advantage in the acute-angle frogs, inasmuch as it decreases, and in some cases will eliminate, the flange bearing and gives a tread bearing across the flangeway at the frog point. This it would seem is a matter which could be well taken up by a joint committee of the American Electric Railway Association as it affects the mechanical, as well as the maintenance of way, department. The increase in the width of the wheel tread would affect the weight of the car and probably some other details of its construction, but it would certainly increase the life of the special work. There ought to be, and is, some width of wheel which would be most economical, taking all things into consideration.

Your criticism of the maintenance of way departments in regard to the matter of maintaining a foundation for special work is certainly to be commended. Too many of us are in the habit of forgetting our special work because it looks so well after we have installed it. A point, however, not mentioned in your article is "how to obtain a good foundation," and for the sake of bringing out some comment on this matter I would suggest as a proper foundation for special work good, hard-wood, sawed ties, a 6-in. bed of crushed stone ballast laid on a sub-grade properly sloped to drain toward a 6-in. tile sub-drain laid from 24 in. to 30 in. below the top of the rail and properly connected to the sewer.

The use of special wooden ties for special work may be objected to by some engineers on the ground that they are difficult to remove or tamp when the special work is renewed. This applies particularly when individual repair pieces are to be installed. There are, however, undoubtedly places where special ties may be used to good advantage.

Any concrete which must be put in on account of the pavement should be between the ties or above them, depending on the type of pavement, and should be made as thin and weak as it is possible to make it and still maintain the pavement properly. This, it seems to me, is a very important point as it will enable the maintenance gangs to tamp up the ties under the special work when it becomes loose instead of putting in shims as is frequently done.

The type of foundation here suggested is a construction which can be more easily maintained, and in addition to this will furnish a resilient base for the special work. That this resilience is desirable is illustrated by the fact that the blacksmith invariably places his anvil on a wooden block in order to absorb the shock, instead of placing it on a stone or concrete pedestal. This resilience of the foundation should absorb the shock and thus relieve the pound and the tendency to cup at the centers. The tendency with this type of foundation would be to increase the life of the special work and, as above stated, make it more maintainable.

With regard to the different methods of holding the insert plates, as described in your article, it would seem that the study and observations which have been made in preparing this article should be given considerable weight, as an inspection of a large variety of work of this kind would, in the general, give average conditions.

The functions of the holding device should be, first, to make the insert plate act as a unit with the remainder of the piece in distributing the load and impact to the foundation, and, second, to make the insert plate renewable. This second feature of the design of the holding device may be objected to by the manufacturers on the grounds that the hard centers should last during the life of the piece. There are, however, enough instances in which the insert plate does not last to make this feature of the design desirable. From the report of the inspection it would seem that all of the different types of hard centers have failed in some instances and that some of each of the different types have remained tight, indicating that there are certain conditions which make all of the designs practical, although those conditions may be difficult to obtain at all times.

While my experience and observations as regards the loosening of centers is somewhat limited, it would seem to me in general, with some noticeable exceptions, that the larger sizes of insert plates do not loosen as readily as the smaller ones, regardless of the type of fastening, and this brings us to another matter in the design of special work which should be given consideration, that is, the shape and detail design of the insert.

A great deal has been written regarding the joint between the insert plate and the head of the running rail. The general conclusions are, I think, that a beveled or mitered joint of some nature gives better results than a straight joint at right angles to the direction of the wheel movement. This joint is not the only matter of importance, as the bevel on the riser for the flange bearing, and the length of the flange bearing are important. This is particularly true when different types of wheels are operated over the same track. For instance, a case which has recently come to my attention is one in which the riser of the hard center was so designed as to take care of the wheels on city cars properly, whereas the flange on the interurban wheels which operated over this same track was such as to throw the weight of the car on the flange at the edge of the insert in approaching the frog point. This flange bearing was carried through to a point so that the tread bearing was again obtained only after the wheel had left the insert plate with a resulting tendency to cup the head of the rail just beyond the insert. The manufacturer's attention was called to this matter and in later designs the difficulty was eliminated by the lengthening of the insert.

This again brings out a matter which is frequently overlooked by the engineers or purchasing agents in regard to the purchasing of special work, namely, that the manufacturers should be given all of the data necessary to properly design the special work. This includes information as to the type of wheel and the great many other data which are frequently not furnished with the specifications for special work. The manufacturers are only too willing to help us solve our problems and they should be given every opportunity by being furnished with data necessary for an intelligent design.

The engineer comes in again for criticism in regard to the selection of the type of special work to be used. This criticism is probably justified, although there are times when, on account of questions of finance or emergency conditions, he is obliged to use materials which he knows are not the ones best suited for conditions under which they are to be used.

Your second article as regards the different examples of failures is most interesting, though the majority of the illustrations can be duplicated in most of our larger cities. With reference to the maintaining and repairing of such special work there are a great many details which can be developed to good advantage. For instance, in the case shown in Fig. 3, this layout can be put in very good condition by resetting the hard centers or by installing new ones to the level of the rail and filling the cupped ends of the running rail by means of a welding outfit so that the whole can be reground.

The suggestion of having special work frequently inspected and maintained by a special gang is a very good one, and with care in selecting the men so as to obtain those who are interested in this type of work a great deal of money can be saved. D. P. FALCONER,

Engineer Maintenance of Way.

In Support of the Flagging Rule

NEW YORK, Sept. 25, 1914.

To the Editors:

The editorial "Proceed Protected by Flag—a Fallacy" in your issue of Aug. 1 has been read by me with interest as well as with regret that it has not occasioned as much discussion as the subject merits. I cannot agree with your views, nor indeed with those of some of your correspondents, for I am of the opinion that a rule permitting a train in an emergency to flag to a point of communication is requisite to the maintenance of regularity of service.

Hostility to a rule under which a train, delayed by the adverse indication of a block signal or other cause, may flag to the next available telephone station in the event of interrupted communication from the point of delay is predicated on the probable incompetence or carelessness of the flagman. But since the flagman who is preceding the train is always within sight and under the direction of the motorman, it is within the power of such motorman to keep a safe and proper distance in the rear of his flag.

The old rule which allowed a train to "Proceed under control within half the range of vision" was suited only to a city street railway, and had no rightful place in the code of a high-speed interurban line. Its elimination marked a long step toward "safety first." However, the right to move under flag protection is recognized by Rule 99 and by the rule (I do not recall the number) which provides that whenever it is necessary to back the train it must be done under the protection of a flag. In addition, the practice of flagging is in accordance with the rules of the American Railway Association and is considered by it a safe and proper movement.

Although the rules governing the operation of automatic block signals primarily state that, unless otherwise provided, those signals do not affect the movement of trains under the time-table or train rules, a train halted by a stop signal at the entrance to a block could not proceed on its time-table rights. This is on the assumption that, since no superior train is due, the signal must be disarranged, as has been suggested by one of your correspondents; therefore, the stop signal effectually forbids any further movement until the signal is cleared or the train released by an order.

Under the system of operation which obtains on most interurban roads, such indefinite delay to a regular train by a defective signal would demoralize the service, as with positive meeting points every train affected by the delayed train would remain at a standstill until the signal cleared or telephone service was restored. But if the right to proceed "under the protection of a flag" was accorded, the delayed train would soon release the opposing train at the regular meeting point.

F. A. BOUTELLE.

Economic Limits of Passenger Haul

CHICAGO, ILL., Sept. 24, 1914.

To the Editors:

My attention has been directed to the discussion of the Boston fare zone question in a recent issue of the ELECTRIC RAILWAY JOURNAL. Your brief editorial comments, together with the recent joint commission's report have been of such great interest to me that I venture to attempt some further discussion of this complex subject, based upon several years of observation in this particular field of transportation. At the outset I am quite aware of the widest divergence of opinion among railway men and other students of the problem. Therefore I shall only attempt to eliminate, if possible, some of the variables and to draw the lines of discussion perhaps a little closer though upon broader ground.

Fundamentally, there are two entirely different points of view from which this subject must be discussed, viz.: whether the economic limits of haul are being considered for:

1. An individual line, regardless of the earning capacity and traffic characteristics of the remainder of the system, or
2. A completely unified system with universal transfers, wherein the net results of the system as a whole are the determining factor.

If the latter, then existing irregularities in the boundary of the five-cent zone, due to topographical or other equally logical reasons, are of lesser direct interest than the average passenger haul and the average radius of car operation within the five-cent zone. This average haul, I take it, is in reality the ultimate subject of the joint commission's inquiry and I am quite in accord with this viewpoint for the general purpose of defining the economic limits of average revenue haul. (This restatement of the subject, it seems to me, is much less liable to misconception than "maximum length of profitable haul" which distinctly pertains to the other viewpoint, i. e., to the maximum haul of an individual line.)

Even casual study of the development of our American cities shows the practical impossibility of applying an inflexibile economic measuring stick to individual lines. The hill contours, water courses, street plan, railroad, factory and park locations, competitive steam suburban service, and the modern tendencies toward restricted residential development, all exert so powerful an effect upon the shape and growth of the city that an analysis of the practical problem can hardly be predicated upon so idealistic a hypothesis as presented by a circular city with central business district, radial thoroughfares and uniform density of settlement. Consequently this discussion purposely goes further than the problem of the individual line, to which so much attention has been directed in the past, because so restricted an inquiry fails to serve the broader and ultimate purpose.

It has always seemed to me that consideration of the railway situation would be immensely clarified and reduced to more tangible form if we could accept the homely lesson of the churn and be content with a reasonable proportion of cream and milk, of fat and lean, of short haul and long haul. That is to say, except in some special problems (outside of the scope of this discussion), the economic problem of passenger haul is in the last analysis broadly associated with four principal factors: 1, Total operating revenue; 2, operating ratio; 3, fixed charges, and 4, routing and traffic characteristics. And it is to the last that I particularly desire to address myself.

Contrast, if you please, two widely diverse plans of route operation in a city with centrally located business district. First, by through routes; second, by loop routes terminating in the business district. The former, as developed in progressive cities, have clearly resulted in the maximum encouragement of multiple riding, which may become so pronounced that a route 10 miles or more in length will show earnings per car mile much in excess of normal. On the other hand, the latter or terminal loop system, with only half the length of car haul, unquestionably curtails multiple riding to the minimum especially in the central business districts. While it would be possible in practice to split the earnings of a through route arbitrarily at the axes of the principal delivery district (if one exists) and thus, for the purpose of investigation, to merge the operations of through and loop routes as regards average haul from the business centers, this would fall short of being an exact method. It is therefore to be emphasized that the method used in the Boston inquiry strictly applies only to systems operated with a radial system of downtown terminal loop routes, and with no inter-line traffic (the full effect of which would only appear as such in a through-routed system), unless the assumptions made are based upon sufficiently accurate knowledge of the average route characteristics.

Now, this matter of multiple riding obviously affects most seriously any assumption of average ride in per cent of car haul or one-way trip, and in view of the well-known extreme variations in this so-called "trip factor" one is hardly justified in even hazarding a guess, in the absence of essential traffic records, for the purpose of drawing comparisons between systems. Then the principle of "short-line" operation, which is being

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This report defines the maximum distance that it is economically feasible to transport passengers *on the average* (long and short haul included), to be 4.28 miles for a 5-cent fare (exclusive of depreciation), based upon an average return on securities of 5.18 per cent; or 4.03 miles with an average return of 7 per cent. The fundamental assumption is made that the average passenger (including his transfer), rides two-thirds of the full one-way car trip.

so generally accepted by railway men (and properly so as a scientific means of proportioning service to travel), further invalidates any other than a very general assumption of the basic "trip-factor," for the average ride on short lines is in most cases relatively longer than on lines running through. And finally the enormous variation in transfer traffic certainly has great bearing upon such an assumed "trip factor." Thus 70 per cent of the Chicago fare passengers transfer in order to complete their ride on other lines; in Pittsburgh only 18 per cent transfer.

In the Boston inquiry it was assumed that the average passenger (including transfer) rides two-thirds of the one-way car trip, a distance of 2.86 miles. From this basis an average profitable haul of 4.25 miles was derived, which is practically equal to the actual length of the average car haul, 4.28 miles, as stated. Even though a coincidence, are we to infer that the average passenger could ride 50 per cent further, i.e. through to the outer terminal (if such a condition could exist), without occasioning loss to the company, or else that an equivalent margin of surplus profit exists in the operation of the property? I think not. In Chicago the average car haul is nearly 5 miles one way; in Pittsburgh but slightly less. This economic equilibrium would certainly be absent in these two cases if such a long average haul actually took place. It may be pertinent to cite the fact that the average haul per revenue passenger has been found to be as low as 2.4 miles in San Francisco, 2.5 in Providence, with a large proportion of through routes; 2.7 in Philadelphia, with long car hauls, and, I understand, a little under 3 miles in Pittsburgh with car hauls of 7 miles and over.

And should not this comparatively short actual ride set at rest the fears held by many railway men as to the question of maximum possible ride for a single fare? Obviously no company could afford to transport all passengers 26 miles for 5 cents, the possible ride in Chicago, nor to permit them to transfer around a given circuit *ad infinitum*. The answer drawn from the annual income account seems to be that in most cities such riding is relatively quite negligible and confined to persons of inquisitive and adventurous disposition. Obviously, the average ride is the economic criterion, and the fact that these long routes are often the largest earners positively reflects the multiple riding that must have taken place. Why then the extreme uneasiness and the citation of these possible long hauls as prima facia evidence of the necessity for increase in fares (or curtailment of fare zones), reduction in service, or both? This will be automatically regulated by the law of possibilities; for the fare zone is akin to a rubber band stretched outward by the pressure of public demand into various irregular contours and contracted quite as vigorously by the necessity of an adequate return on the investment until equilibrium is finally achieved.

Does it not seem more logical, in view of the indeterminate nature of many of the factors in the problem of estimating average profitable haul, that every effort should first be made to ascertain by actual traffic surveys the true characteristics and riding habit on transit lines? Such studies are highly illuminating, and invaluable in any specific determination of service requirements. Such methods are not "academic" or "theoretical"—they are intensely practical. Many progressive companies have traffic bureaus especially established for the prosecution of these studies. With the average haul and riding characteristics thus determined throughout the system and the ultimate financial returns known, all of the elements are available for computing the gross margin of expansion for the future on a basis that leaves little room for conjecture. And given this gross figure, it then is not a difficult matter to allocate the economic boundaries of the 5-cent and the succeeding fare zones, whether regular in form or greatly distorted by reason of purely local conditions. Assuming reasonably efficient operation, the gross income is the key to the situation and, in the broader sense, the economic fare limits are to be extended or contracted according as the property as a whole shows a return on the investment above or below normal. This broad conception is evidently at the bottom of the Boston commission's findings, but they were distinctly handicapped by the absence of complete operating data as so stated.

The annual financial results thus tell the story. Why pursue nimble-footed figures to the end that some particular line may be found too long or too short? Why should not the fare zone limits as a whole constitute one of the flexible elements of the economic structure of rates and service? The income will support a certain service mileage per year. That agreed to, it is not a matter of vital concern to the operating companies whether the municipal authorities prefer to fix an adequate fare and warp the magic cordon here and there or to fix the boundaries of city fare for the time being and then adopt a flexible fare securely bulwarked (let us hope) against the premise of an adequate return upon a fair investment. It is only necessary to agree upon the fundamentals. The latter is perhaps best adapted for frequent economic adjustments to meet current operating conditions, but the former plan has undoubted merit in facilitating the welding together of a city and its tributary suburbs into one homogeneous community. After all, arbitrary political boundaries *per se* have little influence upon the broad movements of urban population, and the imposition of such artificial restraints within an otherwise compact community can only result in distorted settlement and restricted internal development.

I trust that this communication will be construed only as an attempt to direct attention to some of the broader phases of the fare zone question and not primarily as a criticism of methods heretofore pursued. Unfortunately, surveys of traffic condition have been few and far between. But however difficult and costly, there appears to be no other source of positive information necessary to adjust the delicate questions of fares and service which are constantly arising in the electric railway field.

J. R. BIBBINS, Engineer.

Virginia State Corporation Commission Report

The State Corporation Commission of Virginia has issued an appendix to its eleventh annual report for the year ended Dec. 31, 1913. The book contains the reports and statistics of canals, railroads, electric railways and other corporations for the fiscal year ended June 30, 1913. Individual reports are presented for each electric railway, giving the history of the company, its directors and officers, and data concerning the mileage, capitalization and operating results. In addition there are statistical tables showing the combined figures along these lines for all the companies. The total electric railway mileage operated in Virginia as of June 30, 1913, was 639.98 miles. The total common stock authorized was $85,320,000; outstanding, $31,795,600; preferred, authorized, $24,225,000; outstanding, $10,995,000. The funded debt authorized was $78,950,580 and outstanding, $44,752,180. The total operating revenue amounted to $5,564,679 and the operating expenses $3,360,629. The report also contains a list of railroad corporations not yet engaged in business with statistical tables showing the date of the charter, the amount of capital authorized and paid in, the expenditures already made and proposed routes and terminals.

ASSOCIATION NEWS

MILWAUKEE COMPANY SECTION MEETING

The first meeting of the Milwaukee Electric Railway & Light Company Section, A. E. R. A., was held on Sept. 10 with an attendance of 110. This attendance was considered very satisfactory in view of the unpleasant weather. The program comprised, in addition to the election of a delegate to the Atlantic City convention and other business matters, a paper on courtesy by H. F. Scheife, a short address by J. P. Shaw, general counsel for the company, an exhibition of lantern slides on the European war and several musical numbers.

In his paper on courtesy, Mr. Scheife pointed out how an employee thus fortified is ever an asset to a company. Motormen, conductors and clerks are the principal employees through whom friends can be made for their employers. A car crew is often the choice of disgruntled passengers for the venting of their wrath. With courtesy the conductor or motorman can combat the assailant without difficulty. The speaker dwelt upon the telephone as a means for developing either a hostile or a friendly attitude on the part of the public, and in which courtesy can be used to good purpose. Mr. Shaw showed the influence of little acts of discourtesy upon the operation of the legal department. The attorney in defending the public service corporation in court must argue his case before the twelve "tried and true men" forming the jury, chosen from the public. Unkind treatment on the street cars, a snub by a meter reader, an impudent reply over the telephone accorded one or more of those twelve men prejudices those individuals and may stand in the way of a verdict in favor of the company.

The secretary of the Milwaukee Section for the current year is Harry G. Abendroth.

NEW COMPANY SECTION IN MANILA

Word has just been received of the formation of a company section by the Manila Electric Railroad & Light Company, of which C. N. Duffy is vice-president and general manager. The new section starts with eighteen members. The names of the officers have not yet reached this country. This is the fifth company section, the other four being Milwaukee Electric Railway & Light, Public Service, Denver City Tramway and Washington Railway & Electric. Other sections are in process of forming, but developments are not sufficiently advanced to warrant announcements.

COMMITTEE ON COMPANY SECTIONS AND INDIVIDUAL MEMBERSHIP

The committee on company sections and individual membership, of which L. S. Storrs, president of the Connecticut Company, is chairman, contains a sub-committee on membership at the convention, of which Martin Schreiber, engineer maintenance of way Public Service Railway, is chairman, and C. W. Stocks, statistician A. E. R. A., is secretary. The following have been requested by Mr. Schreiber to act on this committee during the convention for the purpose of securing new members for the association: Representing the American Association—H. C. Donecker, assistant general manager Public Service Railway; W. H. Sawyer, vice-president E. W. Clark & Company Management Corporation, and R. B. Stearns, vice-president Milwaukee Electric Railway & Light Company; representing the Accountants' Association—H. A. Gidney, auditor Montpelier Traction & Power Company; M. R. Boylan, general auditor Public Service Railway; and W. H. Forse, Jr., treasurer Union Traction Company of Indiana; representing the Claims Association—J. H. Handlon, claim agent United Railroads of San Francisco; T. G. Rice, Pittsburgh Railways, and G. C. Whitney, chief clerk accident department, Washington Railway & Electric Company; representing the Engineering Association—J. P. Barnes, general manager Syracuse & Suburban Railway; H. H. Adams, superintendent of equipment Chicago Surface lines, and R. C. Cram, assistant engineer Brooklyn Rapid Transit Company; representing the Manufacturers' Association—W. V. Dee, general sales manager the G. Drove Company; C. R. Ellicott, Westinghouse Traction Brake Company, and L. E. Gould, western manager the ELECTRIC RAILWAY JOURNAL; representing the Transportation and Traffic Association—W. O. Wood, president New York & Queens County Railway; J. L. Adams, division superintendent Denver City Tramways, and Bruce Cameron, superintendent United Railways of St. Louis.

It is planned to furnish each member of the committee with a receipt pad with stubs, and each will be supplied with an alphabetical list of association members. He will be prepared to explain the plan and scope of the association to prospective members, to call attention to the association pin and its significance, and to enroll as many individual members as possible. The members of the committee will be requested to report each day to the secretary.

Mr. Schreiber has also instituted a plan for interesting members of the American Railway Engineering Association in the American Electric Railway Association. A circular letter has been sent out calling attention to the advantages of membership, particularly mentioning the "Engineering Manual," and the A. E. R. A. standard specifications for rails in paved streets.

COLLEGE REUNIONS AT ATLANTIC CITY

University of Pennsylvania men who expect to attend the A. E. R. A. convention are requested to notify J. Walter Wright, roadmaster Public Service Railway, Elizabeth, N. J. Mr. Wright expects to be at Atlantic City on Thursday and Friday and will be pleased to arrange for a reunion on one of those days.

CHICAGO CONVENTION TRAIN RESERVATIONS

The convention transportation committee of Chicago has just put in the mails a handsome pamphlet announcing the various accommodations available on the Pennsylvania special which will leave Chicago at 5 p. m., Saturday, Oct. 10, and arrive in Atlantic City on Sunday at 4 p. m. This year's pamphlet is up to the standard of those issued in former years, containing twelve pages, illustrated in colored conventional and halftone designs. Already the number of reservations indicate that the Chicago convention train will carry its usual quota of delegates. Those desiring to make reservations for the Chicago-Atlantic special train may do so by addressing communications to E. K. Bixby, district passenger agent Pennsylvania Lines, 175 West Jackson Boulevard, Chicago.

The new shops of the Atlantic City & Shore Railroad has just been completed and can be inspected during the convention. The company, through its general superintendent, George F. Faber, extends an invitation to readers of the ELECTRIC RAILWAY JOURNAL to visit the shops and will provide guides to show visitors around. The new shops are at the eastern or Inlet end of the Atlantic Avenue line.

Secretary McConnaughy has opened his office on the Pier at Atlantic City and is planning to have all of the exhibits in finished form by Saturday night, Oct. 10. He has announced Hopper Smith as the official photographer of the convention.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Determining the Character of Armature Winding

BY C. W. SQUIER, E.E.

Different armature connections and the method of connecting them to the commutator are best shown by a developed view of the armature conductors, pole pieces and commutator as in the accompanying illustrations.

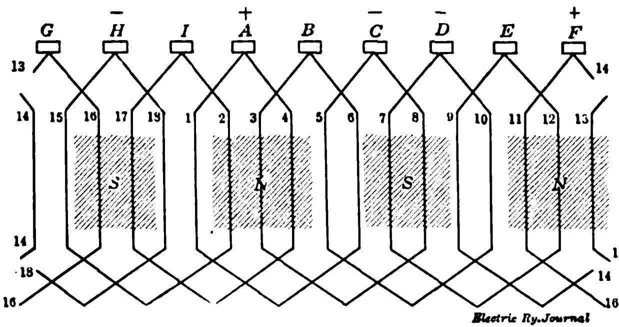


FIG. 1—DEVELOPMENT OF DRUM-WOUND ARMATURE

The small squares at the top represent commutator segments, the cross-sections are the pole pieces and the conductors are shown by the full lines.

Figs. 1 and 2 show developments of drum-wound armatures having eighteen conductors and a four-pole field. The number of conductors and the method of connecting the back end of the armatures are identical in the two illustrations, but the connections to the commutator and the method of connecting the conductors together at the commutator end of the armature are different.

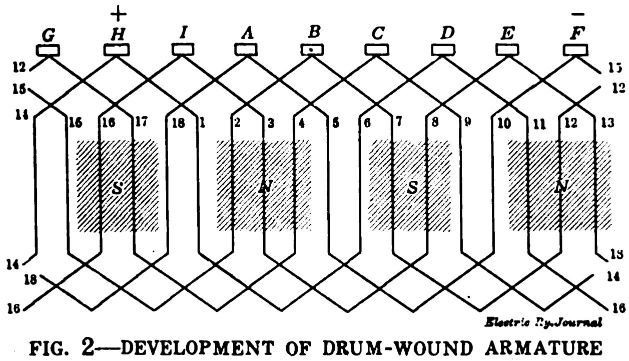
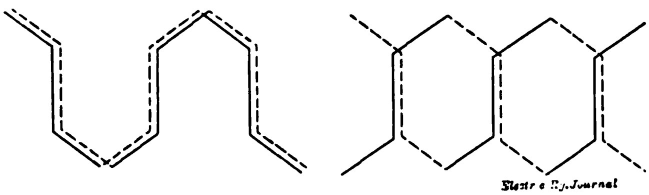


FIG. 2—DEVELOPMENT OF DRUM-WOUND ARMATURE



FIGS. 3 AND 4—ORDINARY AND RETROGRESSIVE WAVE WINDING

With the connections shown in Fig. 1, if we start from the commutator segment *A*, which in the position shown is the point where the current enters the armature, we find the winding as follows: *A*-1-6-*B*, *B*-3-8-*C*, *C*-5-10-*D*, etc., until it arrives at the coil *I*-17-4-*A* where it returns to the starting point. The path of the current through the armature between the two brushes is through conductors lying under adjacent north and south poles, and the winding at each turn around the armature laps back to a commutator segment adjacent to the one from which it started. On account of this fact this form of winding is usually known as "lap" winding. A lap winding requires as many brush-holders as there are poles.

Now if we trace out the winding in Fig. 2, starting at the positive brush-holder the winding is as follows: *H*-1-6-*D*, *D*-11-16-*I*, *I*-3-8-*E*, etc., until it arrives at *C*-9-14-*H*, where we return to the starting point. In this case it is seen that instead of the winding lapping back as in the previous case, it progresses in a regular manner around the armature. Such a winding is sometimes called "progressive" but more commonly, on account of its wave-like path, is called a "wave" winding. This winding requires but two brush-holders for a four-pole motor.

In these diagrams the armature conductors are represented by single lines, but it would be impracticable to wind an armature with single conductors, especially if only a few conductors were used. It is evident, however, that if each coil consisted of a number of turns and the ends of the coil were connected as shown in the diagrams the effect would be the same, as far as the armature connections are concerned. Also in order to get small coils, two or more are placed in each slot. A wave winding with two coils per slot will then take the appearance shown in Fig. 3, where the dotted lines represent the bottom coil in the slot.

Another form of "wave" winding is obtained if we merge any two pairs of similar adjacent slots, shown in Fig. 2, into one another, using but one-half the number of slots. We would then obtain a winding with two coils per slot of a form shown in Fig. 4. This type of winding is called "retrogressive wave winding" in contradistinction to the ordinary wave winding shown in Figs. 2 and 3.

Effect of Car-Wheel Diameter on Motors

BY H. J. PARKS, MASTER MECHANIC EAST ST. LOUIS & SUBURBAN RAILWAY, EAST ST. LOUIS, ILL.

Some time ago there was more or less discussion regarding the effect on the motors of variation in car-wheel diameters. Recently the East St. Louis & Suburban Railway mechanical department had this effect most forcibly demonstrated. While I believed that it was more economical to turn all wheels the same size than to save wheel metal merely by restoring the flanges, for the benefit of my inspectors I wanted an actual demonstration of the effect of different wheel diameters on the motors in a car. I knew that unless all the wheels under a car were of the same size, the motor geared to the large wheels would be doing the greater part of the work, especially in a four-motor equipment.

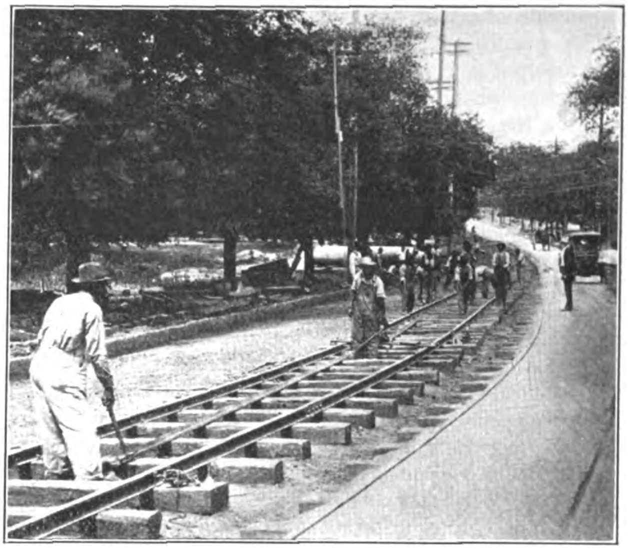
One day a car was turned into the shop with a locked armature which had resulted in two flat wheels in one truck. These flat wheels were removed and replaced by a new pair which were ¼ in. larger in diameter than the rest, and the car was again returned to service. Before four days had elapsed, the armature driving these large wheels was turned in burned out, and at the close of seven days more, or after 800 miles had been run, the second burn-out occurred. When this second instance was reported, I was satisfied that the trouble was due to the size of wheels rather than to a defective motor or overloading from any other cause. Accordingly I had the large wheels removed and turned to the same diameter as the other wheels on the car. Since that time I have had no trouble with this particular car, and in every instance of armature trouble the diameter of the wheels in four-motor equipments is checked to make sure that all are the same size. Prior to this time care had not been exercised by inspectors to see that all wheels were of the same size under each car. Hence the adherence to this rule has made it possible to reduce armature trouble in the four-motor cars in service approximately 22 per cent.

Vineville Avenue Concrete Paving, Macon, Ga.—The Job

BY CARL H. FULLER, FORMERLY ENGINEER OF WAY, MACON (GA.) RAILWAY & LIGHT COMPANY

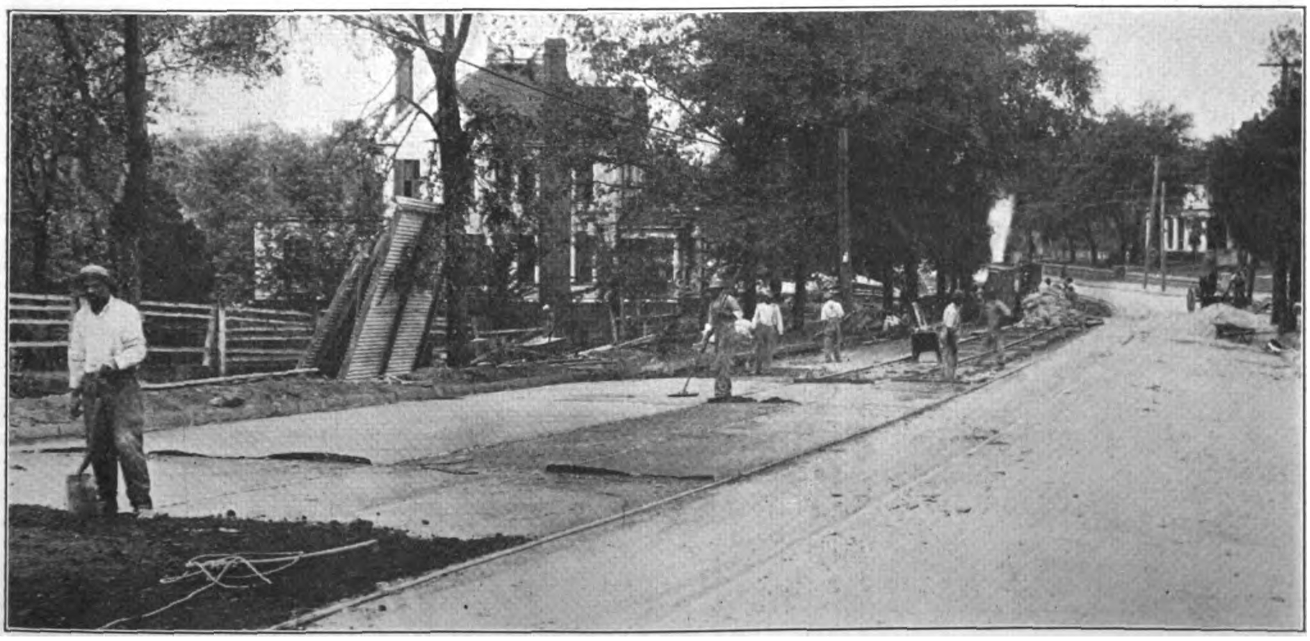
Vineville Avenue with its branching continuation of Cotton and Georgia Avenues forms the main thoroughfare from the downtown section of Macon, Ga., through the Vineville addition, to extensive and rapidly growing suburbs beyond the city limits, where it becomes a state highway connecting Macon and Atlanta. The street is paved with brick from downtown to Rogers Avenue, some 2145 ft. from the city limits, while the county road beyond the city limits is one of the finest automobile roads in the state. Consequently this highway has a very heavy team and automobile traffic. But the unpaved section from the ridge at Rogers Avenue through the intervening valley to the crest at Pinona Avenue or city limits, was rough, practically ungraded and continually gullied by the rains which followed the track rails until at times it became almost impassable; while in the dry season a constantly drifting cloud of dust, stirred up by every passing vehicle obliterated vegetation and made life unendurable in the locality.

For several years the city of Macon had been paving with brick. This brick, however, had been increasing in price, and owing to its poor quality had caused much dissatisfaction. A short time before, two blocks on another street had been paved with concrete at far less cost than the brick, its smooth clean surface meeting with instant popularity among both property owners and the traveling public. All of these facts influenced the paving of Vineville Avenue with concrete.



VINEVILLE AVENUE PAVING—ONE TRACK FINISHED WHILE MEN ARE PREPARING TO INSTALL GUARD RAIL ON OTHER TRACK

The energetic chairman of the aldermanic paving committee believing that the cost could be reduced still further by doing the work with city forces, persuaded the council to add a concrete mixer to the city's paving equipment and commissioned the engineering department to purchase the necessary paving materials. In the meantime the City Council passed an ordinance requiring the public service corporations to lay their



VINEVILLE AVENUE PAVING—PAVING GANG AT WORK, SHOWING COATING OF CLAY AND SAND TO PROTECT CONCRETE; ALSO LOCATION OF CROSS JOINTS IN PAVING INDICATED BY PROTRUDING PAPER pipes and wires and cut in services to the curb lines every 50 ft. under penalty of not being allowed to open the street for five years. The companies immediately took advantage of this ordinance and in the case of the city water works a new and larger main was laid while the telephone company proceeded to install underground service. The city engineer then established the grade, and granite curbing was placed at a cost of 25 cents for the stone, 3 cents for hauling and 3.5 cents for setting, a total of 31.5 cents per foot in place. This expense was charged directly to the property owners.

The grading was performed by the city convict or stockade gang, consisting of some twenty-five or thirty men and teams working under armed guards. Where possible the plating of the old road was broken with a breaker plow and the surplus dirt was shoveled into slat-bottom wagons and hauled to neighboring yards that happened to be below the grade. This work included the rough grading for paving, trenching out for the street railway tracks, grading for sidewalks, and in some cases terracing the front lawns of property owners, no charge being made for this work either against the paving or against the abutting property. As the stockade keeps no detailed cost of such work it is impossible even to approximate either the quantity of dirt handled or its cost.

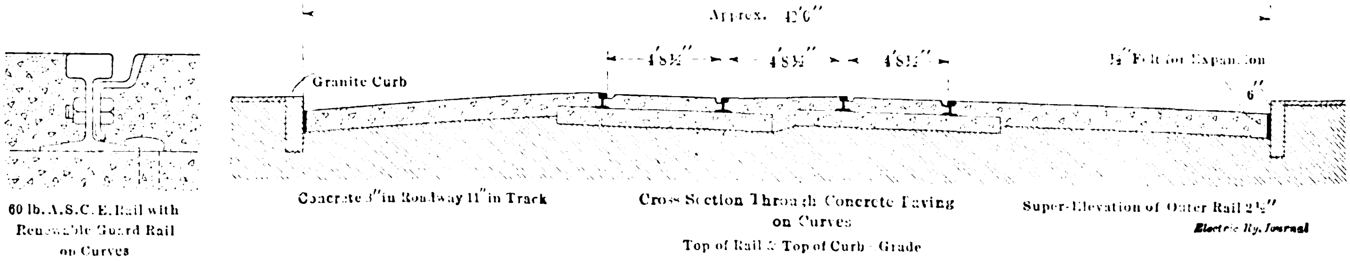
Owing to the fact that for several years the street railway patrons had been greatly inconvenienced during paving operations by being obliged to transfer around the work, and because of the fact that Vineville Avenue was the only practicable thoroughfare through that section of Macon, it was agreed by the city authorities and the traction company to keep one side of the street open to the public while paving the other, and to avoid any transfer if possible. The interval between cars in each direction is fifteen minutes, giving seven and one-half minutes running time between meeting points, namely, Monroe Street switch on the end toward town and Pinona Avenue at the beginning of the single track leading to the country, a distance of 6500 ft.

The following plan of operations was worked out by the writer, acting for the traction company, and Col. J. J. Gilliard, engineer for the city. It gave satisfaction all around as no time arose when the company had to transfer passengers on account of paving although to accommodate the work it did transfer from car to car on parallel tracks for a few hours. The accompanying sketches marked Case 1 to Case 5 (not drawn to scale) readily show the plan followed in handling traffic and in paving operations.

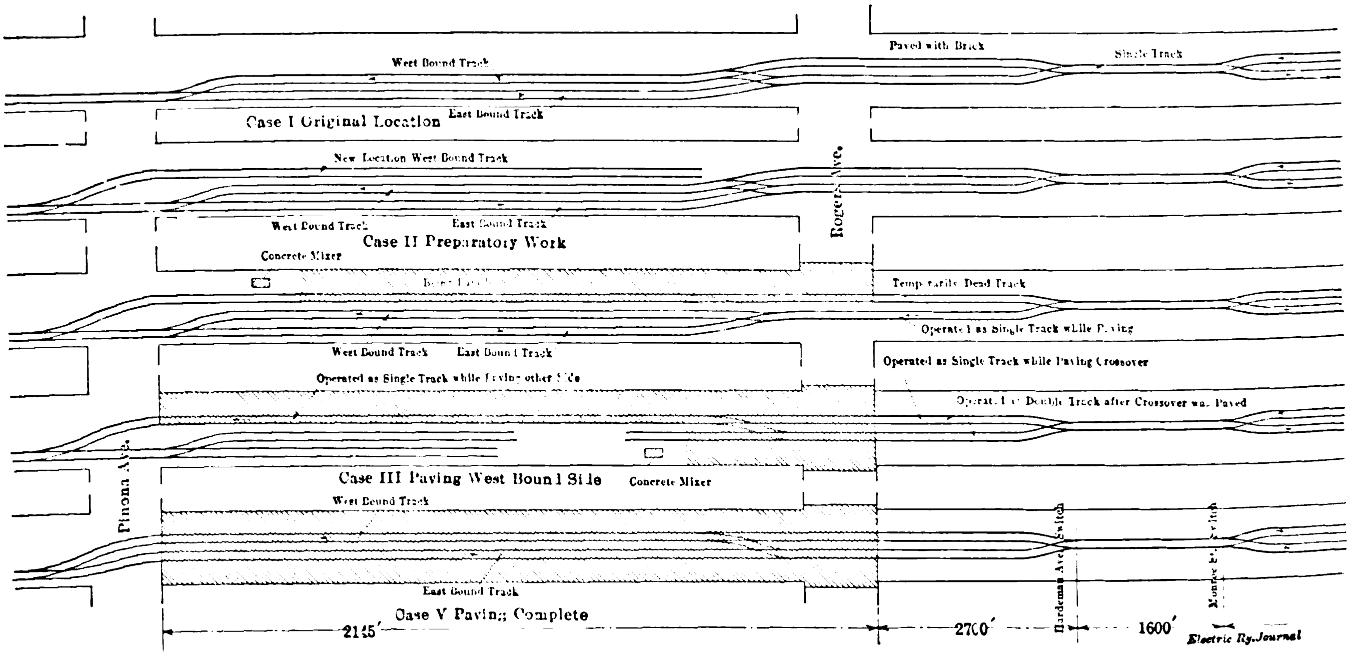
Case 1—This plan shows the relative, original location of the tracks and switches from Monroe Street to Pinona Avenue. It will be noted that for some 2000 ft. along the unpaved portion of the street the two tracks lay next to the left-hand curbing, while the public service corporations and sewers occupied the right-hand side of the street. While these companies were taking care of their services prior to paving operations, the street traffic used that portion of the street occupied by the traction company's tracks.

Case 2—When the foregoing work had progressed sufficiently, the traction company hauled its material, rail and ties and constructed a new third track from a new switch beyond the city limits back to Rogers Avenue crossover, putting it in readiness for the paving. The city forces followed, fine-grading this portion of the street for final paving operations.

Case 3—When everything was in readiness to begin actual paving, the traction company cut its west-bound


Approx. 42'6"
4'8½"
4'8½"
4'8½"
½" Felt for Expansion
Granite Curb
6"
60 lb. A.S.C.E. Rail with Renewable Guard Rail on Curves
Concrete 3" in Roadway 11" in Track
Cross Section Through Concrete Paving on Curves
Top of Rail & Top of Curb = Grade
Super-Elevation of Outer Rail 2½"
Electric Ry. Journal

VINEVILLE AVENUE PAVING—CROSS-SECTION THROUGH CONCRETE PAVING WITH DETAIL OF RUNNING AND GUARD RAIL


Paved with Brick
West Bound Track
Single Track
Case I Original Location
East Bound Track
New Location West Bound Track
Rogers Ave.
West Bound Track
East Bound Track
Case II Preparatory Work
Concrete Mixer
Temporarily Dead Track
Operated as Single Track while Paving
West Bound Track
East Bound Track
Operated as Single Track while Paving Crossover
Operated as Single Track while Paving other Side
Operated as Double Track after Crossover was Paved
Pinona Ave.
Case III Paving West Bound Side
Concrete Mixer
West Bound Track
East Bound Track
Case V Paving Complete
Hardeman Ave. Switch
Monroe St. Switch
2145'
2700'
1600'
Electric Ry. Journal

VINEVILLE AVENUE PAVING—FIVE STAGES IN THE WORK, SHOWING ORIGINAL, INTERMEDIATE AND FINAL POSITIONS OF TRACK

track at the crossover and shifted the end to connect with the new west-bound track. The old west-bound track was then connected to the east-bound track by means of one end of the crossover, thus confining double-track operation between Rogers Avenue and the city limits. As the latter point, however, was the natural meeting point this arrangement did not interfere with the operation of cars, although the necessity for teams to use the tracks between these points sometimes delayed cars a little. The paving force then began laying concrete from the curbing to the inner rail of the new track or the rail next to the future devil strip working from the east end toward Pinona Avenue.

Case 4—When this side of the street had been finished and the eight-day restriction removed, team and car travel were diverted to the new work. This necessitated single-track operation from Monroe Street to Pinona Avenue, where the cars had to be switched while the new east-bound half of the crossover was being moved to its new location and paving laid. Then after the eight-day restrictions were removed, cars were passed on the double track between Rogers Avenue and Hardeman Avenue switch. This proved an awkward meeting point as it was more than 2000 ft. east of the normal meeting point so that west-bound cars had to wait several minutes on east-bound cars, but as this line was the longest in the city and had long stretches of double track, the cars were able to leave the terminals on time. The traction company then proceeded to remove its old double track, laying the new track with paving operations following close behind.

Case 5—This plan shows the paving complete with the tracks connected in their final locations.

VINEVILLE AVENUE PAVING—TEARING UP THE OLD DOUBLE TRACK WITH THE AID OF TRACK JACKS—NOTE UTILITY CAR IN THE BACKGROUND

The first of the three accompanying photographs was taken near the crossover, looking westward, and shows the west-bound side of the street finished and the paving gang at work on the east-bound side. To the left may be seen the coating of clay and sand which was placed to protect the concrete from the sun until it had set. The cross joints in the paving are clearly defined by the paper, protruding above the concrete, while along the curb is an expansion joint (Carey Elastite paving joint).

The second photograph was taken a little further west and shows the finished half of the street, as in the first picture, while on the left the traction company's forces are surfacing the new track. In the foreground may be seen two men preparing to attach the rolled shape guard, used on curves, to the low 60-lb. T-rail. The street at this point has been fine-graded and steam rolled ready for concrete.

The third picture shows the traction forces still further to the west tearing up the old double track, using track jacks to lift it bodily from the hardened road surface. After this the ties were detached from the rails by driving down on their ends with a "deadman" made of an old tie with track spikes for handles, and then the joints were broken loose by means of "cleaver" and hammer. This is an economical method of wrecking track and loosens the ground for the graders. In the background of this picture is shown one of the company's utility (flat) cars hauled by one of the regular bench cars for a motor. This style of equipment handled all of the track material used on this job and is fairly economical. The flat car, which is single-truck, is equipped with extra log drawbars to admit handling 33-ft. rail. This combination carries eighteen 60-lb. rails, or five tons, per trip and has to negotiate some 5 per cent grades.

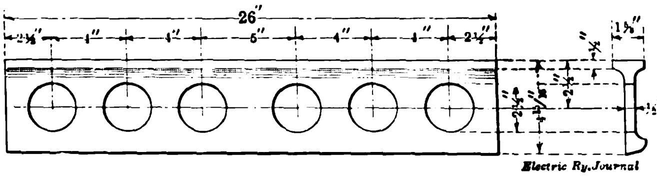
Exhaust Ventilators for Railway Motors at East St. Louis

By working on the principle that if a little ventilation is good more is better, H. J. Parks, master mechanic East St. Louis & Suburban Railway, has applied exhaust ventilation to his railway motors. One 6-in. exhaust ventilator of the "Peerless" type has been installed on each motor by cutting a hole in the top inspection plate and riveting the ventilator in place. The largest size ventilator of this type that could be installed and clear the truck was purchased and in order to obtain good circulation the bottom inspection plate was drilled full of ½-in. holes. In a nineteen-hour test run with a G.E.-216 motor, it has been found that this ventilator maintains the normal maximum temperature 19 deg. lower than that in the unventilated motor. At the same time the number of rewindings has been reduced one-third, namely, from an average of three coils per car a month to two coils. Three cars were equipped with these exhaust ventilators more than a year ago and no difficulties have arisen. As a result of the economies demonstrated twelve more cars are being equipped. A peculiar yet self-evident result of this ventilating scheme has been that while dust may enter the motor housing the motors are actually much cleaner than before.

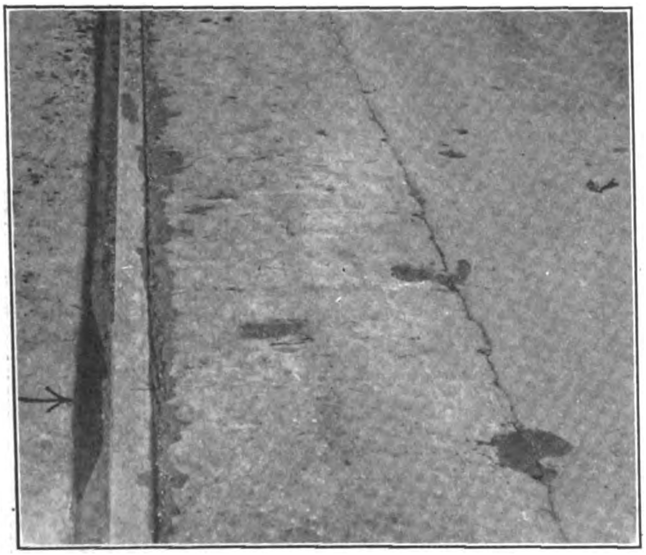
Cast-Iron Filler for Use with Bolted Joints

BY E. P. ROUNDEY, ENGINEER MAINTENANCE OF WAY NEW YORK STATE RAILWAYS, SYRACUSE, N. Y.

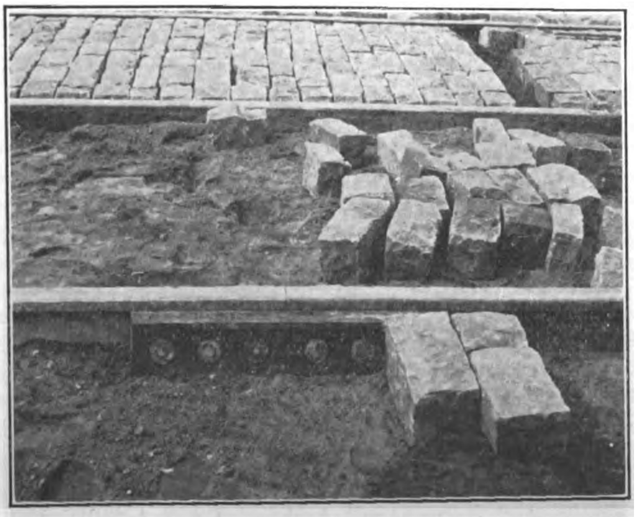
The accompanying halftones and drawing show a cast-iron filler which we are using at the joints in connection with paving up to our T-rail, and which may be of interest to your readers. We use a bolted joint, the bolts and nuts projecting 1½ in. beyond the joint plate, so that the groove nose block which fits under the head of the rail cannot be used at the joint. We have heretofore filled the holes around the bolts with cement mortar, but halftone *A* shows the hole which soon develops at the joints with this method. We have also used asphalt which gives much better results than the cement. However, to overcome the trouble we have this year designed and are using the cast-iron filler shown. These fillers weigh 20½ lb. and cost us $0.56 each, or $95.20 per mile of single track if 62-ft. rails are used. The fillers should outlast at least two sets of rails and then have an appreciable scrap value. If desired the holes in the filler can be made square instead of round, so that they will also prevent the nuts from turning.



SYRACUSE TRACK—CAST-IRON FILLER FOR 7-IN. T-RAIL



SYRACUSE TRACK—VIEW "A" SHOWING HOLE DEVELOPED AT JOINTS WHEN CEMENT MORTAR WAS USED



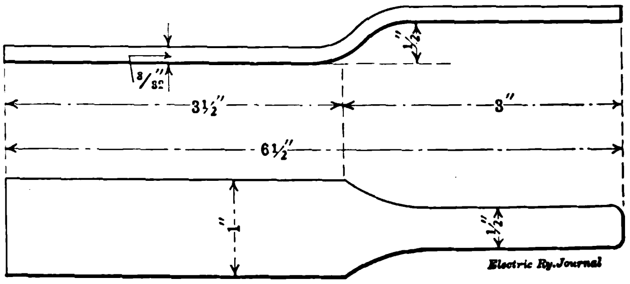
SYRACUSE TRACK—VIEW "B" CAST-IRON FILLER IN PLACE AGAINST JOINT PLATE

Bonding Cable Sheaths

BY G. H. MC KELWAY, ENGINEER OF DISTRIBUTION BROOKLYN RAPID TRANSIT SYSTEM

While in many places the lead-covered underground cables are not even bonded to the negative bus in the power or substations, yet this should be done in all cases as a preventative of electrolysis; and in manholes with more than one cable the sheaths of the cables should be bonded together. This may seem to be an unnecessary precaution, but if it is not applied noticeable differences of potential will be found between the sheaths of the various cables, especially if the cables drain the current from several points.

Many companies now make it a practice to bond all of their cables together in each of their manholes, using ordinarily a No. 6 B & S gage copper wire soldered to the sheaths of the cables and running from one of them to the next. The trouble with this plan of bonding is that when one of the cables becomes grounded its lead sheath immediately forms one side of the circuit back to the station, and therefore carries much current because the cable has been short-circuited. This heavy flow of current spreads from one cable sheath to the others over the bond wires and is usually great enough to cause them to be fused. If the burning-off of the bond wires was all that occurred the damage would not amount to much, but the fusing of the wires also burns the lead sheaths to which they are attached. Hence after such a burn-out, even if only one cable has failed, it is generally necessary to make repairs to the sheaths of several other cables to prevent water from working into the paper through the holes in the sheaths.



COPPER STRAP FOR BONDS ON CABLES

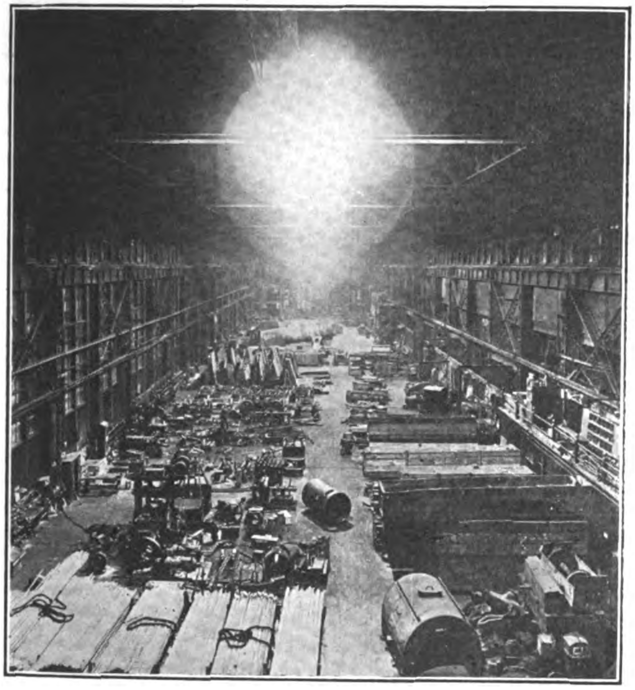
A better arrangement than the plain No. 6 wire, although slightly more expensive in first cost, is that shown in the illustration. Here a copper strap is made and soldered to the lead sheath, the portion in contact with the lead being 3½ in. long x 1 in. wide. The rest of the strap, approximately 3 in. long x ½ in. wide, is raised ½ in. from the sheath and to it the bond wire is soldered. With this plan there is a contact area of 3½ sq. in. between the strap and the sheath, so that there is no danger that the sheath will be burned by the drawing of a heavy current through a poor connection. Neither is there any danger that the sheath will be damaged when the bond wires fuse, for they are at least ½ in. away from the lead and are likely to burn apart even further away. The copper strap costs but little more than enough No. 6 wire to wrap well around the cable, so that the only additional cost over the old plan is the labor of attaching the strap to the sheath and the wire to the strap, instead of bonding the wire directly to the cable.

Mercury Quartz Lighting of a Railroad Shop

The accompanying halftone is a night view of one of the shops of a prominent Eastern railroad. The buildings are 528 ft. long and 58 ft. wide, giving an area of 30,624 sq. ft. in each building.

The illumination for these buildings is furnished by type Z Cooper Hewitt quartz lamps operating on a 220-volt d.c. circuit. This lamp is a modification of the well-known Cooper Hewitt lamp based on the same fundamental principles, but possessing some essential differences. The lamp uses the mercury vapor and a short tube of pure fused quartz instead of the long tube of lead glass in the older types.

Ten lamps are installed in the boiler shop, placed at regular intervals of 52 ft. down the middle of the building, each lamp lighting an average of 3062 ft. In the erecting shop there are twelve lamps regularly spaced down the middle of the building at intervals of 44 ft., giving an average space lighted by each lamp of 2552 ft. All the lamps are hung at a height of 50 ft. above the floor. The lamps are rated at 2400 cp with an energy consumption of 725 watts, or a total for the installation of approximately 16 kw. The light afforded by these lamps is entirely sufficient for all purposes, even the locomotive pit being well illuminated. The only other form of artificial light required is a portable hand lamp needed by the workman when he goes inside the boiler.



EFFECTIVE ILLUMINATION WITH MERCURY-VAPOR LAMPS OF QUARTZ TYPE

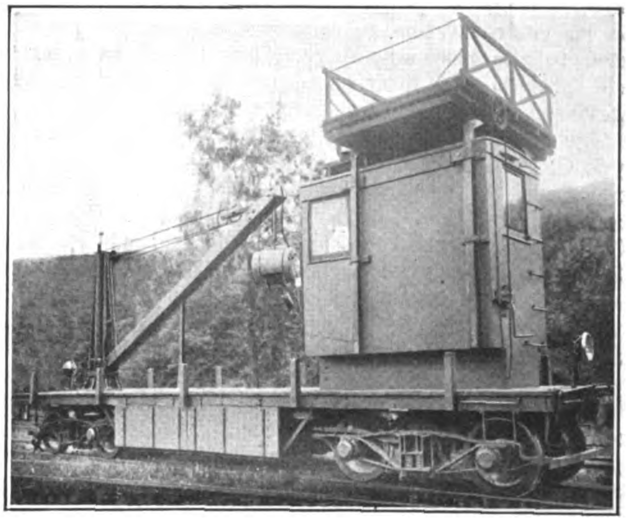
The total lumens per lamp from these units is 14,603, with a total available in a zone of 0 to 60 deg. of 10,800 lumens per lamp which, with a wattage of 725 gives a value of 20.2 total lumens per watt, and 14.9 available lumens per watt. The efficiency of the system as installed is made evident from the low wattage consumption obtained per square foot, these being 0.28 for the erecting shop and 0.24 for the boiler shop, the former being said to be the best-lighted erecting shop in the country. The average candle-feet obtained are 4.24 for the erecting shop and 3.53 for the boiler shop.

No better evidence of the success of the installation from a practical viewpoint can be secured than the commendation of the employees who are working under the light. They are universally pleased with it, yet when a trial installation of four lamps was first made, there was a certain antipathy to the light on the part of the men employed, because of the difference in color value, but this speedily disappeared after they gave it a thorough trial. This trial resulted in the adoption of the complete installation of these units.

The lamps have been installed at various times, but the entire outfit averages practically sixteen months and the maintenance charges for the period totals $134.54, or $4.58 per lamp a year.

A Storage Battery Way-Service Car

The emergency, wrecking and construction car shown in the accompanying cut has just been built for the Havana Central Railroad by the Field Omnibus Company, New York, as the first car of its kind. Three more are under order from the same company. These cars are designed for wrecking and construction purposes on the railroad system named, part of which is equipped with overhead trolley. The cars are built to operate from the trolley wherever available and from storage batteries elsewhere. The batteries may be charged directly from the trolley wire at any point on the trolley system. The normal speed of the car on level track when operating from the trolley is 35 m.p.h., and when operating from the Edison batteries the speed is 20 m.p.h. It is stated by the maker of the vehicle that the guaranteed 70-mile capacity of the batteries is exceeded by 50 per cent. The battery equipment comprises 280 A-6-H cells.



STORAGE-BATTERY EMERGENCY, WRECKING AND CONSTRUCTION CAR FOR HAVANA CENTRAL RAILROAD

The hoisting motor and air compressor motor are operated from the storage batteries. The car is controlled and operated entirely from the cab. On the roof of this cab is a raising trolley tower which may be extended 7 ft. out from the side of the car.

Although the car was not intended to have enough capacity to haul other cars, it shows ample power for this work. After a 65-mile run with the batteries it has pushed a 25-ton car up a 7 per cent grade, the energy still being secured from the storage batteries.

The car has two GE-25-hp motors, both mounted on one truck. The trucks are equipped with roller bearings. The energy consumption of the first car, as determined by a 60-mile run on the tracks of the Pennsylvania Railroad on an official test, showed an average of 30.2 watt-hours per ton mile.

A Rail Weld Saving

A typical example of the savings possible with the Indianapolis portable electric welder is reported by the manufacturer from a property which is using four of these machines.

On the head of the rail in a paved street a cast-weld joint had broken out down to the web and for a distance of 4⅞ in. A new head was built up on the rail by a single operator and a helper in one hour and forty minutes, at a total cost, including time, welding steel and current, of $2.17. The former method of cutting out a section of the broken rail and welded joint and inserting a short piece of rail of special splice plate, together with the taking up, replacement and relaying of the paving block would have required nine and one-half hours at an outlay of $14.83. Further, this breakage occurred on a line operating cars at two and one-half minutes headway, yet the welding caused no interruption of traffic.

Four Gas-Electric Motor Cars for the Illinois Central Railroad

The Illinois Central Railroad, Chicago, Ill., has recently contracted with the General Electric Company for four gas-electric motor cars, which will be placed in commission for supplementary service on some of the connecting lines of the company. The railway company has not yet advised where these cars will be placed in operation, but is canvassing the branch line service on its entire system to ascertain where they may be used to the best advantage. The initial installation will probably be distributed partly on southern and partly on northern branches of the road.

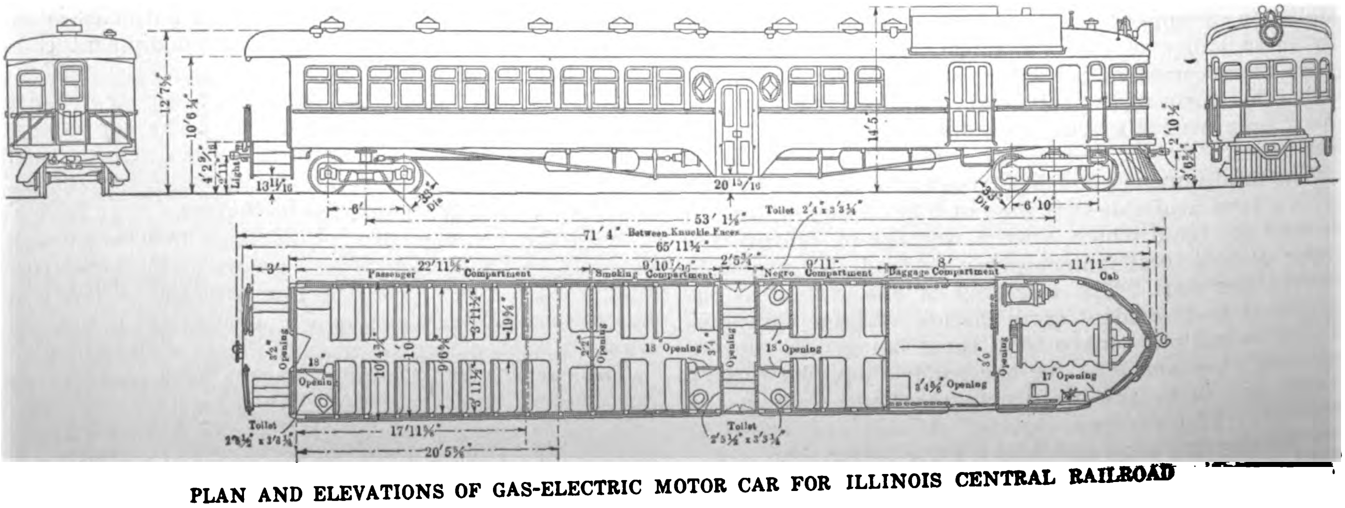
The cars of this company will be what is known as type CRE-70-B-8. The details of construction conform in general to those of the standard gas-electric motor cars manufactured by the General Electric Company. These cars measure 71 ft. 3⅞ in. over bumpers by 10 ft. 6⅜ in. wide over all, weigh approximately 51.5 tons, seat eighty-six passengers and are each equipped with two GE-205 600-volt, box-frame, oil-lubricated, commutating pole railway motors having a total of 200-hp capacity. The motors are mounted with nose suspension directly on the axles of the forward truck. The generating unit consists of an eight-cylinder, four-cycle gas engine of the "V" type, direct-connected to a 600-volt, commutating pole electric generator, designed to meet the special conditions the service demands.

The interior of the cars is partitioned into five compartments. The cab in front, containing the power plant apparatus, measures 11 ft. 11 in. long; next is the baggage room, 8 ft. long; then the colored passenger compartment, 9 ft. 10⅞ in. long; the smoking section, 9 ft. 10 in. long; and the passenger compartment, 22 ft. 11⅞ in. long. The body of the cars is of all-steel construction, except the seats and interior finish, which are of mahogany. Center vestibules with side entrances run between the passenger and smoking and smoking and colored passenger compartments. A rear platform entrance is also provided. The bearings and treads and flanges of the wheels conform to M.C.B. standards. The trucks are of the heavy swing bolster type with elliptic bolster and coil equalizer springs.

Steel Freight Car with Unique Framing

W. R. McKeen, Jr., inventor of the well-known McKeen gasoline motor car, has recently secured patents on a steel freight car with unique framing of commercial shapes, comprising chiefly a herringbone truss for the underframe, and a combination of plate and truss girders sheathed for the sides. The whole produces as a unit structure a trussed car body comprising underframe and floor, side and end frames, roof frame and sheathing for roof and walls, all formed of metal to constitute practically a tubular truss. Normal stresses received either in pulling or in buffing are transmitted by the coupler and draft gear to the draft sills, and by these and the center sill and diagonal braces to the bolsters, side sills and end sills, and from the side sills and end sills through the uprights and their bracing to the top plate and finally to the roof members, the diagonal bracing throughout the floor, sides and ends of the car acting to distribute the stresses over the structure, and thus finally to dissipate them without concentrating undue stress on any part or parts. Very severe or exceptionally heavy stresses are in part transmitted direct to the end sill by the horn of the coupler, as usual, and thence distributed as explained.

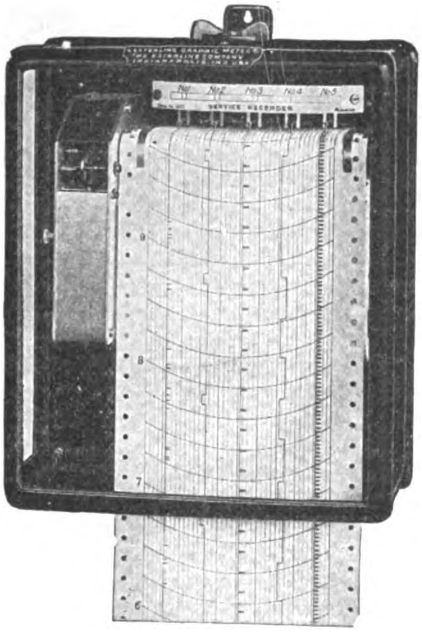
Further, the fact that the metallic plates or sheathing are riveted to the structural or truss members throughout the walls and roof of the car, and are thus held against buckling, contributes enormously to the tying together and bracing or staying of the structural members and to the strength of the trusses themselves. Hence any bending or distortion of said structural members is prevented, thus precluding collapse of the trussing of which they form elements. Together with the structural members arranged to constitute trusses, the plates riveted to them produce combined plate and truss girders. In consequence of the mutual contribution and support so obtained, it is possible to use structural parts far lighter than would be practicable if advantage were not taken of the strength and staying effects of the metal plates or sheathing.



PLAN AND ELEVATIONS OF GAS-ELECTRIC MOTOR CAR FOR ILLINOIS CENTRAL RAILROAD

Service Recorders for Machine Tools

A device intended to increase efficiency in machine tool operation is represented by the new service recorder of the Esterline Company, Indianapolis, Ind. This meter operates on the same general principles as common graphic or curve drawing instruments. It is equipped with any number of pens desired from one to ten inclusive. The instrument is mounted in an enameled metal case with rubber-covered binding posts and has suitable lugs for fastening to a wall or partition. Glass panels permit inspection of the record without opening the instrument.



SERVICE RECORDER WITH RECORD STRIP

The pens rest on a long strip of paper or record chart which is driven through the meter at a constant rate of speed by a jewel balance-wheel type eight-day clock. The clock may be equipped with gears giving five paper speeds of ¾, 1⅛, 3, 6 or 12 in. per hour. An attachment can also be provided on this clock giving additional chart speeds of 45, 90, 180, 360 and 720 in. per hour.

Stops are used to interrupt operation at any time. A regulator is provided for adjusting the speed of the clock in service. Clocks are furnished with a rerolling device for winding up the finished record in the bottom of the case, or this device may be omitted and the finished chart fed through a slot in the bottom of the cover, the record being torn off daily. Record charts are supplied in rolls 90 ft. in length and 6 in. in width. This record may be torn up in short lengths for convenience in filing. Perforations are provided along each margin of the chart which are engaged by pins on the clock driving roll insuring perfect alignment of the paper and accurate timing of the clock.

Each pen is so controlled that when a record is made a vertical line about ⅛ in. long is drawn across the chart, the pen returning to the zero position after each record is made. The controlling devices for the various pens are so connected to different machines that one record is produced for each operation or for a certain number of operations. The record is presented as a series of short lines, the spacings of which represent the rate at which operations are being completed. If the machine is being operated up to capacity, the series of lines will be close together, but if the machine stands idle for several minutes a straight horizontal line will be drawn across the chart showing that no work was accomplished during this time.

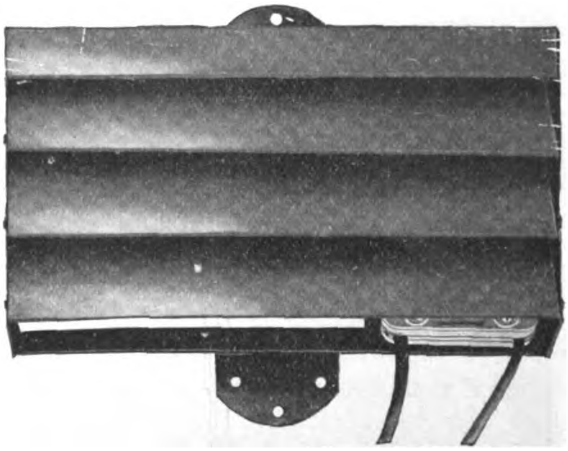
The electrical control for the pens requires such a small amount of current that the energy consumption is negligible. The instruments have high internal resistance and may be operated at any distance from the machines. One instrument may be located in the superintendent's or manager's office and operated by small wires connected to the machines located at different parts of the plant. Any source of direct current may be used for operating the instrument.

On machines operating at a high rate of speed and completing a number of pieces or operations in a short period of time, it is advisable to gear the controlling device on the machine so that one line on the chart will represent ten, 100 or any other convenient number of operations. If operations are completed at a slow rate, then the chart may be worked at a slow speed so as to shorten the record; but if operations are completed at a rapid rate, then a faster chart speed will give a clearer record. These instruments are also furnished with a counting attachment to total the production for a day or other period.

Service recorders are used for a variety of purposes in addition to machine tool records. Each pen can be arranged to give a record of when motors or other machines are being operated and when idle. They are also used for traffic recording on interurban and city railways. In this case, each pen is operated by trolley contacts and records the exact time of cars passing a given point of the system.

A Switch-Stand Light Resistance

A special resistance unit has been brought out by the Nichols-Lintern Company, Cleveland, Ohio, to insure switch-stand lighting with the least amount of wiring and at less cost and maintenance than oil lamps or high-voltage electric lamps. The resistance unit is wound on a pottery tube and is protected against physical and chemical depreciation by means of enamel. It is mounted in a suitable housing for protection against the weather, and is provided with means for thorough ventilation and radiation. Further, it is said to be practically immune to lighting discharges, a factor of no mean importance since continuity of service is essential to safety. The resistance is 11 in. long, 3½ in. wide, 9 in. high over all and weighs 3½ lb. This method of lighting switch-stands has already been applied to seventy-five installations by the Cleveland, Southwestern & Columbus Railway after a competitive test with other methods.



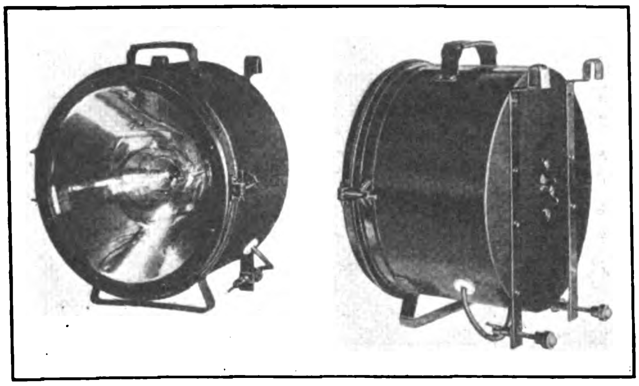
SWITCH-STAND LIGHT RESISTANCE

Report on the Westinghouse Air Brake Story Awards

The committee of three judges, consisting of W. E. Symons, mechanical engineer, Chicago; Willard A. Smith, president and manager, *Railway Review*, Chicago, and R. V. Wright, managing editor, *Railway Age Gazette*, New York, in whose hands the Westinghouse Air Brake Company placed the decision as to the merits of the stories submitted in the air brake story contest recently conducted by it, has just rendered its report, which shows the lucky prize winners to be as follows: First prize, $1,000, James Cain, engineer, Wabash Railroad, Peru, Ind.; second prize, $500, H. C. Woodbridge, general manager's special representative, Buffalo, Rochester & Pittsburgh Railroad, Rochester, N. Y.; third prize, $200, Alexander M. Stewart, engineer, Illinois Central Railroad, McComb, Miss.; fourth prize, $150, D. Oxenford, road foreman of engines, Lehigh Valley Railroad, New York; fifth prize, $100, Carl H. Fuller, chief engineer, Macon Railway & Light Company, Macon, Ga., and sixth prize, $50, Millard F. Cox, assistant superintendent of machinery, Louisville & Nashville Railroad, Louisville, Ky.

Interurban Headlight with Modern Incandescent Filament

Another addition to the "Golden Glow" line of headlights, manufactured by the Esterline Company, Indianapolis, Ind., has just been put on the market. This lamp, designated as Type T-128, has been produced especially for interurban electric railway service. It is of the incandescent type, employing as a source of light concentrated filament Mazda bulbs of high power and intensity. This type is intended to replace the standard 4-amp arc lamps commonly used in interurban service. The makers state that in the volume of light it equals and in many cases is superior to the arc lamp, while at the same time it gives a steady, uniform light.



INTERURBAN HEADLIGHT WITH INCANDESCENT FILAMENT

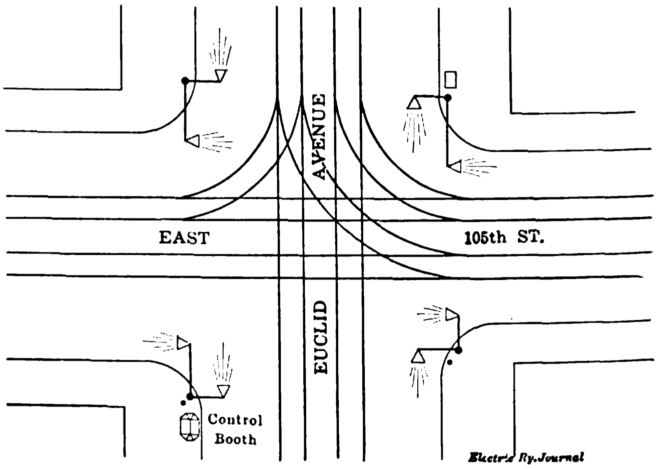
The reflector used in this lamp is 12 in. in diameter and has a depth and focal length of proper design to accommodate spherical bulbs up to 150 cp. It has a polished glass parabolic mirror, which is suitably colored to extract all blue and violet rays from the beam of light. It is asserted that the blinding effect of brilliant headlights, and the tiring of the eyes of engineers and motormen, is due largely to the presence of the blue and violet rays in the light from an arc. The removal of these rays not only renders the beam of light less blinding and less discomforting, but enhances the ability of the motormen to see the track ahead, especially in misty and foggy weather.

The reflector is mounted in a heavy sheet steel case which is finished inside and out in black baked enamel. The door is made of pressed steel and is arranged to fit tightly over a sealing ring to make the lamp dust-proof and waterproof. The body is fitted with standard hangers and is equipped with a focusing screw so that the position of the bulb in the reflector can be adjusted without opening the lamp. It is asserted that numerous tests on interurban lines have demonstrated that this lamp when fitted with a standard bulb will enable the motorman to see light-colored objects on the track at a distance of 1500 ft. and dark-colored objects at 900 ft. to 1000 ft. As the source of light is an incandescent bulb, the flickering unavoidable in arc lamps is eliminated. The weight of the lamp complete is 16 lb.

Illuminated Signals for Traffic Control at Cleveland

The traffic signal system installed some time ago at the corner of Euclid Avenue and East 105th Street, Cleveland, Ohio, by the American Traffic Signal Company of that city should be of interest to all concerned with the prompt and safe movement of city traffic. This particular installation is operated by the police force.

As will be seen from the accompanying drawing, the system consists primarily of eight high-power lights, located in pairs at the four corners of the intersecting streets. They are placed about 15 ft. above the pavement and therefore may be seen for some distance away. One of each pair of lights is red and the other green, and they are so placed that a red light at the right hand and on the near side of the crossing and a green light on the far side faces traffic from any direction that approach may be made. The showing of the red light means that traffic must stop, while the green light indicates that it may proceed. When one color is switched on the other is turned off. Again, when the red light shows in one direction the green light is visible in the other.



PLAN OF TRAFFIC SIGNAL INSTALLATION AT CLEVELAND

As the signals are so high above the pavement the car or vehicle operators who are stopped some distance from the crossing see the signals at the same moment as do those who are nearer, thus preventing loss of time almost entirely. This method is superior to having an officer stand in the middle of the street, even where he uses a whistle as a signal. Many accidents have occurred because people are liable to mistake the whistle warnings of an officer, but in this system the signals are fixed and unmistakable.

All the cars and vehicles may move up close to the corner when the red light is shown and remain there until the green light across the street indicates that the way is clear. This, of course, gives permission to cross the street, and those wishing to do so may turn out of the line to the right. The problem for some time was how to handle those who wish to turn to the left and yet prevent loss of time. This system therefore provides that those wishing to turn to the left into the cross street shall drive out as far as possible into the street at the extreme right and stop. When the signals are reversed those waiting may complete their turn and proceed with the traffic moving in the direction they wish to go. They are in such a position that the traffic on the opposite side of the street may move on past them.

The lights are operated by the local traffic officer from a glass-inclosed booth at the northwest corner at the curbing. The floor of the booth is raised enough to afford him a full view in every direction. Current is furnished for the lights by the city, and switches controlling them are mounted for operation by the officer when seated in the booth. Where desired, the signal maker furnishes a set of auxiliary control switches located in a metal box in the center of the street so that the traffic officer may operate the lights from that point if it is necessary for him to remain in the street for some time. Experience at this point indicates that the corner location is preferable in many ways. Here the officer may be conveniently reached by those who wish to make inquiries and they, as well as he, avoid the danger of standing in the center of the street intersection.

HOTEL
EGENT
HOTEL

SCENE AT EUCLID AVENUE AND EAST 105TH STREET, CLEVELAND, WHERE TRAFFIC SIGNALS ARE USED

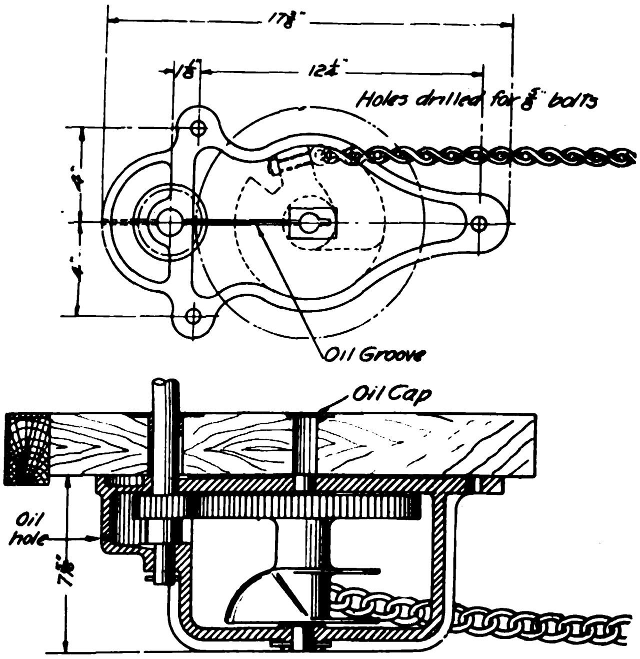
In changing the lights the officer merely turns a lever in front of him, but if it is necessary for the fire department to pass that point with its equipment he has an emergency switch which sets the red lights to flashing and a gong on each of the four street corners to sounding. He may go to the center of the street after turning on the emergency to signal the equipment over the crossing; and in case two or more equipments approach from different directions at the same time he can prevent the possibility of collision. However, several experiences have shown that the crossing can be cleared within a few moments, and since the system was installed the fire equipment, located 200 ft. away, has never been compelled to halt because of street traffic.

Fire and police telegraph signals have been placed in the officer's booth to warn him when this street intersection will be used for emergency purposes. This gives him full command of the situation in ample time. Street cars come to a stop on each side of the intersecting street when the flashing lights show and the gongs sound, while all vehicles drive to the curb and leave as wide a clearance as possible. Further, all persons in the vicinity also become aware at once of the near approach of the apparatus. Should the traffic officer be off duty the system may be controlled by telephone or telegraph from police headquarters or the fire department.

It has been estimated by traffic officers and autoists that this system has increased the traffic speed from 25 to 30 per cent. This gain, of course, is of special importance to the railway in maintaining its headway, and the installation is of still further value in preventing accidents.

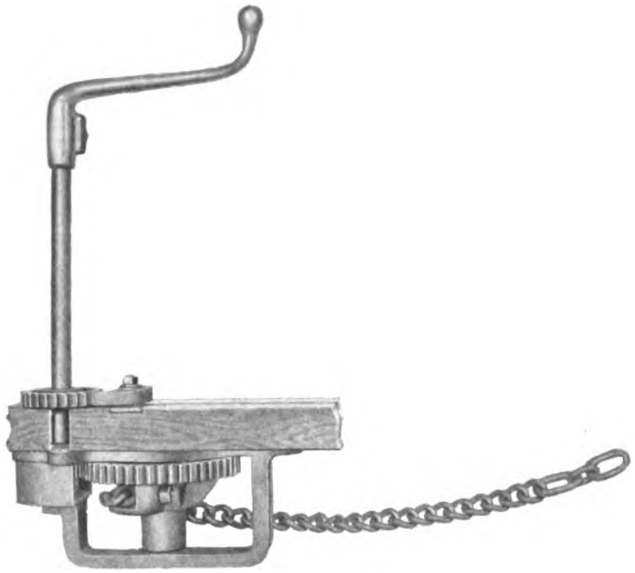
A Light and Powerful Hand Brake with Automatic Lubrication

The Lord Manufacturing Company, Brooklyn, N. Y., has this year effected some notable improvements in hand-power brakes. The new Lord differential staffless brake was described in the ELECTRIC RAILWAY JOURNAL for May 23, 1914. In addition to this brake the company has recently redesigned and materially improved the "Giant" brake, formerly manufactured by the Sterling-Meaker Company. The changes have been so marked that the name has been altered to the "Giant Perfected" brake. This brake can develop a tremendous brake pressure, and yet its weight, 43 lb., is said to be less than any other geared hand brake now manufactured. The platform space has been cut down to a minimum, as shown by the very shallow housing illustrated in an accompanying cut. The general outline and the over-all dimensions of the redesigned brake are also illustrated. Particular attention is called to the rigid construction of the new housing, which is attained by means of a longitudinal arm which supports the lower drum shaft bearing.



DETAILS OF GEARED HAND BRAKE, INCLUDING DIMENSIONS

The castings are of malleable iron. The pinion for driving the gear is squared for connection to the brake staff, eliminating the use of a key and keyway. Oil grooves and cups are provided for convenient automatic lubrication of both the gear and pinion bearings. This feature alone embodies a big improvement in hand brakes. The new brake is made with three different types of chain drums; the regular drum with slack absorbing eccentric; the inverted drum with slack absorber at the bottom and provision for winding the brake chain upwardly, and the straight drum without the eccentric shoulder. For heavy cars where much chain travel is necessary, the slack absorbing type of drum is essential to efficient and prompt operation. When brakes are considered for light-weight cars having little travel in the truck levers, the straight drum without the large slack absorber is sometimes more desirable, as high brake pressure can be obtained at once without need of special provision for the quick taking up of slack chain. The periphery of the chain drum is so constructed that a smooth and natural path is provided for the brake chain. The sloping shoulder adjoining the eccentric guides the brake chain to the straight spindle of the drum. This arrangement eliminates undesirable projections upon which the brake chain might bind, and thereby assures smoothness of action as the brakes are released.



GEARED HAND BRAKE AND CHAIN AS INSTALLED

Another improvement is a provision for limiting the amount of release to eliminate lost motion when applying the brakes, and to enable the motorman to work more efficiently. This feature is accomplished in the following novel manner: A spiral groove is cast in the roof of the housing, through which a so-called stop pawl connected to the gear drum operates with the application or the release of the brake. A stop block is placed in the spiral groove which halts at the proper distance any superfluous unwinding of the chain which tends to follow due to the momentum. The stop pawl can be furnished in a variety of lengths without altering the other parts of the brake; so the automatic stop in this brake may be said to be adjustable.

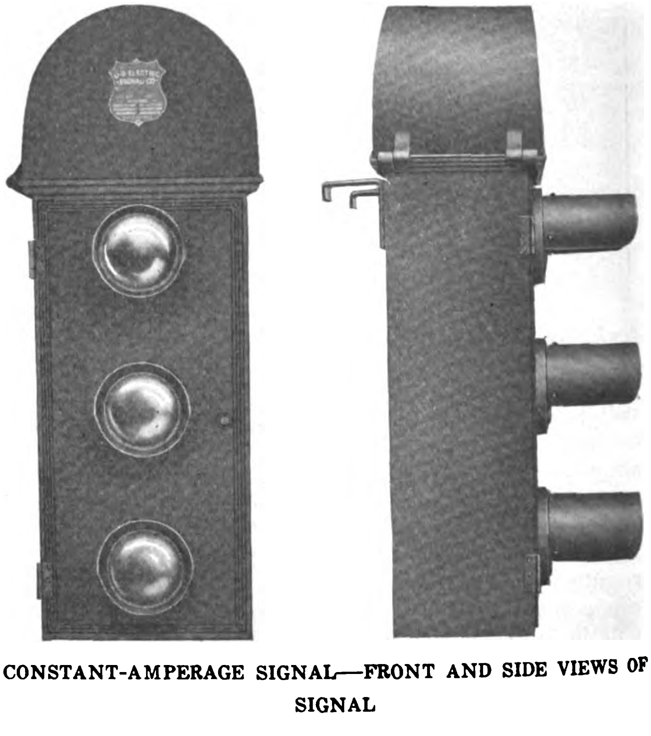
The table below shows the chain tension that can be obtained with this brake for each of its three ratios, together with the travel of the brake rod per turn of the brake handle:

	Gear Ratio, 18-42	Gear Ratio, 14-46	Gear Ratio, 12-48
75 lb. on a—			
12-in. handle—chain tension..	1200 lb.	1687 lb.	2057 lb.
13-in. handle—chain tension..	1300 lb.	1827 lb.	2229 lb.
14-in. handle—chain tension..	1400 lb.	1968 lb.	2400 lb.
Average chain travel per turn of handle	5¾ in.	4⅛ in.	3⅜ in.

The manufacturer feels that all of the requirements of high power, compactness, quick action, easy application and definite release have been foreseen in the design of the "Giant Perfected" brake, and that these qualities have been combined with extreme simplicity of design.

Constant-Amperage Light Signal for Electric Roads

Probably in no class of apparatus for use on electric roads has the interest increased more rapidly during the past four or five years than in signaling. The increased interest is only natural as signals are used on suburban and interurban electric roads, many of which have only been completed in the past few years. Another reason for the increased interest is that, at first, many roads, while appreciating the operating value of signals, did not so fully appreciate the safety features of them until the need of the safety feature was vividly brought to their minds by some bad collisions which received great publicity. The manufacturers of signals, of course, have developed signals in accordance with the demands of the users. The users of signals on electric roads, of necessity, have had to demand from the start that the signaling apparatus must be sold at a low figure and the manufacturers have had to produce such a signal.

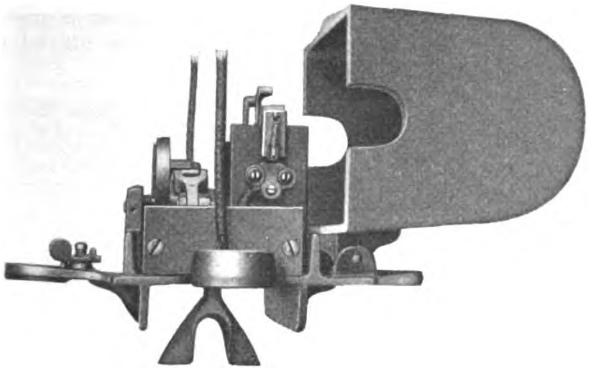


CONSTANT-AMPERAGE SIGNAL—FRONT AND SIDE VIEWS OF SIGNAL

In the development of electric railway signaling the old hand-throw signals were, as an apparatus to operate by, fairly satisfactory, but as schedule speed became more of a factor, there arose a demand for a signal which was operated automatically and which could be passed without stopping the car. In addition, it was found that, with a partial ground or a partial feed on the line wire of the hand-throw signal, a proceed signal could be given at both ends of a block, several collisions being caused in this way. The automatic signal was, therefore, designed not only to be automatic but to be safe in case of a break, cross, ground or foreign feed on the line wires.

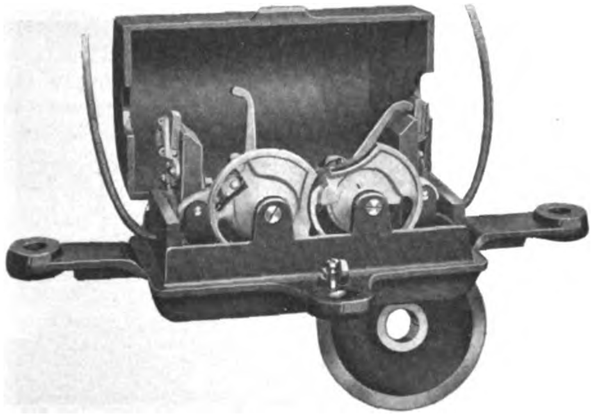
As signals on electric railways came more and more to be considered as safety features more thought was given to signal design so that operation would be safe under unusual conditions that included not only simple crosses, breaks, foreign feeds and grounds on the line wires but also all of the various simple combinations of them. However, in actual practice this step has been approached with considerable hesitancy owing to a feeling that, in order to make signals safe under these unusual conditions, there were required more complicated mechanisms which were more expensive to install and to maintain and that protection against combinations of line-wire troubles was not warranted.

It is, however, beyond dispute that it would be desirable to design a signal not only to be safe in case of a simple foreign feed, break, ground or cross on the line wires, but also to be safe for combinations of these as well, provided the mechanism was not complicated nor increased in cost, and the United States Electric Signal Company of West Newton, Mass., now claims to have produced the first contactor operated signal which meets these requirements. This is the new Type-M signal, illustrated herewith, which safely takes care of twenty-four combination line-wire troubles.



CONSTANT-AMPERAGE SIGNAL—END VIEW OF CONTACTOR

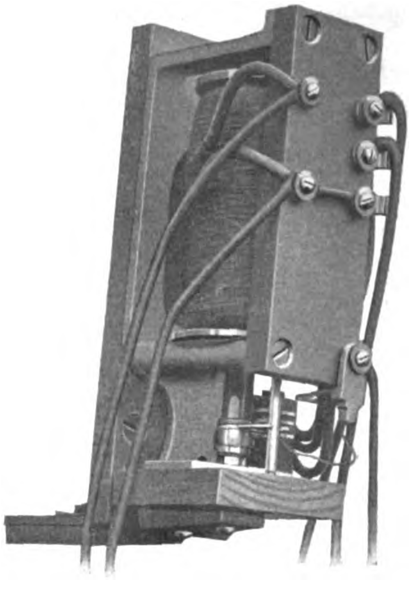
The new signal is of the all-light type, using lights for day indications as well as at night and being simpler than a semaphore signal as the blades and the mechanisms for operating them are eliminated. In the past, light signals operated by trolley current have not been altogether satisfactory, for while sun shields have largely eliminated the troubles due to the sun's rays and suitable lenses have been developed, yet the great fluctuations of voltage which occur in service result sometimes in practically putting out the lights during the peak load. The Type-M signal, however, employs a simple current regulator which keeps the lights constant regardless of the voltage. This is a simple solenoid that uses a very small amount of current and has a laminated plunger carrying a contact.



CONSTANT-AMPERAGE SIGNAL—SIDE VIEW OF CONTACTOR

The plunger moves up and down in accordance with the voltage fluctuation and makes contacts at various points, shunting out portions of a resistance which is in series with the lights and keeping the amperage in the lights constant. As the contacts rub and as the amperage and voltage are very low the arcing is practically imperceptible and the contacts therefore cause no trouble.

The new contactor that is used with this signal is designed so that the contact fingers are mechanically locked in the open position and cannot be jarred into contact by any blow on the contactor or span wire. The fingers will operate only after the pendulum that is operated by the trolley wheel has removed the lock from its locking position. The interlocking in this contactor absolutely prevents any simultaneous operation of the two contactor fingers.



CONSTANT-AMPERAGE SIGNAL—CURRENT REGULATOR

The Type-M signal is of the car-counting type and registers up to fifteen cars in the block. It is intended for operation on single track between turnouts. When the block is unoccupied, there are no lights showing in the signal, but as the car enters the block the counting-in magnet is energized, a red light shows at the far end of the block and a yellow light, which is the top one of the three lights in the signal, shows at the near end and gives the proceed indication to the motorman.

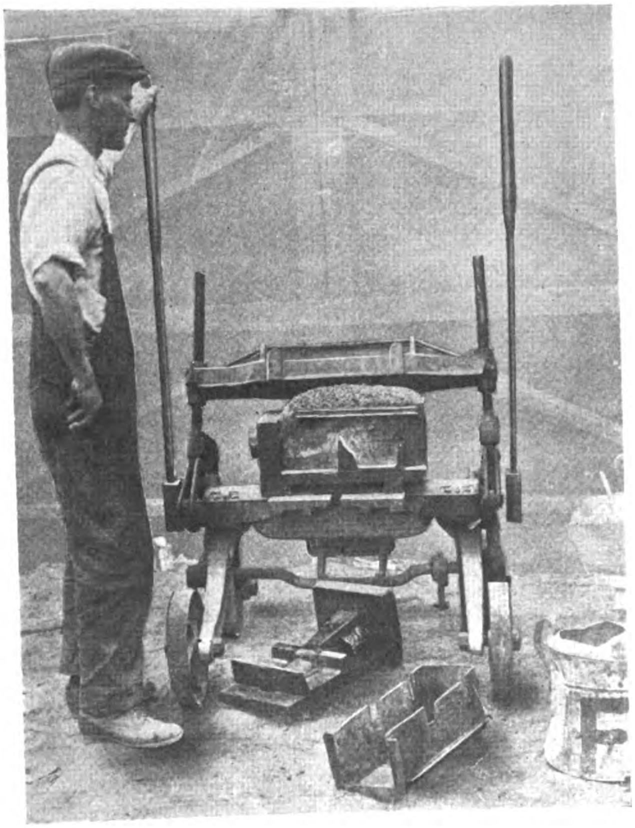
If a second car approaches the block and the motorman sees this yellow light at the top of the box he knows that there is a car in the block going in the same direction as himself. As the car passes over the contactor the yellow light located at the top of the box is replaced by one at the bottom of the box and this is an indication that the entering car is properly recorded in the block and may proceed.

A third car entering the block makes the permanent change from the yellow light at the bottom of the box to the yellow light at the top of the box, and each succeeding car makes this permanent change in getting the proceed indication. As each car in leaving the block passes over the contactor at the opposite end, the counting-out magnet is energized one step for each car so that when the last car has left the block the signals go to their neutral positions.

The annual meeting of the Massachusetts Street Railway Association was held at Young's Hotel, Boston, Mass., recently, and the following officers were elected for the ensuing year: President, H. H. Crapo, New Bedford; first vice-president, W. W. Sargent, Fitchburg; second vice-president, D. A. Belden, Haverhill; treasurer, Fred H. Smith, Quincy; secretary, Charles S. Clark, Boston. The executive committee consists of Messrs. Crapo, Sargent and Belden, Robert S. Goff, Francis H. Dewey, P. F. Sullivan, J. T. Harmer and J. L. Richards.

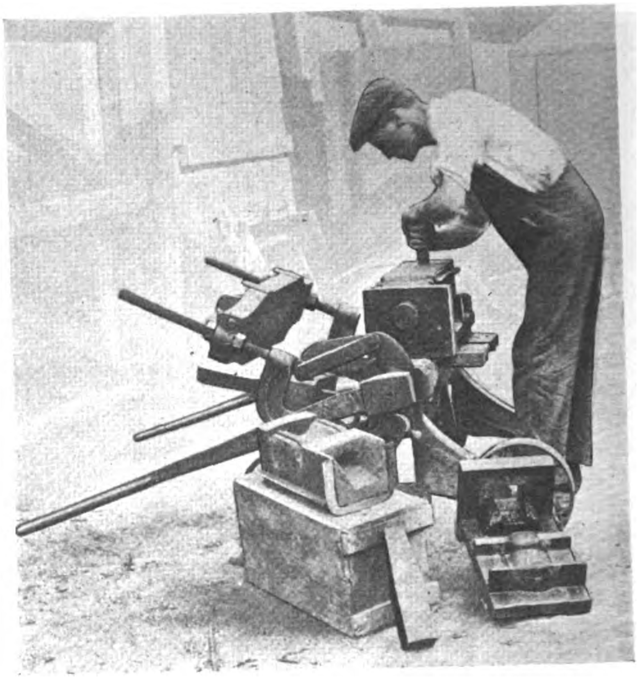
Simplified Method of Making Thermit Insert Joints

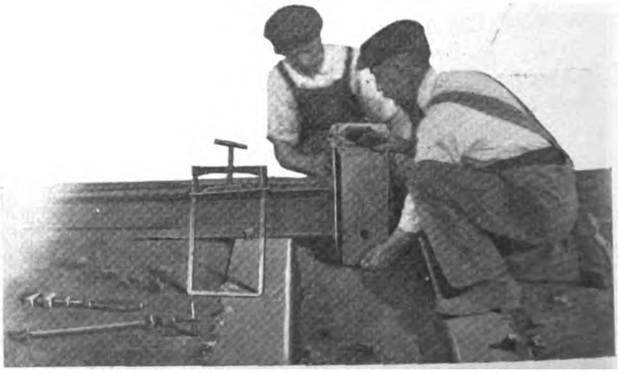
The Goldschmidt Thermit Company, New York, announces that its method of installing thermit insert joints has been so simplified that hereafter the welding may be carried out directly by the railway instead of by contract, whether the job calls for one joint or a thousand. At the same time the cost of the completed joint has been appreciably lowered. The company will sell the complete outfit and supply an experienced foreman at the start to instruct the customer in making the welds. It is confidently believed that street railway companies owning the necessary equipment and having a properly instructed welding gang will now be able to weld a 9-in. rail at a cost not exceeding $7 per joint and a 7-in. rail at about $6.50 per joint, including a fair proportion of the first cost of material and apparatus for depreciation and maintenance.


RAMMING MOLDS ON SQUEEZER FOR THERMIT INSERT RAIL WELD; PATTERN AND MOLD BOX SHOWN IN FOREGROUND

ADJUSTING ASBESTOS AND MOLASSES STRIPS TO RAILS PREVIOUS TO PUTTING ON MOLDS

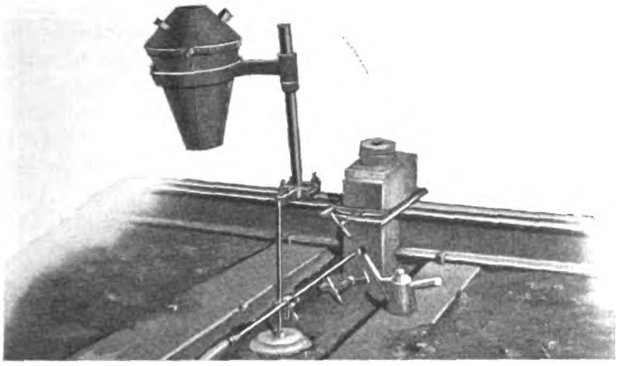
The improvements apply to the methods of making and adjusting the molds so that the operation of ignition, melting and welding can be quickly executed but without any danger that the thermit steel, which is exceedingly liquid, will run out. Up to the present time, the general practice was to ram the two-part molds by hand, clamp them to the rails and lute around the edges with fire-clay. Now the molds are rammed on a foundry squeezing machine which enables one man to do this work with great facility, while the molds are constructed with a bead around certain parts which is compressed when the two parts are clamped together to form a safeguard against a run-out between the two parts of the mold. While the molds are being prepared another man adjusts two cords of asbestos dipped in molasses to the rails at a point just inside of the mold box. The molasses is sticky enough to make these cords adhere tightly to the rail, and when the mold boxes are adjusted these cords are compressed, forming a very efficient luting all around the outside edges, between the molds and the rails.


CUTTING PREHEATING GATE IN MOLD WITH SPRUCE CUTTER; COMPLETED MOLD AND PATTERN SHOWN IN FOREGROUND


ADJUSTING THE TWO PART MOLDS TO THE RAILS FOR THERMIT JOINT

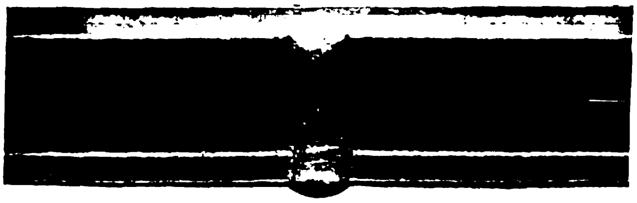
However, to guard doubly against a run-out, a small amount of powdered fire-clay is blown into the molds by means of compressed air. This is directed into the pouring gate while the other openings of the mold are closed temporarily by wooden plugs. If there is any opening around the edges of the mold, the fire-clay is blown into such openings, is caught by the molasses and seals the mold absolutely tight. It also forms a thin coating over the entire interior of the mold, making a weld of smoother appearance. Any surplus of fire-clay is blown out while the rails are being preheated with the molds in place and before the thermit steel is poured in.

These improvements are said to eliminate very greatly the human factor in the welding operation and practically eliminate the danger of run-outs due to carelessness in luting. They also increase the speed with which the molds can be adjusted, luted and poured, so that many more joints can be welded per day than formerly.



MOLDS AND CRUCIBLE CLAMPED TO RAILS READY FOR PRE-HEATING AND POURING

A further saving has been effected in the welding portion. Instead of mixing the additions of manganese, nickel thermit and other materials, for improving the quality of the thermit steel, throughout the thermit itself, these additions are now put up in a sheet-iron container which is placed on top of the mold during the preheating and is heated red-hot by the waste gases. It is then placed in the center of the crucible and is melted down by the heat of the thermit reaction. This method enables the production of more steel from a given amount of thermit without any sacrifice of heat, with the result that the cost of the welding portion of thermit is greatly reduced.



VIEW OF FINISHED WELD

Special tools have also been devised for certain operations to facilitate the work of aligning the rails, welding the joints and grinding them afterward.

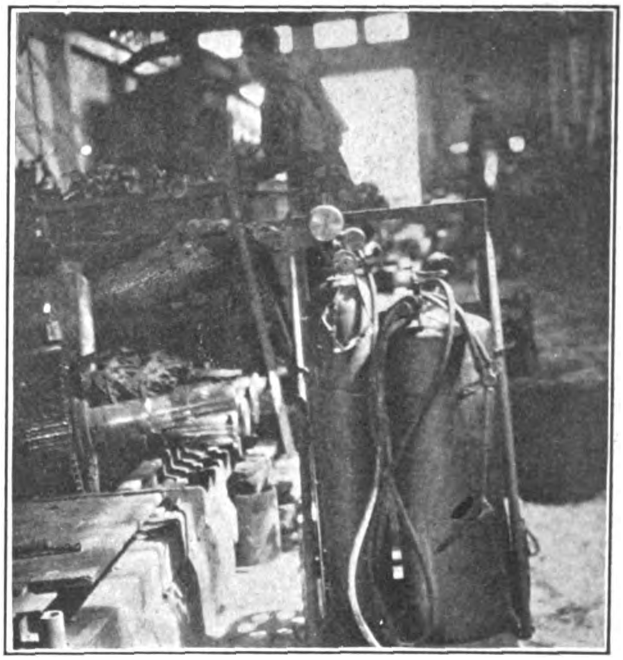
Electric Lantern with Standard Batteries

The H. W. Johns-Manville Company announces a new type of portable electric lantern of exceptionally wide utility, and one which it asserts will find a ready market among lantern users because it entirely overcomes the usual inconvenience in securing proper size batteries. This lantern, called the J-M Mobilite electric lantern, uses standard size dry cells which are easily obtainable everywhere. The use of larger batteries has naturally given this lantern infinitely greater burning capacity, in fact the maker states that with two ordinary good dry cells, used intermittently, it will burn for nearly 150 hours.

The lantern is fitted with a tungsten bulb of very low amperage and a specially designed parabolic reflector. Working in conjunction this bulb and reflector produce a light of remarkable brilliance and power by which objects are clearly discernible at a distance of 150 ft. So powerful is the light that repairs have been made at night on pole lines with one of these lanterns held on the ground pointing upward into the network of high-tension wires. The absolute safety of this lantern has opened up a field practically closed to oil and gas-burning lanterns.

Portable Oxweld Outfit in Aurora, Elgin & Chicago Shops

The main repair shops of the Aurora, Elgin & Chicago Railroad are located at Wheaton, Ill. In these shops the maintenance and repair work is done for the entire system which includes 83 miles of high-speed suburban and interurban lines leading into the heart of Chicago, a 40-mile cross-country single-track interurban up and down the Fox River Valley, and the city street railway systems of Aurora and Elgin, Ill. W. J. Bowman is master mechanic.



PORTABLE OXY-ACETYLENE WELDING OUTFIT

The equipment of the Wheaton shops includes a portable oxy-acetylene welding outfit manufactured by the Oxweld Acetylene Company, Chicago. Mr. Bowman states that an almost unlimited number of different kinds of work can be performed with the oxy-acetylene blowpipe. This outfit consists of one cylinder of acetylene, one cylinder of oxygen, regulating valves for each cylinder and an Oxweld blowpipe with an assortment of tips or nozzles. The different nozzles admit changing the flow of gas and the amount of heat to adapt the flame to the character of work being welded. The outfit is mounted on a two-handled steel truck so that it can be wheeled to any part of the shop. It is but the work of a moment to replace an exhausted cylinder.

Some of the pieces of work done during one day include repairing broken and cracked seat castings, building up the noses of GE-66 motors either by the direct application of metal or by welding on flat pieces of steel and repairing motor-driven air compressor cases. This form of work brings about considerable economy because of the low scrap value of the cases as compared with their first cost. When parts of this character are to be repaired they are inclosed in walls of brick and sheet asbestos and are preheated over a charcoal fire until the metal is relieved of all of the casting strains.

OXY-ACETYLENE WELDING AT A MOTOR AXLE SEAT

The defects are repaired with the oxy-acetylene blowpipe and then the part is recovered so that it may cool very slowly.

In working on large steel castings such as the shells of GE-66 motor, a gas flame with an air attachment is used for preheating, and such parts as the edges of the bearing seats for the axle bearing are preheated for about thirty minutes. This preheating relieves the local part of the casting from the danger of cooling cracks and also greatly reduces the amount of gas required for making welds.

Some of the other pieces of work on which the welder is frequently used include brakeshoe heads, contactor frames, controller segments and the repair of shop machines and tools. Another use is the insertion of new teeth or the building up of broken teeth in the gearing of shop tools. For such work and for similar jobs in which the furnished metal must withstand high stresses the welding is done with nickel steel filler.

The welding outfit is particularly valuable in emergencies when the larger shop tools are broken, because almost any ordinary breakage can be repaired quickly and the loss of time of the machine is thus cut down to a few hours, whereas if a new part had to be ordered and installed the tool might be out of commission for several weeks. Such an incident recently occurred in connection with a large hydraulic wheel press when a ram yoke broke. Another class of work which effects substantial savings is that of applying new metal and building up and filling in the keyways of the taper end of GE-66 armature shafts. Nickel steel is used for this work.

All of the welding operations are performed by three old employees of the company machine shop. These men were broken in for the new work by receiving instructions and experimental practice of one to three days. They receive machinist wages.

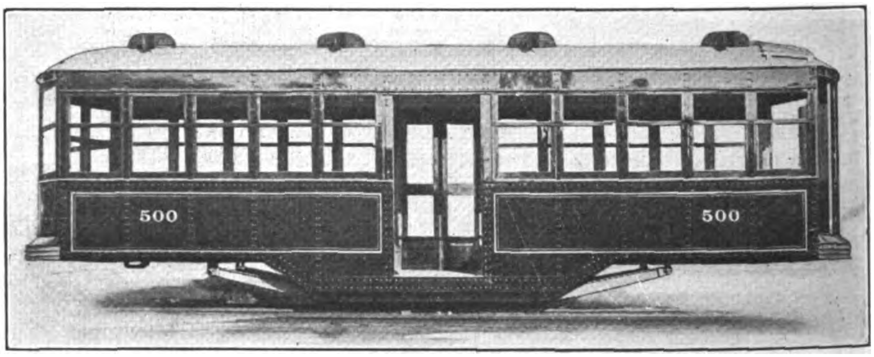
Rules on Inductive Interference

In a communication which appears in the current issue of the *Electrical World* R. D. Coombs calls attention to certain points in connection with the new California rules on inductive interference. These rules were described on page 485 of the issue of the ELECTRIC RAILWAY JOURNAL for Sept. 12. He contends that the rules practically prohibit the construction of power lines or railway rights-of-way which are not usually wide enough to permit the installation of a communication line on one side and a power line on the other. He contends that the provision for a separation not less than the height of the taller supports gives only imaginary safety, as contact of a line with falling wires would not be prevented there.

A Light-Weight Truckless Car

The Laconia Car Company will exhibit opposite the entrance to the steel pier at the Atlantic City convention a low center-entrance, truckless car, 33 ft. over buffers and seating forty-four passengers. This provides an increase of 37½ per cent in seating capacity over standard, double-end cars of the same length. Completely equipped the car weighs less than 500 lb. per seated passenger, the lowest unit weight for any motor car yet exhibited. The car is of semi-steel construction with an arch roof, the top of which is but 10 ft. above the rails. It will be shown completely equipped with 40-hp outside-hung motors and air brakes. The car body is mounted on special pedestals and therefore no trucks are required, duplicate construction being eliminated. The car is equipped with levers pivoted to the journal pedestals and these absolutely prevent oscillation.

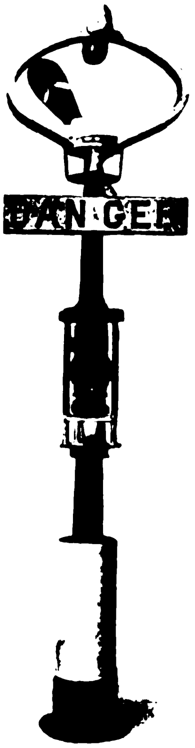
Summed up, the distinguishing features are: *a*, a low entrance which facilitates loading and unloading, improves schedule speed and prevents accidents; *b*, a large seating capacity which provides room for 37½ per cent more passengers than standard double-end cars of the same length; *c*, light weight which is effected by a short framework betwen axles for absorbing the supporting strains; *d*, elimination of trucks, the car body being mounted on special pedestals; *e*, a low center of gravity that is close to the wheels and axles where the starting and stopping forces are applied; and, *f*, absence of oscillation which is absolutely prevented by use of levers pivoted to journal pedestals. The Laconia Car Company will be represented at the convention by Cornell S. Hawley, president; Peter M. King, assistant to president; J. E. Johnson, purchasing agent, and E. J. Fitzgerald, sales agent.



FIRST TRUCKLESS CAR COMPLETE, READY FOR SERVICE

Combined Audible and Visible Highway Crossing Signal

In November, 1911, the Hoeschen Manufacturing Company, Omaha, Neb., designed and installed in a steam railway yard at Shreveport, La., its first visual highway crossing signal. This signal had a locomotive-type bell, waving semaphore blades for day indications and flashing red lenses with an oil lamp for night indications. During the past three years the manufacturer has made several refinements in this type of signal, which has since been adopted as standard on many steam and electric railways. The oscillating illuminated semaphore blades are a supplement to the standard type of crossing bell manufactured by this company and are used on more than a hundred steam and electric railways. The accompanying illustrations show this type of crossing signal, of which more than forty are used by the Illinois Traction System, while about fifty are used by the Aurora, Elgin & Chicago Railroad. Two types of visual aspects are illustrated, the operating mechanism for both being identical.

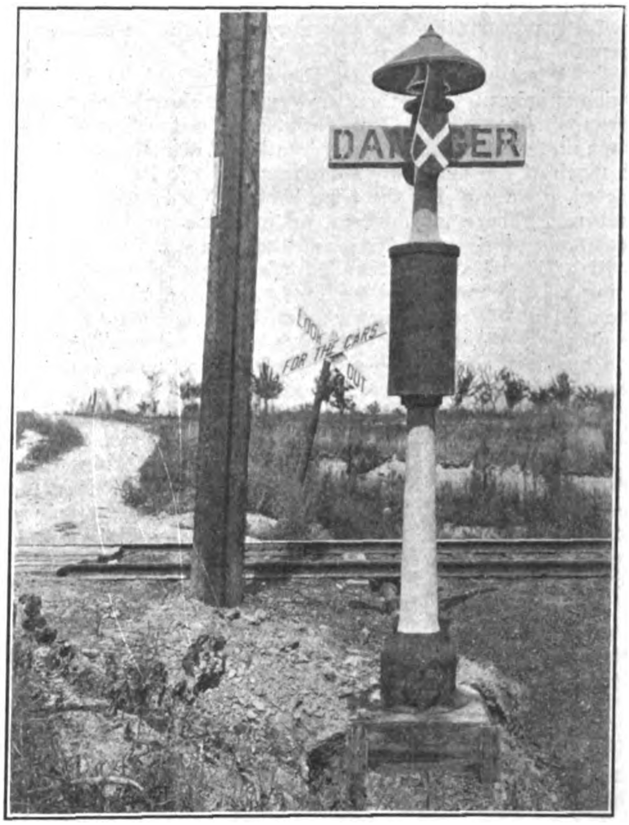


CROSSING INDICATOR

The Hoeschen signal is actuated by a powerful spring motor equipped with three 35-ft. springs, and when once fully wound by the passing cars it is capable of sounding the bell and waving the blade continuously for one hour and forty minutes. The motor is wound by the natural movement of the track rail, which is transmitted to the winding mechanism of the motor by means of a connecting rod and a plunger lever resting against the base of the rail. The starting control of the bell may be located at any desired distance on either side of the crossing to be protected. This control apparatus is not in any way connected with the trolley or transmission circuit, this particular feature being considered as one of the chief advantages of the company's type of crossing protection apparatus. The small electric impulse necessary to unlatch the bell when a car passes the control point is generated in a rugged piece of apparatus also connected with the track rail and actuated by the depression of the rail as the car passes the control point. The generator, which is about 8 in. wide x 10 in. long x 6 in. deep, consists of a laminated permanent magnet through the poles of which two generating coils are bolted. A keeper placed across the face of these two poles is operated by a lever clamped to the base of the running rails in such a way that the rail is twisted and its gage line is raised about $\frac{1}{8}$ in. above normal surface. When a car passes, the rail is depressed to its normal level and the lever connected with the base of the rail kicks the keeper away from the pole faces of the coils which are attached to the permanent magnet. This breaking of the magnetic circuit generates an electrical impulse which is sufficient to unlatch the bell-ringing spring-actuated motor. The passage of the car by the crossing bell and the automatic winding due to the depression of the rail at the bell cuts out the ringing mechanism.

On electric roads where traffic is heavy and cars follow each other at close intervals, a second car may enter the bell section before the first car has passed the bell. This is a common situation which demands the fullest protection. For such operations, the crossing signal must not cut out when the first car passes it, but, on the contrary, must continue to ring until the last car in the bell section has passed the bell. This protection is provided by a simple gravity latch in the spring motor which rings the bell. This latch will drop only while the bell is ringing and will operate only when a second car passes over the starting generator before the first car has passed the crossing. The impulse from the generator, when operated by the second car in passing, will cause the gravity drop latch in the bell to lock the motor release lever so that when the first car passes the cut-out it cannot restore the release lever, thus causing the bell to ring continuously until the last car in the protected zone passes the cut-out at the bell.

Some of the features emphasized as of particular value to electric roads are that no battery or trolley or high-tension connection are necessary and that neither the rail bonding nor the block signal track circuits are interfered with. Simple control is provided for single and double track, and the control also may be made directionally selective if desired. As the weight of the car itself actuates the control, the bell will operate equally well whether or not the train is motor or engine-drawn or whether or not the trolley is on the wire. It is stated that an ordinary single-track installation can be made by three or four men in one day.



CROSSING SIGNAL FOR ILLINOIS TRACTION SYSTEM

The indications available include the loud-sounding locomotive-type swinging bell giving warning like an engine, an illuminated sign reading "Danger," a set of red and white enameled-steel illuminated semaphore blades which wave through an arc of approximately 180 deg. or a combination of the bell and waving arcs. The Illinois Traction System has recently installed at Champaign, Ill., a so-called silent crossing signal equipped with two oscillating blades and a flashing red danger sign 4 ft. long. This signal, with others of the same type to be installed, is placed within the city limits where the noise from a loud bell might be objectionable.

LONDON LETTER

Brief Review of English Tramway and Manufacturing Conditions—Testimonial to Sir Albert Stanley—Other Notes

(From Our Regular Correspondent)

So far the European war has not affected British tramway receipts to any great extent. Almost every city in Great Britain operating tramways has had to contribute to the fighting forces of the country. In Glasgow, for instance, a week or two ago about 800 of the tramway employees had to report to the war office for duty, and it is probable that many others have since gone. Manchester, Sheffield, Bradford and all the other larger cities have suffered in this way to the extent of hundreds of employees, but there has been little curtailment of service and receipts have kept up well. Some tramway extensions which had been contemplated may not be carried out for the time being and municipalities requiring more tramway cars will probably not order them or build them until the effects of the war are better known. In London the car and the omnibus services on the underground railways are all proceeding as usual. A feature is the number of London General omnibuses and London taxicabs which are at the front conveying commissariat and war material. The motor omnibus services in London, however, have not suffered, and one can get transported now as comfortably as before. One of the main steam railways has stopped its work of electrification for the present, and some of the tramway companies have deferred dividends, but otherwise transportation business may be said to be practically normal.

The effect of the war on the manufacturing industries which supply material for tramways and electric railways is perhaps more serious. All Continental construction of tramways and electric railways is practically at a standstill, and as much of the material came from Great Britain it has reflected adversely, for the time being, on the Briitsh manufacturer. There is, however, an immense amount of business from foreign countries, and the Board of Trade and the British Electrical & Allied Manufacturers' Association are doing all they can to gather information and statistics as to the amount of the German competition which there has been in all parts of the world. It is hoped that a large portion of the business which has previously gone to Germany will come to this country. In general, the British manufacturers have decided to continue to advertise, more especially for export business.

A few words as to what the Continent is suffering from a tramway and electric railway point of view would doubtless be interesting, but there is no way of obtaining such information, except in a general way. A few of the tramway systems in Belgium must have been wiped out entirely, but Brussels, though invested by the Germans, does not appear to have suffered much.

All arrangements for the International Tramway Congress, which was to have been held at Budapest early in September, were canceled by the executive council at Brussels on the outbreak of war.

The annual conference of the Municipal Tramways Association was to have been held at Salford in September, but the council felt it inadvisable to hold the conference under the present circumstances.

The council of the Institution of Electrical Engineers has issued a circular suggesting that the members place their services as electrical engineers at the disposal of the war office and of the admiralty and be in readiness to fill vacancies in public services, electric power stations, tramways, railways, etc., caused by the calling up of the reserves and territorial forces. The council desires to receive offers of services from members of the institution and to obtain the names of as many other qualified men as possible who may be willing to offer their services in the directions indicated. The council adds that it has offered to place at the disposal of the war office, for immediate occupation and free of charge, the available portions of the institution building, or a total area of 10,000 sq. ft.

The British Electrical Federation, representing a capital of about £20,000,000 and comprising forty tramway, motor-omnibus, electric supply and electric manufacturing undertakings has established a mutual aid fund to assist the wives, children and dependents of men in active service. This fund will be maintained and supplemented by the federation as long as hostilities last. Every employee who enlists for the war will, on his return, be reinstated in his present position or will have suitable employment with the federation found for him.

The tramways act authorizing the Bristol Corporation to purchase the undertaking of the local tramway company has received royal assent.

The Board of Trade inspector of railways has inspected the new Liverpool tram route, which extends from the Edge Lane terminus to Bowring Park, a distance of 2½ miles. He was accompanied by the general manager of the tramways and the city engineer, and found everything to his satisfaction.

It is anticipated that it will be possible to inaugurate through electric train services between the Elephant & Castle and Watford by the end of this year. This will be the first portion of the intercommunication scheme with the London underground railways made possible by the recent electrification of the suburban lines of the London & North-Western.

One of the first contracts to be transferred to Great Britain on account of the war is that recently given out by the electricity committee of the Bradford Corporation. It had accepted the tender of the Adnil Electric Company, Ltd., London, representatives of the Bergmann Electrical Works, Berlin, for a turbo-generator of 5000-kw capacity. The generator was nearly completed when the war broke out. The committee recently met and decided to relet the contract to the British Westinghouse Electric & Manufacturing Company.

The engineer of the Bradford Corporation Tramways is so well satisfied with the experiments he has made during the last three or four years with the R. E. T. railless trolley buses that he has just equipped an 11-mile circular route on the same system. He contends that for cheapness and comfort the trolley buses are superior to the petrol vehicle. On the other hand, the Leicester tramways committee is commencing to equip certain sections in Leicester with petrol-driven motor buses

The tramways committee of the Liverpool Corporation had before it at a recent meeting a report of C. W. Mallins, general manager, which stated that the chairman, deputy-chairman and himself had had an interview with the chief inspecting officer of the Board of Trade, who had inspected the tram lines and consented to an increase in the speed limit.

J. M. McElroy, general manager of the Manchester Corporation Tramways, was a member of the deputation which recently waited upon the president of the Local Government Board, with reference to a superannuation scheme for municipal officers. Addressing Mr. Samuel, Mr. McElroy said: "In Manchester we have some 5000 employees. We have a thrift scheme whereby the officers contribute 3¾ per cent of their salary and the Corporation 1¼ per cent. In addition, the Corporation adds interest at the rate of 4 per cent. The officers draw their allowance at the age of sixty-five, or, in case of incapacity, earlier. At present the corporation is considering the question of turning this thrift scheme into a superannuation scheme."

A special sub-committee of the Glasgow Town Council's committee on tramways has been appointed to consider and report on the desirability of the tramways department providing cottages to be rented by workmen in the service of the department.

In his report for the year, W. Marsh, engineer and manager of the Brighton Corporation Tramways, says: "Manganese steel plates to the number of 400 were fixed on the joints in Queen's Road and the lower end of Dyke Road, much to the satisfaction of those who live on the routes so dealt with. The reduction in the noise made by the cars was most marked, and it necessarily follows that the life of the rails must be prolonged in consequence."

The tramways committee of the Leicester Corporation finds that cars with canopy tops are much better for meeting the demands of the public than those without, and it has decided to put covers on 75 per cent, or forty-seven of the present cars. The estimated cost is £101 10s. per car for the manufacture and delivery of the canopies, which will be fixed by the Corporation workmen at the car shops.

A. C. S.

News of Electric Railways

OPINION ON TOLEDO MUNICIPAL OWNERSHIP ORDINANCE

Toledo City Solicitor Holds Municipal Ownership Ordinance Legal in Contempt Case Hearing

Wesley S. Thurstin, Jr., city solicitor of Toledo, Ohio, issued an opinion to the City Council on Sept. 28, in which he said that the municipal ownership ordinance, recently voted upon by the electors, had carried legally and that Council now has the right to proceed with legislation for taking over the railway, light and gas properties. He said that the franchise committee should adopt a franchise that can be turned over to the bondholders, in case the city fails to operate the properties satisfactorily, and he held that such bonds, being a lien on the railway property, may be advertised and the Council receive bids for them. The bonds can be transferred when the property is turned over to the city. The opinion rendered by Mr. Thurstin follows in substance:

"The election held on Aug. 4, 1914, was for the purpose of the qualified voters of Toledo passing upon the subject of whether or not the city of Toledo should own and operate the public utilities of street railway, electric light, gas and heat, and a certified copy of such ordinance, together with the result of said election, is now on file in the office of the clerk of this body, and which should be by him recorded in his latest volume of city ordinances and published as other ordinances are published.

"This ordinance is legal. It received a majority vote of those participating in the election and thus becomes an ordinance of Toledo, and, in my opinion, not subject to change or alteration, except by a subsequent act passed upon by the qualified voters of Toledo. The ordinance provides for a bond issue, which, in my opinion, received sufficient votes to carry, and the additional leigislation is necessary by Council providing for the quality and character of a franchise to be given to the holders of the bonds in case of forfeiture.

"Such legislation should be enacted so that when the property is to be transferred the bonds may be issued and sold and the money turned over to the holders of the property, as an act simultaneous with the transfer of the property.

"In the event the city should purchase the existing properties a valuation should be had of them, the amount determined upon and the bonds placed upon the market and bids received on the same, subjecting their transfer to the condition that the property be taken over. Should condemnation proceedings be resorted to the city may elect to take the property within six months from date of finding of value, and in that period of time a market could easily be found for the bonds and for the sale determined upon and the property acquired at the same time the bonds are transferred.

"It is my opinion that this legislation by the electors is in all respects legal and binding upon the city of Toledo in even a greater degree than an act of Council and is in compliance with the statutes and constitution of the State of Ohio."

In connection with the statement the city clerk presented the results of the election, properly certified by members of the board of elections. They show that 10,597 votes were cast in favor of the ordinance and 9,409 against it.

A meeting of the franchise committee was scheduled for the evening of Sept. 30.

A resolution to employ former City Solicitor Cornell Schreiber to aid the present city solicitor in the franchise fight was placed on the table by the City Council without comment at the regular meeting on the evening of Sept. 28. The idea of having Mr. Schreiber identified with the case arose from the controversy between him and the Federal Court over a statement made by Mr. Schreiber following the recent injunction decision.

The hearings in the contempt proceedings against the three men connected with the Toledo Newspaper Company and the Toledo *News-Bee* were begun on Sept. 22 before Judge Killits, who gave his reasons for dismissing Harry J. Howard, managing editor of the paper. He said Mr. Howard was merely an employee of the paper and had to follow the wishes of his superiors. During the hearing Judge Killits made it plain that he brought the proceedings not because of personal criticism of himself, but because the court should be allowed to conduct its hearings and render its decisions without annoyance and without an attempt to influence people against orders of the court.

J. W. Curts, attorney representing the newspaper, argued that the matter contained in the articles and editorial did not constitute contempt and that a newspaper has a right to criticise the courts and their decisions. He said the court was endeavoring to abridge the rights of the press and to establish a censorship. Mr. Curts said that the Toledo *News-Bee* had done a glorious work and that Editor Cochran should be commended for the part he played in it.

On Sept. 23 Judge John M. Killits of the Federal Court, sitting in the contempt proceedings against Negley D. Cochran and E. B. Conliss, the editor and business manager respectively of the Toledo *News-Bee*, said that in case he decided to strike from the court's records the amendment and supplement to the original order of citation, he might call in another judge to hear the case. Counsel for the men were granted four weeks in which to file briefs and Judge Killits will reply in writing three weeks later. His decision in regard to who shall hear the case will probably not be announced until that time. Attorney Charles S. Northup, representing the *News-Bee* and its editor and business manager, argued that the court had no right to issue a supplemental order, as the contempt proceedings are of a criminal nature, and supplemental or amended orders cannot be issued in criminal cases. The attorney contended that Negley D. Cochran should be discharged since it was an order of this kind, issued on Sept. 17, that brought him into the case. He contended that the court could not punish Mr. Cochran and the *News-Bee* for inciting resistance to its order even if the incitement resulted in resistance. Judge Killits said that if the attorney insisted upon striking out the amendment and supplement, it would be granted, but that unless Mr. Cochran voluntarily appeared the court would have to serve the respondents with the amended and supplemental order.

Henry L. Doherty went to Toledo on Sept. 22 at the request of the franchise committee of the City Council, but it seems that the committee was not prepared to proceed with negotiations at once. On his departure for New York Mr. Doherty announced that he would return on Sept. 29 prepared to proceed at once with the franchise negotiations.

JOHN F. WALLACE ON TERMINAL ELECTRIFICATION

John F. Wallace, chairman of the railway terminals commission of Chicago, returned to that city on Sept. 18 from a European tour. Mr. Wallace was quoted as follows in an interview:

"The day of steam as a motive power in internal city traffic is gone or is rapidly going. The terminals commission has before it a dozen or more matters relating to electrification which were referred to it by the City Council. The first step that must be taken is to work out a rearrangement of railroad tracks so as to reduce the number and provide for an interchange of facilities. Here in Chicago there are numerous instances where railroads parallel and cross each other so as to double and triple the amount of necessary trackage. An improvement in the present track situation is bound to come, and that will make possible a change in motive power. American cities are far ahead of Europe in the electrification of railroad terminals, though London and Paris are using electric motive power for a few suburban lines. But there is no development abroad that can be compared with the electrification of the New York, New Haven & Hartford, the New York Central and the Pennsylvania railroads in New York."

Mr. Wallace said the railway terminals commission would soon begin active work. The first matter to come before the commission probably will be the request of the Chicago &

Western Indiana Railroad for an extension of the terminal facilities of the Dearborn Street station. In this connection Mr. Wallace said:

"This request involves the whole terminal problem with respect to the railroads using the Illinois Central, the La Salle and the Dearborn stations. In handling this problem some way must be found to confine railroad occupancy to private property and thus open up more north and south and east and west streets. In London the railroads are compelled to keep the highways open, and we should follow the same policy here."

NEW YORK SUBWAY CONTRACTS AGGREGATING $140,516,385 AWARDED

The city of New York on Sept. 1, 1914, had outstanding or completed contracts for rapid transit railroad construction under the dual system agreements aggregating $140,516,385, of which $69,462,918 is on lines to be operated by the Interborough Rapid Transit Company and $71,073,466 on lines to be operated by the New York Municipal Railway Corporation.

During the week ended Sept. 26 the Public Service Commission for the First District of New York awarded the contract for the construction of Section No. 2 of Route No. 48, the William Street part of the Park Place, William and Clark Street subway, for operation by the Interborough Rapid Transit Company, to Smith, Hauser & MacIsaac, Inc., the lowest bidders, for $2,254,670. Section No. 2 extends from a point near Beekman Street, southward under William Street and eastward under Hanover Square, to a point about opposite the easterly building line of Pearl Street. The plans call for a two-track subway, and the work must be completed within twenty-eight months from the delivery of the contract.

Chairman Edward E. McCall of the commission is urging Congress to pass the appropriation for the improvement of the East River channel, contained in the pending River and Harbor bill. The government proposes to deepen the channel and to blast away part of Coenties Reef. One of the new rapid transit tunnels under the dual system will pass through this reef and the engineers of the commission fear the effects of blasting upon the tunnel after it is completed.

CLEVELAND'S LABOR PROBLEM

W. D. Mahon, president of the Amalgamated Association of Street & Electric Railway Employees, and a committee from the local branch of the union at Cleveland, Ohio, called on John J. Stanley, president of the Cleveland Railway, on Sept. 29 and discussed the demands that have been made upon the company for increased wages and longer work-day for the tripper men. Mr. Stanley said that he was unwilling to make any change in his original proposition of a minimum day of five hours, with 27 cents an hour for men in the service less than a year and 31 cents for those who have been in the company's employ more than a year. This change of hours and increase in wages, he told them, will cost the company $152,000 a year. The men asked Mr. Stanley if he would be willing to consider a seven-hour minimum instead of an eight-hour day, but he told them that his original proposition was the best that could be made. A meeting of the men was then called for the evening of Oct. 3.

Councilman Meyers, of Cleveland, Ohio, has brought up his resolution providing for a rule that cars shall stop on the near side at all street intersections and insists that the street railway committee of the Council act upon it or allow Council to take it up direct.

People served by the Clark Avenue cars have signed a petition asking that these cars be run alternately on West Fourteenth and West Twenty-fifth Streets in order to improve the service. Peter Witt, street railway commissioner, is in favor of looping the West Fourteenth Street cars at the Holmden Avenue carhouse as a solution of the problem.

W. F. Thompson, president of the City Council, has announced that he will offer a resolution at the next meeting, asking for an investigation of the cost and feasibility of building an elevated system. His idea is to keep such lines off the main streets and adopt the Berlin ornamental idea. He also wishes to investigate the advisability of making this a municipal system.

JOPLIN & PITTSBURG STRIKE SETTLED

The Joplin & Pittsburg Railway resumed operations on the afternoon of Sept. 24, the eightieth day of the strike. Practically all the old men went back to work. Cars were run over all the city and interurban lines, and regular schedules, it was announced, would be resumed during the week commencing Sept. 27. The agreement signed by the company and the men included all the subjects of difference as to working conditions, and is to run for three years. The contract provides for the course through which complaints shall run and for permanent arbitration. The matter of wages is to be arbitrated. The men are to select for this board a member of the utility commission of Kansas or Missouri, the company is to select a member of the board from the membership of these two commissions, and the two arbitrators so selected are to name the third member of the board. The decision of the arbitrators on the subject of wages will automatically become a part of the contract already signed. While the strike was in progress the interurban traffic, particularly between the mines and the homes of miners, was cared for by steam railroads, which ran special trains. The three-year contract is automatically renewed for another three years at its expiration unless one side or the other gives ninety days' notice of a desire to change any of its provisions.

INDIANAPOLIS LABOR SITUATION

Court Order Sought to Restrain Indianapolis Union From Disregarding Arbitration Award

A temporary restraining order to enjoin officials of the Amalgamated Association of Street & Electric Railway Employees of America from calling a strike on the city lines of the Indianapolis Traction & Terminal Company was granted on Sept. 23 by Judge Albert B. Anderson of the United States Circuit Court at Indianapolis, Ind., on petition made by the Guaranty Trust & Safe Deposit Company, Philadelphia, trustee of the mortgage securing the bonds of the Indianapolis Traction & Terminal Company.

Attorneys and representatives of the plaintiff appeared before Judge Anderson and declared that at a meeting of the executive committee of the union it was planned to call a mass meeting of men who were members of the union, after midnight on Sept. 23, ostensibly as a "smoker," but that at the meeting officials of the Amalgamated Association and other labor organizations would make speeches inciting the men to strike and violate the award of the Public Service Commission in the recent arbitration. The bill of complaint shows that the majority of the employees are non-union men, and have signed a working agreement with the company which would be violated if these men should be forced or induced to join in a strike. The complaint further shows that as a part of the general conspiracy five shares of stock of the Indianapolis Street Railway were purchased by the labor organization and held in the name of William Dobson, secretary of the union of bricklayers, masons and plasterers; that at the time of the strike in November, 1913, suit for a receiver was brought in the name of Dobson against the Indianapolis Traction & Terminal Company for the ostensible purpose of cancelling its lease of the property of the Indianapolis Street Railway for failure to operate the same during the time of the strike, the real purpose being to attempt to secure the appointment of a receiver who would be favorable to the union and to operation on the closed shop principle, and that since that time this suit has been kept pending in the Marion Circuit Court for the real purpose of furthering the ends of the union in case of a strike.

The local attorney for the Amalgamated Association was ordered to appear before Judge Anderson. He insisted that the defendants had the right to violate the contracts set forth in the bill. The court then asked the attorney to give assurance that the contemplated strike alleged in the bill would not be ordered, and that then all action of the court should be held in abeyance until the matter could be heard. The attorney for the organization declined to give such assurance, and thereupon Judge Anderson at once issued a restraining order enjoining all of the officials of the Amalgamated Association and other labor organizations, as well as each union and non-union car service employee of the company from causing, or attempting to cause a strike on the lines of the Indianapolis Traction & Terminal Company in violation of the award of the commission and the working agreement between the company and its employees, and restraining all the defendants from gathering in the streets or in any way attempting to interfere with the operation of the business of the company. The members of labor organizations who were parties to the attempted suit for receivership were also enjoined in the order of the court.

When the mass meeting of the employees was called to order at 1:30 a. m., Sept. 24, a United States marshal and deputies entered the hall and read the order of the court to the union labor officials and men assembled for the meeting.

On Oct. 2 the court was to hear evidence and determine whether a temporary injunction should be granted.

TORONTO PURCHASE OFF

Prior to the commencement of business at the meeting of the City Council of Toronto, Ont., on Sept. 21, Mayor Hocken announced that in consequence of the changed conditions in the financial world brought about by the war all negotiations for the purchase of the properties of the Toronto Railway and the Toronto Electric Light Company had been discontinued. He later laid on the table a copy of the draft agreement for the proposed purchase, which had been approved by counsel on both sides. He also called attention to the fact that the increase in the earnings of the companies had not been as great during the past few months as had been expected. He pointed out that although the purchase scheme would not be carried out, the Council should proceed without delay to improve the transportation facilities of all the outlying districts, intimating that a solution of the problem might be found by the establishment of a bus service. No resolution was introduced in connection with the Mayor's message.

MISSOURI PUBLIC SERVICE VALUATIONS

The following table shows the comparative values of the different classes of properties in 1913 and 1914, as fixed by the Board of Equalization of Missouri for taxation purposes:

	1913	1914
Steam railroads	$133,687,203	$137,549,729
Electric and street railways	35,472,857	37,509,050
Telephone lines	11,083,455	11,602,309
Telegraph lines	2,724,959	2,701,909
Bridges	5,799,000	5,811,000
Total	$188,767,475	$195,172,998

Bus Franchise Desired in Philadelphia.—The United Traction Improvement Company, of which W. C. McIntire is president, has applied to the Councils of Philadelphia for franchises to operate gasolene-electric buses, charging a 5-cent fare and running every three minutes over three routes in north and west Philadelphia. The directors of the company are W. C. McIntire, V. H. Conkel, W. W. Gibbs, C. V. Mannering, G. G. Wigginton, John Monahan and Harry S. Calvert, receiver of the Mercantile Trust Company, Pittsburgh, Pa.

Waterloo-Cedar Rapids Line Open for Service.—The Waterloo, Cedar Falls & Northern Railway, which has had a 60-mile extension between Waterloo and Cedar Rapids, Ia., under construction for the last year and a half, opened the line to regular service Sept. 15. While this extension is not yet completed in every detail, the main track and the overhead were completed early in September. The initial schedule provides for thirteen trains each way daily, alternating local and limited. Local trains make the 60-mile run in two hours and fifty minutes, and the limited trains in two hours and ten minutes.

San Francisco's Municipal Railway Extension.—Specifications for the San Francisco (Cal.) Municipal Railway's California Street line have been prepared by the city engineer and adopted by the Board of Works, but Assistant City Engineer Ransom told the supervisors that, as this line would cost $127,500 and the available balance remaining in the bond fund was only $35,500, enough bonds to make up the difference would have to be sold before a contract for construction could be let. The sales of the $3,500,000 issue already made total $2,650,000, and the contracts so far awarded call for about $2,615,000, according to Mr. Ransome.

Mr. Whitridge on the War.—Frederick W. Whitridge, president of the Third Avenue Railway, New York, returned to New York from Europe on the *Adriatic* on Sept. 25. He said he had gleaned from the opinions of well-informed persons abroad that the conflict could not be terminated in less than twelve months. Mr. Whitridge said his son is with the Foreign Legion of the French army, but thus far has not been ordered to the front. In this connection he was quoted as follows: "If I were his age I would be impatient to get into action. The war will be a long one, but there can be only one finish, and that is victory in every detail for the Allies."

Seattle Negotiations Abandoned.—Negotiations looking to the purchase of the Seattle, Renton & Southern Railway by the city of Seattle as a link in the existing municipal lines have come to an abrupt end, six members of the Council having agreed to abandon the plan of making an offer for the property. They agreed, however, to put the offer up to a vote of the people if the receivers of the line made an offer to the city similar to the one made by the city and acceptable to the railroad. As the receivers have stated that they will never consider another offer made by the city nor make an offer to the city, the deal of the purchase of the Seattle, Renton & Southern Railway by the city is regarded as being off.

Public Service Railway Baseball.—The second game of the series of three games between the teams representing the railway department and the electrical department of the Public Service Corporation of New Jersey was played at Hilton on Sept. 21. The electric team won by a score of 6 to 4. This gave them the championship. On Sept. 23 a game was played between the Public Service representatives and the champions of the Brooklyn Rapid Transit System. This was also decided at Hilton and the Public Service men won by a score of 10 to 9. The fans from Brooklyn were carried from Jersey City to the grounds at Hilton in special cars. It was expected that a return game would be played between the two teams at Bedford Park in Brooklyn on Oct. 1.

The New Haven Investigation.—The first step in the renewed criminal inquiry into the affairs of the New York, New Haven & Hartford Railroad was taken on Sept. 28, when a special Federal Grand Jury was sworn in by Judge Mayer at New York. This was in accord with the recent suggestion of President Wilson that the criminal investigation should not be dropped. The Grand Jury was impaneled by Assistant District Attorney Stephenson. Assistant Attorney-General Swacker, who, with James W. Osborne, will be in charge of the government's case, was present. It is expected that the decree for the dissolution of the New Haven and Boston & Maine lines will be brought before the Federal District Court in the next week or two. The railroad company will agree to it, and the proceedings will be merely formal.

Japanese Engineer Studying Turbine Plants.—K. Shiraki, hydroelectric engineer, associated with the Kinugawa Hydroelectric Company, which supplies power from a plant on the Kinugawa River to the Tokyo (Japan) Municipal Railway, is visiting America to investigate steam-turbine plants in this country. The company that Mr. Shiraki represents is planning to erect a steam-turbine plant as an emergency addition to its present hydroelectric station, which was built about three years ago. For this purpose Mr. Shiraki plans to purchase steam turbine and condenser equipment in the near future. He has already visited a number of American cities, including Pittsburgh, Buffalo, Schenectady, Boston, Washington, Baltimore and Philadelphia. It is expected that he will arrive in New York on Oct. 4, to remain about three weeks. Mr. Shiraki has recently ordered through Mitsui & Company, New York, exporters, three 1500-kw and three 1000-kw General Electric frequency changers, with switchboard apparatus, for the Kinugawa River power house.

Financial and Corporate

RECENT FINANCIAL TENDENCY

On Sept. 25 the governors of the New York Stock Exchange, acting in conjunction with dealers in unlisted bonds and stocks, announced that private purchases and sales of unlisted securities would be permitted on moderate concessions from prices of July 30. Up to that time the rule had been stringently enforced against the purchase or sale of stocks beneath the closing level of prices on July 30. The representative of the New York Curb Market Association announced the same day that members wishing to buy or sell any stocks not listed on the New York Stock Exchange must submit their proposed transactions to the committee on unlisted stocks and act in accordance with the regulations of that committee. Bond trading in New York broadened during the week. The New York City new 6's of 1917 sold at practically 102, with a steady demand. While nothing official has been announced, the steps so far taken toward the resumption of trading are generally believed to indicate that the exchange will be opened by Nov. 1. During the week the organization of the $100,000,000 gold fund to be used for easing the foreign exchange market was practically completed, and on Sept. 30 the New York gold pool committee shipped $10,000,000 in gold to Ottawa for the account of the Bank of England and began selling London exchange against the amount on Oct. 1. Further shipments of gold will be made to Ottawa from time to time as the committee may deem expedient. On Sept. 30 foreign exchange rates declined. At the close of the day demand sterling was quoted at $4.97¼, cables at $4.98¼. This was regarded as an effect of the gold pool. On the whole, trade conditions are considered more favorable. A particularly important recent development is the announcement that the New York Central & Hudson River Railroad will again enter the short-time note field with an offering of $20,000.000 of notes to mature in six months and another $20.000,000 to mature in a year. Both issues are to be dated Oct. 1, and carry interest at 5 per cent. The railroad has asked J. P. Morgan & Company to manage the syndicate, which will buy the notes on a 7 per cent basis, the date of offering and the price to be decided later.

CHANGES IN NEW HAVEN DIRECTORATE

William Rockefeller, George F. Baker, Charles F. Brooker and James S. Elton resigned as directors of the New York, New Haven & Hartford Railroad on Sept. 29. The resignations were accepted, and J. Horace Harding was made a director. It was announced at the same time that the New Haven board, which has been reduced to twenty members, would be cut to seventeen if the stockholders at the annual meeting on Oct. 28 approved a recommendation to that effect to be made by the board. All four of the men who retired were directors under the Mellen régime. J. P. Morgan and John L. Billard resigned some time ago. William Rockefeller had been a member of the board for many years. Besides his Standard Oil interests, he is the dominant factor in Amalgamated Copper and a director in many banks, railroads, and gas and electric companies. George F. Baker had also been a director for years. He is chairman of the First National Bank board, of which he was long president, and is a director in railroad, banking, public utility and manufacturing corporations. Charles F. Brooker is president of the American Brass Company and a director of several banks and of the International Smelting & Refining Company and the Westinghouse Electric & Manufacturing Company. James S. Elton, of Waterbury, has large and varied interests in Connecticut.

J. Horace Harding, the new director, is a member of Charles D. Barney & Company and a director in the American Express Company, the Amalgamated Copper Company, the American Beet Sugar Company, the Brooklyn Rapid Transit Company, the Columbia Trust Company, the Metropolitan Trust Company, the New York Municipal Railway Corporation, the Public Service Corporation of New Jersey, the Southern Pacific Company, the Tobacco Products Corporation, the Wabash Railroad, and a number of other companies.

ANNUAL REPORTS

Pacific Gas & Electric Company

The condensed comparative statement of income, profit and loss of the Pacific Gas & Electric Company, San Francisco, Cal., for the calendar years 1913 and 1912 follows:

	1913	1912
Gross earnings	*$15,869,006	$14,473,525
Deduct:		
Maintenance, operating expenses, taxes and reserves for uncollectible accounts, etc.	9,331,207	8,431,561
Net earnings from operations	$6,537,799	$6,041,964
Add:		
Profit on merchandise sales and miscellaneous income	333,332	271,126
Total net income	$6,871,131	$6,313,090
Deduct:		
Interest on funded and floating debt	3,902,045	3,568,943
Balance	$2,969,086	$2,744,147

*Includes $261,733 in litigation, for which a reserve has been created from the surplus account.

The increase in gross operating revenues of the company was well distributed geographically and also well divided among the different branches of the company's business. The increases in the various departments were as follows: Electric, $558,211; gas, $741,730; railways, $25,725; all other, $69,814; total, $1,395,480. The total increase, including miscellaneous income, was $1,457,685. Maintenance, operating expenses, taxes, etc. (including the entire extraordinary outlay occasioned by the strike of employees) increased $899,645. The net income increased $558,040. The influence of voluntary rate reductions which affected 1912 by more than $1,000,000 was still felt in the earlier months of 1913. In the first nine months of the year gross revenue increased $937,711, with an increase in net of only $140,332, whereas in the last three months the gross revenue increased $519,974 and net revenue $417,708.

After the payment of 6 per cent dividends on preferred stock amounting to $600,000 and 1¼ per cent on the common stock amounting to $398,848, the entire balance, after establishing a reserve of $261,733 in connection with rate suits still pending, was transferred to the depreciation reserve. Against this was charged $518,568 for current depreciation. An extraordinary charge of $1,299,848 was made to cover the elimination from property schedules of all obsolete, abandoned and unused plant. The balance remaining to the credit of the depreciation reserve was $2,433,493. On Dec. 31, after charging off all ascertained losses, the balance to the credit of the insurance and casualty reserve was $52,353 and to the credit of the reserve for bad and doubtful debts $34,162.

The net earnings of the company after bond interest have aggregated $21,781,471 in the eight years since its organization. Of this amount only 21 per cent ($4,622,103) was paid out in cash dividends. The remaining 79 per cent ($17,159,368) was reinvested in property, applied to the reduction of funded debt or expended for other corporate purposes. The expenditures for net plant additions (cost less value of property replaced) amounted to $9,091,192 during 1913. This compares with expenditures of $7,821,712 in 1912 and $6,802,158 in 1911. In the eight years since organization $8,931,444 was expended for maintenance, an average of $1,116,430 per year, in addition to which the cost of replacements was met from earnings.

The street railway system owned by the Pacific Gas & Electric Company is the Sacramento Electric, Gas & Railway Company. The progress of this company from 1906 to 1913 is shown by the accompanying table:

Year	Miles of Street Railway Track	Cars Owned	Total Passengers Carried	Car Mileage	Car Hours	Gross Revenue
1906	27.6	34	7,164,659	1,591,324	204,148	$355,916
1907	28.9	44	8,655,918	1,803,742	234,829	431,800
1908	28.9	45	8,476,369	1,731,311	227,868	414,326
1909	34.1	51	9,466,704	1,895,766	242,194	452,396
1910	35.9	52	10,691,475	2,136,494	269,865	509,152
1911	38.9	62	11,464,696	2,279,998	293,107	533,520
1912	40.0	62	11,926,098	2,301,342	276,438	547,187
1913	42.0	60	12,508,744	2,469,745	301,930	572,913
Increase in seven years	14.4	26	5,344,085	878,421	97,782	$216,997
Percentage increase	52	76	75	55	48	61

New York Consolidated Railroad

The New York (N. Y.) Consolidated Railroad has reported to the Public Service Commission for the First District the result of its business for the first year of temporary operation, namely, from Aug. 4, 1913, to July 31, 1914. The system was operated under the terms of the dual system contract made by the city with the New York Municipal Railway Corporation, of which the New York Consolidated Railroad is the operating company, and it included the two westerly tracks of the Centre Street Loop, the first section of the new subway to be opened to the public, and the old elevated lines. A condensed statement of the total earnings and expenses for the year follows:

Revenue	$8,677,417
Maintenance (15 per cent depreciation included)	$1,302,770
Other operating expenses	3,367,805
Rents not included in operating expenses	86,102
Taxes	584,727
Total	$5,340,405
Operating income	$3,337,012
Company's preferential ($3,500,000 per annum to represent return on property at date of contract)	3,471,774
Amount due company on preferential	$134,762
Interest and sinking fund on company's new investment in operation	31,321
Interest (4½ per cent) and sinking fund (1 per cent) on city's investment in operation	363,895
Total deficit	$529,979

By the terms of the dual subway contracts the earnings of the elevated railroads throughout Brooklyn operated by the New York Consolidated Railroad and those of the new Centre Street Loop subway were pooled and made subject to certain deductions. These included first the payment of operating expenses and taxes, next the so-called preferential payment to the operating company of $3,500,000 per annum as a return on its property investment at the date of the contract, and finally the interest charges on the company's and the city's investments. The preferential payment is really profit, for it is based upon the estimated profit made by the company for the two years preceding the beginning of operation. The earnings of $8,677,417 paid not only the increased cost of operation of the loop subway but also the entire operating expenses of the whole system, amounting to $5,340,405, and left an operating income of $3,337,012, within $134,762 of paying the full amount of the company's preferential of $3,500,000.

With allowances for the interest and sinking fund charges upon moneys invested by both the company and the city, there was a deficit of $529,979. Of this $363,896 was for interest and sinking fund payments upon money invested by the city in the construction of the Centre Street Loop subway, and $31,321 for interest and sinking fund payments on the money invested by the company in equipping the subway. According to the terms of the dual system contracts, however, the unpaid interest on the company's bonds will accumulate until the surplus profits are large enough to meet them, while the unearned interest on the city's investment will be included in the cost of construction.

For four months, namely, April, May, June and July of this year, the earnings were large enough to provide for both the preferential and the company's interest charges. In May and July the surplus was large enough also to cover the interest due the city. Next year, when the other two tracks in the loop subway will be opened, the commission expects a marked improvement over the results of the first year's operations.

WESTCHESTER STREET RAILROAD DECISIONS

New York Upstate Commission Straightens Out Capitalization of Subsidiary and Authorizes Bond Issue for Improvements

The Public Service Commission for the Second District of New York has issued an order straightening out the capitalization of the Shore Line Electric Railway, a subsidiary of the Westchester Street Railroad, White Plains, N. Y., and reducing that capitalization to the real value of the property. According to the commission, this act is a result of the sale of the road to the New York, New Haven & Hartford Railroad at a price which the commission's experts have characterized as several times the real value of the road. The excess value was created through the fight between the New Haven line and the Third Avenue Railway, New York, for the old White Plains, Mamaroneck & Tarrytown Railway. This was divided into three parts at a receiver's sale, the New York, New Haven & Hartford Railroad buying two of these at big prices and the Third Avenue Railway the other. The Third Avenue line, finding that it could not compete with the New Haven road on this basis, sold out its interest to its rival, and the Shore Line Electric Railway was thereupon organized as a part of the Westchester Street Railroad.

The present decision of the commission follows the decision of the Court of Appeals in the Westchester Street Railroad case. The capitalization is fixed at the present real value of the property, as determined by the engineers of the up-State commission and E. G. Connette, at the time engineer for the first district commission. It is far less than the price originally paid for the property. By the terms of the order the Shore Line Electric Railway is authorized to issue $50,000 of capital stock at not less than par and the New York, New Haven & Hartford Railroad is authorized to acquire and hold the same, in accordance with permission granted in 1913.

The commission also authorized the Westchester Street Railroad to execute a mortgage to secure an issue of $2,000,000 of first mortgage 5 per cent thirty-year gold bonds and to issue thereunder bonds amounting to $386,000. The bonds cover the following improvements, some of which have already been made: Overhead work, $49,485; track repair, $112,545; power plant equipment and transmission line, $43,900; new cars and equipment, $60,200; new carhouses and shops, $115,000; repairs to carhouses and power stations, $3,016, and miscellaneous equipment, $1,854. This order amends those entered on April 24 and June 13, 1912.

Alton, Jacksonville & Peoria Railway, Alton, Ill.—The Alton, Jacksonville & Peoria Railway has recently made application for permission to issue $750,000 of stock and $500,000 of bonds. The matter has been taken into consideration by the Illinois Public Service Commission. A legal point has been raised that the railway was in the hands of a receiver for two years before it was sold to its present owners and that it is doubtful whether the commission has jurisdiction over an agreement made before it was organized and now about to be consummated. The foreclosure and sale of this road were noted in the ELECTRIC RAILWAY JOURNAL of April 11 and June 6.

American Public Utilities Company, Grand Rapids, Mich.—The board of directors of the American Public Utilities Company on Sept. 28 declared the regular quarterly dividend of 1½ per cent on its preferred stock, payable on Oct. 10 to stockholders of record on Sept. 30. In view of the present general financial depression, however, the board passed the usual quarterly dividend on the common stock. At the beginning of the European war the company had undertaken certain large construction work, particularly at Indianapolis. The board was not certain that these construction operations could be carried forward without using funds available for dividends, and after action on the matter had been deferred until Sept. 25 the above decision was reached.

American Water Works & Electric Company, Pittsburgh, Pa.—The American Water Works & Electric Company, Pittsburgh, Pa., the successor to the American Water Works & Guarantee Company, has decided not to begin the payment of dividends on its preferred stock at the present time. In a circular addressed to the stockholders the directors state that the gross and net earnings of the subsidiary water companies have increased and are in excess of the estimates made at the time of the reorganization, but that in view of existing financial conditions and the difficulty of securing funds for construction purposes by the sale of subsidiary securities, it is deemed inadvisable now to commence the payment of dividends.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill.—The Aurora, Elgin & Chicago Railroad has passed its usual quarterly dividend of three-quarters of 1 per cent on the common stock, but declared its regular quarterly dividend of 1½ per cent on the preferred stock, payable on Nov. 1 to stock of record on Sept 23. Vice-President E. C. Faber says that the common dividend was earned but the directors suspended payment in view of the existing financial conditions and the necessity of meeting capital requirements out of income.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—The independent bondholders protective committee, of which S. H. Cunningham is chairman, as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19 and 26, has requested the deposit of the first mortgage thirty-year 5 per cent bonds of the Birmingham, Ensley & Bessemer Railroad with the American Trust Company, Boston. The bondholders may also deposit their holdings with the Riverside Trust Company, Hartford, Conn.; the Columbus Trust Company, New York; the West End Trust Company, Philadelphia, Pa.; the Maryland Trust Company, Baltimore, Md.; the Louisville (Ky.) Trust Company; the First National Bank, Chattanooga, Tenn., and the Traders National Bank, Birmingham, Ala. If the committee adopts a plan of reorganization, depositors will be given thirty days to withdraw their bonds after payment of their pro rata share of the expenses.

Columbus, Urbana & Western Electric Railway, Columbus, Ohio.—L. P. Stephens, general manager of the Columbus, Urbana & Western Railway, says that the statement in regard to the ownership of the bonds of that company by the Columbus Railway & Light Company, published in the Columbus papers of Sept. 5 and 6 and noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19, was incorrect. Mr. Stephens explains the present status of the company as follows: "The affairs of the company having been satisfactorily adjusted there was no longer any necessity for continuing the receivership, and upon agreement with the owners of the property I applied to the court for permission to file a final accounting and turn the property over to the company. There was no statement made before the court that any company owned the outstanding bonds of the Columbus, Urbana & Western Electric Railway. The Columbus Railway & Light Company does not now own and never has owned any of the securities of the Columbus, Urbana & Western Electric Railway, for the entire bond and stock issues are held by seven individuals, none of whom have any interest in the Columbus Railway & Light Company."

Lehigh Traction Company, Hazelton, Pa.—In a recent letter from N. C. Yost, treasurer of the Lehigh Traction Company, to holders of the $500,000 of the company's first mortgage 5's, it was stated that in order not to subject the bondholders to further inconvenience or delay Alvan Markle, president of the company, had volunteered individually to purchase all the coupons which matured on June 1, 1914, if presented on or before Nov. 1 to the Markle Banking & Trust Company. Mr. Yost said that the company had resumed operations cut off by the recent strike and the traffic was approaching its normal volume. The demands of operation, however, required the resources of the company to be utilized in that direction, so that the company was still unable to meet the interest which matured on June 1. A protective committee of first mortgage bondholders, composed of W. Frederick Schneider, George P. Bissell and Henry M. Watts, in a circular letter dated Sept. 23 advised the bondholders to accept Mr. Markle's proposition in view of the present financial conditions.

Ohio River Electric Railway & Power Company, Pomeroy, Ohio.—Application has been made to the Ohio Public Utilities Commission by the Ohio River Electric Railway & Power Company, a Delaware corporation, for permission to purchase from Richard C. Ellis an electric railway line between Middleport and Hobson. The consideration is the payment of $30,000 and the assumption of a debt of $9,161 against Mr. Ellis. At the same time an Ohio corporation, the Ohio Electric Railway & Power Company, filed an application for permission to purchase the original company's property, consisting of an electric line between Middleport and Racine and the one to be acquired between Middleport and Hobson. The Ohio company desires to increase its capital stock from $10,000 to $500,000. Of this $150,000 of preferred and $150,000 of common stock would be paid to the Delaware corporation for its property.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—The directors of the Puget Sound Traction, Light & Power Company passed the dividend on the $18,557,800 of common stock normally payable on Oct. 16. From April, 1912, to July, 1914, 1 per cent was paid quarterly. According to an official statement issued by the company, during the last two years the Puget Sound district has suffered from the general business depression prevailing throughout the Pacific Coast states and British Columbia. It was hoped that benefits would arise from the opening of the Panama Canal and the expected development of Alaska, but these improvements have been retarded by the foreign war. The company has cut operating expenses as far as possible without injuring the service and has stopped all new construction, except such as was nearly finished or required by its franchises. The company has a substantial cash balance and no floating debt, but on account of the impossibility of estimating how long the present depression will continue, the directors deemed it advisable to conserve the company's resources. As there was, however, an ample margin over the preferred dividend, the directors declared the regular quarterly dividend of 1½ per cent on the cumulative preferred stock, payable on Oct. 15.

Quebec Railway, Light & Power Company, Quebec, Que.—According to the *Monetary Times*, the affairs of the Quebec Railway, Light & Power Company have not been growing any worse since the present exceptional conditions developed. While the war has affected earnings in the majority of cases adversely, it is believed that the opposite will be true in the case of this company. The Valcartier camp, with from 20,000 to 25,000 troops, is within a short distance of the railway, and the company's earnings will be increased both through a larger passenger traffic and through contracts for lighting the camp and pumping water to it.

Seattle, Renton & Southern Railroad, Seattle, Wash.—As a preliminary move to the closing out of the receivership of the Seattle, Renton & Southern Railroad and the sale of its franchises, good-will and property to the highest bidder, Judge A. W. Frater has taken under consideration creditors' claims amounting to $1,461,000. Some of the claims are being opposed by the receivers of the company, among such being the mortgage and collateral trust notes of $1,261,000 in the hands of Peabody, Houghteling & Company, Chicago, and numerous individual holders of small amounts. There is $825,000 of 5 per cent mortgage bonds with $100,000 of interest overdue, together with $336,000 of 5 per cent collateral trust notes, which are alleged to have been executed on usurious terms. It is contended that the discount on the bonds and notes exacted by the purchasers raised the net interest to a fraction above 7 per cent. Claims amounting to approximately $200,000 were filed by creditors for supplies, power, etc.

United Railways Investment Company, San Francisco, Cal.—In a circular to the stockholders dated Sept. 22, Mason B. Starring, president of the United Railways Investment Company, called attention to the script dividend recently announced by the Philadelphia Company, Pittsburgh, Pa., as noted in the ELECTRIC RAILWAY JOURNAL of Sept. 26. Mr. Starring stated that until Dec. 31 his company would offer to its stockholders an opportunity to purchase a portion of such script, subject to prior sale at par and interest from Nov. 2. The script is redeemable on or before eighteen months from Nov. 2, and bears interest until date of redemption at the rate of 7 per cent per annum. The interest on the collateral trust sinking fund 5 per cent gold bonds of the United Railways & Investment Company (Pittsburgh issue), due Nov. 1, will be paid in cash as usual.

West Penn Traction Company, Pittsburgh, Pa.—The consideration of the quarterly dividend of 1½ per cent due on April 15 upon the $1,625,000 of preferred stock of the West Penn Traction Company has been postponed until the present outlook is brighter. The resolution of the executive committee was substantially to the effect that on account of the present business depression and the large cash requirements for new construction in 1914 out of both its construction fund and earnings, it was deemed advisable to pass the preferred dividend, although it had been amply earned.

DIVIDENDS DECLARED

Athens Railway & Electric Company, Athens, Ga., quarterly, 1¼ per cent, preferred.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill., quarterly, 1½ per cent, preferred.

Cincinnati (Ohio) Street Railway, quarterly, 1½ per cent.

Columbia Railway, Gas & Electric Company, Columbia, S. C., quarterly, 1½ per cent, preferred.

Halifax Electric Tramway Company, Ltd., Halifax, N. S., quarterly, 2 per cent.

Manchester Traction, Light & Power Company, Manchester, N. H., quarterly, 2 per cent.

Memphis (Tenn.) Street Railway, quarterly, 1¼ per cent, preferred.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

Philadelphia Company, Pittsburgh, Pa., quarterly, 1¾ per cent, common, payable in script; 3 per cent, cumulative preferred.

Puget Sound Traction, Light & Power Company, Seattle, Wash., quarterly, 1½ per cent, preferred.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

Scioto Valley Traction Company, Columbus, Ohio, quarterly, 1¼ per cent, first preferred; quarterly, 1¼ per cent, preferred.

South Carolina Light, Power & Railways Company, Spartanburg, S. C., quarterly, 1½ per cent, preferred.

Western Ohio Railroad, Lima, Ohio, quarterly, 1¾ per cent, first preferred.

Winnipeg (Man.) Electric Railway, quarterly, 3 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BATON ROUGE (LA.) ELECTRIC COMPANY							
1m.,	July,	'14	$14,742	*$9,260	$5,482	$2,074	$3,408
1 "	"	'13	13,774	*8,522	5,253	2,082	3,171
12 "	"	'14	176,904	*115,621	61,284	25,278	36,006
12 "	"	'13	151,510	*91,570	59,940	22,857	37,083
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.							
1m.,	July,	'14	$15,694	*$9,037	$6,658	$1,064	$5,594
1 "	"	'13	16,883	*10,177	6,706	1,117	5,589
12 "	"	'14	120,543	*101,069	19,475	12,815	6,660
12 "	"	'13	123,511	*95,600	27,911	12,938	14,973
CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.							
1m.,	July,	'14	$31,467	*$19,666	$11,801	$6,407	$5,394
1 "	"	'13	32,543	*17,616	14,928	6,082	8,846
12 "	"	'14	372,570	*209,389	163,181	75,578	87,603
12 "	"	'13	373,216	*201,385	171,831	70,690	101,141
COLUMBUS (GA.) ELECTRIC COMPANY							
1m.,	July,	'14	$53,827	*$24,153	$29,974	$29,597	$77
1 "	"	'13	48,875	*21,405	27,471	24,222	3,249
12 "	"	'14	651,457	*276,839	374,617	304,812	69,805
12 "	"	'13	640,011	*293,090	346,921	243,843	103,078
EL PASO (TEX.) ELECTRIC COMPANY							
1m.,	July,	'14	$83,641	*$48,672	$34,968	$4,196	$30,772
1 "	"	'13	67,219	*35,970	31,248	4,178	27,070
12 "	"	'14	983,239	*545,470	437,769	51,326	386,443
12 "	"	'13	873,223	*465,728	407,494	49,848	357,646
DALLAS (TEX.) ELECTRIC COMPANY							
1m.,	July,	'14	$179,131	*$113,181	$65,950	$33,651	$32,299
1 "	"	'13	175,356	*101,294	74,057	24,852	49,205
12 "	"	'14	2,283,051	*1,354,024	929,027	334,265	594,762
12 "	"	'13	2,039,099	*1,186,806	852,294	295,946	556,348
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.							
1m.,	July,	'14	$61,066	*$35,832	$25,234	$8,580	$16,654
1 "	"	'13	47,506	*27,206	20,300	8,847	11,453
12 "	"	'14	637,974	*390,016	247,958	99,429	148,529
12 "	"	'13	347,616	*180,821	166,795	30,046	136,749
GALVESTON-HOUSTON ELECTRIC COMPANY, HOUSTON, TEX.							
1m.,	July,	'14	$226,664	*$112,435	$114,229	$38,441	$75,788
1 "	"	'13	228,910	*121,141	107,769	34,469	73,300
12 "	"	'14	2,454,805	*1,366,180	1,088,625	438,042	650,583
12 "	"	'13	2,265,182	*1,294,545	970,636	411,554	559,082
HOUGHTON (MICH.) COUNTY TRACTION COMPANY							
1m.,	July,	'14	$28,309	*$16,882	$11,428	$6,600	$5,828
1 "	"	'13	31,758	*15,980	15,759	5,630	10,130
12 "	"	'14	284,921	*180,532	104,389	67,111	37,278
12 "	"	'13	312,500	*179,225	133,275	67,933	65,343
JACKSONVILLE (FLA.) TRACTION COMPANY							
1m.,	July,	'14	$57,442	*$37,241	$20,100	$12,476	$7,625
1 "	"	'13	57,130	*35,935	21,195	12,976	8,221
12 "	"	'14	731,117	*464,829	266,288	150,003	112,284
12 "	"	'13	600,897	*402,385	198,512	130,161	68,351

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*Includes taxes.

Traffic and Transportation

HEARING ON REVERE FARES

The Massachusetts Public Service Commission heard the petition of residents of Revere on Sept. 23 for a reduction of fares to 5 cents through the establishment of free transfers at Broadway and Park Avenue on the Bay State Street Railway, the petitioners desiring to be able to travel between points on Park Avenue and Lynn at the above rate. Henry E. Reynolds, assistant general manager of the company, pointed out that 90 per cent of the company's traffic on this line terminates or originates in Boston, to which a 5-cent fare applies. He further stated that in response to a former ruling of the Massachusetts Railroad Commission, workingmen's tickets good between 5:30 and 7:30 a. m., 4:30 and 6:30 p. m., and between 12 noon and 1 p. m. on Saturdays are sold at the company's office in Central Square, Lynn, and at the local carhouse, the ticket rate being 7 cents. Very little demand exists for these tickets. James F. Jackson, attorney for the company, pointed out that the Park Avenue line is one of several lateral routes in Revere and showed that if a [illegible]cent fare were established as petitioned the same privileges would logically follow on other lines, resulting in a 5-cent fare between all parts of Lynn and Revere Beach. On either of the company's main lines in Revere a 5-cent fare prevails, with a universal transfer at Lynn. The speaker could not recall a single instance of a 5-cent fare between two communities accompanied by transfers at both ends.

W. H. Day, traffic manager of the Lynn Chamber of Commerce, admitted that the establishment of a 5-cent fare on the Revere Beach line would be a hardship to the company. He suggested that the public would not press this issue, however, as a 5-cent fare exists on the Boston, Revere Beach & Lynn Railro[illegible]een Lynn and the beach. Chairman McLeod said that while certain people may be served by the latter road at the easterly end of Lynn where its terminal station lies, people from other sections of the city find it much more convenient to patronize the Bay State Street Railway, and that if the petition were granted he believed that the people of Lynn would appear before the commission inside of two weeks to ask for a 5-cent fare to the beach. Commissioner Clinton White brought out the point that if the petition were granted, with its resulting logical changes on other lateral lines, it would alter the through fare between Malden and Lynn and generally upset the existing schedules of rates between Lynn and its outlying districts. Chairman McLeod said that it is fair to make some distinction between pleasure riders and those who must use the lines daily in going to and from work. He felt that the very limited use of the 7-cent tickets between Park Avenue and Lynn indicates that the community is not materially tributary to Lynn from the standpoint of the workingman. The fact that a few persons may desire to go shopping in Lynn from these lateral lines does not make such lines tributary to Lynn to the extent that the company ought to be forced to adopt a special fare arrangement The hearing was then closed.

NEAR-SIDE STOPS IN LEXINGTON

After a fortnight's trial in Lexington, Ky., of the near-side, front-entrance plan of operating the city railway service, F. W. Bacon, vice-president of the Kentucky Traction & Terminal Company, made public a statement in part as follows:

"I hope the people of Lexington will be kind enough to give the new near-side street car system, recently inaugurated here, a fair trial without overmuch criticism. We are a public service company and it is our duty to please the public. If this system does not please the public after it has received a thorough trial, we will have to take our medicine, but I am asking that the public give it a fair and impartial trial before condemning it altogether. The new system was introduced because it is the policy of the company to practice 'safety first,' and now we have shifted the business end of the car from the rear end to the front end and thus eliminated a three-cornered proposition between the conductor, the motorman and the passenger and placed all the responsibility on the motorman. The change was made for no other reason than to insure safety. The schedule has not been changed. The cars are running as rapidly under the new system as under the old. If the public is pleased ultimately as much as we are at the present time everybody will be happy. We have not had a step accident of any kind since the new system was introduced and this would seem to prove the value of our theory."

The plan was put into operation at a time when the traffic was much heavier than usual. The first week of its operation saw several large meetings in Lexington and during the second week a fair for colored people was held in Lexington. During this fair many negroes from the surrounding country visited Lexington and the white people had to mingle with the colored passengers both in entering and leaving the cars.

SERVICE REDUCTION QUESTION IN CINCINNATI

Mayor Spiegel, of Cincinnati, Ohio, wrote to the Cincinnati Traction Company recently, stating that if all cars taken off the various lines were not restored at once the City Solicitor would be instructed to bring action to compel their restoration. He traced the legislation that has been enacted which has finally placed the authority over operation in the hands of the director of public service, who some time ago refused the request of the company to be allowed to reduce the service. W. Kesley Schoepf, of the Cincinnati Traction Company, replied on Sept. 16 that the company recognized its obligation to the public and was endeavoring to give the service required. It did not follow if the number of cars was changed that the convenience of the public was affected. Conditions were watched carefully and were met from time to time as the needs varied. He said that the cars had not only been restored during the rush hours, but that additional cars had been put on some of the lines, as there had been an improvement in the number of passengers on those lines. Chief Street Car Inspector Wisehahn reported that cars had been restored on all lines except the College Hill and Colerain lines.

Traffic Regulations in Lexington.—The principal thoroughfares of Lexington, Ky., have been marked at the intersections with white paint to indicate to pedestrians the routes they, as well as vehicles, shall take in crossing the streets. Some time ago the regulation was promulgated that pedestrians, as well as vehicles, should cross the streets at right angles, and the traffic police have had much trouble in enforcing the measure. The white painted lines are counted on to impress the regulation on the "foot brigade" and it is believed by the police authorities of Lexington that, especially in narrow, crowded streets, most of the accidents could be avoided if people crossed at right angles to the curb.

Accident Suggestion Prizes in Philadelphia.—For the best practical suggestions as to how the public can be induced to exercise proper care in avoiding preventable accidents, the Philadelphia (Pa.) Rapid Transit Company has offered $100 in cash prizes. Announcement of the contest is made by the company in connection with the Home and School League Safety Carnival at Convention Hall. The competition is open to everybody and closes on Oct. 31. Only practical suggestions are desired. No essays, sketches or poems will be considered. The prizes will be awarded on the following basis, the names of the winners to be made public on or about Nov. 15: Best suggestion, $25; second best suggestion, $15; third best suggestion, $10; ten next best suggestions, $5.

Series of Accidents in New York.—A wreck and fire occurred in the Lenox Avenue Subway in New York between the 135th and 145th Street stations, at 4:30 a. m., on Sept. 29. While firemen were at work on this accident three surface cars figured in a double collision on the 145th Street bridge over the Harlem River. The subway service still was tied up when a short-circuit caused a fire on a Third Avenue elevated train between Sixty-seventh and Fifty-ninth Streets. A collision of trolley cars at the Manhattan end of the Williamsburg Bridge was the last of the series of accidents. It was estimated that 250,000 persons were delayed by the accidents. One man was killed, a score of persons were injured, police reserves were called out, and both fire department and ambulance service had to be called into play.

Market in Philadelphia Trolley Terminal.—Under an arrangement between the Philadelphia & Western Railway and the Lehigh Valley Transit Company a farmers' market is to be established at Sixty-ninth and Market Streets, Philadelphia, Pa., in a building of the former company. Only a nominal rental will be exacted for stalls, a condition being that the occupant must be a producer, selling direct to consumer. Plans for the new market were matured at a conference at which Thomas Newhall, president, and J. L. Adams, general manager of the Philadelphia & Western Railway, and Harrison R. Fehr, president, and C. C. Collins, traffic manager, of the Lehigh Valley Transit Company, were present. The two roads connect at Norristown, where freight cars carrying farm produce to West Philadelphia will be transferred from the Lehigh Valley to the Philadelphia & Western line and brought through to the terminal.

Suburban Stop Signs in New Jersey.—The Public Service Railway, Newark, N. J., has adopted a new character of sign to designate stops on suburban lines. Heretofore the trolley station sign suspended from the span wires has been in vogue throughout the whole system. Experience has shown that while these markers have served their purpose well in the cities, it has been next to impossible to keep the signs in sparsely settled territory from being defaced. To take the place of the span wire signs the management decided to mark trolley poles with a conspicuous white band painted "stop" and to number each stop. The change went into effect on Sept. 28 on the South Amboy line and on the Middlesex line. No changes will be made in the signs in the cities of New Brunswick or Perth Amboy, but the use of pole signs will be extended to all the lines in suburban territory as rapidly as the changes can conveniently be made.

Change in Ticket Conditions in Illinois.—As a result of a decision by the Illinois Public Utility Commission at Springfield, the East St. Louis & Suburban Railroad will make an immediate change in its rules. The time limit on commutation books will be extended from three to six months and only one coupon will be detached for any one ride. On May 4 the company issued a supplement to tariff No. 2, governing passenger fares, and on July 1 put out commutation books in accordance. These books stated that the coupons inside were void if detached, but must be presented with the cover of the book, must be used within ninety days and no less than two coupons would be accepted for any fare. Their use was limited to the holder and his family or, if issued to a firm, to the employees of the latter. Protests were filed against the restrictions. The company asked for a ruling and also for permission to change the fare zones. The commission ruled, in part, that the requiring of the presentation of the commutation book cover is reasonable; that the ninety-day limit on commutation books for the use of 150 rides is unreasonable; that the requirement of two coupons as a minimum fare is unreasonable; that the zone change proposed is not desirable.

Serious Accident in Memphis.—T. H. Tutwiler, president of the Memphis (Tenn.) Street Railway, authorized a statement on Sept. 19 concerning the collision between an Illinois Central freight train and Raleigh Springs train of the Memphis Street Railway. Mr. Tutwiler stated that he had not made any comprehensive statement heretofore, because the entire time and attention of himself and other officials of the company had been occupied in giving attention to the dead and injured, and, as far as practicable, to an intelligent investigation of the facts. Mr. Tutwiler said in part: "Our investigation of the causes of the accident at Binghamton is not complete, but we are prosecuting it as rapidly as possible. We want to learn everything known that will throw light upon and fix responsibility for the catastrophe. If it appears that our company was solely responsible, we will assume the responsibility promptly. If it appears that the Illinois Central and our company both were at fault, we will share our proportion of the loss promptly. If there is doubt about our company being at all liable, we will still endeavor to dispose of all claims promptly upon a fair basis, in view of the doubt. We earnestly hope that the unfortunate sufferers will not contract with lawyers, involving large expenses and loss, until the company has had a fair chance to make settlements. None of the passengers in the motor car was injured, but eleven persons who were in the trailer were killed and sixteen were injured."

Personal Mention

Mr. Arthur St. George Joyce has resigned from E. W. Clark & Company, Philadelphia, to become financial editor of the Philadelphia *Evening Ledger.*

Mr. L. D. Pellissier, who has been general manager of the Holyoke (Mass.) Street Railway, has been elected president of the company to succeed the late William S. Loomis.

Mr. K. Shiraki, hydroelectric engineer associated with the Kinugawa Hydroelectric Company, which supplies power to the Tokyo (Japan) Municipal Railway, is visiting the United States to investigate steam turbine plants, as noted more in detail elsewhere in this issue.

Mr. L. S. Boggs has resigned as general manager of the Macon Railway & Light Company, Macon, Ga. Mr. Boggs was formerly superintendent of electrical construction with the New York, New Haven & Hartford Railroad. He was graduated from Purdue University in 1888 and has been connected with electric railway and power work uninterruptedly since that time.

Mr. William D. Kerr, who has occupied the position of director of the Bureau of Public Service Economics, New York, N. Y., since the organization of the bureau, has resigned to resume his law practice in Chicago. He will devote special attention to matters affecting relations between public utilities and the public and is also to lecture on transportation law in the Northwestern University School of Commerce. The activities of the bureau will not be interrupted, although some interval may elapse before the appointment of a new director.

Mr. N. B. Rhoads, formerly manager of the Waycross Street & Suburban Railway, Waycross, Ga., has resigned to accept the position of general superintendent of the Southern Railway & Light Company which operates the street railway, electric and gas plants in Natchez, Miss. Mr. Rhoads started in railway work with the Richmond (Va.) Traction Company. Later he was assistant superintendent of the Savannah (Ga.) Electric Company and then superintendent of the company. He was also superintendent of the Key West (Fla.) Electric Company and superintendent of transportation of the Beaumont (Tex.) Traction Company.

Mr. M. B. Rosevear, has been appointed superintendent of distribution of the Public Service Railway, Newark, N. J. Mr. Rosevear was born in 1886 at Port Oram, now Wharton, N. J. He entered Cornell University in 1904, taking the course in mechanical engineering, and was graduated in 1908. Following his graduation Mr. Rosevear became connected with the Public Service Railway as a cadet engineer. After completing the two-year course as cadet engineer, he was made assistant to the superintendent of distribution, and later, upon the death of E. J. Dunne, he was made acting superintendent of distribution. His appointment as superintendent of distribution was announced on Sept. 25.

Mr. William Eugene Keily has resigned as associate editor of the *Electrical World* with headquarters at Chicago, to engage in independent literary work. Mr. Keily was born in Utica, N. Y., June 4, 1865. In 1880 he entered a printing office and five years later, at the age of twenty, he secured a place as reporter on the *Post-Express* of Rochester. Since 1891 Mr. Keily has been a resident of Chicago and engaged in electrical journalism. He was made managing editor of the *Western Electrician* in 1899, but resigned in 1908 when the paper was sold. On March 1, 1909, Mr. Keily became associate editor of the *Electrical World.* On Sept. 26 Mr. Keily was the guest of honor at a luncheon tendered him by President James H. McGraw and fourteen members of the Chicago staff of the McGraw Publishing Company, Inc., publisher of the ELECTRIC RAILWAY JOURNAL, *Electrical World, Engineering Record* and *Metallurgical and Chemical Engineering.*

Mr. C. C. Backman, who has been appointed superintendent of ways and structures of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, began his railway career in 1892 as a motorman with the Valley Street Railway. When the Valley Street Railway was taken over by the Youngstown Consolidated Gas & Electric Company in 1901 Mr. Backman was appointed assistant division superintendent, which position he held until the merger of the lines of the Mahoning Valley Railway and the Youngstown & Sharon Street Railway as the Mahoning & Shenango Railway & Light Company in 1906. He was then appointed division superintendent of the Youngstown & Sharon Street Railway, Valley Street Railway and the Sharon & Wheatland Street Railway, and during the last seven years, in addition to the duties of superintendent, he has had charge of all construction and reconstruction of tracks of the Mahoning & Shenango Railway & Light Company.

Mr. H. C. Prather, who has been general manager of the Buffalo, Lockport & Rochester Railway, has been appointed manager of the Rochester-Syracuse division of the Empire United Railways. This division includes the interurban line between Rochester and Syracuse and that between Port Byron and Auburn, in all about 186 miles. Before he was appointed general manager of the Buffalo, Lockport & Rochester Railway, Mr. Prather was master mechanic of the company. He has been connected with electric railway work for eighteen years. His first work was with the Union Traction Company of Indiana on overhead lines. He served subsequently with the United Railways, St. Louis, the Brooklyn Rapid Transit Company, the Public Service Railway and the Roanoke Railway & Electric Company. He was also connected with I. R. Nelson & Company, Newark, for which company he equipped seventeen cars for the Buffalo, Lockport & Rochester Railway with electric apparatus.

Mr. P. E. Emerson has been appointed manager of the Syracuse-Oswego division of the Empire United Railways, Syracuse, N. Y. This division includes the Oswego city lines. Its total trackage is 75 miles. Mr. Emerson was born in 1880. He was graduated from Williams College in the class of 1902, and then entered the employ of the Auburn & Syracuse Electric Railroad, Auburn, N. Y., in the accounting and auditing department. In January, 1904, he resigned from the company to accept a position as night carhouse foreman with the Detroit (Mich.) United Railway and subsequently held the positions of day foreman and assistant superintendent with that company. He resigned from the Detroit United Railway in July, 1908, to become superintendent of the Rochester, Syracuse & Eastern Railroad, then just placed in operation, and has continued with the company as superintendent up to the present time.

P. E. Emerson

OBITUARY

Tarleton McClure, son of William H. McClure and the third member of his family to succumb to illness in seven weeks, died at the family home in Louisville, Ky., on Sept. 15. His father, who was purchasing agent of the Louisville Railway, died a week previously and his mother seven weeks before.

E. G. Ervin, superintendent of the Wilkes-Barre (Pa.) Railway, was killed while riding in the front vestibule of one of two cars of the company which collided near Harvey's Lake on the morning of Sept. 22. Mr. Ervin was born in Middle Smithfield, Pa., on Oct. 7, 1866. He attended public school at Kingston, Pa., and also studied at Wyoming Seminary. He entered the employ of the company at Wilkes-Barre on March 4, 1890, as a conductor on the horse car line between Wilkes-Barre and Kingston. After the line was electrified he was appointed power house foreman. On Feb. 18, 1899, he was made assistant superintendent under Mr. John Clifford, then superintendent of transportation. On Jan. 1, 1914, he was appointed as the head of the transportation department of the company with the title of superintendent. Mr. Ervin is survived by a widow and two children.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Cushing Construction Company, Cushing, Okla.**—Chartered in Oklahoma, presumably to build an electric railway from Cushing to the eastern oil field. Capital stock, $5,000. Incorporators: Frank Brown, Roy Jones and R. D. Long.

FRANCHISES

Phoenix, Ariz.—The Phoenix Railway has received a franchise from the Council for an extension of its Brill line from its present terminus in Phoenix to the city limits at McDowell Road and thence northerly for a distance of 5.8 miles to Sheridan Street in Syndicate Place.

Corona, Cal.—The Pacific Electric Railway has asked the Council for a franchise to build an electric line from Ontario Street and Lincoln Street to Taylor Street, and south on Taylor Street to Lemon Street in Corona.

Vallejo, Cal.—The Vallejo-Benicia Railroad has asked the Council for a franchise to build an electric railway in Vallejo. The company will soon ask the Board of Supervisors for a franchise to operate outside the corporate limits of Vallejo. This is part of a plan to build an electric railway to connect Vallejo and Benicia. The line as proposed will have its terminal at the Monticello wharf, where connections can be made with the boats for San Francisco. W. F. Henry, Vallejo, is interested. [E. R. J., Aug. 22, '14.]

New Haven, Conn.—The Connecticut Company has received permission from the Public Utilities Commission for the right to relocate its tracks on Church Street from Elm Street to a point near Wall Street in New Haven.

St. Peter, Minn.—The Electric Short Line Railroad, Minneapolis, has asked the Council for a franchise in St. Peter. It is planned to build this St. Peter branch in the spring.

Camden City, N. J.—The Public Service Railway has asked the Council for a franchise on White Horse Pike, linking the Haddon Heights line with the Haddon Avenue tracks. This is part of a plan to shorten the route of the line to Camden and thus cut the running time between Camden and all places on the route to Clementon.

Buffalo, N. Y.—The International Railway has received a franchise between Elmwood Avenue and Main Street in Buffalo.

Brantford, Ont.—The Brantford Street Railway has asked the Council for a franchise for an extension of its lines and the construction of a loop in Brantford.

Newmarket, Ont.—At a meeting of the Town Council on Sept. 21 the first and second readings of the Hydro-Radial Railway project were passed practically unanimously. All that now remains will be the vote of the townspeople, which will be taken on Oct. 19.

Portland, Ore.—The Portland & Oregon City Electric Railway will retain its recently secured franchise as granted by the City Council.

Corpus Christi, Tex.—The Ward Island Development Company has asked the Nueces County Commissioners Court for a franchise to build an electric line from the Corpus Christi city limits to Ward's Island, 6 miles. The company, composed of California capitalists, has acquired Ward Island, which will be developed as an amusement park, with a modern club house. [E. R. J., Sept. 26, '14.]

East Dallas, Tex.—Formal acceptance of the franchise granted by the Council to John T. Jones to build an electric railway on Parry Avenue and other streets from the Fair Grounds east to the city limits has been filed by the Board of City Commissioners in Dallas. [E. R. J., Sept. 12, '14.]

Ogden, Utah.—The Ogden Rapid Transit Company has asked the Council for a franchise for a line on Lincoln Avenue between Seventeenth Street and Twenty-third Street. The line will be used in connection with the joint interurban terminal to be erected by the local Ogden Rapid Transit Company and the Salt Lake & Ogden Railway.

TRACK AND ROADWAY

Carmack Railway & Power Company, Opelika, Ala.—As soon as financial arrangements can be made work will be begun by this company on its 7-mile line between Opelika and Auburn. The repair shops will be located at Opelika and the power house located at Lake Carmack. The company will also furnish power for lightng purposes and owns 130 acres at Lake Carmack, where it will build an amusement park. The capitalization of the company is: capital stock authorized, $15,000 and bonds authorized, $85,000. Officers: H. A. Bedell, Opelika, president; W. L. Carmack, vice-president and general manager; G. N. Hodges, secretary and treasurer, and Fulton Pace, chief engineer, all of Opelika. [E. R. J., Aug. 15, '14.]

Tramways Company, Ltd., Edmonton, Alta.—It is reported that this company has succeeded in making an agreement with the city of Edmonton that meets with the approval of the Council and Commissioners. If the Council formally passes the agreement in the near future, some work may be done this year upon the construction of the 18-mile line from Edmonton to Fort Saskatchewan. [E. R. J., Aug. 29, '14.]

Northern Electric Company, Chico, Cal.—By the end of the year this company will have spent $200,000 on improvements. New ties and new ballast are being installed all over the lines, the road is being resurfaced, new abutments are being placed on all of the principal bridges and other improvements are in progress. The Marysville and Yuba City bridge has been equipped with a complete new set of abutments.

San Diego (Cal.) Electric Railway.—The park line in San Diego to the eastern entrance of the Panama-California exposition grounds and the terminal station there are nearing completion and cars will soon be operated to that entrance.

San Francisco (Cal.) Municipal Railway.—Construction of the extension through the Fort Mason reservation to the United States transport docks will be begun at once and completed within thirty days. Owing to the great amount of work yet to be done on the Stockton Street tunnel, the line through the bore will not be in operation before the end of the year. The Columbus Avenue extension of the Union Street line will probably be completed and in operation the latter part of October.

Sacramento Valley Electric Railway, Willows, Cal.—The first unit of this railway which extends from Dixon to the junction of the Oakland, Antioch & Eastern Railway, a distance of 12½ miles, has been completed and will be placed in operation on Oct. 12. Work will soon be begun on the second unit from Dixon to Davis. [E. R. J., Aug. 22, '14.]

Freeport Railway & Light Company, Freeport, Ill.—This company plans a new extension in Freeport. Officials of the company and members of the City Council now are working out the proposed route for the new line.

Galesburg Railway, Light & Power Company, Galesburg, Ill.—Plans are being made by this company to extend its tracks west on West Losey Street in Galesburg.

Murphysboro & Southern Illinois Railway, Murphysboro, Ill.—Plans and reports have been submitted for the 8-mile electric line between Murphysboro and Carbondale. Edward Flad & Company, DeKenil Building, St. Louis, Mo., are the engineers in charge. [E. R. J., Sept. 12, '14.]

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company is asked to extend its West Tenth Street line from Bismarck Avenue to Tibbs Avenue in Indianapolis, a distance of 1 mile.

Richmond-Hamilton Traction Company, Richmond, Ind.—Surveys have been completed by this company on its line between Hamilton and Richmond and also for a spur to Connersville and plans are being made to begin construction on Nov. 15. Eugene Purtelle, promoter. [E. R. J., Sept. 19, '14.]

Waterloo, Cedar Rapids & Northern Railroad, Waterloo, Ia.—This company has placed in operation its new line between Waterloo and Cedar Rapids.

South Covington & Cincinnati Street Railway, Covington, Ky.—Plans are being made by this company for an extension to Erlanger in the near future.

Berkshire Street Railway, Pittsfield, Mass.—Work will be begun soon by this company that includes the entire relaying of its tracks on Main Street in Pittsfield and the removal of all the trolley poles from that thoroughfare. Heavy T-rails will be laid in cement and the street will be repaved inside of the rails and for the required distance outside. Metal poles will be erected along the street instead of the present wooden ones.

Southern Minnesota Traction Company, St. Paul, Minn.—No definite plans have yet been decided upon by this company as to when construction will be begun on its proposed electric lines in St. Paul. Butler & Mitchell, St. Paul, attorneys. [E. R. J., Aug. 29, '14.]

United Railways, St. Louis, Mo.—This company is asked to consider plans to build a 2-mile extension to connect the Delmar line with the Manchester line from Rosedale Station, Delmar Boulevard, it will extend west of Forest Park near West End Heights, thence along Yale Avenue to the Maplewood-St. Louis city limits. Plans may be made to extend this branch south into Lindenwood. If the company refuses to build this extension the citizens will build it by popular subscription.

Brooklyn (N. Y.) Rapid Transit Company.—Plans are being made by this company to extend its tracks on Metropolitan Avenue, from Dry Harbor Road to Jamaica Avenue in Brooklyn.

***Cleveland, Ohio.**—An elevated railroad system, to relieve traffic congestion in the downtown section in Cleveland, is being considered by W. F. Thompson, of the City Council, and J. W. Reynolds, member of the Council committee on electric railways, who will offer a resolution at the next meeting of the Council calling for a report on cost and feasibility of the project.

***Columbus, Ohio.**—Plans are being considered by the City Council for the construction of an elevated railway to High Street to connect Hilltop and Columbus.

Stratford, Ont.—The City Council of Stratford has in contemplation the laying of 1¾ miles of electric railway on Arthur, Brock, Nelson, Alfred and St. Paul Avenues in Stratford. T. H. Jones, consulting engineer, and C. H. Hartman, chairman of the Railway Commission.

Toronto, Ont.—The members of the committee in charge of promoting the campaign in York County in support of the Hydro-Electric Municipal Railway have renewed their efforts and plans are now under way for the holding of a number of meetings during the month of October.

Ephrata & Lebanon Traction Company, Lebanon, Pa.—Before the first of the year this company plans to expend approximately $165,000 in electrifying its railway. The overhead system will be used, two new power houses built, the line improved and new equipment purchased.

West Penn Railways, Pittsburgh, Pa.—This company has placed in operation its new extension from Connellsville to Uniontown, via Leisenring, Oliver and Phillips.

Regina, Sask.—Plans are being made to build a new electric line at Regina this season to connect the new power house in Regina with the Canadian Pacific Railroad line.

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—Details of the projected extension to Springfield, Tenn., are given in a communication from President H. H. Mayberry, of the company, to the Commercial Club of Nashville. In it Mr. Mayberry asks Davidson County, in which Nashville is located, to take stock to the amount of $25,000, while Robertson County is requested to take $150,000, all of this to be preferred stock at 5 per cent. The total mileage of the proposed new construction with that already built would be 45 miles, and Mr. Mayberry cites the report of the engineers who made an examination of the ground estimating that construction, equipment, etc., would average $35,000 per mile, or a total of $1,575,000.

Gulf, Freeport & Northern Railway, Freeport, Tex.—About 20 miles of grading has been completed and 10 miles more will soon be finished on this 90-mile line from Sealey to Freeport at the mouth of the Brazos River, on the Gulf of Mexico. It is planned to award a contract for tracklaying soon, as it is desired to have the first 30 miles of track ready for use within five months to afford the new line connection with another railway. The company will purchase 52 or 56-lb. relaying steel rails for the entire line, with angle bars, bolts and spikes, delivery of all material to be made at Beasley, Tex.

McKinney, Bonham & Paris Interurban Railway, McKinney, Tex.—Preliminary surveys have been completed by this company for the proposed electric line between Bonham, McKinney, Paris, Blue Ridge and Leonard. L. A. Scott, president. [E. R. J., June 20, '14.]

Ogden (Utah) Rapid Transit Company.—This company has placed in operation its extension from the Hermitage Hotel to the Idlewild resort, 2 miles east of Ogden. Plans are being considered to reroute the Bingham City cars over a new track to be constructed on Lincoln Avenue north in Ogden to connect with the fair grounds tracks on West Seventeenth Street.

Ricesville, W. Va.—The Monongahela Valley Traction Company has received a franchise from the Council to extend its electric railway from Rivesville to Morgantown, 15 miles. J. O. Watson, Fairmont, general manager.

Tacoma (Wash.) Municipal Railway.—The contract for furnishing the special work to build the municipal line from the center of the business section of Tacoma to the tide flats has been awarded to the Seattle Frog & Switch Company and the Buda Company. The contract for furnishing 118 tons of 70-lb. rails and fourteen tons of 91-lb. rails has been awarded by Public Works Commissioner Woods to the United States Steel Products Company.

SHOPS AND BUILDINGS

Illinois Traction System, Peoria, Ill.—Work has been begun by this company on a new building in Madison County. This new work is being designed for the Granite City branch of the Madison County Light & Power Company. The structure will be 25 ft. x 70 ft.

New Orleans Railway & Light Company, New Orleans, La.—Plans are being considered by this company to build a new passenger station on its property along the New Basin Canal at West End in New Orleans.

Boston & Worcester Street Railway, Boston, Mass.—Work has been begun by this company converting the carhouse on Mechanic Street in Marlboro into a freight station.

Cleveland & Youngstown Railway, Cleveland, Ohio.—Preliminary plans are being made by this company to build a new freight terminal and warehouse at the intersection of Broadway and Orange Avenue in Cleveland. The structure will be 360 ft. x 1000 ft., and there will be 360,000 sq. ft. to each floor of the six proposed in the preliminary sketches. Actual construction is not a matter of immediate consideration and further details may not go forward until the new railroad line is completed from Shaker Heights to the downtown district of Cleveland. Concerning the warehouse project, the company has obtained all land necessary for a station in the Broadway-Orange Avenue district in addition to such property as is necessary to provide right-of-way.

Texas Traction Company, Dallas, Tex.—Work will soon be begun by this company on the construction of a new depot in Dallas.

POWER HOUSES AND SUBSTATIONS

Danbury & Bethel Street Railway, Danbury, Conn.—This company will install additional substation equipment comprising a 300-kw, 600-volt rotary converter, three 100-kva, 2300-volt transformers and switchboard. The apparatus has been ordered from the General Electric Company.

Ephrata & Lebanon Traction Company, Lebanon, Pa.—Two modern power houses will be built at once by this company. One will be located at Iona and the other at Clay. The power houses will be similarly constructed, each costing $8,500.

Monongahela Valley Traction Company, Fairmont, W. Va.—Building and machinery contracts have been awarded for the new $300,000 electric plant at Hutchinson. The structure will be 230 ft. x 72 ft. The general contractor is the Nicola Building Company, Pittsburgh, while the concrete pile foundation will be provided by the Raymond Concrete Pile Company, New York. Its machinery will include gas engines built by the Bethlehem Steel Company, Bethlehem, Pa., and electric generators built by the General Electric Company.

Manufactures and Supplies

ROLLING STOCK

Peninsula Railway, San José, Cal., has ordered one passenger car.

Seattle (Wash.) Municipal Railway has ordered one freight car from the Seattle Car & Foundry Company.

H. M. Byllesby & Company, Chicago, are reported to be figuring on five new 31-ft. single-end arched roof cars for one of their subsidiaries.

Stratford (Ont.) City Council is contemplating the purchase of six cars for its proposed street railway. The cars are estimated to cost $30,000.

Carmark Railway & Power Company, Opelika, Ala., is contemplating the purchase of two cars for its proposed line between Auburn and Opelika, as described in the construction news of this issue.

Illinois Central Railroad, Chicago, has ordered four gas-electric motor cars from the General Electric Company. These cars will be used for supplementary service on some of the connecting lines of the system.

Richmond Light & Railroad Company, New York, has ordered thirty-five all-steel closed cars from the Standard Steel Car Company. The cars are 28 ft. over corner posts and 40 ft. over bumpers, and will be equipped with Westinghouse control, air brakes, No. 223 motors and Standard trucks, with 33-in. wheels.

TRADE NOTES

Cambria Steel Company, Johnstown, Pa., has removed its sales department to Philadelphia. This company expects soon to open branch offices in Buenos Ayres, Rio de Janeiro and Mexico City. A branch in London is also contemplated.

McQuay-Norris Manufacturing Company, St. Louis, Mo., announces the opening of its new plant at 2808-2810 Locust Street, Sept. 29, 1914. In connection with this, a formal opening reception will be held, followed by dancing. A large number of invitations have been sent out for this purpose.

Electric Service Supplies Company, Philadelphia, advises that since the work of the Michigan & Chicago Railway, described in the ELECTRIC RAILWAY JOURNAL for Aug. 29, was begun it has furnished through the Michigan Railway Engineering Company more than 13,000 Type L-6 compressed terminal foot bonds for bonding the entire third-rail system.

W. S. Rockwell Company, New York, N. Y., furnace engineer and contractor, has issued a convenient card for hanging in laboratory or furnace rooms, which contains data of value in connection with heating operations. This company is prepared to make inspection of furnaces and plants and devise methods for efficient production in industrial heating operations.

Railway Storage Battery Car Company, New York, has appointed Henry C. Ebert, formerly with the Cincinnati Car Company, as one of its sales representatives. This company has recently received an order to equip a new combination baggage and smoking interurban car of the Lorain, Ashland & Southern Railroad for storage-battery operation. This is the second storage battery car to be put in operation on this line.

Crocker-Wheeler Company, Ampere, N. J., has received an order to equip the Ford power plant in Detroit, Mich., with four huge generators. It will require about fifteen cars to transport all the material which comprise these four big units, each one having a normal capacity of 3750 kw and weighing 105 tons. The field frame is 21 ft. high and 26 ft. wide across supporting feet. The armature is approximately 16 ft. in diameter and weighs about 87,000 lb.

Mooney & Boland Detective Agency, New York and Chicago, announce recent changes in the personnel of the office executive staffs and the appointment of new superintendents. The Chicago office, controlling the Western division, will continue under the personal direction and general supervision of William J. Sutherland, vice-president, and the New York office, controlling the Eastern division, will remain under the personal direction and general supervision of Robert J. Ferns, vice-president.

Hess-Bright Manufacturing Company, Philadelphia, announces that owing to the interruption of communication with its Berlin factory it has made arrangements with outside parties to provide bearings in those few sizes where shortages have occurred in the large stock it has on hand. Rings in various stages of completion, which will be finished in its own factory, and in some cases complete bearings, particularly thrusts, are being made for the company, in accordance with its specifications and subject to the usual inspection.

General Electric Company, Schenectady, N. Y., has recently received orders for the following electric railway equipment: Harrisburg (Pa.) Railways, six GE-216 50-hp, two-motor and four GE-216 four-motor equipments and K platform controllers; Washington, Baltimore & Annapolis Electric Railroad, ten type M, 600-1200 volt trail-car control equipments; Southern Public Utilities Company, six straight air-brake equipments with CP-27 compressors; Hagerstown & Frederick Railway, sixteen GE-88, 40-hp, form B railway motors.

ADVERTISING LITERATURE

Nachod Signal Company, New York, has issued a folder on its signal system.

National Tube Company, Pittsburgh, Pa., has issued a folder containing illustrations included in a series of three films of industrial motion pictures which describe the manufacture of National pipe from iron ore to finished product, and which have been recently exhibited before various organizations and societies.

Prepayment Car Sales Company, New York, has issued a folder entitled "On the Job," which points out to street railway companies the advantages in saving time of allowing a concern, which originated the prepayment idea to utilize its acquired experience in evolving such devices as prepayment platforms, automatic doors, folding steps and signal starting systems, rather than in entrusting them to the ingenuity of the master mechanic.

General Railway Signal Company, Rochester, N. Y., has issued an advance notice of its dispatchers' selective signaling system, by means of which the dispatcher can control train-order signals and take-siding signals located at various stations on his division and can determine, whenever he so desires, the indication displayed by each signal. The system may also be utilized to indicate to the dispatcher a train passing a certain point corresponding to the operators' "OS" or train report.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has issued Bulletin No. 159, containing 80 pages, which lists and describes its various opportunities in used railroad equipment, such as angle bars, axles, rail benders, bolsters, track bolts, air brakes, cars of all types, rail clamps, compressors, cranes, couplers, crossings, cross ties, drills, engines, hoists, fare boxes, frogs, switches and crossings, generators, jacks, lathes, sanders, car seats, track, trucks, wheels and axles.

W. N. Matthews & Brother, St. Louis, Mo., have issued Handbook No. 9, a 208-page catalog, conveniently prefaced with indexes of the specialties manufactured by this company, and of useful data contained in the book. The catalog contains detailed descriptions and illustrations of these specialties which include boltless guy clamps, cable clamps, cable splicing joints, deadendeyes, easy lamp changes, fuse switches, guy anchors, lamp guards, polerectors, prisections, scale knockers, telefaults, teleleights, telepipe and guy clamps. The handbook contains a large number of testimonial letters, among which the following electric railways are represented: Chippewa Valley Railway, Light & Power Company; Fort Dodge, Des Moines & Southern Railroad; United Traction Company, Albany, N. Y.; Northern Ohio Traction & Light Company; Milford & Uxbridge Street Railway; Southwestern Traction Company; Helena (Mont.) Light & Railway Company; Winona Railway & Light Company; Roanoke Railway & Electric Company.

Convention Number

Electric Railway Journal

This number contains an important series of Contributed Articles on the subject of Public Relations grouped under three classifications as follows: Part I—Meeting the Public; Part II—Operating Conditions; Part III—Regulation

HOW THE AMERICAN ASSOCIATION IS DEVELOPING GOOD PUBLIC RELATIONS

By CHARLES N. BLACK

Vice-President and General Manager United Railroads of San Francisco
and President American Electric Railway Association

THE primary and fundamental motive for the formation of the American Electric Railway Association was the advancement of the industry, and the only excuse for its continued existence is this same motive. That it has in the past efficiently and successfully performed its function there can be no question, but to carry on the work in the future and to render as efficient service will require not only greater financial resources, but also, what is far more difficult to obtain, the active and hearty co-operation of the ablest men connected with the electric railways of the country and all affiliated industries and interests.

The paramount question of to-day is public relations and how to better them, and the most important committee of the association is the one dealing with this subject. Composed of men than whom there are none more representative to be found in the electric railway world, this committee has held several meetings during the past year and has formulated a code of principles, which will be embodied in its report to the convention to be held in Atlantic City this month. The committee has also prepared a comprehensive scheme of educational publicity which it will submit for the approval of the association. But this program, while very important, is only the first step in many that will have to be taken before we can hope for any material improvement in the present unsatisfactory conditions, and it will be incumbent upon the association, both through its individual members and as a body, to put its shoulder to the wheel.

> **"The paramount question of to-day is public relations and how to better them. * * * The people of a community must be brought to feel that the electric railways contribute to their comfort and welfare."**
>
> *Charles N. Black.*

Frank and full publicity will be one of the cardinal principles advocated for every transportation company in its dealings with the public and with the public's representatives, the state commissions.

These commissions, in many states vested with almost autocratic power, are composed principally of men who have had but little experience in the public utility field, and, while unquestionably honest, they have had very limited sources from which to secure accurate and reliable data upon which to base their decisions.

The American Electric Railway Association has, in the interests of its members, gathered a large amount of valuable statistics and data, and no better use can be made of this store of information than freely to furnish it to any of the state commissions upon request. In fact, the day is not far distant, if it has not already arrived, when it will be deemed expedient and wise to extend an invitation to every state utility commission to send one or more delegates to the annual convention of the association, not merely as spectators but as active participants in the discussions of the problems before the industry. As Mr. Tripp stated in his admirable address before the association last February, "The time is ripe for the association to do good work in the direction of co-operating with the public." But before any co-operation is possible it is absolutely essential that the suspicion and distrust of all public utilites which is now so prevalent be dispelled, and no move which the association could make would tend more to bring this about than the one suggested above. The people of a community must be brought to feel that the electric railways contribute to their comfort and welfare, and they must have sufficient faith in the management to defend it rather than continually to knock it, as is largely the case to-day.

A CONCRETE PUBLICITY SUGGESTION

By C. LOOMIS ALLEN

Allen & Peck, Inc.

SO much of the public relations problem is nebulous and intangible that those who are interested in its solution welcome any practical suggestion, by means of which discussion may be translated into action. In my opinion such a suggestion is contained in the testimony of Joseph E. Sterrett, of the firm of Price, Waterhouse & Company, public accountants, before the Pennsylvania Public Service Commission, sitting to investigate the matter of telephone rates.

In this case, as in all rate cases, the question of a reasonable rate of return on investment was an important consideration, and Mr. Sterrett was placed upon the stand by the telephone company to testify as an expert. Mr. Sterrett offered in evidence two exhibits, one of which was a tabulation of the figures obtained from an investigation of the accounts of thirty-six manufacturing concerns and showed for each the investment, excluding as far as possible intangible values, the profits and the rate of return. The other exhibit was a tabulation covering in a similar way nineteen trading concerns. The companies selected were taken, at random, from a large number investigated by Mr. Sterrett's firm, and the witness testified that, in his opinion, the result would not be materially altered were the list indefinitely extended.

> **"Let the people see that the undue limitation of return on money invested in local transportation is not only unfair to the holders of utility securities but it is a preventive of extensions both of line and service as well. Such limitation hits the street car patron as well as the owner of utility stock."**
>
> —*C. Loomis Allen.*

The rate of return for the manufacturing concerns showed an average of 14 per cent, and for the trading firms about the same. Mr. Sterrett testified that most manufacturers expect a rate of return approximating 20 per cent, and pointed out that public utilities were compelled to compete in the open market for the money for extensions and betterments with these concerns.

This was valuable and enlightening evidence and must have made an impression upon the minds of the commissioners. The tendency to limit the rate of return upon money invested in utilities is alarming and the public is apt to lose sight of the very essential fact that, with a limited rate of return, the utilities must bid for investment money against industrial concerns whose rate is unlimited. The opportunity is before every electric railway executive to do some effective publicity work along the lines suggested in the testimony.

The executive knows what the profits of the local manufacturing concerns are. If he will tabulate the data as to local investments and the rates of return secured, he will have some valuable ammunition. These figures should be put in such shape that they can be readily understood and then placed before the local public. This will let the people see that the undue limitation of return on money invested in local transportation is not only unfair to the holders of utility securities but is a preventive of extensions both of line and service as well. Such limitation hits the street car patron as well as the owner of utility stock.

When the improvement of public relations is discussed we are often confronted with the argument that the subject is so abstract in its nature that little if anything can be done by concerted action. Here, however, we have a concrete instance in which good work can be performed, not only for individual interests but for the industry as a whole. Multiply such instances, and in a short time an effective, active campaign will be in operation. In other words, theory should be translated into action.

COMPLETE UNDERSTANDING BETWEEN COMPANIES AND PUBLIC DESIRABLE

By L. S. STORRS

President of the Connecticut Company

NOTWITHSTANDING the efforts of electric railways toward publicity and the work of the public service commissions in promoting public realization of the issues between the companies and the public, much work remains to be done before a complete understanding between these interests, with all the good that it should mean to both, can be expected. It is assumed that one of the principal reasons why the public has not permitted companies to increase revenues as expenses increase is that it has not appreciated the importance of successful financial results of the operations of the public utilities. It has not appreciated the importance of this mainly for the reason that it does not know what it really means to the companies and, in turn, to the public in the way of service. It is the duty of companies to try in every way to inform the public fully in regard to the meaning and effect of changes in their financial position.

Statements of financial operations are made by the companies to the public service commissions, which exist in practically all the states. These statements are open to public inspection, but ordinarily, unless some effort to explain them is made by the company, they are not understood by the public. In the absence of knowledge the public is in danger of regarding the large sums received as gross revenue as somewhat in the nature of profit without considering the existence of heavy deductions which must be made for expenses, taxes and interest. Even in ordinary times it cannot be expected that the public will have a conception of the meaning of the results of operation of the companies unless a strong, persistent and determined effort is made to explain the facts. In extraordinary times, such as these, when the companies are suffering, not only from decreased revenue but also from heavy increases in all of their items of outgo, it is all the more essential that wise, considerate and fair efforts be made to acquaint the public with the facts.

If a company could go ahead indefinitely with the track mileage with which it originally started, with the same cars, power equipment and other facilities which enable it to render service, the problem of financing would be less insistent and it would not be a matter requiring constant explanation to the public. However, neither the public nor the company would be satisfied with a service based on the original investment. Such service would mean not only lack of growth, but absolute deterioration of every city, town and village which now enjoys railway service. American communities have grown so rapidly, and generally the demands for increased service have been so regular from year to year, that greater facilities have been needed continually. Without new investment it would be absolutely impossible for companies to give to the public the service that it ought to have.

It should not be expected that the public will receive all of the benefits of increased investment and increased service at the expense of the company. The company is a going business machine. Unless it is a profitable going business machine it cannot expect to enlist new capital in its service. Unless it can show investors that it is making a profit on the capital already invested, it cannot induce them to advance more money for development. In order that public service corporations may attract the new capital required continually for necessary additions to property and betterments of existing systems it is absolutely necessary for them to obtain sufficient net revenue to provide a reasonable return upon the fair value of the property devoted to the public use.

> **"The people should realize that reduced net revenues mean an inferior service with which they will not be satisfied and a decrease in the amount of facilities added to the property for the benefit of patrons."**
>
> —*L. S. Storrs.*

There is a logical connection between the difficulty of raising new capital which many companies have experienced in the last year and the agitation for reduced fares. New capital has to be invited by the promise of a fair rate of return. If, while the company is seeking new capital, the public served by the company is agitating for reduced rates, investors are likely to fear that the return promised them on their capital will be imperilled. If the amount of revenue is in danger of reduction while actual expenditures, as is well known, are increased, there is certainly no assurance for the investor that the income available for return on the capital will not be seriously reduced.

It is often difficult to trace the reason for an attack on a company. The sources of attacks on public service corporations differ in various communities. Sometimes they are in the public press which, in some communities, does not hesitate to attack corporations and their affairs bitterly. On the other hand many newspapers of public circulation have not hesitated to champion the cause of the public service corporations. We have examples of this fact in the present agitation for an increase in railroad freight rates. Many newspapers are asking that the government authorize an increase in freight rates so that the railroad situation may be strengthened at one of its weak points. In order to advance political prestige public officials in some cities use public service corporations as a target for attack. Public officials are in office to serve the entire public, and they ought to protect companies from improper exactions on the part of the public just as much as they protect the public from improper practices on the part of companies. One glaring case of injustice is the refusal of the Post-office Department to grant adequate compensation for the service performed by electric railways in the transportation of mail. There are of course many public officials who are fair in their dealings with companies.

In times like these, when revenues are declining and expenses are uncertain, public officials can do a good deal to relieve tension by a very careful scrutiny of all of the expenses which they impose upon electric railways. For instance, the present craze for permanent pavements throughout the Eastern part of the United States, together with the demand upon transportation companies to undertake the replacement of that portion of existing pavements which is within the area occupied by the tracks, is placing a constant burden upon revenues. This burden is absolutely unproductive of any return and is a permanent heavy charge on the revenues of the companies. The extent of this burden cannot be appreciated by those who have not had actual experience with it. It can be appreciated by business men who know what it means to be called upon to make an annual capital investment of at least 1 per cent of the total outstanding capitalization of their corporation for betterments that yield absolutely no return.

The unfortunate financial result of the imposition of unproductive expenditures upon the corporations is, however, not the only result. The managers of public service corporations should be on their guard at all times to keep themselves from being so influenced by acts of the hostile element of the public that they will lose that touch with the conservative element which ultimately will help them to preserve the integrity of their property. Unless managers guard themselves against it, the tendency of reductions in rates and the imposition of expenditures for public benefit which cannot possibly yield any revenue will be to create antagonism. Antagonism will not be of the slightest aid in the solution of the problems with which the companies are confronted.

The companies have a large and important work to do in a publicity campaign that will show the inevitable results of pressure upon revenues on one side and demand for greater expenditures on the other side. The people should realize that reduced net revenues mean an inferior service with which they will not be satisfied and a decrease in the amount of facilities added to the property for the benefit of patrons.

THE IMPORTANCE OF GOOD PUBLIC RELATIONS

By THEODORE P. SHONTS

President Interborough Rapid Transit Company, New York

FOR many years the merchants of the world have recognized the value of possessing the confidence of their customers. Those who have been most successful in the conduct of their business have striven to treat the public fairly, have justly acquired a reputation for upright dealing, and thereby through the co-operation of an appreciative public have built up vast business enterprises.

It is an economic fact that good-will is an asset of definite intrinsic value. Therefore those in charge of transportation facilities should keep constantly in mind the fact that to conserve and enhance security values it is just as important to keep continually adding to their "friendship list" as it is to add to the "equipment list"—both being prime factors making for stability of earnings. It may be said that the market value of such good-will is dependent upon the degree of cordial relationship existing between transportation facilities and the public; and while this is a fact which has long been recognized by transportation officials in general, it is only of comparatively recent date that they have come to a full realization of the fact that real and enduring friendship of the public can be builded only upon confidence, and that the public's confidence can only be secured through frank and honest dealings in the handling and treatment of all details of corporation affairs.

In the past many large public service corporations seem to have considered that the franchises held by them and the strategic advantages they had secured placed them in an impregnable position where they could afford to conduct their business in a more or less arbitrary way. Undoubtedly in a large number of instances their business methods were entirely consistent with the ultimate interests of the public and necessary for the welfare of the properties involved, but the officials who were operating such properties did not take the trouble to explain why it was essential to pursue a given line of action.

Taken as a whole, the American public is a reading public and a thinking public. No greater affront can be given to its intelligence than to treat with silence well-meant criticism based on reasonable grounds of complaint as viewed from the standpoint of the public. This does not mean that technical questions of law, engineering or accounting can be lucidly discussed in words of one syllable, and the merits of all sides of an issue clearly presented to the public in a half-column newspaper article. There are, however, very many factors bearing upon the great industry of transportation which are not at all understood by the public at large and which, as the occasion arises in each locality affected, could advantageously be explained so that the public would have a clearer idea of some of the problems with which railway men are confronted. The public should not be allowed to receive the erroneous impression that silence in regard to its criticisms is indicative of contempt for its views and that failure to explain is due to the fact that no adequate or reasonable explanation is possible.

With a public service corporation a policy of silence may, and often does, create a suspicion and distrust on the part of the public which it serves.

During the last forty years this suspicion and distrust have been steadily increasing all over this country. Fuel has been added to the smoldering fire as here and there evidences of wrongdoing on the part of individual public service corporations have been brought to light. The newspapers, which are the great disseminators of ideas as well as of facts, have had very much to do with bringing about the situation existing to-day. Many, and I think the great majority, of the members of the newspaper profession are men of high ideals who aim to publish accurately, quickly and in readable form, the news of the day and to make such editorial comment thereon as from their standpoint is logical and fair. Such men have seen from the public viewpoint the reasonableness of certain criticisms made with regard to public service corporations. In many instances they have been unable to obtain the corporation's side of the question at issue because of the latter's refusal to discuss the matter, and they have therefore been obliged in the light of their own knowledge and reasoning powers to set forth the facts and to comment thereon as best they might. A policy of frankness on the part of public service corporations toward such journalists, if instituted thirty years ago, would have brought about a very different attitude on the part of the public from that existing to-day.

There are journalists of another type, however, who I believe to be in the minority but whose ranks have considerably increased within the last twenty years, who are not especially painstaking about making an accurate statement of the news of the day and an impartial comment thereon, but who from motives of politics, of personal interest, or of personal grievance are prone to color news in order to give the public a very different impression of the facts from what is actually the case. This policy of misleading the public is most successfully carried on through the statement of half truths and through the suppression of a portion of the facts which, if stated in full, would put a very different light on the whole matter. The journalists of this particular class have not been slow to utilize to their own advantage and to the advantage of the newspapers with which they are connected the just resentment of the public against the policy of silence on the part of public service corporations. Through the activities of this group of journalists the public has been deceived, and in an incredible number of cases one finds persons of intelligence who regard as clearly established facts, accusations which have been made by the irresponsible element of the press, either directly or by innuendo. This condition of affairs would never have existed if the corporations had long ago ceased their policy of silence and seeming indifference.

It is beside the question to say that the public is not qualified to judge because of lack of knowledge of all of the facts involved. It is not a sufficient answer to say that the rules, regulations and procedure of the corporations in probably the majority of cases have been and are now observed with due regard for the interests of the public and of the financial integrity of the property. The public has felt it was justified in knowing why such and such things were done or not done, and because the answer was not forthcoming the public was determined to create conditions that would compel satisfactory response to such inquiries.

> **"It is an economic fact that good-will is an asset of definite intrinsic value."**
>
> —*Theodore P. Shonts.*

Another element which has contributed its quota of influence toward crystallizing public opinion against corporations, simply because they are corporations, has been the politician, particularly the municipal politician who has been sufficiently astute to seize upon an issue with which to catch the ear of the public and who has recognized that to attack a public service corporation was the popular thing to do. Many of these men have no doubt been more or less sincere in the statements they have made on hearsay evidence; they have been confirmed in their views by the silence with which their accusations have been received by the accused. Other politicians have known that the statements they have made were inaccurate and in some instances false, but they have trusted, and apparently with good reason, to the policy of silence of the corporations.

All of these factors have led to the enactment of laws and ordinances having for their object the curtailing of the powers and intimate surveillance over the affairs of public service corporations. Furthermore, the influences to which reference has been made have culminated in the creation of public service regulating bodies all over the country. Members of these regulating bodies have been appointed not because their knowledge of the conditions involved has rendered them especially qualified to act intelligently and constructively, but rather because they were deemed willing to give expression to popular resentment and to wreak popular vengeance upon public corporations for real or fancied wrongs. The public is generally inclined to-day to regard all railroad companies with suspicion. The only remedy is a policy of aggressive action, having for its object the education of the people. The old saying, "Necessity is the mother of invention," is applicable to the situation in which the railroads find themselves to-day. They are compelled by force of events to adopt a different policy in the treatment of the public from that followed heretofore if they are to survive as public service corporations.

The sentiment all over the country with regard to the recent action of the Interstate Commerce Com-

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mission favoring an upward revision of freight rates is indicative of the fact that if the public is convinced of the justice of a proposition it will speedily rally in support of it. The public to-day is taking a greater interest in the affairs of corporations than ever before, but the public is also beginning to realize more fully to-day than formerly that the interests of all concerned can best be served by co-operation between the public and the public service corporations. No more important work demands the careful consideration and attention of officers of large public service corporations than that of deserving and winning the confidence of the public and of securing its co-operation in order that the property involved may render to the public the best possible service.

Many corporations have gone to the extent of establishing a department to take charge of this very important matter and are spending considerable money to remedy conditions which might have been prevented by far less effort than is now necessary to correct them.

There are three factors which are indispensable to the securing of satisfactory relations with the public:

First—A policy of fairness and frankness toward the public, followed out in actual practice in the conduct of corporation affairs.

Second—Efficiency of service.

Third—The spirit of helpful and constructive co-operation between the public and the corporations.

The policy of the corporation should not be shaped by any narrow conception that it has a monopoly either through its franchises or otherwise. Experience has taught that if the public is with reason justified in complaining of service rendered it will find some way of applying a remedy and will obtain the end sought, irrespective of all the legal obstacles which may be involved. Science and invention have not by any means reached the limits of their possibilities, and no matter how firmly entrenched any company may believe itself to be, unless it plays fair with its patrons it is certain to be threatened sooner or later by effective competition which the march of science has unexpectedly brought into being.

The term "efficiency" is very elastic, but in the sense above used, as applied to railroads, it means adequate and proper service, with due regard to regularity and frequency. It means also courteous behavior on the part of employees. Regularity of service is necessarily dependent to a marked degree upon proper maintenance of equipment, transportation methods and discipline. Frequency of service is largely determined by reasonable public convenience and a fair return for service rendered. The courtesy of employees cannot be secured by a mere reiteration of regulations or the arbitrary enforcement of discipline. Employees must be convinced that courtesy makes the performance of their own duties much easier, that they are the representatives of the company with whom the public comes into constant touch, and that if they say the wrong word at the wrong time they have committed an act detrimental to their employers and to themselves which it is most difficult and almost impossible to repair.

The feeling of the public toward a railway corporation is undoubtedly influenced to a greater degree by the action of the employees with whom the public comes in contact than by any other single factor. It is of no consequence if the passenger is dissatisfied without reason or complains unjustly; the employee or representative of the company with whom he is dealing must use tact, must say the right thing and say it with the right tone of voice in order that proper public relations may be established and maintained.

An effort must be made to convince the public that the rules and regulations in the operation of a railroad are necessary for the convenience of the public as well as for its safety and comfort, such as rules framed to prevent accidents or those prohibiting throwing rubbish or spitting on the floor of cars, and matters of similar character. By creating a public sentiment against practices which are harmful or annoying to the public, as well as expensive to the railway, the latter can best secure the help of the public. The railway companies are largely responsible for the view in which they are held by the public to-day, and because of that responsibility it is incumbent upon them to set themselves right in the eyes of the people at large. Matters which are frequently considered too trivial or too well understood to require explanation are precisely the subjects which ought to be made clear to the public because the public does not appreciate their significance. The American people as a whole are ready to concede the right of a fair return on invested capital. There is no reason to suppose that when they understand the facts they will demand that investors are to be penalized for putting their money into efficiently managed public service utilities while private capital invested in other enterprises which have not for their object the immediate benefit of the public is to be encouraged and assisted to reap large returns. But the public must be shown that the management is efficient and that if the return on investment is not fair or just such fact is due to overtaxation or underpayment for service rendered.

The impression has been very generally held that public service corporations are necessarily money-making propositions and not subject to the same economic laws as any other kind of business. It is only by taking the public into our confidence, by working in hearty co-operation with the representatives of the public who have been chosen to supervise public service corporations and by the efficient management of the properties devoted to the use of the public, that the money invested in these utilities will be enabled to earn a fair return. It is only through the sympathetic and intelligent co-operation of the public and of their chosen representatives in legislative and regulatory bodies that the public service corporations will be able to live and to render to the public the greatest service of which they are capable.

THE GOOD-WILL OF THE PUBLIC AS A STREET RAILWAY ASSET

By JESSE W. LILIENTHAL

President United Railroads of San Francisco

WHEN I assumed the presidency of the United Railroads of San Francisco I believed that it was the most unpopular public utility in the country. Nothing that has occurred since that time has made me think that the original opinion was unfounded. Much of its unpopularity was no doubt unwarranted, and much of it was to be accounted for by the antagonism developed by the strikes, the graft prosecution and the successful campaign for a municipal railroad. I am assured and believe that much of this ill-will on the part of the general public has been eliminated. That means that when the company now comes before the public its protestations are more likely to be accepted as made in good faith, that when favors are asked by it they are more likely to be granted and that when its troubles are ventilated they are more likely to arouse sympathy and indulgence. If only for these reasons, and especially in the present temper of the public towards public utilities, its good-will must be of paramount importance.

Assuming, then, that the United Railroads has made some progress in the public favor, or at least had begun to do so up to the time of the Solano disclosures, and at the risk of being criticised for a *post hoc propter hoc* argument, reference may be made with some possible advantage to the things that were done by the new administration to obtain the good-will of the public.

It was announced at the outset that the company would keep out of politics and that, if it ever undertook to influence public opinion, it would do so openly and in the name of the company and that the company would consider its paramount duty to be to adequately serve the public and, to that end, invited the co-operation of all citizens in the making of complaints and recommendations.

Then, although the employees of the company were not organized the company proceeded to develop and publish a plan for their welfare according to which, without any compulsion whatever, the wages of employees were substantially increased, the lives of those in the employ of the company three years and upwards were insured for the benefit of their families without expense to them or physical examination, and, in order to insure greater care for the avoidance of accidents, the men were promised the entire saving that might be made from year to year over payments made during 1913 in the settlement of damage claims. A proposition for company stores to furnish the families of employees with necessaries of life at cost was under consideration, but, improper motives having been insinuated, that project was abandoned. Finally, a monthly magazine was established for the interchange of views between the employees and the management and numerous recreational facilities for the men were developed by the company at its own expense.

I believe these things have caused the company to be known now as a public welfare, as well as a public utility, corporation, and that this attitude on the part of the public is the company's best asset. Certainly, when it comes to regulation, the governing bodies are bound to make a difference between popular and unpopular public utilities.

> **"I believe these things [described in the article] have caused the company to be known now as a public welfare, as well as a public utility, corporation, and that this attitude on the part of the public is the company's best asset. Certainly, when it comes to regulation, the governing bodies are bound to make a difference between popular and unpopular public utilities."**
>
> —*Jesse W. Lilienthal.*

THE NEED FOR CORPORATE COURAGE

By GEORGE H. HARRIES

Vice-President H. M. Byllesby & Company

THE one thing needed to make satisfactory our relations with the public is corporate courage. Individual courage is common. Its existence is seen in the vast investments made in electric railway enterprises, many of them shaped by pioneers who builded and hoped, and who died before their visions came to be material. Other pioneers, no less daring, are building and hoping and striving. There are and always will be such makers of communities; the supply increasing or diminishing as public sentiment, embodied in law, approves or makes impossible projects such as those with which we are familiar.

The timidity of the investor's dollar is proverbial, and because the multiplied dollar is the foundation upon which we build it necessarily follows that the structure will have vibratory tendencies and be subject to tremors. When the legislative earth movements become convulsive the basic dollars frequently lose the power of cohesion and are buried (often beyond recovery) beneath the ruins of what should have been an enduring utility.

> **"National conscience—the aggregate of countless individual consciences—is being aroused, and there is perceptible growth of a disposition to deal fairly. Let the trembling investor * * * give substantial support to that corporate courage which enunciates the plainly-stated truth, and 'the truth shall make us free'."**
>
> —*George H. Harries.*

It is therefore not surprising that the menace of destruction should breed corporate cowardice; that some of the owners of the invested dollars should kneel humbly before the altars of the gods of legislation and appeal for righteous consideration; or that other owners of invested dollars, driven to desperation by fear, should curse the templed priests and all their works.

Here and there were a few public-serving corporations—their number growing all too slowly—whose executives assumed or were permitted to talk frankly; to tell the people at large the whole truth and nothing but the truth; to set forth the problems confronting the investor, the operator and the patron; to preach the world-old doctrine that "No man liveth unto himself alone," and that strife (whether the cause was a rare care of corporate misbehavior or the assaults of a demagogue) was an inexcusably wasteful and mutually disadvantageous thing. But for the most part there was corporate silence, broken only by occasional and feeble cries for help—spasmodic sounds that had no more effect on the public than did the gurglings of a drowning witch fighting vainly for life in the presence of a highly virtuous multitude in the good old days when there were no public utilities to be baited or sacrificed.

Of late, however, there has been an awakening. Many corporate worms have done more than merely evince a desire to turn. Some have turned and others are turning. Executive officers have seen and are seeing that only public opinion can overthrow the political charlatan or close the mouth of him who agitates for revenue only. There is less of office seclusion and more of companionship with the ticket-purchasing, freight-paying mass. Careful presentation of facts and analyses of facts—verbally stated to real audiences or prominently and personally set forth in the newspapers—is succeeding the old and often sullen or contemptuous speechlessness. Herein is the way to co-operation and peace.

It is interesting to note that the beginning of this era of tremendous legislative disturbance coincides with the time when, as the result of corporative initiative, free transportation and many other special privileges were either materially curtailed or permanently abolished. There was no spontaneous popular moral uprising, as some folk seem to imagine. The true incentive of the whirlwind attacks on transportation agencies and other public utilities was so much less than moral that it may fairly be declared immoral. When a few corporate crusaders put into effect the doctrine of non-discrimination, selfish and political interests resented the deprivation. Those who had been petitioning or demanding beneficiaries became vicious tormentors, creating opportunity to disguise themselves as reformers and to be improperly counted by the undiscerning as sincere friends of the millions whom they always referred to as "the dear people." Those angry and alert factors in a deeply-disturbed situation have, however, shot their bolts, unless we provide them with new targets and replenish their stores of ammunition.

National intelligence is taking note of corporate conditions and is on the way to realizing the interdependability of the public and the public utility. National conscience—the aggregate of countless individual consciences—is being aroused, and there is perceptible growth of a disposition to deal fairly.

Let the trembling investor take heart. Let him cease to waste his energies in mere railing. Surely he knows that no man ever achieved by quitting. Let him give substantial support to that corporate courage which enunciates the plainly-stated truth, and "the truth shall make us free."

PUBLIC RELATIONS

By H. M. BYLLESBY

President H. M. Byllesby & Company

THE establishment of good relations between a public utility and the community which it serves is of great importance to both the utility and the public. With nearly every public utility corporation this is an old subject. All of those with which I have been connected during the past thirty years have considered this matter as one of the first of the cardinal principles bearing upon the success or the failure of their operations.

While the continent was being subdued, while enterprises were being developed and while utilities were under construction, these matters naturally received but slight attention. That period, which future generations will consider as marking the most wonderful example of the development of a great continent, is now drawing to a close, and it is eminently proper that such questions as the one considered in this paper should now receive careful and thoughtful attention. The scope of this consideration should be larger than the mere question of the relations of a public utility, or common carrier, to the public. It really involves the fundamental question of the relations of each man to his fellow and opens up the entire subject of mutual fair dealing, of justice and common honesty.

Only a few years ago no more autocratic individuals walked this earth than the average, politically appointed officer of the law, of the customs, of the police, or the various branches of government. As a close second to the arrogance and sometime brutality of these political appointees were the junior officers and employees of some of the great railway corporations. The fact that an individual was clothed with temporary power in those days seemed to require him to carry himself in an arrogant and supercilious manner. With the development of the civilization and enlightenment of our continent this spirit has been rapidly disappearing, and to-day is practically extinct.

I believe that the so-called public utility corporations, embracing the electric light and power, gas and electric railways, were among the first to recognize the wisdom and necessity of treating the public with dignified courtesy and with a cheerful willingness to smooth over the inevitable irritations and frictions, which always have occurred and always will occur in the contact of man with his fellows. As long as human nature is as at present constituted it will be idle to look for an Utopian condition. There will always be the discourteous, the unduly selfish, the arrogant and the brutal. The individual or the corporation which proposes never to resent wrongs or insults will not last very long in the present order of the universe. To be able, consistently and under all circumstances to choose the course which will most avoid friction and discomfort without sacrificing to the bully or the unfair individual the rights which should be manfully sustained is exceedingly difficult and trying, and with these difficulties the officer or employee of the public service corporation is amply conversant.

A large part of the frictions and troubles of the world are caused by the unbending egotism, or, in other words, the narrow-mindedness, of the extreme individuals in any community. All successful public relations in any careful analysis will be found to be grounded on the fundamental proposition of fairness to all parties concerned. The sense of relief which the public service corporations as a rule have experienced from the creation of competent, experienced and self-respecting public service commissions is due, principally, to the growing feeling that before such commissions they are justified in expecting a calm and dispassionate review of their situation, with less prejudice against them than has heretofore existed on the part of governing bodies to whom in the past they have been compelled to report.

> **"All successful public relations in any careful analysis will be found to be grounded on the fundamental proposition of fairness to all parties concerned."**
>
> —*H. M. Byllesby.*

When a public utility corporation serves its community with a modern and substantially built and efficiently operated plant of an ample size for the requirements of the territory served, with charges for the service which are not discriminatory and which yield a just return on the value of the utility property, the first element of successful public relations has been discharged.

Of equal importance is the necessity that the utility company shall be officered and served by employees who recognize the rights of the public to courteous treatment, absolutely fair dealing and with an absence of unnecessary, irritating rules, regulations and conditions.

The third and co-equal condition is that the community so served shall recognize its obligations and the necessities resting upon it to deal with the utility in the same spirit of fairness and to avoid imposing upon the utility irritating and unfair rules and regulations, unfair terms and prices for its service, and that the public recognize that the utility has the same right to fair treatment and to a fair return upon its value as any merchant or any other corporation has and with a minimum of unnecessary investigations and hampering restrictions. When these conditions are fulfilled the furore, excitement and exaggerations which have filled the air for the past few years will very largely disappear.

To my mind a necessary step to bring about these conditions is that the regulatory control of public utility corporations should be taken entirely out of politics and should be vested in the hands of thoroughly competent, high-minded, intelligent and experienced officers appointed for that purpose. The utility companies have made their full share of mistakes and errors in the past. They have recognized them. They have corrected them to a surprising extent, and to-day, in the vast majority of cases, more successful relations with the public must come from a changed attitude on the part of the public itself.

The utilities, in general, and with rare exceptions, have gone to the full limit in establishing fair dealing with courteous and considerate attention to the public, and the next step in advance is one which can be taken only by the public. The communities served must recognize the value to them of the public service corporations and treat them in a spirit of justice. This includes regulation by officers or commissions who will be free from political bias, who will not be carried off their feet by unreasoning tirades on the part of the public and who, with equal firmness, will control the utilities and require the public they serve to render to the utilities the fair treatment which all mutually successful affairs require, included in which will be, of course, the allowance to the utility companies of a fair and just return upon the value of their properties.

PUBLIC OPINION AND BUSINESS

By GUY E. TRIPP

Chairman Board of Directors, Westinghouse Electric & Manufacturing Company

IN this country public opinion is the final arbiter of all things political, commercial and financial; and, now that it is turning more and more attention to business, men are looking into the future in an endeavor to forecast whether there will come safety and business freedom or the reverse.

Fortunately we are not without precedent, because we have reached a point in the affairs of public utilities which enables us to view the growth and development of public opinion in connection with those enterprises and the effect that it has had upon their financial stability and prosperity.

> **"Our public utilities, which were in the category of semi-speculative investments, have or will become a preferred class, because the whole plan or regulation by commission must rest upon the fundamental proposition of a fair return on a fair capitalization."**
>
> —*Guy E. Tripp.*

While it is true that a business which is semi-public in its character presents economic features that cannot be found in private and competitive business; nevertheless, if those interested will make an unbiased review of public opinion as it has worked out during the last twenty years, they will be helped considerably in forming a judgment on the probabilities of the future.

That public opinion is based upon a greater volume of knowledge than formerly must be assumed not only from the number, but the character of present-day periodicals. This knowledge may be superficial and much of it unsound, but the fact remains that the people have graduated from the insipid magazines and somewhat crude newspapers of twenty-five or thirty years ago to advanced publications which print much matter understandable and interesting only to people who think.

This educated public opinion is of recent growth, surprisingly recent so far as business is concerned. Men who twenty years ago were conducting public utilities did not then conceive that the public had any desire to acquire knowledge about such things; or, if it had the desire, they doubted its ability of comprehension; and further, it was conscientiously thought to be none of the public's business.

I know from personal experience that inquiries and expressions of opinion from laymen were regarded as impertinences and as prying into one's private affairs.

Such resistance only resulted in damming up the stream for awhile and, when it broke, the education of the people was remarkable for its inaccuracy. In fact, when it came to financial matters, it was weird. Those familiar with affairs of that time will recall popular financial analyses which showed unbelievable ignorance of the simplest fundamentals.

It was then that public utility men went to work explaining, and explanations sometimes degenerated into apologies and evasions. Men who knew their business were exasperated with the honest bunglers and disgusted with dishonest muckrakers, and moreover they were irritated with a vague sense of their own vulnerability.

Public opinion received a severe test at this period; but, notwithstanding the avalanche of incendiary articles in the public prints and the uncompromising attitude of many utility men, it remained fairly steady; and the mere fact that it was not stampeded into confiscation of property and retaliatory measures was reassuring.

I do not mean to criticise the energetic defence of their investments by the capable leaders of the public utility field. Quite the contrary, it was courageous and necessary and the only thing that molded an incoherent mass of public knowledge and misinformation into the germ of public intelligence, which enabled the people to see that business could not be dealt with *en masse*, and the result was the rapid and widespread inauguration of public service commissions with limited executive powers and, best of all, without infringing upon the jurisdiction or weakening the protection of our courts of law. In no other way could the *impasse* have been dissolved, and, while many old-timers in the business failed to see the light, the leaders did and approved and co-operated.

Of course, all obstacles are not yet overcome, and there are many untried phases of the experiment. But it is not an overstatement to say that our public utilities, which were in the category of semi-speculative investments, have or will become a preferred class, because the whole plan of regulation by commission must rest upon the fundamental proposition of a fair return on a fair capitalization. This is something more than a mere formula of words. It is the automatic and inevitable result of mutual necessities and cannot be escaped except by municipal ownership.

It is reassuring that, after nearly twenty years of wrestling with public opinion, public service enterprises have been placed on a higher investment plane than ever before, but it should be clearly borne in mind that this has been the result of two opposing forces, the most important one being the jealous, intelligent, energetic and honest efforts in defence of their rights by the men who had invested their money in these projects.

If the same spirit and energy of defence is shown for the future I believe that public opinion will grow more and more intelligent and will ultimately reach sane conclusions on all business questions. In any event, we want no other umpire than public opinion in this country.

IS PUBLICITY A CURE-ALL?

By A. W. WARNOCK

General Passenger Agent "Twin City Lines," Minneapolis and St. Paul

THOSE of us in the street railway business may think that we receive more than our share of criticism from our patrons and the public generally, but in view of the large number of transactions we have every day with our customers, it is probably a fair statement to say that we do not have any more troubles in proportion to the volume of business than does the corner grocer.

Suppose that we call a street railway company a huge 5-cent department store. In the case of a company which operates 1000 cars over a trackage of 400 miles, we then have the equivalent of 1000 counters, or departments, each in charge of two clerks (motorman and conductor) making sales and serving customers over a wide area. The department store has the advantage over the railway in having all of its clerks under one roof. If a customer has a dispute of any kind with a clerk, a floorwalker or some other authorized representative of the management is at hand to smooth out the trouble in short order. But in the street railway business a controversy between a passenger and conductor may occur 50 miles away from the general offices. With the exception of the conductor and motorman, there is no one representing the company at hand, and considerable damage may result in the loss of a friendly passenger and the acquisition of an unfriendly one because of that geographical fact.

> **"Publicity is like a huge megaphone, but does it not defeat its purpose when we are constantly shouting through the megaphone explaining our business and really taking on a defensive tone when the need to do so may not exist?"**
>
> —*A. W. Warnock.*

In all lines of business there exists the desire to increase the number of friends and to reduce the number of enemies; to convert liabilities into assets. It would seem as though we must look to our clerks (or conductors) to rise to their highest possible opportunities in helping us to have more friends and fewer enemies. If our men will always use fair judgment, if they will always be ordinarily civil, reasonably considerate, and fairly efficient in their duties, they, of all our employees, can do most to keep our relations with the public friendly.

I do not think that publicity is a cure-all, by any means, for the growing tendency of the times to criticise so-called "big business," particularly public service corporations. It is true that in the past we may not have used enough publicity. We have remained silent on too many occasions when we should

> **"The main thing that it behooves a company to do is first to put its house in order, if not already in order, and keep it so. The public will then have greater confidence in the company's sincere purpose to do the right thing."**
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have spoken. It may be true also that we are swinging too far to the other side of the pendulum's arc now and are making a fetich of publicity as a cure for every ailment that we may be heir to.

Publicity can be used, certainly, to good advantage for the purpose of educating the public regarding matters upon which it should be informed. For a long time companies were silent as to the vast costs of the improvements they were undertaking each year, as to the amounts of money they were distributing, in wages, to local dealers for materials, in taxes, and for many other items. These facts the average citizen did not stop to consider, and the companies might have undertaken to enlighten him. Such information tends to give the public the proper idea, namely, that not all of the nickels taken in are paid out to stockholders, but that only a very small part is used for that purpose. Another matter, not properly exploited heretofore, is the giving of information as to the rerouting of cars, necessary new rules, and other operating news which patrons are entitled to receive. In days gone by companies were too prone to withhold explanations if they were not able to grant requests for changes in service, or better service from communities or organizations. We were overlooking the best avenue of becoming acquainted with our customers, by not using printers' ink.

In the past ten years, however, most companies have been converted to the use of printers' ink, and it is an exceptional one to-day that does not give its patrons the fullest information as to the "why and wherefore" of all matters in which patrons are interested. In most large cities street car advertisements appear with nearly the same regularity as those of retail stores. Some companies even print daily delay statements, showing the causes for delay of cars, and this helps to produce a better feeling toward the company. The public is told, without being obliged to ask, why the cars were late on certain occasions. Undoubtedly all such publicity creates better public feeling and is reasonable and proper. Clearly, we are doing a wise thing to give such information as to operation as the public should receive.

But, assuming that publicity is valuable, is it not possible to overdo it, and to feel that all of our troubles can be cured with a liberal use of newspaper space and printers' ink? Are not some of us inclined to believe that if one column of newspaper space is a good thing, then three columns are much better, and a whole page is better still? Does not the constant use of large newspaper space to give information that could be covered just as appropriately in much smaller space, tend to give the public the idea that we are trying to bolster up a losing cause, that we have something to be constantly defended? One sometimes sees street car advertisements occupying whole pages of newspaper space which would ordinarily occupy a quarter that space if they had been inserted by shrewd department store managers. While the argument that a large advertisement is more conspicuous may be advanced, I believe there is a psychological point involved. Is the reader not more likely to infer that we felt that we had to "shout so as to be heard" when we use so much space?

Many companies have conducted "campaigns of publicity" to debate certain questions with their communities. I have watched these campaigns and have often wondered if they always accomplish the purpose for which they are intended. Sometimes it would seem as if these "campaigns" would irritate the reader as readily as they would convince him. Perhaps bombastic in spirit and superlative in phrase, these daily or periodic page advertisements have sometimes taken on a tone much more likely to offend the reader than propitiate him. Are we not going too strongly on the theory that publicity is a medium which can cure all of our ailments, and that the more liberal doses we take the healthier we shall be?

Publicity is not necessarily confined strictly to the use of newspaper space, although when we speak of publicity we usually mean newspaper advertising. In its largest and broadest sense—that of making things known to the public—publicity, whether by the use of newspaper space or of other mediums, is a good thing for the street railway business. It can serve us admirably in many ways. It can educate the passenger and give him a real idea of our side of each question. It can explain our point of view to him intelligently in a way that our conductors or motormen cannot do, and in a way, indeed, that even general officials of a company cannot do, because unfortunately general officials cannot come in close contact with the mass of the public each day. Publicity is like a huge megaphone, but does it not defeat our purpose when we are constantly shouting through the megaphone explaining our business and really taking on a defensive tone when the need to do so may not exist?

The older one grows the less one relishes controversy. We Americans are not strong for war even though we buy newspaper "Extras." Someone has said that fights never settle anything, and so I wonder whether the controversial encounters which so many companies have with their communities, or with local newspapers, settle the questions under discussion. Have any of these campaigns cleared the atmosphere or made friends in any way? Personally, I do not think that it is good policy for a company to keep up a continual open warfare upon its real or imaginary enemies, or upon those who have the temerity to criticise it. The public soon gets weary of this sort of conflict. The main thing that it behooves a company to do is to put its house in order if not already in order, and keep it so. The public will then have greater confidence in the company's sincere purpose to do the right thing.

If every employee of a company, from the highest to the lowest, can be imbued with the spirit of doing his level best every day to please the public he is trying to serve, to receive with an open mind suggestions for the betterment of service and to comply with reasonable requests, I am sure that "campaigns of publicity" will not often be necessary. Perhaps we can establish such cordial relations with the majority of our patrons by fair dealing of this sort as to prevent the frequent rise of irritating issues between the company and the public. Publicity in its proper way, at the proper time and in good humor, is a good tonic for all of us. But it will never cure all of our ailments, solve all of our problems and, as a sort of patented contrivance, settle all our troubles.

However, in the words of an old philosopher, "I may be wrong."

PRINCIPLES UNDERLYING PUBLICITY

By IVY L. LEE

Executive Assistant Pennsylvania Railroad Company

ELECTRIC railway managements are suffering from the same malady as that which afflicts the steam roads, namely, misunderstanding and distrust. Both troubles, and of course the latter is but a consequence of the former, are due in large measure to the failure of railway managements to make it a part of their policy and their every-day work to remove causes for present misunderstanding and to avoid giving cause for future criticism. Of course, there are substantial causes for criticism of transportation managements —it is not by any means all due to misconception. Grave wrongs have been committed—mainly in financial operations—and if these and other wrongs are to be repeated there is no hope that better conditions will be brought about either by means of "publicity" or in any other way. Publicity cannot be used as a screen for wrongdoing; it is a means for disseminating facts to the end that a right conception of conditions may be substituted for distorted ideas.

It should be possible for a railroad to set itself right with the public merely by cold statements of fact. But it is not, and even cold or warmed-over statements are often lacking. What the public wants is a window through which it can look into the affairs of public service corporations. And so long as this vision is denied the public will be very suspicious as to what is going on in the windowless houses of steam and electric railways.

As I have ventured to point out to members of the branch of the transportation industry with which I am connected, railway men seem to be divided into four groups:

First there are those who believe that the crowd on the outside has no right to see what is going on on the inside, and that there is no reason why there should be any windows.

Then there is another class who have no objection to windows being in the buildings, but think that even if the public could see what was going on inside, they would not be in the least affected in their attitude toward the business.

There is also a third class who believe it would be a good thing if the public could look in and see what is going on, but they do not believe there is any human method of making the public do the looking.

And finally, there is a fourth class who believe in the windows, who believe in the public, and who are making great progress toward a better understanding on the part of those both inside and outside the building.

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>
> *—Ivy L. Lee.*

Somehow or other the public has come to have the idea that three essential evils are imbedded in the railroad business:

1. That there is a vast amount of watered stock on which dividends are being paid.

2. That there is a widespread feeling that the railroads are ruled from Wall Street, that a small coterie of bankers in alliance with the so-called "money trust" are absorbing huge profits from the people.

3. That the railroads through their combinations of capital and management exercise undue power over the welfare of the people. With respect to electric railways, there is often a feeling that this

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>
> —*Ivy L. Lee.*

power is used locally against the welfare of the public, and out of this grows the demand for municipal ownership.

That there has been some reason for some of these popular ideas no one can deny. But that transportation as a whole or in the main has been conducted upon unsound lines, that its managers have not been honest, and that its results have not contributed mightily to the wonderful progress of this land, can be emphatically denied.

Why is it, then, that the good in the railroads has been hidden and the bad magnified and distorted out of all proportion? It is because railroad men have neglected the human nature of the situation; it is because loud-voiced politicians have dilated upon the evils while railroad men have not insisted in and out of season, and produced facts to prove that, no matter what fly-specks might be pointed out on the wall, the structure itself was safe and solid.

There is no gain in pointing out the logical inconsistencies of other people's arguments. If we cannot answer what they say with something that will appeal constructively to the imagination or emotion of the public, with something that will supplant the erroneous statements, it is hardly worth while to go into the case at all. We may say what has been said of a woman, that a crowd convinced against its will "is of the same opinion still."

A public to be influenced must feel. Too many railroad announcements are full of cold legal phraseology; they do not make the public feel. To make the public feel, we must be concrete; we must tell of our work in language the layman can understand. He will not analyze figures. What he wants to know is, are you doing the best you can? Convince him of that, and you don't need to argue details.

This necessity to be concrete argues against the establishment of any general publicity bureau. Each railroad should tell its own story to its own constituency. No set of statistics, no generalization as to the facts concerning the railroad as a whole, however convincing, will ever find lodgment in the public mind. But our own story, of how each railroad is performing its obligations to its own community, will always be of interest. And it is here that we must deal with the press. It seems to me we should regard the press simply as the window-glass of this house in which, as I conceive it, we have cut out the space for the windows. It is the glass through which the public can see what we are doing. That glass should be clear; it should not color; it should not distort. Therefore, we should make an effort to see to it that what the press publishes about us consists not merely of complimentary notices about our roads and about our officers, but facts of consequence. We should see to it that the public learns the truth in all matters, but we should take special pains to see that it learns those facts which show that we are doing our work as best we can, and which will create the idea that we should be believed in. We must get so many good facts, so many illuminating facts, before the public that the bad will be overlooked. There will always be some bad facts in every business, as long as human nature is frail.

Do not misunderstand me. Nothing is further from my thoughts than to suggest any attempt to prove things are good which are really bad. No one should condone the bad, and it should be, as I believe it is, the constant aim of nearly every railroad man to make things better. What I do mean is that we should not neglect the human nature of the situation, but should take full advantage of it; that we should tell our story, tell it frankly, tell it fully, tell it with a view to its being understood, and make it carry conviction as to the essential truth.

Unless the railroad men of the country are to be believed in, so that the public will take their advice as to what it should do with reference to railroads, we are not going to make very much headway in the settlement of the railroad problem. The railroad men of this country deserve public confidence, and they must command it.

The extraordinary situation which now prevails, however, is that railroad managers are representatives of one-eighth of the tangible wealth of the United States, yet not a single man with experience in railroad management is on the Interstate Commerce Commission; none is on any of the state commissions.

If we are going to work out this problem properly we must have the confidence of the public. We must imbed in the public mind what is in all truth the supreme fact of the situation, namely, that the railroad men are doing their work as best they can and, in the main, doing it exceedingly well. As soon as the public becomes convinced of that fact, it will give the railroad men opportunity to go ahead at full steam, or on the last notch of the controller.

The crowd craves leadership. If it does not get intelligent leadership, it is going to take fallacious leadership. We know that the leadership which the mob has received not only in this country but in other countries, unless corrected, is going to produce disastrous consequences. Is it not supremely worth while, therefore, that railroad officials should take account of those fundamental undercurrents of human nature, take practical steps to obtain the confidence of the public and assume the leadership which by right of character and ability they are entitled to exercise?

In the electric railway field there are doubtless a large number of officials who profess to believe in publicity but who have been very slow in putting their belief into action. This may in part be due to failure to understand the principles of publicity and how the work is to be done. An attempt to state the underlying principles of publicity and the need for it has been made in the preceding paragraphs. As to methods, they are as various as differing occasions demand. Of course, the daily press is the most immediate means of communication, but in some noteworthy cases pamphlets and bulletins have been equally effective. Public speaking is another potent means of reaching the people. Methods of publicity cannot be described in advance of their application. The management that waits for someone to say exactly what he is going to do throughout a continuous publicity campaign will never get started. The best plan of campaign is to get the best possible man and put him to work studying the problem and working it out.

BUILDING UP CONFIDENCE IN A PUBLIC UTILITY

By JOHN A. BRITTON

Vice-President and General Manager Pacific Gas & Electric Company

OHM'S law is expressed by the well-known equation $C = \frac{E}{R}$. This equation may be taken to express the title of this article—that confidence equals earnestness divided by results.

Building up confidence in a public utility would seem to be no great or Herculean task, if, on the common plane of ordinary transactions between individuals, the public utility is reduced to the same public footing as any other commercial or mercantile enterprise. Building up in its true sense contemplates a beginning from the very foundation; it means a stable and substantial structure and not a house of cards; it means that the materials entering into the structure so to be builded must be of the very highest class in construction.

Building up is the antithesis of tearing down, and yet the tearing down process, in so far as the public utilities are concerned, has been the rule rather than the exception in the latter days. The tearing down process has resulted from a very lack of confidence in utilities, a lack which has been engendered not so much by the daily routine employed between public utilities and their consumers as by the building up of false premises by a few financial managers of corporations in times past.

Before regulation was begun many public enterprises were builded on very insecure foundations, and the enticing profits arising from the manipulation of utilities made a field for promoters not to be resisted. They were careless of future results, and such a thing as endeavoring to secure the confidence and good-will of their patrons was a secondary consideration. As long as the people would pay the price, the corporations pursued their unheeded way, and while public utility managers deserve a great deal of credit for the progress which they have made, particularly for their wonderful pioneering work accomplished in the days of apparently insuperable and insurmountable difficulties, it must also be said that in the wild scramble for great gains, the eventual necessity of building up confidence in the public was largely forgotten, if not eliminated. It is true that charges of property mismanagement can honestly be made only against a very few, but they were of a sufficient number that the whole body-politic of public service corporations became enmeshed in these intricacies of finance and exploitation, and when the day of reckoning came and the necessity for the arrest of such developments as placed burdens upon the public arrived, all corporations of this class were placed in the category of the get-rich-quick concerns. The result is that many to-day are suffering for crimes they did not commit or even consider.

When regulation—sane and insane—came to the front, the penalty had to be paid; and while in the majority of cases public service corporations in the United States enjoyed the confidence of their consumers, such confidence was immediately dissipated by the general thought, engendered by a hostile press, that all public utilities were in league in the game of extortion. Nothing has become more important during the past few years for the public utilities than to seek to correct this very false impression, and by the process of ordinary common sense dealing to seek again to restore the confidence which had been lost.

The one element most strongly entering into the work of building up confidence in a public utility is the personal equation of the men having control of the policies of these utilities. "Like master, like

"Public service managers are now beginning to realize that the greatest asset which a public utility possesses is the absolute confidence of the public with which it deals."

—*John A. Britton.*

man" is a true saying, and more nearly true perhaps in the attitude of public service corporations towards the public than in any other line of trade.

Considered fundamentally, there is no material difference between a public utility offering for sale a manufactured product or engaged in the business of transportation and the merchant in a community who manufactures or delivers his products to consumers. The difference which does obtain is created by law and is founded on the theory that a public utility possesses rights and privileges in a community not possessed by other individuals, such as the general occupancy of the streets of the city, either by a constitutional right or by franchises legally granted to it by municipalities or any governing body.

In its use of the streets a public utility practically occupies no greater portion than does the ordinary public in the daily occupation of merchandising, but because it disturbs the surface of streets and uses the sub-surface for storage of its distributing systems and the space allotted to it in public highways for the erection of structures for conveyors of its products, it becomes at once a public utility subject to rules and regulations such as are not imposed upon merchants, who, by means of vehicular traffic and by utilization of subways attached to buildings, very often use more of the public streets and cause more destruction to them than do the public utilities. However, having placed themselves in the position of becoming amenable to the laws regulating public utilities, these companies are subject to more drastic regulation than is any other class of business, and for that reason, particularly, a public utility should be more consistent and careful in its relations with the public than should an ordinary merchant.

All public utilities are natural monopolies, and prior to the adoption of lenient laws by states and municipalities to promote a larger competitive condition, were essentially such, due to the vast amount of capital necessary for the exploitation of their business, and in the exercise of this monopoly they followed the impulse of man and beast since the beginning of time—to exercise arbitrarily the powers which they possess over others and thereby engendered class hatred as between the utilities and the public served. Competition has served, however, to break the strong bonds of the monopoly formerly cherished, and to-day public utilities are seeking to obtain the good favor and confidence of their consumers, by making the public their confidants and by exposing to the public the inner workings of what were once mysterious organizations. Regulation by the establishment of commissions with control over public utilities has been the instrument which has brought this about more than any other one thing, and public service managers are now beginning to realize that the greatest asset which a public utility possesses is the absolute confidence of the public with which it deals.

We can learn a lesson in the proper procedure of gaining this confidence from the retailer in any community, who, once he possesses an article of intrinsic merit and whether he is protected by a monopolistic right of sale or not, cultivates daily, through the medium of the press and the attitude of his employees, the confidence of the public in the integrity of the article which he sells and in the prices which he seeks to maintain for the goods that he displays.

True confidence in a public utility can be built up only by such exchange of confidence with its patrons; not only by the integrity of its goods but by the integrity of its prices, and by that is meant a service which from day to day is alike in character and is sufficient to meet at all times the demands of the public and is reasonable from the standpoint of a just return on invested capital. Public utilities should pay courteous attention to complaints of consumers and should have the attitude of the men brought into contact with the public always along the line of giving the consumer the benefit of every doubt that exists and not arbitrarily standing upon what they deem their natural or legal rights.

The confidence of the public cannot be purchased. It can only be gained by the kind of treatment that a reasonable person demands from another in the ordinary daily walks of life. The man who stands upright before his fellow men and the one whose word is accepted is the one who has always kept his promises, no matter how detrimental at times it might have been to him to have maintained such promises, and by a truthful declaration of both his rights and his wrongs has taught the public to believe implicitly in him.

In these days of intense development of activities to serve the vast hordes that congest our central marts of trade, it is more than necessary that the public be advised constantly by the utilities of just what their position is as regards service, as to what the service costs and as to what investment is required for the giving of such service. The ordinary consumer has a very general idea of the value of the products that go to make up the things that he essentially needs, and competition in trade in the luxuries of life force him into the position of knowledge of approximately the value of such luxury. But of the service of the public utility he is as ignorant as is the negro of Africa of the classics of Greece. A combination of capital when applied to a public utility is always looked upon by the individual as a means to the end of depriving him unjustly of his money. He should be told in no uncertain terms, by proper publicity, of the contribution that is daily made by the public utilities for the upkeep of its service, the amount which it expends for labor, material and supplies, and of its contribution to the national, state and municipal governments for taxes upon the utility, and the amazingly small return that is left for the benefit of those who have invested their money.

When from time to time, through the medium of the public press to the public, unwarranted statements are made that reflect upon the integrity of the public utility and its management, the public utility man should never cease to refute them, and he should not accept, as he has quietly done in the past, the opprobrium that has been heaped upon him merely because he represented a public utility.

With these things in mind the creation of confidence in the public will be very speedily attained, and the public utility business will get to be considered as fair and as honest as any mercantile or manufacturing business, and the foundation upon which this confidence will then be builded will have been securely laid and will support the structure of harmonious relations.

FIVE YEARS' DEVELOPMENT OF THE AMERICAN ELECTRIC RAILWAY

By FRANK R. FORD

Ford, Bacon & Davis, New York

THE preliminary report upon street and electric railways for the calendar year 1912, recently issued by the Bureau of the Census of the United States, in connection with the statistics of similar reports for 1907 and 1902 makes possible a study of the amount and character of the development of the electric railway industry during these two five-year periods, subject only to the limitations of these reports.

A similar review of the 1907 reports, made in 1910 showed the distinct tendency of diminishing profits at the 5-cent fare. Consequently, it is of interest to determine whether this tendency has continued or whether the economies which were made necessary by reduced profits have been sufficient to overcome the earlier losses.

The effect of diminishing profits of the earlier period upon the expansion of electric railway facilities and investment during the later period is also an interesting inquiry.

Are Profits Still Diminishing? The answer to this question will be found in the income account of which a condensed summary is given in Table I.

From this table it will be noted that the total revenue has considerably more than doubled in ten years and now reaches the enormous total of $585,930,517. The increase in transportation revenue, however, from 1907 to 1912 is only $129,908,426, compared with the increase from 1902 to 1907 of $154,279,342. The percentage increase of the later period of 33.3 per cent is approximately only one-half of the increase of the earlier period of 65.4 per cent. This decreased rate of increase has been due to the financial depression following 1907 and also to the general recognition of diminishing profits of the business, resulting in a smaller rate of expansion and investment.

One of the evidences of thrift in the operation of these properties and of the fact that other businesses, notably electric light and power, are more profitable, is the large increase for 1912 of non-transportation revenue and income from other sources.

Maintenance charges have increased more rapidly than revenue, which indicates better upkeep; transportation expenses have increased in about the same proportion as revenue, while general expenses, including management and accidents, have increased much less than revenue and are only slightly larger than 1907. Taxes, however, have increased at more than twice the percentage of revenue increase.

Interest on funded debt for 1912 has increased faster than revenue and in larger ratio than dividends. The decrease in surplus may be accounted for partly by the fact that while in 1912 charges are made against operating expenses for depreciation, in the earlier periods the surplus was partly accumulated or earmarked for that purpose.

A regrouping of the total operating expenses is given in Table II. This table is based on the assumption that after deducting from total operating expenses the cost of salaries and wages, purchased power, depreciation, insurance, rent and three-fourths of the expenditures for injuries and damages (as one-fourth of the latter are estimated to be included in salaries and wages), the balance represents the expenditures for materials and supplies.

These figures show that the cost of labor has increased in approximately the same proportion as revenue, so that in this largest single item of expense practically no economy has been possible even with the larger volume of business. In materials and supplies a distinct saving in percentage of revenue has been effected, although here again doubtless some of the expense has been shifted to purchased power, which accounts for the large increase of the latter.

Salaries and wages are shown in more detail in Table III.

The salaried employee and the wage earner from 1907 to 1912 have received only a small increase in rate of pay, 1.8 per cent and 2.4 per cent respectively, which is a striking commentary on the general necessity for prosperity in any business to make possible large increases in wages.

The amount spent for materials and supplies is approximately as shown in Table IV. These figures reflect a material economy.

TABLE I—COMPARATIVE INCOME ACCOUNT OPERATING AND LESSOR STREET RAILWAYS OF THE UNITED STATES

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Operating revenues:*					
Transportation revenue	$235,997,005	$390,276,347	65.4	$520,184,773	33.3
Non-transportation revenue	11,556,994	27,911,511	141.5	47,326,931	69.6
Total operating revenue	$247,553,999	$418,187,858	68.9	$567,511,704	35.7
(Total revenue, including income from other sources)	($250,504,627)	($429,744,254)	(71.6)	($585,930,517)	(36.3)
Operating expenses:					
Maintenance of way and structures	$13,600,236	$28,520,925	109.5	$42,666,174	49.6
Depreciation of way and structures	....	....	....	3,705,511	....
Maintenance of equipment	16,676,532	31,485,810	88.8	36,386,002	15.6
Depreciation of equipment	....	....	....	3,670,376	....
Total maintenance	$30,276,768	$60,006,735	98.2	$86,428,063	44.0
Traffic	$1,122,816	$1,730,851	54.2	$2,606,057	50.6
Superintendence of transportation	$2,598,935	$3,545,418	36.4	$7,127,204	101.0
Power	23,062,328	43,972,669	90.7	60,484,917	37.6
Operation of cars	58,373,804	93,577,263	60.3	122,077,311	30.5
Total transportation	$84,035,067	$141,095,350	67.9	$189,689,432	34.4
General and miscellaneous†	$26,877,946	$48,476,316	80.5	$54,172,804	11.8
Total operating expenses	$142,312,597	$251,309,252	76.6	$332,896,356	32.5
Taxes	13,078,899	19,755,602	51.0	35,027,965	77.3
Total operating expenses and taxes	$155,391,496	$271,064,854	74.4	$367,924,321	35.7
Net earnings	$92,162,503	$147,123,004	59.6	$199,587,383	35.7
Income from other sources	2,950,628	11,556,396	291.7	18,418,813	59.4
Gross income	$95,113,131	$158,679,400	66.8	$218,006,196	37.4
Deductions from income:					
Rentals to other than lessor companies	—$598,659	$521,663	....	$9,640,000	....
Miscellaneous	1,292,738	7,598,920	....	13,680,978	....
Total	$694,079	$8,120,583	....	$23,320,978	....
Net income	$94,419,052	$150,558,817	59.5	$194,685,218	29.3
Interest on funded and floating debt	46,462,470	81,771,266	76.0	113,259,470	38.5
Balance for dividends and surplus	$47,956,582	$68,787,551	43.4	$81,425,748	18.4
Dividends	33,039,171	54,485,274	64.9	70,992,218	30.3
Balance—surplus	$14,917,411	$14,302,277	—4.1	$10,433,530	—27.0

*Excluding six companies in 1907 and eighteen companies in 1902 which failed to furnish this information.

†Including $2,188,753 in 1902 and $6,168,873 in 1907, stated as "wages, supplies and expenses . . . not elsewhere included."

TABLE II—OPERATING EXPENSES SEPARATED AS BETWEEN SALARIES & WAGES AND MATERIALS & SUPPLIES

Redistribution of Operating Expenses:	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Salaries and wages	$88,210,165	$150,991,099	71.2	$200,890,939	33.0
Purchased power, depreciation, insurance, rent and three-fourths injuries and damages	15,078,689	32,850,768	117.9	55,628,439	69.3
Materials and supplies (balance)	39,023,743	67,467,385	72.9	76,376,978	13.2
Total operating expenses	$142,312,597	$251,309,252	76.6	$332,896,356	32.5

TABLE III—SALARIES AND WAGES

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Salaries:					
Total	$7,439,716	$12,909,466	73.5	$26,128,786	102.4
Per salaried employee	$1,044	$1,103	5.7	$1,123	1.8
Per cent of operating revenue	3.0	3.1	3.3	4.6	48.4
Per car mile (cents)	0.65	0.80	23.1	1.36	70.0
Wages:					
Total	$80,770,449	$138,081,633	71.0	$174,762,153	26.6
Per wage earner	$604	$658	8.9	$674	2.4
Per cent of operating revenue	32.6	33.0	1.2	30.8	—6.7
Per car mile (cents)	7 05	8.54	21.1	9.09	6.4

TABLE IV—MATERIALS AND SUPPLIES (APPROXIMATE)

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Total	$39,023,743	$67,467,385	72.9	$76,376,978	13.2
Per cent of operating revenue	15.76	16.13	2.3	13.48	—16.4
Per car mile (cents)	3.40	4.17	22.6	3.98	—4.6

TABLE V—EFFICIENCY OF OPERATION

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Car mileage per car owned	17,150	19,300	12.5	20,400	5.7
Passengers per car owned	87,200	114,000	30.7	129,000	13.2
Per cent transfer passengers of revenue passengers	22.3	26.8	....	25.4	....
Operating revenue per mile of track	$11,000	$12,200	10.9	$13,800	13.1
Operating revenue per car mile (cents)	21.6	25.8	19.4	29.5	14.3
Operating expenses per mile of track	$6,320	$7,320	15.8	$8,100	10.7
Operating expenses per car mile (cents)	12.4	15.5	25.0	17.3	11.6
Operating expenses per cent of operating revenue	57.5	60.1	4.5	58.7	2.3
Operating revenue less operating expenses per mile of track	$4,680	$4,880	4.3	$5,700	16.8
Operating revenue less operating expenses per car mile (cents)	9.2	10.3	12.0	12.2	18.4

The smaller rate of revenue increase and the necessity of economy have produced more efficient operation, as will be seen from Table V.

From these figures it will be noted that a larger mileage has been operated and more passengers carried per car than heretofore. The operating revenue per car mile has also very considerably increased from 25.8 cents to 29.5 cents, due somewhat to larger cars, while the increase in operating expenses during the same period is only from 15.5 cents to 17.3 cents, producing a notable increase of net earnings from 10.3 cents to 12.2 cents.

But most important of all, the ratio of operating expenses to operating revenue has actually decreased from 60.1 per cent in 1907 to 58.7 per cent in 1912, or to almost as low a figure as the 57.5 per cent in 1902. This is the more important when it is considered that the operating expenses for 1912 contain $7,375,887 charged for depreciation compared with no similar charges for the earlier years.

Another interesting feature is that the percentage of revenue passengers transferring shows a slight reduction from 1907, due to a better understanding of the expensive nature of this free service.

When the income account is reduced to a car mileage basis the results shown in Table VI are obtained.

The operating revenue received by the street railway industry was expended as shown in Table VII. The interesting feature of this table is that in spite of an increase of 0.9 per cent of operating revenue

TABLE VI—INCOME ACCOUNT IN CENTS PER REVENUE CAR MILE

	1902	1907	1912
Operating revenue	21.6	25.8	29.5
Operating expenses:			
Maintenance of way	1.2	1.8	2.2
Depreciation of way	....	....	0.2
Maintenance of equipment	1.5	1.9	1.9
Depreciation of equipment	....	....	0.2
Total maintenance	2.7	3.7	4.5
Traffic	0.1	0.1	0.1
Conducting transportation:			
Power	2.0	2.7	3.2
Operation of cars	5.1	5.8	6.3
Superintendence of transportation	0.2	0.2	0.4
Total conducting transportation	7.3	8.7	9.9
General and miscellaneous	2.3	3.0	2.8
Total operating expenses	12.4	15.5	17.3
Net earnings before taxes	9.2	10.3	12.2
Taxes	1.1	1.2	1.8
Net earnings after taxes	8.1	9.1	10.4
Operating expenses regrouped:			
Wages	7.7	9.3	10.4
Purchased power, rent, insurance, etc	1.3	2.0	2.9
Materials and supplies (balance)	3.4	4.2	4.0
Total operating expenses	12.4	15.5	17.3

TABLE VII—INCOME ACCOUNT IN PER CENT OF OPERATING REVENUE

	1902	1907	1912
Operating revenue	100.0	100.0	100.0
Operating expenses:			
Maintenance of way	5.5	6.8	7.5
Depreciation of way	....	....	0.7
Maintenance of equipment	6.7	7.5	6.4
Depreciation of equipment	....	....	0.6
Total maintenance	12.2	14.3	15.2
Traffic	0.4	0.4	0.5
Conducting transportation:			
Power	9.3	10.5	10.7
Operation of cars	23.6	22.4	21.5
Superintendence of transportation	1.1	0.9	1.2
Total conducting transportation	34.0	33.8	33.4
General and miscellaneous	10.9	11.6	9.6
Total operating expenses	57.5	60.1	58.7
Net earnings before taxes	42.5	39.9	41.3
Taxes	5.3	4.7	6.1
Net earnings after taxes	37.2	35.2	35.2

TABLE VIII—APPLICATION PER $1,000 OF TOTAL REVENUE

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Total revenue	$1,000	$1,000	......	$1,000	......
Operating expenses:					
Salaries and wages	352	351	—0.3	343	—2.3
Purchased power, etc	60	77	28.3	95	23.4
Materials and supplies (balance)	156	157	0.6	130	—17.2
Total operating expenses	$568	$585	3.0	$568	—2.9
Taxes	$52	$46	—11.5	$60	30.4
Miscellaneous deductions	3	19	......	40	....
Total expense	$623	$650	4.3	$668	2.8
Interest	$185	$190	2.7	$193	1.6
Dividends	132	127	—3.8	121	—4.7
Surplus	60	33	—45.0	18	—45.6
Total for capital	$377	$350	—7.2	$332	—5.1

CONCLUSIONS

"From the above statistics it is possible to draw certain general conclusions:

"The business, as a whole, is being operated more economically and conservatively.

"Maintenance and depreciation of property are being better provided for.

"Increased net earnings due to more efficient operation are being largely absorbed by increased taxes.

"Capital is receiving a slightly enlarged return, but the increase is too small to be attractive in comparison with the returns in other industries.

"Development of and investment in the industry are not keeping pace with the increase of traffic."

—*Frank R. Ford*

being put back in the maintenance of property in 1912 and a decrease of operating ratio from 60.1 per cent to 58.7 per cent, resulting in 1.4 per cent more revenue saved for net earnings before taxes, this entire saving was paid as taxes, and the final net earnings after taxes were the same as in 1907. In other words, practically all the increase of net earnings expressed as a percentage of revenue, due to increased efficiency of operation, was absorbed by increased governmental charges.

TABLE IX—INTEREST AND DIVIDENDS PAID

	1902	1907	1912
Interest on funded and floating debt	$46,462,470	$81,771,266	$113,259,470
Per cent of debt	4.68	4.17	4.31
Dividends	$33,039,171	$54,485,274	$70,992,218
Per cent of stock	2.51	2.60	2.97
Total	$79,501,641	$136,256,540	$184,251,688
Average per cent of capital and debt	3.44	3.36	3.68

Restated in another way, each $1,000 of total revenue was expended as shown in Table VIII. From these figures it would appear that both labor and capital show a decreased return in 1912 expressed in percentage of revenue, this being largely due to increased taxation.

TABLE X—COMPARISON OF CAPITALIZATION

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Funded and floating debt	*$992,709,139	$1,960,050,142	97.4	$2,626,482,670	34.0
Ratio to total revenue (times)	4.0	4.5	...	4.5	...
Capital stock	$1,315,572,960	$2,097,708,856	59.4	$2,384,344,513	13.7
Ratio to total revenue (times)	5.2	4.9	...	4.1	...
Total capitalization	$2,308,282,099	$4,057,758,998	75.7	$5,010,827,183	23.5
Ratio to total revenue (times)	9.2	9.4	...	8.6	...

*Funded debt only; floating debt not available.

TABLE XI—EXPANSION OF FACILITIES AND INVESTMENT

	1902	1907	Increase over 1902, per cent	1912	Increase over 1907, per cent
Miles of track	22,573	34,382	52.3	41,065	19.4
Number of cars (owned)	66,784	83,641	25.2	94,016	12.4
Total capitalization	$2,308,282,099	$4,057,758,998	75.7	$5,010,827,183	23.5
Transportation revenue	$235,997,005	$390,276,347	65.4	$520,184,773	33.3

The actual interest and dividends paid on debt and capital stock have been as shown in the figures in Table IX.

While the rate of interest in this table shows the slight increase of from 4.17 per cent to 4.31 per cent, the rate of dividends shows a slightly larger increase from 1907 to 1912 of from 2.60 per cent to 2.97 per cent on par value, and from this standpoint the owners of these properties have profited by the betterment and economies of operating conditions.

The increase of capital as compared with increased revenue is shown by Table X to be in a conservative direction, the total debt and stock in 1912 being 8.6 times the total revenue, compared with 9.4 times in 1907.

A decrease in amount of development is shown in Table XI.

It will be noted from the figures in this table that the increase of track mileage from 1902 to 1907 was 52.3 per cent and only 19.4 per cent from 1907 to 1912, and that the rate of increase in cars owned was about half as much for the latter as for the earlier period. Similarly, new capital issues increased only 23.5 per cent for the five years to 1912, compared with 75.7 per cent for the earlier period.

All of these rates of increase for five years to 1912 were considerably less than the 33.3 per cent increase of transportation revenue.

CONCLUSIONS

From the above statistics it is possible to draw certain general conclusions:

1. The business as a whole is being operated more economically and conservatively.

2. Maintenance and depreciation of property are being better provided for.

3. Increased net earnings due to more efficient operation are being largely absorbed by increased taxes.

4. Capital is receiving a slightly enlarged return, but the increase is too small to be attractive in comparison with the returns in other industries.

5. Development of and investment in the industry are not keeping pace with the increase of traffic.

POPULARITY OF ELECTRIC RAILWAY SECURITIES

By ALLEN G. HOYT
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MANY explanations have been offered as to why the investing public during the last few years has been turning to the securities of public utility companies in preference to those of steam railroads and industrials, but there are two which probably have had a great deal to do with this tendency. One is the comparative stability of the earnings of these properties, and the other is the immunity which experience has shown that they enjoy against confiscation.

There is no doubt that public utilities have a stability of earning power that is equal to, if not better than, that of any other class of corporations. This subject has been widely discussed in current periodicals, and detailed arguments thereon are unnecessary. But it is interesting to note that during 1913, according to the report of the comptroller of the currency, the 26,000 banks of this country increased their holdings in public utility bonds by $118,000,000 and released $101,300,000 of steam railroad bonds. This is a rate of gain for public utility bonds larger than ever before. Even such a world catastrophe as the European war should have little effect upon the earning power of these properties. There may be some sentimental or sympathetic reaction in prices or a temporary decline caused by a rapid foreign liquidation, but the stability of the issues as regards permanent investment will not be impaired.

> **"There is no doubt that public utilities have a stability of earning power that is equal to, if not better than, that of any other class of corporations."**
>
> —*Allen G. Hoyt.*

The second reason mentioned for the investment popularity of electric railway securities—which they enjoy in common with other public utilities—is their immunity from confiscation. By this is meant that public service commissions or other regulatory bodies cannot reduce the rates or fares of these properties to the point of confiscation. While the subject of appraisals is not yet on a completely standardized basis it has progressed sufficiently far in that direction that the investment value in these properties is generally recognized and protected. Commissions have also generally held that rates must be such as to afford a reasonable and fair return on this investment value. The principle of the economic desirability of monopolies in the field of public utility service has also been widely accepted by commissions and has been carried to the extent of refusing permits for the organization of rival companies. For this reason public utilities are practically exempt from the danger of ruinous competition. These facts enable bondholders in such companies to determine easily the safety of their investments. Steam railroads have not in general been able to establish their investment value to an equal extent, for there is not yet a sufficiently standardized basis upon which to work.

Electric railway investors are also protected to a large extent against the mistakes of public service commissions, made either unwittingly or through over-zealousness in the so-called interests of the public. Commissioners are beginning to see that when they appraise a public utility property and decide upon a reasonable return, the public will eventually suffer if the rates are not high enough. With the higher standard of living, people desire better public utility facilities. To provide adequate facilities the corporations require additional capital from time to time, but the necessary capital will not be forthcoming unless the commissions permit the companies to charge rates which will show an attractive return on the investment value of their property.

Some scheme must be devised which will allow the capital invested in a public utility to make increased returns as the corporation prospers, whether its prosperity is due to exceptionally able management or is the natural result of the increase in wealth and population of the community served. The Wisconsin scheme, the so-called Massachusetts idea and the Chicago Traction plan, all recognize this phase of the situation.

It cannot be denied, of course, that the hazards of electric railways are still many. Even if there is little threat of private competition there is the actual and potential danger of municipal lines, and there is a continued increase in operating expenses, despite constant watchfulness and increased efficiency. There are also the growing burdens of labor, taxes, enforced extensions and hostile political attacks of one kind and another. But these facts do not destroy the stability of electric railway securities; they are simply points about which the investor should be cautioned. They have been largely overcome in the past, and undoubtedly the same will be true of the future. The electric railway business as a whole is now organized on a firm foundation that makes its issue of securities among the most attractive that are available in the market.

IMPROVING THE ATTITUDE OF THE PUBLIC TOWARD THE TRACTION COMPANY

By EDWIN GRUHL

Assistant to the President, North American Company

THE recent interest in the desirability of traction companies cultivating better public relations has raised the question as to the most practicable means and the possibility of concerted action upon the part of all traction companies to achieve that end. The need for some plan of action arises principally from two sources:

(a) The constantly increasing demand in many communities for extended facilities and better service must ultimately be accompanied by increased earnings if returns upon the investment are to be sufficient to attract new money into the public service. In many instances this question of increased revenues has already become as pressing as the similar problems now being faced by the shippers and the railroads. It is necessary that the public be advised in time as to the importance of its interest in obtaining new capital in order that the proper co-operation may ultimately be secured to remedy existing revenue conditions.

> **"The fact that under regulative laws the utility's affairs are public information has apparently not lessened notions prevailing in many communities that the business is abundantly profitable and that the cost of service is far below the rate of fare paid by the public. Unfortunately these views are not altogether due to public ignorance but are frequently voiced by people who ought to know better."**
>
> —*Edwin Gruhl.*

(b) Unfortunately the best public relations are not always promoted alone by careful conduct of the business. The traction utility, occupying as it does a position in the public streets, is particularly subject to unwarranted complaints. Unless such complaints are promptly dealt with they are very easily extended into widespread sources of dissatisfaction. Attacks on public utilities are, moreover, still employed by public officials for political purposes and are still one of the various indignation topics used by many editorial writers to promote interest in their newspapers. With the best conducted utilities, therefore, adverse criticisms still occur at more or less frequent intervals.

Until recently few utilities have paid attention to public policy campaigns. It is not many years ago that publicity of accounts was expected completely to fill the requirement of preventing any misunderstanding as to the fairness of the utility in dealing with the public. But publicity of the business, even when coupled with the vast inquisitorial powers of regulating commissions, has, in itself, failed to produce good public relations. The public has no interest in the usual financial statements and statistics, because it is at a loss to interpret their significance. It is impressed with the magnitude of the net earnings, but has no inclination to associate that sum with the investment. The figures involved are usually beyond the ordinary individual experience, and there is almost a universal tendency to desire an opportunity to distribute other people's money. The fact that under regulative laws the utility's affairs are public information has apparently not lessened notions prevailing in many communities that the business is abundantly profitable and that the cost of service is far below the rate of fare paid by the public. Unfortunately these views are not altogether due to public ignorance but are frequently voiced by people who ought to know better.

It also seems certain that occasional newspaper campaigns stating the utility's case have not secured desirable results. Frequently such campaigns have been postponed until public antagonism has become acute. As a result the utility's motives have been questioned and the sudden attention to publicity taken as a confession of weakness. It is difficult to induce prejudiced people to accord the utility a hearing, much less read lengthy advertisements. While public prejudice is easy to create and foster, it is evident that convincing the public is a more gradual process.

Obviously, no definite plan of procedure can be devised which will fit any local condition. In some instances the transportation of working people to and from their places of employment, in others the ambitions of real estate owners in outlying districts for the speedy development of their property through extensions of the traction company's lines, are the immediate sources of dissatisfaction. In some communities, also, public opinion is centered around the need for industrial expansion and a bigger city; in others it is concerned with the high cost of living, and the regulation of profits and municipal ownership are topics of public discussion. In the more conservative cities, a definite program for public improvements, health, education and economy and efficiency in city administration receive a more popular response than general plans for social reform after a thorough upheaval of existing conditions. Where public sentiment is most rational, and hence the most readily convinced by a campaign of education, the pressing problems of good city administration occupy so much public notice that there is no necessity for a public policy campaign. It is only possible, therefore, to outline in a general way the means for bettering public relations.

As a part of the "public policy" of a traction company the treatment of individual complaints is important. The managements of most companies encourage well-founded complaints, and handle them courteously and with dispatch, stating the means taken for correction, pointing out where the public must co-operate and correcting any misstatements. The handling of the unwarranted complaint requires greater tact and patience. Every community has its number of habitual complainants who are not open to reason and whose only certain convictions, in fact, are based upon vague ideals impossible of attainment. In such cases the only result which it can be hoped to achieve is the reduction of this class of complaints to the smallest possible number. The writer of anonymous public letters to the newspaper presents another difficult problem. In a number of instances such sources of dissatisfaction have been stopped and the letters diminished in number by requests to the press to permit reply by the company in the same issue.

The company's policy towards the settlement of accident claims is also important. The prompt settlement of claims where such have merit, and the restriction of litigation to only such cases where the company is not responsible, often has a far-reaching effect upon public sentiment.

Educating the public to the traction company's problems has in many instances supplemented the efforts made to dispose of individual complaints. Such educational articles may include topics of historical interest reminding the public of the pioneering work and improvement in the art which have occurred, the great changes in the character and length of transportation, the growth of transfer privileges and of rush-hour service and their influence on the cost, and the smaller purchasing power of the nickel. Significant conclusions may be drawn from comparisons of the rise in price of other items entering into the average citizen's cost of living as compared with the stationary rate of fare. The schedule of subjects may also include topics illustrating the mutual interest of the utility and the public in promoting the growth and prosperity of the community, in observing the company's rules, in encouraging the movement for public safety, and in minimizing taxation and similar assessments which must ultimately be borne by the patron.

> **"The problem of unsettled public relations is apparently one of the risks inherent in the traction business which careful local treatment may minimize, but to which no single general plan is applicable."**
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> —*Edwin Gruhl.*

Frequently, as local conditions may determine, the tenor of the educational article must be such as to appeal to other business men and must deal with the more general economic problems of the industry, correcting prevailing notions as to rates of return at which securities will find a market, as to the traction business being one of increasing returns, as to the incidence of public utility taxation, and as to the form of government necessary to insure the success of municipal ownership and administration in the form and under the conditions as practiced abroad. While many commissioners understand that a high rate of return on capital is necessary to attract the money required into the business, the ordinary professional or business man apparently exaggerates the risk involved in his own and minimizes the risks obtaining in the traction business, and accordingly believes that 5 per cent or 6 per cent is sufficient.

Local conditions will determine what is the most effective medium for such publicity. Advertisements in newspapers have been effective. Dodgers, circulars and placards have also been used with varying degrees of success. Much has depended upon the subject matter as well as upon the persistence and attractiveness with which it has been presented.

It is difficult to ascertain whether improved public relations following such efforts have been due to success in handling complaints, the company's policy in other matters such as accident claims, the persistent campaign of education or to other contributing causes. Owing to the difference in the needs and public attitude in each particular case, it would be impossible to expect that a public policy campaign can be outlined which will apply under all conditions. In this respect the "public policy" movement for the traction industry differs from the sales campaigns attempted upon a national scope by other utilities. The problem of unsettled public relations is apparently one of the risks inherent in the traction business which careful local treatment may minimize, but to which no single general plan is applicable.

Part Two

PUBLIC RELATIONS—OPERATING CONDITIONS

IMPROVEMENT OF RELATIONS BETWEEN ELECTRIC RAILWAYS AND EMPLOYEES

By CHARLES W. ELIOT

President Emeritus of Harvard University

THE industrial warfare gets worse, rather than better, in both Europe and the United States; and the events of the last five years tend to show that neither legislatures nor courts are likely to bring about peace and goodwill between capital and labor, or to prevent the industrial losses—some slow and chronic, others sudden and violent—which result from the warfare. Public utility corporations like railroads, electric companies, and gas companies are especially exposed to the losses caused by strikes; because the unions to which the employees of such companies belong are well aware that the general public, being much inconvenienced by strikes, will generally favor the granting of any demands its employees may make on the employing corporation, and will resent the stoppage or impairment of service. The general public distrust of corporations, and the fear of organized labor which elected officials almost universally manifest, contribute to make the position of the employing corporation in all public utilities a difficult one.

Under these conditions, it is for the interest of the employees, the employer, and the public that a method of carrying on the business of public utilities should be devised which will give real content and satisfaction to both employees and employer, and through them to the general public—a method which steadily promotes efficiency in the service, and, therefore, satisfies the public needs, both old and new.

An urban electric railway corporation offers several advantages for instructive experiments on ideal relations between employer and employed. In the first place, the need of such a corporation to secure a method which would bring peace is urgent indeed. Secondly, the business of such a corporation ought to be steadier and more stable than most businesses; because it is comparatively unaffected by the ups and downs of business in general, and by political changes. Again, such a business should always be expanding moderately, and improving through new inventions and new demands. Lastly, the employees are numerous; and, while many of them remain but a few years in the service, many marry and remain long in the same employ without change of residence. An electric railway company has another advantage as a field for experimenting on sound industrial organization, in that it cannot render satisfactory service to the public and make money, unless good discipline is maintained among its employees as regards punctuality, alertness, politeness, and honesty. Now, in a twentieth century democratic society, good discipline in industries is best maintained by interested co-operation between the working force and the managing force, the motives on each side being identical—pecuniary profit and an unembarrassed pursuit of happiness. Of course, the employees of a street railway company are much freer as regards individual initiative and variety in their work than the men and women are who tend machines indoors at a speed determined for them. They are, therefore, particularly good subjects for experiments on industrial relations based on co-operative management and impregnable goodwill.

Anyone who has watched labor legislation and judicial decisions on labor cases during the last five or ten years will have come to the conclusion that it is for the manufacturers, bankers, and merchants of the country to invent and bring into practice the modifications of the wage-system needed to bring industrial peace and success in the pursuit of happiness to both employer and employed.

The experiments on this general subject already tried in France, England, and the United States indicate clearly that a combination of the following modes of action promises to produce the desired result,—(a) co-operative management, (b) profit-sharing, (c) insurance against accidents, (d) sickness and death benefits, and pensions, and (e) good housing.

(a) The value of co-operative management has already been demonstrated in many industries. It is safe and profitable to give elected representatives of the employees a large minority representation on the committee which makes and enforces the rules of a factory, mine, or railroad; provided that the employees have a significant pecuniary interest in the success of the corporation.

(b) The profit-sharing must give promise or hope to every employee of a substantial addition to his wages; and every employee must feel that his own personal return in money is going to depend upon the personal efficiency and fidelity of himself and his co-workers. There are many modes of interesting employees in the success of the employing person, firm, or corporation. Making a dividend to the pay-roll every time that a dividend is made to the shareholders, is one way. Announcing beforehand that a certain percentage of the net profits of the company will be paid in cash once a year, or once in six months, to every employee who has been one year in the service of the company, is another way. Promoting investment by employees in the stock of the employing company, is another; and this may be done in many businesslike ways, as well as in ways which are not businesslike. Thus, whenever the privilege of subscribing to new stock is offered to shareholders, the same privilege may be offered to employees; and the company may agree to take payments for the stock subscribed by employees in weekly or monthly reserves from their wages. No employee should be urged to take stock in the company which employs him, or be induced to do so by the offer of shares at less than the market price; for employees who take stock under such conditions are sure to feel bitterly against the employer, if their investments turn out to be unprofitable, or even to be of fluctuating value. Profit-sharing and co-operative management go well together; but either may be used without the other. Moreover, there are methods of interesting employees in the success of the service an electric railway company renders which are not true profit-sharing,—as is shown, for example, in the plan of the Philadelphia Rapid Transit Company called "co-operative management."*

In that company the pecuniary interest of the employees is in the rise of wages which accompanies automatically an increase in the gross receipts of the company. In the Home University Library of Modern Knowledge, Henry Holt & Company, New York, there is included a little book on "Co-Partnership and Profit-sharing, 1913," which describes a considerable variety of schemes for co-operative management and profit-sharing, both European and American, which have succeeded in practice.

(c) Insurance against accidents, at reasonable rates, and with just co-operation on the part of both employers and employed, is an indispensable part of any scheme for uniting both parties to successful production in one common productive endeavor.

(d) Sickness and death benefits are also indispensable parts of any such scheme. These benefits should be planned and carried into effect by a committee representing both owners or managers and workmen; and this committee should have large discretion in the adjustment of doubtful cases, and of cases of peculiar hardship. Pensions on disability or old age have also a beneficial effect on any industrial corps in which many examples of long continuous service occur, provided the industry itself has proved to be steady and reasonably profitable through a long term of years and, therefore, is likely to be permanent. A pension system works best in government or university employ, or in that of an old, well-managed railroad. It is hardly applicable in novel, precarious, or unproved industries; for it requires a stable corporation of high reputation for honesty and success. From the point of view of the workman, a pension will never be a satisfactory substitute for an equitable share in current earnings. It is most valuable as a means of content and goodwill in occupations which are not conducted for a profit. Just sickness and death benefits are particularly necessary in the service of an electric railway company, because so much depends in that sort of service on punctuality and regularity on the part of all employees.

> **"No plan of co-operative management and profit-sharing will be permanently successful, unless it turns out to be profitable both to employer and to the employee; but it is well-nigh certain that any well-devised plan * * * will prove successful in this sense; for sharing in the profits of the business, and in determining the details of discipline and sanitation, creates a spirit of good-will and contentment which promotes in the highest degree industrial efficiency, and therefore enlarges profits."**
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> —*Charles W. Eliot.*

(e) An interest on the part of an electric railway company in the housing of its employees may seem at first sight superfluous or sentimental. But, on the contrary, it is a highly practical interest; because family and social health and enjoyments are really essential to the formation and preservation of a large body of employees who are contented and satisfied for good and permanent reasons. It is to be observed, however, that the term "good housing" covers many things beside the house, as, for instance, a garden patch with the house, clean streets, defences against alcoholism and prostitution, a Neighborhood House with reading rooms and an auditorium for concerts, moving pictures, and plays, and playgrounds for open-air sports and folk-dancing,—in short, provision for ample light, fresh air, and all sorts of wholesome games and sports. Every factory village, every garden city, and every neighborhood for cottages of mechanics and operatives, should be so planned as to provide all these advantages. An urban electric railway sends its lines into the city's surrounding suburbs; and the dwellings of the employees may, therefore, be conveniently distributed in large suburban groups among the different divisions of the road. In this respect an electric railway company has some advantage over a factory or mine, which needs to have all its men living within easy reach of the site of the works.

Here it should be observed that it is imprudent for any industrial company to own houses, or carry on stores to be used by its employees. To be sure, the location and conditions of an industry may temporarily be such that the employing company is compelled itself to make these provisions; but such action is always undesirable, because it is apt to lead to suspicions and complaints on the part of the employees, particularly in times of discontent and excitement. Nevertheless, judicious co-operative management will always secure advantages to employees in the purchase of household supplies and uniforms or other clothing.

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*This plan was introduced by T. E. Mitten, chairman, in 1910-11, and for three years past has proved remarkably successful.

No plan of co-operative management and profit-sharing will be permanently successful, unless it turns out to be profitable both to the employer and to the employee; but it is well-nigh certain that any well-devised plan which contains the various features above mentioned, or most of them, will prove successful in this sense; for sharing in the profits of the business, and in determining the details of discipline and sanitation, creates a spirit of good-will and contentment which promotes in the highest degree industrial efficiency, and therefore enlarges profits.

The problem of an urban electric railway is, in some respects, more difficult than that of an industrial corporation which is not in such immediate and daily contact with the public; but on the other hand a successful solution of the problem is likely to receive from the public prompt and effective support; because the public's interest in the excellence and continuity of the service is strong and lasting. It is worth while for any urban electric railway to win the confidence and approval of its public.

A well-managed street railway can make itself very useful in resisting and relieving the frightful congestion of population which makes a wholesome life impossible in modern cities. On this account the establishment of permanent peace and content in the conduct of that industry has special importance.

CORDIALITY IN PUBLIC RELATIONS

By JOHN A. BEELER

Vice-President and General Manager Denver Tramway Company

MUCH is dependent upon the character of the relations between a public utility company and the public which it serves. The ideal state is where cordiality exists between them. This condition is sometimes very difficult of attainment.

Polite and courteous employees are among the first and most important requirements; especially is this true of a street railway. The trainmen are the personal representatives of the company, the ones who daily meet and deal with the patrons, and the management is judged by its representatives. Rarely, if ever, do you find a body of pleasing and courteous trainmen, but you find the same kind of officers at the head of the company.

> **"Publicity, like charity, should begin at home. Take the employee into your confidence; explain to him the whys and the wherefores. Trust him, and he will not distrust you and will become an invaluable aid."**
>
> —*John A. Beeler.*

A utility company seldom makes any rules or regulations without a justifiable reason for so doing, but frequently such regulations are formulated and enforced without any effort to explain the necessity of these rules even to the employees.

One should never hear an employee remark, "I don't know why, but them's the company's rules." Such an "explanation" sets the patron squarely against the company, once and forever. Publicity, like charity, should begin at home. Take the employee into your confidence; explain to him the whys and the wherefores. Trust him, and he will not distrust you and will become an invaluable aid.

Transportation occupies second place in the world's plan of economics. The railway is a human machine, and the more intensely human, the more efficient. Elbert Hubbard says, "He who eliminates sentiment from his cosmos, takes no interest in the game. Laughter, love, courtesy and friendship are all very tangible assets in making the wheels go round."

Each employee should be made to feel that the proper performance of his work is just as important as that of the head of his department, or of the manager himself.

When any improvement or change in the service is inaugurated, tell the patrons about it. A leaflet circulated in the cars or a brief announcement on a poster in the cars, may be sufficient, but first of all "post" the employees. We in Denver have found our monthly publication, known as the *Bulletin*, very helpful in such matters.

A successful utility should not only be wide awake and progressive, but it must be always on the job and jump at any opportunity to help the community which it serves. Last December, Denver was visited by a snowstorm the like of which the memory of the oldest inhabitant does not recall. Four feet of wet snow fell and was quickly transformed into ice. The snow-fighting equipment was completely helpless; plows and sweepers were marooned in all parts of the city. Not a thoroughfare was open; not a wheel was turning in any of the streets or on any of the steam railway lines leading out of the city. Even the rotary plows of the railways were useless. The people were dazed. After three days of storm, many thousands were suffering for want of coal and provisions. All business and traffic was at a standstill. The city faced a crisis which threatened the existence of many of its inhabitants. Something had to be done and at once!

While the storm was at its height, the Denver Tramway Company had every available man that it could hire at work. Breaking ice with pick and shovel was tedious work, even though several thousand were so engaged. It was an unusual situation and required unusual methods. Great plows, used for breaking virgin prairie sod, were obtained. Horses were requisitioned by digging stables out of 12 ft. drifts. These plows broke the ice up in great chunks, and the hundreds of men piled it up at the sides of the streets. Relays rushed the work along the various lines night and day. Several thousand good citizens, including business and professional men marooned in the suburbs, volunteered their services and set to work clearing the car tracks, and while many of them did not accomplish nearly as much as would a man accustomed to hard work, they at least came to an appreciation of the herculean task that confronted the company.

At the end of the third day of the tie-up an avenue had been opened from the business center into the north and south sections of the city. As the first cars made their progress through the canons of snow and ice, people ran out from their homes and made vociferous demonstrations of approval. The work of opening other lines followed without cessation by night and day.

Work trains were then changed into conveyors of coal and provisions, supplying public institutions, hospitals and private dwellings, wherever necessary to relieve distress.

Even with the addition of all the teams and wagons that could be had, the city was unable to cope with such a volume of snow and made slow progress toward clearing the business section. The Tramway Company placed practically its entire equipment of flat cars and work trains at the disposal of the municipal authorities every night for several weeks and hauled thousands of loads.

In this emergency the company was enabled to confer a benefit upon the community, and the value of a live, human, compact and energetic organization of its kind was apparent to every citizen. Expressions of appreciation poured in from all quarters. Those who formerly had no good word for the company were frank to speak proudly and approvingly of it.

State your case truthfully, in plain language, free from technicalities. The day of the joker, hidden in wordy phraseology, has departed. Substitute sincerity and cultivate cordiality.

INTERURBAN TRANSPORTATION AND THE PUBLIC

By C. D. CASS
General Manager Waterloo, Cedar Falls & Northern Railway Company, Waterloo, Iowa

PRIMARILY the interurban railway was conceived strictly as a mode of passenger transportation between densely-settled centers or between urban and suburban districts. Where the population of the territory served is sufficiently dense, this restricted service has been successful, but where the population is scattered or there is little or no real reason for frequent intercommunication between the points so served, it has been necessary for the managers to seek elsewhere for their profit and future growth.

Personally I believe that many electric interurban lines have little or no right to exist in this restricted form. Most of them were built on common-carrier charters, yet they are operating as limited carriers. If they can do so profitably well and good, but if they cannot it is their own fault if they do not take advantage of the opportunities which are offered to them by the public they serve. In any case the failure profitably to utilize to their fullest capacity all existing railway facilities is an economic waste. I believe greater success could be had in practically every case if the electric interurban railway would become a common carrier in the broadest sense. It should operate on the same plan as a large department store—that is to say, it should sell the public any kind of goods (transportation) it desires to buy.

An interurban railway should also fill a unique position in the field of common carriers. It should not exist simply as a parasite or a competitor of other means of transportation. It should begin by affording suburban and rural districts a form of street railway service both local and limited, and it should handle all classes of package freight. It should provide side tracks and belt lines for switching service, and finally, it should assume its position as a commercial railroad. In other words, it

> **"Where track is laid on which freight cars might be run and no freight cars in fact are run, there is a loss both to the investor in the track and to the person desiring to use this track.**
> **"The more ways in which an electric road serves its public the more dependent the public becomes, and if this dependence is not betrayed, the right kind of public relations is bound to exist."**
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> —*C. D. Cass.*

should accept, on a profitable basis, the transportation of any class of freight. Of course, this means interchange relations with trunk line railroads which, under the existing conditions, may be had if the electric line has any excuse for existence other than that of a strictly passenger carrying machine.

To maintain a profitable relation with its public means not only to be on friendly terms with the public, but the electric line outside of densely settled territory must compel every dollar of its investment to work to its fullest capacity. Economic waste in anything is more or less apparent to the dullest of us, and it does not take a very keen mind to perceive that where track is laid on which freight cars might be run and no freight cars in fact are run, there is a loss both to the investor in the track and to the person desiring to use this track in the manner suggested. Farmer Jones, Grocer Smith, and Manufacturer Brown can all see this as well as anybody, and it is useless to explain to Jones, Smith or Brown that a curve at Podunk is too sharp for the use of freight cars because they know that the company could give a longer radius to the curve, if necessary, by moving the track.

When one attempts to use friendship as a means of reaching the public's pocketbook he is treading on unreliable ground. On the other hand, when one establishes his reliability as a carrier and meets every transportation need of his patrons, his service is looked upon as a necessity rather than as a luxury. The more classes of service the electric road can offer the more will its public accept these services as a matter of habit. In fact, I believe that each class of traffic will increase as a result of this broad policy, not because the shipper is a friend of the road but because he must have the service and is satisfied with the electric. When he or his employee travel or have anything to ship, force of habit subconsciously enters as much as any other one thing in placing the business.

According to my way of thinking the proper relation between the public and an interurban road should not only be a friendly one, but in its diversified transportation services reliability should be so established as to make it an absolute necessity. If such relations are established on a profitable basis, friendly relations must exist. No patron quibbles with his department store when it charges a slight increase in price for a service over its neighbor, if he has positive assurance that the quality of the service rendered is better. Moreover, no set rule may be recommended to define the way to reach this enviable position. Eternal alertness in regard to the present and future possibilities of any class of transportation is about the only recommendation one can offer. This is exemplified in the beginning of an electric road. Evidently various modes of intercommunication between points furnished the idea for the establishment of a street railway as well as an interurban line. Once established the latter was forced to accept a package freight business, and if the manager was alive to his position he could see the possibilities of profitably relieving the teams of the duty of transporting freight between near terminals.

Following the establishment of a bulk freight haulage, facilities to accommodate the public become a necessity. Unless these facilities are adequately provided at convenient points, the shipper is sure to give his business to the road more favorably situated. The public is patient but heartless, when it comes to its pocketbook. It will give its friends an opportunity to make good, but if in the end the public finds it is at the expense of its own business, the friend is sure to lose its confidence. Reliability and necessity must go hand in hand to produce success, and the more ways one can serve his shipper the better.

In providing station facilities it is necessary to consider future possibilities and not allow local considerations to force their establishment in a location which would be unfavorable to their future growth. To transfer a terminal once established means inconvenience to the public and may mean a loss of business, especially when it is necessary to move to a new location not so easily accessible as the old. Too much importance cannot be attached to the advantage of having an established place of business.

Liberal contracts for industrial tracks and even the provision of sites for industries will redound to the future welfare of any freight-carrying line. A freight belt line around cities served by several trunk line roads and not by one common line of transportation offers an excellent opportunity for increased freight business. Once industries are established on a belt line it becomes a necessity in place of a convenience. Service is what the public is constantly looking for, and it is most certainly going to deal with the company that will furnish it.

As a rule, electric lines hold an enviable position from a service standpoint. This is because the court of last resort, usually, is in charge of a manager who lives in the community his road serves. This insures quick action and at the same time enables the manager to give personal attention to getting new business and holding the old. In this connection, to insure a satisfied patron once you have obtained him, it should be a positive rule that the electric line will be responsible for both the receipt and delivery of freight. In other words, you may please a patron if you deliver his goods at the nearest crossroad, but even if he does relieve you of responsibility after it has been unloaded at the point he designates, theft or damage to the shipment is sure to gain his ill-will. All receipts and delivery of freight should be made through agents and in this way the responsibility is fixed. Passenger traffic does not come under the foregoing category, but much better relations may be maintained if the passenger, too, is provided with a reasonable place to board and alight, along with a simple form of shelter for use in inclement weather.

An unlimited freight service is a valuable publicity agent. One will be surprised upon investigation to find how few of the public know where any railroad runs. If you furnish the public a freight service it must know, and frequently it is called upon to convey its knowledge to others. In other words, the more ways in which an electric road serves its public the more dependent the public becomes, and if this dependence is not betrayed the right kind of public relations is bound to exist.

TRAMWAY FARES IN AMERICA AND EUROPE

By LOUIS BELL

Consulting Engineer, Boston

ONE of the most difficult things for the man on the street to understand is the apparent discrepancy in the tramway fares as he knows them at home and those which are persistently reported from abroad, particularly by the irrepressible advocates of municipal ownership. He pays a nickel, to be sure, with more or less cheerfulness for his ride home, but when he sees a long and specious article in his evening paper explaining that under the beneficent reign of municipal enterprise in Europe the street car fare is 2 cents or thereabouts, at which price the enterprise is financially successful, he inwardly protests and perhaps joins the throng of those who write to the papers about "grasping monopolies," "street car barons" and such like familiar topics. Even the great army of Americans who go abroad do not generally look at the transportation facilities with an educated eye and hence do not grasp the real inwardness of the situation.

Now the broad fact which discloses itself when one begins to study European conditions of transportation is that the costs on the whole run rather high. Railway fares average materially higher than here, taking the second-class car as the equivalent of our ordinary day coach, and the first-class car as a rather poor substitute for our familiar Pullman. When one comes to the tramway proposition the facts are much the same as with the railways, when the comparison is made on the basis of fare per mile.

The three facts which stand out conspicuously to one who uses the foreign tramways with an eye to actual tramway practice are these. First, the general area of a European city, including those suburbs which are regularly associated with it as a part of the same social entity, is very much smaller than the American city of corresponding population. Take, for example, Berlin and Chicago, which are of approximately the same size. Or compare Munich and Boston, or smaller cities of similar character. Not to indulge in dismal statistics, a little reflection convinces the observer at once that the American city is in working area very much the bigger. Its density of population is on the whole something like one-half that of its European equivalent. This is chiefly owing to the fact that, more even than the American, the Continental citizen is a dweller in apartments, the great suburbs filled with separate houses being much less usual in Europe than here. Suburbs there are, and fine ones, in many Continental cities, but they are on the whole less scattered and less distant than those in America. Therefore the average distances traveled by a citizen of a European city, whether on foot or by some vehicle, is a third or a half less, at least, than would be necessary here in a city of similar size. Some particular pairs of cities might be chosen in which the discrepancy would be very much greater. The result is that the number of miles of tramway required adequately to serve a given population, and consequently the investment in fixed plant, is very much less abroad than here, and the density of traffic taken through the whole day is very much greater. Therefore the actual cost of hauling a passenger per mile is greatly reduced below American figures, quite apart from matters like difference in cost of labor.

"The number of miles of tramway required adequately to serve a given population, and consequently the investment in fixed plant, is very much less abroad than here, and the density of traffic taken through the whole day is very much greater. Therefore the actual cost of hauling a passenger per mile is greatly reduced below American figures, quite apart from matters like difference in cost of labor."

—Louis Bell.

> **"Looked at in the sense of the broader civics, the single fare with a long available radius of country which can be reached for 5 cents meets conditions here better than would be possible by the European zone system with its apparently low rate of fare covering a limited area within which comparatively few would from choice wish to live."**
>
> —*Louis Bell.*

Now, second, let us see what the effect of these conditions is on the actual matter of service and fares. As to character of service, the ordinary European tramway car is less comfortable and less expensive than is usual here. Of course, exceptions should here be made with respect to some of the very fine foreign lines of the interurban class. Generally, the distances are short, and so are the cars. A passenger may be supposed to grumble twice as much in riding 4 miles in an uncomfortable car as he would in riding 2 miles, and therefore the Continental passenger puts up a less strenuous kick than would be the case here were the rolling stock similar. The writer still has a miasmatic memory of the discomforts of bumping along on the top of a wheezy compressed-air car in Paris, which must at times have reached the appalling speed of 6 m. p. h. With the advantage of short haul and the relatively cheap rolling stock, to say nothing of cheap labor, it is easy to see why fares could be lowered below American standards without much danger of losing money.

But the European tramway man has a still further string tied to the low-fare proposition. As is quite familiar to most Americans, the European tramways are worked on a zone system, on a basis which may roughly be taken as 2 cents per zone, more or less, according to the place and the currency of the country. One can therefore get a short ride cheaper than here, but a longer one brings the fare nearly up to the American standard, and a run to a point corresponding to the average American suburb brings the fare quite to or beyond our own standards in spite of the low figure for the very short haul. I cannot recall any Continental line on which one can, as is almost universally the case in American cities of any size, pick up a ride of 8 or 10 miles for a nickel or its humble equivalent. There may be a few such exceptional runs, but they correspond to the American instances in which one can with a judicious transfer or two ride 12 or 15 miles for the same modest sum.

The ordinary condition on the foreign line is comparable with that on a certain insignificant interurban line with which the writer is acquainted where the fare for a distance of 7 miles is 25 cents, collected in 5-cent driblets at convenient crossroads along the way. Divide this, as it were, by two or three, and fancy going from the Battery to Central Park with 2 cents collected to Bleecker Street, two more to Madison Square, and a third similar contribution to Forty-second Street, and you have something like the situation when you trundle along through the ordinary foreign city. The payments come in small contributions, but if you ride for any considerable distances they add up very successfully.

Moreover, the zone system has an exasperating way of catching the short-haul traveler just before he gets to his destination, in much the same way as on some of our own lines those who dwell only a short distance beyond the fatal corner where the next nickel is demanded find in that circumstance a perennial cause for irritation. The zone system at first sight seems to be a perfectly fair one in proportioning the payment to the length of ride, and in a densely populated region it works out fairly well. In the loosely built up American city with tramway lines running into the distant suburbs, it would be extremely unpopular if tried again, as it was in the distant days of the "Blue trip slip" of which Mark Twain so feelingly sang.

Finally, the weakest point in the European fare system is that it does not readily lend itself to the conditions of rapid growth which exist in our American towns. To the writer's mind this is the really fatal objection to the zone scheme, by which those who dwell in the periphery of the city pay higher fares than they would under American conditions. It is certainly for the advantage of a city starting, as it were, from the beginning in its growth, to be able to spread out unrestricted, to build up suburbs full of small homes instead of tenement districts, and to give breathing space outside for still further expansion. There is no doubt whatever that the American single-fare system very strongly aids in the establishment of better conditions of life for the working man. Indeed, as a matter of practice, the difference between a 5-cent fare limit and the regions beyond where another nickel is required is keenly felt by those to whom an extra dime a day is a very perceptible fraction of their earnings. Looked at therefore in the sense of the broader civics, the single fare with a long available radius of country which can be reached for 5 cents meets conditions here better than would be possible by the European zone system with its apparently low rate of fare covering a limited area within which comparatively few would from choice wish to live.

In one marked respect the European tramways give the traveler an apparent advantage. He is sure of a seat, such as it is, unless the car happens to be full, in which case he can cool his heels upon the sidewalk and wait for room. One must readily grant that standing in a street car is not altogether comfortable, but when he contemplates the probable language of the average American five o'clock crowd watching a procession of cars —and every one marked "Full"—he calls to mind that delightful old tale of "The Frozen Pirate," and loves his country as it is.

THE ELECTRIC RAILWAY AND THE FARMER

By JOHN R. GRAHAM

President Bangor (Maine) Railway & Electric Company

THE extension of the electric railway into the rural districts has contributed in a greater degree to the advancement of farming in communities remote from markets than any other development of modern times. The electric railway has brought the markets to the farmer's door, making it possible to load his produce on cars without leaving his premises and at the lowest possible expense for handling and haulage. Butter, cream, milk and garden truck can be delivered fresh to the markets each morning within two hours by express service, enabling the farmer to compete successfully with the city gardener. In many cases small sawmills have been built along the line with convenient loading facilities, permitting the farmer to manufacture his lumber and market it where, previous to the coming of the electric railway, this lumber had little value.

Social conditions on the farm have been immensely improved as a result of the electric railway. The farmer's family is no longer isolated from its neighbors and the city, and the problem of how to keep the children on the farm should no longer be a serious one in the communities thus served. Thanks to the electric railway, the farmer can enjoy the advantages of the city, the schools, churches and the theater, while his wife and daughter can take advantage of the bargain day sales in the city stores. With the electric railway has also come the electric light, and village streets once dark and gloomy after sunset are now brightly illuminated. Manual labor on the farm is being replaced with electrically operated devices, and this wonderful development will result in bringing more people back to the farm.

The electric railway is a genuine help to the farmer if its work is carried out along broad lines, without legal restrictions against encouraging the progress of the agriculturist. To aid in developing agriculture along its lines the Bangor Railway & Electric Company has established a demonstration farm of 120 acres on the line running from Bangor to Charlestown. This farm is under the supervision of the University of Maine, to demonstrate the possibilities of intensive production of potatoes, corn, oats and other crops. A strict account is being kept of the amounts of each crop raised and the phosphates used, along with the cost of labor and any other expenses associated with raising this produce. It is hoped to produce 400 bushels of potatoes per acre when the farm is in full operation, compared with the usual 200 bushels which represents the average output of the farmers in the State of Maine.

In order to encourage the raising of potatoes in the Kenduskeag Valley, the Bangor Railway & Electric Company in 1908 reduced the electric freight rates one-half on carload lots of potatoes. In that year sixty-seven carloads were shipped. The business has increased greatly each year, and in 1913 more than 600 carloads were shipped. During the present season it is anticipated that more than 750 carloads will be handled by the line, representing an increase of more than 1100 per cent in six years, and on a line only 25 miles long, with a population of but 2500 people. The freight and express over this line totals more than 50 per cent of that handled on all the other electric railways in Maine. What has been done on this line can be duplicated elsewhere. The opportunities are attractive for the farmer in stock-raising, but to do this successfully there must be good fencing. The farms of Maine present a decided and unfavorable contrast to those of Canada in this particular. Stock raising will help to keep the young men on the farm, and besides improving the fertility of the land it will stimulate additional traffic on the electric railways running through such communities. I would like to buy 500 head of yearling Hereford cattle in the West and distribute them to farmers along the lines of the Bangor company, but at present we have no fences good enough to hold them.

> **"Social conditions on the farm have been immensely improved as a result of the electric railway."**
> **"As a device for taking up what may be called economic lost motion between the city and the country, the electric railway * * * has no superior."**
> —*John R. Graham.*

The prosperity of public utilities closely affects the communities served by them. Farmers sometimes do not appreciate any more than other people the benefits of a centralized management of public utilities. These may be brought home to them in a practical and common-sense way, without undue self-praise. In 1902, for example, the various properties centering at Bangor were five or six in number. Their bonds were selling at about 50 per cent below par and their stocks were at the lowest ebb financially. None of these corporations paid dividends. All have now been consolidated into the Bangor Railway & Electric Company and are in a prosperous condition through economical and financial operation under centralized management. Where the Maine savings banks and investors used to buy out-state securities, they are now gradually absorbing the stock of our public service corporations. One of the trust companies in Bangor has sold securities to the amount of more than $3,000,-

000 to investors in our locality. There is a good demand for Maine public utility securities, and there are great possibilities in water-power development, which should be encouraged by low taxes and liberal laws. The different companies in which I am interested in Maine are to-day using more than 30,000 hp hydroelectrically generated, whereas ten years ago there were only 3000 hp of hydroelectric development in these systems. All of this benefits the farmer as well as the city resident in our territory, and through broadened services, possible production of fertilizer by the utilization of atmospheric nitrogen, application of power from the railway and lighting transmission lines to farming machinery, electric cooking and other developments, the outlook for the future is very attractive. As a device for taking up what might be called economic lost motion between the city and the country, the electric railway managed along the lines above outlined has no superior.

WINNING THE CONFIDENCE OF THE PUBLIC

By R. M. SEARLE

Vice-President New York State Railways, Rochester Lines

At times the public's idea of how a railway should be operated may seem somewhat strange. Indeed, one of the most complimentary remarks about our management that ever came to my notice had nothing at all to do with railroad operation, although it was made by a highly intelligent citizen of Rochester. This man had purchased a black lynx muff on Easter Sunday eve for his wife to carry the next day. About nine o'clock Saturday night he telephoned to the home of the vice-president of the railway that his wife had left the muff on the car. He asked whether it had been found, and if so, how it could be obtained in time for church the next morning. The man was told that he would be notified within a few minutes whether or not the muff had been turned in and how he could get it. As it happened, the conductor of the car had telephoned at the end of the line to the despatcher, saying that he had the muff. In consequence, the night inspector's automobile was immediately despatched for the muff and within fifteen minutes the muff was in the owner's hands. The point of this is that the owner's husband telephoned immediately to the vice-president of the railway, and, in thanking him, said that that was the way to run a railroad.

This citizen's idea of railroading may have been vague, but his outlook naturally did not go beyond that which he could understand. Indeed, most of our troubles have been due to misunderstanding on the part of the public. My experience dictates that if the public is unfair it is so because it is kept in ignorance. Every day a representative of each of five newspapers visits our office. These men have the entrée unannounced to every officer's room, may listen to all manner of conversation that is carried on at the time, and receive typewritten digests of anything of unusual interest that has happened during the day. Without fail, every day in the year, parts of reports that I receive are published as news.

The railway business is an honest one—there is no reason for secrecy, and the better informed these able newspaper men are, the more they will appreciate the problem of operating the road to the satisfaction of the public, and the more their sympathies are with us in any unusual difficulties. I never yet have had a conference in our office from which I felt that there was any reason for excluding anybody. To illustrate: frequently a railway manager has felt chagrined because some paper has said that he operated a rotten road, just as it is probably true that some morning he has taken up a paper in which there was no news and has said that it was a rotten paper. Does this same manager realize that the public is interested in every important feature of railway operation, in construction or reconstruction, in passenger problems, in delays or accidents? Does he realize that everything in connection with his road, so far as the public is concerned, is news and that, if he does not zealously contribute his portion of the news in which the public is interested, he cannot expect others to contribute news in which he himself is interested?

I have frequently been asked by newspaper representatives if unjust criticisms do not "get my goat," and I have said "No!" The criticism that "gets my goat" is the just one—the one that criticises the management about things that could have been and should have been prevented, or things that could have been avoided had one of the officers of the company taken time enough to make the matter plain to the newspaper men.

The most dangerous thing that street railway corporations do to-day is to answer criticisms of passengers or others by correspondence. No man on earth can make a criticism by correspondence and tell the same story that is conveyed by the personal mannerisms which appear to an investigator in personal contact with the complainant. If a person complains by letter he should be interviewed by a representative of the company with authority to adjust the complaint, and after it is all cleaned up he should again be seen personally and have it made plain to him that the rights which he has, and which the company is bound to respect, have been respected. The point in this is that after three or four letters have passed between a complainant and the company's representative all the original complaint is lost track of, and it becomes a personal quarrel between the two, resulting in nothing more or less than a combat of literary "cussing."

I have frequently analyzed a condition where a man has complained of the treatment he has received from an officer of the company, and by running it down I find that the complaint is about what has been said in a letter and not what he wrote about originally. If the men had met together, face to face, or over the lunch table, they would have thoroughly understood each others' problems, and if a dispute had developed it would probably have been on the golf links.

Another policy of our company is that any employee can talk for publication if he tells the truth. If he is asked a question and does not know the answer he is encouraged to say that he will put the inquirer in touch with the man who does know the answer.

We have found that much criticism and bitter feeling can be avoided if, during construction, signs are placed at crossovers reading, "Dangerous construction going on here, do not cross." When this is done, the burden of thoughtlessness is placed upon the one who then attempts to cross. If temporary work is going on and the pavement is put back in a temporary manner, we put up signs reading, "This work is temporary. New pavement will be placed in position and street restored in original condition in September." The object of this is to let the whole neighborhood know that the company has no idea of leaving the pavement permanently in a "sloppy" condition. So long as everyone does know it there is no neighborhood gossip or criticism derogatory to the company, no appeal to the alderman, no rush to the engineer's office, and no bitter newspaper articles that the company is trying to "slip one over" on the public.

In a case that may be cited as an example, where a mile of new double track was being laid, a mass meeting was held at a citizen's home to protest against the blowing of dust created by the cars into the houses during the hot weather when the windows and doors were open. It was suggested that a petition signed by all the residents on the street should be sent to the Board of Aldermen to compel the company to sprinkle the streets. However, the citizen in whose home this meeting was held, having a knowledge of the company's attitude in these matters, stated publicly that if they would delegate him to see the general manager he was sure that the railroad would gladly eliminate the nuisance if the responsibility was up to it. He visited the railroad office and was told that either the railroad or the contractor who was paving the street was responsible for sprinkling the street, but that, in any event, the street railway would handle the matter and have the streets sprinkled until construction was completed. It was found later that the responsibility actually did rest on the street railway so that it continued to keep the street sprinkled and thus abated the nuisance. The result of this was that, subsequently, whenever the citizens had any criticism to make, the street railway management was called into conference and a most pleasant condition obtained during the entire reconstruction.

"I never yet have had a conference in our office from which I felt that there was any reason for excluding anybody."
"Any employee can talk for publication if he tells the truth."
"The public is simply an aggregate of individuals. If the companies treat the public in the same way that one individual would treat another whose respect he wished to gain or keep, the difficulties of the public service corporations will largely disappear."
—*R. M. Searle.*

As another illustration it might be said that there were two factions on the street, one wanting asphalt and the other creosoted wood-block. The latter was contracted for, and the asphalt faction formed vigilance committees to follow up the wood-block pavement. One night they made a discovery that much of the wood block was spaced from ¾ in. to 1 in. apart, and the railroad management was notified that the citizens felt the contractor was putting something across on the railroad company's job. Investigation showed that this work was done during the late afternoon and had not been permanently spaced for acceptance. Instead of either telling the committee that this was bad work, or else ignoring the complaint, the railroad management arranged a meeting with the committee, the contractor, the city inspector and the railroad officials during which it was made plain to all concerned that there was no intent on the part of the contractor to do anything but good work. This had the effect of stopping all criticism on construction in this street. The point here is that instead of making a "goat" of the contractor and putting it up to the city engineer to satisfy the asphalt-paving faction and the other citizens generally, the railroad management obtained all the credit for bringing them together. Everyone was left with a friendly feeling for each other, and the city engineer was relieved of a disagreeable job.

During the course of reconstruction of track in the business center of our city in front of the Osborn Hotel a Knights Templar convention committee from Toronto said that they would bring to this hotel two commanderies of 125 men each, providing the street in front of the hotel was repaired so that they could form for parade. The manager of the hotel telephoned to the railway that he could get this business on condition that the street was placed in good shape. He was promptly advised by the railroad management that the attitude of the railroad to the citizens of Rochester was in every way one of co-operation, that the railway wanted them to get all the business they could because the railway was commercially selfish and its success was dependent upon that of the hotel. The railway promised that if the construction was delayed so that the street could not be permanently repaired in front of the hotel, it would be planked over during the three days of the Knights Templar convention, and stated that the proper course was, by all means, to sign up with the Toronto commanderies. As a matter of fact, it was found by the construction department that it could have the job permanently closed on time without any additional expense, showing that there is always a little more you can do if your liver is in order.

An example of the direct value of possessing the confidence of the public was shown recently in the application on our interurban line, the Rochester & Sodus Bay Railway, of an increase in fare. This line had been operating at a loss for some time, and it was imperative, if the company was to continue to give the service which the community demanded, that increased rates should be charged. The subject was taken up with all the citizens within reach of the line, which is 40 miles long. The company placed the matter before them frankly and asked for their co-operation. This was given in practically every case. A petition was submitted to the Public Service Commission and received its indorsement, and new rates went into effect. This example is cited because, in the opinion of the writer, the public is willing to grant anything that is fair when it understands the situation. The public is simply an aggregate of individuals. If the companies treat the public in the same way that one individual would treat another whose respect he wished to gain or keep, the difficulties of the public service corporations will largely disappear.

ASPECTS OF RUSH-HOUR SERVICE

By E. C. FOSTER

President Manchester (N. H.) Traction, Light & Power Company

THE opinion that rush-hour traffic is handled at a large profit on the modern city street railway system is held by many otherwise well-informed persons. Accustomed as they are in daily affairs to the idea that the larger the gross volume of business the greater the profit upon the cost of handling it, such people fail to take proper account of the time element as a factor in economical transportation. Out of this mistaken view, which looks upon the rush-hour patronage of an electric railway as a veritable harvest of divisible net returns, have come demands for reduced rate service which are entirely unjustified by the conditions.

> **"The idea that rush-hour profits are relatively high is a fallacy which cannot too soon be brought home to active champions of cut-rate transportation and to commissions sitting upon petitions for such reductions."**
>
> —*E. C. Foster.*

In order to meet the traffic demands compressed by the public into the narrow limits of a few hours in the early morning or forenoon and the late afternoon, an operating company must meet vastly increased overhead expenses and heavy additional operating costs as compared with the outlay which would be required to handle a reasonably uniform amount of business distributed throughout the whole day. These extra heavy and temporarily sustained demands, picturesquely called "load peaks" by engineers, are not only very difficult to surmount with a prompt and safe service, but they impose serious financial burdens upon the railway system. It is desirable that the trained railway man, who understands this situation thoroughly in his own mind, even if he does not take the trouble to put it into words, shall be prepared to make it equally clear to the public. By so doing he may more effectively resist an invasion of his revenue in the form of popular agitation for cut-rate transportation for certain classes of patrons in the rush-hour period. Fair-minded men are not likely to demand such concessions, once they realize their economic injustice to the company and to other classes of patrons enjoying no discrimination in fares or transfer privileges.

During the rush-hour period on almost any representative street railway the traffic demands require the company to run upon its lines at least double, and sometimes three or four times, the number of cars required to serve the public at other parts of the day. Here is an investment in rolling stock which stands idle more than two-thirds of the time; it involves an additional outlay of real money for extra copper in feeders, poles and line fittings, generating station capacity, shop facilities and carhouse space. There is no escape from the fixed charges which must be paid upon this extra equipment required to move the traffic as best it may under the trying conditions of the rush hours. These charges are not ordinarily apprehended by the public as it sees heavily loaded cars moving along the streets morning and night; they are not apparent to the casual passenger, but they are none the less real.

On the operating side rush-hour business exacts a heavy toll. If a company could put a motorman and a conductor on each extra car and pay them at the regular rate for the exact time spent on the platform, the cost would obviously be much less than at present. It cannot do this, however, for American wages and standards of living require a certain minimum compensation which almost always calls for an outlay on the part of the company in excess of the value of the rush-hour platform service performed, so that the per diem earnings of the employee on the extra list shall attain a minimum above that which would be received for net platform labor on a very limited number of rush-hour trips. Therefore, although a company appears to be reaping a harvest from its crowded cars and is actually carrying more passengers per car-crew than in the normal hours of the day, it is obliged to meet a very much larger wage expense the day through than would be the case if its traffic were fairly uniform. It must also carry along a force competent to handle this short-lived peak business, although, during many hours, that force must be laid off from active service.

Rush-hour travel probably does not seriously increase the so-called manufacturing cost of power production per kilowatt-hour if the generating station is of a flexible design and of ample capacity for the service; but on many systems where it is necessary to start up an auxiliary steam plant to tide the company over the peaks, the unit cost of power rises considerably and, on every system subjected to rush-hour peaks one may expect to find that the total power cost per unit of energy developed is greater, when fixed charges are considered, than it would be if the company could run its cars fairly uniformly and without the inordinate demands for power which force the management to spend large sums on equipment capable of carrying the plant through the rush periods.

Without elaborating further on the increasing costs due to rush-hour service, it is apparent that reduced rates at such a time tend to make conditions still harder to meet. Increased patronage of the extra and regular cars inevitably congests the tracks and slows down the schedules, necessitating the operation of a larger number of cars on the ends of lines, known on large systems as "set-backs," the effect on small systems being to delay travel, with increased demands upon the power station and distributing system and less satisfactory service to patrons. Logically, if any reductions are to be made in fares they should be such as to encourage riding in the normal hours of the day, and efforts spent to develop this class of travel and to reduce the margin between mid-day and rush-hour service are most commendable, although the writer believes that a "one-price" system, with everybody on a par, should always be the policy of the city company. Surely the workingman is no more entitled to a reduced rate than is the working girl who travels an hour or two later, and the fairest plan is to treat everyone alike. The idea that rush-hour profits are relatively high is a fallacy which cannot too soon be brought home to active champions of cut-rate transportation and to commissions sitting upon petitions for such reductions.

ENGINEERS AND ACCOUNTANTS AS FACTORS IN SECURING BETTER PUBLIC RELATIONS

By DUGALD C. JACKSON
Professor of Electrical Engineering Massachusetts Institute of Technology

THERE are certain important differences between the businesses of public service companies and the businesses with which the average citizen is familiar. These differences are fundamental, but unfamiliarity with them has not uncommonly given rise to misapprehension, antagonism and criticism toward the public service companies by the general public even in places where the service rendered is good and of reasonable price. The average man has no natural measure of comparison except that springing from his own experience, and he instinctively judges the business profits of a public service company by the ratios of profits to investments in the businesses with which he is familiar, whether these businesses are large or small. When informed that this experience is not borne out by the book accounts of a public service company, he may retreat to the cover of a belief that the investment accounts shown in the books of the company in that case do not represent expenditures of cash and legitimate effort but are fictitious.

The fact that the interest on the investment in a public service property requires a much larger part of the total revenue than mercantile experience might lead one to believe makes one very important difference between the business of an electric utility company and the ordinary businesses

"The average man may, as a matter of his own business experience, honestly believe that he is being unfairly treated by an electric utility company when such may be far from the fact, and the only way to convince him and his associates, composing the public, of the truth in the matter is to present the facts in such a manner that the individuals may measure them by means within the reasonable scope of their own experience."

—*Dugald C. Jackson.*

with which citizens are familiar, and this difference is not now fully understood. Merchants, manufacturers and other business men expect to turn over their capital at least once in every year, and it is not unusual in mercantile businesses to turn it over several times a year. This reduces the proportion with which the interest on investment enters the prices that must be charged to customers, because the annual interest is spread over sales aggregating from one to many times the amount of the capital invested. If the value of product made and sold by a manufacturer in a year is twice the amount of the invested capital, it is obvious that 10 per cent profit earned on the product above all manufacturing costs and charges means 20 per cent profit on capital.

On the other hand, while, broadly speaking, the economic laws under which the public service companies operate are the same as those applying to mercantile and manufacturing businesses, most public service companies are situated under conditions quite the contrary in respect to ratio of investment to the annual revenue from those that relate to the processes of general business and manufacturing. Instead of earning gross annual revenue equal to or exceeding the capital investment, an electric railway company must ordinarily put out and expend a sum of money in establishing its plant and business which is not less than four or five times, and in some times as much as six or eight times, the gross annual revenue that it may expect to receive. This at once multiplies the proportion of the revenue which must go to the investors in case a reasonable return is paid on the investment. For instance, if the annual gross revenue of an electric railway is one-fifth as large as the cash investment in the business, then 7 per cent on the investment amounts to as much as 35 per cent of the revenue. It is obvious that the ratio is here exactly the contrary of that arising under the conditions which exist in most of the branches of business and manufacturing.

This being the case, the average man may, as a matter of his own business experience, honestly believe that he is being unfairly treated by an electric utility company when such may be far from the fact, and the only way to convince him and his associates, composing the public, of the truth in the matter is to present the facts in such a manner that the individuals may measure them by means within the reasonable scope of their own experience. It seems to me that the public in general holds the correct belief that the public service companies are under the same economic laws as general business, and that this very belief, correct though it is, causes a break between the public and the companies which is due in large measure to the failure of the public to recognize that the electric utilities usually have, as already said, from $4 to $6 of actual money invested in property which is rooted to the earth, for every dollar per annum of gross receipts which goes into their treasuries from the public, and that this is equally true whether the utilities are owned by private corporations or by municipalities. Failing to recognize this condition, the public comes to the belief that it is being treated to robbery when it observes that from one-fifth to one-third of the annual gross receipts are paid to the stockholders in dividends or as interest on borrowed money.

It is to be observed that not only is the average citizen who comes in contact with the public utilities ignorant of the conditions above mentioned, but this is also true of the great part of the employees of the utility companies. These employees, as a rule, are better acquainted with the business processes of their brothers or their brothers-in-law and their other acquaintances who are shopkeepers or connected with mercantile or manufacturing concerns than with the business processes of their employers; and it is their honestly founded belief, even though they may have a loyal regard for the honesty of the officers of the employer companies, that the business processes of such a company do not differ except in magnitude from the usual processes of which they have knowledge through their shopkeeping relatives and acquaintances. The public seems to be fairly liberal in its views of what makes a reasonable return to enterprise and money which is invested in general business. A community is ordinarily rather proud of a banker who has earned a competency or even become wealthy as the result of the success of his business, provided he has been fair-minded and reasonable in his treatment of his customers. The same is eminently true of successful merchants. The public knows, however, that the merchant, and likewise the banker, makes on the average relatively small profit off of each dollar which passes annually through his hands, and the contrast between these lines of business which are well known to the public on account of its own participation therein and the conditions of investment which must be followed by the electric utilities occasion no little friction on account of the insufficient information of the public.

Twenty years ago it was quite generally accepted that the value of public service properties could be estimated from the earning power afforded by rates for service which were founded on expediency, and out of that circumstance arose conditions which increased the misunderstandings thus far described, but these misunderstandings ought to disappear as a consequence of the closer analysis of to-day, which argues that the receipts of public service companies should not be matters solely of expediency but should bear relation to cost of serving, including the return on the property required for giving the service as a part of the cost.

It is usually not practicable in this relatively changing industry of the electric utilities to rely on the records and books of account of long-established companies to give itemized facts in regard to the extent and first cost of the plant. As a rule these data are not in sufficient detail to afford an adequate foundation for a determination of the original cost of the existing plant, which might set at rest some of the misunderstandings referred to. The older companies have not uncommonly gone through processes of evolution in bookkeeping contemporaneously with the evolution of their business, and earlier books commonly exhibit little more information than the extent of receipts and expenditures, with the latter perhaps divided between operating and plant accounts, but with no reliable separation between the cost of new plant and of renewals. That is to say, the art of bookkeeping itself, when viewed from the modern standpoint of a complete record of the company's physical as well as financial affairs, is of rather recent development. Also, many properties are the result of consolidation, sometimes accomplished through foreclosure sales, and the earlier records may be lost. It is, therefore, necessary to formulate principles which define the relations of the utility companies to the public, and adjust the relations by negotiations so as to establish right conditions. Limitations of space, however, do not admit of the complete presentation of such principles in this article.

One of these principles must relate to certain special conditions, licenses or rights, which are conferred on a public service company, which include the franchise to use the public streets for a particular service and in some instances to invoke the State's right of eminent domain, and upon this franchise question has been founded much misapprehension and error in the minds of the general public as well as the public utility managers, which has been increased by the utterances of some economists. The misinformed and unthinking assume that the grant of a franchise to use the streets for tracks to guide cars, poles and wires to convey electric current for lighting, power or communications, or pipes for water or gas is equivalent to the grant of a valuable concession to enable private parties to make extraordinary profits, but this is a misapprehension. The grant in most cases is intended as an authorization by the public for a utility company to perform in a particular way service for which the public has a need. The word "concession," in other words, is not a correct appellation. The grant is made by a corporation comprising all of the public concerned (i. e., a state or municipal corporation) to a corporation (i. e., an incorporated limited-liability company) comprising such part of the public as are willing and able to risk money in the enterprise. Such an authorization is nowadays usually of a nature analogous to a license such as is given to various other kinds of business, with some added limitations, and it should be for the mutual advantage of the licensee and the licensor. There are differences, however, between the business of a public utility company, like an electric railway, and the usual trading businesses, as I have already pointed out. Certain of these may be expressed by the fact that the capital required for the average trading business is usually small and within the reach of many individuals who may care to take up such businesses. For this reason competition will be apt to arise in such businesses and will tend to bring the prices for the service to reasonable figures and the quality of the service to satisfactory character. The fact that this possibility that competition will take place under the conditions described also reassures the public in respect to the reasonableness and desirableness of the treatment accorded. On the other hand, the capital required by a public service company is commonly large, and competitive ventures are not so likely to occur, nor is it so desirable to have them occur.

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These same differences may be expressed by the further fact that competition does not introduce any inconvenience in the relations between customer and purveyor in ordinary business, nor is inordinately expensive duplication of capital caused by competition where the fixed capital is small, as in ordinary businesses. But inconvenience to the customers is often caused where general competition of like public service companies occurs, as, for instance, when two street railways go into the same territory and do not give interchange transfers,

> **"It is of importance that engineering statistics be made more a part of the permanent records of the companies, and that the record keeping of the companies become a joint structure of accountants' financial statistics and engineers' physical and production statistics. This accomplished, the facts of legitimate electric railway investment and management are likely to fall out of their present sphere of public controversy."**
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and duplication of capital is likely to be large and economically indefensible in the case where such companies lay separate tracks on the same streets.

Another principle should plainly assert that the bookkeeping for a public utility should scrupulously distinguish between capital expenditures and operating expenditures (including within the latter such expenditures for renewals of plant as are required to be made as the plant depreciates so that economical and good service may be maintained).

It is obvious that, excepting the cost of extensions and enlargements proper to be provided for as additions to investments, the legitimate expenses of an electric railway company must ordinarily be provided for out of the revenue obtained from the charges which are made for hauling passengers and freight or performing associated services, and the rates should raise only enough revenue on the average to meet these expenses, provided the word "expenses" is used comprehensively so as to include return on the investment. A reasonable amount of standing surplus of the nature of a reserve is needed as a reservoir to maintain a parity of conditions from year to year, and if this has been drawn upon it must be replenished as earnings warrant. The item called return on the investment is sometimes referred to as "interest" and sometimes as "interest and profit." In the latter phrasing, it may be understood that the interest referred to must be taken at current rates for well secured investments, and that any additional return required to support the solvency of legitimate projects may be called the commercial or contingent profit which is necessary to attract people to invest money in a business with many risks of failure. The courts hold that a public utility must be allowed to earn a fair return on its investment provided this can be done with prices for service that are, commercially speaking, reasonable to the consumers; but if the business cannot be made to pay returns to the stockholders with such rates, then the loss is the stockholders'. This risk the stockholders must bear in addition to the risks always incident to commercial enterprises which are embarked in a growing and changing art.

If the stability of the company's properties and the rates by which the revenue is raised are to be put upon a rational basis to which the confidence of the public will be extended, there must be some better reason for the differences between the charges for service than only the judgment of company officials, however able and experienced those officials may be. To improve upon this condition it is necessary to obtain intimate statistical records of the character of the service required to meet the needs of the customers, and, in a general way, of the plant investment required to provide that service, the effect of providing the service on the wear of plant, the expenses of operation associated with the service, and other like information that electric utility companies have not generally been in the habit of gathering or recording. In those instances where the statistics have been gathered and recorded, it has as a rule been done by a statistical department unassociated with the regular accounting department. The inefficiency of this process seems manifest and leads to the suggestion that the plant statistics, the money statistics and the traffic statistics should be brought into association.

Many utility companies have heretofore been satisfied to hold their accounting as a species of auditing, capable of showing what dividends the company can pay after leaving some surplus as the result of any year of operation, and they have failed to erect their accounting into a statistical structure which will show correctly the relations of their business to their property and the profits which the business brings. But to bring about the needed confidence between the public and the companies without friction and shock, it is of importance that engineering statistics be made more a part of the permanent records of the companies, and that the record keeping of the companies become a joint structure of accountants' financial statistics and engineers' physical and production statistics. This accomplished, the facts of legitimate electric railway investment and management are likely to fall out of their present sphere of public controversy. Public studies of the elements which are comprised in the cost of hauling passengers, such as those now in progress at the Massachusetts Institute of Technology, will tend to the same end.

Part Three

PUBLIC RELATIONS—PUBLIC SERVICE REGULATION

QUALIFICATIONS OF A PUBLIC SERVICE COMMISSIONER

By ALEXANDER C. HUMPHREYS

President Stevens Institute of Technology

WHEN we pause to consider the tremendous authority given to, and hence the tremendous responsibility carried by, the members of our public service commissions, this question of qualifications is found to be one of vital importance to all the interests involved—which means the people as a whole. Public service commissions are invested with a scope of authority which is not only out of harmony with the traditions of our form of government but is in actual conflict therewith. According to our form of government, no one man or body of men should have authority in the three functions of government—legislative, executive, and judicial. Reasonable and effective regulation of public utilities does not require any such extreme measures. Until recently such a consolidation of authority would not have been even considered in this country. But this is the day of radical changes, made recklessly, in the face of the teachings of experience.

In view, then, of the extraordinary power wielded by these men, and the fact that they are acting outside of the traditions of our form of government, the chief qualification for membership in one of these commissions should be an intense, overmastering desire and purpose to hold even the scales of justice. Furthermore, the commissioners should be men imbued in no ordinary degree with the saving quality of common-sense coupled with self-restraint. They should be so qualified temperamentally that they will hold fast to the fundamentals of truth. No matter what may be the other requirements in the line of specialization, the qualifications named should be found in each and every commissioner in these United States. This means the selection of men of unusual balance and strength of character. But a general compliance with these specifications can hardly be expected where "politics," in the form of rewards for services rendered, plays such an important part in municipal, state, and national governments.

It has been suggested repeatedly that to secure men of sufficient character and ability for these positions, liberal salaries should be paid. Undoubtedly, the highest salaries as yet paid in the United States are none too high as compensation for the service required, and much higher salaries could be earned by the right men. But high salaries are by no means a cure-all. In fact, the higher the salaries the more determinedly and persistently will these positions be sought by party hacks, and the more highly prized will they be by the appointing powers as a means for paying political debts. Those of us who have had personal experience with the commissions know that many of the commissioners are over-paid, while, no doubt, there are a few who are inadequately compensated for the work they are doing.

It must be borne in mind that these commissioners have to pass judgment on many questions for which no one man is qualified to render a final opinion. As most of the questions, or at least a large majority of them, have to do with industrial and engineering questions, place should be found on every board for at least one broadly-equipped engineer. It by no means follows, however, that because a man is an engineer he is qualified to sit on one of these boards. But the theoretical training and practical experience of the engineering profession should be fully represented. An engineer so chosen should have to the full the qualifications first named, and he should particularly have had experience, not only in construction of engineering works but in the operation of industrial properties, preferably public service properties. In other words, he should be qualified as designer, constructor, and administrator of such properties. Also, he should have full command of the principles, at least, of accountancy, and should be a student of the subject of "depreciation," so-called. Notwithstanding the fact that many of the questions which our public service commissions are called upon to determine require for their solution the highest engineering training and experience, it is the exception when an engineer is appointed as a commissioner.

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In this connection, I may well quote from an address delivered last spring before the American

> **"Our public service commissions should be composed of common-sense men, broadly trained, broad-minded, fair, and competent as investigators (an unusual qualification); and in each commission there should be men fully qualified in the theory and practice of the professions of engineering, law, business, finance and accountancy."**
>
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Railway Engineering Association in Chicago by Judge C. A. Prouty, formerly chairman of the Interstate Commerce Commission, and now director of valuation of railroads:

"In the last fifteen years the price of every article of universal and general consumption, with one exception, has advanced, and that exception is transportation by rail. If transportation by rail alone has not advanced it is because railway engineers, by providing a better way and a better machine to operate upon that way, have rendered it possible to make economies which have offset the increased cost of labor and of supplies. The United States is about to enter upon a work of very great consequence, and the railway engineers are identified with that work. The problem is not altogether an engineering problem. It smacks of economics and of law and of politics, but the business of ascertaining and collecting a great part of the information is peculiarly a task of the engineer's, and I am not certain but the engineer may finally turn out to be the best qualified of all to consider the other problems.

"Now when I began this work, I was told that an engineer could measure and figure with accuracy, but that he was not competent to discuss the intricate problems presented by the valuation of our railroads, and that we must be very careful not to let him undertake to discuss them. I am fast coming to the conclusion that he may be better qualified than anybody else to discuss them. I have been a lawyer all my life and I believe that my profession is the greatest of all professions, but I am obliged to admit, and I think I have said this before, that the training of a lawyer does not fit him for the discussion of questions of this kind. A lawyer by his training is a partisan. If you go back to the law school you will find that he is given a certain thing to affirm, and it is his business to make out that case. In life he has one side of a controversy, and he must establish that his side is right.

"The engineer is entirely different. He begins in school with mathematics. There is but one answer to a problem in mathematics. It may be hard work to find it, but there never can be two answers. When the engineer gets into life it is still his business to find the fact, and just according as he can find the fact and be certain of the fact, he grows. If an engineer designs a bridge, and that bridge falls, his reputation falls with it. He cannot call in the undertaker and bury his blunder, as the doctor does. He can't charge it to the stupidity of a court, as the lawyer does. He must assume the burden of it himself. So I say that the very training of the engineer fits him for that precise kind of thinking which is essential in the working out of these new problems where absolute impartiality is necessary."

The business and financial interests should also be fully represented on these boards. It is coming more and more to be the practice for these commissions to control the financing of public-service corporations. It is ridiculous to suppose that a man who has studied finance only in the economics department of a college or university is thereby qualified to act intelligently and fairly on great financial questions. If a man thus prepared has later had the necessary broad practical experience, then the college training may be of definite value.

The profession of law should also be represented, but emphatically not to the extent at present found to be the case. In other words, the lawyer has his place on these commissions, and a most important place; but it is distinctly a misfortune that the lawyer and the theoretical economist are, as at present, practically dominating this most important branch of our industrial life. The lawyer is no more qualified for a position on one of these boards because he is a lawyer than is the engineer because he is an engineer. A lawyer may be most competent as an advocate, but he may be totally unfitted to act as legislator, administrator, and judge. As to the inexperienced college economist—words fail.

The Minnesota rate case indicates that even the august United States Supreme Court might be improved by some of this non-legal leaven. To refer to one point only, the valuation of lands, which, according to the court, are to be inventoried at a "fair average market value of similar land in the vicinity, without additions by the use of multipliers or otherwise to cover hypothetical outlays." These are hardly "hypothetical" outlays, when the evidence is apparently indisputable that a Minnesota railroad, recently built, paid from one and three-quarters to three times as much as the price of adjoining lands.

It has been argued that the engineer is not qualified to act as a commissioner by reason of his lack of broad experience. My answer has already been indicated. He is not qualified simply because he is a competent constructing, consulting, or administrative engineer. He must have had the broad experience suggested by the combination of these three branches. And there are many such to be found; although I confess it may be hard to find many willing to make the necessary sacrifices involved in the acceptance of one of these political positions.

Again, it has been argued that the engineering profession might better be represented by membership on the staff and by competent outside specialists, these last to be consulted as specific needs develop. The idea here is that no engineer can keep up with the details of all branches of engineering, and so it is better to depend upon many specialists, each in his particular field; and, further, that if an engineer of reputation is on the board, the tendency will be for the other members of the board, not engineers, to be dominated by the engineer member on all engineering questions. My answer to this is that I have stipulated for a broadly-trained engineer. Such a man, of judicial and open mind, will recognize his limitations as to the details of specialization and will avail himself of the opinions of specialists; but he will, if he is the kind of engineer I have specified, be better qualified to pass judgment on the opinions of these specialists than could be a man of any other profession. In other words, he is qualified in the fundamentals of engineering science and practice. This argument against the engineer might just as logically be urged against the lawyer, for there are specializations in the law as there are in engineering.

To obtain in sufficient numbers such men as I have thus roughly described unquestionably will call for the exercise and development of patriotism. Men who, by preliminary training and, later, by sufficient practice in the school of experience, can meet the specifications I have outlined, can be found in ample numbers. But generally these men could not be drawn into public service, where the monetary compensations are limited and the tenure in office is subject to the whims of distributors of patronage, and where those who listen to conscience and reason rather than to public clamor are not likely to be reappointed to office. This evil has already deprived us of the services of men who were not properly qualified when appointed but who, through conscientious and hard work, had qualified themselves in some degree at least, an expensive system of education for the interests involved, and particularly wasteful when its one good feature is sacrificed to "politics" when the day comes for reappointment.

On the other hand, there will be found some members of the engineering profession, as of other professions, properly qualified, and blessed with enthusiasm together with independent means or simple wants and tastes, who will be willing to face all of these objections for the satisfaction of knowing that they are performing a public service.

This very difficulty in obtaining men of the necessary character, ability, and training points to a very real objection to this bureaucratic form of government and the need for readjustment along lines of greater simplicity and less power.

To summarize: our public service commissions should be composed of common-sense men, broadly trained, broad-minded, fair, and competent as investigators (an unusual qualification); and in each commission there should be men fully qualified in the theory and practice of the professions of engineering, law, business, finance, and accountancy.

THE PARTNERSHIP PROVISIONS OF THE KANSAS CITY FRANCHISE

By PHILIP J. KEALY

Member of Board of Control Kansas City Railways Company

WITHIN the past ten years a great change has come about in the attitude of the public toward the granting of franchise contracts to public utility companies. During the eighties and early nineties the country was carried away with the possibilities of electric traction, urban and interurban, and with the prospects of cheap electric light and power. The urban population had increased greatly, and the standard of living, at least as to conveniences, was raised. As a result, every encouragement was given to capital to invest readily and bring to the community, large or small, the electric car, electric light and power, gas and water, former luxuries which had become necessities. Franchises were to be had for the asking, and competition and duplication of plant were encouraged. Furthermore, no referendum vote was required, and the political standards differed materially from those of to-day. Franchises were limited in many states by constitutional provisions to a term varying from twenty to thirty years. These older grants have, therefore, either expired or are about to expire. Consequently, a readjustment of the relations between the public and the utilities has been made, or is under way, in many of the cities within recent years.

The limited-term franchise, carrying no protection for permanent investments, has not proved satisfactory. Abuses of many kinds existed, and public service has been largely for private gain. Municipal ownership has many advocates. Therefore, in the readjustment of the relations between the municipality and the company there are two methods by which the distrust and dissatisfaction which exists in the mind of the public, be it just or unjust, can be removed or pacified. These are, first, municipal ownership, and second, supervision by public authority over those features of the company's affairs directly affecting the public welfare or the city's interest.

> **"The interests of the community and the private company furnishing public service to that community are identical and the interests of each can be best served by concerted and mutual action."**
>
> —*Philip J. Kealy.*

The passage of public service commission laws in many of the states has affected the second method in so far as mere supervision of many features of the company's affairs are concerned, but the spirit of the day tends to confirm the assertions long before made by public utility corporations that the interests of the community and the private company furnishing public service to that community are identical, and that the interests of each can be best served by concerted and mutual action. However, no public service commission law yet passed provides for a detailed participation in, or supervision of, the affairs of a private company, something essential in a partnership management. Therefore, where the city is interested in other than the mere standard of service furnished, a closer affiliation with and participation in the company's business is necessary than that which most public service commissions can undertake under the laws which created them.

The Chicago ordinances of 1907 were, perhaps, the first tangible expression of the idea of public participation in private management, and it is significant that an amendatory ordinance, passed a few months ago, increased the powers and broadened the scope of the activities of the Board of Supervising Engineers. In the Cleveland settlement a somewhat different arrangement exists, but this is due to the fact that the city's interest in this case is solely in good service at minimum rates, whereas in Chicago, in addition to securing good service at minimum rates, the municipality participates in the profits.

In the preparation of the franchise granted in Kansas City, Mo., on July 7, 1914, the conditions hereinbefore discussed were duly considered, as were also the plans evolved in Chicago and Cleveland. At about the same time, one of the local newspapers started a campaign for a "disinterested management of the traction company." This doctrine, however, met with little favor. It was charged that the company's difficulties were due to financial mismanagement about ten years previous. It was further charged that the burden of this alleged mismanagement was borne largely by the community, since, because of the inability of the company to secure funds with which to make needed improvements, it was forced into a receivership and the extension and betterment of its lines was delayed. Of course, the investors in the property suffered, as no dividends were paid; and the public suffered also. Inasmuch as the shareholders had a voice in the management of the company, while the public, which was likewise concerned, had not, those on the city's side of the controversy, who were contending for the widest possible participation by the city or its agents in the company's affairs, had a very strong argument on their side.

To meet this general situation there was devised a plan of city participation in the management which varied widely from any yet proposed in a franchise settlement, and as might have been expected, the Kansas City contract, being the last franchise ordinance adopted in this country, is perhaps somewhat more radical in regard to partnership provisions than any of its predecessors. The new contract essentially places the two contracting parties in different relative positions than those resulting from either that in Chicago or in Cleveland.

The essential features of the Kansas City ordinance, in brief, are as follows: In the first place the value of the property is fixed, and on the fixed value it is agreed that the company shall be entitled to a 6 per cent return, "if and when earned." Of the total agreed value of $30,000,000 approximately $7,500,000, or 25 per cent, represents intangible elements of value. It is further agreed that before the company participates to any extent in the earnings over and above the fixed return of 6 per cent, all excess earnings shall be put back into the property until the $7,500,000 of intangible value shall have been made good with physical property, and without any increase in the capital account. When this has been accomplished, the company and the city are to divide the surplus earnings over and above the 6 per cent return in the proportion of $2 to the city and $1 to the company.

The city is to receive certificates of ownership for the intangible value made good out of earnings, and the contract also provides that if the city shall devote its portion of the surplus towards the purchase of the property, then when one-half of the capital value has been so paid down, the city shall assume the ownership of the entire system, subject to a mortgage indebtedness of the other half.

The contract further provides that the city may secure the property at any time upon giving sixty days notice and paying the agreed value. The city, therefore, is interested in the manner in which the company is financed, in the amount of capital additions, and must necessarily watch all the operating expenses closely.

That all these various interests of the city may be properly safeguarded, the contract contains the following general partnership provisions:

1. The company is to be incorporated with eleven directors, five of whom are to be nominated by the city.

2. Those features pertaining to the detailed operation of the road are to be handled by a board of control, consisting of two members, one appointed by the company and one by the city, each of equal authority, and, in case of dispute, provision is made for the selection of an arbitrator.

3. Whatever mortgages are placed upon the

property must be drawn up in a manner satisfactory to the city counselor and approved by him in writing.

4. An independent audit of all books, vouchers and expenditures of the company shall be made annually by the city comptroller.

The following paragraphs give additional details regarding the above provisions:

1. The city directors are initially selected for a term varying from one to five years, and thereafter one director is to be selected each year. In addition to the powers given the directors by law, the new contract grants many other rights or powers to them. For example, the city directors may reject any and all bids for material and work constituting capital additions, and they have the sole right to determine where track extensions to the system shall be made. They may also object in writing to the payment of excessive compensation to any employee, officer or agent of the company, excepting that of members of the board of control. Such objection is to be considered by the board of control.

Through this representation on the board of directors, the city is at all times cognizant of the financial affairs of the company and will, in addition, assist in its financing and reorganization. This form of city participation is, in many respects, an innovation and approaches as closely as is possible the ideal of public management of private property.

2. The board of control, in brief, is charged with the following duties:

a. To supervise and direct the routing, stopping and scheduling of cars, either in accordance with ordinances of the City Council or order of the Public Service Commission, if the latter should possess the final authority in the matter.

b. To require sufficient cars to be operated at all times and approve type of these.

c. To designate and approve the kind, character and amount of all construction and reconstruction equipment and re-equipment.

d. To certify to the amounts of all capital expenditures.

e. To determine the system to be used in keeping the company's books and to supervise all disbursements.

f. To regulate the issuance of transfers.

g. To recommend a site for an interurban station and to determine in general the many features connected with the use of the city system by interurban roads.

h. To regulate the carrying of mail and packages on the cars.

i. To determine the amount to be annually expended or set aside for maintenance and renewals and for injuries and damages, it being provided that not less than 16 per cent shall be set aside for maintenance and renewals, and not less than 4 per cent for injuries and damages.

> **"While this franchise undoubtedly has faults, the sincere hope and expectations of all parties who have assisted either in its preparation or final adoption are that it will carry out the true purposes of a public service franchise, provide the best possible service at minimum rates, permit a fair return on the capital invested and insure public service confidence by making the public, through its delegated authority, share the responsibility."**
>
> —*Philip J. Kealy.*

j. To see that the property is at all times insured to its full insurable value.

k. To fix the terms under which surplus power shall be sold.

l. To dispose of any property which is, or may become, in their opinion, unnecessary for the company's business.

Thus it will be seen that the board of control has supervision and initiatory power over every phase of the operation of the system, and on this board the city has equal representation and rights.

3. The provision that all mortgages covering the property are to be satisfactory to the city counselor and approved by him in writing is another innovation. Whether this will prove to be a point of strength in the partnership relations only experience will show, but in theory, certainly, it is correct, for the city, being interested equally with the company, in every phase of the latter's business, should necessarily have a voice in deciding what sort of a lien should cover the equities owned by it.

4. The independent audit, which is to be made annually under the direction of the city comptroller, is a provision which is copied from the Chicago ordinance. Whether or not this is necessary is an open question, as the local contract places the members of the board of control who will supervise the company's expenditures in a somewhat different position from that of the Board of Supervising Engineers in Chicago. There, the chairman of the board, who is the arbitrator, is named in the ordinance and represents neither the city nor the company, but stands for the best interests of both. He can be removed only by a majority vote of the judges of the Appellate Court of Cook County. In Kansas City, however, the board of control consists of two members. The city's member can be removed by a majority of the city's directors and the Mayor. The arbitrator, however, is to be selected by the judges of Kansas City Court of Appeals.

In accounting matters upon which the board of control may disagree, and which therefore, go to arbitration, the company is at a disadvantage in that a public body selects the arbitrator to decide the question at issue. Therefore, the necessity for the independent audit is questionable.

Numerous additional partnership ideas are included in the Kansas City contract. It is further provided that in the contemplated reorganization all of the stock of the new company formed to take over the present Metropolitan system is to be deposited in the hands of Judge Hook of the United States Circuit Court, and the equities are to be distributed by him. This insures a fair division and makes certain that each stockholder will receive that to which he is entitled in the final plan.

From the above it will be evident that virtually every partnership idea which has yet been incorporated in a public utility contract is found in the new Kansas City franchise. In addition, many innovations, some of which have been discussed by men prominent in public utility affairs, and others which are original, are likewise embodied.

The best interests of both parties make necessary a strict compliance with the contract. No human document is perfect, and while this franchise undoubtedly has faults, the sincere hope and expectation of all parties who have assisted either in its preparation or final adoption are that it will carry out the true purposes of a public service franchise, provide the best possible service at minimum rates, permit a fair return on the capital invested and insure public confidence by making the public, through its delegated authority, share the responsibility.

LOCAL VERSUS STATE REGULATION

By RICHARD McCULLOCH

Vice-President United Railways, St. Louis

WHEN in 1907 the states of New York and Wisconsin passed laws turning over the regulation of their public utilities to state commissions and gave these state commissions the widest powers, it was supposed by economists, reformers and lawmakers that a new era had dawned in the matter of regulation of public utilities and that these commissions would proceed immediately to solve all of the problems connected with the financing, management and operation of public utilities. Most of the other states followed the lead of New York and Wisconsin, and nearly all of them now have public utility commissions possessing more or less absolute powers.

Now, after state public service regulation has been in vogue for only seven years in two states, and for shorter periods in others, there has arisen in certain quarters a new demand to take these regulatory powers away from the states and to place them in the hands of municipalities.

It would be interesting to analyze this demand and to determine the reason for the sudden change of opinion. Several articles published in the May, 1914, number of the *Annals of the American Academy of Political and Social Science* discuss this matter from the standpoint of local regulation. The following extract is taken from a paper by Delos F. Wilcox on the "Effects of State Regulation Upon the Municipal Ownership Movement."

"Generally speaking, * * * the popular prestige of public service commissions is waning. The people are disappointed in the results obtained for the money spent, and a great many are coming to fear that the commissions as organs of government are primarily organs of the public utility interests to protect themselves from the mosquito bites of rampant democracy. At the same time there is a noticeable revival in the movement for municipal ownership and a strengthening of local resistance to the practical abrogation of municipal home rule as it relates to public utilities."

One of the allegations repeatedly made by the advocates of local regulation is that, while at first state regulation was fought by the public utility companies, it is now being urged by them, and that the recent passage of public utility laws in some of the states has been inspired by public utility interests.

Examining the recent literature on the subject the arguments against state public utility regulation and in favor of local regulation are about as follows:

1. With few exceptions men occupying positions on state commissions have had no qualification for this work, but have been appointed for political reasons.
2. State regulation has not given the people the benefit of as favorable rates nor as good service as many cities, with home-rule powers, have secured for themselves.
3. In the valuation field, both for rate making and purchase, the state commissions have shown a strong leaning toward the interests of the utility companies.
4. An analysis of the cases passed upon by one of the most important commissions shows a very small percentage of cases in which municipalities have received relief.
5. The commissions move with extreme deliberation, and their orders have frequently been nullified by appeals to the courts by the utilities.
6. The commissions are developing a growing disposition to write legislation and thus control the action of state legislatures in the public utility field.
7. The commissions interfere with the management of municipally owned plants.

These allegations may be answered as follows:

1. If it has been difficult to find men qualified to occupy positions on state commissions, how much more difficult would it be to find suitable men for municipal commissions where ward politics and local prejudice have much to do with appointments? As a matter of fact, the appointments on state commissions have been much above the average, and these commissions, after several years of work, have collected statistics and have trained experts who are invaluable to them in their present work. Would municipal commissions do as well?

2. Where municipalities have made better bargains with their public utilities than could have been exacted through regulation, it means merely that these bargains have been driven by the municipalities by cut-throat methods of which they need not be proud. The present condition of the franchise negotiation in Toledo is a shining example of this method of bargaining.

3. In the valuation field no fair-minded man has ever accused a state commission of showing partiality toward the interests of the public utility companies. On the contrary, few valuations have been made by state commissions where the utility has received credit for all to which it was entitled.

4. If an analysis of cases passed upon by a well-known commission shows a small percentage of cases in which municipalities were afforded relief, it indicates merely what every operator knows, that a large percentage of complaints brought before commissions are of a trivial nature or not founded upon facts.

5. If the commissions have moved with deliberation, they have done so to preserve a judicial attitude, and if their orders have frequently been nullified by appeal to the courts, the same might be said with greater force of the orders of a municipal commission.

6. If the commissions are developing a disposition to write legislation, we are at least sure that this legislation is written by experts. Can the same be said of legislation on public utility matters proposed by the average lawmaker?

7. If the commissions have interfered with the management of municipally owned plants, it is probable that these plants are woefully in need of some sort of intelligent interference and relief from government through municipal politics.

Considering these charges as a whole, it would seem that the chief cause of complaint against state commissions is that they have not adopted a sufficiently militant policy and have not made the drastic rulings against public utility companies which were expected of them by those instrumental in the passage of the original public utility regulation acts.

The men appointed to membership on state commissions have, as a rule, been men of ability and character, and if, as alleged, they have at first lacked experience in public utility matters, the commissions in most of the states have now been working long enough to acquire experience, to assemble a technical staff and to collect valuable statistics. This period of incubation has been a trying one for the utilities, but now that the state commissions have been well organized it would be unfortunate if the whole process had to be gone over again with municipal commissions.

> **"Regulation is of value in proportion to its fairness and impartiality. Commissions, whose members are not personally concerned with local matters, will give better decisions than those whose members are so involved. The farther removed the commission is from the seat of contention the more judicial will be its attitude. On this account state regulation is better than municipal regulation, and federal regulation would be better still."**
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> *—Richard McCulloch.*

Few of our important public utilities are confined to one municipality. They are interurban and often interstate in their ramifications. Regulation of such utilities operating in many municipalities by independent municipal commissions would be a clumsy, if not an impracticable, expedient. It would work great hardship on the utilities, and there appears to be no advantage to the public in such a diversified regulation.

It has been the universal experience with municipal commissions that in order to keep themselves busy they take up the most petty and trivial matters and endeavor to constitute themselves managers and directors instead of maintaining a judicial attitude.

Under the theory of public service regulation the commission occupies a neutral attitude as between the public and the public service companies. They see that the companies fulfil all their obligations, but, on the other hand, they protect the utilities against useless duplication and against unfair demands on the part of the public. In order to perform these duties, the commissions must weigh the evidence on both sides, and they must hand down their decisions after taking into account the rights and the obligations of each party.

It is often stated that the utilities have the right of appeal to the courts, but public utility companies must rely upon proving their cases before the commissions, because, although the acts of the commissions are subject to court review, the utility which appeals to the court is put in the unfortunate attitude of fighting the State. This attitude of waging war on the community is always made the most of by the enemies of the utility.

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In the city of St. Louis we are perhaps well qualified to judge as to the relative values of local and state regulation, having had for several years a municipal commission which has now been replaced with a state commission. The municipal commission was composed of a lawyer, an insurance man and a city official, who became chief engineer of the commission. None of these gentlemen had had previous experience in the construction, operation, valuation, financing or investigation of public utilities.

They fearlessly proceeded, however, with an examination and valuation of all the utilities, and made recommendations in the most vital matters of operation and finance with the utmost *sang froid.* They recommended that the lighting company be allowed to earn 8 per cent on the appraised value of its investment, but limited the railways company, conducting a business of much greater hazard, to an earning rate of 6 per cent. As a result of their valuation and investigation they recommended the enactment of a municipal ordinance requiring the railways company to furnish at all times of the day one car for each fifty passengers, which was really a requirement for a seat for every passenger at all hours of the day. If the commission had allowed the railways company the same rate of earnings as it had already established in the case of the electric lighting company, no demand for increase in service could have been justified. Fortunately the proposed legislation to put this recommendation into effect was not passed, and the efforts of the municipal commission were partially recognized by its replacement by a state commission before it had an opportunity to make any more recommendations. When its demand for a seat for every passenger was answered by the argument that this had been accomplished in no other American city and had been required by no other commission, it replied that this made no difference, and that St. Louis should be the first to put this millennium into effect.

A municipal commission is too close to the seat of contention, too apt to be swayed by prejudice, local influence or newspaper attacks, too ready to respond to the passing whims of half-baked reformers and demagogues, to take that broad judicial view of matters presented to it which is necessary in order to render a fair decision on the important business matters brought before it.

An interesting feature of state regulation is the fact that in many of the states the commissions have regulatory powers, not only over privately owned utilities but over those owned and operated by the municipalities. When state commissions have pointed out to municipalities the defects in construction or operation of their utilities or their unfairness toward their customers, this advice has seldom been graciously received.

An interesting incident in connection with the Missouri state commission has recently occurred. Upon complaint of citizens of St. Louis County, the state commission investigated the conduct of the St. Louis County Water Company, a privately owned concern. After investigation, the commission ordered the company to perform certain duties, which were, among others, to furnish water meters free of charge, refund money to customers who had paid for their meters, pay interest upon deposits, etc. The finding of the commission was received with great satisfaction by the newspapers and the public. When, however, the commission notified the municipally owned water department of the city of St. Louis that it must obey the same rules laid down for the county water company, there was great uproar from the newspapers and the politicians. The following editorial from the St. Louis *Star,* under the caption, "Grabbing the Water Works," shows the attitude of the newspapers toward state regulation of municipally owned utilities:

"The State Public Service Commission has issued a number of orders concerning rates, management and regulation of water works, which will, if enforced, cause a raise in water rates as well as the loss of several hundred thousand dollars a year to the city of St. Louis. The orders were made by the commission to apply to public utilities owned by corporations in all parts of the State, but the commission included St. Louis among the cities to come under the new regulations.

"The new rates apply to water, gas and electric power. One of the rules would compel the city to buy all water meters now privately owned, which number more than 3000. Another regulation would compel the city to pay 6 per cent upon all deposits to secure the water bills. This alone would add $50,000 to the cost of operating the water department. At present the city requires water consumers to deposit money sufficient to pay the estimated amount used for six months. To pay interest on this and to buy the privately owned meters would mean a huge increase in the water rates, merely to gratify the whim of a politically appointed board."

We might cite the homely adage, "What is sauce for the goose is sauce for the gander," but it is evident that this sauce is not to be applied without hysterical squawking on the part of the gander. Meanwhile, we well-plucked geese will extend our sympathies to the outraged gander, welcome him to our well-regulated circle and assure him that he might as well get used to the sauce and pretend that he likes it.

CO-OPERATION IN TRANSIT CONTRACTS

By TIMOTHY S. WILLIAMS

President Brooklyn Rapid Transit Company

WHILE smaller municipalities are scrapping with public service corporations in a spirit of vindictiveness and oppression which bodes no good to either party in the combat, it is encouraging to note that the largest cities of our country have committed themselves in their important transit undertakings to the more reasonable attitude of co-operation.

Chicago, New York, Philadelphia and Boston, together with some smaller cities, have, in varying degrees, as expressed in comparatively recent ordinances and contracts, apparently come to appreciate the unescapable truth that under existing conditions enlightened municipal self-interest demands co-operative effort with their carrying corporations —not retaliation, blackmail, punishment or oppression.

There never should have been any other conception of public attitude and duty. Where, as in urban transportation, municipal privilege is a necessary preliminary to the furnishing of adequate facilities by others than the municipality itself, the grant of such privileges was not properly the opportunity for personal graft or of unreasonable official exaction. It was the opportunity for wise public service, the procuring for the people of the best transit at the least cost and under reasonable safeguards, accompanied by a frank recognition of the justice and wisdom of ample returns upon private investment. For only as the commodity, transportation, thus purchased yields a profitable return to the producers can its quality be long satisfactory to the buyers.

This in its full scope could not have been foreseen in the early days of franchise grants, when street railroad transportation was in its infant and experimental stage, but later, when its influence on municipal development was manifest, and when the conditions which permitted profit or loss were more readily calculable, a wise appreciation of the advantage to the cities of businesslike co-operation with the carriers would have avoided much wasteful duplication of capital, would have made the development of city transit more uniform and intelligent, would have given the city governments a firmer and more practical control of service, and would have prevented many of the evils and scandals which have characterized a shorter-sighted policy. Instead of public interest, the personal or political interests of officeholders too often dominated the grant of franchises, city governments were too frequently the facile instruments of blackmail, grants were often made without necessity or reason, and the greed and official disloyalty of officeholders was reflected in the indifference of franchise-holders toward the obligations of their contracts.

When, out of conditions for which the people and their official servants were primarily responsible, the evils became unendurable, the pendulum swung in the opposite direction, the franchise-holder became the target of official attack of every kind, and no new or renewal franchises were forthcoming except upon conditions which prohibited or discouraged honest investment. And this opposite swing of the pendulum unfortunately reflects the situation very largely in our cities to-day. Burdensome and restrictive legislation or official orders are increasing the expense of service, crippling the ability to improve facilities or to add to them, and even when the disposition and the capital exist for enlargement of facilities, the city governments too often prohibit them by insistence upon terms and conditions which are not merely unreasonable but impossible of wise acceptance. It seems to be only the intensity of suffering and the consciousness of helplessness otherwise which finally bring the community and its officials out of the close atmosphere of recrimination and suspicion and into the broader and more wholesome atmosphere of co-operation.

The example set by the big cities therefore in the movement toward co-operation with traction corporations for the improvement of transit conditions marks the beginning of a new era in the handling of these matters. What are the characteristics of this co-operative effort and how will it work out?

In each of these important cities the particular conditions leading to new contractual transit relations were different, in each the purposes sought were worked out in different ways, in each the extent and character of municipal co-operation differed, but it may be said of the new contracts compositely that they:

Recognize the necessity of utilizing existing transportation facilities as the basis for a larger and better system;

Respect the private rights of property, both intangible and tangible;

Reserve to the city a large measure of control over service, equipment and operations;

Make provision for the extension of lines and the construction of new lines;

Require a strict system of accounting and an official audit;

Reduce the rate of fare either actually or by extension of haul or interchange of transfers;

Provide for immediate or eventual municipal ownership, in whole or in part, without commitment to municipal operation;

"Burdensome and restrictive legislation or official orders are increasing the expense of service, crippling the ability to improve facilities or to add to them, and even when the disposition and the capital exist for enlargement of facilities, the city governments too often prohibit them by insistence upon terms and conditions which are not merely unreasonable but impossible of wise acceptance."

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Assure by contractual terms, if not by direct guarantee, a preferential return on private investment;

Make necessary the establishment of reserve accounts and provide for the amortization of capital;

When reserving to the city the right to terminate the contract, or to take over property at expiration or prior termination, establish safeguards for determination of and payment of compensation;

Require a generous division of earnings with the municipality;

Enlist the endeavors of operators by the allowance of fair terms, the protection of honest investment and the opportunity for reasonable returns; and

Recognize the necessity and equity of a contribution of municipal credit and privilege in order to procure a large measure of transit facilities under the severe conditions exacted for the city's advantage.

Not all of these contracts are as wide in scope as this composite picture, and some have additional features of interest, but they all illustrate in greater or lesser degree a broader and juster conception of enlightened co-operation between city and railroad corporation than has heretofore attended such contractual undertakings.

In Boston the new co-operative contracts involve mainly the contribution by the city of large amounts for the construction of subways for rapid transit and the relief of street congestion. The railroad company operates the new facilities in connection with its own and pays a rental. In time the rentals will have paid for the cost and the city will have a valuable asset free. In the meantime the people will have had the benefit of better facilities.

In Philadelphia the reasons declared for the co-operative contract of 1907 were (*a*) to terminate the dispute and uncertainty as to existing franchises; (*b*) to give the city "a voice in the management of the company and a supervision of its accounts and expenditures"; (*c*) to enable the company to raise the funds necessary to "improve, complete and extend" its system, "in order that it shall better serve the public," by clearly defining the company's position, making its securities unquestioned, and its right to make extensions assured, "in order that it may obtain credit to finance the increased transit facilities so necessary for the welfare of the public and the development of the city"; and (*d*) to readjust the payments by the company to the city, make the city a sharer "in the earnings of the company from further growth of the city (without making the city liable for any of the obligations of the company)," and provide for "the ultimate acquisition by the city of the leaseholds and property of the company."

These liberal purposes were liberally provided for in the contract, and the city was to have a representation of three in the company's board of directors. Operations under the contract have been going on now for seven years, and presumably with general satisfaction, for it is proposed by the Department of City Transit, with the apparent concurrence of the Philadelphia Rapid Transit Company, to further extend the principle of co-operation by the construction and equipment of new rapid transit lines, to be operated in conjunction with existing lines as a unified system, the city contributing toward the cost approximately $45,500,000 and the company $12,000,000. The company is to operate the new lines for fifty years, with a preferred charge on the net earnings for its interest and sinking fund. The city's interest and sinking-fund charges are a subsequent claim on the net earnings. At the end of the period the city takes over the entire property, paying the company the amount of its investment in equipment and applying any accruals in the company's sinking fund for that purpose. In addition, under the 1907 contract as proposed to be extended, the city at the same time may take over all the company's lines upon paying the price therefor as stipulated in the contract. The annual payments to the city out of earnings are expected to provide a large part, if not all, of this purchase price. Whether the Philadelphia contracts (present and proposed) are equitable in all respects will not be discussed here, but that they reflect to a large degree the new spirit of co-operation is indisputable. If they require a large investment by the city, it is the price which the city has to pay for facilities presumably needed by its people, and these could not possibly be procured otherwise so cheaply or satisfactorily to its people as by co-operation with the transit company. The company, on the other hand, makes large sacrifices in concessions demanded, as for instance reductions in fares and surrender of possible profits over a moderate return, and by these sacrifices and concessions indicates a praiseworthy disposition toward co-operation.

In Chicago the new contracts (originating in the same year as that of Philadelphia) were the outcome of a vote of the people for municipal ownership. The situation was favorable for an advantageous bargain with the street railroad companies, for a large part of their franchises had expired. It was unfavorable for immediate municipal ownership because of the limited borrowing capacity of the city. It required prompt attention because, as usually happens near the expiration of short-term franchises, the railroad facilities had been allowed to deteriorate, there being no assured terms of renewal. The problem concerned only street surface railways.

The outcome of the negotiations was novel and apparently generally satisfactory to both parties. The contracts as executed establish an agreed value of $50,000,000 for the tangible and intangible property of the companies. It was a compromise figure. Upon this valuation, plus the cost of rehabilitation and extensions (borne by the companies) the companies are allowed an interest return of 5 per cent per annum. The remaining net profits are divided between the city and the companies in the ratio of 55 per cent to the city and 45 per cent to the companies. The result of seven years of operation has been not only the reconstruction and extension of the system, the improvement of service and equipment, and a comprehensive system of transfers and through routes, but the receipt by the city of about $13,000,000 as its share of divisible profits. Moreover, the city has the option to purchase and take over the property at any time upon payment of a prescribed amount. If taken over for municipal operation prior to Feb. 1, 1927 (twenty years), the price is to be the agreed valuation ($50,000,000), plus the cost of additions, reconstruction and improvements, reduced by the value of any property lost, destroyed or impaired (ordinary wear excepted), which latter value is supposed to be made good by depreciation funds. If taken over free from such restriction prior to that date 20 per cent is to be added to the price. In case the street railways are not thus purchased prior to Feb. 1, 1927, the city may designate any corporation to acquire and operate the railways as its licensee, in which case the licensee must pay the same price as the city would be obliged to pay.

In order that the city should have a voice in the character and cost of improvements an impartial board of supervisory engineers is created, whose approval is necessary to the plans and expenditures therefor. Extensions of tracks may be required but under restrictions which reasonably safeguard the companies' investments. The city is given a large measure of control over service. The rate of fare is fixed at 5 cents, but the city may, if it chooses, apply any part of its share of net profits toward a reduction of fares, provided that the companies shall be entitled to deduct and retain from the net receipts an amount equal to what their share would have been had the passengers carried paid the fare prescribed in the ordinance. This provision is probably too uncertain in its working to be availed of—but it is important as recognizing the just principle that the cost of an enforced reduction of fares diminishing the measure of contractual returns to the operator should be borne by the city, and not by the operator. This principle is again recognized in the new operating agreement of Dec. 22, 1913, whereby, besides reaffirming and in comparatively minor respects modifying the 1907 contract, the city, in order to extend the benefits of unified operation and a 5-cent fare to other parts of the town reached by another railway, reduced the fare on the Calumet & South Chicago Railway south of Seventy-ninth Street from 10 cents to 5 cents, but agreed to compensate the company in cash for such reduction.

Chicago has thus, so far as surface transit is concerned, solved in a businesslike and reasonable way the problem which confronted it. Because of the expiration of most of the street railway franchises when the bargain was negotiated, the city was able to make terms on a more advantageous basis with the existing companies than it could have made by ignoring them and contracting with new and independent interests, or by the creation of a municipal system, had that been financially possible. It gets a substantial part of the measure of control which would have come with immediate municipal ownership. It is assured a cheap fare and extensions of tracks where required. And it is placed where by husbanding its share of earnings it may acquire the railways within a reasonable period without serious burden, if any, upon the taxpayers. For these advantages it naturally made concessions which the extremists have criticised—although these were not only equitable but necessary to the investment of private capital. Its contract is liberal in the accounting, measured by radical standards. It recognizes, as have our courts, the substantiality of intangible rights, created though they may have been primarily by official or legislative privilege, as well as of tangible, physical property. It properly assumes that cost of property is not in large undertakings limited to the purchase of material and labor, but includes interest, discount and commissions, and contractors' profits. In the radical reconstruction of existing facilities, including the change from cable power to electricity and other substitutions made advisable by changes in the art of railroading, it abandons the doctrinaire idea that these improvements must be in all cases paid for out of earnings, and adopts the saner and more practicable conception that the cost of progress, if progress be attained, must often be capitalized.

The conditions which led to co-operative methods in New York were different from those in each of the other large cities.

The city had laid the foundations for a municipal rapid transit system by its contract in 1900 with John B. McDonald, afterward assigned to the Interborough Rapid Transit Company. Under that contract city capital created subways, private capital equipped them and a privately owned corporation operated them. Strange as it may seem, considering the criticisms

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which had attached to the character of other franchises following their profitable utilization, this new municipal transit effort embodied the most remunerative opportunities to private capital and energy which had ever been afforded in any municipal franchise—although it must be admitted that in obliviousness toward these opportunities most of the experienced men in the traction business were as serene as city officers and municipal reformers. Not only was the route laid out (considering as one for this purpose both contract No. 1, covering Manhattan and a small portion of the Bronx, and contract No. 2 comprising the extension into the heart of Brooklyn) through the congested part of the most populous city of the continent, but the low interest charge made possible by city credit, the freedom from taxation, the comparatively small requirement of private capital and the moral support of the city gave the enterprise a very great advantage over any similar undertakings dependent solely upon private funds. Profitable as it proved to be to those who had the courage to undertake it, the new subway was of even more profit to the city and its people—it gave a much-needed relief to transit conditions, stimulated property values and not only yields to the city interest on the cost but is gradually amortizing that cost.

The weakness of the McDonald contract, however, from the city's point of view, was revealed as conditions became more aggravated, namely, its powerlessness to compel extensions or branches and its failure to provide for any interchange of traffic (except for double fares) with any other subways which might be constructed and operated by the city or private interests other than the Interborough. Notwithstanding the great and insistent demand for additional rapid transit facilities, the city was helpless to provide them by an extension of its own railroad except upon terms which it was unwilling to make. Apparently secured in profits, and, practically, in monopoly, the city's lessee had the whip hand of the situation.

It was at this juncture, ten years after the first subway contract had been entered into, that a special committee of the Board of Estimate, of which the Hon. George McAneny was chairman, began a special study of the subject in combination with the Public Service Commission for the New York district, and finally brought about the co-operative contracts of 1913, which in the scope of their requirements, the magnitude of their capital investments, the comprehensiveness of their territorial influence and the care with which their terms were formulated, mark them easily as the foremost constructive work of their kind in the world. Their significance, for the purposes of this paper, is the extent to which, for the good of the community, they have recognized the necessity of, and made possible the accomplishment of, intelligent co-operation between city and railroad corporations.

The New York contracts have to do only with rapid-transit lines and service. Both the Interborough Rapid Transit Company and the Brooklyn Rapid Transit Company have surface railway interests, but these are not involved, except as they are indirectly affected by the success of the rapid-transit lines in diverting travel. The city deals with two operators—the Interborough Rapid Transit Company, controlling by lease the first city-owned subway lines and the after-acquired Manhattan elevated lines; and the New York Municipal Railway Corporation (organized on behalf of the Brooklyn Rapid Transit Company) controlling the Brooklyn elevated lines with three former steam-railroad connections. The contracts call for the immediate construction of approximately 362 track miles of new subways, elevated railroads and additional tracks on existing railroads, and the necessary accompanying additional facilities of equipment, power, shops, etc. The estimated expenditure of new capital is about $320,000,000, of which the city contributes nearly one-half. The routes traverse all boroughs except Richmond, and that borough, because of its insular position, prospectively. They are competitive only by incident—the idea being to extend the Interborough Company's Brooklyn line further into that borough through a territory where there is no rapid transit now, and to give to the Brooklyn company subways in Manhattan between Fifty-ninth Street and the Battery for the distribution of its Brooklyn and Queens passengers. While serving some common territory each system is reasonably complete in itself. There is to be one 5-cent fare over the lines of each system—not over both. Both systems are physically capable of unified operation without the handicap of much duplication of capital—but such operation would not be possible financially at a 5-cent fare for a long time to come, because of the great distances and expensive construction.

In order to procure the advantages which the city sought for its people and to reserve to itself full powers of control, concessions were necessary to the companies. The earning power of existing lines as of certain years was made a first charge on net receipts, thereby procuring the concurrence of the Interborough company. In the case of the Brooklyn company this was less than 6 per cent on the investment. In the case of the Interborough subway lines it was estimated at over 13 per cent. On the Manhattan elevated lines it was something more than 7 per cent on the capitalization. In addition, the new capital furnished by the companies is allowed a preference out of earnings as to interest and sinking fund. Return on the city's investment comes next—and then divisible profits, if any, half to the city and half to the companies. The city after ten years may take over any of the new subway lines, or the additional tracks and extensions of privately owned elevated lines, with their equipment, upon paying stipulated sums representing the company's contribution of cost and a moderate profit, which sums gradually diminish, until at the expiration of the full term of forty-nine years the city gets the property without payment, except for additions to the extent that they have been unamortized. The powers retained by the city over contracts both for construction and operation, over accounting, and over service are as broad as they well could be. The city's ability to enforce the construction and operation of extensions of each system without the imposition of an additional fare is secured, but if done without the operator's concurrence the burden of cost of construction (other than equipment), and any deficits in operation are borne by the city. This is a proper safeguard against reckless extensions.

The significant aspects of the New York contracts, as bearing upon co-operation, are first,

That, as to new construction, the character and mileage were such as to preclude investment of private capital alone, upon the tenure and terms of possession set forth; second,

That the city had not the financial ability alone to carry out the whole undertaking; third,

That any partial efforts toward transit relief by the city to the extent of its available funds could only benefit a portion of the large population; fourth,

That confining municipal privilege and financial assistance to either one of the two important traction corporations would be unjust to the other and to the constituencies served by it; and, fifth,

That by recognizing existing corporate utilities, protecting their earning power as a basis for new credit, enlarging their opportunities for usefulness by grants of new privileges, supplementing their old and proposed facilities by new city-owned lines, and inviting the investment of new capital by reasonable assurance of returns, the city could accomplish more for its people than by any other course, could control for itself the future scope and effectiveness of rapid transit, and could look forward eventually to having a complete system of its own, to operate or lease as it may choose.

"The final test of all these co-operative efforts is not merely the care with which the bargains have been made but the continuance of the co-operative spirit in their carrying out. This spirit is as essential for the corporation as for the municipality."

—*Timothy S. Williams.*

The companies, on the other hand, had much to gain from co-operation. The Interborough, though sacrificing the possibility of adding to its already large and growing profits, was thereby protected against a reduction of existing profits by the creation of competing lines. The Brooklyn company, struggling to serve a large area of rapidly increasing population but unable to do so without additional tracks across the East River and new terminals in Manhattan, rights for which only the city could give, was thereby released from the bonds which restricted its growth, was given the opportunity properly to serve its constituency, and was assured, with greater density of population in its wide areas, of a constantly increasing earning power.

The final test of all these co-operative efforts is not merely the care with which the bargains have been made but the continuance of the co-operative spirit in their carrying out. This spirit is as essential for the corporation as for the municipality. A disposition to evade the terms of contracts, either by the city or the corporation, or to take undue advantage of provisions not duly considered in advance, or of omissions overlooked, may produce a return to the old atmosphere of suspicion and recrimination which is always a great obstacle to effective service. It is quite probable, too, that the working out may reveal conditions not fully comprehended or foreseen by either party, and these must be met and handled with fairness and wisdom.

In contracting with private interests for the furnishing of transportation, the city's chief object should not be the money return to its treasury from its contributed privileges or capital, but the completeness of facilities and service for its people and the requirement of reasonable fares. It is particularly essential, however, unless we drift toward socialism, that where the city contributes its own capital toward the construction of public utilities, as in these contracts which have been cited, the burden of interest and cost should fall on the utility itself and not upon the taxpayers, and that the return from operation should be sufficient to cover such charges. If in addition to such return the city, while commanding generous facilities and service at reasonable fares, can by encouraging prudent management look forward to its participation in profits, applicable to relief of taxation or to other municipal projects, then the perfection of municipal bargaining and administration would seem to have been reached. Herein, however, lies a possible weakness. The officers entrusted with the carrying out of these co-operative contracts are not in all cases in control of municipal administration and policy. In New York they are appointive state officers. The danger is that the desire to please local interests, or to gain temporary political popularity, will preclude that steadfast and intelligent regard for wise and economical action which is most likely to be held by responsible city officers charged with broad municipal powers and obligations.

It seems to me, moreover, essential to the best co-operation on the part of the contracting corporation that there should be the inducement which comes from the possibilities of profits over and above the bare cost of capital. That expectation was the controlling motive which led the Brooklyn Rapid Transit Company to contract with the city of New York. While no such additional profits are possible until full interest and amortization charges on both the city's investment and our own have been earned, and while the period of divisible profits is not likely to begin until some years in the future, the possibilities for growth of business through the territory operated, and the comparatively low company preferentials to be first deducted from the earnings, give promise eventually of large surplus profits in which the city and corporation will share equally. It is of particular importance to the city and to its people that the realization of this expectation should be expedited by wise administrative action, for just as soon as the city's investment becomes self-supporting the government will have a large margin of credit available either for new transportation lines or for other municipal purposes—besides the annual payments of money profits into the city treasury.

Few contracts are safe which are all one-sided. The best and most enduring are those with which both parties are continuingly satisfied. It would seem as if, for a time at least, most of the advantages accruing from the co-operative contracts of the cities which I have mentioned would be with the people of the municipalities. The immediate satisfaction of the corporations is that of taking the choice of possible evils, in indulging in hopes for the future, and in the consciousness of public service. If co-operation proves successful—and profitable—the benefits under these particular contracts ought to be quite evenly distributed between city and corporation. One thing is reasonably assured, namely, that for some time to come there will be no such excess of corporate profits as excites the blustering babble of politicians and invites the attacks of legislators and office-holders.

WHAT MIGHT HAVE HAPPENED TO THE TALENTS

By L. R. NASH

Stone & Webster, Boston, Mass.

THERE was once in ancient days a certain rich man who, according to a parable in Holy Writ, sought relief from business cares by traveling into a far country, even as rich men do in these latter days. As in these days, he called to him his trusted servants and delivered unto them his goods. And unto one he gave five talents, to another two and to another one, to every man according to his several ability, and straightway took his journey. After a long time he returned from foreign lands and called his servants for a reckoning. We are told that he that had received five talents came and brought other five talents; he also that had received two talents had gained two other talents beside them. But he which had received the one talent had been afraid and hid his talent in the earth, so that he brought to his lord only that which had been his.

The respective rewards and punishments of these servants are well known and have been a guide and spur to faithful servants through the ages. Those were days in which anti-trust laws and regulation were unknown, and profits of 100 per cent in a few years were not uncommon. Let us consider what might have been the experience of these servants of ancient days had the present legislative methods and tendencies come into effect during the sojourn of this rich man in the far country, supposedly quite out of touch with his business interests. Let us recast the reports of the servants after the unheralded return of their lord in the light of present-day conditions.

The servant to whom had been given five talents might have reported as follows: "Lord, thou deliveredst unto thy servant five talents; behold he cometh unto thee empty handed. Alas, the tale is one of woe. After thy departure I straightway sought a safe and profitable way to use the talents intrusted to me. Walking in the market place I saw a drove of camels lately arrived from Damascus, laden with rich goods. The owner, who had carried goods to and from Damascus for many years with much profit, had suddenly been gathered to his fathers and the camel train was for sale. Thy servant bought the camels, although paying as much more for the good-will of the business as the camels themselves were worth. The venture proved successful, and later another camel train, carrying to Tyre, was purchased. Later others were added unto them, also storehouses and certain ships sailing from Tyre to other lands. All these uses of thy talents were profitable, particularly after all means of public travel had been bought up, and there was no man to limit the tolls on the burdens carried.

"But it came to pass that certain Publicans looked upon my growing business and declared, 'This man payeth not sufficient tithes into our hands; his storehouses and camels are taxed but he should also pay us from his gains.' And when they searched and learned of my large gains, grievous burdens of taxes were added.

"Then certain of the Scribes gathered together and reasoned among themselves that the carrying of burdens and travelers should not be committed to one man to exact such tolls as he may desire. They found in the books of the law that no man should have divers weights and measures, great and small, in his bag or in his house, which they interpreted to mean that all charges should be reasonable and alike to all. And forthwith they prepared new statutes which placed certain of the Elders over the carrying of burdens to see that just charges were made and that no man paid more than his neighbor. The law further decreed that the carrier of burdens was a servant, worthy of a servant's hire, but that all else belonged to the people whom he served.

"Then a traveler complained of a toll of five shekels, saying that three shekels was more than enough. The Board of Elders, therefore, determined to find what tolls would give a fair return on the property in use. And they valued the camels and equipment; and behold, they found that many of the camels were old and their present value very small, and they knew naught of good-will and cost of establishing the business. And the tolls which they fixed were grievously low.

"And it came to pass that other Scribes, reading the books of the law, found a commandment that no man should covet his neighbor's house, or ox, or ass, or other possessions. And they reasoned from this commandment that one should neither covet his neighbor's business nor acquire it, should it be like unto his own. They, therefore, passed a law further forbidding combinations in trade. Then there arose a magistrate who claimed that thy servant was unlawfully lading and sending forth camel trains in parallel or similar directions and having ships to receive and carry goods and passengers from them to other lands. After due hearing, it was decreed that many camels and ships must pass out of my hands. They were taken from me and are now held by certain wise men for sale to others. What will become of them no man knoweth, for many of the camels are strained and footsore from heavy burdens which they have been carrying.

> **"And they valued the camels and equipment; and behold, they found that many of the camels were old and their present value very small, and they knew naught of good will and cost of establishing the business. And the tolls which they fixed were grievously low."**
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> —*L. R. Nash.*

"Because of this breaking up of my business I found there was no gain from what was left. When the matter of greater tolls was laid before the board of Elders they called together many people to determine what should be done, and a certain Scribe, who had often ridden upon camels, stood forth and proclaimed that there was much waste and mismanagement, yea, that many shekels per day were being lost which might otherwise enrich the carriers. And the Elders gave heed thereto and bade me set my affairs in order and profit thereby. Behold, therefore, the gains and the five talents which were thine have been swallowed up. And the end is not yet."

The rich man was sorrowful, but said, "Surely my other servants have not been entangled by this new and strange doctrine." And he called for him who had received two talents, receiving from him the following account of his stewardship:

"Lord, thou deliveredst unto me two talents with which to trade and bring thee just gains. As I went about the city seeking where I might find opportunities, I saw many water bearers going about the streets with their vessels of water. And they came from many wells outside the gates, selling to whomsoever would buy throughout the city. Thy servant saw that there would be much saving if all people were served regularly by the same bearers from near-by wells. I, therefore, bought many wells and hired the water bearers to go each through certain streets and was soon supplying the whole city with water. And because of the new plan of supply and delivery the gains from the business increased many fold.

"And it came to pass that certain Elders gathered together and reasoned among themselves, saying, 'What manner of man is this that causeth water to be borne to us and by what right doth he use our streets with his bearers?' The scrolls of the city were brought forth, and it was found that the rights granted to many of the old bearers had expired. And the Elders rose up and declared that the streets should not be used without a new writ which should protect the rights of the people. It was thought just that the city should receive half the profits of the business for the right to use its streets. Because there was much property which could not be used for other purposes, and lest there might still be too much gain left, it was decided

> **" 'And thy servant was afraid and went and digged in the earth and hid thy talent. Lo, here thou hast that is thine.'**
> **"And the rich man rose up and fell upon his servant's neck and wept aloud, for, though he had thought himself poor, he was still rich. And he made this servant ruler over all his house and his possessions."**
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> —*L. R. Nash.*

that the city might safely require more than an equal share, perchance 5 per cent more. Now this agreement, which the people approved with great joy and which I had to accept or lose my all, was called a Franchise.

"And a mighty famine arose in the land and no rain fell upon the earth for many days. When the wells became low I ordered the bearers to charge more for water so that there might be less waste and the wells be not emptied. But the city decreed that this should not be, no such provision being in the franchise. So freely did the people continue to demand water that the wells soon became quite empty, and the bearers had naught to sell. Then rose up those in authority and cried, 'Where is this fellow whom we allow to supply us with water. What matters it if no rain falls in our midst and his wells are dry. He is our servant and there is water somewhere in the earth. Let him go forth and dig until he finds it, so that all may drink. We care not what the cost may be, and will cheerfully give up our share of profits, if necessary, until the rain falls again.' And in fear I went forth with many diggers and found a little water here and there many cubits deep in the parched earth. But this did not satisfy the people, who drove me forth again with many men and asses to the distant mountains where some water was found and borne with great labor to the city. Before the rain came again to fill the empty wells all my gains and more had been swallowed up, but being a servant of the people I was required to keep on.

"With plenty of water I began to make up my grievous losses when, behold, there appeared before me one day certain of my bearers and others whom I knew not. The latter declared that they had journeyed far to aid the bearers in gathering themselves together into a band which would consider with me certain grievances and arrange better conditions. I told the strangers that I know them not, and, as for the bearers, any one of them could bring his troubles to me at any time. They replied that henceforth I must deal with all together through their leaders, and that they required less burdensome labor and greater hire; that for many years they had borne the heat and burdens of the day for one penny, but henceforth their wages must be doubled. In vain I pleaded misfortunes and debts. They would work no more at the old wage.

"I went into the marketplace and hired other bearers, but they were stoned and beaten in the streets and became afraid. And when the people received no water they rose up and declared that under my franchise they must be served and demanded that the differences with the bearers be adjusted by public hearing.

"To the board of Elders appointed for the purpose the bearers told their story of poverty, long and patient labor and oppression, and the Elders listened not to my tale of fair treatment and wages and the many men standing all day idle in the marketplace willing to work at the wage I offered, but with no man to hire them. They ordered me to pay the hire demanded even though the business did not yield enough to meet the increasing burdens which had been laid upon it.

"Behold, therefore, thy two talents have been taken by the people and their hirelings, and naught remains but an unprofitable business which must be continued and which no man will buy from me."

And the rich man was exceeding grieved and cast down, his possessions being taken from him under laws he knew not of. Afraid to hear more from his servants, and believing that all was lost, he shut himself in his house to mourn his losses in anguish of spirit.

On the morrow there came unto him the third servant who had received one talent; and when his lord saw him he lifted up his voice and cried: "Tell me not of other statutes and devices whereby this my last talent which I gave into thy hand has been taken away. I can bear its loss, although it is all I had left of my worldly goods, but I can hear no more of devious ways by which I have been despoiled. Spare my thy tale of woe and leave me to my wretchedness."

But the servant tarried and finally spake in this wise:

"Lord, my fathers were numbered among the seers and prophets of their day and generation, and some threads of their mantle have fallen upon me. While I was busy with thy affairs under thy guidance in other years, I heard rumors and murmurings of discontent, tales of poverty, oppression and extortion by the rich. When thou gavest me the talent and took thy journey I saw the handwriting on the wall, saw that people would rise up and demand each his equal share of the world's goods, saw coming confiscation, excessive taxation and oppression of the rich. And thy servant was afraid and went and digged in the earth and hid thy talent. Lo, here thou has that is thine."

And the rich man rose up and fell upon his servant's neck and wept aloud, for, though he had thought himself poor, he was still rich. And he made this servant ruler over all his house and his possessions. Verily now it is written: "Lay not up for yourselves treasures upon earth, for from every one that hath shall be taken away and given unto him that hath not, and he shall have abundance."

PUBLIC UTILITY REGULATION—A CLOUD ON THE HORIZON

By H. H. CROWELL

President Michigan Railway, Grand Rapids, Mich.

WE are beginning to realize that our public utilities should be operated on a plan that is adequate to the continuously growing needs of our communities, that these utilities should develop normally, that the price for the service they render should be reasonable and fair, and that those who furnish the service and those who use the service should receive equal justice. It is quite generally admitted that the speculative, competitive days are practically ended, that destructive competition is economically unsound, that non-regulation of *de facto* local monopolies is unreasonable, and that, in lieu thereof, a trial period of commission regulation is begun.

It has, of course, been generally understood for many years by the furnishers of gas, electric and transportation service that such service was affected with a public interest, but this fact has usually been ignored by the operators and owners of public utilities and likewise, to a considerable extent, neglected by the authorities in so far as the regulation of rates and service was concerned.

Public service commissions have been created in forty-three or more states, and the several legislatures therein have duly delegated to these commissions broad regulating powers over public service corporations coming under their jurisdiction in the matters of rates, capitalization and service. In other words, it appears that the state has practically served notice upon the public service corporations that they must from now on submit to detailed supervision over their operations, that they will be required adequately to serve the public and that they will be permitted to earn, from the commission's viewpoint, but a reasonable rate of return or profit from operations for rendering the service.

During the early speculative period in the development of the public service business, opportunity was had for great success or absolute failure. During this period commercial warfare prevailed to a degree, and the far-sighted and forehanded pioneers who were successful and avoided failure in those trying times really laid the foundation for the present wonderful development in transportation, and in gas and electricity supply. The public now uses and enjoys these highly developed facilities, and the public should freely acknowledge its indebtedness therefor, the present status having been reached at a much earlier date under so-called destructive, non-regulated competition than would have been possible under any other plan.

It is possible, and quite probable, that in many cases the more astute operators were well rewarded for the labor they performed, the risks they took and the service they furnished. The rates of charge were unregulated and were generally based on what the traffic would bear, and the costs of operation were not swelled by constant effort to improve and better the service beyond an average efficiency. However, all the property and property rights created, brought into use and now existing as the net result of past operations, legally and morally belong to the corporations now serving, and such property, under the new plan or scheme of operations, is entitled to fair and just consideration by the regulating powers.

The situation at present facing the public service corporation may be summarized as follows: The rate of return from operations from now on is to be regulated; the profits to be taken from the business are to be fair but not over-large, and the service rendered must be satisfactory to the general public.

This notice to the operators of a limited rate of return is short, sharp and severe and, recognizing the laws of commerce governing the employment of capital, there should be and must be a period of adjustment. Operations must be continued, extensions must be made to satisfy the never-ceasing demands for a better and more adequate service, and, therefore, new capital must be furnished, and the public service corporations must procure this new capital on a basis different from that on which capital was formerly secured, when profits were limited only by the skill of the management and its ability to withstand competition.

It must be admitted that, concurrent with this notion of regulation, in some places there has arisen a clamor that the service in the past has been poor and unsatisfactory, that the obligations resting upon the corporations have been ignored, that excessive profits have been squeezed out of the public by exorbitant rates, and there is prevalent an undercurrent of feeling looking toward a recovery, a spirit of retaliation, a desire to "get even," and the vociferous advocate of the "get-it-back" theory is frequently welcomed and applauded.

Public service commissions which fully grasp the significance of the problems to be solved by them in regulating these public service corporations, will realize that it is more important for a community to be furnished with an adequate and satisfactory service than that there should be a general reduction in the rates of charge for the service. Right here let us call particular attention to this matter of good service. Safe and expeditious transportation, an ample supply of high quality gas, and an ade-

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—*H. H. Crowell.*

quate, well-regulated system of electrical distribution of energy for power and light are now considered necessities in the daily life of every municipality. Why does a municipality grant franchises? A franchise is granted because the municipality desires and expects to receive satisfactory and adequate service from the grantee. That is the reason and purpose of the grant. All artificial and unnecessary burdens should be carefully eliminated from such grants in order that the best service may be had at least cost under prevailing conditions.

The public desire is practically lost sight of and there is an ever-present opportunity to defeat it in the attempt to punish corporations, to hold them down, to hamper their activities and to reduce their rates, thus killing every incentive to give good service, to better the property and enlist more capital.

The first important duty of all public service commissions is to use their every effort toward the building up and betterment of the service rendered by public service corporations. When this has been accomplished and sufficient data have been gathered to give the commissions an accurate understanding of all the costs and the circumstances under which the service is furnished, then and not till then will it be time to move toward a general reduction in rates, if it appears that there is inordinate return from rendering the best service which the state of the art permits and which the public demands. It goes without saying that the time will never come when it would be practical or judicious to reduce rates to such a point that there no longer would be incentive to work for economies or improvements. Public service commissions will fail and "regulation" will fail unless good service is given and the corporations are permitted to make sufficient gains from operation to enlist the employment of the large amounts of additional capital that are immediately needed to make the extensions presently demanded by the communities served.

Public service commissions, when called upon to fix the rates of a public service corporation, are required to determine the amount on which the corporation is entitled to earn a fair return, the fair rate of return under all the circumstances of a given case and also the rate or rates of charge that will enable the corporation to earn such return. The commissions, in such proceedings, are required by court decisions to value the property of a corporation which is rendering the service before fixing the rate of return and rates of charge, and a crucial test of a commission's worth is its ability equitably to fix a present fair value of the property of a public service corporation. This ability to determine values is a strong indication of the usefulness of the commission to the public at large.

There are several theories of valuation, or rather, several methods for arriving at the value of the property of a public service corporation. There is some confusion and necessarily some experimentation in undertaking to determine what is meant by "value" of a public service property. The courts have decided that it is the present fair value of the property of the corporation which must be found, and the courts have indicated what kind of value shall be taken into consideration when arriving at present fair value, but there is no definite mandate as to the weight to be given to each kind of value which finally determines present fair value.

It must be conceded that the property of a public service corporation is private property owned by its stockholders, and should be treated as such up to the point of excessive rates of charge or exorbitant return from operations. In determining present fair value, commissions usually consider original-cost theory of value, continuous-property theory of value, reproduction-cost-new theory of value, and, in part, cost-of-duplicating-the-service theory of value. Each one of these theories furnishes something of worth to the regulating body, either from an ethical or an economic viewpoint, that is of use in determining present fair value. On account of the difficulty of ascertaining original cost, due to the fact that there has been no uniform system of accounting and that the plants have been built piecemeal under various managements, it is exceedingly difficult to obtain a true concept of original cost, and commissions are giving greater weight to the reproduction-cost-new theory of value, modified or guided by such information in regard to original cost as will be helpful.

The tangible property includes structurals at reasonable unit prices for labor and material plus certain legitimately related overhead construction expenses, such as engineering and contingencies, administration, interest and taxes and general contractor's profit. The intangible property includes sacrifices made or incurred in connection with promoting the enterprise, creating the tangible property proper and such values as have accrued or accumulated by reason of undistributed profits or equities earned into the business previous to the period of regulation.

Regarding these intangibles, it is a fact but little known to those who have had no actual experience in the financing and constructing of public utilities that, under the accounting methods practised in the past, but a small portion of the expenditures necessarily made in promoting and establishing public service corporations ever appeared in the corporate books of account. Practically all of the expenditures necessarily incurred, in addition to those expenditures directly related to the physical and structural plant, were represented by certain forms of junior securities and, as capitalization is given but little weight by commissions in rate-fixing proceedings, there is an apparent lack of direct evidence as to the amount and value of such costs and expenditures, and they are many times presented in rate-fixing proceedings in such an indefinite manner as to raise in the minds of investigators a grave doubt as to their actual existence.

The time and expenses of administrators, engineers, lawyers and promoters were devoted to the promotion and creation of the plant and business of the public service corporation. Locations, housings, apparatus and equipment, rights-of-way and distribution systems are not to be had without general supervision. There is need for administrative and executive ability of various kinds for the promotion of the general proposition as distinct from the overhead costs directly relating to construction, and the value or cost of this general supervision generally appears only in the intangibles. Intangible property values are much involved. There are difficulties in arriving at definite standards and in many cases indirect methods must be used properly to determine them.

A list of the principal items of value, generally classed as intangibles, which must be included in the sum total value, will include outgoes consequent upon the acquisition of real estate, plant construction and supervision of the general contractor; also costs in reference to promotion, preliminary general corporate and executive expenses, the securing of state and municipal consents and the development of plant and business, the cost of financing, the going costs during construction and deficits from operations until the time when profitable operations were begun. All these and more should be carefully weighed and determined if the corporation is to receive full credit for past sacrifices made and values accrued in creating the facility whose present fair value is sought.

After issue is joined in a rate-fixing proceeding before a public service commission, under the usual conditions it is but a short time before the burden of proof is shifted from the complainant to the public service corporation, which corporation must then show affirmatively the value of the property it may include and the amount on which a rate of return may be earned; further, that its operating expenses are normal, that its revenues from operations are reasonable and that the per cent rate of return on the property included is not excessive. The complainant is generally not called upon to make a case. On the contrary, the commission will require the company to construct a complete defense to the complaint of unfair rate of return or excessive rates of charge.

It is exceedingly difficult for the corporation, in affirming the value of its property, to demonstrate the full value of its intangibles, and the "cloud on the horizon" is that there is imminent danger of partial confiscation of property on account of mixed reasoning of courts and commissions and inadequate presentation of the case by the corporation. There is generally too much stress laid upon reproduction-cost-new value and too small an allowance made for overhead percentages; there is a general tendency on the part of commissions to eliminate going value and cost of developing the business. There is great difficulty in creating a proper conception of earned or accrued intangible values. The present status of the property, its present value as a going concern and its ability to serve its public economically and adequately is due to, and is the net result of, the trials and operations of the past, the records of which in most cases have never been written. All existing values, tangible and intangible, are the product of past expenditures or past gains from profitable operations as yet undistributed. Full credit should, therefore, be given to all existing property values that may be found and there should be no consideration given to the clamor that certain existing values should be eliminated or ignored, under the theory that they were secured through exorbitant rates of charge, it being clearly shown that there was no regulation of rates in the past and that the public service business then was unregulated and competitive and that the fittest survived. The corporation's claims for intangible values are constantly discounted and the present fair values, as found by commissions, are approaching nearer and nearer to the "bare-bones" value of the plant, and thus partial confiscation is being practised under the guise of regulation.

"This 'cloud on the horizon', * * * will go on if the present tendency to give excessive weight to the reproduction-cost-new theory of valuation continues, unless the corporations more adequately present their side of the case and more conclusively present their claims for intangibles in rate-fixing controversies."

—H. H. Crowell.

The salient facts are these: Public utilities are promoted and there is always direct need for a legal, administrative and technical organization from the first move toward the establishment of the utility to the end of the construction period. The corporation exists, past rates were legal and competitive, the profits were the remainder after operations, which remainder, if any, was partly undistributed and was used for betterments or extensions, and such property, so obtained, must now be duly considered if used to render a needed service.

The best way to arrive at truth is to examine things as they really are, with an open mind, uncolored by fancy. In rate-fixing proceedings, the determining of a reproduction-cost-new value is dependent upon opinion testimony offered by both parties to the controversy. Lately there have ap-

> **"In order to get a square deal from the general public, the public service corporation must let the people it serves know the cost and requirements of good service. * * * In the long run a well-informed public is the safer friend to depend upon."**
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peared a number of self-styled experts who are offering their services for a price for the purpose of assisting the users of any public service to get a lower rate for such service—never to get a just rate. These self-styled experts, admitting their total inexperience in the business of financing, constructing or operating public utilities, will qualify as expert witnesses, engineers and appraisers before commissions and, with a maximum of assurance and a minimum of practical information, swear to values on physical plants which are but a fraction of the existing values based upon any rational theory of value. Then they further unconscionably reduce these values to their lowest terms by the application of some theoretical rule of depreciation. Next, they calmly proceed to lumber up the record with their fanciful ideas as to why this or that intangible value in the property should be neglected or excluded in fixing value as a basis for rates. The commissions are not bound by rules of evidence as to the admission of testimony, and scores of pages of irrelevant, immaterial and incompetent matter dealing with specious theories of social justice, fanciful ethics and economic fallacies are offered by these self-styled experts, making "confusion worse confounded." The testimony of this type of witness apparently weighs as heavily with commissions and referees as does the testimony of duly qualified witnesses called in rebuttal by the public service corporation whose affairs are being investigated. These self-styled experts, practically immune from indictment for perjury, and generally in no danger of suffering in the public esteem even when their testimony is in fact misleading and worthless, place no limit on their tortured estimates of the value of public service corporation property or business. Their veracity has not been formally impeached, they are treated leniently by the public service commissions, and many times are taken seriously and considered as being more reliable and capable than are the witnesses offered by the corporation itself.

Public service corporations have generally failed in the full presentation of their cases in rate-fixing proceedings before public service commissions. Their engineer witnesses are sound and exact in their testimony as to structural values, but a knowledge of the technique of the business does not necessarily presuppose a knowledge of the ethical and economic principles involved. The engineer witness, employed by the corporation on account of his familiarity with the business, lacks the sophistry and plausibility of the self-styled expert whose chief business is to testify as his employer desires (in fact, this is his chief reason for being, and his financial prosperity depends thereon) and to assist with all his ability in the attempt to lower the rates without regard to the ultimate effect on the community or the corporation rendering the service. It appears that witnesses who are thoroughly grounded in material facts regarding structural values and costs of operation are seriously handicapped when they undertake to present overhead theories of value, theories relating to overhead expenses or theories of intangible values. The self-styled experts enlisted in the cause of the complainant, however, can on demand glibly discourse on such matters to the great disadvantage of the corporation. It will make for greater justice and equity for all concerned when these self-styled experts are properly weighed and labeled in the records of every commission before which they appear.

This "cloud on the horizon," this ignoring of intangible values, this partial confiscation of values earned into the property from past operations, will go on if the present tendency to give excessive weight to the reproduction-cost-new theory of valuation continues, unless the corporations more adequately present their side of the case and more conclusively present their claims for intangibles in the rate-fixing controversies that will arise continually from now on. A public service corporation, through its representatives or attorneys, has a perfect right and it is its proper duty to appear openly and frequently before the public service commission in opposition to movements against its interests, and also to propose action that will benefit the company and the community it serves. The corporation does not perform its full duty to its patrons, creditors or owners unless it does so appear and unless it does make needful representations. Every right-minded regulating body will welcome such appearances and suggestions as to service and standards of practice, for, in the end, it is not the public service commission that furnishes the service. The commission must depend upon the management for this and can issue orders if the management does not fulfil its obligations. The majority of the commission personnel are sensible and intelligent enough to separate wheat from chaff, provided the wheat is properly presented to them.

The question is sometimes asked: "Will good service and reasonable rates relieve a public service corporation from serious attack?" The answer must be "No." Good service and reasonable rates will not carry immunity from attack because of the political demagogue who finds an easy road to travel to office when riding a public service corporation.

In order to get a square deal from public service commissions, the public service corporation must make honest, intelligent and persistent effort before them and establish the fact with a commission that it is giving adequate service at reasonable rates.

In order to get a square deal from the general public, the public service corporation must let the people it serves know the cost and requirements of good service, the progress continually being made, the extensions continually going on, the perfection and improvement of its facilities and the reasonableness and equity of its rates and charges.

Public service corporations must frankly acknowledge the obligations of their charters and franchises, that the interests of the public are first, that compensation for service and profit from operations are in the hands of the public or its duly delegated representatives. The public, when rightly informed, will be free to admit, if it accepts the service offered, that it must pay a price commensurate with its value. In the long run a well-informed public is the safer friend to depend upon. Public service corporations go into partnership with the public, and as one thrives so thrives the other. The future credit of the public service corporation and its ability to obtain money for future additions and betterments is contingent upon the protection of its property from political demagogues and from vicious misrepresentation.

Unless this "cloud on the horizon" is dissipated, unless this tendency toward partial confiscation in rate fixing proceedings is curbed and full consideration is given to the intangible values existing in public service corporation properties, and unless the reproduction-cost-new theory of value is supplemented by some element of ethical value, thus promoting substantial equity, then this "cloud" will develop into a storm of financial trouble, disastrous alike to the public service corporations and to the public at large.

ELECTRICAL RAILROADING IN UTAH

By SIMON BAMBERGER

President Salt Lake & Ogden Railway

THERE is nothing of especial encouragement to be written from the average inter-mountain state concerning electric railway development. While the progress in Utah is far beyond the average, it has been but slow.

After the lines are built there is no trouble about patronage. The public is quick to show its appreciation of cleaner travel and more frequent service. But difficulties are encountered in the promotion and construction of electric lines, nothwithstanding the rapid growth of Utah and surrounding states in wealth, population, agriculture and almost every kind of industrial enterprise.

The chief difficulties may be summed up as follows:

1. The keen antagonism of the Goulds and Harriman interests against the development of interurban lines renders it almost impossible to secure outside aid, and it is therefore necessary in the main to build electric roads with local capital.
2. Excessive freight rates are charged by trunk lines between manufacturing centers in the East and points west of the Rocky Mountains, on materials and machinery essential to the construction and operation of electric roads.
3. In many localities trunk lines have built spurs which give infrequent and unsatisfactory service but with the evident aim and the actual result of discouraging the establishment of electric railways and dividing the traffic with those which might be constructed.
4. There is no public utility commission in Utah, although its creation would stimulate the extension of electric railways and other independent lines, as it would offer some protection to such roads when built.

Without some guarantee from the State that their rights are going to be respected and their interests safeguarded against political deals and unlawful combinations men hesitate to invest their capital. A public utilities commission in Utah would aid very materially in the development of her resources.

We have an abundance of water power generating electricity, more fuel than any state of the Union, mining districts and fertile valleys to be reached, produce to be taken from farms and ore to be taken to the smelters—every inducement for the establishment of electric roads, except the guarantee of fair treatment which the State should give.

"Without some guarantee from the State that their rights are going to be respected and their interests safeguarded against political deals and unlawful combinations men hesitate to invest their capital. A public utilities commission in Utah would aid very materially in the development of her resources."

—*Simon Bamberger.*

In this and in other Western states where politics and business seem to mingle and big corporations are able to hold a balance of power, or where abrupt changes in management might follow partisan reversals, public ownership would not seem altogether practicable.

When this comes it will be after the bitterness of party warfare is diluted with deep-seated concern for the public welfare, which will obtain in the Eastern states long before it is felt here.

ELECTRIC RAILWAY SECURITIES AND FRANCHISE READJUSTMENTS

By ALBION E. LANG

Past President American Electric Railway Association

THE relations of the electric railway to the public are so many and varied that to discuss them adequately would require columns of printed matter. A subject of deep concern to many at the present time, however, is the one dealing with the proper treatment of already legally issued securities when the company's franchise expires or when some readjustment of contracts is made between the public authorities and the company. The alteration or the renewal of a franchise invariably involves the lowering of rates, or the assumption of burdens amounting financially to the same thing, and usually forces a readjustment of the outstanding securities. Some assert that the security holder has only himself to blame for being caught under such conditions; that a railway franchise at best is only a permit of limited tenure to use the streets, and that when this franchise expires or the authorities wish to change the terms of it in any way, the security holder must gracefully submit and take whatever is offered him. He knew, or he ought to have known when he acquired his stock or his bonds, that he was purchasing an interest in a hazardous business and that he would have no just cause for complaint if, at the end of the franchise term, the property should be sequestrated with the exception of the value represented by the material as scrap.

> **"Cities are entitled to receive the lowest rates of fare the company can give consistent with good service and future growth and development, but rates should be fixed under a just and fair valuation, calculated to produce exactly these results while at the same time preserving intact the capital already invested. * * * To adopt any other policy now would be not only unfair but also unwise, because it would put what ought to be a most stable business on a hazardous basis, with resulting high interest rates and retarded development."**
>
> —*Albion E. Lang.*

Others, on the contrary, assert that this was not the attitude which could properly be assumed by the investor from previous acts of the state. They fail to see why the property of an electric railway should rest on any more precarious a foundation, as far as its rights at the end of a franchise period are concerned, than that of other public utilities which operate under limited franchises, such as water works, gas and electric lighting plants and even steam railroads, all of which, to a greater or lesser extent, also use the public streets in the operation of their properties. Rate adjustments which have been made by the state with companies of these different kinds have been accompanied by fair treatment, and the investing public has been justified in the past in accepting this fact as an indication of what should follow in the case of electric railways. In general, then, it may be said that in the past this has been the accepted point of view when the securities of street railway companies have been offered by reputable bankers or bond dealers and were issued in due form, and this fact is attested by the low interest rate at which mortgage bonds of electric railway companies in the large cities have been sold.

It is fortunate for the country that this view has been accepted so widely by investors, for it has resulted in the development of our electric railways far beyond similar enterprises in foreign cities and thus has conferred vast benefits in equal measure upon both municipalities and individual citizens. The growth of the communities in particular has been stimulated by the capital invested by the electric railways and the energy with which they have extended their lines to outlying districts. These facts should make a strong appeal to public officials and citizens to protect the electric railway capital investments within their communities. Any course that retards the development of these systems of any city will inevitably be reflected in the growth of the city itself and in its real estate values. No reputable newspaper or well-informed citizen should favor the reduction of rates or an increase in the burdens of an electric railway if the result will be an impairment of its service or development. Cities should receive the lowest rates of fare the company can give consistent with good service and future growth and development, but rates should be fixed under a just and fair valuation, calculated to produce exactly these results while at the same time preserving intact the capital already invested.

Such a policy has already been shown to be the only equitable one to pursue toward the security holders, because it is the one on which the securities were bought, and the city acquiesced in the plan and reaped the benefit of it. To adopt any other policy now would be not only unfair but also unwise, because it would put what ought to be a most stable business on a hazardous basis, with resulting high interest rates and retarded development.

TENDENCIES OF PUBLIC OWNERSHIP, ILLUSTRATED BY FEDERAL EXPERIENCE

By WILLIAM J. CLARK

Manager Traction Department General Electric Company

THE undertaking of business ventures by various forms of government has invariably come through representation to, and arguments made in and before, legislative bodies, to the effect that financial benefits would thus accrue to their respective communities, states or nations, and to the population of these bodies. Disillusion on these theories eventually comes through practical experience, usually too late, however, to remedy the political and economic mistakes thus made. This is because the first result from the inauguration of public ownership is an enormous increase in the total of government employees, as demonstrated wherever public ownership has been extensively undertaken.

What has already occurred in America as regards such increases, and how numerous those now in public employ are, few appreciate, but the "Official Register" of the United States for 1911, which lists those in federal employ for the year 1909, states as follows: "The growth of the 'Register' in size and number of names contained was approximately at the rate of 50 per cent in each decade previous to 1907."

The publication also shows that in the period of two years from 1907 to 1909 this increase was proportionately much greater, as it approximated 21 per cent. It also states that the number of federal employees in 1909 was 370,065. Hence, if the last rate of increase has continued in subsequent years, their total is at present more than 500,000, which is doubtless true.

From the census returns of 1910 it is evident the employees of the states and their minor divisions of civil government now also aggregate more than 500,000. Consequently, the total number of public employees of all kinds in this country is already more than 1,000,000, or approximately one for each fifteen votes cast in the last presidential election, the result of which was decided by a plurality of only 2,173,512.

If the ownership of railroads and other public utilities should be acquired by our various characters of government, an addition of more than 3,000,000 would be made to the total present number of public employees, and one would then exist for each four of our present voting population. What an opportunity would consequently be afforded for the unjust perpetuation of political power and repression of the will of the people not in government employ need not be elaborated, for it is obvious that under such conditions even the referendum would afford a powerful means of assistance to machine politicians in the attainment of their unworthy and dangerous ends.

So, if public ownership were universally adopted in this country, bringing with it the inevitable political situation just outlined, there would never be a departure from it, no matter how unfortunate its results were to the true interests of the country and its citizens.

Let us now turn to another inherent, fundamental feature incident to public ownership.

Unquestionably, that which basically causes and encourages the development of corruption, extravagance and inefficiency of every name and nature in such connection rests in the defects, inaccuracies and misrepresentations of public accounting, the foundation for which is laid by the methods followed in legislative procedure, which alone can bring public ownership in this country. The financial riders to general legislative acts and appropriations made under misleading titles, which are so common in all of our legislative bodies, force such a condition or at least are directly conducive thereto.

> **"The total number of public employees of of all kinds in this country is already more than 1,000,000, or approximately one for each fifteen votes cast in the last presidential election, the result of which was decided by a plurality of only 2,173,512."**
>
> —*William J. Clark.*

These statements can be verified by the citation of innumerable instances where their truth has been demonstrated by experience throughout the civilized world, and volumes could be written upon the details of undesirable resultants therefrom. Time and space, however, prevent the writer from now fully demonstrating this contention through citation of many well-established facts in such regard and force him to limit his efforts in so doing to a brief and only partial description of two situations of our federal government in this respect.

The lessons thus taught, however, will apply, in principle, at least, to any and all forms of public ownership, and they have a direct and important bearing upon what might result from the legislation now pending in Congress, which would provide for the public ownership of all electric railways that are located within or enter the District of Columbia.

"One town with a population of 799, whose post-office receipts are too small to be determined, has an authorization for a post-office building estimated to cost $48,125. Another, whose population is 741 and whose gross receipts are $6,158, has a like appropriation of $60,000. Another, whose population is 836, and whose gross post-office receipts are $5,684, has an appropriation of $50,000."

—*William J. Clark.*

Official publicity has never been given to the fact that federal buildings used for post-office purposes do not cast the slightest burden of investment, with its proper interest charges, upon the Post-office Department, nor does this department pay for the care and maintenance of these buildings. The accounting methods of the Post-office Department and the statements of its net financial results are, therefore, misleading to the extreme, as the investments and expenses just referred to are cared for by Congressional appropriations made to the Treasury Department, and from which no financial return is ever shown.

It is regretted that the combined total number of public buildings partially or entirely used for post-office purposes, and the extent of the financial obligations from which the Post-office Department is relieved by their existence, cannot be readily ascertained. Descriptive of this condition, however, Henry A. Castle, formerly auditor for the United States Post-office Department, has publicly stated as follows:

"The fallacy of calling our postal system self-sustaining, even if on the face of the books and on its present foundation it should fail to show a deficit at the close of some fiscal year, does not occur to casual observers, but it is recognized by all who study the subject. A railway company doing a business of nearly $1,000,000,000 a year, which was required to pay no interest on bonds or dividends on stock, would be a financial phenomenon. It is conceivable that the mail service might be so managed by a corporation as to yield satisfactory results and pay a small dividend, provided it performed no gratuitous services for the government as a condition of its existence. As now managed the Post-office Department has no 'plant' whatever. All it owns in the way of personal property is mail bags, mail locks, letter boxes, carriers' bags, and a few similar inconsequential items of equipment. Even in public buildings it is the tenant of the Treasury Department."

The invariable arguments urged in Congress for the construction of public buildings have, however, been that monetary savings would result to the government from their erection. An official statement of the present Postmaster General also defines the construction of these buildings as an extensive business undertaking. Consequently their erection can be considered as a government owned commercial proposition, from which results of like character have, in fundamental theory at least, been intended and expected, as well as elaborately pictured.

The report of the public buildings commission made to the present Congress throws much light upon true conditions in such regard, and the members of the commission are to be congratulated upon their efforts to eliminate the more serious economic evils, extravagances and incongruities existing in connection with this matter. The patriotic, disinterested stand of the Hon. A. S. Burleson, Postmaster General and a member of this commission, is especially commendable, for the continuance and expansion of the present methods of Congress on appropriations for public buildings would, as already indicated, so operate as to improve the fallacious net showing of his department.

The following directly appears in or is made apparent by the report of the commission:

"There has been authorized for public building sites and construction in twelve years, $163,085,431, an average of $13,590,452 per year."

"The public buildings act, approved March 4, 1913, authorized the expenditure of $41,797,350 for buildings and sites through the Treasury Department."

"In the construction, maintenance and operation of public buildings, the government has entered upon a great business enterprise. For the past three years the average expenditure for sites, construction of buildings, maintenance, operation and all other expenses, was $20,000,000 per year. Of this sum $2,706,754 represents the average expenditure for maintenance, and $3,495,686 represents the average expenditure for operation of buildings. In all of these figures no account is taken of interest on money invested." In subsequent calculations, however, the commission considers the rate of such interest as 3 per cent, which is unquestionably too low in view of the present tendency toward increase in the rates of interest throughout the world, caused principally by war conditions abroad.

"The only limitation now placed upon the authorization of public buildings is the requirement that buildings for post-office purposes only shall not be authorized where post-office receipts have not reached $10,000 per year."

While, as already remarked, a full list of buildings used or authorized for post-office purposes and the particulars in regard to them is not obtainable by the writer, 129 exceptions to, or violations of, the limitation just cited, are alone shown by tabulations contained in the commission's report, entitled: "Buildings Authorized Prior to 1913 but Not Acted on by Nov. 1, 1913." "New Buildings in 1913 Act." "New Sites and Buildings, 1913 Act." "Sites in Act of 1913."

These fall far short of enumerating all existing public buildings used for post-office purposes or which have been provided for. These tabulations, however, give 394 instances where the estimated cost of maintenance, with 3 per cent interest on the cost of public buildings, far exceeds the present rental paid for post-office accommodations in such locations, and in many instances this excess is several times greater than the present rentals paid.

The report remarks upon this feature, that the average rental of 508 post-offices having receipts of $10,000 or more, not now situated in government buildings, was $822, and it estimates the additional annual cost from locating them in government buildings at an average of $2,594 per post-office—this based upon an interest charge of only 3 per cent. Consequently, if this is done, an additional and not easily discoverable annual expense will be incurred by the government of $1,317,752, which would favorably increase by that amount the already fictitious financial showing of the Post-office Department.

The Postmaster General, in supplementing the report of the commission, states as follows:

"Public buildings have been authorized in the past for places where the needs of the government do not now and probably never will require such accommodations. Authorizations have been made for buildings costing more than $50,000 in places where the population is less than 1000. Such buildings would be large enough to house the entire population, and their authorization is indefensible.

"The interest of the government, therefore, requires that a building for post-office purposes only shall not be authorized for any place unless the rental paid for government offices is as much as $1,000 per annum, and then only when either the gross post-office receipts amount to as much as $15,000, or the population as much as 5000."

The tabulations contained in the report of the commission, and previously alluded to, show the following departures from the essentials to their justifiable erection, as defined by the Postmaster General.

Post-offices for which public buildings have or are to be provided, where the rental is less than $1,000........	374
Places where the population is less than 5000.........	319
Places where the gross receipts are less than $15,000...	288

As pointed out by the Postmaster General, such glaring inconsistencies and violation of all reason as these appear in the report of the commission: One town with a population of 799, whose post-office receipts are too small to be determined, has an authorization for a post-office building estimated to cost $48,125. Another, whose population is 741 and whose gross receipts are $6,158, has a like appropriation of $60,000. Another, whose population is 836 and whose gross post-office receipts are $5,684, has an appropriation of $50,000.

Contrasted with these conditions, as is generally known, there are comparatively large cities which have no government owned buildings or appropriations therefor, yet their gross post-office receipts are much greater than those of the offices mentioned.

Results from Federal Supervision of National Forests

Receipts	**$11,967,630.09**
Disbursements	**26,515.040.81**
Deficit*	**$14,547,401.72**

*Not including a total of $2,642,519.38 contributed to states and territories on account of the national forests.

—*Statistics compiled by William J. Clark.*

Great incongruities also exist in the relative cost of public buildings as fixed by congressional appropriations, for the Postmaster General shows such wide variations therein, as from an average of $5 to more than $21.50 per square foot of floor space, and on the estimated number of employees to be cared for ten years hence, ranging from approximately $1,000 to $5,000 each.

It is almost unnecessary to remark that the "Official Report" just quoted from, and the facts which it reveals, evidence the inherent general tendencies of and the results which come from public ownership, as already outlined herein; especially as regards the inaccuracies of government accounting and the easy conversion of expected economic benefits therefrom, into financial burdens which must be borne by the public at large.

TABLE COMPILED FROM OFFICIAL GOVERNMENT RECORDS SHOWING RESULTS FROM FEDERAL SUPERVISION OF NATIONAL FORESTS.

Receipts.	Total Seven Years, 1906 to 1912 inclusive.
Timber sales................................	$5,095,821.91
Timber settlement............................	209,366.83
Timber trespass..............................	319,152.04
Grazing	6,242,279.57
Grazing trespass.............................	22,862.14
Special use..................................	281,603.28
Fire trespass................................	40,593.98
Water power..................................	50,562.98
Total	$12,262,242.73
Refunds	294,612.64
Actual receipts..............................	11,967,630.09
Amounts paid states and territories for roads and schools....................................	$2,606,431.63
Amounts paid Arizona and New Mexico for school fund..................................	36,087.75
Disbursements.	
Salaries	$11,711,486.54
Travel	729,711.14
Rent	189,704.38
Supplies and equipment.......................	460,056.30
Other general expenses.......................	1,737,253.33
Total administration and use.................	$14,828,211.69
Improvement	2,546,551.45
Fire	1,481,160.31
Total on national forests....................	$18,855,923.45
Administration, supervision, inspection, etc., properly chargeable as national forest cost..	$5,491,160.22
Forest investigations........................	2,167,957.14
Total for forest service work................	$26,515,040.81
Actual receipts as above.....................	11,967,630.09
Deficit, not including a total of $2,642,519.38 contributed to states and territories on account of the national forests................	$14,547,410.72

In recent years, both before the public and in the halls of Congress, probably no feature of federal government ownership, other than the Panama Canal, has been so thoroughly discussed or claimed to be of greater immediate economic benefit to the nation as a whole than our national forests.

Resulting therefrom has come a material increase in the number of federal employees.

Whether or not federal accounting in connection therewith reveals all expenses thus incurred is not determinable, but the table on the previous page, prepared from official government records, shows what in accordance therewith have been the recent financial results secured from our national forests.

The two amounts last mentioned have, of course, been paid for out of the general funds of the federal government that had been raised by taxation of some name or nature.

Obviously the undesirable net financial results thus shown need not be elaborated other than perhaps to direct attention to the fact that the salaries directly paid in the service alone aggregate approximately the same amount as its total actual receipts; while in addition, it has cost more than 45 per cent of this amount to administer, supervise and inspect the service.

REGULATION FROM A COMMISSION VIEWPOINT

By WALTER A. SHAW

Commissioner, State Public Utility Commission of Illinois

THE Legislature of the State of Illinois which assembled Jan. 1, 1913, appointed a committee to make a thorough investigation of the laws passed by the various states creating public utilities commissions and the work of these various commissions. The committee, after a thorough investigation, reported in detail on the subject and recommended the passage of a law creating a state public utilities commission. This recommendation was concurred in, and such a law placed on the statute books of the State of Illinois.

The law as passed provided that it should go into effect on Jan. 1, 1914, and that the commission should be composed of five members to be named by the Governor. A few days prior to the day when the law went into effect, the present State Public Utilities Commission was appointed, and on Jan. 2, 1914, assembled and proceeded to organize for business and to carry out the duties imposed upon it. One of its first duties was to establish the nucleus of a working organization to carry out and put into effect the provisions of the law and also to provide an organization sufficient in size to take care of the immediate work and capable of being increased as the demands made upon the commission increased.

As was expected, the first eight months of the life of the commission have been hard, trying months, as the commission was starting with a new and untried organization and a new and untried law, and the demands made upon the commission were varied and many.

At the present time the commission has an efficient organization to cope with the duties imposed upon it, practically all of its work has been completed up to date, and it is in shape to take up promptly and intelligently all demands which are made upon it.

> **"I believed that the public, as a mass, is convinced that as an economic proposition, combination and consolidations of public utilities, if properly managed and governed, should be allowed and will result in a benefit to all."**
>
> —*Walter A. Shaw.*

The commission finds that during the last eight or ten years large combinations have been made, both as to capital and plants for the serving of municipalities and the public in the state of Illinois. The tendency with electric and steam roads, as well as with municipalities, has been to reorganize and arrange themselves into large units. For example, in the city of Chicago, not many years ago, there were several gas companies, several electric companies supplying energy and power, numerous street railway lines serving different sections of the city, and four distinct corporations and lines of elevated railroads acting independently of each other and under different managements. Within recent years, consolidations have been made and approved by the municipality, creating one gas company, one electric company and one unified street railway system, with a universal transfer system covering the entire city, and the elevated railroads are now operating under one management, and a passenger may ride for one fare to any part of Chicago to which the elevated roads extend. As to telephones, Chicago has been, I might say, fortunate in having practically but one system. In years past such cities and municipalities as Evanston, Oak Park, Blue Island, etc., which are suburbs and tributary to the city of Chicago, had independent plants for the furnishing of light, power, heat, transportation, etc. Now, we find that these various corporations and plants have been combined, and in the main, with the exception of transportation, are operated as one company.

Through the State of Illinois, in many localities and municipalities, holding companies have been formed and have purchased the plants in the various cities and localities, and what have heretofore been operated as individual plants are now operated as one unit, the tendency being to abandon many of the individual plants and to supply the energy, as far as possible and practicable, from one central plant, located at a point most advantageous for the serving of the surrounding cities and community. The theory of the combinations has been that great savings can be made in operating expenses, maintenance, etc., as well as great savings as to duplication of plants, distribution systems, appurtenances, etc., by the installation of larger and more economic units whereby the cost of production is greatly reduced. At least this has been the representation to the people, and, in general, the various governmental bodies having jurisdiction have accepted this theory, and have given permission for the forming of such combinations and consolidations. Theoretically, the statement is correct, as it necessarily follows that where there is a duplication of this kind, someone must pay, although temporarily, through competition, the people might obtain those commodities at a less cost; but if there is not a fair return upon a fair value, somebody eventually must lose, and if an analysis is made that somebody will be found to be the public.

I believe that the public, as a mass, is convinced that as an economic proposition, combination and consolidations of public utilities, if properly managed and governed, should be allowed and will result in a benefit to all. The question that now confronts the public is, how shall they be governed? Naturally, in one of two ways: either through the agency of the legislative bodies of the various municipalities or through the agency of the state through a properly organized public utilities commission, exercising the police power which is inherent in the state.

The police power, which is practically the only power for the regulation of utilities, as I have said before, is inherent in the State and remains so unless by an act of the Legislature a municipality has been authorized to make a special contract. Therefore, it naturally follows that the State has the direct power to regulate properly all utilities within the State whether they are owned by holding companies, single corporations or individuals. In the exercise of this power the rights of all parties interested, including the public, should be properly protected.

As between the party investing his capital and the party served, the law provides that capital invested shall receive a fair return for a fair value. Therefore, any state utilities commission, in treating with companies serving the public, must insist that the public shall receive sufficient and adequate service for a fair compensation based upon a fair value of the investment.

> **"Both the public utility corporations and the public ought to receive their legitimate shares in all reductions in the cost of manufacture and distribution of the output of the companies."**
>
> —*Walter A. Shaw.*

One of the first duties which a state public utilities commission owes to its citizens is to see that adequate service is rendered by the corporation serving the public. Hence some of the more important things with which a commission has to deal is the investigation of all legitimate complaints, the adoption of proper rules and regulations and the exercise of a proper supervision of the public utilities through the agency of a service department so that it will know that the utility companies carry out and live up to the rules and regulations adopted and that adequate service is rendered. The commission should also see that proper rates are charged for the service performed, and by this I mean rates which will return to the utility companies a net income, which, after the deduction of all legitimate charges, will be a fair return upon money invested.

These important acts in the regulation of utilities are undertaken by the state utilities commission in the states in which they exist. Where there are no commissions, this regulation is undertaken and performed by City Councils. In Illinois the commission may take up the subject of rates upon complaints filed by associations, individuals, City Councils, etc., or the subject may be taken up by the commission upon its own initiative. The adoption of a proper rate which will give fair return upon a fair value for the property used and needed by the company in serving the public is fixed after a complete investigation by competent experts. In addition to a fair return upon a fair value, the utility company should also be allowed to make its charges for services rendered sufficiently high to take care of maintenance, depreciation, obsolescence, etc.

In making a rate for a large city where the capital invested is large, it often happens that both the company and the city are represented by experts, and it sometimes happens—on account of past grievances between the municipality and the companies—that the object in view is lost sight of by both sides. The people have become prejudiced because of inadequate service given in the past, and in many instances exorbitant rates are charged. Often the utility companies have taken the position that they had a right to charge a rate based on an overcapitalization and to have a return upon a plant in which, for various reasons, the cost of construction has been excessive. In other words, they use all possible excuses to make the rate as high as possible, and they ignore the principle of a fair return based upon a fair value.

After a rate is finally fixed and determined, after thorough investigation and consideration, to be fair both to the public and the capital invested, the corporation may appeal from the findings of the commission. If the corporation honestly believes that it has not been treated fairly and that a fair return is not allowed upon a fair value, it cannot be blamed for resorting to the courts. But it ought to realize the interpretation which will be put upon such action by the public, namely, that it is an attempt on the part of the corporation to gain delay in putting in force a proper rate and the hope that the courts will legalize an exorbitant charge. The company should also take into consideration the tendency of the times, which is the regulation of public utilities by commissions rather than by competition, that regulation by commission is beneficial to the companies because it prevents a waste of capital and that the principle is one which the companies should support. Is not capital short-sighted when it resorts to tricks of law and other means at its command with the object of finally establishing a rate which is not just and reasonable?

If, in the future, the process of rate making by public utilities commissions is handicapped with expensive proceedings before commissions, if methods are employed by the investor that are unjust and unreasonable, and the adjusting of a rate is followed by long and continued fights in the courts, will not the people become disgusted and the method of governing utilities by commissions be a failure? And will it not be a fact that, as a natural consequence, municipal ownership will follow? At present, the people, as a mass, are inclined to believe that the attitude of the corporations before the public is unfair and has been unfair; that the prime object of the corporations is, and has been, to charge rates which are excessive, and that their purpose is to return dividends upon securities that represent little or no value. Why is this? I believe the reason is that in the past many corporations have been unreasonable in their attitude towards the public. Capital has not taken the people into its confidence to the extent that it should. It seems to me to be a fair proposition that the public is the principal and the utility corporation the servant.

Finally, the writer believes that both the public utility corporations and the public ought to receive their legitimate shares in all reductions in the cost of manufacture and distribution of the output of the companies, secured by economical management and by taking advantage of improvements in the art, in machinery, etc. The public can obtain the best results only when there is an inducement to the capital invested in these undertakings which supplies the incentive to maintain and keep the plants strictly up to date and to be continually on the alert to take advantage and adopt the most modern methods known to the art. Utility commissions of various states could well give this thought serious consideration, and possibly much good would result if the various commissions would interchange ideas on this subject.

THE EXPIRING FRANCHISE

By CALVERT TOWNLEY

Assistant to the President Westinghouse Electric & Manufacturing Company

Franchise. A particular privilege conferred by grant from a sovereign or a government and vesting in an individual or individuals a right or privilege conferred by a superior jurisdiction or government and not belonging of common right to the members of the public.—*Webster's Dictionary.*

A STREET railway cannot be operated without a franchise. A street railway is expected to continue in service indefinitely; therefore there never will come a time when its franchise may cease. But the public will neither trust the trolley companies with perpetual franchises, nor will the public trust themselves now to make terms which they are willing should endure beyond a limited term. They know that a franchise will be necessary perpetually, but they believe that only by granting it for a limited term will they be able, at its expiration, to impose on the street railway conditions more favorable to themselves and more onerous to the company than would be acceptable now. Now, confidence begets confidence and distrust engenders distrust. If the public will not trust the street railways it can hardly be expected that the street railways will trust the public.

If the street railway is to be deprived entirely of its power to earn money at the expiration of a fixed period on pain of submitting to unknown burdens at that time, the street railway will only be built now if its projectors can feel reasonably sure of getting their money back, and their profits as well, by the time the franchise expires. If a street railway could be constructed for a fixed sum and thereafter required no additional money, the amortization of its investment in any given period could, of course, be readily calculated. Under these circumstances an estimate could be made in the beginning as to whether there would be sufficient profits from operation to amortize and retire the capital investment at the maturity of the franchise. Unfortunately such is not the case. If anyone were to suggest that the public to-day could properly be served with the street railway construction and equipment common twenty or even ten years ago the proposer would be ridiculed, yet there are apparently many otherwise well-informed people who seem to think that the street railway of to-day will give sufficient and satisfactory service ten or twenty years hence. No one can claim accurately to forecast the future, but judging by the results of the past we shall be within the bounds of reason in saying that in twenty years it will be necessary at least to double the amount of money required to-day to construct an up-to-date street railway system, suitable to give sufficient and satisfactory service in the average American city. As the additional money will be needed in varying amounts from year to year any advance amortization calculation is put entirely out of the question. It might be possible to take sufficient money out of earnings annually to amortize the investment in fifty or forty or, may be, even in twenty-five years, provided no additional money is put into the enterprise. But if this is done, and it will have to be done from year to year if the property is kept up to date, the amortization period for this additional investment becomes shorter and shorter as the time for the expiration of a limited franchise approaches. The result is that toward the end of the franchise period the impossibility of amortizing any additional capital during the short period of life remaining in the franchise will prevent any additional investment in the business, and this will mean impaired service, a dissatisfied public, rows, recriminations, and all sorts of disagreeable occurrences. In the last analysis the blame for this condition cannot be placed on the railway, but squarely rests upon the shoulders of those who originally insisted upon an entirely uneconomical and unworkable term franchise.

The foregoing facts are by this time well known to almost everybody, and the vital question is: What workable arrangement can be made?

I take it that the controlling necessity is suitable transportation facilities. In view of the present public temper it is probably futile to suggest a perpetual franchise. It is equally sure that unless investors believe they will get their money back they will not put it into street railway securities. There is a hazard to this business as there is to every business. In the past it has been developed with great rapidity because along with the hazard went the chance of a considerable profit. If we take away this chance of profit we remove one of the greatest incentives to street railway growth, and that means the retardation of all sorts of civic growth in the communities served by its railways, and no one wants to lose this distinctively American aid to the country's progress. It is easy to point out objections to either the perpetual or the fixed-term franchise. It is by no means so easy to propose a general plan which will avoid these difficulties and objections, but probably the plan which comes nearest to meeting most of the objections from either side is that of a franchise irrevocable for a liberal fixed term, and continuing thereafter under the same terms and conditions until renewed on terms mutually agreed upon or until the municipality elects to purchase the property at its then "fair value." If a municipality refuses to trust a company for longer than a limited term of years it must accept a like refusal on the company's part to trust the municipality. The bargain is made for a fixed term. If the company loses money or if it makes money it should stand the loss or be entitled to the profit, but both it and the municipality should be in the same free and independent positions as regards bargaining rights when a new franchise is to be negociated as when they first made the trade for the original franchise. There must be no duress. This is secured when the municipality is obligated to take the property at its fair value. There can be no honest objections and no commercial hazard in buying a business at its real worth. "Fair value" is a term already pretty clearly defined by the courts. Its meaning will almost certainly be more fully settled as time passes. Something must be left undetermined, and as no one desiring to buy or sell at an "unfair value" has any logical claim to consideration, why not trust the courts to say what really is fair? There is no agency having or likely to retain the confidence of all concerned to any greater degree.

> **"Probably the plan which comes nearest to meeting most of the objections from either side is that of a franchise irrevocable for a liberal fixed term, and continuing thereafter under the same terms and conditions until renewed on terms mutually agreed upon or until the municipality elects to purchase the property at its then 'fair value.'"**
>
> —*Calvert Townley.*

Something certainly must be done. It does no good to rail at the municipalities or to call the companies hard names. Neither franchises nor the much-needed money will be secured by this means.

No plan is perfect; and an obvious objection to the foregoing one is the fact that no one can foretell that capital will continue to be attracted to street railway investments during the next, say, fifty years, even if no additional burdens are imposed on the investor. Security selling is competitive, and it may very well be that the chances for larger returns will be so much better elsewhere that greater inducements than exist at present will have to be offered to secure capital for street railway additions and betterments. However, should that condition arise, those in command at the time will have to face the situation and show the commissions or other regulatory bodies that through increases in rates of fare or by some other means the necessary additional yield must be forthcoming.

CO-OPERATION AND HARMONY BETWEEN COMPANIES, COMMISSIONS AND PUBLIC

By TRAVIS H. WHITNEY

Secretary New York Public Service Commission, First District

IN 1907 the State of New York created two public service commissions for the regulation of gas and electric companies, railroads, street railroads and allied transportation companies. This, with the Wisconsin commission, marked the commencement of so-called strong commissions, that is to say, commissions with power to investigate, to hold hearings, to make orders and to approve franchises, leases and securities. Prior to that time there had been in existence a considerable number of state commissions with mere power to investigate and make recommendations to the companies but without power to make orders. Following the New York and Wisconsin precedents a number of states have since created similar commissions, until now practically every state in the union has a commission of one form or another. Representatives of the companies interposed strong objections to such legislation, alleging infringements of their constitutional rights and predicting constant interference with their internal affairs and disaster to their success if such commissions were created.

> **"One might almost say that the companies and the public have ceased to criticise each other because of the love of criticising a common enemy."**
>
> —*Travis H. Whitney.*

Although in the beginning there was active criticism, first by the companies which alleged a too close supervision by representatives of the public, and second, by the public that there was lack of sufficient supervision, one might almost say that the companies and the public have ceased to criticise each other because of the love of criticising a common enemy. Due to the great growth of public opinion and the change of attitude of the corporation officials towards the public the commissions are now the means of co-operation between the public and the companies, the value of which is recognized by both.

The Public Service Commission for the First District of New York has jurisdiction within the city of New York, and the commission for the Second District over the remainder of the State. The companies within the jurisdiction of the former, of which I can speak more particularly, do about 20 per cent of the entire business of the country within their respective fields. The exactions of the enormous population concentrated within this small area are constant and require prompt attention. The average state commission deals largely with freight rates and freight service. This commission has chiefly questions of the adequacy of passenger service on urban lines, street, elevated and subway. The receivership and reorganization of the largest street car system in the city, as well as the various gas and electric rate cases, have required the appraisal of approximately $300,000,000 worth of corporation property. Such appraisals have been detailed and thorough. The commission has continued its work to the best of its ability and the present indication is that the commissions are permanent institutions and that the forthcoming constitutional convention will include them as constitutional offices with a broad grant of power.

It is not my desire, however, to give any detailed review of the work of the commission, but in a very general way to indicate what is perhaps the most important future field of regulation work. Public service corporations are under the affirmative duty (imposed not only by statutory law but by the common law) of rendering adequate service at reasonable rates with safe and adequate equipment. To see that they complied with these duties the commission received the following general powers:

1. To order adequate service.
2. To order safe and proper equipment.
3. To order reasonable rates.
4. To prescribe uniform systems of accounts.
5. To require periodic and other reports.
6. To approve securities.
7. To approve franchises and leases.
8. To investigate.

The first three indicate the results expected by the public. The other powers are given as means to secure such results.

If the duty of rendering adequate service at reasonable rates with safe and proper equipment is to amount to anything standards must be established by superior public authority; such standards must be uniform for similar classes. In my opinion this constitutes the chief field for future regulatory work, namely, the establishment and necessary gradual modification of uniform standards, inspection and supervision to secure compliance and finally publicity to the resulting reports. Effective regulation is dependent upon faithful performance by the commissions of these duties.

The Interstate Commerce Commission long ago prescribed a uniform system of accounts for steam railroads. This is the basis for similar uniform systems of accounts for steam, electric and other public service corporations, modified for the various classes and sizes of corporations. The form of annual report prescribed by the Interstate Commerce Commission and based upon the uniform system of accounts has likewise been the basis for periodic reports required of other corporations. The First District commission has found it necessary to make various modifications in these systems and reports to meet the conditions within its jurisdiction. In the way of reports it requires annual, quarterly and monthly statements and, with respect to certain phases of operation, daily reports. Prompt and adequate publicity is given to such reports or to summaries thereof by the issuance of bulletins to the press and to individuals who are interested in having them.

If corporations of a similar class are required to keep their accounts in accordance with a uniform system and to make frequent reports, and if publicity is given to such reports there will be in the hands of prospective investors such adequate information with respect to the corporations in question that the market price of securities will be a true index to the real value of the property of such corporations. As a consequence the mere approval of the issuance of stocks and bonds becomes relatively unimportant, although the retention of such approval would seem to be wise in order to keep in the hands of the commission a further occasion for the checking or rechecking of the methods by which a company is complying with the requirements of the commission with respect to its accounts and property. For example, at the present time various corporations in New York City which have made additions to property are keeping the commission fully informed with respect to such work in order that the commission's engineers may examine work during its progress and pass upon the bills as they are paid. When such companies subsequently apply for approval of bonds to pay for such permanent additions the work of investigation will have already been done and the matter of approval is to that extent routine but nevertheless important.

If accounts are kept in a manner prescribed, including allowances for depreciation and other accounts so often neglected in the past, the operating men can more adequately maintain and operate their equipment and service. To aid in this, the commission has prescribed standards for such matters as fenders and wheelguards, ventilation, brakes and protection for employees of electrical companies. In the matter of equipment it requires companies to submit plans and specifications of rolling stock about to be purchased in order that suggestions of possible improvements may be made. Orders respecting electric railway service have been made in which continuing standards are attempted, that is to say, that cars must be run either to the physical maximum of the line or sufficient to have the seats equal the number of passengers within a limited period, such as ten or fifteen minutes.

"In my opinion, this constitutes the chief field for future regulatory work, namely, the establishment and necessary gradual modification of uniform standards, inspection and supervision to secure compliance and finally publicity to the resulting reports. Effective regulation is dependent upon faithful performance by the commissions of these duties."

—*Travis H. Whitney.*

In the beginning it was apparently the general idea that the commission was a great tribunal to redress every complaint that might be made. The very name "Public Service Commission" denoted a commission for the benefit of the "public service." One day a man came to the office to dictate and have typewritten his answers to certain inquiries he had received. He was indignant when a stenographer was not placed at his disposal, for as he said he understood that this was a "public service" commission.

Pertinent complaints are received and have a prompt hearing and disposition, but, after all, complaints, if well founded, arise from defects and deficiencies of equipment, operation or management. Complaints are sporadic and therefore do not furnish sufficient evidence for thorough improvement. Orders made only as the result of complaints are like new shingles in an old roof. Careful and patient study of conditions antecedent to the establishment of standards and compliance therewith produces a thoroughgoing improvement—a new roof with no opportunity for leaks.

Finally, nothing succeeds like publicity, telling the patrons of the difficulties, showing them the machinery by which service is rendered to them, asking their co-operation and improving conditions. One of the most important phases of present-day attitude is the readiness and anxiety that the public shall have full knowledge and shall understand. In my opinion the commissions have been of immense aid in securing this attitude, that is to say, the readiness of the commissions to be a tribunal for the disclosure and publicity of grievances has accelerated a desire to forestall the embarrassments of commission or even legislative investigation by a straightforward "appeal to the people." Much remains to be done in the way of more complete publicity by public service corporations for the benefit of investors, patrons and the public. But the period of co-operation and harmony as between the companies and the commission and the public has begun. The work of the commissions has been of immense aid in this and should not be hampered. Legislatures should not plan laws infringing on the powers of the commissions. The companies should not try to throttle the impartial and energetic attitude of the commissions.

PROPOSED CO-OPERATIVE ARRANGEMENT AT PHILADELPHIA

By A. MERRITT TAYLOR

Director Department of City Transit, City of Philadelphia

PROLONGED conferences between the Department of City Transit (city of Philadelphia) and the management of the Philadelphia Rapid Transit Company have resulted in the submission by the conferees of a program for rapid transit development with universal free transfers.

The salient features of the program are as follows:

The program provides for a total investment of approvimately $63,000,000 in the transit development, of which about $45,500,000 would be invested by the city in building the subway and elevated lines (which the city would own), about $12,000,000 would be provided by the Philadelphia Rapid Transit Company for the equipment of the municipally owned lines, and about $6,000,000 would be provided for the Rapid Transit Company by outside interests in constructing the Camden tube. The Philadelphia Rapid Transit Company, as operator, would be allowed to deduct from the earnings of the municipally-owned lines 6 per cent on the cost of the equipment supplied therefor, and, after ten years, an additional 1 per cent on the cost of equipment, which would be deposited in the fund to be accumulated toward the amortization of that cost, and that fund would be available to the city in paying for and taking over the equipment at the end of fifty years.

The company would also be protected to a reasonable extent against such decrease in the net income of the company-owned lines (except the Camden tube) as would result solely from the diversion of such normal net income as may have been gained by the company prior to the opening of the municipally-owned line or lines, by the preferential payment, the necessity for which it is calculated would be eliminated by the normal growth of the company's business within a few years after the opening of the municipally-owned high-speed lines.

From any preferential payment due to the company out of the earnings of the high-speed lines there would be deducted:

1. The net income resulting from the operation of the Camden tube.
2. The difference between the interest rate paid by the company and the amount allowed, namely, 6 per cent on operator's equipment investment.
3. The rental paid for the temporary use of the Market Street Subway-Elevated line, between Thirtieth and Market Streets and Front and Arch Streets, by the Frankford-Darby line, until the Chestnut Street Subway is required.

Subject to these prior deductions, the city would receive all interest and sinking fund payments accruing on the city's investment, before any further division of earnings would be made to the Philadelphia Rapid Transit Company.

Upon the city being paid its interest and sinking fund accruals on the city's investment in full, any remaining annual surplus resulting from the operation of the city-built lines would be divided between the city and the company in proportion to their relative investment therein (Market Street Subway investment excluded).

Thus the city gains the advantage of these items as credits on any preferential payments and also, in calculating the preferential which protects the company, gains the advantage of any economies or savings which the company is enabled to accomplish in engaging in this co-operative program.

> **"The program, as a whole, assures to the people of Philadelphia a splendid modern rapid transit system, operated in conjunction with the existing lines as one great unit, in a manner which will render the public the greatest service at a minimum reasonable cost."**
>
> —*A. Merritt Taylor.*

The program further provides for the operation of the existing and new transit facilities of the city as a unit, in such manner as will best serve the public, including the elimination of all exchange tickets; and further, for the issuing of free transfers wherever surface lines intersect high-speed lines (city's and company's—Camden tube excepted) at station points, and at all points of intersection between high-speed lines (Camden Tube excepted). The intent of this provision is to make all high-speed lines (city's and company's) available as a link in a complete journey in a forward direction between any two points within the city for one 5-cent fare.

All exchange tickets on the existing system would be eliminated outside of the district bounded by Arch and Walnut Streets (both inclusive) and the two rivers, on Jan. 1, 1916, after which one free transfer would be allowed outside of that district to each passenger using the company's surface lines at all points of intersection. On Jan. 1, 1920, the remaining exchange tickets would be eliminated, and one free transfer would be allowed to each passenger using the company's surface lines at all points of intersection within the city of Philadelphia.

Upon the elimination of all exchange tickets outside of the district bounded by Arch and Walnut Streets (both inclusive) and the two rivers, on Jan. 1, 1916, a passenger would be enabled to reach any point in that district by taking a line running east and west, either north of the district or south of the district, and by transferring free to the north and south line leading to the point in the delivery district which the passenger wishes to reach. The effect of this arrangement is to give the people a free transfer to the delivery district, subject only to such restrictions as are necessary to avoid the serious overloading of the east and west lines in the delivery district before the city has time to build the Subway Delivery Loop to relieve such congestion as would otherwise result.

In consideration of the elimination by the company of exchange tickets on the existing system and the substitution of free transfers therefor, as above provided, the city would agree to release the company from the payment of the tax now paid upon dividends of subsidiary company stocks, as provided by ordinance, in the amount of approximately $116,000 per annum for a period of six years only, or a total amount of approximately $696,000. The city would also surrender to the company the accrual in the sinking fund (established under the contract of 1907 between the city and company to amortize the company's capital stock) and permit the company to postpone future payments into the sinking fund for ten years from July 1, 1914. The sinking fund payments so surrendered and postponed are to be made up by such larger annual payments by the company, after the aforesaid ten years, as will be required to produce the same amount in the sinking fund at the expiration of the 1907 contract extended for seven years, as would, with interest included, have been produced by the original sinking fund payment at the end of the fifty-year term.

Thus the city pays only $696,000, as above stated, in consideration of the elimination of all exchange tickets and the issuance of free transfers at all points, as already described.

It is further provided that ultimately, when the Market Street Subway becomes overloaded (which will not be for many years) and when the city builds the Chestnut Street Subway at that time, or other delivery facilities or connections to the Frankford and Darby lines, or when the city builds any additional rapid transit lines or extensions, the city would have the right to require the company to equip and operate such lines on the basis prescribed.

The city would further have the right to require the company to extend its present surface system from time to time, as such extensions are reasonably justified.

> **"It provides that the city is to own the new facilities and all their future net earnings excepting such reasonable payments as are allowed the operator, including 6 per cent on operator's investment."**
>
> —*A. Merritt Taylor.*

In making the proposed extension of the present contract between the city and the company for seven years beyond the present term thereof, in order that longer term bonds may be issued by the company for its financing, the interests of the city are safeguarded by providing that after the present fifty-year term expires all surplus earnings on the stock of the Philadelphia Rapid Transit Company in excess of 6 per cent on the par value shall be turned over to the city.

Provision also has been made for both city and company to capitalize practically all of the interest and sinking fund payments accruing on their investments during construction and during the first year of operation, so that such payments would not be a burden to the taxpayers of Philadelphia. This is the method pursued in many great constructive enterprises, and provision therefor is made in the proposed amendment of the state constitution now in process of adoption.

In consideration of the Philadelphia Rapid Transit Company allowing the use of its present Market Street Subway-Elevated line for the through-routing of Frankford-Darby trains, the city would allow the company a rental out of the earnings of the high-speed line for the use of this subway-elevated line, but that rental would be limited to such proportion of the fixed charges accruing against that portion of the structure of the Philadelphia Rapid Transit Company which is used by the Frankford-Darby line as shall bear the same proportion to the whole fixed charge on that portion of such structure as the proportion of car miles operated by the Frankford-Darby trains through that portion of the subway bears to the car mileage of all trains operated through that portion of the subway. The fixed charge against the operation of that portion of the subway which is used for surface cars is not included in the calculation.

The 1907 contract between the city and the company provides that "The company shall not declare or pay any dividends to its stockholders beyond a return of 6 per cent per annum, cumulative from Jan. 1, 1907, on the actual amounts of capital paid into the treasury in cash, calculated from the date of the several payments, without at the same time appropriating from earnings and surplus and paying into the city treasury a sum equal to that portion of the total dividend which is in excess of the said 6 per cent return, so that the city shall share with the stockholders equally in all net earnings properly distributable as dividends over and beyond a return of 6 per cent per annum, cumulative

"The cost will be slight, and furthermore the cost will be more than completely and generously offset by the 1-mill tax on personal property which has been turned over by the State to the city as a practical subsidy in the aid of transit developments, by the great increase in property values and therefore in tax returns which will accrue to the city treasury, and by the cancellation of the present exchange ticket charge on the public of $800,000 per annum, which amount would have increased from year to year. * * * The city's growth will be accelerated. The efficiency of the population will be increased by time saved, which, capitalized on the basis of 15 cents per hour, would amount to upwards of $38,000,000."

—*A. Merritt Taylor.*

from Jan. 1, 1907, upon the paid-in capital stock of the company."

As the company has not paid any dividends on its stock since Jan. 1, 1907, and under the 1907 contract is entitled to 6 per cent dividends from that date, before sharing one-half of the profits with the city, a large amount of back dividends, amounting to about 42 per cent, or $12,000,000, would have to be paid to the Philadelphia Rapid Transit Company stockholders out of any future net income of the company, in addition to 6 per cent after this time on the par value of their stock, before the city could hope to have any return from the company's present system.

The program provides that all dividends accrued on the Philadelphia Rapid Transit stock, up to Dec. 31, 1914, shall be waived and cancelled, thereby cancelling what is equivalent to a $12,000,000 obligation of the Philadelphia Rapid Transit Company to its stockholders, which would otherwise have to be liquidated before the city could share in the profits above 6 per cent on the company's capital stock and which result from the company's own operations.

The program also provides that the Department of City Transit shall have free access at all times to the books, accounts and records of the company and the right to audit the same. This is in addition to the present provision in the 1907 contract, which gives the city comptroller the right to audit the company's books.

It is provided in the program that the Union Traction Company and the Market Street Elevated Passenger Railway Company will become parties to and be bound by the terms of the program.

It is contemplated that the company shall forthwith make such changes in its routes and lines as will enable it to take advantage of the economies which may be gained by the substitution of free transfers for exchange tickets. This means that such people as are now carried by indirect routes (which are so arranged for the protection of the company's exchange ticket business) will be carried more directly than heretofore to destination for 5 cents instead of for an 8-cent fare.

The Union Traction Company will be expected to aid in securing only such funds as will be required for the normal extension of the existing surface system, the requirements for which will be greatly lessened by the establishment of the new high-speed lines.

The program, as a whole, assures to the people of Philadelphia a splendid modern rapid transit system, operated in conjunction with the existing lines as one great unit, in a manner which will render the public the greatest service at a minimum reasonable cost.

It provides that the city is to own the new facilities and all their future net earnings excepting such reasonable payments as are allowed the operator, including 6 per cent on the operator's investment.

It assures to the city and the people the added prosperity and comfort which every such great constructive enterprise and added convenience brings; the cost will be slight, and furthermore the cost will be more than completely and generously offset by the 1-mill tax on personal property which has been turned over by the State to the city as a practical subsidy in the aid of transit development, by the great increase in property values and therefore in tax returns which will accrue to the city treasury, and by the cancellation of the present exchange ticket charge on the public of $800,000 per annum, which amount would have increased from year to year.

The indirect advantages must not be overlooked. Present and ever-increasing congestion will be eliminated. The city's growth will be accelerated. The efficiency of the population will be increased by time saved, which capitalized on the basis of 15 cents per hour at 5 per cent, would amount to upwards of $38,000,000. The city's areas available for development will be so enlarged as to make comfortable and economical homes readily available to all, and undue congestion of population will be prevented.

There has been a great world-wide awakening to the view that communities must collectively, for the good of all, undertake wider spheres of service, and that the community itself should retain, to a greater degree, the unearned increment in values which is created by the concentration of its own population and by its own activities. In Philadelphia there is an undoubted urgent need for additional and better transportation facilities. Private interests cannot handle this proposition without municipal aid. No one can reasonably doubt that the comprehensive transportation system proposed will in time develop ample direct earning capacity, not only to carry itself but actually to relieve taxation for other purposes.

PUBLIC VERSUS PRIVATE OWNERSHIP

By WILLIAM D. KERR

Director Bureau of Public Service Economics

THE function of a public utility is a public one.[1] The establishment of regulating commissions and the acceptance by public utilities of the principle of regulation give recognition to the public nature of the function. Commission regulation is an attempt to provide safeguards without which the performance of public duties could not be entrusted to private hands. Regulation is one of the alternatives so clearly set forth in the following language in the report of the National Civic Federation Commission on "Public Ownership and Operation":

"First, we wish to emphasize the fact that the public utilities studied are so constituted that it is impossible for them to be regulated by competition. Therefore they must be controlled and regulated by the government or they must be left to do as they please or they must be operated by the public. There is no other course. None of us is in favor of leaving them to their own will, and the question is whether it is better to regulate or to operate."

We make no secret of our belief in the ability of private organization and private capital to meet every fair test of approval in the contest with public ownership. The burden of proof, however, rests on private organization. Apparently this is an inevitable consequence of the responsibility that attaches to the possession of power. Philosophically and practically it must be conceded, however, that *prima facie* public functions should be discharged by the public and not by private organizations. In its attitude toward regulation, and particularly rate regulation, private organization has its most favorable opportunity to overcome this presumption.

An element of certainty has come into the regulation of public service rates which a decade ago did not exist. The uncertain or indefinite factors of the equation have been largely eliminated. To representatives of the public, at least, the economics in general of public utility services are known in all their manifold intricacies. This was not the case when regulation began to be practised on a large scale. It was not the case when the courts began their difficult struggle with legislative rights of interference and with principles of valuation. Practical limitations of knowledge and experience are fairly well understood regarding construction costs, operating expenses, depreciation requirements, service economics and margins of profit. In practical discussions the available data are not always used, or they are abused, but the foregoing statement applies to the representative public service commissions. Practically the sole factor of downright uncertainty in the whole situation is property and its value.

This uncertainty as to the limitations of value, as will later appear, seems an inevitable result of the very nature of that which is known as value. Not only, however, is this thing called value, for the protection of which the courts have thrown a mantle against legislative interference, a factor indefinite in itself, but with the clarification of the other factors in rate making it has become the residuary legatee of the animus engendered by the questioning of supposed vested rights. Value and the principles governing its determination are the fortifications before which promises to be fought the last great battle between public and private ownership.

> **"Value and the principles governing its determination are the fortifications before which promises to be fought the last great battle between public and private ownership."**
>
> —*William D. Kerr.*

The value of property employed by private agencies of public service is the most important limitation on legislative rate-fixing powers. Protected by the courts under constitutional limitations property is alike the citadel of entrenched monopoly and the *bête noir* of overzealous champions of supposed public rights. The resulting situation as presented in countless cases before administrative bodies and courts suggests one of these three conclusions:

1. Rules resulting in under-valuation throttle private initiative and leave the field to public ownership.
2. Rules resulting in over-valuation throttle legislative action, nullify regulation and encourage recourse to public ownership.
3. Fair rules of valuation impose on the public burdens not appreciably greater under all the circumstances and in the long run than would be experienced under public ownership.

The effect of under-valuation is self-evident. Neither flattery, nor cajolery, nor injunction of law will prevail to induce capital to enlist in a known losing cause. If the rules of value claimed in isolated cases were the established rules of the land,

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[1] "A railroad is a public highway and none the less so because constructed and maintained through the agency of a corporation deriving its existence and powers from the state. Such a corporation was created for public purposes. It performs a function of the state." Smythe vs. Ames, 169 U. S. 466, 544. See also Snell vs. Clinton Electric Light Company, 196, Ill., 626; San Diego Water Company vs. San Diego, 118 Cal. 556.

"If the rules of value claimed in isolated cases were the established rules of the land, private building would stop instantly and a wild scramble would ensue to save as much as possible of existing investments. On the other hand it needs no argument to demonstrate that rules which effect overvaluation will lead speedily to public ownership. In no other way can the public protect itself."

—*William D. Kerr.*

private building would stop instantly and a wild scramble would ensue to save as much as possible of existing investments.[2]

On the other hand it needs no argument to demonstrate that rules which effect over-valuation will lead speedily to public ownership. In no other way can the public protect itself.[3]

The Supreme Court of the United States saved the country from the curse of immediate government ownership of railroads by discarding emphatically and completely the rule of railroad right-of-way and terminal land value advanced by the railroads and approved by the trial court in the Minnesota rate case.

Fair value is not value but equity. It is a reduction to a common denominator of all the multifarious, divergent and sometimes seemingly inconsistent factors entering into relations between the public and the private agencies. Value as an economic conception is a comparative measure of exchange worth. In rate regulation there is neither occasion for comparison nor effort to exchange. Application of the economic conception would defeat the purpose, as value depends on return and return depends on rates. Rate regulation presents not a hypothetical case for the application of abstract theories as to value but a practical case for the determination of fundamental equities. Every case must stand on its own feet and be decided on its merits. The extreme caution with which the Supreme Court has treated valuation questions raised in litigated cases would seem to indicate recognition by the Court that rules applicable alike to all cases do not exist. The only infallible rule is the one of equity and good conscience propounded by the learned Lord Mansfield. The determination of value that will enjoy permanence is the one that appeals to the reason, judgment and good conscience of the layman.

The contest between public and private ownership is not to be decided on "authority." Authority, as such, is no more infallible than the men who made it. It is characteristic of modern times to discard authority as such in all the realms of the mind—religious, economic, social and political. The administration of the law has suffered in the opinions of many by its too rigid adherence to authority. Progressivism, if it means anything at all, means conscious movement toward the highest known conception of justice. Any material deviation to one side or the other from a just conception of value under the circumstances of each particular case widens the breach between public and private ownership and hastens the progress of the former. Equity seeks the substance, not the form.

If these observations in a measure are correct they counsel recognition and application of the following definite policies:

1. Moderation and fairness in valuation claims made to commissions and courts. Immoderation tends to produce immoderation and not "judicial fairness."[4]

2. Excessive care on the part of commissions and courts to do equity according to the circumstances of cases as they arise.

3. Removal, certain even though gradual, by corporations on their own initiative, of causes, just or unjust, which lead to the supposed necessity of making extravagant claims of value when confronted by rate revision. This, it will soon be recognized, is a duty of management to stockholders second not even to the economical and efficient administration of the physical property.[5]

Finally, let it be observed that while natural economic laws conduce to monopoly in the supply of public services, there is no monopoly of agencies for the rendering of the services. Public ownership is everywhere a potential if not an actual competitor of private. The general administrative inefficiency of public ownership under normally existing conditions alone in most cases has sufficed to hold the balance for private ownership and may continue for some time to do so. Actual safety, however, lies only in the squaring of values with the fact. In this connection it is important to remember that individual establishments in the several industries are so related sentimentally in the public mind that unsatisfactory conditions found to exist in one establishment are likely to be attributed to all. The wise conduct of each is the concern of all.

The ultimate verdict lies with the public. The testimony on which strongest reliance is placed is the conduct of private corporate enterprises. The psychology of salesmanship forbids detraction of a competitor's wares and lays emphasis on convincing the customer of the essential merit of one's own goods. Private enterprise in the furnishing of public services has a product to sell composed of high efficiency and the economical combination in practice of the factors of production. To win and hold success, however, it must make buyers for its product to-day, to-morrow and every day.

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[2] See report of committee on District of Columbia of the House of Representatives on bill for condemnation of Washington street railways, in which bare structural cost is advanced as the exclusive rule of value.

[3] See report and attached papers, with discussions thereof, of committee on railroad taxes and plans for ascertaining fair valuation of railroad property of the National Association of Railway Commissioners in Proceedings of 1913 Convention, page 259 *et seq.*

[4] "It is my singular experience that in no case brought to my attention has the utility before the commission failed as a result of the activity of its sworn experts, to justify rates as high, and usually higher, than those which had voluntarily been accorded. Certainly this is a tribute to the generosity of those in charge of utilities beyond the generosity of the rest of us, and a demonstration that all expense and time expended in the regulation of monopolies is worse than wasted." Commissioner Eshleman in concurring opinion in Town of Antioch vs. Pacific Gas & Electric Company, Case No. 400, decided July 6, 1914, by Railroad Commission of California, page 55.

[5] See *Re* Capital Account of Brooklyn Borough Gas Company, V Reports of Decisions of the Public Service Commission, First District, New York, 203, in which an agreement was reached whereby a plan was placed in execution for amortizing the excess of the company's capitalization above the fair value of the property.

STOCK DIVIDENDS; WHY AND WHEN JUSTIFIED

By PHILANDER BETTS

Chief Engineer Board of Public Utility Commissioners of New Jersey

A DISCUSSION of this subject appears to be desirable, because of the applications which have been made for such approval by the public utility commissions. At the outset, it should be stated that the opinions here expressed have been formulated by the writer in his position as chief engineer of the New Jersey Public Utility Commission. They have, however, up to the present time met with the approval of the commission to such an extent that all actions so far taken have been along the lines herein discussed.

The desirability of discussing this subject at this time is due to the fact that in the minds of many persons there appear to be two bases upon which such issues are justified. The first is the assumption that where moneys from earnings have been expended in connection with extensions and additions to the permanent plant of a company, the later capitalization of such extensions is justified up to the full cost of such extensions. This does not take into account the requirement that various items should be amortized from earnings. These items include bond discount, extraordinary organization expenses, most of the intangibles, accrued depreciation, etc.

The second basis on which stock dividends are justified is that a property now has a value in excess of the outstanding capitalization. This basis does take into account the amortization of all such items which ordinarily result in a situation where the outstanding capitalization exceeds the value of the property represented by it.

Up to the present time there have been before the New Jersey Commission seven applications for approvals of issues of stock for the purpose of distribution as dividends. Of these seven applications, two have not yet been acted on; one was disapproved, and four have been approved.

The first application which came before the commission was that of a gas company operating in southern New Jersey. The financial history of this company had been so well preserved that a complete analysis was readily made. This analysis is illustrative of the various elements which should be considered in passing upon the justification for the declaration by a company of a stock dividend.

This company built its plant in 1857 and furnishes gas exclusively entirely within a city having a population of about 19,000. The financial history shows that in the period from 1857 to 1870 the plant increased in value from $21,000 to $34,700, the average value during the period having been $22,730. During this period the dividends amounted to $14,230, or 4.9 per cent on the investment. In addition about $160 was invested in the plant from surplus earnings. This statement shows that on the basis of a 5 per cent return the cost of building up the business, including all deficits and lack of early profits, had been made up by the year 1870. Up to 1870 the capitalization of the plant kept pace with the actual cost of the plant.

Table I shows the amount of surplus earnings invested in the plant.

TABLE I—SHOWING SURPLUS EARNINGS INVESTED IN PLANT

Surplus earnings invested in plant, 1870.........	$169.35
Surplus earnings invested in plant, 1870-1875....	7,620.50
Surplus earnings invested in plant, 1875-1880....	9,083.97
Surplus earnings invested in plant, 1880-1882....	6,271.17
Surplus earnings invested in plant, 1882-1887....	6,080.84
Surplus earnings invested in plant, 1887-1892....	17,859.38
Surplus earnings invested in plant, 1892-1908....	95,037.32
Surplus earnings invested in plant, 1908-1912....	28,788.55
Total	$170,893.08

The par value of the capital stock outstanding in 1870 was $31,040, and no stock was issued from that time up to 1912. In 1870 there were loans outstanding to the value of $3,500, making a total capitalization in 1870 of $34,540. Standing for this, there was a plant which had cost $34,699.35.

Table II shows the cost of the plant at the beginning of each of the periods; the average cost of the plant during each period, which is also taken as the average capital invested in plant; the dividends paid during each period; the surplus earnings invested in the plant; the total net earnings during each period, and the ratio in percentage which the net earnings bore to the average value of the capital invested during each period, the average for the entire fifty-five years being 8.9 per cent.

Table III shows the dividends paid during each period, also the percentage which the amount bore to the capital stock outstanding.

TABLE III—SHOWING DIVIDENDS PAID AND YEARLY RATE IN PER CENT.

	Amount	Average Yearly Rate, Per Cent.
1857-1870	$14,230.20	5.2
1870-1875	10,864.00	7.0
1875-1880	18,582.40	11.8
1880-1882	6,208.00	10.0
1882-1887	23,900.80	15.4
1887-1892	20,796.80	13.4
1892-1908	93,740.00	18.9
1908-1912	44,232.00	35.6

The net result of the operations of the company has been to create in the period from 1857 to 1912, fifty-five years, a plant having a value as carried on the books of $170,893.08, against which is outstanding capital stock to the par value of $31,040.

It will thus be seen that approximately 82 per cent of the company's present plant was provided for from earnings in excess of the amounts paid out in dividends, this surplus, however, having been built up in approximately forty-two years, or at about an average rate of 2 per cent per annum. We can easily conclude that plant in excess of capitalization exists, and if this is the only basis on which stock dividends are to be justified, no further investigation is necessary.

TABLE II—SHOWING COST OF PLANT, DIVIDENDS PAID AND OTHER DATA FOR DIFFERENT PERIODS FROM 1857 TO 1912
BRIDGETON GAS LIGHT COMPANY

Period	Col. 1. Cost of Plant at Beginning of Period	Col. 2. Average Cost of Plant During the Period	Col. 3. Dividends Paid During Period	Col. 4. Surplus Earnings Invested in Plant	Col. 5. Total Net Earnings During Period	Col. 6. Per Cent No. 5 is of No. 2	Col. 7. Per Cent No. 3 is of No. 2	Col. 8. Per Cent No. 4 is of No. 2
1857-1870	$20,980.00	$22,730.00	$14,230.20	$159.35	$14,389.55	4.9	4.8	0.1
1870-1875	34,699.35	38,509.60	10,864.00	7,620.50	18,484.50	9.6	5.7	3.9
1875-1880	42,319.85	46,861.83	18,582.40	9,083.97	27,666.37	11.8	7.9	3.9
1880-1882	51,403.82	54,539.45	6,208.00	6,271.17	12,479.17	11.5	5.7	5.8
1882-1887	57,674.99	60,715.42	23,900.80	6,080.84	29,981.64	9.9	7.9	2.0
1887-1892	63,755.83	72,685.52	20,796.80	17,859.38	38,656.18	10.7	5.7	5.0
1892-1908	81,615.21	134,133.87	93,740.00	95,037.32	108,777.32	8.8	4.3	4.5
1908-1912	176,652.53	191,046.80	44,232.00	28,788.55	73,020.55	9.6	5.8	3.8
Average per annum:								
1857-1912	....	80,160	4,228	3,108	7,336	8.9	5.3	3.6
1870-1912	....	97,937	5,198	4,066	9,264	9.5	5.3	4.2

It appears desirable, however, to inquire into the rates charged by the company during the period in which the surplus was built up. Were these rates in themselves reasonable, and did they result in more than a fair return to the owners of the property?

Table III, already mentioned, is a statement of the dividends paid and the ratio between the amount of dividends and the amount of capital stock outstanding, but it does not fairly represent all of the pertinent facts.

TABLE IV—SHOWING REVENUES, EXPENSES AND OTHER DATA

	1887-1892	1892-1908	1908-1912
Gas sales	$77,715.13	$399,069.11	$191,417.50
Miscellaneous operating revenue	7,282.06	75,836.68	39,631.23
Gross operating revenues	$84,997.17	$474,905.79	$231,048.73
Operating expenses	51,913.53	307,334.33	157,047.14
Net operating revenue	$33,083.64	$167,571.46	$74,001.59
Non-operating revenue	2,396.85	21,206.66	2,705.88
Gross revenue	$35,480.49	$188,778.12	$76,707.47
Thousand cubic feet gas sold	52,698	360,622	191,417
Gas sales per thousand cubic feet	$1.48	$1.10	$1.00
Operating expenses per thousand cubic feet	.99	.85	.82
Net revenue	$0.49	$0.25	$0.18

Table IV is a general statement of revenues and expenses of the company divided into three periods, showing the gas sales and operating expenses.

Table V is a statement of the rates charged since the organization of the company in December, 1857. This table shows that there has been a gradual reduction in the rate charged, and that since 1906 the rate has been $1 per thousand for all purposes and to all customers without discrimination of any kind. This rate bears very favorable comparison with the rates charged in municipalities having similar conditions and comparable population.

Independently of the analysis of cost made up from the books of the company, an appraisal of the physical property was made which developed that the cost to reproduce the property new was not far from $240,000. The present value of the property, allowing full theoretical depreciation, was not far from $190,000. The variation between the figures representing the appraised values and the costs as indicated from the books is explained by the fact that many large items of replacement were charged to operating expenses at the time the work was done, in addition to which depreciation was written off from time to time, much as is customary with commercial concerns.

TABLE V—SHOWING RATES CHARGED FOR GAS PER THOUSAND FEET SINCE COMMENCEMENT OF COMPANY'S BUSINESS

Dec. 1, 1857, to Oct. 1, 1864	$4.00
Oct. 1, 1864, to Oct. 1, 1866	5.00
Oct. 1, 1866, to July 1, 1875	4.00
July 1, 1875, reduced to	3.50
July 1, 1877, reduced to	3.00
July 1, 1878, reduced to	2.50
July 1, 1882, reduced to	2.00
Jan. 1, 1886, reduced to	1.80
Jan. 1, 1887, reduced to	1.70
Jan. 1, 1888, reduced to	1.50
May 1, 1894, reduced to	1.35
July 1, 1897, reduced to	1.25
July 1, 1898, reduced to	1.20
Jan. 1, 1899, reduced to	1.10
Nov. 1, 1906, reduced to	1.00

The present rate of $1 per 1000 feet is the uniform rate to all consumers, large or small.

We are next concerned with the question as to the proportion of the net earnings which was paid out in dividends and the proportion invested in plant. It will be readily agreed that the management of a company would have the right to invest its net earnings in extensions to the plant instead of paying them out as dividends. Examination of the seventh column of Table II shows the percentage which the dividends paid bore to average cost during the period in which the dividends have been earned. The sixth column of Table II shows the percentage the net earnings were of the capital invested during the corresponding period. This shows that the average net earnings for the entire fifty-five years amounted to 8.9 per cent while the average for the period since 1870, at which time the company appears to have made up all of its operating deficits and to have paid a dividend averaging 4.9 per cent, is 9.5 per cent. This amount has been disposed of in two ways. Column 7 in Table II shows the per cent paid out as dividends, and column 8 in Table II shows the per cent invested in plant.

If it is conceded that an average net return on capital legitimately invested amounting to 9.5 per cent is not excessive and unreasonable, then no fault should be found with the method which this company has pursued.

As to whether an average return on capital invested amounting to 9.5 per cent is excessive and unreasonable must be looked at from various standpoints. A comparison of this figure of 9.5 per cent with the average net return on utility properties generally shows that this figure is probably higher than is usually obtained in such investment. Comparison with industrial undertakings shows that textile mills, foundries and many other manufactories produce net incomes available for dividends ranging from 10 to 18 per cent. Indeed, it has been the custom with many of these larger industrial establishments to pay either 6 per cent or 7 per cent on the original capital invested, and to invest the balance in building up the business and adding to the plant. Almost all of the large department stores and large commercial establishments have been built up in this way, so that we are forced to the conclusion that an average net return of 9.5 per cent should not be considered as excessive and unreasonable.

This must however be viewed from another standpoint. What has been the result to the users of the product of this plant? This is best answered by an examination of the list of rates charged by this company from 1857 down to the present time. This list of rates is given in Table V. From this table it is seen that since 1906 the rate for gas to all persons and under all conditions has been $1 per thousand cubic feet.

It appears that the service rendered by the company has been generally satisfactory in regard to the quality of the gas and the conditions under which it has been delivered. The operations of this company extend over practically the entire city, and the population served is approximately the same as that of the city, which is about 19,000.

A study of the rates charged in a number of cities having a gross revenue somewhat similar to that of this company shows the average of a large number of such companies in New York State to be $1.20 per thousand cubic feet, and of a number of gas companies in Massachusetts of about the same size and average of $1.17 per thousand cubic feet.

> **"In the opinion of the writer the company in this case was fully justified in issuing capital stock sufficient fully to represent the present value of its property. The rates in themselves have been and are reasonable; the net result to the stockholders has not been excessive; the property created by means of revenues in excess of that paid out as dividends is undoubtedly the property of the stockholders and should therefore be represented by the proper certificates of ownership."**
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> —*Philander Betts.*

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It will be noted that the case referred to was determined by analysis of the relation between value of property and capitalization representing it but not without due consideration of the rates as a result of which the surplus had been accumulated.

Conservative financing, in the opinion of many, requires that bond discount be amortized and that extraordinary costs for establishing business be also amortized. Many financial houses in accepting trusteeship under corporate mortgages include provisions for these items and provide also in many cases for the amortization of accrued depreciation, the result being in the end that the outstanding capitalization will bear a fair relation to the present or depreciated value of the property.

It has been the contention of some that the mere investment of earnings in extensions to the permanent plant of the company is sufficient justification for later capitalization of such expenditures. Those holding this view lose sight of the real purpose of capitalization.

Commissions, under certain conditions, have allowed the issuance of securities for the purpose of paying interest, rehabilitating property, replacements and other similar items not strictly chargeable to the permanent capital account. Such approvals, however, have always been coupled with the requirement for amortization of the amounts so expended. Capitalization represents property, nothing more and nothing less, and attempts to inflate capitalization are due either to misunderstanding or to a desire to deceive or mislead.

Equally improper and unwise, in the writer's opinion, was a decision of one of the commissions rendered some months ago refusing to approve the issuance of securities for the purpose of constructing new plant. In this case the company, which was a gas company, had been in the habit of paying for a large portion of its annual extensions from earnings. The commission decided that the policy theretofore actuating the company had been a wise one and concluded that the company should continue to be guided by the same policy.

In conclusion, capitalization ought to be approximately equivalent to the property which it represents, and wherever excess capitalization is present amortization should be provided, a plan which will ultimately result in reducing the capitalization to its proper relation to the property which it represents. On the other hand, a "stock dividend" is justified where the capitalization is below the fair present value of the physical property. This ideal condition is found in very few properties, but it is one to be heartily wished for by financiers, as well as by operators and investors.

PUBLIC UTILITY LEGISLATION

By MATTHEW S. DUDGEON

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LEGISLATIVE regulation of public utilities which will insure adequate service at reasonable rates without injustice and without checking enterprise and initiative is alike most desirable and most difficult of attainment. Intelligent effort in any state to provide for such a regulation is worthy of consideration. The advanced ground Wisconsin legislation has occupied and the satisfactory operation of the law itself justifies reference to the public utility law of that State.

In considering regulatory statutes it is well to remember that centuries ago it became the common law rule, and that ever since it has continued to be the common law, that every public utility: (1) Must serve the public without discrimination; (2) must serve it adequately, and (3) must perform the service at a reasonable rate. By the terms of the federal constitution it may be said that a fourth principle is added: The public utility cannot be deprived of reasonable compensation for the use of the plant employed in furnishing the service. These four principles constitute a statement of the law as it is independent of the existence of regulatory statutes. In other words, the purpose of present-day regulatory statutes is to declare and enforce the law as it has existed for centuries, rather than to put any new duties or burden upon the public utilities.

With this conception of the law the framers of the Wisconsin measures had in mind certain other principles which found expression in the act, as follows:

a Absolute justice to the public utility as well as to the public must characterize an effective regulatory statute.

b Regulation is a function of the Legislature, but certain administrative duties connected with regulation can be well performed only by an expert commission.

c The commission should be a state body, rather than a municipal board, but certain purely local matters may be left to municipal control.

d The commission should correct abuses and supervise without attempting to become a managing board for the public utilities.

e A correct valuation is a basic condition precedent to effective regulation.

f Since all accounts and records must be accurate, honest, easily understood, and available for purposes of comparison, a uniform system of accounting is indispensable.

g The utmost publicity is desirable.

h The fullest facilities for collecting data must be provided.

i Dilatory court proceedings should be made impossible.

j Fixed-term franchises involve many difficulties in regulation.

k Wasteful competition is unwise and detrimental to the public and to the public utility.

l Municipal ownership should be made a possible alternative for ineffective regulation.

m There should be some incentive for initiating improvements and economies.

n Prior to enactment, every interest, private and public, should be heard from and its contentions considered.

The framers of the law felt that neither harshness nor injustice toward the public utility was a wise public policy. They sought, therefore, to regulate, but to regulate in a manner that would work no injustice to the utilities. The law bears witness that its framers, while taking a determined stand in defense of the rights of the public, have not countenanced any injustice to the owners of public utilities. The principle of reciprocal justice everywhere crops out.

It is universally conceded that to regulate public utilities is legally a function of the legislative branch of government. No thoughtful man maintains, however, that a legislative body is itself in

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[NOTE.—Mr. Dudgeon took an important part in the drafting of the Wisconsin public utility law.—EDS.]

a position to exercise this function directly. It meets only occasionally; its members have no special knowledge of public utilities; its time is fully occupied in more purely legislative duties, and it has no facilities and no machinery for the collection of the data necessary to a decision as to the details of public utility service. So it is better that the Legislature first perform the purely legislative function of enacting a law that rates must be reasonable and that service must be reasonably adequate and non-discriminating. It then delegates to a commission the administrative duty of investigating and collecting the data relating to a disputed rate or service, so as to be able to determine whether or not a rate is reasonable or the service adequate. The distinction between the purely legislative function of lawmaking which cannot be delegated to a commission on the one hand, and the quasi-legislative or administrative functions of investigating the facts, and applying and enforcing the law which may be delegated, was clearly conceived and observed in drafting the Wisconsin measure.

If it be granted that a commission is the proper regulatory body, the question as to whether the commission should be a state or a municipal body arises. The considerations that led the Wisconsin lawmakers to give jurisdiction of public utilities to a state commission rather than to any municipal board were: (1) Many of the problems of public utility regulation involve inter-city transactions; (2) the intricacies of valuation, uniform accounting and computation of rates, and the difficulties of investigating adequacy of service cannot be successfully coped with by city councils of transient existence; (3) one large force of experienced experts will work more economically and efficiently than a less experienced force hired by, and working in, only one city, and, of necessity, often inadequately paid.

At the same time the democratic desirability of reserving to the municipalities as liberal powers of home rule as possible was recognized. The framers of the bill felt also that it would not be well to burden the commissions with determinations of questions purely local in their nature. The law, therefore, gives to the municipality, in certain cases, the power to determine by contract or ordinance the character of the service which will meet local needs, and to prescribe the terms and conditions upon which a public utility may be permitted to occupy the streets. The municipality also has the power to require of any public utility such additions and extensions as shall be reasonable and necessary in the interests of the public. These powers are exercised, however, subject to appeal to the railroad commission as to reasonableness.

There are limits to commission regulation. No commission, however well qualified and equipped, is competent to conduct all the details of the affairs of the diversified public utilities within an entire state. It cannot be a substitute for the management. In the Wisconsin law it was planned to make the commission not a managing, rate-making board, with multitudinous duties which would swamp any commission, but rather a supervising board. No wholesale overhauling of rates or service was contemplated. The schedule of rates and service in force at a certain date, arbitrarily designated, was declared the legal schedule until rates or service were investigated and changed upon complaint of a patron, upon petition of the public utility, or because of some inadequacy or unreasonableness discovered by the commission.

> **"The distinction between the purely legislative function of law-making which cannot be delegated to a commission on the one hand and the quasi-legislative or administrative functions of investigating the facts and applying and enforcing the law which may be delegated, was clearly conceived and observed in drafting the Wisconsin measure."**
>
> —*Matthew S. Dudgeon.*

All commission-made rates must provide for a reasonable percentage of profit computed upon the value of property employed in furnishing the service. The value to be used in the mathematical computation necessary to determine this percentage of profit is of basic importance and must be definitely fixed. If the value be too high the result would be an unreasonably high rate. If the value be too low the result might be a rate so low as to be unconstitutional. Any system of regulation which does not include a proper valuation of the property actually used and useful for the convenience of the public is a failure, no matter how perfect it may be in other particulars. The Wisconsin law emphasizes the importance of this process of valuation.

Among the charges to be paid out of the receipts from the rate imposed is the current expense of operation. The possibilities and intricacies of accounting are such that if given a privately devised, uninspected, unregulated system of accounting, any expert accountant would have the public and the commission at his mercy. It would be possible to conceal from casual inspection practically unlimited profits. Almost any extravagant schedule of rates might be demonstrated to be justifiable. Hence, next to a correct valuation nothing is more essential to proper regulation than an open, honest, uniform system of accounts. Under the Wisconsin law, the public utility is required to keep its accounts in such form as the commission may prescribe, and no accounts other than those either prescribed or approved are permitted. Secret sets of books or accounts are made illegal. Examination and audit of the accounts may be made by the commission or its agents, and all items must be allocated to the accounts as the commission may direct.

It is expressly made the duty of the commission to require the utility to keep its accounts in such a

> **"Certainly some device which will preserve to the investors the fruits of energetic improvements should be incorporated into a regulatory measure."**
> —*Matthew S. Dudgeon.*

manner as to distinguish clearly between operating expenses and the cost of new construction. This is obviously to prevent any attempt to justify high rates by charging the cost of new construction to the operating expense account.

The public utility must in its report show in detail every item of expense going to make up the cost of producing a unit of service. Tables showing unit costs are important for comparative purposes. They are not only an aid to the commission in determining reasonable rates, but are of service to the utilities in the study of the efficiency of operation. The reports of the commission containing these details are comparable with the valuable English publications known as "Field's Analysis" and the "Gas World's Analysis of Accounts."

The law requires the publication of annual reports from the commission and permits such monthly or occasional reports as the commission may wish to issue. No facts or information in possession of the commission can be withheld from the public, except in cases where the commission determines that the interests of the public require secrecy. In such a case, information may be withheld for a period not exceeding ninety days. Full publicity prevents actual fraud and allays unjustified suspicions of fraud. It compels open and fair dealing between corporations and the public and tends to establish between the two a mutually helpful co-operation. It protects the commission and all public utilities from a multitude of ill-considered and unfounded complaints. It also places the commission itself under the constant surveillance of the public, a not unwholesome situation.

The Wisconsin law is not aimed simply at certain specific evils. The theory upon which it is framed is that absolute publicity coupled with full power to regulate and supervise will prevent any wrong from being perpetrated upon the public now or hereafter. It, therefore, gives to the people and to the commission opportunity for honest and complete knowledge of the affairs of the public utility.

The law does not expressly grant to the public utility any new right of recourse to the courts for the vacation or modifications of the orders of the commission. Recognizing, however, that such rights have a constitutional existence, the law undertakes to insure a speedy procedure which will prevent dilatory tactics upon the part of the corporation interested. It accomplishes this by providing for short periods of notice and prompt hearings, and by giving actions for review precedence over all other civil actions both in trial and appellate courts. The determinations of the commission are made in all cases *prima facie* reasonable and lawful, and the burden is placed upon the party complaining to prove them otherwise. The orders of the commission go into immediate effect and no injunction can issue suspending or staying any order, except after hearing upon notice to the commission.

The law has also the somewhat unique provision that if evidence is introduced before the court different from or additional to that offered upon the hearing before the commission, the court must transmit forthwith to the commission a transcript thereof and stay all proceedings for fifteen days. The commission must consider this additional evidence upon its receipt, and may thereupon modify or rescind its previous order and report its action to the court. This provision tends to induce all parties to present their case fully and fairly to the commission, and to a certain extent secures the co-operation of court and commission.

The plant of a public utility operating under a fixed-term franchise is likely to be, at the end of the term, of little more than scrap-heap value. With rates unlimited it has always been possible for the public utility to earn, besides interest on the investment, profits sufficient to replace rapidly the amount expended in construction. With the prospect of regulated rates, the public utilities were prepared to make the claim that rates must be high enough to provide for the accumulation of a sinking fund aggregating the value of the plant before the expiration of the term of years provided for in the franchise. The courts seem not to have settled whether such a position is tenable or not, but it is a question that would seriously embarrass any commission.

Facing these conditions, the framers of the Wisconsin law provided in the law that all franchises hereafter granted shall have the effect of permits "which continue in force until such time as the municipality shall exercise its option to purchase as provided in the act." The holders of the present terminable franchises may exchange them for indeterminate permits.

The demand for state control evidences the failure of open competition to regulate. Such failure is the justification for state interference. There is genuine justice in the claim that if regulation is to rob the companies of all but the most meager profits, it should protect them from losses which result from unjustified competition and which cannot be recouped from the limited earnings permitted under state regulation. The framers of the bill realized that the interests of the public and of the public utilities alike demanded that competition be so limited as to prevent uneconomic waste. The law provides, therefore, that no franchise or permit shall be granted to operate any plant in a city where there is already in operation a public utility engaged in similar service, without first securing from the commission a declaration that public convenience and necessity require such second public utility.

Where unregulated private ownership has failed to furnish adequate service at reasonable rates, there are but two alternatives, public control or public ownership.

Commission control of corporations has not always succeeded in the past, and future failure is still possible. Recognizing this possibility and recognizing also the right of the community to save itself from such a failure by employing the alternative of public ownership, the law provides, first, for the construction of a competing municipal plant if the commission certifies that public convenience and necessity require such competing municipal plant; and, second, for the acquirement of the plant of the existing public utility by purchase or through condemnation proceedings, whenever the municipality determines to take over the plant. No certificate from the commission is required to authorize the condemnation of the existing plant, since condemnation may be a refuge from inefficient regulation by the commission.

The indeterminate permit, which supplants the old form of franchise, contains an agreement that the municipality may purchase the plant for a just compensation to be fixed by the commission, subject to the review of the court.

It is often contended that state control entirely eliminates motives for initiating new improvements and economies, since increased earnings will eventually result, not in larger profits, but in an order to reduce rates. The Wisconsin law makes an effort to preserve the incentive of self-interest by permitting a sliding scale or other arrangement for the division of profits with customers or employees. This is an effort in the right direction. Certainly some device which will preserve to the investors the fruits of energetic improvements should be incorporated into a regulatory measure.

Such are some of the features which should characterize public utility legislation. Such legislation cannot be enacted, however, unless the Legislature is inclined to be absolutely just to the pubilc utilities, yet firm in its purpose to secure an effective law. The method used in drafting and enacting the Wisconsin law will be suggestive. The legislators were evidently anxious to frame an effective law, but were equally anxious to avoid every unfair feature. The committee having the measure in charge requested the Wisconsin legislative reference department to assist in drafting the bill.

The department at once detailed one of the lawyers employed in the department as draftsman. Prof. John R. Commons of the University of Wisconsin, who had long been a student of questions relating to public utilities and who had made extensive investigations in America and abroad, was called in for consultation and placed himself at the service of the committee. Several conferences were held and the general plan of the bill which the legislators desired was mapped out. The draftsman and Professor Commons with the committee then began the work of drafting the bill. Existing regulatory statutes were carefully considered. The decisions of the various courts relative to regulation of public service corporations were studied. Wherever possible, language which has been construed by the courts was used. In some cases a phrase or word was used only after an exhaustive study of decisions lasting several days. Experts in various parts of the country were consulted as to special features and their suggestions carefully considered. When a complete draft of the bill was made it was printed and copies sent to every man who was supposed to have any special knowledge of the subject or any feature of it. These copies of the bill were sent to economists, to practical experts, to managers and superintendents of public utilities, to lawyers and judges, and to mayors and aldermen of various cities. Each was asked to comment upon and criticise the measure. The public utilities themselves were specially urged to present their views. Many, financially interested, responded in a disinterested manner with valuable suggestions. The representatives of the legislative reference department were present at these hearings. All arguments advanced before the committee were taken in shorthand, and a typewritten transcript was later used by the committee in its executive session. The facts stated, the court decisions cited, and the economic principles advanced by those making arguments upon the hearings were subjected to careful verification. After the hearings closed the committee took up in detail all suggested changes. Arguments pro and con were considered and weighed. Some suggestions were accepted and incorporated into the measure; many were rejected. Special attention was given to any suggestion of unconstitutionality, and no claim that injustice would result from any feature of the law was ignored.

A somewhat unique situation thus developed. Here were legislators, experienced draftsmen, eminent university economists, high-priced legal counsel and experts representing the special interests affected, state and city officials, as well as public-spirited lawyers, and citizens interested in behalf of the public, all centering their efforts and contributing their best thought toward the framing of a single law.

The law has been in operation for seven years. Its provisions have been tested, and both public and public utilities seem to agree that it is at once effective, just and practical.

> **"The law has been in operation for seven years. Its provisions have been tested, and both public and public utilities seem to agree that it is at once effective, just and practical."**
>
> —*Matthew S. Dudgeon.*

FINANCIAL RELATIONS BETWEEN CITIES AND UTILITIES

By BION J. ARNOLD

Chairman Board of Supervising Engineers, Chicago Traction

IN a number of cities in this country arrangements of one sort and another have been made recently by which the municipalities share directly in the profits of the local electric railways and exert managerial influence in their operation. This movement is so vital in its nature and so far reaching in its consequences that each experiment must be studied carefully in order that its lessons may be well and promptly learned.

The partnership arrangement in Chicago has now been in operation for seven years, long enough for the determination of the wisdom of its provisions. It will be remembered that the city agreed with the railroad companies, as a condition preliminary to any settlement, that a valuation should be made and agreed upon which should be accepted as the initial price of the property. The difference between this amount and that of the outstanding securities was to be either sacrificed by the holders thereof or taken care of out of such net profits as the companies were allowed to make under the ordinances.

> **"During seven years the companies have paid themselves 7 per cent on their investment, * * * and have put about $14,000,000 in cash into the city treasury. By the end of twenty years I estimate that there will have been so deposited a fund, which * * * will, with accrued interest, amount to $90,000,000 at the end of the twenty-year period."**
>
> —*Bion J. Arnold.*

The railway companies saw fit to make this arrangement because almost every main franchise had expired, and operation was being conducted under temporary permits in the business districts of the city. One of the companies contended that it had a ninety-nine-year franchise under a certain ruling of the Illinois Supreme Court, but shortly after the settlement was made the United States Supreme Court ruled otherwise.

The valuation ultimately agreed upon was $50,000,000, the city allowing actually $11,000,000 more than the physical property was considered to be worth, partly because the legal decision mentioned above had not been handed down when the agreement was concluded and partly as the price of peace. Thus the $11,000,000 was in reality mainly allowed for unexpired ordinances and obsolete plants.

The most important provision made in the arrangement was that for the rehabilitation of the property and the extension of the system under public supervision. The agreed purchase price to the city, which is practically the bonding limit of the companies, was to be increased by the amount of the expenditures made for these purposes, and the expenditures were to be authorized by a board consisting of three men; one representing the city, one the company, while the third was to be chosen by both. The last-named was to be independent of both interests and his name was to be written into the ordinance. During the past seven years under this arrangement the purchase price to the city has been increased to about $140,000,000 by the cost of the rehabilitation of the old property and by extensions to it.

A second important provision of the contract provided for the acquisition of the railway property at any time by the city upon six months' notice, the price at any time to be the original $50,000,000, plus the amounts that had been added for rehabilitation work and extensions with the approval of the board. This will continue to increase by the method mentioned until in 1927, when the present twenty-year franchise expires. The amount will then be about $204,000,000.

A third provision is concerned with operation. The city granted a twenty-year franchise to the company, the maximum which could be granted under the state laws. The company operates the property, paying all operating expenses, including maintenance, insurance, taxes and a contribution to a renewal and damage fund, and receives 5 per cent interest upon the agreed purchase price of $50,000,000 plus additions as above. The balance of the receipts is divided between the company and the city, 45 per cent to the companies and 55 per cent to the city. During seven years the companies have paid themselves 7 per cent on their investment, including the above 5 per cent interest, and have put about $14,000,000 in cash into the city treasury. By the end of twenty years I estimate that there will have been so deposited a fund, which if invested in suitable securities netting 5 per cent income will, with accrued interest, amount to $90,000,000 at the end of the twenty-year period. The city can then buy for $114,000,000, which is $204,000,000 less this $90,000,000, a property having a tangible value of $150,000,000. In other words, this fund which the companies are putting into the city treasury is in reality an amortization fund, if it is allowed to accumulate properly, although it is not so called. It is thus seen that the price of the properties is automatically fixed and the machinery provided so that the city can acquire them at any time without dispute. When it is remembered that the present scheme was worked out after the municipality had endeavored to inaugurate municipal ownership, the wisdom of the present arrangement is obvious, as such ownership is automatically provided for whenever it is deemed necessary.

The question may be raised as to why there will not be a property worth $204,000,000 at the termination of the franchise. In the first place the new arrangement started with $11,000,000 in intangible assets. The railways of Chicago first operated horse cars, then cable equipment was substituted, next light electric cars were used and finally heavier electric cars became necessary. Thus not only was the sum of $11,000,000 paid for "junk" and franchises, as previously stated, but provision had to be made for the old cable system, obsolete cars, etc., which had to be eliminated, and for 400 miles of track which had to be rehabilitated. Hence the purchase price when all these things are done is about one-third higher than the tangible value.

We made a mistake, some of us now believe, when the ordinance was passed in not providing that all or at least some of the profits should be used as an amortization fund for the purpose of retiring this intangible value. This will probably be rectified in the consolidation plan now being worked out under which it is proposed that the surface, elevated and subway lines will be operated as one system.

The city of Cleveland made a solution of the traction problem quite different from the Chicago plan. Instead of an agreed purchase price a certain capitalization was agreed upon, and the company was allowed to earn 6 per cent upon that capitalization and no more. This capitalization may be increased from time to time under the supervision of a city railway commissioner. The fare was also reduced to 3 cents with provision for increase under certain conditions. That is, there was incorporated in the franchise a clause providing some flexibility by stipulating that if a reserve fund of from $300,000 to $500,000, established by the terms of the ordinance, cannot be maintained with a 3-cent fare the fare can be increased or the income can be increased by means of a charge for transfers. Since the company has some outlying roads to which the 3-cent fare does not apply and the fact that cash passengers pay 5 cents unless they happen to have the exact change ready, the actual average fare now collected is 3.24 cents. At present the operation is experimental at this rate, and the rate may have to be raised still higher, and I understand that it has recently been decided to charge 1 cent for a transfer in addition to the initial fare. It is possible to operate on a low fare in Cleveland because the agreed capitalization is very low. The plan is, in my opinion, an experimental one. If it succeeds it should be remembered that the citizens of Cleveland are getting and will continue to get only such service as a 3-cent fare or a 3.24-cent fare or a 3-cent fare plus 1 cent for a transfer will yield. They will never get a 5-cent service for a 3-cent fare.

> **"While I think that Kansas City has the best solution of the partnership arrangement so far worked out, the Chicago plan has worked very smoothly for seven years. * * * Chicago has watched with pride the growth of the city's fund, now amounting to about $14,000,000, and the citizens as a whole seem not displeased that the railways have earned 7 per cent."**
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The recently adopted Kansas City arrangement is a modified Chicago plan in which the "oversights" which I have mentioned have been eliminated. In Kansas City the railway was operating under a receivership. The citizens were rabid in their antagonism to the railway, as they believed that they had been misused. They felt that the system was overcapitalized, so much so that one of the leading papers of the city stated that the property was worth not more than $14,000,000, although, to be fair to it, this was before an actual valuation showed it to be worth much more. In fact, the company had vouchers to show that $35,000,000 had actually been spent upon the property. Under the settlement the company is to be allowed to earn 6 per cent on $30,000,000, and all surplus above this is to be invested in an amortization fund to be used in gradually retiring the intangible value of the property. The tangible property, as shown by my valuation, is actually worth more than $21,000,000 to-day so that the amount to be amortized is about $14,000,000. This is a fundamentally sound proposition for, if the railway is finally acquired by the city, it will be purchased for what it is actually worth, or if the property is continued under private ownership and management, the rate of fare can be adjusted on a basis of paying a fair return on real value where the intangible value has been amortized.

In conclusion I would say that while I think that Kansas City has the best solution of the partnership arrangement so far worked out, the Chicago plan has worked very smoothly for seven years. Of course we have had differences of opinion in Chicago from time to time as to the wisdom of the board's judgment on one point or another, but these have thus far been easily adjusted. Chicago has watched with pride the growth of the city's fund, now amounting to about $14,000,000, and the citizens as a whole seem not displeased that the railways have earned 7 per cent. While I personally believe that the $14,000,000 fund should be used as an amortization fund so that in time, after the intangible value has been eliminated, the patron of the street car will not be paying a higher price than it costs to render the service he receives, nevertheless the Chicago arrangement taken as a whole can be considered sound and successful.

COMMISSIONS AND THE N. E. L. A.

By T. C. MARTIN

Secretary National Electric Light Association

IT is a generally recognized fact that in the earlier days of all the great modern public utilities very little thought or care was given to the subject of regulation from the standpoint of safeguarding the public welfare, protecting the utility companies themselves, or insisting with equal emphasis upon the rights of the investors and the employees. The change that has come over the scene in all these respects in the last twenty-five years and more particularly the last ten, is little short of incredible. As one looks back it is now seen that what has come in the way of regulation by public service commissions was there to come and sure to come. But the main point is that regulation cannot be effected until there is something to regulate; until the new agency for public service and benefit has taken some kind of definite shape, and presents itself in concrete form as an entity that can be dealt with. New industries or utilities like the electric street railway or the electric light, or the industrial transmission and supply of electrical energy, have first to place themselves on the map before the legislative function can very well be applied to them. There had to be some wonderful periods and stages of invention, some strenuous times of financial and manufacturing competition, some tremendous efforts to raise capital for the installation of extensive plants; and it cannot yet be said that this introductory epoch or era has closed, for the advances in all the electrical arts are still frequent and often revolutionary. As in the case of the present dreadful war in Europe, it is extremely difficult to figure where and how it is all going to work out, but it would seem that in the public utility field we have in the public service commissions our Hague Peace Tribunal started, and some ruling body that can help to cut out an awful lot of trouble, turmoil and waste, the net gain to the public being in direct ratio to the efficiency of the commissions. We now have some forty-eight state commissions whose work applies directly to the regulation and control of public utilities, and while at the moment perhaps only about half of these have so far been developed from "railroad commissions," or created specially to deal with all public utilities generally, it is evident that in the long run every such body of officials will have entire utility regulation placed in its hands. That is the proposition before us, although in many quarters legislatures having substituted this kind of stable administrative control for their own spasmodic butting in, show an inclination to hamper the system thus wisely set up.

The National Electric Light Association may fairly and reasonably be credited with an early appreciation and acceptance of the new conditions. As far back as 1905-1906 it organized its first public policy committee, whose gait and scope may be inferred from the fact that its sub-committees, all making reports, were: (1) on municipal ownership; (2) on public regulation and control; (3) on London sliding scale (gas) as applied to electricity; (4) on taxation and franchises; (5) on industrial insurance, rewards and pensions; (6) on publicity and popular education; (7) on rates and methods of charging. This looks like a large program, but the writer, as secretary of the association, can testify that at the very instant of writing, every one of these points of service, of development, of attack on economic heresies, of better service to the public, is being followed up either by the public policy committee or by similar committees to which it has delegated part of the work. All of this is based on the statement made in 1907, to which every progressive street railway man subscribes: "There is a community of interest between the public served and the corporation serving it. The goal of the regulating body should be to seek that happy medium as to prices charged and return upon capital arrived at which will result in maximum benefits in the way of service."

An illustration of the important work undertaken immediately after it thus got into action by the National Electric Light Association, was the codification and issuance in pamphlet form—really a bulky book—of the public service commission statutes of the states of Wisconsin, New York and Massachusetts. This was an intensely interesting and useful analysis and comparison which not only showed the trend of regulative legislation but quite surely helped to shape it in other states falling into line under the new régime. It was an expensive job and it was absolutely colorless as it offered no criticism or suggestion, but it was worth the price as a flat-footed proof of the tendency to variation and the hideous danger that lay in the future of the great central station industry and every manufacturer supplying its essential materials, if every state in the Union were to set up standards and criterions of its own. It sounds like a modified form of treason to say that any art shall dictate to a sovereign commonwealth what the art deems best, but, on the other hand, has any state the right to set up and dictate local standards which shall not be common to our whole 100,000,000 people?

Fortunately the National Electric Light Association has been able to enforce and insist upon its national point of view, and it is at once the duty and the pleasure of its secretary to state that it has been able to maintain reciprocity and co-operation with all the various public service commissions. It is in frequent, friendly daily communication with them. It has already established what is perhaps one of the most complete collections of their literature that exists anywhere in the world. Only those who are in close touch with the situation can have any idea as to the immense amount of matter thus coming out, much of it doubtless merely temporary and of fugitive value, but much of it charged with dynamite, opening up new conceptions of law and doctrine, not necessarily destructive but, let us say, reconstructive; a great deal of it intensely instructive and suggestive; on the whole sane and solid and reflecting the American ideal of treating everybody on the square.

Next to its codification of the Public Service laws in the three great States of Massachusetts, Wisconsin and New York, comes the work that the N. E. L. A. has done in trying to "keep tab" of all the essential decisions affecting utilities in its field, by the issuance of a special bulletin known as "Rate Research," now ending its fifth volume, a most useful and valuable compilation of commission rulings and decisions, supplemented by references to general literature on the subject and on such important matters as may be covered along this line in the technical press or in other ways. This sixteen-page weekly publication has nearly 1000 subscribers, which is at least an evidence of its value, and it now seems likely that through some process of broad co-operation among utility groups in the various fields, the pioneer work thus undertaken and so far carried on with brilliant success by the N. E. L. A. may flower and bear fruit in something much better. It may be noted incidentally that the commissions have been glad to assist in this work and share in its benefits.

Accounting has been another important subject on which distinctive effort has been made, and with success, to co-operate with the commissions. For some years the association has had a standard classification of accounts adopted by a great many of its member companies, which have control over a very large percentage of the income and expenditures of the industry. The intrinsic value of the system of accounts has been more or less directly acknowledged by all of the commissions, and as in the case of Maryland has been authorized, which means adoption. Work of this kind done in mutuality is still going on actively, as, for example, in the extension of part of the system to give a fuller expression to the significance of hydroelectric work, so that the system of accounting may conform as closely as possible with the requirements of commissions on the Pacific Coast, where so large a proportion of the electrical energy needed in the business is derived from water power. One example of the manner in which the association strives to secure national uniformity is given in the work this year of the accounting committee in collecting for examination the annual report forms and accounting orders prescribed by the various state commissions. The exhibition thus made of frightful heterogeneity, of moderate requirements in some cases and of illimitable micromania in other directions, and in general of a total lack of unanimity in applying the powers given to the commissions—is in itself sufficient reward for the effort. Obviously, the best thing any such public utility body can do is to help the commissions "find themselves."

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This last remark applies to even another line of work of vital interest to central stations, that which embraces the whole field of meters, a branch of development in which the central station differentiates wholly from the street railway, whose basic feature is the "register" as modified by the pay-as-you-enter method. The N. E. L. A. has a meter committee which does important work from year to year in watching and guiding the progress and perfection of consumers' meters, one type after another being needed as the art gets closer to its problem of universal supply. This year the committee prepared and issued with its report a large chart showing at a glance all the public service regulations, or laws, now in vogue bearing upon the installation and use of meters. It is a most instructive survey of quite unnecessarily conflicting conditions in a very highly specialized electrical art, in which for the production of the best instruments, of the highest precision, at the lowest possible cost, universality and uniformity are needed for the consumer, the utility company and the manufacturer, without any peculiar advantage to be derived by any group or class.

Other examples of this kind might be cited, but it is probably needless to pile them up. A final paragraph may be in order as to the attitude taken by the association as to the commissioners themselves. Here one deals with such a changing personnel, it is most difficult to maintain continuity of touch. A public utility company that changed its management every one, two or three years would be condemned at once as being in a "parlous," which means perilous, condition, but in the commissions men come and go, for politics are vicissitudinous, and the archangel of to-day may be the outcast of to-morrow. This is in itself one of the biting reasons why public utilities have been so ready and willing to submit to regulation provided it be but regulation that can regulate itself and be consistent. Where the people of the state have insisted that

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politicians should keep hands off, tolerant relations have been established between the utility and the commission, but this can in no wise be characterized under the head of friendship. The utility now has the respect and regard that any decent and competent lawyer has when appearing before the bench of the court in which he practices his profession. From the first, the N. E. L. A. has regarded it as both a duty and a pleasure to ask the various public service commissioners to participate in its conventions. In 1912 every commissioner on the Pacific Coast was invited to attend the Seattle convention. At the Chicago convention of 1913 every commissioner within range was invited to be a guest. At the Philadelphia convention of 1914, the head of the state commission was properly regarded as a guest of honor. There are very few national meetings for years past at which the head of the Massachusetts commission has not been gladly hailed as a guide and adviser, apart from his pre-eminence as a judge of unswerving rectitude, trying to hand out the square deal as between man and man. Equally noticeable is the fact that at all the meetings of the N. E. L. A. state or geographic sections, the effort has been made, mostly with great success, to secure the presence of some member or officer of the commonwealth commission, from whose presentation of its point of view help and illumination could be secured as to what the utilities must do, or are expected to do, by the commissioners, to live up to the full measure of their opportunity in service to the public.

It is perhaps at this juncture that further evolutions of relationship appear in order or are gradually putting themselves in evidence. There is in reality to-day no central authority among the commissions to which resort can be had to secure uniformity of action in regard to very large problems in the central station field. To some extent, the member companies of the American Electric Railway Association come within the purview of the Interstate Commerce Commission; and of course there are the meetings of the various railway commissions in convention duly assembled when traction questions dominate and all else is forgot. This does not help the central station industry at all, and makes it most difficult for such a body as the National Electric Light Association, aiming at uniformity, unanimity and universality of apparatus, methods and practice, to suggest, let alone enforce its ideals, in such respects. Evidently there must come for the best interests of all concerned—the nation itself in these electric days—a *modus vivendi*, a getting together. The symptoms of this are seen in the work already being done in some of the state or geographic sections of the N. E. L. A. in co-operating with the state commission by way of standing or special committees of the organization to consult on any new proposition that may come up. Let it be recognized that fundamentally the real underlying idea of any commission is regularity and uniformity, in the enforcement of which the largest number of people possible get the same treatment in the shape of justice and equity. To such an end all most co-operate, or admit themselves advocates of discrimination and difference. Failing a central commission body—not forgetting the admirable work being done by the United States Bureau of Standards—there is thus developing among the state branches of the N. E. L. A. a system of co-operating by committee with the local state commission, so that when a serious question comes up the commission can get the utility point of view and the best technical data or advice that its utilities can give, before any vital action is taken. This process is already in evidence, and as it advances it may happily lead on to the condition where no one commission will assume infallibility but will be guided, as must we all in the long run, by the force of mature public opinion.

Possibly a sympathetic note may be struck within the American Electric Railway Association when reference is made to the amount of time and energy consumed in regard to public service commission work by members of the National Electric Light Association. Once and again, and then again, men whose heart is in their work, whose one aim is to reach higher and highest efficiencies in serving the public, are called off their jobs to take care of some minor order, ruling or sleight complaint or criticism that filters through the commission office. We have heard of breaking a butterfly on the wheel, but these are ghastly instances of breaking the useful wheel at the instance of some giddy, evanescent butterfly. The writer knows something from observation of the discouragement of spirit and the bitterness of heart, the inevitable lowering of efficiency on the part of many central station men at the point of physical exhaustion seeking to deliver the goods to a million people, but quite often tripped up and baited and mauled and overworked by incessant hearings and inquiries. Out of that wretched stage we are already emerging, but some of us feel that the central station men who have loyally helped to carry out the public service commission principle, who believe in it heartily, and desire its utmost development along national lines, as an essential part of our modern system of government of the people, by the people, for the people, are entitled to fuller praise and consideration than has yet been accorded to them.

PUBLICITY ON ELECTRIC RAILWAYS

This Article Describes Typical Methods of Securing Publicity in Use on a Number of Electric Railway Systems. It also Contains a Newspaper Editor's Views on the Subject

IN several of the contributed articles published elsewhere in this issue stress has been laid upon the importance of full publicity on the part of the electric railway companies of their actions and problems, so that the public may be better acquainted with both. There is also a unanimity of opinion that publicity is useless without good service. An attempt to bolster up a deficient treatment of the public by publicity in any form is useless. No amount of fine printing or exuberant oratory will take the place of the good service to which the public is entitled, but if this is supplied, every advantage is to be gained by publicity. No service can be perfect, and even the struggle to make it better may cause inconvenience to the public. Hence it is always important for the riders to understand why delays are necessary, or why they are obliged to transfer at unusual points. A large steam railroad has recently adopted the practice of reporting directly to the passengers the reasons for unexpected hold-ups. What is true in regard to traffic conditions is also true in larger matters such as financing, franchises, etc.

A most obvious way of reaching the public is through the reading and advertising columns of the newspapers, but posters, circulars, or useful articles such as drinking cups, fans and even hatpins have been used to good purpose. Public service commissions have been organized partly to insure publicity of public utility matters, and while this function should possibly not have been necessary, they are now very important publicity agents for the electric railways.

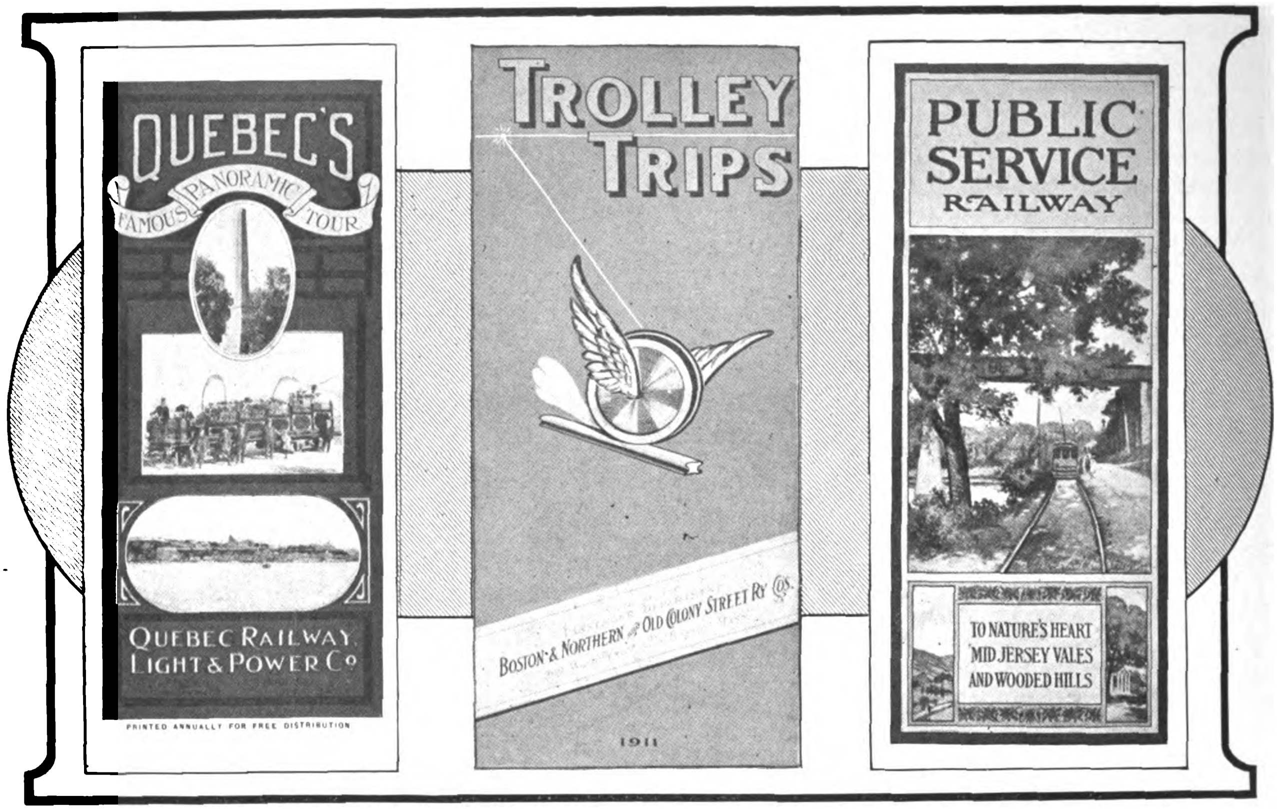
Systematic publicity work among electric railways may be said to be a development of the last decade. Before that practically all the news on electric railways which appeared in the daily papers was secured by the newspaper men from unofficial sources, and when such information came from headquarters it was obtained by the reporter only after a great deal of effort on his part and often at serious inconvenience to one or more of the officers of the railway. The point lost sight of at that time by the railway officials was that the daily newspaper man had to publish the news as it came to the office of his paper, and that after an unsuccessful attempt to interview the railway officials, the reporter would use such information regarding the company as came to hand from outside sources. Mistaken attempts to thwart newspaper men simply serve to whet their appetites. In the words of an editor who has contributed his views to this chapter the tip which is in the newspaper office is sure to appear. But as this gentleman says, the manner and form of its appearance remain largely with the railway man. Attempts at suppression are retroactive. Never was censorship more strongly enforced than in the present crisis in Europe, yet there was that terrible story in the staid London *Times* saying that the British force in France had been "broken to bits." If there had been no embargo on news it is very improbable that there would have been any such sensational dispatch. As the New York *World* said editorially in commenting on attempts made to throttle the press: "One of the surest ways to promote falsehood is to suppress the truth. When facts cannot be had, people are thrown back upon the imagination, and there is no terror in this world like that which exists only in the mind."

With the line of demarcation fixing the responsibility for giving out news not sharply drawn by the railways, it was only natural that railway men, fearing misquotation and misconstruction, were loath to speak for publication. In short, no one making a statement for the press knew how his utterance might be viewed by the man higher up. From this rose the practice of designating some official of the company, or of appointing as official some one with a newspaper experience, who would know what the papers wanted and could secure it readily. This plan has now been adopted by such companies as the Brooklyn Rapid Transit Company, the Boston Elevated Railway, the Interborough Rapid Transit Company, the Portland Railway, Light & Power Company, the Illinois Traction System, the Southern Pacific Company, the Detroit United Railway, the Toledo Railways & Light Company, the Empire United Railways, the Public Service Railway, the Washington Railway & Electric Company, the Puget Sound Traction, Light & Power Company, the Twin City Rapid Transit Company, the Bay State Street Railway, the International Railway, the Northern Ohio Traction & Light Company and many others. It was deemed advisable to secure for this chapter as far as possible the ideas of men in charge of publicity work of representative city and interurban companies and to present the views of these men only as they concern their respective properties. Men on other properties entrusted with similar duties can thus see what has been attempted and accomplished elsewhere and appropriate to their own use such ideas and suggestions as may appeal to them as suitable for application to their own needs. The companies whose practice is described, however, by no means comprise all of those which have established publicity departments. They are simply examples illustrative of modern custom. Other, and possibly more conspicuous instances, may occur to the reader, such as the Toledo dispute where one of the most elaborate and aggressive campaigns has produced markedly good results.

This much has been firmly established. Publicity work to be successful must be founded on confidence. The work of the man to whom this phase of public relations is entrusted is always intensive, frequently educational and sometimes must be preventive. The soft answer will not, however, turn away wrath unless the management lives up to promises which are made. It is infinitely worse to break the promises made than never to have made them. The late J. P. Morgan was not so much concerned with the present financial ability of men to whom he made loans as he was with the reputation which men had for carrying out their promises. The credit system which Mr. Morgan set up as a criterion for judging men does not differ materially from that set up by editors.

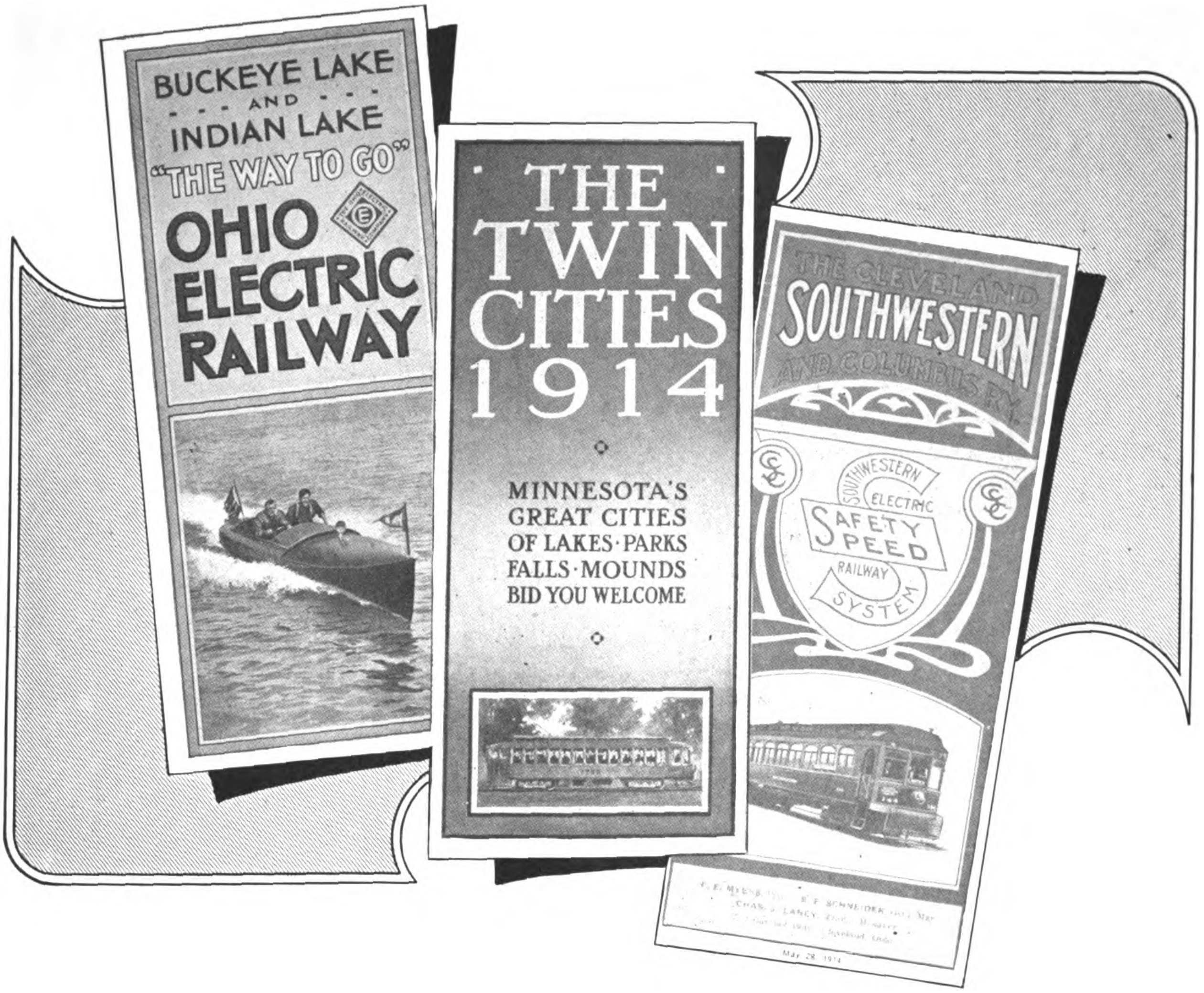
BOSTON ELEVATED RAILWAY

The Boston Elevated Railway was the first company in the United States to establish a publicity department, and since the inauguration of this service in 1897, under the presidency of Col. William A. Gaston, its work has been continuous under his successor, Gen. William A. Bancroft. Within the past two years the financial burdens of the company have necessitated some curtailment of what might be called "originating publicity," but the duties of the publicity agent closely resemble those outlined in the ELECTRIC RAILWAY JOURNAL of Oct. 26, 1907, in so far as response to outside inquiries is concerned. The publicity agent reports to the second vice-president under the present organization of the company, and a broad co-operation is maintained between all of the general offices and the publicity agent, whose office thus becomes a general informational clearing-house.


QUEBEC'S
FAMOUS PANORAMIC TOUR
QUEBEC RAILWAY LIGHT & POWER Co
PRINTED ANNUALLY FOR FREE DISTRIBUTION
TROLLEY TRIPS
BOSTON & NORTHERN & OLD COLONY STREET RY COS.
1911
PUBLIC SERVICE RAILWAY
TO NATURE'S HEART 'MID JERSEY VALES AND WOODED HILLS

COVERS OF UNUSUALLY ATTRACTIVE TRAFFIC PROMOTION CIRCULARS ISSUED BY EASTERN ROADS

Inquiries from outside sources directed to the publicity department cover such subjects as operation, construction, equipment, legislation, plans, policies, accidents, etc. The office is open daily from 9 a. m. to 5 p. m., except on Sundays and holidays. Inquiries received after the close of the office are referred to the superintendent of the day, who is located at the company's general office on Milk Street in Boston. During the late arbitration hearings the publicity department performed valuable service in supplying the press with copies and digests of statements, tables of data, etc., and the newspapers utilized this material liberally in the accounts of the hearings, which extended through several months and included a large amount of technical testimony. A small library is maintained as a part of the publicity department's office, located on the same floor as the general offices of the company and in close touch with these. Complete files of clippings bearing upon the company's work are maintained.


BUCKEYE LAKE
AND
INDIAN LAKE
"THE WAY TO GO"
OHIO ELECTRIC RAILWAY
THE TWIN CITIES 1914
MINNESOTA'S GREAT CITIES OF LAKES·PARKS FALLS·MOUNDS BID YOU WELCOME
THE CLEVELAND SOUTHWESTERN AND COLUMBUS RY.
SOUTHWESTERN ELECTRIC RAILWAY SYSTEM
SAFETY SPEED

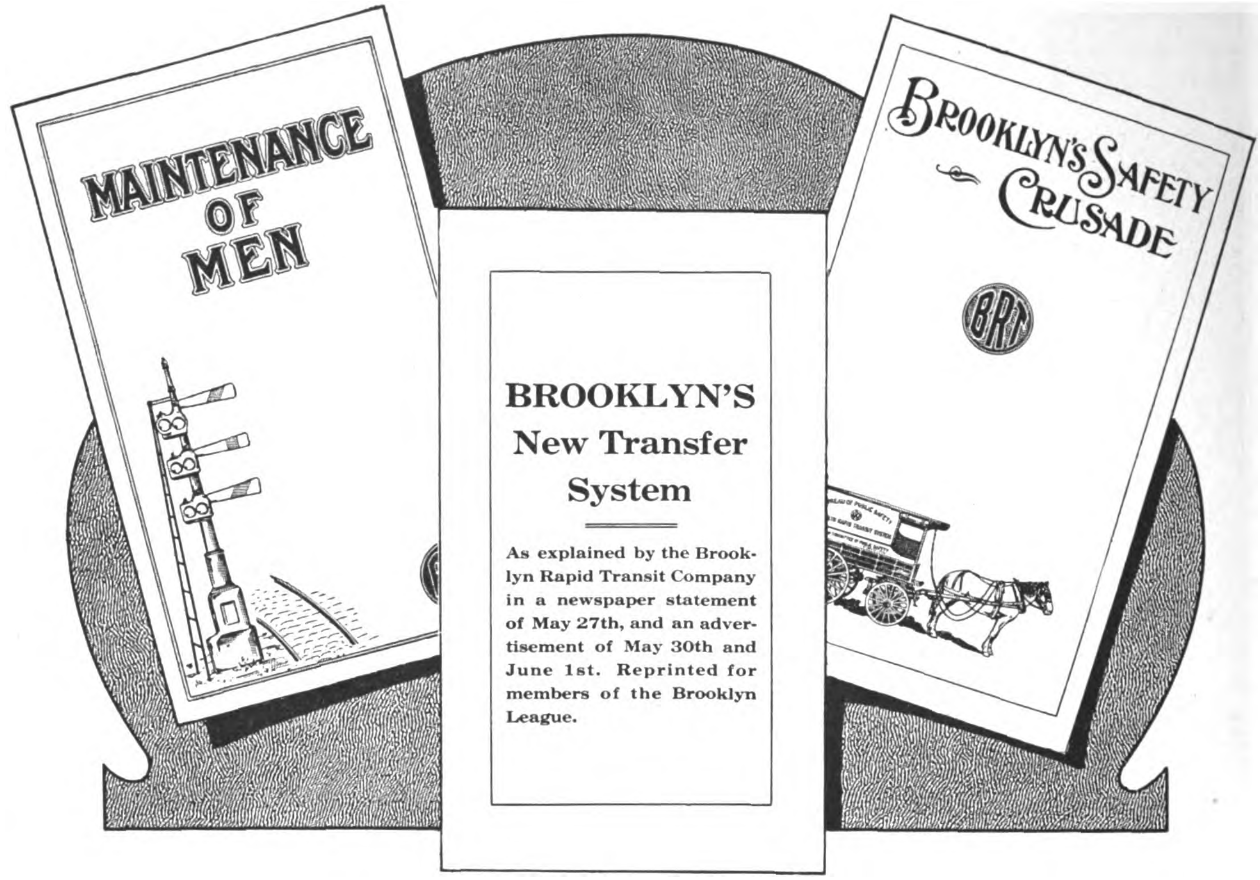
COVERS OF UNUSUALLY ATTRACTIVE TRAFFIC PROMOTION CIRCULARS ISSUED BY CENTRAL WEST ROADS

THE BROOKLYN RAPID TRANSIT COMPANY

The Brooklyn Rapid Transit Company has no regularly organized department of publicity but pursues a general policy of giving out freely all information solicited when it can be properly given to the public. President Timothy S. Williams makes it a rule personally to receive inquiries relating to the work and policies of the company, and in this informational work he has the active co-operation of H. A. Bullock, his staff assistant.

As an important element in maintaining proper relations with the public all departments keep in close touch with their employees through bulletins issued from time to time. For example, the transportation department, in addition to the regular bulletins of an instructive character calling attention to existing rules or establishing new ones, also puts out special bulletins under such titles as "Health Hints for the Summer Months," "Health Hints for the Winter Months," "Concerning Profanity," "Safety Always—A Holiday Motto." Whenever matters of general importance seem to require it, the company issues bulletins to all employees in convenient pocket folder form. Recently when the workmen's compensation law became effective in the State of New York, a special pamphlet was issued. In this, as in other such publications, the employees were not merely furnished with the bare legal requirements of the law, but they were supplied with information intended to explain the essential relationship of the company and the men under the new law. The company has a means for keeping in close touch with the employees through the Employees' Benefit Association, in which the social activity of the employees is centered.

In its direct relations with the public the company's main problem is to insure an accurate knowledge of the facts connected with the operation of the system. It has not been found necessary to use means to stimulate traffic, as the territory has grown, in many instances, more rapidly than it was possible to provide facilities to accommodate the new business. Whenever specific matters relating to traffic need to be called to the attention of the public, this is done through large posters placed in the cars, supplemented occasionally by the distribution of leaflets. On the whole, however, the principal purpose of the publicity work of the company is to improve public relations in general. The basic policy underlying this work is that the public should be kept fully advised in regard to the affairs of the company and especially of the peculiar problems which have to be met. The company has had an unusual opportunity to become acquainted with the public, and to explain its work and methods, during the present expansion in Greater New York.



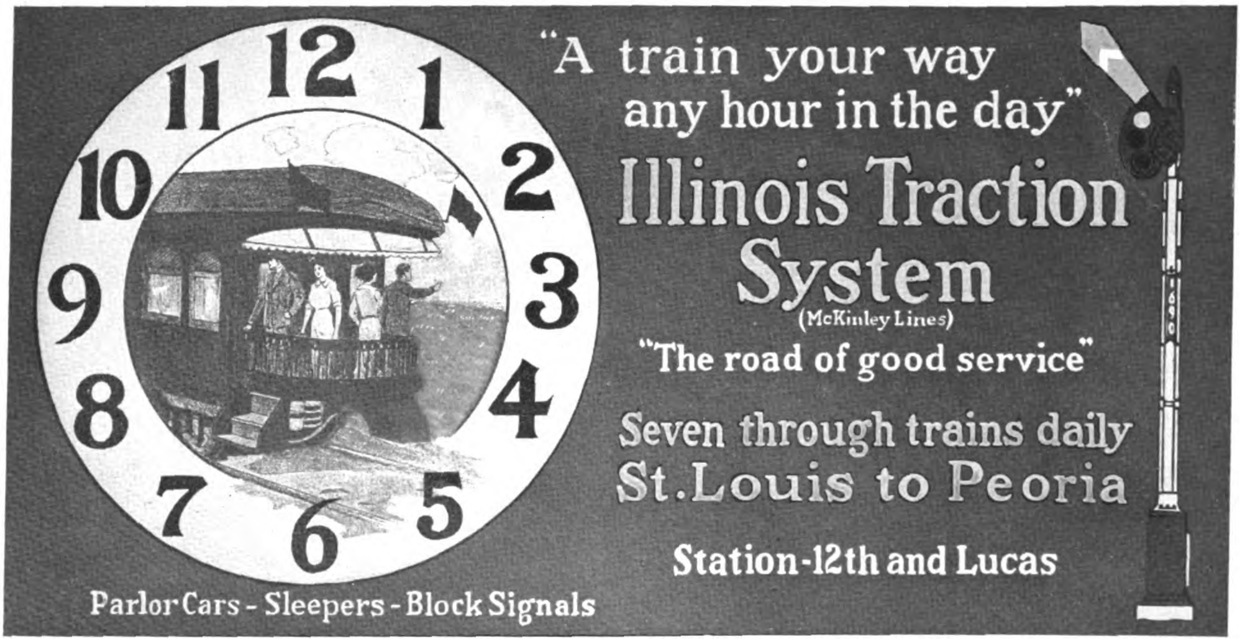
As explained by the Brooklyn Rapid Transit Company in a newspaper statement of May 27th, and an advertisement of May 30th and June 1st. Reprinted for members of the Brooklyn League.

COVERS OF THREE CIRCULARS ISSUED BY THE BROOKLYN RAPID TRANSIT COMPANY FOR GENERAL CIRCULATION

In the effort to improve public relations four general methods are used, as follows: Newspaper inquiries are responded to fully and frankly as received; from time to time formal statements of the company's attitude on important questions are issued; newspaper advertising campaigns are carried on for special purposes, and reprints of important advertisements are distributed on the cars when some special message is to be given to the public.

Elaborating somewhat on these four subdivisions of general publicity work it should be said first that the success of this work is due largely to the personality of Colonel Williams, who is noted for his frankness in responding to newspaper inquiries. Any properly accredited newspaper reporter can see him without difficulty any day when he is in his office. If the inquiry is of a general nature or relates to subjects requiring specific attention by departments it is handled by Mr. Bullock, who obtains the information direct from the company official most directly in contact with the subject under inquiry or puts the inquirer into communication with this official. As a result of this practice newspaper men accept the statements of the company at their face value when it is necessary to tell them that a subject cannot be discussed at the time of an inquiry. Experience has shown them that the company will furnish the information whenever it can properly be published.

The formal statements of the company's attitude on important questions, which are issued from time to time, are generally signed by the president, although sometimes they are issued simply over the signature of the Brooklyn Rapid Transit Company. Letters to public officials explaining the attitude of the company on subjects of public concern are also sometimes given out. The endeavor is made not to overdo the issuance of statements by attempting to drag in discussion which is not properly a matter of news. As a result, the statements receive better consideration than if the company attempted to force publicity by issuing statements on all sorts of subjects or attempted to secure the publication of prepared matter not given out over the signature of the company itself or some responsible official. When formal statements are volunteered by the company or issued in response to inquiries, all of the morning or the afternoon papers, as the case may be, receive them, but when information is obtained in response to specific inquiries for particular papers these papers are protected in their news as it is withheld from others unless another newspaper asks the same questions. It is sometimes found difficult to draw a line between a question which justifies a general reply and one which entitles the newspaper asking it to receive protection in its information. The company finds that the safest criterion is whether the subject matter of the answer is something which the company would normally be giving out itself if no newspaper inquiry had been made.



TYPICAL CARD USED IN ADVERTISING THE TRAIN SERVICE OF THE ILLINOIS TRACTION SYSTEM

During the past year the company has been advertising extensively in the Brooklyn newspapers. During the preceding rapid transit campaign, conducted during the previous year, extensive advertisements were carried in the Brooklyn and Manhattan papers. The recent campaign was a continuation of this one. The principal feature was a series of advertisements entitled "Why We Need the Nickels." In these chaptered advertisements various problems were discussed and the difficulties which beset the operation of the company were frankly stated. These advertisements formed a continued story and were recently issued in a special booklet.

Mention has been made of the distribution of reprints of important advertisements in the cars. This is a very efficient way to secure a large and immediate circulation of such material. As many as 375,000 copies of such reprints have been distributed in a day when the subject at issue was one of a very heated discussion. On another occasion, without any special stress or excitment, a circulation of approximately 100,000 per day was maintained for several days. The company has now under consideration plans for systematically utilizing this means for distributing educational material.

One of the recent very effective means for giving out information on the new rapid-transit construction work is a monthly bulletin showing the status of the work. This is issued in mimeograph form, and the newspapers have given it very fair attention. It has a distinct value in the present situation, when a great many inconveniences are experienced in different parts of the city as the result of pending reconstruction of existing facilities and the construction of new ones.

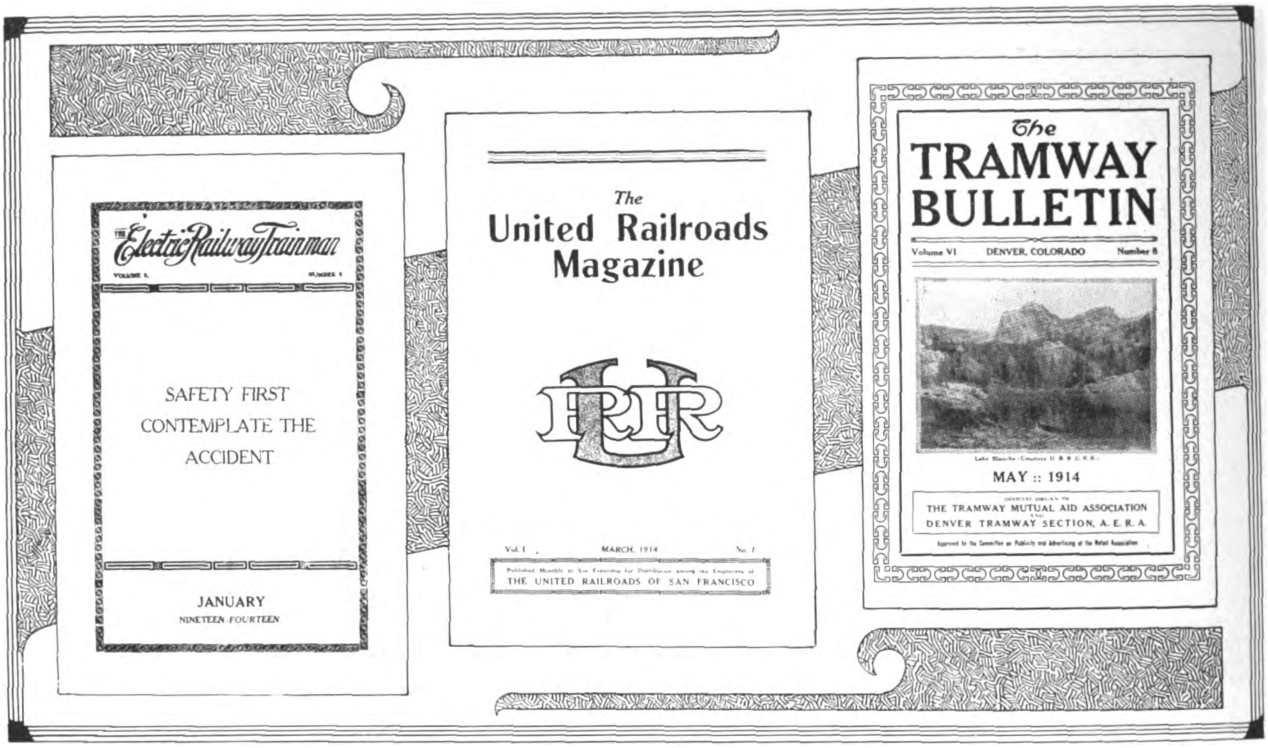
THE "TWIN CITY" SYSTEM

The publicity work of the "Twin City Lines" is in the hands of A. W. Warnock, general passenger agent, who believes that "making the public your friend is a fine art, and like most arts, it is an extremely simply one, once you know how." Mr. Warnock's experience shows that friendly public sentiment can be developed through the giving out of accurate information on such subjects as "Why Present Rates of Fare Are Not Unreasonable," "How the Electric Railway System is Operated," etc. In reaching the general public the company has found the best mediums are the daily and weekly newspapers, window cards in the cars, folders and time-tables.

The company uses a great deal of advertising space in the local newspapers, utilizing such space liberally whenever there is any important announcement to be made, such as changes in schedules or any other matter which requires the co-operation of the public. In the news columns the company makes no attempt to play up new construction or development work, feeling that the papers are somewhat chary of printing matters of this sort. Mr. Warnock is, however, always ready to co-operate with the newspapers in getting up stories, and the company is on the friendliest relations with all of the local papers.

Window cards in the cars are found to be very effective means for reaching the public. The endeavor is made in these to teach some lesson of importance in promoting efficient transportation. Among the titles of these cards may be mentioned "Please Read Your Transfer," "Suggestion to Passengers," "For the Comfort of Passengers," "For Better Service," "Regarding Small Children," etc.

The "Twin City Lines," to an unusual extent, makes use of folders and time-tables, advertising particularly its steamboat line on Lake Minnetonka, the White Bear Lake Resorts, Minnesota State Prison, and points on the Stillwater line. In getting up this printed matter the underlying motive has been to produce something of a very high class, in the belief that cheap printed matter is not acceptable to the public and does not hit the mark. Handsome folders like one recently issued under the title, "The Twin Cities—1914," are highly prized by the public, and local publicity organizations of a civic nature are glad to send these out to people inquiring as to the merits of the "Twin Cities" as a permanent residence. The 1914 folder was the ninth annual publication. Of the folders just mentioned 52,000 copies were printed this year, and time-tables giving information regarding the Lake Minnetonka and Stillwater lines have been printed in editions of 35,000 to 50,000 copies each. A local company distributes these folders in all hotels, ticket offices and folder racks, and the steam railways use quantities for distribution to prospective tourists. For a period of five weeks at the beginning of the season the company advertised that this folder would be sent to any address on receipt of 6 cents in stamps. From this advertising an average of nearly a hundred inquiries a day were received from people who


The Electric Railway Trainman
SAFETY FIRST
CONTEMPLATE THE
ACCIDENT
JANUARY
NINETEEN-FOURTEEN
The
United Railroads
Magazine
URR
Vol. I MARCH, 1914 No. 1
THE UNITED RAILROADS OF SAN FRANCISCO
The
TRAMWAY
BULLETIN
Volume VI DENVER, COLORADO Number 8
MAY :: 1914
THE TRAMWAY MUTUAL AID ASSOCIATION
DENVER TRAMWAY SECTION, A. E. R. A.

COVERS OF EMPLOYEES' MAGAZINES PUBLISHED IN KANSAS CITY, SAN FRANCISCO AND DENVER expressed an intention of spending a day, a week or longer in the twin cities. The steamships on the Great Lakes, from Buffalo to Duluth, are also supplied with these folders, and tourists destined for Minneapolis are given copies. The same holds true on the Mississippi River steamboats.

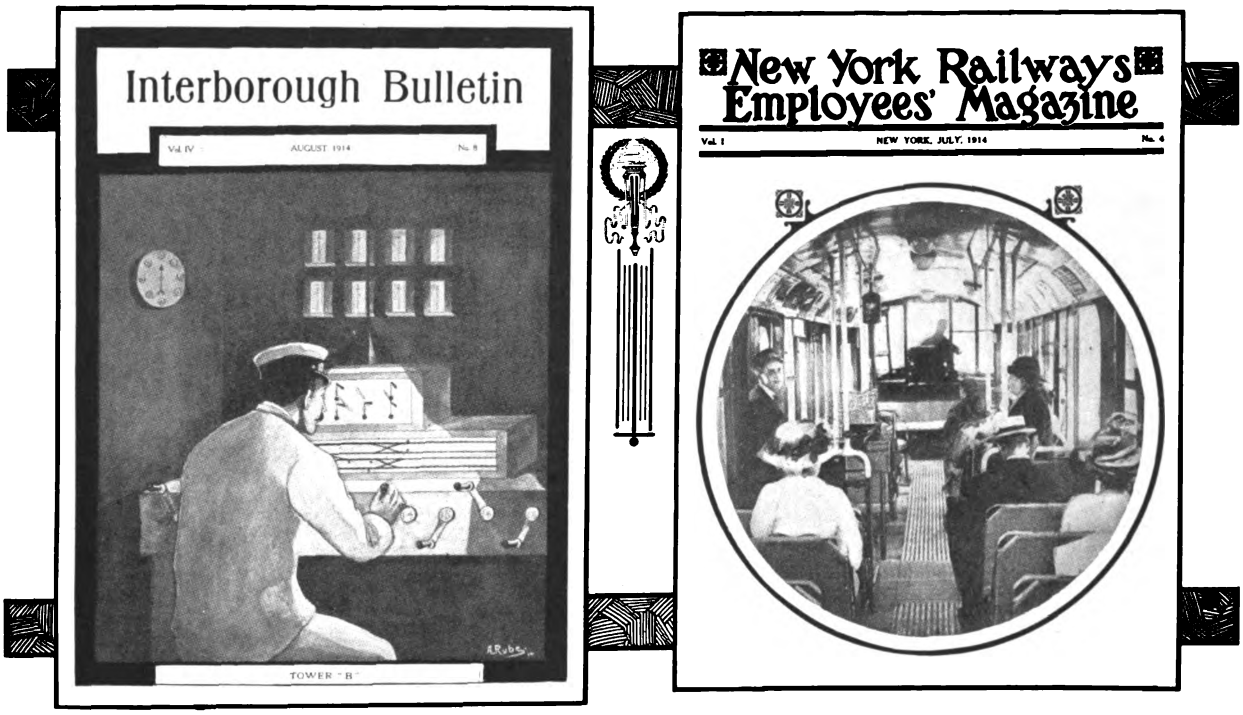
In reaching its own employees the company uses no regular publication, but prepares small bulletins occasionally which can be handed to the men with their pay checks. The bulletin boards posted in the clubrooms are also useful for this purpose.

To quote Mr. Warnock in a recently published statement: "I hardly agree with the sweeping statement that the public is always unreasonable. It is our experience that the average public is a pretty decent public. Perhaps, who knows, what unfriendly feelings the public may entertain toward us may be largely our own fault. Don't we usually get what we give in all other relations of life? Maybe the same principle obtains in this matter."

THE INTERBOROUGH RAPID TRANSIT COMPANY

The policy of the Interborough Rapid Transit Company of making a systematic effort to keep the newspapers informed of its activities dates back to the inauguration of the present management under Theodore P. Shonts, as president. The beginning, which was made at that time toward providing a center where correct information of the doings of the company could be obtained, has been developed until now the work of the department, which is under Henry Porter Waugh, has been extended to include the supervision of the publication of two monthly papers for the employees: the *Interborough Bulletin* and the *New York Railways Magazine.* Mr. Waugh was engaged in newspaper work for eight years in Atlanta, Knoxville, Nashville and Chattanooga. He then came to New York and for twelve years, up to 1909, was connected with the New York *World,* of which he finally became assistant city editor.

The bureau of which Mr. Waugh is the head secures records of all matters of public interest affecting both companies, such as new construction, changes in personnel, financing, accidents, etc., and makes such material available for the newspapers. Through it are also given out the monthly statements of earnings of both the Interborough Rapid Transit Company and the New York Railways. On these statements and such other information as is deemed advisable, a release hour is placed, as competition is particularly keen in New York in regard to financial matters, there being two independent financial news bureaus with ticker services. The bureau gives information wherever it is necessary to foster a correct understanding of any matter, and Mr. Waugh arranges for interviews between newspaper men and officials of the company. He is on call at all times either at his office or at his home. All the daily and other papers received at Mr. Waugh's office are scanned by him, and matters relating to the company are clipped and placed before the president, who forwards them to other officials who may be interested. The eclippings are afterward filed permanently for reference.


Interborough Bulletin
Vol. IV AUGUST 1914 No. 8
A.Ruby
TOWER "B"
New York Railways Employees' Magazine
Vol. I NEW YORK, JULY, 1914 No. 4

TYPICAL COVERS OF MAGAZINES PUBLISHED IN THE INTEREST OF THE EMPLOYEES OF THE SUBWAY AND ELEVATED, AND THE SURFACE LINES IN MANHATTAN AND THE BRONX

Mr. Waugh makes it a practice to inform the newspapers promptly of all the functions and activities of the company. An illustration of the method followed is shown in connection with the opening of the stores for employees where foodstuffs are sold at cost by the company. All the newspapers were informed in advance of the company's purpose, and on the afternoon of the day preceding the opening of the first store Mr. Waugh showed the newspaper men around. He left the talking largely to the man engaged as supervisor of all the stores, who gave the reporters such information as in his discretion would be of value to them in preparing their stories. Mr. Waugh also makes it a point to look after the needs of the newspaper men in connection with the other welfare activities of the companies, such as athletic events, picnics, theater parties and entertainments. He has also made it a practice to attend the public hearings before the Public Service Commission affecting matters concerning his company so as to be readily available to the newspaper men should any question arise on which an expression of opinion might be desired by the papers from some one in authority in the company.

The *Interborough Bulletin* was started less than four years ago. It is a paper of and for the employees of the company, and is distributed free. The circulation is about 18,500, and its appearance is eagerly awaited by the employees. Besides the circulation which it has among the employees, it is sent to a large mailing list of technical papers, magazine editors, city editors and others. It is delivered to subway employees at the Brooklyn Bridge station and to elevated railway employees at South Ferry. A superintendent leaves the necessary supply at the station and also delivers copies at the shops, power houses, etc. In each of the six recreation rooms of the Interborough Rapid Transit Company 500 copies of the bulletin are delivered. The *Bulletin* was such a success that after the sale and reorganization of the old Metropolitan Street Railway, controlling the surface lines, a similar publication was started for the employees of the successor company. This is called the *New York Railways Employees' Magazine*. It has a circulation of 8500 copies. The first issue was in May of the present year. The matter for these magazines is furnished mostly by the men, and information is collected by the chief clerks of the different departments, who send it to Mr. Waugh at the information bureau.

In the employees' magazines of both subsidiary companies explanations are made to the employees of criticisms of the companies which have appeared in the public press. Marked copies containing such explanations are sent to city editors. Some of the material in each issue of both magazines is also written with the special end in view of explaining some particular phase of the companies' work, and many of these articles, written by department heads or prepared from information supplied by such officers, have been reproduced *in toto* by the daily newspapers.

THE PUBLIC SERVICE RAILWAY

The fundamental principle of the work done by the publicity department of the Public Service Railway of New Jersey is simplicity. The work is in charge of J. L. O'Toole, who was for many years a newspaper editor on that effective paper, the Newark *Evening News*. In his present work Mr. O'Toole endeavors to put himself in the editor's place again and to supply only the kind of information which he as an editor would have "hunted down" as news. His ambition is to be considered by the editorial staffs of the newspapers in his district as one of themselves and to convince them that they can depend upon the authenticity of the news which he furnishes. If they want information on a subject not ripe for public discussion, he prefers to tell them so frankly rather than to give out ambiguous and misleading statements.

When a city editor Mr. O'Toole was disgusted by the vast amount of "stuff" with which editors are deluged and which is prepared to serve the purpose of the writers, regardless of the style and character desired by the publishers of the papers. He realized that discreetly prepared copy would be conspicuous through its rarity, and if the supply from one source was not too voluminous its welcome would not be worn out. This vital fact underlies all of the company's publicity work. Another important principle is that, to have news value, items must relate to local territory and conditions. Hence the characteristics of the different localities in which the company operates are studied, and news items are prepared to have local interest.

In order that the publicity department may have inside information as to the occurrences of interest, Mr. O'Toole attends conferences when important matters are discussed. He thus becomes a general center of information. This fact is appreciated not only by the newspapers but by the general public as well, as is indicated by the invitations which Mr. O'Toole receives to address associations of one sort and another, amounting to four or five a month during the winter season.

The Public Service Railway issues no periodical for employees at present, although projects for this purpose have been considered. The amount of printed matter distributed is not very large, the public being reached principally through the news columns of the papers, advertisements being sometimes, but not often, employed. The company gets a great deal of very desirable publicity through its safety crusade, and will get more in the future through a film, recently released by the Edison Company, which was prepared through the co-operation of the film company and the Public Service Railway Company.

THE PENNSYLVANIA RAILROAD

The fundamental ideas underlying the publicity work of the Pennsylvania Railroad are described in an article by Ivy L. Lee, executive assistant, printed elsewhere in this issue. In the practical working out of the policy based upon these principles different types of circulars and bulletins are issued to the press, the public and employees. Through the press announcements which can be given news value are circulated. In these circulars, statements such as the following are made:

"Difficulty has been experienced by railroad passengers from time to time in learning the causes of delays to trains on which they were traveling. In order to remove this source of irritation, the Pennsylvania Railroad has issued instructions to all conductors of passenger trains that when traffic is interrupted trainmen shall pass immediately through their trains and freely announce the conditions, advising passengers without reservation the reason for the delay, and, if necessary, the best means of proceeding on their journey.

"When a train is disabled at or near a station, trainmen are to notify the passengers as to cause and probable extent of the delay in order that they may continue on their journey, or return on an available train. If passengers desire to communicate with their friends from the station they are to be accorded promptly the use of the telephone or telegraph.

"Similar instructions have been given to station agents to post on their bulletin boards, or in other conspicuous places in their stations, a notice giving the location of whatever obstruction to traffic is taking place, the probable length of delay, and any other information in their possession, as to the cause and extent of the difficulty.

"The management of the Pennsylvania Railroad has for some years made public full details of accidents. It realizes, however, that passengers upon trains or passengers waiting at stations for the arrival or departure of trains, have a right to prompt information as to the cause and details of any delays which may take place either to the train on which they are traveling, or that for which they may be waiting. It also realizes that passengers should have every opportunity to allay unnecessary anxiety on the part of friends or families, due to train delays or accident."

The public is reached directly through station posters which are changed frequently. These not only state some definite points of vital interest to travelers, but they explain the reasons for the practices described. The announcements and the accompanying facts are therefore coupled and false impressions are thus avoided.

The most extensive circulation of facts to the newspapers is through the little magazine—*Information*—published at irregular intervals of about one week apart. In these a great deal is made of the human element referred to by Mr. Lee in his contributed article in this issue. *Information* is usually a 4-page leaflet, 6½ x 9 in. in size, printed and illustrated with great care. Each issue is devoted to a particular topic and there is a wide variety in the choice of topics, as is shown by the following titles: "He Risked His Life to Save Another," "The Railroad Roll of Honor," "Providing Increased Facilities for Handling Grain," "Pennsylvania Railroad System Owns Nearly 3000 Steel Cars," "87,000,000 Passengers on 680,000 Trains—All Safe," etc.

Especial attention is paid to retiring employees, portraits of the more prominent of whom are published.

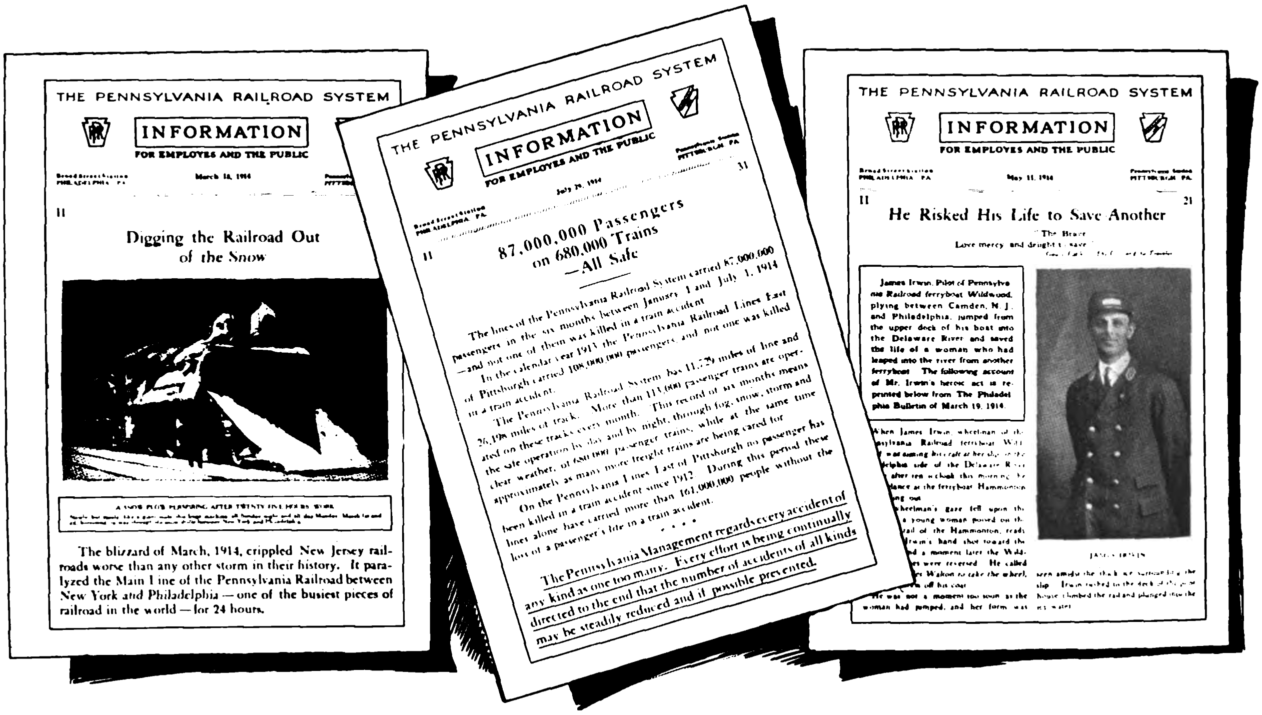
THE NORTHERN OHIO TRACTION & LIGHT COMPANY

On the system of the Northern Ohio Traction & Light Company the general passenger agent, James A. Braden, is also manager of publicity, although the department was originally simply the advertising department. The chief activity of the department, after the regular advertising, is the publication twice each month of a four-page paper entitled the *Traction Bulletin*, of which 30,000 copies are printed at each issue. They are placed in small boxes in all city and interurban cars and passengers are invited to help themselves. Just before each number appears a poster is placed in car windows announcing the next number and date of issue, with a strong line calling attention to the chief article.

The work of the publicity department is handled by Mr. Braden, with the help of a stenographer and the co-operation of other employees, particularly for clerical work. The employees are reached by bulletins and circular letters through the safety department in charge of E. H. Clinedinst, safety supervisor. Aside from the *Traction Bulletin* the company reaches the general public by newspaper advertising and by posters announcing change of time or special events. The company depends primarily on the bulletin in connection with work on public relations, but furnishes the newspapers with matter calculated to work toward the same end. Photographs, cuts and text for the papers are prepared with the end in view of meeting the various newspaper requirements so far as it is possible to anticipate them. The experience of Mr. Braden in newspaper work, extending over ten or twelve years, has of course been of great value in this work. The company invites complaints and looks into them, answering promptly all letters. On one or two occasions Mr. Braden has improved opportunities to talk before local clubs on electric railway subjects. It is his opinion that the *Traction Bulletin* has been the most effective work the company has undertaken in the promotion of better relations with the public.

THE ILLINOIS TRACTION SYSTEM

This large interurban system has a fully organized department of publicity in charge of E. E. Soules, manager of publicity. Among the different lines of work which fall to the publicity department of this company are the following: Placing of all display advertising in newspapers and magazines, including the making of the necessary contracts; preparation of special articles from time to time when requested by publications for use in special editions, etc.; preparation of "news stories" on the subjects of equipment, extensions, change of schedule and service, changes in organizations and other such topics as are acceptable to a newspaper as desirable news matter; arranging copy, printing and distributing folders and time cards for the use of the public, and planning and executing various advertising campaigns that may be considered advisable from an operating and traffic standpoint.



THE PENNSYLVANIA RAILROAD SYSTEM

INFORMATION

FOR EMPLOYES AND THE PUBLIC

March 18, 1914

II

Digging the Railroad Out of the Snow

The blizzard of March, 1914, crippled New Jersey railroads worse than any other storm in their history. It paralyzed the Main Line of the Pennsylvania Railroad between New York and Philadelphia — one of the busiest pieces of railroad in the world — for 24 hours.

THE PENNSYLVANIA RAILROAD SYSTEM

INFORMATION

FOR EMPLOYES AND THE PUBLIC

Broad Street Station PHILADELPHIA, PA

Pennsylvania Station PITTSBURGH, PA

II 31

87,000,000 Passengers on 680,000 Trains —All Safe

The lines of the Pennsylvania Railroad System carried 87,000,000 passengers in the six months between January 1 and July 1, 1914—and not one of them was killed in a train accident.

In the calendar year 1913 the Pennsylvania Railroad Lines East of Pittsburgh carried 108,000,000 passengers, and not one was killed in a train accident.

The Pennsylvania Railroad System has 11,729 miles of line and 26,198 miles of track. More than 113,000 passenger trains are operated on these tracks every month. This record of six months means the safe operation by day and by night, through fog, snow, storm and clear weather, of 680,000 passenger trains, while at the same time approximately as many more freight trains are being cared for.

On the Pennsylvania Lines East of Pittsburgh no passenger has been killed in a train accident since 1912. During this period these lines alone have carried more than 161,000,000 people without the loss of a passenger's life in a train accident.

* * * *

The Pennsylvania Management regards every accident of any kind as one too many. Every effort is being continually directed to the end that the number of accidents of all kinds may be steadily reduced and if possible prevented.

THE PENNSYLVANIA RAILROAD SYSTEM

INFORMATION

FOR EMPLOYES AND THE PUBLIC

Broad Street Station PHILADELPHIA, PA

May 11, 1914

Pennsylvania Station PITTSBURGH, PA

II 21

He Risked His Life to Save Another

James Irwin, Pilot of Pennsylvania Railroad ferryboat Wildwood, plying between Camden, N. J., and Philadelphia, jumped from the upper deck of his boat into the Delaware River and saved the life of a woman who had leaped into the river from another ferryboat. The following account of Mr. Irwin's heroic act is reprinted below from The Philadelphia Bulletin of March 19, 1914.

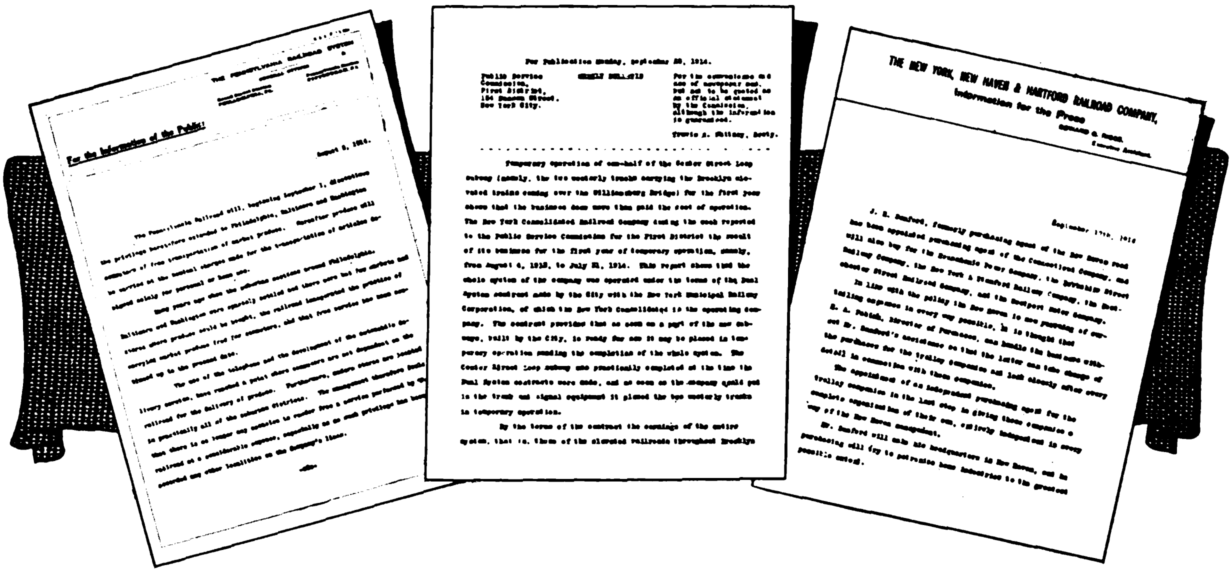
FRONT PAGES OF THREE INFORMATION CIRCULARS OF THE PENNSYLVANIA RAILROAD

The manager of publicity reports to the vice-president executive and general manager of the company. Every agent or representative of the company is considered an assistant to the publicity manager, for it often happens that the local representative, acting in co-operation with the publicity department, can be of great assistance in handling the publicity problems in his particular territory.

Mr. Soules finds that the methods to be employed in reaching the general public for the purpose of stimulating traffic depend largely upon the local situation. For instance, the territory served by the company is not so well supplied with summer resorts as are many of the Northern and Eastern electric properties and it is a case, therefore, of keeping up the every-day travel, with the exception of inducements that may be offered in the shape of excursions into some of the larger cities on the lines, such as St. Louis, Mo.; Peoria, Ill.; Springfield, Ill., and other points.

The experience of the company has been that the daily and weekly newspapers are the best mediums for reaching the public with the story of an excursion rate or special attraction, and a large amount of newspaper display advertising is used for this purpose, supplemented with the usual window cards and "fliers" in interurban cars. The advantage of the newspaper is that, in connection with the display advertising, the excursion or attraction is usually given notice in the news columns. Recently the motion-picture playhouse has opened up a valuable medium for reaching a class of people likely to patronize the excursion, and this medium has been used to a considerable extent with the display of artistic curtain slides in "picture" and vaudeville houses. The slides tell concisely the story that it is desired to convey to prospective patrons of the road. This department and the traffic department co-operate to a considerable extent with organizations giving excursions on the company's lines, in the advertising of such movements.

The company has found that newspapers consider "feature" stories on the subject of interurban operation as desirable matter for their columns, and some time ago a newspaper supplement was prepared by this company and offered to newspapers in its territory. It was eagerly accepted, and two other supplements have since been issued. The last one was put up in magazine style, containing twenty-four pages of reading matter and illustrated with cuts of street scenes in cities served, views along the line, pictures of equipment, track scenes, terminals, etc. The supplement had as its basic theme the story of the advance in the use of electricity in the transportation world in the last ten years, and contained a number of original articles written by officers of commercial organizations in cities along the lines of the company on the subject of "The Advantages of an Interurban Railway to a City." It also contained articles depicting the resources of the various cities and communities along the lines of this company, and the principal daily and weekly newspapers considered it a desirable addition to their regular editions. Where desired a page was donated to the newspaper for its own advertisement or to the commercial organization for an advertisement of the city itself.



MIMEOGRAPH AND PRINTED NEWS BULLETINS OF THE PENNSYLVANIA RAILROAD, THE PUBLIC SERVICE COMMISSION OF NEW YORK AND THE NEW HAVEN RAILROAD

This company has from time to time taken the public into its confidence in various ways. For instance, in connection with the annual State fair which is held in Springfield, Ill., an important point on the system, patrons were asked to make suggestions for the improvement of service. Each passenger traveling into Springfield on the company's lines during the fair was entitled to make a suggestion by depositing a slip in a ballot box located in the company building at the fair, and prizes were offered for the best suggestions. A number of valuable suggestions were received, and the plan attracted considerable attention.

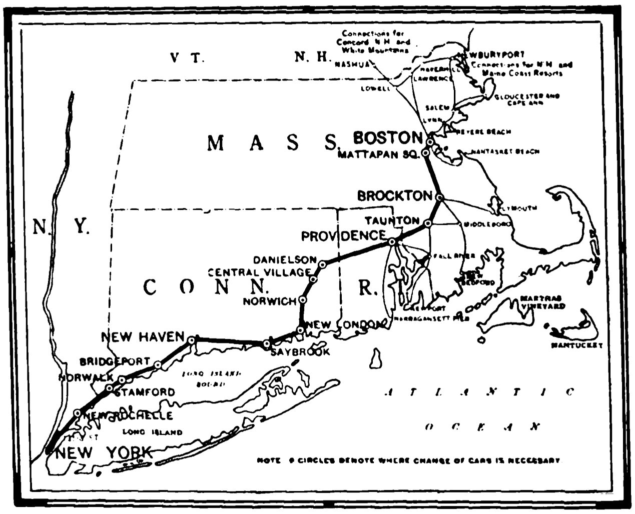
A "phrase" contest was also conducted in connection with the State fair. Prizes were awarded for the best three phrases containing three words beginning consecutively with the letters "I," "T," "S." Nearly four hundred suggestions were received and a committee of newspaper men awarded the prizes. The first prize was awarded for "Ideal Train Service," and this phrase has since been used to a considerable extent in company advertising.

In connection with the State fair this company also conducts an information bureau on the fair grounds and, in addition to supplying information in regard to railway connections, details of the fair, etc., an opportunity is afforded for a large amount of advertising.

When sleeping and parlor-car service was established on the system the first car to be put in operation was sent on a trip over the lines and placed on exhibition at each city and town. At the time block signals were first installed, full-sized models were exhibited on the street corners in the principal cities and the operation of the mechanism was demonstrated.

In the "playing up" of construction and development work this company affords every facility possible to the newspaper man. This kind of information is considered "live stuff" by the news departments of the city paper, and assistance in securing such information is appreciated by the working newspaper man. From time to time groups of newspaper men have been taken over the lines for the purpose of allowing them to see new construction work and development of the properties and to give them an idea of the operation of the system. Photographs and in many cases cuts are supplied where desired.

Folders and time-tables are distributed direct to agents from the publicity department of this company, and agents are required to see that stocks are well kept up. Requisition for folders is made direct to this department and when a supply is sent out it is accompanied by a slip stating the number of folders forwarded, date, etc. A receipt is attached which the agent fills out and returns to the publicity office indicating that he has received the shipment. An arrangement with a distributing company provides for a supply of folders to all hotels. In addition to folders this company issues a "terminal time card" for the principal points on its lines, which gives briefly the arriving and departing time of all trains and other information in regard to connections, etc. These are displayed in hotels and public places. In distributing other advertising matter where the services of a professional distributer are required, the assistance of the local agent is depended upon. Advertising matter of this kind is sent to the local agent and the distributer is instructed to call on the agent for it. The agent is then supposed to check up on the distribution and report back to the publicity department.


Connections for Concord N H and White Mountains
V T.
N. H.
NASHUA
NEWBURYPORT
Connections for N H and Maine Coast Resorts
HAVERHILL
LAWRENCE
LOWELL
GLOUCESTER AND CAPE ANN
SALEM
LYNN
REVERE BEACH
M A S S.
BOSTON
MATTAPAN SQ.
NANTASKET BEACH
BROCKTON
PLYMOUTH
N. Y.
TAUNTON
MIDDLEBORO
PROVIDENCE
DANIELSON
FALL RIVER
CENTRAL VILLAGE
C O N N.
R.
NEW BEDFORD
NORWICH
MARTHAS VINEYARD
NEWPORT
NEW LONDON
NARRAGANSETT PIER
NEW HAVEN
SAYBROOK
NANTUCKET
BRIDGEPORT
NORWALK
LONG ISLAND SOUND
STAMFORD
A T L A N T I C
NEW ROCHELLE
LONG ISLAND
O C E A N
NEW YORK
NOTE ○ CIRCLES DENOTE WHERE CHANGE OF CARS IS NECESSARY

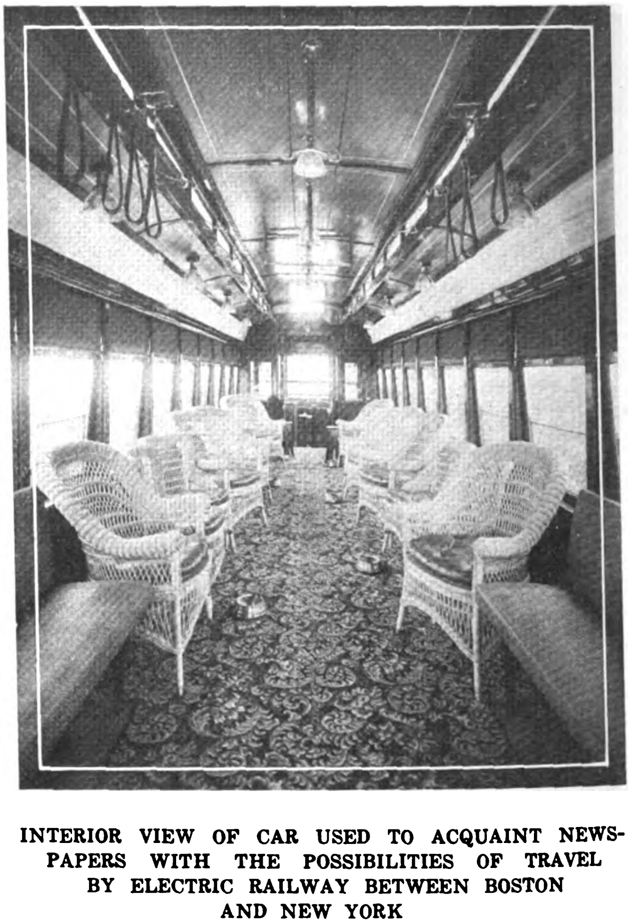
MAP OF ROUTE FOLLOWED TO ACQUAINT NEWSPAPERS WITH THE POSSIBILITIES OF TRAVEL BY ELECTRIC RAILWAY BETWEEN BOSTON AND NEW YORK

A 350-MILE CITY AND INTERURBAN SYSTEM

The head of the publicity department of a large city and interurban system has supplied information regarding the publicity work of his company. On this system the publicity department was created in 1911. Its work consists in keeping the company management fully informed as to articles appearing in the press throughout its territory which, directly or indirectly, affect its interests; giving such information to the press as may be deemed advisable concerning the company's policy or undertakings, and controlling the company advertising.

The reporters of the daily papers call or telephone to the publicity department every day for items and always receive courteous treatment. The effort is made to see that nothing except correct information concerning matters with which the company is connected appears in the newspapers. This work has been accomplished well, as the city editors know that the publicity man is at their service, day or night, to assist them in every way to secure an accurate account of the subject under consideration. Copies of "hand out" articles are sent to all publications of similar class. Where a publication asks for information on a special subject, the facts are reserved exclusively for it. By strictly observing well-framed rules as to the giving out of information the company has been spared attacks arising because of the rivalry of local publications.

In the matter of public relations, reliance is placed chiefly on news items and paragraphs supplied to reporters as they call. Extended articles are also prepared for the press, as needs demand, and put into the form of "time copy" material for the magazines covering the company's field. Last year a series of traffic talks was prepared and appeared in the company's regular advertising space with good effect. The opinion of the publicity manager of the company is that such talks should appear in serial form so as to keep up a day-to-day interest, rather than as longer advertisements published spasmodically. The company's development work is played up in every possible way and the reporters are supplied with data, photos, etc., ac-



INTERIOR VIEW OF CAR USED TO ACQUAINT NEWSPAPERS WITH THE POSSIBILITIES OF TRAVEL BY ELECTRIC RAILWAY BETWEEN BOSTON AND NEW YORK cording to their requirements. Every facility is afforded to newspaper men who desire personally to visit the scene of any operations which are being carried on by the company.

Efforts are made to stimulate traffic through advertisements in the daily press. All attractions, whether of a public or private character, are advertised if they are likely to create traffic. For attractions running at fixed times throughout an entire season special folders are prepared and sent out with the company's lighting bills. Considerable publicity regarding special attractions is also obtained through news paragraphs and articles prepared along lines of indirect appeal. During the summer season the company usually issues folders suited to the demands of tourists. Where the probable return would seem to warrant the expenditure special folders are prepared to cover special excursions. These folders are distributed through hotel racks in the centers of traffic.

In the line of advertising the newspapers are supplied with fresh copy according to existing conditions. Copy for the daily papers is generally changed every day, and for the weeklies it is changed according to circumstances. In this work close touch is kept with the various departments of the company, and every advertisement is framed in such a manner as to make it likely that the company will, directly or indirectly, reap some benefit, financial or otherwise, as a result of its appearance. All publications of a similar class are treated in the same manner as to advertising space, and extra space taken in one is also taken in others of the same class.

All advertising propositions are classified under their respective headings, and a definite policy is established regarding each class. All applications from any one class are similarly treated as to rejection or consideration. By putting up the barrier of a definite policy regarding rejection, and showing the advertising canvasser that his proposition and every other of his class are being treated alike, the work has been greatly simplified. In short, the criterion adopted on this property regarding public service advertising is one of freeing the advertising appropriations from the burden of payments authorized because of sentiment. Where such expenditures are deemed necessary, they are placed under their proper classification of donations or grants.

The department is under the charge of the publicity agent who acts directly under the general manager. Its staff consists at present of the publicity agent, a clerk who takes charge of the clipping system, indexing, etc., a stenographer and an office boy, who assists in the work of handling the clippings. The "clipping" system covers all publications within the company's territory. Every morning a letter is sent to the chief officials containing a digest of each clipping. This makes it possible for incorrect or misleading statements covering the work of any department to be corrected promptly. The clippings are pasted on loose leaf sheets, indexed by card system and are filed permanently in the publicity agent's office for reference. The office also scans the periodicals and technical journals dealing with the business which the company carries on and memoranda of paragraphs or articles are sent to the departmental heads as the demand arises.

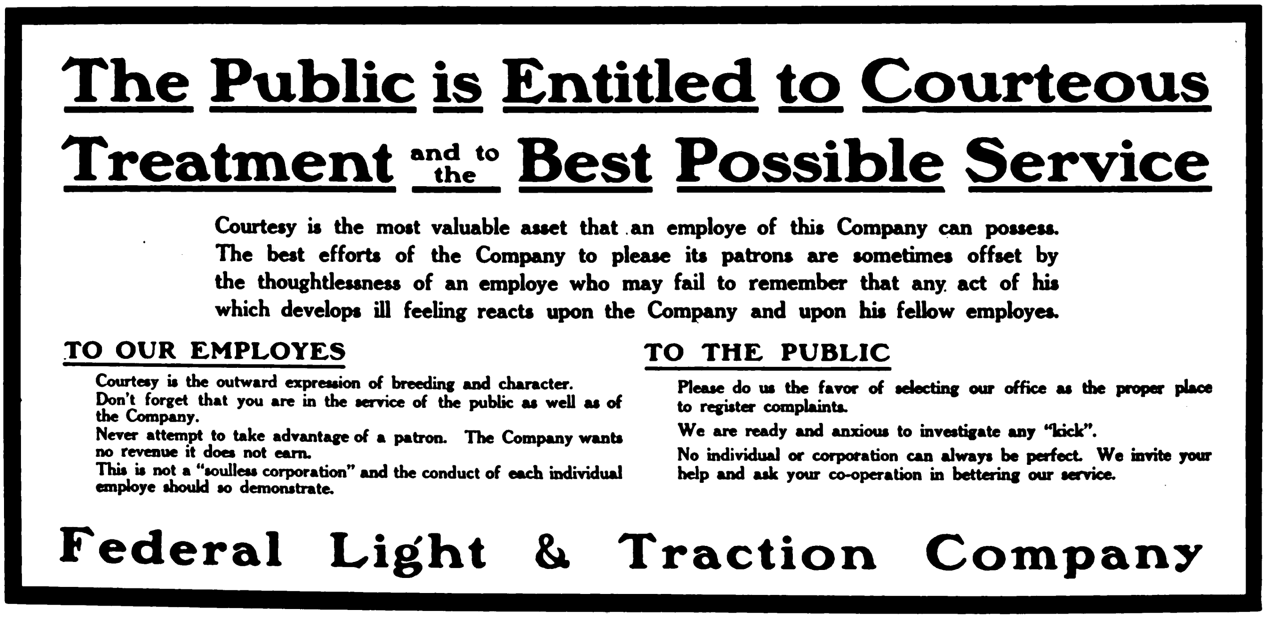
SPECIAL
BOSTON to NEW YORK by TROLLEY along the SHORE LINE
BAY STATE STREET RAILWAY CO.
4182

CAR USED IN THE TRIP TO ACQUAINT NEWSPAPER MEN WITH POSSIBILITIES OF TRAVEL BY ELECTRIC RAILWAY BETWEEN BOSTON AND NEW YORK

THE ATTITUDE OF THE NEWSPAPERS TOWARD PUBLIC UTILITY PUBLICITY

In connection with the account of the ways in which the utilities keep in touch with the newspapers it will be interesting to have the viewpoint of the newspapers in regard to public utility publicity. To secure this from one newspaper editor the ELECTRIC RAILWAY JOURNAL requested an interview with Fred G. Buffe, secretary-treasurer of the Peoria (Ill.) *Herald-Transcript*. Mr. Buffe has had experience with public utility publicity, both from the standpoint of the railway and that of the newspaper, having formerly been connected with the Illinois Traction System, and so has had exceptional opportunities for seeing both sides of the question.

Mr. Buffe commenced by quoting an editor of a great newspaper who said that anything that affected the streets was good news. The streets were the arteries of the city for the common good of all the citizens, and anything that assisted or interfered with rapid communication and transportion was front-page "stuff." This is true also of water, gas and light, because on these depends the comfort of the average citizen. Mr. Buffe considers that public utility news as a general thing, therefore, is good copy. The people are interested in anything that influences their comfort and convenience. They are pleased to read of improvements being made, whether by the utility company or the department store. The extension of a car line is as interesting to the people of the city as the building of John Jones' new barn is to the village.



The Public is Entitled to Courteous Treatment and to the Best Possible Service

Courtesy is the most valuable asset that an employe of this Company can possess. The best efforts of the Company to please its patrons are sometimes offset by the thoughtlessness of an employe who may fail to remember that any act of his which develops ill feeling reacts upon the Company and upon his fellow employes.

TO OUR EMPLOYES

Courtesy is the outward expression of breeding and character.
Don't forget that you are in the service of the public as well as of the Company.
Never attempt to take advantage of a patron. The Company wants no revenue it does not earn.
This is not a "soulless corporation" and the conduct of each individual employe should so demonstrate.

TO THE PUBLIC

Please do us the favor of selecting our office as the proper place to register complaints.
We are ready and anxious to investigate any "kick".
No individual or corporation can always be perfect. We invite your help and ask your co-operation in bettering our service.

Federal Light & Traction Company

CARD ON COURTESY DESIGNED TO BETTER PUBLIC RELATIONS

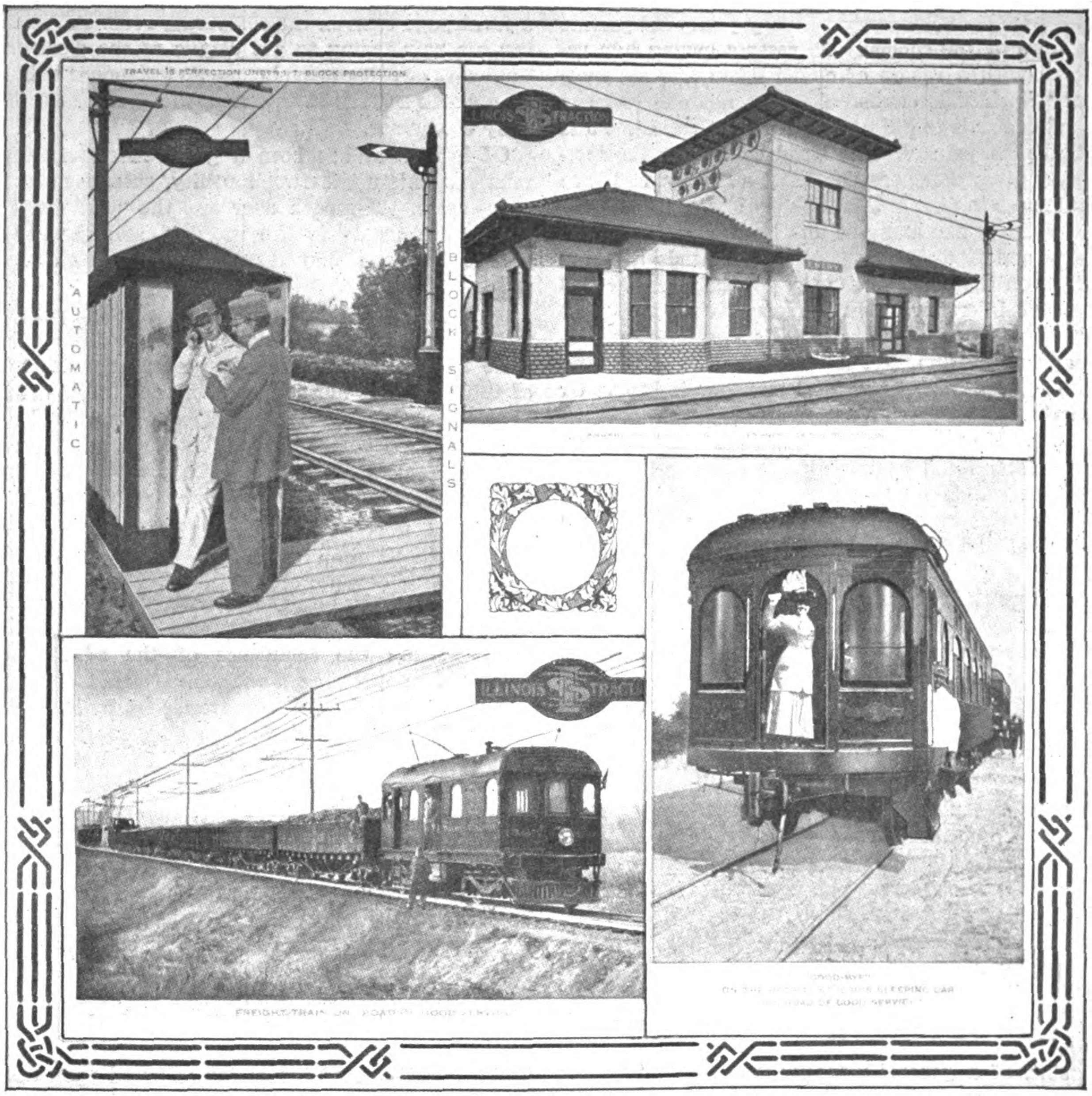
The way in which an editor looks upon public utility publicity varies with different varieties of editors and different types of utilities and utility executives. If the point of view were reversed and the attitude of the public utility toward the editor investigated, the conditions would be about the same. If two and three make five so do three and two; likewise one is paid in the same coin that he gives. Whether a company is "a myriad-headed octopus sucking the life blood of the community," or "a highly efficient, up-to-date, capably managed, soundly financed institution" is in a great measure determined by the man who heads the payroll of the company.

It is safe to say that the attitude of the editor toward public utility publicity is the same as it is toward that of the street-cleaning department, the police station, the circuit court or any other source of news. He is paid to see that what happens in his town that is news is gathered, well written up and printed. If the public utility has legitimate news he will print it. Of course, in many cities, extraneous things enter the relationship, and influences outside the editor's control are determining factors. It may be that the company and the publisher are at outs, or that the paper is allied with a city administration or a political organization which makes political capital by "lambasting" the public utility. It may be that because of past misdeeds or poor service, public sentiment has crystallized against the company. In that event this sentiment may be shared, reflected or even fostered by the newspaper. But these are special cases, for, in a city where the relations are neutral and where there is no political bias, the editor—the man in charge of the news end of the paper—will approach public utility publicity with an unprejudiced mind. If he is treated fairly he will be willing to give the company more than an even break in the news.

This subject brings in labor and franchise matters, according to Mr. Buffe. For a newspaper these are dangerous questions and have to be handled with gloves. The news must be carefully edited and written without bias. An editor cannot be expected to jeopardize the success of his paper and his position by espousing the cause of a public utility company. But unless the policy of the paper is partisan he will be willing, if treated courteously and given the facts, to print them fairly.

The editor, contrary to the frequently expressed opinion, is quite human. It may be that long experience with hypocrisy has made him cynical or that his dealings with press agents have made him prone to "examine the band on the gift cigar," but, as a matter of fact, his human qualities are generally uppermost. He is engaged in the absorbing occupation of giving the people what they think they want, and his waking hours are spent in quest of news. He is glad to welcome facts, but views "bunk" with "a cold and clammy eye." He resents having anyone attempt to put something over on him with the "gold brick" of free advertising. While the editor is supposed to be divorced from the business department he is aware of the source of his salary and does not feel at all unfriendly if now and then he observes utility publicity in the display advertising.

The public utility manager must put himself in


TRAVEL IS PERFECTION UNDER I. T. BLOCK PROTECTION
AUTOMATIC
BLOCK SIGNALS
ILLINOIS TRACTION
ILLINOIS TRACTION
FREIGHT TRAIN ON ROAD OF GOOD SERVICE
GOOD-BYE!
ROAD OF GOOD SERVICE

FOUR OF THE PICTURE POSTCARDS DISTRIBUTED BY THE ILLINOIS TRACTION SYSTEM TO AFFORD ITS PATRONS AN EASY MEANS OF "WRITING HOME" the editor's place. Assume, for example, that some news has leaked out that the manager would prefer not to see in print. If the "tip" is in the newspaper office it will appear, but the manner and form of its appearance is largely up to the manager. The editor is a pretty busy individual. He is trying to make the "deadline." When the editor sends an inquiring pest of a reporter to pry into the private affairs of the company he resents having him return with a report of closed doors and stubborn and implacable clerks. He does not like requests and demands to kill news when it is legitimate and should be printed. His blood boils when the company gives the opposition sheet a "scoop" and then attempts to placate him with excuses and apologies.

Perhaps like many editors he is cursed with too few and inefficient reporters. He sends a young man on the jump to see the general manager and get an interview. So the reporter makes haste to the general office where he finds a secretary guarding the sanctum. He is told that there is "nothing doing," or that the general manager is busy. Or perhaps he is given a manifolded typewritten statement. He fails to reach the "Presence," does not get the story, and returns to his office sore, mad and disgusted. When he reports, the editor says, "We can't print excuses. Write what you have for a 'follow' and I'll write the 'lead.' I'll bet the big stiff sees the next man I send over." And a big black mark is chalked up against that general manager in the mind of everybody from the editor to the office boy. And red-headed office boys seldom forgive and never forget.

The reporter isn't like the supply salesman. He cannot wait when the general manager is busy. The hands of the clock are racing to press-time, and neither time nor the press will wait on the manager's pleasure or convenience. No matter what the business of the moment may be he should see the reporter and be pleasant. It may be an annoyance to interrupt an important conference to interview a reporter, but it should be done by all means and at once. By so doing the manager is creating a correct attitude of the editor toward the railway property and also the attitude of future editors.

Mr. Buffe enjoys telling a story, much to the point, of a general manager who is liked by the newspaper men in three states. He has the newspaper instinct highly developed. One stormy night in winter one of his cars made a skating rink out of the track and banged into a loaded car ahead, smashing windows and injuring several passengers. The editor of the morning paper, who was a good friend, called up the manager and asked him about the story and halfway apologized for having to use it. "You print the news, that's your business," was the reply. "I'll call the superintendent and have him send someone up with the names and the facts."

This same manager, on the occasion of a disastrous wreck on his interurban line, loaded his private car with newspaper men, picking them up along the line, put the company telephone at their service and gave them every facility to get the news. He was able to put himself in the place of the fellow at the copy desk, 50 miles away, holding a front page open in the composing room and tearing his hair trying to get details of the disaster. That sort of thing helped make an attitude that has been worth a lot in favorable publicity for his company ever since.

Of late there has been a great change in the relations existing between utility executives and newspapers. The open door and the "glad hand" are now elements in the accepted and generally practiced policy, and excellent results naturally follow.

To facilitate the working out of this policy, public utilities should have certain officials who come in contact with the newspaper men as part of their duties. Most utilities now have publicity departments, and, properly handled, these should be among the most valuable cogs in the machinery of the organization. They should be in charge of men with newspaper experience, whose duties should not be merely those of the "press agent." In fact, nothing is so certain to make the editor unfriendly, for he has been afflicted with this gentry for years and views their inspired utterances with much suspicion.

By getting the confidence of the editor, by making him understand that there is no disposition to grab free space for advertising, by showing him that the company desires only to give him legitimate news, the head of a publicity department can make himself a welcome visitor in the editor's office.

Like the public utility, the newspaper depends for its success upon service. Every day it has so many columns of reading matter to fill, and its readers are entitled to these columns with the most interesting and attractive matter it is possible to put together. The advertisers pay for the display columns, but the news end is paid for by the subscribers. The public utility office should be a good news center. And the management will find that the attitude of the editor is based upon this fact if he is given half a chance. The public utility serving the public should have little difficulty informing the public of changes and improvements in that service through the medium of the newspaper, the duty of which is to print the news.

In general, then, Mr. Buffe believes that the attitude of the editor is but a reflection of the attitude of the utility, and mutual understanding and helpfulness will exist if consideration is given to the requests and to the work of the gentleman with the blue pencil.

Electric Railway Journal

Published by the McGraw Publishing Company, Inc.
Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY, OCTOBER 10, 1914 No. 15

RAMIFICATIONS OF SAFETY WORK

The article in this issue describing the lines of activity of the safety department of the Public Service Railway suggests the extent to which it is possible for this movement to go. There is practically no resistance to its expansion, and the only limit seems to be set by the appropriation which the railway company feels justified in making for the work. The returns for the expenditure are difficult to measure in dollars and cents. In this the safety movement is like advertising. We know instinctively that it is a good thing and that, up to a certain extent, it will pay good returns. Just what this extent is cannot be scientifically determined, but we can be sure of a good return on all of the money that a railway is likely to spend on the movement. At the moment the safety movement has caught the public fancy. It fits in well also with a number of civic movements. It is well that the electric railway industry, being an inherently hazardous one, should make the most of its opportunity and should keep up the good work. The electric railways will thus take their places as leaders in their respective communities and will reap a direct reward in reduced accident costs.

ASSISTANCE FROM THE HOME GUARD

The attendance at the Atlantic City convention will be large, but necessarily a larger body of men must remain at home to keep the wheels going round. Many of those best qualified to take part in the discussion of papers and reports cannot break away. They can be represented, however, if the remarks which they would have spoken if at the convention are sent to the secretary by mail either this week or early next week. It is possible that all of these compositions cannot be read at the convention, but undoubtedly most of them can be, and in any event they will enrich the printed proceedings. Chairmen are always glad to have ammunition in reserve ready for use at some juncture when verbal manifestations of interest lag. Written contributions are second only in value to spoken ones, and often they are better, for many men can write better than they can speak. This should, however, not be taken as an excuse for staying at home, for there are reasons for coming to the convention other than to increase the volume of eloquence. The preprints of many of the reports and papers were distributed so early this year that there has been ample opportunity to study them. A large crop of written contributions would furnish good evidence that they have been studied.

A MEANS OF ECONOMY

If we think of the convention principally as a means for securing greater efficiency in the operation of individual companies, as it undoubtedly is, any question as to the desirability of a member-company being represented at Atlantic City this year disappears. This is a time when many, indeed most, railways are enforcing systems of strict economy. The need for this has been accentuated by the financial stringency resulting from the war, and stern efforts are being made on most properties to keep all expenses down to the minimum. This is entirely proper, but expenses may be cut so close as to defeat the object sought. With the five associations which will meet at Atlantic City and the opportunities afforded there for comparing notes and getting new ideas, more than enough benefit should be derived from the meeting, in suggestions for practical economies, to pay the expenses for a good delegation from each member-company. It should be remembered that these meetings occur but once a year. It seems that at least once during that length of time the accountant, the engineer, the claim agent and the transportation manager on every electric railway could gain enough advantage from discussing their problems with the corresponding officials on other properties to warrant their being sent to attend such a gathering. This argument for attendance at the convention is based purely on the self-interest of the individual railway concerned, the only question being the most effective way of saving money in the long run.

VALUE OF INDUSTRIAL SIDINGS

The value of a side track connecting an industrial plant with a main line is obvious, and it is a question if any other single agency is so potent a factor in cutting the cost of handling manufactured products and raw material between the stock room and the railroad. The development of electric freight and express business has in many localities dated in a large way from the use of side tracks which entirely eliminated the obstructions and sanitary inconvenience of teams, saved labor formerly devoted to costly rehandling, and insured prompt shipments of both perishable and durable material. Unfortunately local municipal authorities are sometimes slow to appreciate the convenience and desirability of electric railway sidings as compared with steam-railroad private tracks which cross sidewalks and streets at grade. Something may very properly be said against permitting the indiscriminate use of steam locomotives on the public highways, but very little objection is tenable relative to the handling of freight and express in and out of such industrial plants by electric cars or locomotives. To cite a typical case now pending, an electric railway company desires to build a side track in connection with the erection of a new creamery whose owners are prepared to expend about $30,000 to secure a model plant. In order to make the site available, the siding must cross the sidewalk at grade. The daily traffic amounts to about 9000 quarts of milk at present, and this can be handled by a single car. However, it appears that if the siding is not installed, the product of the farms must be brought into the plant by several motor truck trips each day, and at a public hearing on the company's petition the point was well made that one or two car movements a day across the sidewalk would constitute a far smaller hazard to pedestrians and children than would the automobile truck service. The matter is, of course, one of mainly local interest, but it suggests the greater fitness of the electric railway for handling such traffic and has some general significance thereby. On the grounds of cleanliness, restriction of route, minimum number of movements for a given load, and quiet effectiveness, to say nothing of economical transportation, the electric railway is much superior to its gasoline competitor. When it has a fair chance to show its merits in districts of the distinctly wholesale or manufacturing type a trolley express and freight service with industrial sidings meets a need which should be generally recognized by public authorities.

MONOGRAPHS IN COMMITTEE REPORTS

Recent years have developed a decided departure from the practice of having convention papers or reports prepared by individuals, at least so far as the larger technical questions of the electric railway industry are concerned. The committee method now in vogue has much in its favor, for it facilitates the collection of data, and the deductions from such data are based on a greater fund of experiences than any one man, no matter how expert, could be expected to possess. Furthermore, the danger of a colorless compromise in harmonizing the divergent views of committee members is much less than the acceptance of conclusions which embody the unchecked bias of one man.

While such matters as the selection of standards, forms of specifications and analyses of data sheets are best handled by committees, it is evident from the reports this year that very good supplementary work has been done by individuals in the form of monographs on matters which are of great present interest but do not call for committee work as a whole. One of these monographs, for example, is that by L. M. Clark, who describes in the report of the committee on equipment, Engineering Association, the wonderful advances recently made in more economical and better distributed car lighting. Much information of this character has already appeared in the technical press, but necessarily in fragmentary form, while the monograph marshals all the important facts to date in most convenient fashion. Thus the association member is really presented with an up-to-the-moment handbook as only one of many membership benefits. Among other monographs in committee reports are those given as appendices by the committee on power generation, Engineering Association. They are as follows: "Status of Automatic Stokers," by J. S. Pigott; "Control and Safety Devices for Power Stations and Feeder Circuits with Special Reference to Reactance," by J. W. Welsh and Fay Woodmansee, and "Advantages and Disadvantages of Sixty-Cycle Apparatus with Particular Reference to Rotary Converters for Railway Service," by L. P. Crecelius and W. H. Sawyer.

Aside from these signed monographs, other committee reports will be found to contain similar supplements which are apparently the work of individuals and form most readable and instructive statements of advances in the art.

MOTION TIME STUDY OF FREIGHT HANDLING

It seems somewhat strange at first thought that an efficiency study of a steam railroad freight terminal should be undertaken by a corps of electrical engineers. Yet the principles of engineering analysis are the same in electrical as in other branches of engineering, so that the selection of Professor Pender and several of his associates at the Massachusetts Institute of Technology to study the Boston freight terminal station is not really illogical. Professor Pender's conclusions, presented in a paper before the New York Railroad Club recently, are naturally of primary interest to the steam roads concerned, but the unusual process itself of applying motion time studies to freight handling will appeal to electric railways as well.

In a study of freight-handling methods on interurban electric railways published in our 1913 convention number, we noted the congested conditions as a rule existing in freight terminals. The central location of such terminals in limited areas on account of high land values has generally caused freight congestion. The margin of profit under present rates does not warrant extensive freight terminals. In fact, several electric interurban railways have been forced to stop the solicitation of less-than-carload freight simply because the cost of the needed extensions was too great. Under such conditions a motion time study of the handling methods in order to eliminate lost motion is advisable in order to secure the complete utilization of the property already owned. The principles used in Boston are applicable to electric railway freight terminals, whether large or small, and the success of the investment there may well lead many electric railway managers to resort to such means before authorizing expenditures for enlarging congested terminals.

The percentages obtained in Boston are not intrinsically valuable to electric railways, of course, but they do indicate the lines along which time may be saved in handling freight. An analysis of the total time spent by wagons in the freight yard showed that 6 per cent was taken up by inquiries at the cashier's office, 9 per cent in searching for freight, 15 per cent at the freight-house door, 7 per cent in loafing and 35 per cent in loading and unloading. It was concluded that the time required at the cashier's office could be reduced 40 per cent by employing more accurate methods in handling delivery checks. The time necessary for finding freight, including calls without load, could be reduced 60 per cent by grouping consignments and keeping identification marks in view.

In an analysis of the time between the arrival of trains and the delivery of freight, the most interesting point was the time interval between the making of delivery checks and the removal of freight. At one freight terminal the average delivery time was about eighteen hours after the beginning of the free storage period of seventy-two hours. Only 55 per cent of the freight was removed on the day of the first notice. There seems to be no remedy for this abuse of the storage privilege except through the establishment of a store door delivery. Another point especially interesting to electric railways was the inefficiency of the average loads of less-than-carload freight. The low tonnage on some divisions represented only 20 per cent of the normal capacity of the cars. When the high cost of handling the unused equipment is compared to the time and expense of concentrating the shipments in only the cars actually needed, the opportunity for saving on this item will be seen.

OUR CONVENTION ISSUE

We believe that we do not owe our readers an apology for the selection of the subject of public relations for our convention issue this year. As President Black says, it is the paramount question to-day before the electric railways of the country. Indeed, it underlies their financial existence. The reason for this is that the electric railway industry is undergoing a process of change so far as its relations with the public are concerned. This change began some ten years ago with the establishment of public service commissions with broad powers of supervision and regulation. It has been hastened by many economic factors, among which the increased cost of operation is probably the most important.

The consequence has been that the electric railway has ceased to be an enterprise largely private in its character, subject only to such limits as apply to mercantile enterprises and liable also to the hazards of those enterprises. Instead, it has become very similar in character to a public undertaking. The service is being regulated in the interests of the public, and the belief is general now that these companies should be protected in their investments against competition, like other public enterprises. The only difference is that they are managed and owned privately and not publicly. These conditions have introduced important questions in connection with the subject of regulation and rates. These questions are acute in cities where the franchises have expired or are about to expire, but they are also the cause of considerable concern even for those companies which are operating under perpetual franchises.

The subject of public relations naturally divides itself into three parts—namely the proper attitude of the companies and the public toward each other, the improvements possible in operating conditions and the broad question of regulation. These are the main divisions of the contributed articles in our convention number. We do not intend here to review the different articles in that number. The authors speak for themselves in better and more convincing language than we command; but it might be well to touch briefly upon the general conclusions reached.

No one can read the articles in the convention issue without being impressed with the fact that the managements of our electric railway companies realize to the fullest degree the importance of establishing the proper kind of relations with the public which they serve. They must not only keep their service up to the proper standard, but they must give full publicity to their accounts and actions and let the public know what they are doing. They must be prepared to receive criticisms and complaints graciously and to show that they are ready, within their ability, to improve any conditions of which legitimate complaint is made.

This attitude does not mean the sacrifice of dignity or of any right possessed by a public utility. Where advantage is taken by the public of this attitude to extort unreasonable privileges, or in case of other oppression, the electric railways should not hesitate to explain their position clearly and definitely and to defend it, and if they have established a reputation for fair dealing with the public they should expect and demand equally fair treatment in return.

The question of the proper character of regulation is a basic one in any consideration of the relation of public utility companies to the public. Granted government regulation, the first questions to be determined are whether there should be state or municipal regulation and the proper qualifications and powers of the regulators. Another question closely allied with this is that of the most desirable form of franchise for a public utility company. On this point we consider ourselves fortunate in being able to present to our readers a number of most interesting discussions, including a series of articles on the subject of partnership relations. This series discusses in detail the partnership arrangements in four cities in which this plan has been adopted or proposed, namely, Chicago, New York, Kansas City and Philadelphia. Other articles in this section discuss the functions and powers of commissions and the importance which the questions of valuation possess in connection with railroad properties. In conclusion an article describes methods and policies of public utility publicity from various standpoints.

We believe that our readers are greatly indebted to all of the gentlemen who have contributed their thoughts to this symposium and that their statements will be of great assistance to the industry, as they should help to secure that great desideratum at present —a better condition of public relations for the public utility companies.

New Shops and Carhouse of the Atlantic City & Shore Railroad

These Recently Completed Shops Show the Influence of the Experience of Steam Railroad Engineers in Shop Layout as Applied to Electric Railway Conditions—Owing to Local Conditions the Shops Have Been Made Remarkably Complete, Considering the Size of the Road

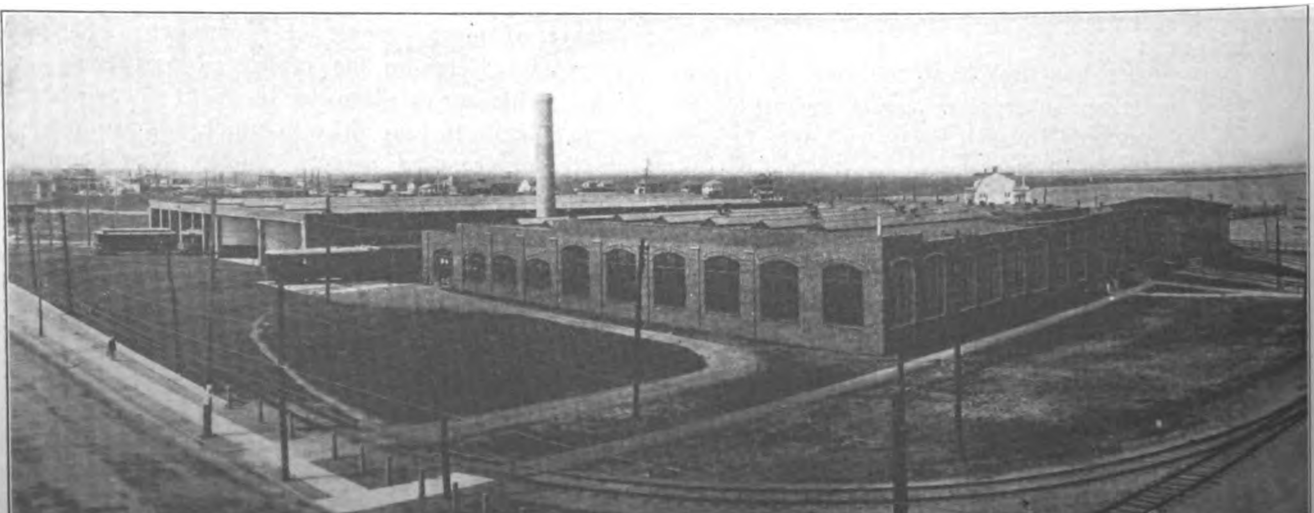
The accompanying diagrams and illustrations tell an interesting story of the shops and carhouse just completed at Atlantic City, N. J. The system of the Atlantic City & Shore Railroad is probably one of the best known to electric railway men in this country because Atlantic City is most frequently selected for the meetings of the American Electric Railway Association. The new shops, carhouse and office building, together with the site, represent an investment of about $250,000. They contain provision for adequate maintenance and storage of the present rolling stock and for a considerable increase. They were built by the West Jersey & Seashore Railroad under the lease of their property to the local company, and suitable charges will be made to several underlying companies for their shares of the operating costs and overhead charges on a car-mileage basis. Before taking up details of the special features of the building and general plan, a brief summary of the organization and equipment of the company will be made to give the reader data for analysis beyond the scope of the present article.

The company operates 48 1/3 miles of single track in Atlantic City and its environs, a line to Ocean City being the longest single section. The company also operates during the summer time a line of boats between Longport and Ocean City, having for this purpose an equipment of five steamers. The rolling stock comprises eighty-two passenger cars, of which about one-half are summer cars, four are combination baggage and passenger cars, one is a funeral car and six are miscellaneous service cars.

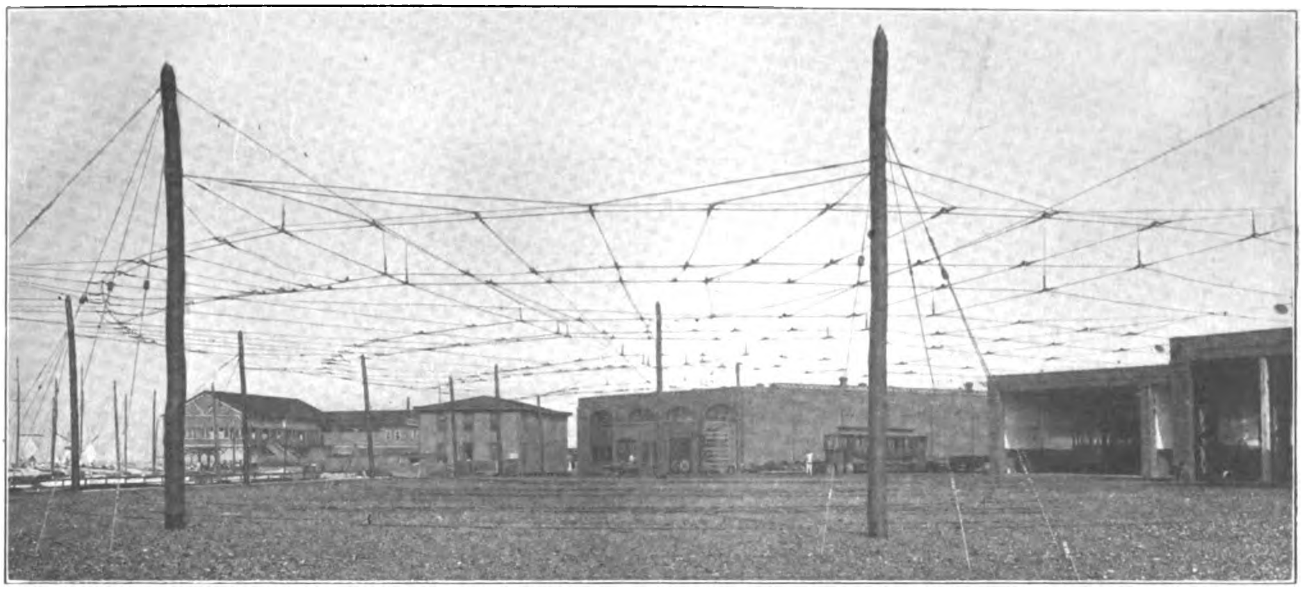
The organization of the Atlantic City & Shore Railroad is somewhat complicated due to the fact that the several underlying properties are still maintained intact. The Central Passenger Railway, over whose less than 2 miles of track an entrance into Atlantic City is secured, is the smallest. The Atlantic City & Shore Railroad has a right-of-way only over this track. It leases the Atlantic City and Longport track from the West Jersey & Seashore Railroad, and also part of the Newfield branch to Pleasantville. The railroad has also a traffic right over the double-track road from Pleasantville to Somer's Point, the second track having been built to meet the demands of traffic. The line from Somer's Point to Ocean City was built by a separately organized company known as the Atlantic City & Ocean City Railroad, which leased its track for 999 years to the Atlantic City & Shore Railroad. Separate sets of books of accounts for all these underlying railroads are maintained.

GENERAL LAYOUT OF THE PLANT

The new plant is at the extreme eastern end of the island upon which Atlantic City is located. Here the railroad was fortunate in owning a plot which, while not central with respect to the system, was accessible. In shape and size it was better adapted to its purposes than the old site farther downtown. By adaptation of the requirements to the new location, it was possible to utilize all of the area and to provide for the convenient handling of cars with a minimum of yard space. The general plan of the layout is shown in one of the accompanying illustrations. The shops are housed in two buildings, one containing the paint shop and the other the machine and wood shops and the boiler-room and sundry other small rooms. These two buildings are placed opposite, 52 ft. apart, with a transfer table 36 ft. wide between. The carhouse is detached from the shops and contains twelve tracks placed in four bays. Across one end of the transfer-table alley is the office building, in two floors, joining the shop building. This arrangement brings all the parts of the shops within easy reach of the officials located in the office building.



ATLANTIC CITY SHOPS—PANORAMIC VIEW OF SHOPS AND

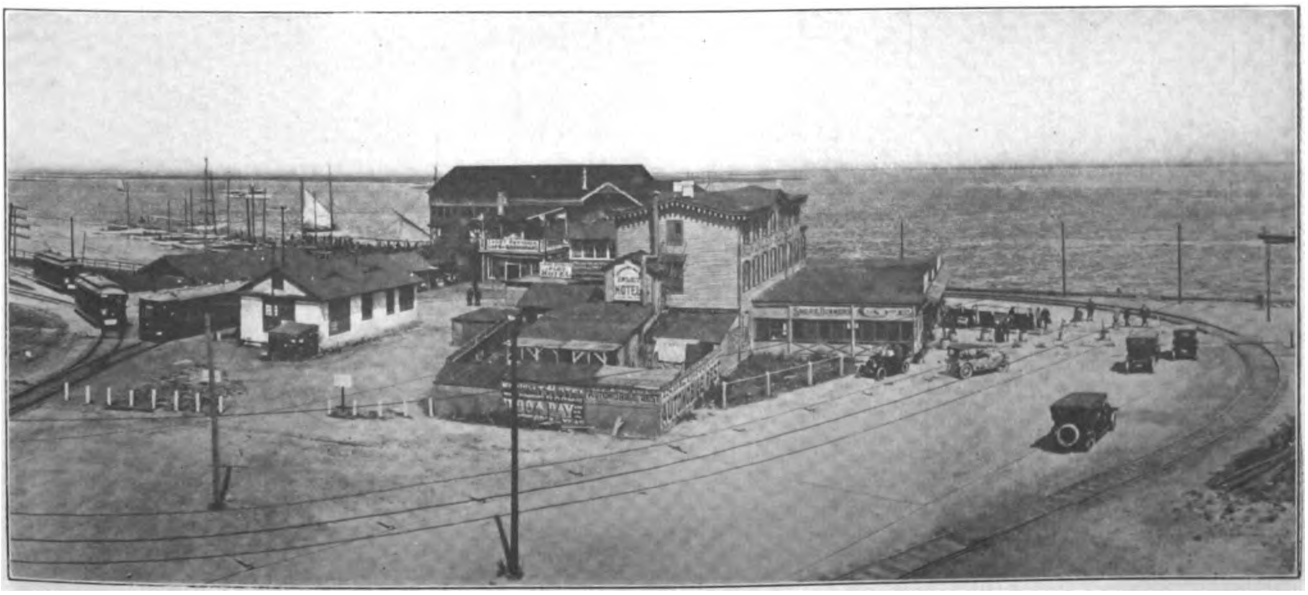


ATLANTIC CITY SHOPS—VIEW OF OVERHEAD CONSTRUCTION IN YARD

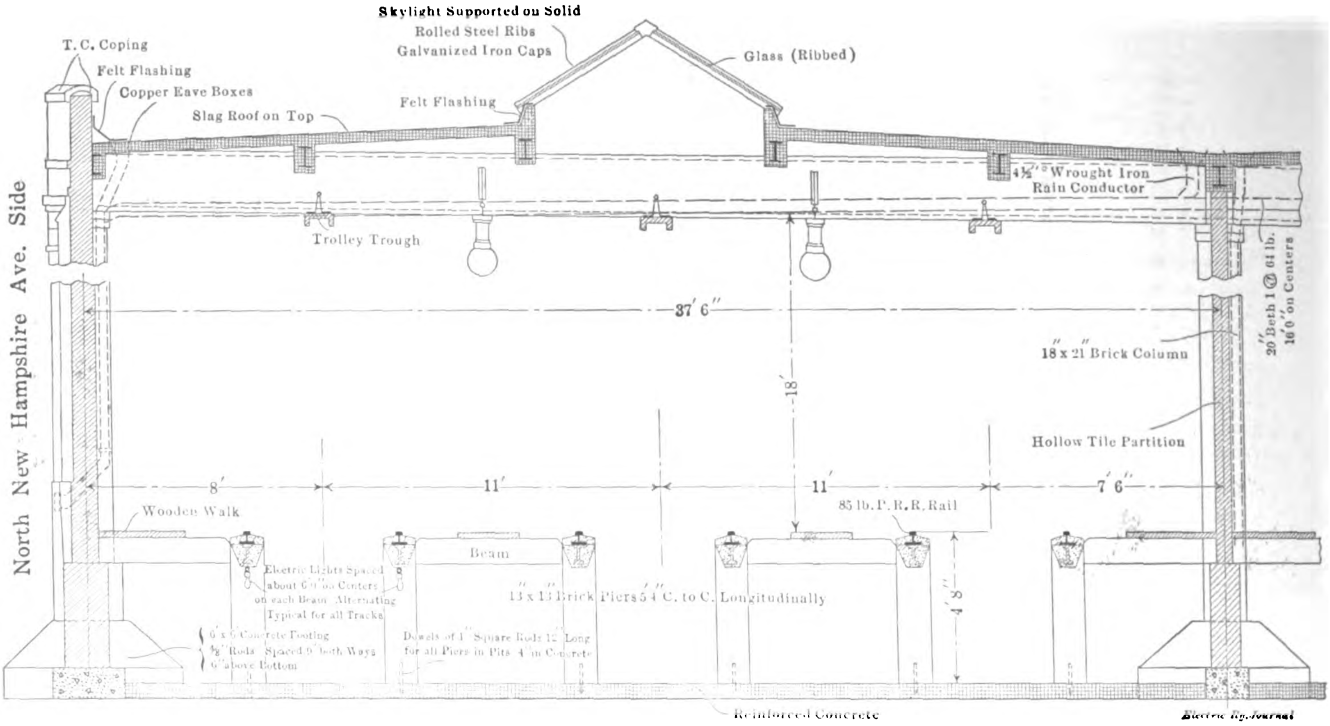
In comparing these shops with others there are certain conditions imposed upon the designers due to the location which must be kept in mind. It was in the first place economical to use as small a site as possible because the area had to be filled in to a height sufficient to bring the bottoms of the pits well above high water. This filling had not only to be put in but it has to be kept in against the encroachment of the severe storms to which this point of the island is particularly exposed. At the same time these same storms made necessary an unusually large shop area because much maintenance work must be done to offset the excessive wear and tear of equipment. The wind drives the sand everywhere and causes cutting of bearings and commutators, necessitating frequent overhauling. Similarly, the storms produce severe abrasion of the car-body surfaces which have to be refinished frequently. For this reason a very large paint shop was provided, as well as ample carhouse space to enable the cars to be kept under roof when not in use. The combination of these two general conditions accounts for the complete filling of the site.

In the design of the buildings a substantial type of construction was adopted on account of their exposed location. All unnecessary refinements were avoided and as inexpensive a form of construction as was consistent with the other requirements was adopted. Appearance was, however, considered unusually important also because the site is such a conspicuous one. The company desired to do its share in boosting the city as a summer and winter resort not only by means of attractive buildings but by suitable planting of all unoccupied areas. The provision of ample light was also considered of prime importance by the designers, and the general type of construction lent itself readily to the use of numerous skylights and large windows.

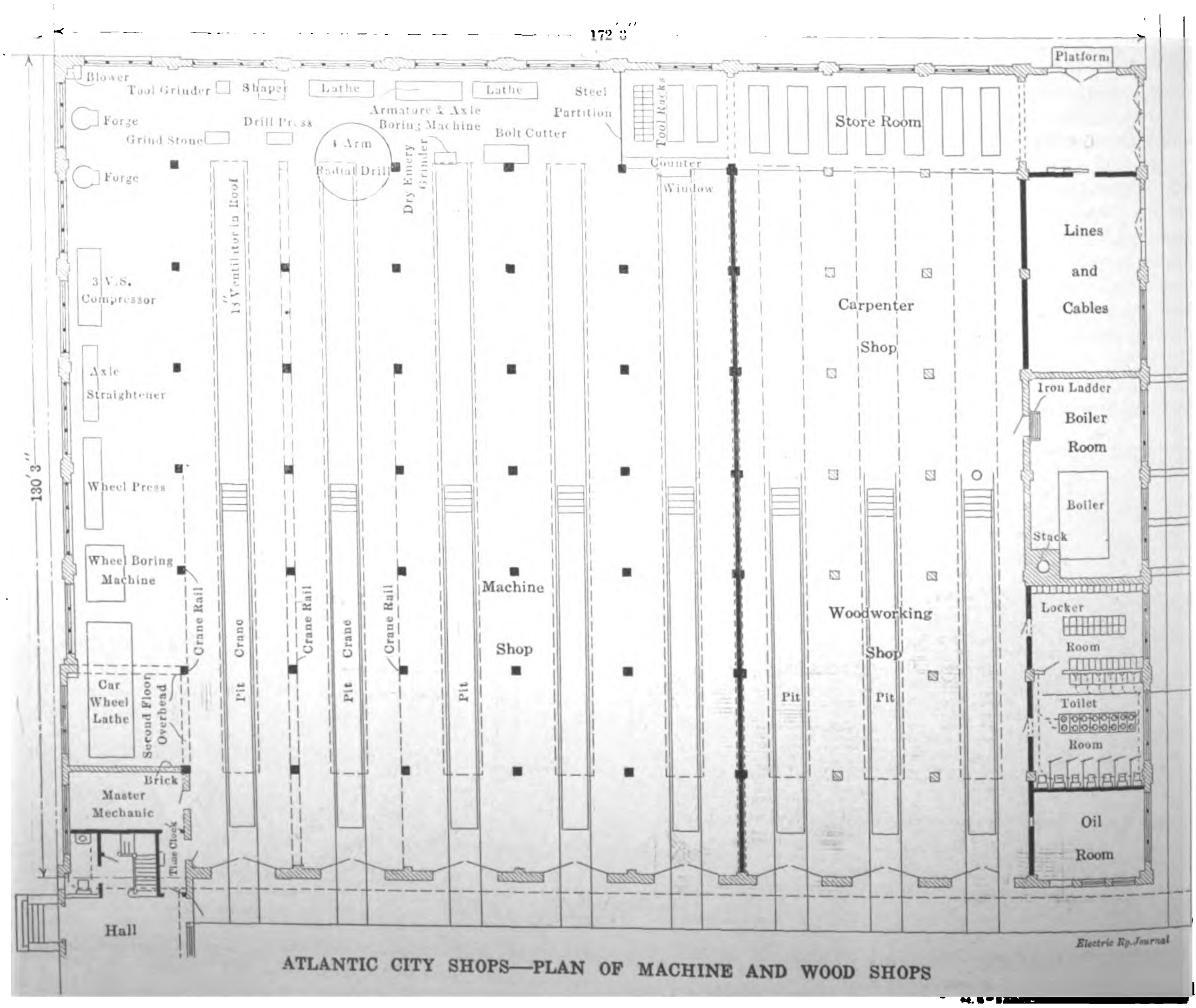
An important design feature in the layout was imposed by the fact that, while the number of cars to be handled in the shops is comparatively small, yet for the reasons indicated the area covered by them had to be quite large. On the other hand, the road could not afford to employ as many men as would usually be necessary in shops of the same size. The equipment, therefore, had to be so selected and placed that the repair and maintenance work could be handled rapidly by a small force. Moreover, Atlantic City is comparatively isolated from other large cities, and it was necessary to have the shops as independent of other shops



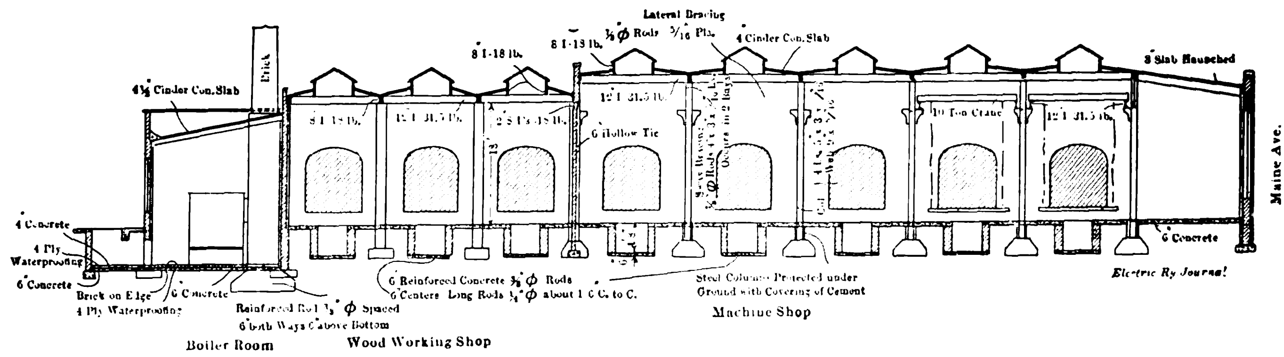
SURROUNDINGS AT INLET END OF ATLANTIC AVENUE LINE


Skylight Supported on Solid
Rolled Steel Ribs
Galvanized Iron Caps
Glass (Ribbed)
T. C. Coping
Felt Flashing
Copper Eave Boxes
Slag Roof on Top
Felt Flashing
4½" Wrought Iron
Rain Conductor
Trolley Trough
North New Hampshire Ave. Side
37' 6"
18'
20" Beth 1 @ 64 lb. 16' 0" on Centers
18" x 21" Brick Column
Hollow Tile Partition
8'
11'
11'
7' 6"
Wooden Walk
85 lb. P. R. R. Rail
Beam
Electric Lights Spaced about 6' 0" on Centers on each Beam Alternating Typical for all Tracks
13" x 13" Brick Piers 5' 4" C. to C. Longitudinally
4' 8"
6' x 6' Concrete Footing ⅝" Rods Spaced 9" both Ways 6" above Bottom
Dowels of 1" Square Rods 12" Long for all Piers in Pits 4" in Concrete
Reinforced Concrete
Electric Ry. Journal

ATLANTIC CITY SHOPS—ELEVATION OF BAY OF CARHOUSE


172' 3"
130' 3"
Platform
Blower
Tool Grinder
Shaper
Lathe
Lathe
Steel Partition
Forge
Grind Stone
Drill Press
Armature & Axle Boring Machine
Bolt Cutter
4 Arm Radial Drill
Dry Emery Grinder
Tool Racks
Counter
Window
Store Room
Forge
15" Ventilator in Roof
3 V. S. Compressor
Axle Straightener
Wheel Press
Wheel Boring Machine
Car Wheel Lathe
Second Floor Overhead
Crane Rail
Pit
Crane
Crane Rail
Pit
Crane
Crane Rail
Pit
Machine Shop
Carpenter Shop
Woodworking Shop
Pit
Pit
Lines and Cables
Iron Ladder
Boiler Room
Boiler
Stack
Locker Room
Toilet Room
Oil Room
Brick
Master Mechanic
Time Clock
Hall
Electric Ry. Journal

ATLANTIC CITY SHOPS—PLAN OF MACHINE AND WOOD SHOPS


Lateral Bracing
½" φ Rods 5/16" Pls.
4" Cinder Con. Slab
8 I-18 lb.
8 I-18 lb.
8" Slab Haunched
Brick
4½" Cinder Con. Slab
8 I-18 lb.
12 I-31.5 lb.
2-8 I's-18 lb.
12 I-31.5 lb.
6" Hollow Tie
10 Ton Crane
12 I-31.5 lb.
Maine Ave.
4" Concrete
4 Ply Waterproofing
6" Concrete
Brick on Edge
4 Ply Waterproofing
6" Concrete
Reinforced Rod ⅜" φ Spaced 6" both Ways 2" above Bottom
6" Reinforced Concrete ⅜" φ Rods 6" Centers Long Rods ¼" φ about 1' 6" C. to C.
Steel Columns Protected under Ground with Covering of Cement
6" Concrete
Boiler Room
Wood Working Shop
Machine Shop
Electric Ry. Journal

ATLANTIC CITY SHOPS—VERTICAL SECTION OF SHOP BUILDING

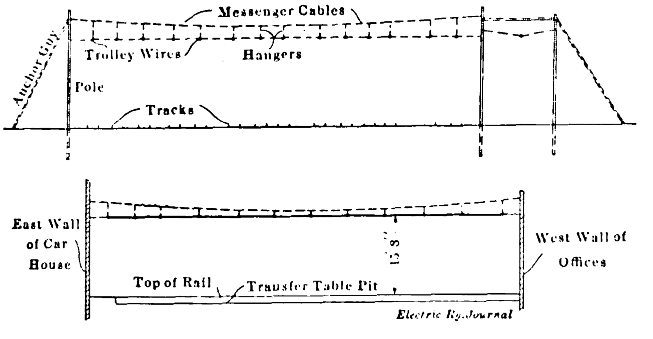
as possible, therefore they were made quite complete and self-contained.

IN THE OFFICE BUILDING

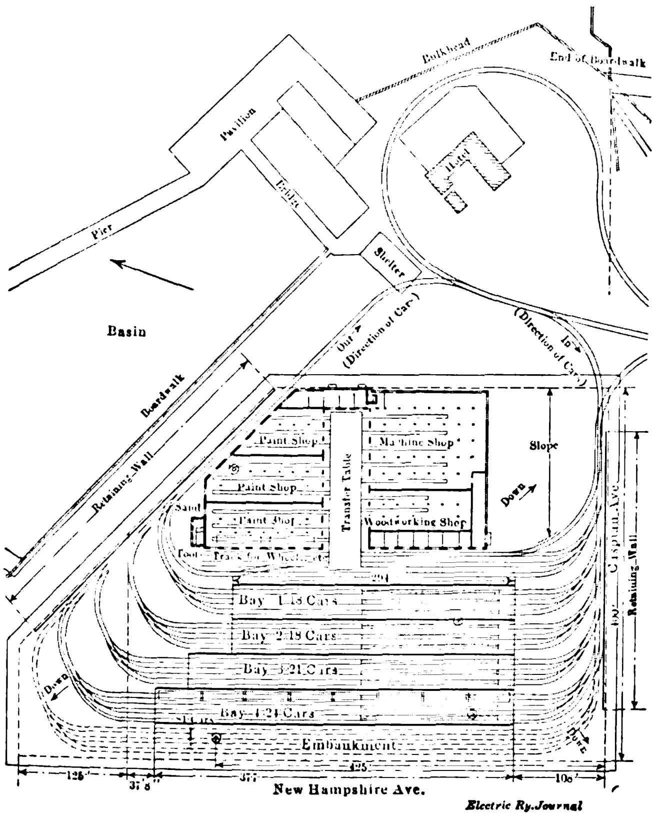
The office building contains two floors, the lower of which is used for general operating purposes. There are two main entrances, one into the room provided for the trainmen, the other into a general lobby in which the local telephone switchboard is located and from which access is furnished to the master mechanic's office and to the general offices upstairs. The trainmen's room is furnished with tables and chairs, and opening from it is a handsomely equipped lavatory beyond which is a large room containing sanitary metal lockers. The receivers' counter is placed on one side of the trainmen's room, and a door on the same side leads into the dispatcher's office. From the wide front windows of his room this official commands an unobstructed view of all cars rounding the loop or entering the yards.

The master mechanic's office is so placed that it is virtually in the corner of the machine shop, yet it forms a part of the office building. The men entering the machine shop pass an office door near which the time clock is placed.

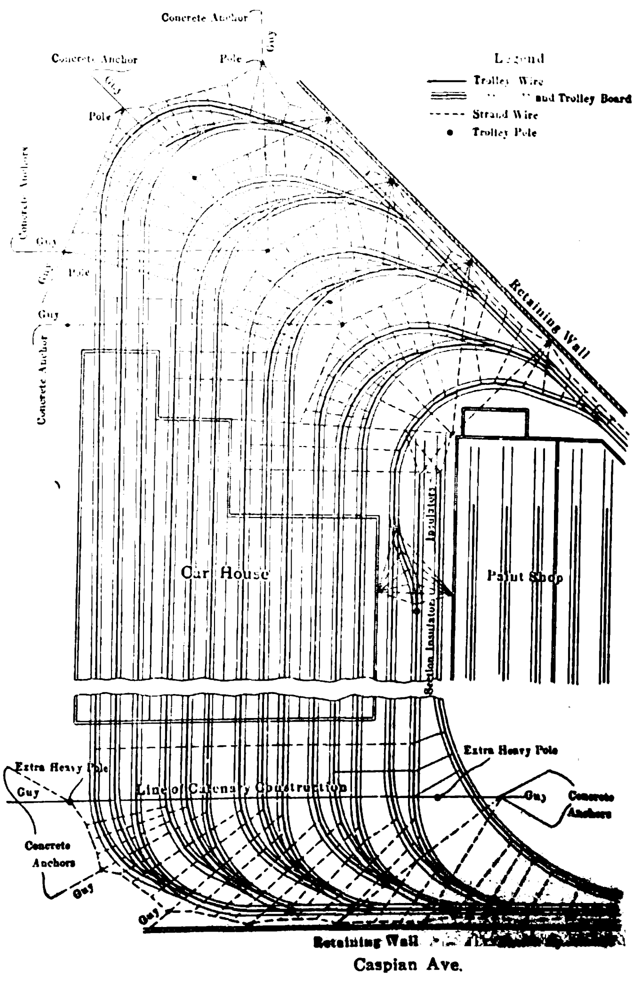
Upstairs is a suite of offices for the accommodation


Messenger Cables
Anchor Guy
Trolley Wires
Hangers
Pole
Tracks
East Wall of Car House
West Wall of Offices
Top of Rail
Transfer Table Pit
Electric Ry. Journal

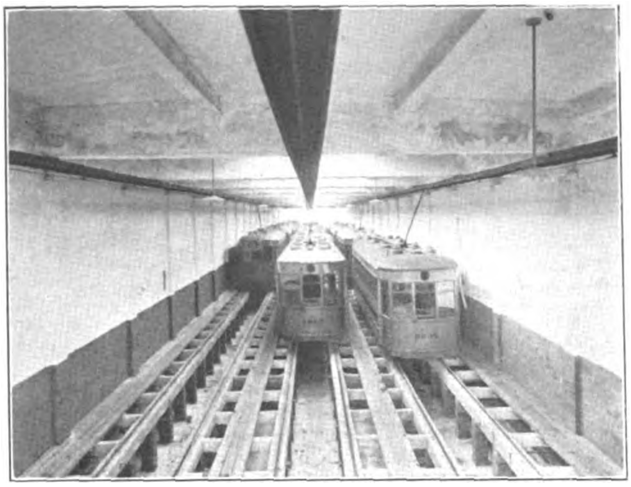
ATLANTIC CITY SHOPS—CATENARY SUPPORT FOR YARD TROLLEY WIRE

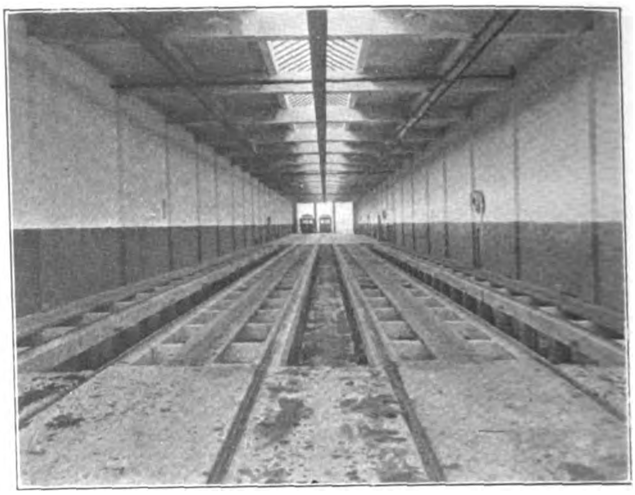

Bulkhead
End of Boardwalk
Pavilion
Hotel
Bridge
Pier
Shelter
Basin
Out (Direction of Car)
In (Direction of Car)
Boardwalk
Retaining Wall
Paint Shop
Machine Shop
Slope
Paint Shop
Sand
Paint Shop
Transfer Table
Woodworking Shop
Down
Tool
Track for Wheels
Caspian Ave.
Retaining Wall
Bay 1-15 Cars
Bay 2-18 Cars
Bay 3-21 Cars
Bay 4-24 Cars
Down
Down
Embankment
125'
37' 8"
377'
425'
105'
New Hampshire Ave.
Electric Ry. Journal

ATLANTIC CITY SHOPS—GENERAL PLANS OF SHOPS AND SURROUNDINGS


Concrete Anchor
Guy
Concrete Anchor
Pole
Guy
Pole
Legend
Trolley Wire
" " and Trolley Board
Strand Wire
Trolley Pole
Concrete Anchors
Guy
Pole
Guy
Guy
Concrete Anchor
Retaining Wall
Insulators
Car House
Paint Shop
Section Insulator
Extra Heavy Pole
Extra Heavy Pole
Guy
Line of Catenary Construction
Guy
Concrete Anchors
Concrete Anchors
Guy
Guy
Retaining Wall
Caspian Ave.

ATLANTIC CITY SHOPS—OVERHEAD CONSTRUCTION SHOWING SPAN AND PULL-OFF WIRES





ATLANTIC CITY SHOPS—TWO VIEWS IN BAY OF CARHOUSE

of the local officials of the company and their staff of clerks.

In the Machine and Wood Shop Building

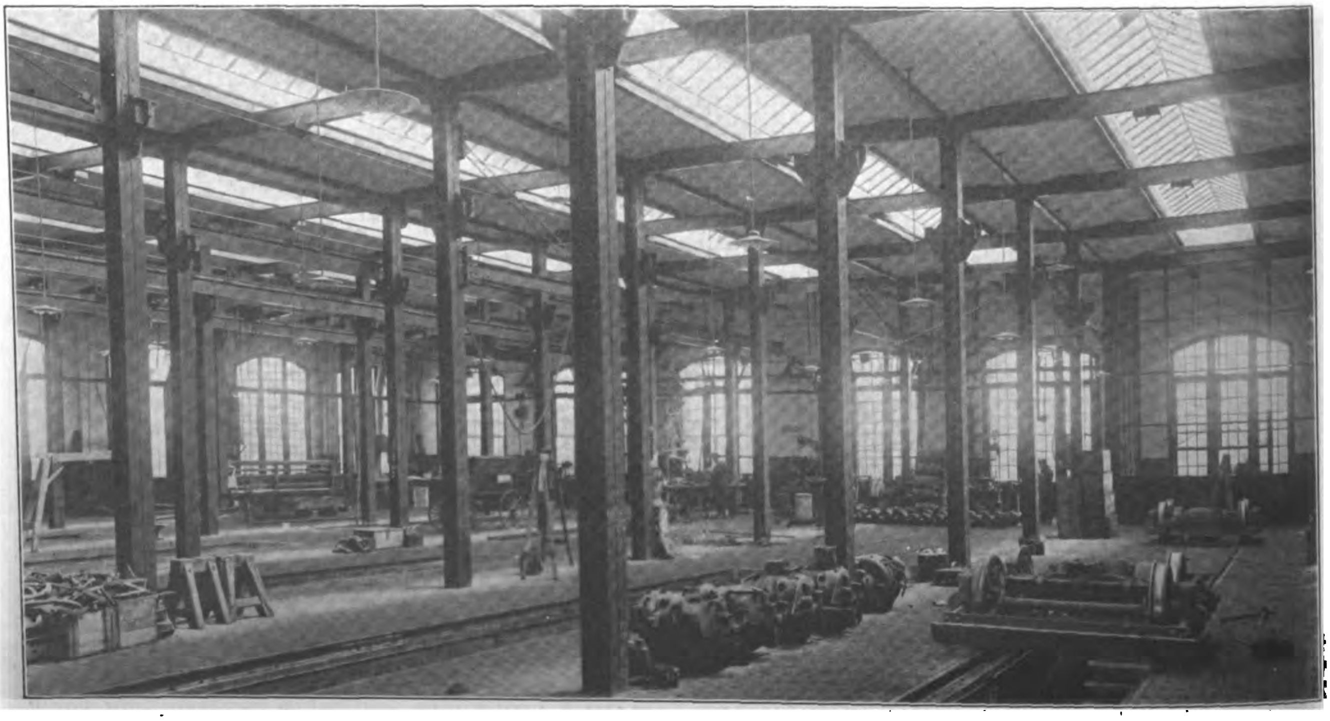
The machine tools in the machine shop are placed around the outside walls, which consist almost entirely of glass. Two of the five tracks are served with 10-ton, single-beam, hand-operated traveling cranes. Each crane is supplied with two trolleys, each carrying a 5-ton chain hoist. Two light air-operated jib cranes with a reach of 11 ft. swing from columns and serve some of the pits and machine tools. All of the five tracks in the machine shop are provided with pits for one-half their length.

In one corner of the shop is a tool room with modern steel racks and bins. This is rather distant from the heaviest machine tools, but it is placed in its present position so that it can open into a large store room partitioned off at one end of the adjoining wood shop.

The wood shop is provided with three short tracks and pits, leaving about three-fifths of the floor clear for benches, tools and temporary storage.

The machine and wood shops are floored with wooden blocks. These are of long leaf yellow pine, averaging 8 in. in length, 3 in. deep and 3 in. wide. They are impregnated with a dead oil of coal-tar to the extent of 12 lb. per cubic foot. The blocks are laid upon a concrete foundation 3 in. thick, over which is laid a 1-in. bed of sand screened of pebbles of more than ¼-in. diameter.

The western side of the building occupied by the machine and wood shops is taken up with locker room for shop men, lavatory, store rooms and boiler room. As the floor of the last-named had to be below high water level special pains were taken to keep the water out. The construction is as follows: After the soil had been excavated to the required depth a 4-in. concrete bed was laid on the bottom and upon this a layer of hot asphalt was spread. On this were laid alternate layers of heavy waterproofing felt and Trinidad asphalt, four of each. The layers of felt were carried under and up along the sides of the walls and attached thereto with asphalt. On the felt was laid immediately a 1-in. layer of cement to protect the waterproofing and above this the finished floor of 12-in. thick concrete, reinforced with steel rods, was placed. The remain-



ATLANTIC CITY SHOPS—VIEW IN MACHINE SHOP der of this part of the building has a concrete floor of the usual type.

IN THE PAINT SHOP AND CARHOUSE

The paint shop is in three bays, each containing three tracks, those in one bay being provided with pits. As in the machine and wood shops there is a skylight over each track, as indicated by the dash lines in the illustration. The floor is of concrete.

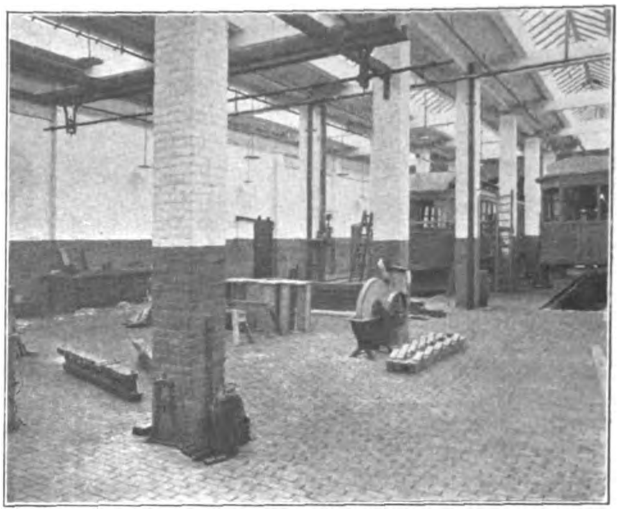
The pit arrangement of the carhouse is shown in section in an accompanying figure and photograph. On a 6-in. reinforced concrete foundation 13-in. x 13-in. brick piers were erected in parallel rows 5 ft. 4 in. center to center longitudinally and dowelled into the floor. On these were laid 7-in., 15-lb. I-beams, spaced about 4 ft., 11 in. apart. On top these beams were laid steel plates 5/16 in. x 4 in. x 10 in. in size, and upon these standard T-rail was laid, clipped at 2-ft. intervals to the I-beams. Concrete beams were then molded about the I-beams and rails, and crossbeams of reinforced concrete were placed in the alleyways outside the pits to support a plank runway. The usual concrete floor was laid in the section without pits.

The pits are lighted by means of incandescent lamps placed under the stringers described above and clusters hung from the roof. The incandescent lamps in the pits are placed about 6 ft. apart and are fed from conduit line imbedded in the concrete stringers.

OTHER FEATURES OF GENERAL INTEREST

With the exception of the machine shop the roofs are supported on brick columns, and partitions are, in general, of hollow tile. The exception of the machine shop columns, which are of steel, is made on account of the cranes. In all but the office building the columns support deep steel I-beams upon which lighter longitudinal I-beam roof purlins are laid. On this is laid a 4-in. reinforced gypsum slab, known as the Metropolitan system, with Barrett specification roof.

The buildings will be heated by steam on the vacuum system from three boilers having a combined heating surface of about 25,200 sq. ft. The vacuum will be maintained and the condensate removed from the return pipe by means of an electrically driven pump.



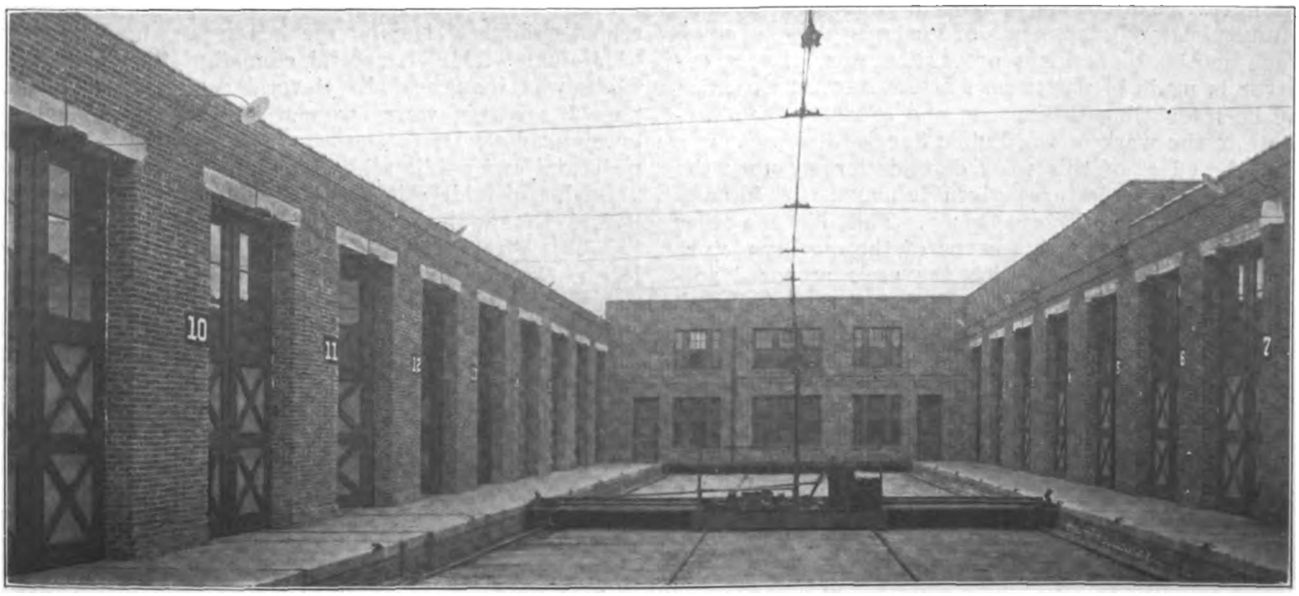
ATLANTIC CITY SHOPS—VIEW IN WOOD SHOP

Although it was at first intended to use arc lamps for general illumination throughout the various buildings, and drawings were prepared accordingly, it was subsequently determined to use Mazda incandescent lamps exclusively, these being operated in series directly from the railway circuit. Clusters of five lamps are used with 18-in. enameled steel reflectors all rigidly suspended from the roof by means of pipe conduit. The main distributing switchboard of marble is located in the master mechanic's office, and contains the usual switches, fuses, circuit breaker and wattmeter. From this main switchboard feeders are run to centers of distribution in the various buildings and connected to panelboards located in iron boxes from which the individual circuits are run direct to the outlets. All wiring throughout, both lighting and power circuits, is in iron conduit imbedded in the roof and floors.

Fire protection is furnished by an equipment of wall reels and racks, hose, nozzles, etc., and a special system of piping. An automatic sprinkler system is installed in the carpenter shop and store rooms.

The trolley wire in the yard is supported from span wires in the manner shown in an accompanying diagram. Space for poles was at a premium and they were placed to use only space which was not available for car movement.

The design and construction of the new shops were carried out under the direction of Stern & Silverman, Inc., of Philadelphia, consulting engineers for the West Jersey & Seashore Railroad Company. The operation of the Atlantic City & Shore Railroad is in charge of George F. Faber, general superintendent.



ATLANTIC CITY SHOPS—TRANSFER TABLE PIT BETWEEN PAINT AND MACHINE SHOPS

Educational Safety Work by the Public Service Railway

This Work Is in Charge of a Specialist Who Devotes His Entire Time to Co-operating with All Educational Agencies in New Jersey as Well as Furnishing Regular Instruction to Company Employees

The Public Service Railway Company carries on systematic educational work in co-operation with all educational agencies. An active interest in the subject has been developed throughout the State of New Jersey.

In the issue of the ELECTRIC RAILWAY JOURNAL for May 30, page 1190, Charles H. Coe described the manner in which the system for educating trainmen has been developed by this company. The systematic training of platform men was begun on December 1, 1907, primarily for the purpose of reducing the number of accidents. Since the training schools were inaugurated the safety movement has spread in all directions, until now the company utilizes every available educational agency in the State to promulgate the idea of "safety first." The fundamental purpose of the present movement here as elsewhere is to impress upon the individual his responsibility for his own safety as well as that of others. In carrying out this idea regular lectures are given to trainmen, talks are made in the schools, films are shown in the moving-picture houses, illustrated lectures are given in department stores, the Boy Scouts and the Camp-Fire Girls are enlisted in the movement, public lectures under various auspices are delivered, co-operation of wagon and automobile owners is secured, moving picture shows are given on public playgrounds, in short, every possible agency is used to reach the people. This educational work is in charge of H. V. Drown, general claim agent, and the detail work is directed by A. J. VanBrunt, who devotes all of his time to it.

LECTURES TO TRAINMEN

The carhouse lectures are delivered at intervals of six months, being given at each carhouse two or three times so that all of the men may have an opportunity to hear them. Attendance at the lectures is voluntary, but the record shows that nearly 87 per cent of the men attend. The lectures last from one to one and a half hours and consist of explanations of the work which the company is doing, statements of progress since the last lecture, exhibitions of lantern slides and moving-picture films and statements of general principles upon which successful accident prevention rest. Every endeavor is made to put these matters into forms which will be interesting to the men and to relate the statements to the work of the Public Service Railway.

As the effect of this work depends largely upon the character of the lectures given it may be of interest to outline a sample lecture briefly. This, like the other lectures, is illustrated by means of the moving-picture machine, by means of which the reels prepared specially for the Public Service Railway are exhibited. Pictures not bearing directly upon the safety work, such as those of field day sports and comedy performance, are used to relieve the more serious part of the lecture.

A sample lecture may be taken for illustration. In this the men were first told briefly some of the interesting things which had occurred since the last lecture. Data as to the welfare of the work were given, showing that the amount of benefits, pensions and insurance paid was much greater than was necessary to comply with the law; that, in fact, the present system was in operation before the law was put into effect. The endeavor was made to inspire a spirit of pride in the organization with which these men are connected, and instances were given to show that the organization is permeated with a spirit of loyalty.

After this preamble the lecturer discussed in detail some of the accidents which had occurred on the Public Service Railway recently. The classification of the accidents was made under these heads: Boarding cars, leaving cars, collisions with cars, collisions with vehicles, collisions with bicycles, collisions with automobiles, derailments, disturbances, injuries on cars, pedestrians struck, clothing damaged, and accidents to employees. The illustrations were taken from accidents which had occurred under the men connected with the carhouse in which he was speaking at the time. In closing attention was called to some of the characteristics of human nature with which the platform man has to struggle and suggestions were made as to the proper way to deal with these.

One of the features of the lectures which proved most interesting to the men was the résumé of the results of efforts of men and departments to reduce the number of accidents. Statistics were given showing gain by cutting down the number of accidents, or loss by increase in the number of accidents, and comparisons were made to explain the conditions existing in the several districts and the effect upon the number of accidents resulting therein. The effort was made to show the men that the safety department is working with them, not for them; in other words, that the movement is a co-operative one.

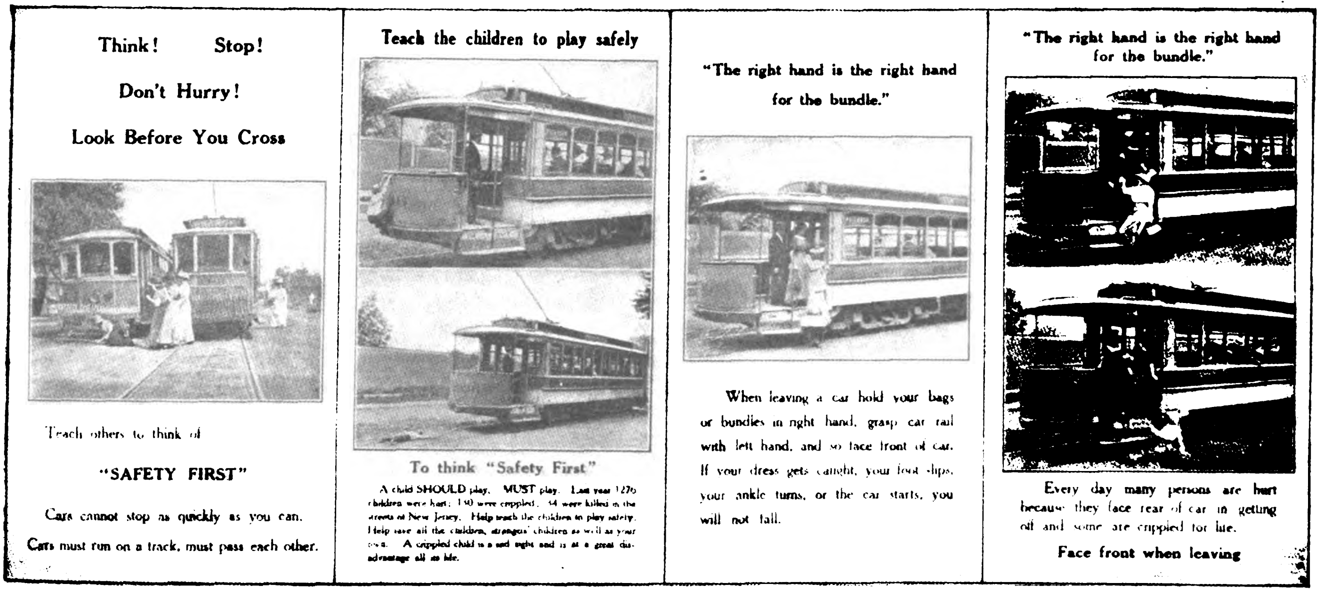
To facilitate the lecture work an automobile has been provided for the purpose of carrying the lecture equipment. This consists principally of the moving-picture apparatus, including an asbestos booth. A first-class operator goes with the outfit.

WORK IN THE SCHOOLS

As it is generally agreed that education along safety lines must begin with the child, the Public Service Railway makes a systematic effort to get in touch with school children. During the latter part of the month of January, 1912, a special campaign throughout the State was inaugurated. Several assistants were employed for this work, women being assigned to the lower grades. Up to January 1, 1914, practically every parochial and public school on or near trolley lines was visited. In addressing children the speaker hangs up before the audience a large banner with the words "Safety First" lettered in contrasting colors. The lecture is put into attractive story form, sometimes using "the giant" to make it more impressive. The speaker takes some powerful giants, which are normally made to work for us but which, on account of their great strength, may do much harm. These giants may be sources of danger and are, therefore, closely related to the "safety first" movement. The acrostic on the following page has been found very effective.

In many of the schools it has been possible to establish corps of "safety scouts." Two dozen, more or less, of the elder boys are picked out, the selection being made on the basis of their standing with their comrades. These are organized into teams, each under a

Steam is a giant which comes from the water.
Automobile is a giant which comes from the ground.
Fire is a giant which comes from the end of a match.
Electricity is a giant which comes from the sky.
T is for "think."
Y is for You, the person who must do the thinking
if he is to be safe.


Think! Stop!
Don't Hurry!
Look Before You Cross

Teach others to think of

"SAFETY FIRST"

Cars cannot stop as quickly as you can.

Cars must run on a track, must pass each other.

Teach the children to play safely

To think "Safety First"

A child SHOULD play. MUST play. Last year 1276 children were hurt; 130 were crippled; 34 were killed in the streets of New Jersey. Help teach the children to play safely. Help save all the children, strangers' children as well as your own. A crippled child is a sad sight and is at a great disadvantage all its life.

"The right hand is the right hand for the bundle."

When leaving a car hold your bags or bundles in right hand, grasp car rail with left hand, and so face front of car. If your dress gets caught, your foot slips, your ankle turns, or the car starts, you will not fall.

"The right hand is the right hand for the bundle."

Every day many persons are hurt because they face rear of car in getting off and some are crippled for life.

Face front when leaving

PUBLIC SERVICE SAFETY WORK—PAGES FROM DEPARTMENT STORE FOLDER

leader, for the purpose of watching the other children. The teams serve during alternate weeks each with the leader in charge during the entire time that the scouts are on duty, namely in and after school hours as well as during recesses and at other times when the children are apt to be in danger. The leaders report to the school principals as occasion requires.

The children are furnished with safety buttons which they are expected to wear, and in each school a pennant is hung bearing the legend: "New Jersey Safety League." The teachers are very enthusiastic about this work and back it up in every possible way.

A law was passed last year by the Legislature of the State of New Jersey making the teaching of the idea of safety compulsory in the public schools. While this law is just now being put into effect the teachers, with very few exceptions, have been utilizing the safety lectures for educational purposes for some time and have endeavored to maintain interest in the idea. An appropriation has now been made to enable the State commissioner of education, Dr. T. M. Kendall, to carry out the provisions of the law. In all of the school work which has been described the idea of the economy of safety is pointed out to the children. The lectures are followed up by subsequent visits and the instructor has been gratified to note how much of the original instructions remained. A safety text-book has been prepared as well as a number of wall charts for use in connection with the instructions.

OTHER DEVICES FOR GIVING PUBLICITY TO SAFETY

The introduction of the moving-picture outfit has given the opportunity to co-operate with moving-picture houses throughout the State. The operator has been sent to all of the large cities with the accident film and has exhibited it himself. The theater managements are not willing to pay for a film of this kind, but few of them object to having it shown. In some cases the exhibition of the film has been preceded by a lecture which has been repeated several times a day when necessary. At least 225,000 people have been reached in this way. As the film is costly it is not deemed advisable to send it out without the company operator, on the assumption that the ordinary operator would not give it the proper care.

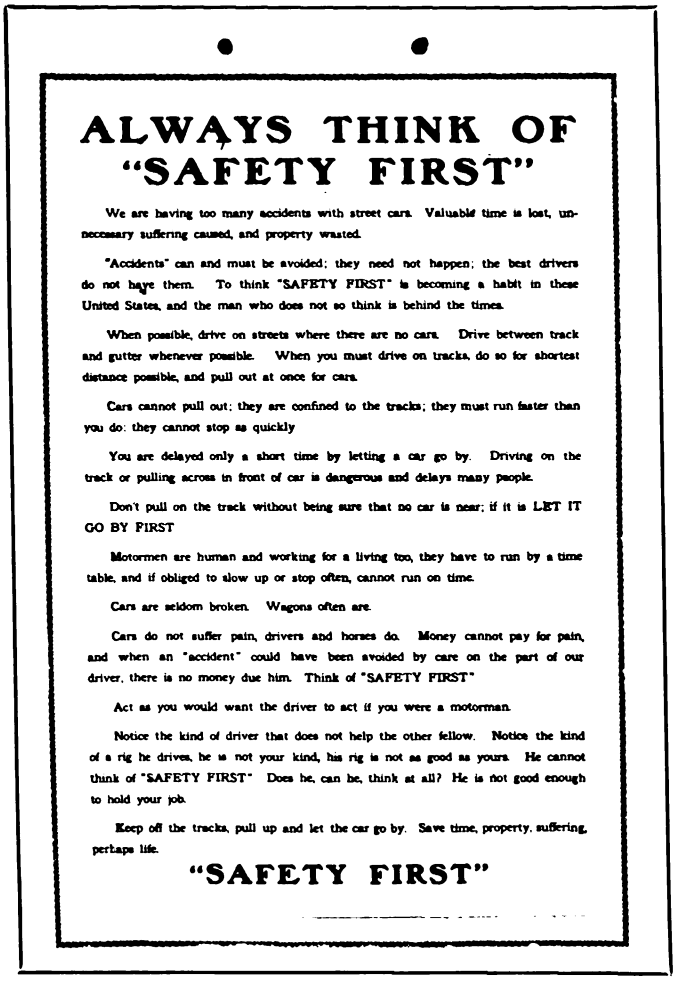
Another avenue to publicity has been through the department stores. Most of the large stores are provided with lecture rooms and they are very glad to have safety lectures delivered, as it is good advertising for the merchants. The lectures are advertised by means of circulars distributed to shoppers, as illustrated herewith.

The company "stereomotograph" is also doing good work in showing slides in the windows of the company's stores in several cities. This machine exhibits a series of lantern slides automatically, and a number of accident slides have been prepared for use in it. These are shown interspersed with catch phrases, such as the following: "Don't Play Ball, Tag, Catch, or Any Game in the Street Where Cars, Automobiles and Wagons Must Run," "Don't Steal a Ride on a Car, a Wagon or an Automobile," "Do Wait Until a Car Comes to a Stop Before Getting Off, and When You Do Get Off Face Toward the Front of the Car," "The Right Hand is the Right Hand for the Bundles," "Don't Walk on a Railroad or Trolley Track," "Work, Play, Travel, but Always Think 'Safety First'," etc. The machine is kept in one store from one to three weeks, that is, until the public interest has begun to decline.

The organization of the Boy Scouts and the Camp-Fire Girls and the popularity of these movements has furnished an excellent means of reaching an influential class of boys and girls. Illustrated lectures are given under the auspices of these organizations, and the Y. M. C. A. has also co-operated. The churches have also freely offered the opportunity for meeting other boys and young men not actively connected with the Scout movement, as many churches have organizations along somewhat similar lines. Co-operation in this phase of the work has been most noticeable throughout the southern part of the State where there are few cities.

Still another effective method for reaching the general public has been through lectures delivered in lodge rooms, high schools and churches. By means of active advertising in the local papers it has always been possible to secure a good attendance at these lectures. The line of argument brought out in them has been that mental poise is essential to success and that the successful men and women are those who do not hurry. It is the hurried person who is hurt.

As a great many accidents occur through carelessness of wagon or automobile drivers, the safety department has endeavored to co-operate with owners by means of posters which are furnished for use in barns and garages, and occasionally lectures are given to groups of drivers. The meetings of drivers' unions have afforded an opportunity in this direction. Up to the present time nearly 250 owners employing 6000 drivers and chauffeurs have hung the company's posters, signed either with their individual or firm names.



ALWAYS THINK OF "SAFETY FIRST"

We are having too many accidents with street cars. Valuable time is lost, unnecessary suffering caused, and property wasted.

"Accidents" can and must be avoided; they need not happen; the best drivers do not have them. To think "SAFETY FIRST" is becoming a habit in these United States, and the man who does not so think is behind the times.

When possible, drive on streets where there are no cars. Drive between track and gutter whenever possible. When you must drive on tracks, do so for shortest distance possible, and pull out at once for cars.

Cars cannot pull out; they are confined to the tracks; they must run faster than you do; they cannot stop as quickly

You are delayed only a short time by letting a car go by. Driving on the track or pulling across in front of car is dangerous and delays many people.

Don't pull on the track without being sure that no car is near; if it is LET IT GO BY FIRST

Motormen are human and working for a living too, they have to run by a time table, and if obliged to slow up or stop often, cannot run on time.

Cars are seldom broken. Wagons often are.

Cars do not suffer pain, drivers and horses do. Money cannot pay for pain, and when an "accident" could have been avoided by care on the part of our driver, there is no money due him. Think of "SAFETY FIRST"

Act as you would want the driver to act if you were a motorman.

Notice the kind of driver that does not help the other fellow. Notice the kind of a rig he drives, he is not your kind, his rig is not as good as yours. He cannot think of "SAFETY FIRST" Does he, can he, think at all? He is not good enough to hold your job.

Keep off the tracks, pull up and let the car go by. Save time, property, suffering, perhaps life.

"SAFETY FIRST"

PUBLIC SERVICE SAFETY WORK—POSTER FOR USE IN GARAGES AND STABLES

Another and the last phase of the work which will be mentioned is the co-operation with the playground commissioners. These officials are very willing to give opportunity for moving-picture shows in the public playgrounds at night. In this way the largest audiences of all are reached, in some cases amounting to several thousand.

THE SAFETY COMMITTEE

A new and promising feature of the safety plans is the safety committee organized on Feb. 20. It is subsidiary to the works committee and its members are the assistant general manager, the general superintendent, the mechanical engineer, the engineer of maintenance of way, and the general claim agent (chairman). The assistant to the general claim agent acts as secretary. Regular meetings are held monthly and special meetings are called when occasion demands. Suggestions for safety plans are requested from employees and are given serious consideration. A great many are received, in one case eighty being considered at one meeting. If suggestions are approved they are referred to the works committee, with recommendations for their adoption. In each instance the maker of a suggestion is notified of its receipt, with the statement that it will be carefully considered. In addition to the handling of suggestions the committee passes on general matters relating to safety. The bringing together of a committee of this sort makes practical the accomplishment of improvements that could not be made without its aid.

CONCLUSIONS

From the above description it is evident that the work of the safety department of a railway company can have branches of its work reaching out in all directions. In all of this work, as has been illustrated, the Public Service Railway endeavors to instil fundamental principles. Safety of life and limb comes first. If, in spite of all this work, accidents do happen the claims department considers the moral aspect of the accident first in endeavoring to adjust the claims. Contrary to the general impression the company finds that claim adjusters do not become hardened by their work. The endeavor is made also to impress the fact that the destruction of property as well as life is criminal. The studies which the company has made indicate that in the United States less progress has been made in the conservation of human life than abroad. Our government has done much in the conservation of natural resources of a material nature, but not much in the conservation of human life. In Europe there are at least twenty-eight safety museums under the direction of the governments. To be sure, our government is giving some attention to the safety of workmen in mills and factories, but pedestrians and travelers generally are in as great danger as our workmen. The importance of recognizing this fact has been demonstrated in New Jersey as well as elsewhere. While it is difficult to evaluate safety work in terms of statistics there is no doubt that it well repays any reasonable expenditure made upon it.

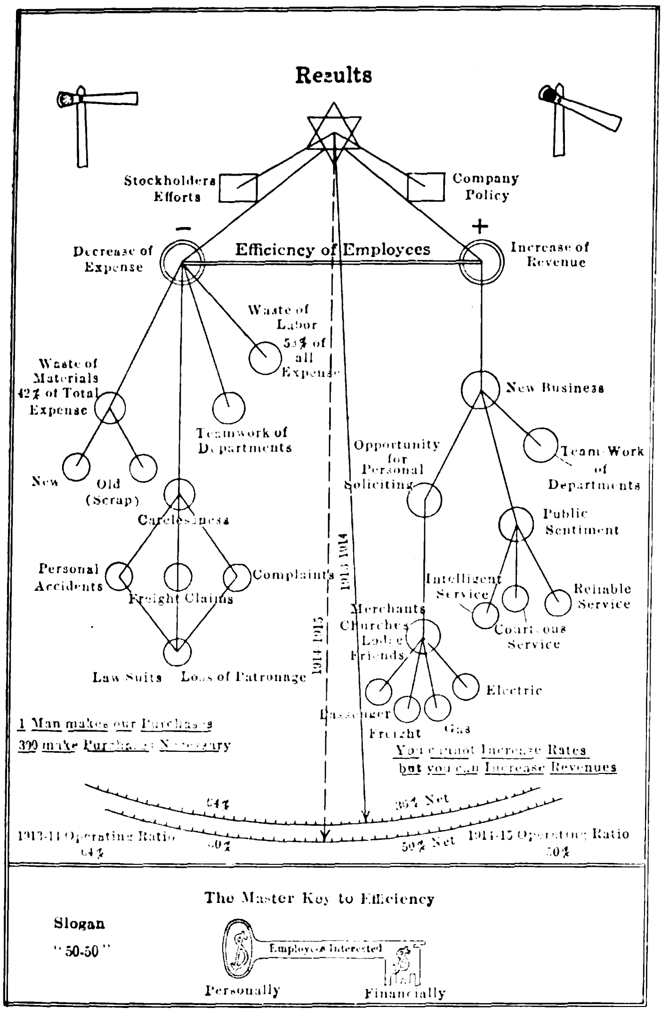
Reducing the Operating Ratio

BY S. H. BENNETT, AUDITOR HAGERSTOWN & FREDERICK RAILWAY COMPANY

The Hagerstown & Frederick Railway Company of Maryland has under way an active campaign to bring down the operating ratio from 64 per cent, which it was last year, to 50 per cent, which is considered a proper goal for effort. To stimulate interest in this campaign the accompanying diagram has been prepared and is posted in blue-print form in conspicuous places. The chart was prepared primarily to excite interest in obtaining "results" for the company. No one can read the various articles in the ELECTRIC RAILWAY JOURNAL, both editorial and contributed, without being interested, and no man filling a position of responsibility with his company can stop at simply being interested. The step from interest to enthusiasm is an inevitable one. To carry enthusiasm to other people, however, is not easy. The problem is to get the rank and file of the men in an organization to not only read articles bearing on lines of work, but to absorb them. Unless it is possible to inspire an ardent wish for the opportunity to assist in carrying out formulated plans, the preparation of these plans is largely in vain.

As will be seen from the diagram, the central feature is a pointer attached to the center of a beam at the point indicated by the star. On opposite ends of the beam are hung weights representing counterbalancing influences, some of which tend to increase revenue and others of which tend to decrease expense. The former is indicated by a positive sign and the latter by a negative sign. Obviously the purpose of the organization is both to increase revenue and to decrease expense and thus to swing the pointer toward the left. The signals at the top of the chart are intended to indicate danger on the expense side and safety on the revenue side.

Beginning at the top of the chart it will be noted that the efforts of the stockholders are indicated by a small rectangle. While it is true that, to accomplish results, everyone should contribute to this end, yet in the electric railway business the owners—that is, the stockholders—have no part in conducting the business. No one seems to expect them to do anything, and as a rule they live strictly up to this idea. The directors occupy a different position and are represented here by the rectangle labeled "company policy." While they do not engage in active work they consciously or unconsciously formulate the policy of the company and in this way exert a powerful influence upon the public. This influence the officials constantly feel, sometimes helpfully, sometimes otherwise. We cannot in any manner govern the actions of our directors. We simply know them as a power which exists. As neither the stockholders nor the directors influence the operating ratio they are represented as outside of the beam and pendulum system.


Results
Stockholders Efforts
Company Policy
−
+
Decrease of Expense
Efficiency of Employees
Increase of Revenue
Waste of Labor 53% of all Expense
Waste of Materials 42% of Total Expense
Teamwork of Departments
New
Old (Scrap)
Carelessness
Personal Accidents
Freight Claims
Complaint's
Law Suits
Loss of Patronage
1913-1914
1914-1915
New Business
Opportunity for Personal Soliciting
Team Work of Departments
Public Sentiment
Intelligent Service
Courteous Service
Reliable Service
Merchants Churches Lodge Friends
Passenger
Freight
Gas
Electric
1 Man makes our Purchases
300 make Purchases Necessary
You cannot Increase Rates but you can Increase Revenues
64%
36% Net
1913-14 Operating Ratio 64%
50%
50% Net
1914-15 Operating Ratio 50%
The Master Key to Efficiency
Slogan "50-50"
Employees Interested
Personally
Financially

Electric Ry. Journal

HAGERSTOWN & FREDERICK RAILWAY—"RESULTS" CHART

As stated above, the position of the beam is influenced in the direction to indicate improvement by increase in weight on the revenue side or decrease in weight on the expense side. In practice too often the latter method is used to improve conditions, as it is the easier one. In doing this, however, great care should be exercised so that the property may not be sacrificed in order to make a good showing. The best effect is produced by securing a combination of as great an increase in revenue as possible with such a decrease in expense as will not interfere with the proper upkeep of the property nor imperil its safe operation.

At the bottom of the chart is shown the master key to efficiency. The ideal key, as shown, is one in which personal interest forms the handle and financial interest the blade. If the employees own some of the company's securities the greatest possible interest is assured, for "where a man's treasure is, there will his heart be also."

This chart is put out in blue-print form because there is something compelling about a blue-print. Men will pass pamphlets, books or even libraries, with hardly a glance, but a blue-print they will not pass. It demands attention as something out of the ordinary; it catches the eye and carries an impression to the mind more lasting than that conveyed in any other manner. Plans are usually shown in blue-prints, hence a blue-print suggests a plan. Any concrete plan of a particular business is interesting, if only that it may be criticised and condemned. We had this idea in mind when the present chart was produced, and determined to make it the first step in a campaign in which there would be no stopping places.

I have stated that the securing of results depends upon the excitation of interest. This in turn depends upon stimulating the faculty of observation. I am convinced that men do not see as they should and have proved this to my satisfaction by a very simple test. I placed in different parts of a building, in halls, waiting-room, freight yard, etc., the following articles: Two gem lamps worth say 25 cents each, one copper bond worth 40 cents, one block of switch rubber worth 60 cents and a package of stationery worth $1.50. These were placed carelessly but conspicuously and a dozen employees of the company were taken over routes embracing visits to every one of the articles. Incidentally they were taken past a hydrant running at full blast (we buy water on a meter basis) and six 40-watt tungsten lamps burning brightly in broad daylight. As far as possible the routes were all different but at the end of each a coin was conspicuously placed. The result of the test was that not one of the men saw anything in the material line, but every one saw the coin and pocketed it. One cannot think that if these articles had been lying around in the men's homes they would have been passed by. In this case each article would have commanded instant, personal interest as something purchased and labored for and therefore something which the owner could not allow to go to waste. The articles which were owned by the company were not observed simply because the men had not been trained to see them and because they lacked the element of personal interest. The test seems to me to prove conclusively that, not only do men not see, but they are living under two separate standards. One standard applies to their own affairs, the other to the affairs of the company from which they derive their livelihood. The employers should do all in their power to correct this condition, as no man is a really valuable employee until he learns that there is but one standard of interest in personal and company affairs. Our company is hopeful of results from a consistent effort to enlist single-standard interest. We believe that real progress is being made in the reduction of the operating ratio.

Block Signals on the Kansas City, Clay County & St. Joseph Railway

This 1200-Volt, High-Speed, Interurban Railway Has Recently Placed in Service a Complete System of Automatic Block Signals Which Is Described in Detail by the Author, Who Includes Figures Covering the Total Cost of the Installation

BY ROBERT P. WOODS, CITY MEMBER BOARD OF CONTROL, KANSAS CITY RAILWAYS COMPANY

An automatic block signal system recently completed on the Kansas City, Clay County & St. Joseph Railway, under the direction of the writer, embodies some features of interest in signaling on electric railways. This road is a 1200-volt d.c. line, doing an exclusive interurban business and operating frequent trains at high speed. After about two years of consideration as to the system and the type of signals best adapted to the conditions, J. R. Harrigan, general manager of the company, directed that contracts be entered into for the installation of an absolute automatic block signal system with continuous, alternating-current, track circuits. It was decided also that current should be provided for station and switch lights along the whole route. The Union Switch & Signal Company's apparatus was used.

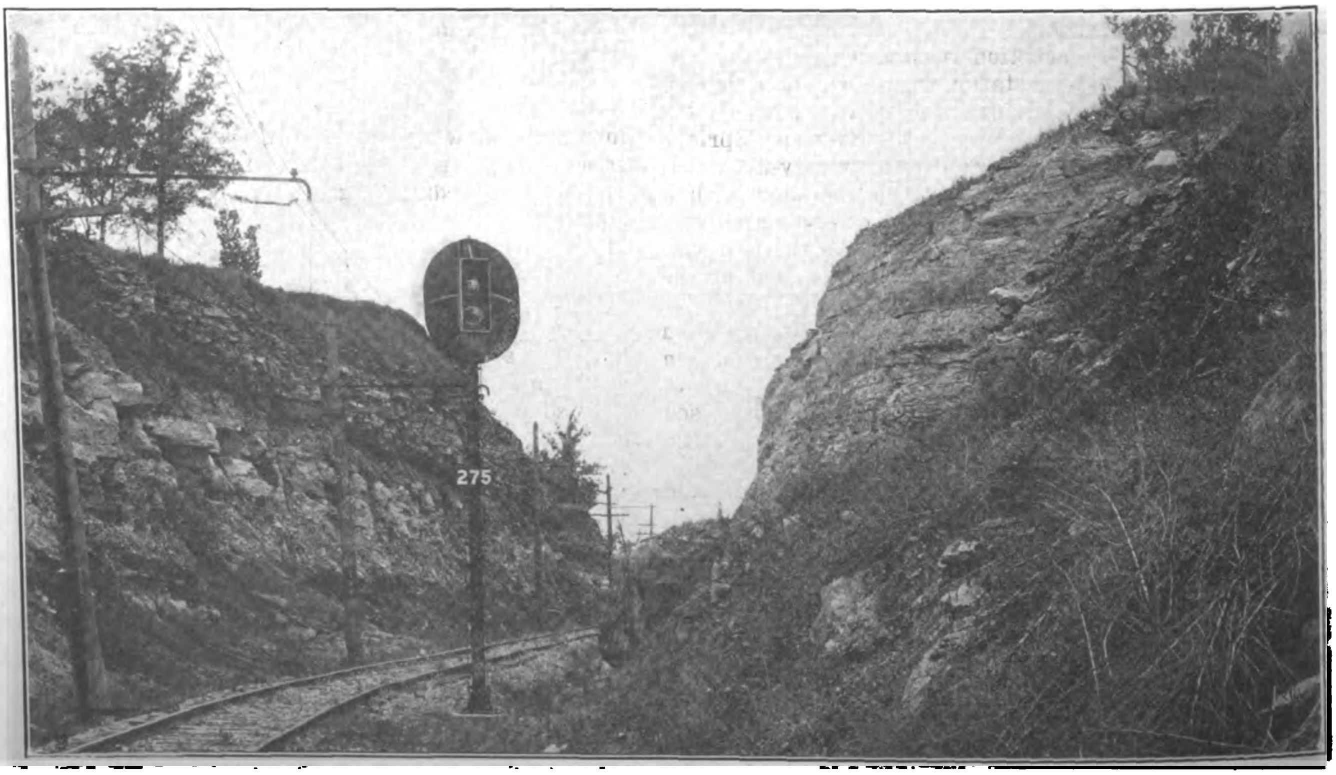
The road consists of two single-track divisions, both extending from Kansas City, Mo., one northeast 28.35 miles to Excelsior Springs and the other northwest to St. Joseph, a distance of 52.44 miles. The length of track outside of terminals on the Excelsior Springs division is 24.5 miles, all of which has been included in the signal system. This division has been divided into nine blocks varying in length from 6950 ft. to 18,704 ft. The predominant length of block is about 15,000 ft. The length of track under the signal system on the St. Joseph division is 46.6 miles, which also includes all track outside of terminals. This division has been divided into sixteen blocks varying in length from 6154 ft. to 23,201 ft., with about 15,000 ft. as the predominant length of block.

Each block in the signal system, which is of the Union Switch & Signal Company's "T-D-B" type, is a unit in itself, and cars occupying one block have no control over signals in an adjoining block, following movements being provided for by having intermediate signals located about 1000 ft. either side of the center of the block, thus providing for the operation in the same direction of two trains in the same block and both being protected by absolute signals.

At each siding there are placed two semaphore signals, one for each direction of traffic. These semaphores are electrically operated and for night indications are lighted with two 2-cp lamps. The semaphores are of the Style B one-arm, two-position type, operating from 0 deg. to 60 deg. in the upper left-hand quadrant, indicating "Stop" at 0 deg. or horizontal and "Proceed" at 60 deg.

About 1000 ft. on either side of the center of block, depending upon the block length, is located an intermediate light signal of the Model 13 type, provided with one red and one green lens, each about 8 in. in diameter, and hooded for daylight indications. Two 25-watt lamps are used for each of these indications.

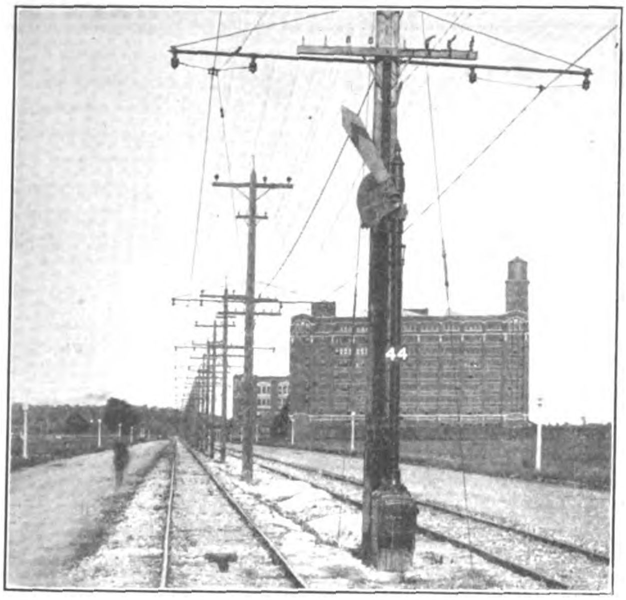
At two sidings which are used for light freight operations only, there have been installed switch indicators. These indicators are small unlighted semaphores, each mounted in an iron case on a 4-ft. stand, and they always indicate "Stop" to trains occupying the siding. Before a car leaves one of the sidings the trainman must open the case and throw the indicator into circuit; if the block is not occupied the small semaphore will go to "Proceed" and must be held in this position



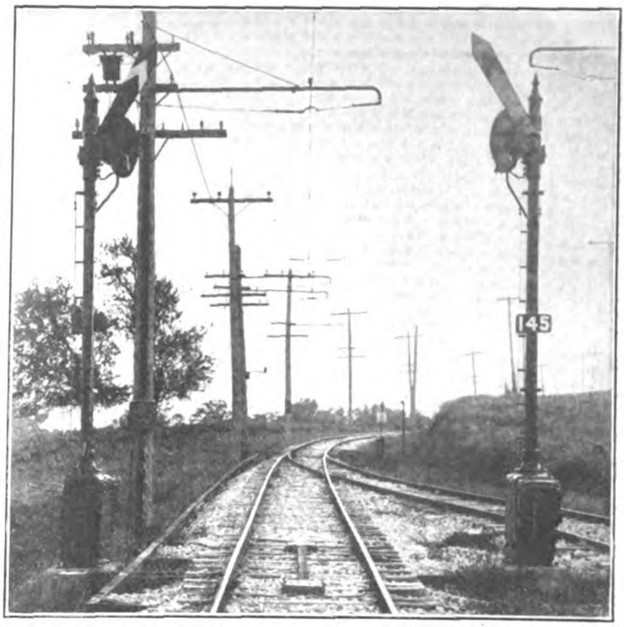
K. C., C. C. & ST. J. SIGNALS—INTERMEDIATE LIGHT SIGNAL AT CURVE IN ROCK CUT until the car passes out on the main line, thus setting the home signals at "Stop" and giving the car that leaves the siding the right-of-way in the block. The switch indicators do not indicate any movements into the siding from the main line.

The overhead wiring for this system consists of two No. 6, 40 per cent, copper-clad wires for the transmission system, which is 2200-volt, single-phase, twenty-five-cycle; and three No. 10, copper-clad, 30 per cent wires for the 110-volt control wires. There are two additional wires of the same voltage from the center of the block to each of the intermediate light signals. Where station lights are provided an additional wire from the nearest line transformer is necessary.

Insulated rail joints of the Keystone type are placed in the track at the end of each block, confining the signal track circuits, and impedance bonds of 500-amp capacity are placed in the track to take care of the return propulsion current. All of the old cross-bonds in the track were removed.



K. C., C. C. & ST. J. SIGNALS—HOME SIGNAL REAR END OF LONG SIDING IN CITY STREET



K. C., C. C. & ST. J. SIGNALS—VIEW OF HOME SIGNALS AT SIDINGS, SHOWING FRONT AND REAR ASPECTS

Power for signal operation is obtained from the 730-volt side of the main substation transformers, a double-throw switch being provided for taking power from either bank. At the substation on the Excelsior Springs division, two 15-kva, 730—2200-volt, twenty-five-cycle, single-phase transformers have been installed with a single panel switchboard for controlling the signal current. Similar installations were placed in the two substations on the St. Joseph division, except that at the second station two 10-kva transformers were used instead of the larger size. Line transformers are installed along the line to step the 2200-volt signal transmission current down to 110 volts for signal controls and to 12 volts for track circuits. Vane type relays are used for the line and galvanometer type for the track circuits.

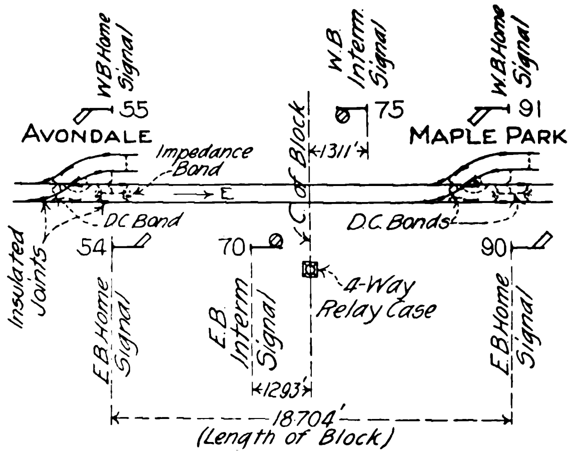
All shelter stations and switch stands are electrically lighted, the shelter lights being taken from the 110-volt taps on the line transformers and the switch lights from the 12-volt taps of these transformers. The switch lanterns are provided with two 2-cp Mazda lamps. The shelter stations each have one 40-watt Mazda lamp. Individual 2200—110-volt transformers are used at the three depots for lighting these stations.

Trains are operated on orders from the dispatcher and the signals are additional safeguards against misinterpretation or mistaken orders. A red signal light indicates "stop" and a green light "proceed." In case of a signal giving an indication contrary to the train order, the dispatcher is called and the order verified, because a block signal at "stop" may indicate: (a) a train is in the block; (b) an open switch in the main tracks; (c) a car outside of the clearance point on siding; (d) a broken rail; (e) failure of the system; (f) a broken bond.

The operation of a typical block may be better understood by referring to the diagram on the next page, which shows the block between Avondale and Maple Park on the Excelsior Springs division. This particular block is 18,704 ft. long and the distance between intermediates is 2604 ft. With no trains occupying the block the signals assume proceed indications. Assuming an east-bound car entering the block at Avondale, east-bound home signal 54 and opposing west-bound home signal 91 and west-bound intermediate signal 75 go to the stop indications. The east-bound intermediate signal 70 will indicate stop when the car is within about 400 ft. of the center of the block, and when the car passes a point about 400 ft. beyond the center of the block east-bound home signal 54 will clear, thereby allowing a following movement from Avondale and at the same time protecting the first car from the rear. East-bound intermediate signal 70 and west-bound home signal 91 will not clear up until the car has passed out of the block or entered the siding at Maple Park, and obtained clearance with the main line. The intermediate signals lend an additional safeguard, as in the case of two trains entering the block, one at Avondale and the other at Maple Park, at one time, both intermediates would indicate "stop" and the trains would be held.

Located at each switch is a switchbox which is connected to the closed point of the switch, and when the switch is opened the signals in the adjoining blocks show stop indications. The box may be so set that any desired opening of the track switch will operate the signals. An illustration shows the circuit plan for a typical block.

In Table I is a detailed estimate of the construction of the entire signal system and, as the work is now practically completed, represents the cost of the work. The Union Switch & Signal Company furnished and installed all semaphore and light signals, line transformers, relays, impedance bonds, trunking and all necessary connections. The concrete foundations were


W.B.Home Signal
55
AVONDALE
Impedance Bond
E
DC Bond
Insulated Joints
54
E.B.Home Signal
70
E.B. Interm Signal
1293'
W.B. Interm Signal
75
1311'
C of Block
4-Way Relay Case
D.C. Bonds
MAPLE PARK
91
W.B.Home Signal
90
E.B.Home Signal
18704'
(Length of Block)

K. C., C. C. & ST. J. SIGNALS—TYPICAL BLOCK ARRANGEMENT

built by the signal company with materials furnished and delivered by the railway company. The railway company furnished transportation for the distribution of all materials and apparatus and did all else including the supplying of poles, wires and line fixtures. All the line-construction labor and the furnishing and erection of all substation transformers, switchboards, and lighting fixtures were also furnished by the railway company. The contract for the equipment was entered into on Feb. 14, 1914, and the signals were placed in operation on the Excelsior Springs division on July 11, 1914, and on the St. Joseph division during the latter part of September, 1914.

The estimated power consumption taken at the switchboard in each substation on the 2200-volt side, is as follows: The Excelsior Springs division, which comprises nine complete blocks, or 24.5 miles of protected track, has nine electrically lighted switchstands and forty-six 40-watt station lights. It will consume under normal conditions 8.1 kw. When all signals are clearing, that is all motors are operating, the maximum demand is estimated at 12.2 kw.

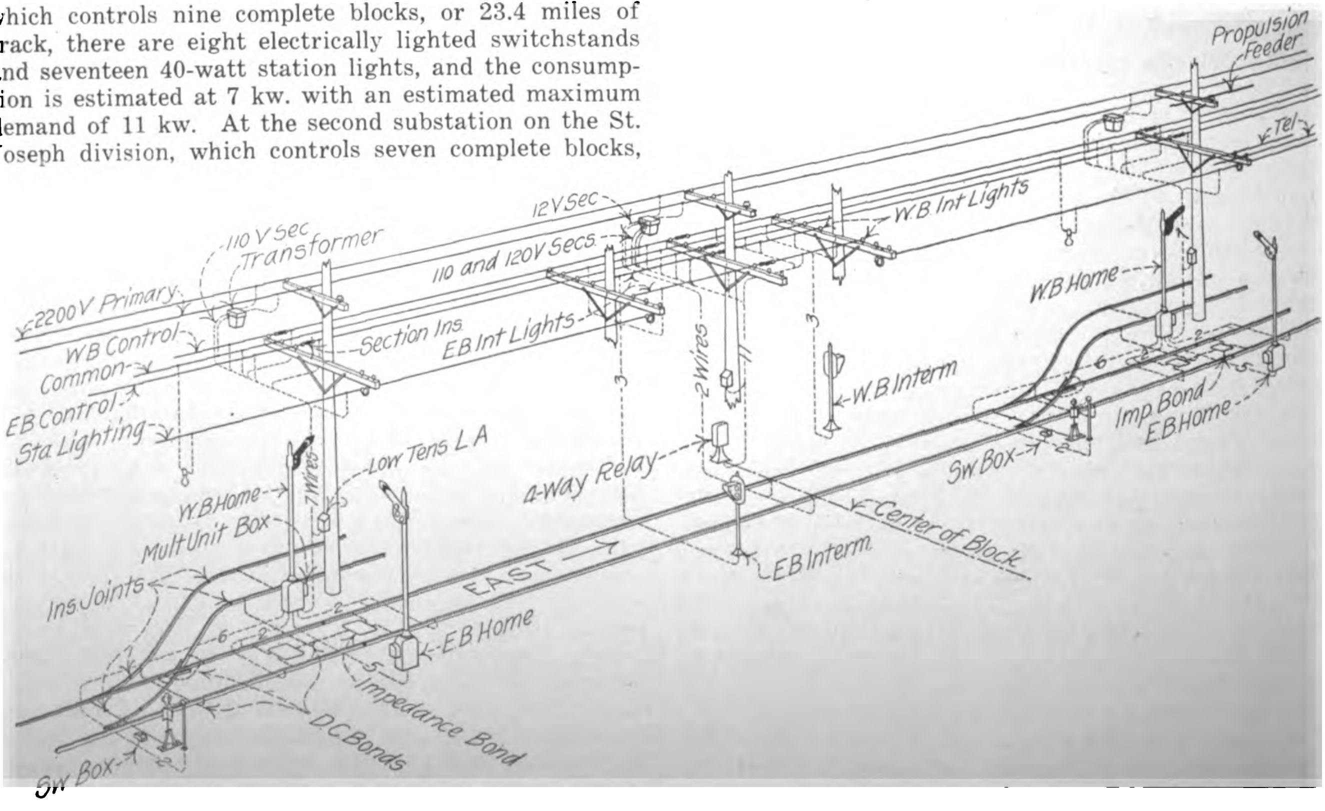
At the first substation on the St. Joseph division, which controls nine complete blocks, or 23.4 miles of track, there are eight electrically lighted switchstands and seventeen 40-watt station lights, and the consumption is estimated at 7 kw. with an estimated maximum demand of 11 kw. At the second substation on the St. Joseph division, which controls seven complete blocks, covering 23.2 miles, there are seven electrically lighted switchstands and twenty-six 40-watt station lights, the estimated power consumed is 6.1 kw normally, or an estimated maximum of 9.7 kw with all signals clearing.

A summary covering the installation of signals and shelter station lighting is as follows:

Total miles of track protected	71.1
Number of blocks operated	25
Number of semaphore signals	50
Number of intermediate light signals	50
Number of switchstands lighted	24
Number of shelter stations lighted (one light each)	51
Estimated cost of lighting	$3,900
Total cost of signal system, including switch lighting, but exclusive of station lighting	$106,490
Cost per mile of track protected	$1,500
Cost per block complete	$4,250

TABLE I—DETAILED COST OF SIGNAL INSTALLATION ON KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY

Material and labor by the Union Switch & Signal Company	$73,000
Material and labor by Kansas City, Clay County & St. Joseph Railway:	
132 cu. yd. crushed stone (delivered), at $2.50	330
66 cu. yd. sand (delivered), at $2.00	132
198 bbl. cement, at $2.00	396
130 miles No. 6 H. D. C. C. 40 per cent bare wire, 50,700 lb., at 16 cents	8,112
262 miles No. 10 H. D. C. C. 30 per cent bare wire, 40,348 lb., at 15 cents	6,052
18 miles No. 10 H. D. C. C. 40 per cent bare wire, 2772 lb. at 16 cents	443
146 70-lb. Keystone insulated rail joints, at $6.00	876
10 75-lb. Keystone insulated rail joints, at $6.40	64
4 transformers for substations, 15 kva, at $200	800
2 transformers for substations, 10 kva, at $150	300
3 single-panel switchboards for controlling signal circuits, at $125	375
325 lb. 24-in. tie wire, at 16½ cents per pound	53
400 lb. 14-in. tie wire, at 16½ cents per pound	66
6300 porcelain insulators (2300-volt line), at 7 cents	441
11,100 porcelain insulators (110-volt line), at 4 cents	444
600 "J" pins at 25 cents	150
Changing feeder cross-arms to obtain clearance for 2200-volt a.c. signal wires:	
2840 three-pin, 3½-in. x 4½-in. x 5-ft. fir arms (replacing present 4-ft. arms), at 34 cents	965
8520 1½-in. x 9-in. locust pins, at 2 cents	170
5680 ¼-in. x 1¼-in. x 18-in. gaivanized iron braces, at $50 per thousand	284
Miscellaneous bolts and lags	100
Labor substituting new arms, 71 miles, at $10	710
Labor stringing 410 miles wire at $10	4,100
Labor installing switchboards and transformers at substations	225
Changing poles and guys for clearance	350
Telephone interference	750
Transportation of men and materials	950
Bonding and installing insulated joints	600
Increasing track centers at sidings	750
Engineering and contingencies	4,500
Total	$106,490


Propulsion Feeder
Tel
W.B Int Lights
12V Sec
110 V Sec
Transformer
110 and 120V Secs
2200V Primary
W.B Control
Common
Section Ins
EB Int Lights
EB Control
Sta Lighting
3
2 Wires
3
W.B Home
W.B Interm
Low Tens L A
W.B.Home
7 Wires
4-Way Relay
Mult Unit Box
Ins Joints
EAST
Center of Block
EB Interm
Sw Box
Imp Bond
E.B.Home
6
5
2
EB Home
Impedance Bond
D.C.Bonds
Sw Box

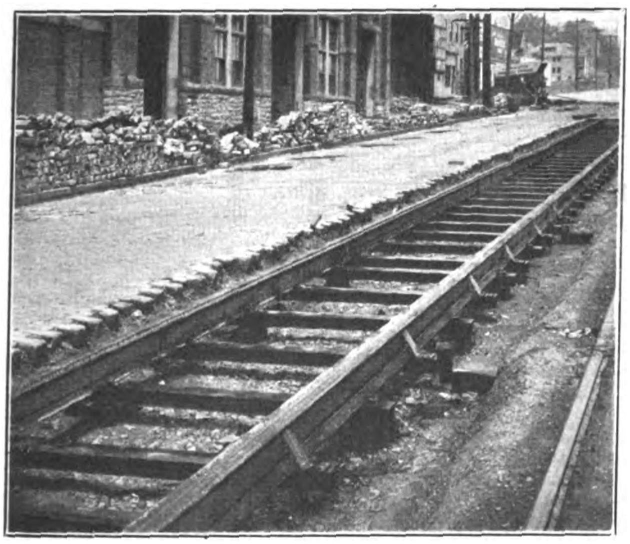
K. C., C. C. & ST. J. SIGNAL—TYPICAL CIRCUIT PLAN

Electric Welding in Track Repairs

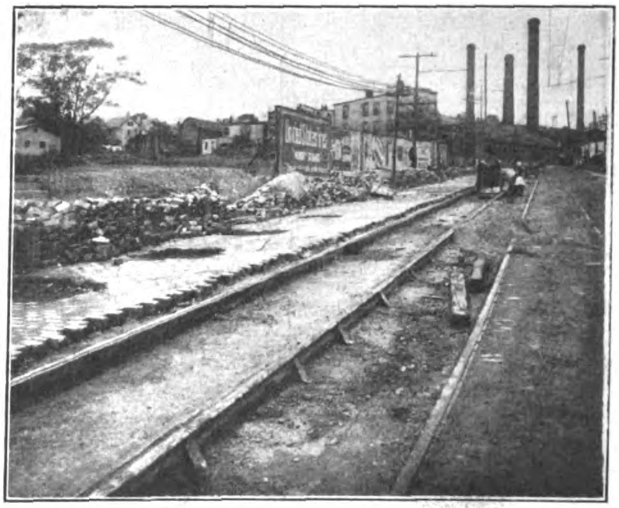
The Author Outlines His Experience with Electrically Welded Frogs and Rail Joints, Giving Details of the Time Required and Current Consumed in Completing Different Pieces of Work with a Portable Electric Welding Outfit

BY F. J. VENNING, SUPERINTENDENT OF CONSTRUCTION CINCINNATI TRACTION COMPANY

In July, 1913, the track and roadway department of the Cincinnati Traction Company received its first portable welder from the Indianapolis Switch & Frog Company. A demonstrator was sent to Cincinnati to instruct our man in operating the outfit. We immediately began the building up of manganese centers in frogs, switches and mates with very good success at first, although our men, as their experience increased, became more proficient in the use of the welder and greatly improved the quality of their work. In a very short time we could see the value of the apparatus and secured a second welder in October, 1913. At this time we set about with the new machine to fill up some open joints in a 2-mile piece of double track laid with relay rails in 1910. Every open joint was closed, thus making a continuous rail for the entire distance. In all the joints thus filled, we have had but one failure and that was due to improper plugging before the joint was welded or filled. After this work was done the welders were kept at work continuously and with increased success on worn-out special work and manganese centers in frogs and crossings.



ELECTRIC WELDING IN CINCINNATI—ELECTRICALLY-WELDED RAIL BRACES AND TIE PLATES ON OAK TIES



ELECTRIC WELDING IN CINCINNATI—ELECTRICALLY-WELDED TRACK READY FOR CONCRETING

During the winter I became personally interested in the welder and followed the work carefully. One of our first important jobs included the building up of twenty broken expansion joints on a viaduct. These were originally made by cutting the rail-ends vertically for about 10-in., and lapping the ends. They were badly battered in some cases and one-half of the head was broken off in others. The repair work included building up all joints to their normal section and replacing the missing sections. This work is to-day in as good condition as it was when completed.

On another job we built up and reclaimed two double-track, double crossovers that were in such a dilapidated condition that renewals would have been necessary if the repairs had been unsuccessful. In some instances as much as 10 in. of the head of the rail at the joint was entirely gone. The method used in this instance was to weld two strips of iron on top of the joint plate and then to build a new head on the rail.

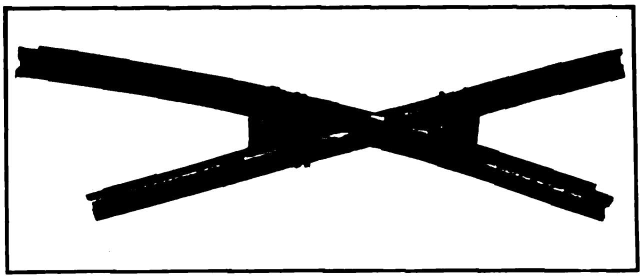
Little or no difficulty has been experienced in obtaining successful results where the welding was done on ordinary open hearth or Bessemer steel rails, but on the manganese inserts and in solid manganese layouts the process is somewhat different. After careful study and a number of tests, it has been found that the maximum success is obtained in repairing work of this type when the amount of metal added at one time is small and the whole quenched at frequent intervals. This keeps the temperature of the manganese insert or manganese casting below the critical point, thus insuring that no change takes place in wearing qualities after the new material has been added.

ELECTRICALLY-WELDED FROGS

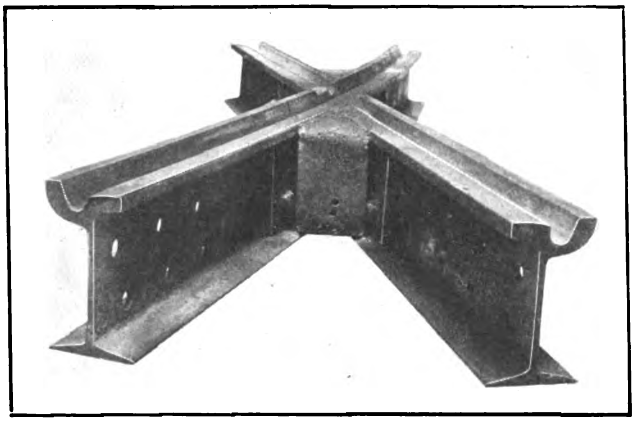
As a rule the Cincinnati Traction Company renews defective insert special work or solid manganese pieces in a large layout with built-up work made of open-hearth standard rail sections. These pieces generally last about as long as the rest of the layout, making it possible to renew the whole at one time. Prior to December, 1913, we had all frogs made at a local shop, the company furnishing the rail and templets from which any piece was to be made. During December, 1913, we concluded that we could make this class of frog cheaper and in much less time, and at the same time could manufacture a better article by using the electric welder, and we found that shop-made frogs which formerly cost us from $45 to $65 could be manufactured for from $16 to $23. Moreover, the shop-made frogs were merely bolted together, whereas our frogs were bolted and welded, making a frog that could not possibly be shaken nor hammered apart, all parts acting as a unit.

Wherever these frogs have to perform heavy duty we burn away the intersecting parts of the head of the rail with the carbon electrodes and build up the parts so removed with hard steel. By this method we supply a harder metal at the excessive wear points and the result has been very satisfactory. Between December, 1913, and May 1, 1914, we built and installed twenty-four electrically-welded frogs, and none have given any evidence of failure in any of the welds. However, if any of these electrically-welded frogs should develop defects, or should begin to show indications of wear or cupping at the intersecting flangeways, we expect to restore the points by welding on hard steel.

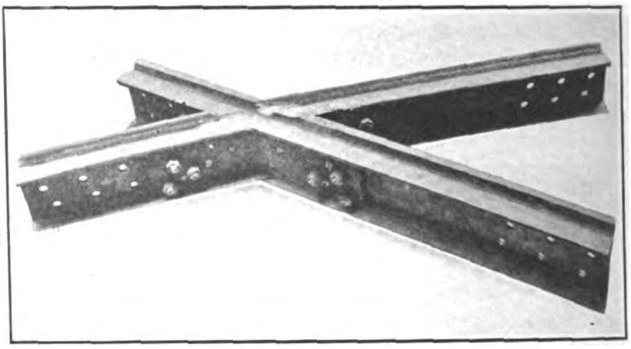
It might be stated that the frogs shown in the illustrations were made practically by two men who did the sawing and fitting, and by a blacksmith bending the plates. All the sawing was done by hand, the only machine work required being that of drilling the few bolt holes. Since this was experimental work no special time was set for the welding, but it was done on rainy days and during extremely cold weather when it was impossible to work men outside.



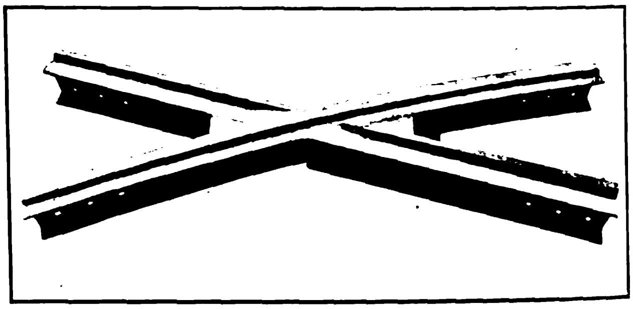
ELECTRIC WELDING IN CINCINNATI—JUMP CROSSING WITH THROUGH RAIL ON CURVE



ELECTRIC WELDING IN CINCINNATI—VIEW OF FROG SHOWING PAVING CHUCK



ELECTRIC WELDING IN CINCINNATI—VIEW OF THROUGH FROG



ELECTRIC WELDING IN CINCINNATI—JUMP CROSSING WITH BUILT-UP FLANGEWAYS

In order to determine accurately the exact cost of frogs built in this manner the Cincinnati Traction Company arranged for an energy-consumption test to be made by the electrical engineering department of the University of Cincinnati. The instruments used were a Westinghouse graphic-recording ammeter, a portable Weston ammeter and a wattmeter. In the test for welding together a frog there was 308 lineal inches of welding. The average current required was 170 amp and the total energy consumption to complete the entire welding process was 161.7 kw-hr. The time consumed in welding the frog was three hours and four minutes, and all of the welding was done with the panels of the welder in parallel. In an experimental run made for a few minutes with only one panel in the circuit, the current consumption was 90 amp. With this, however, the arc was not of sufficient density for heavy welding, but could be used for light welding on thin metal. Other overhead charges added to the total cost of making one of these frogs include that of preparing the drawings and making the templet.

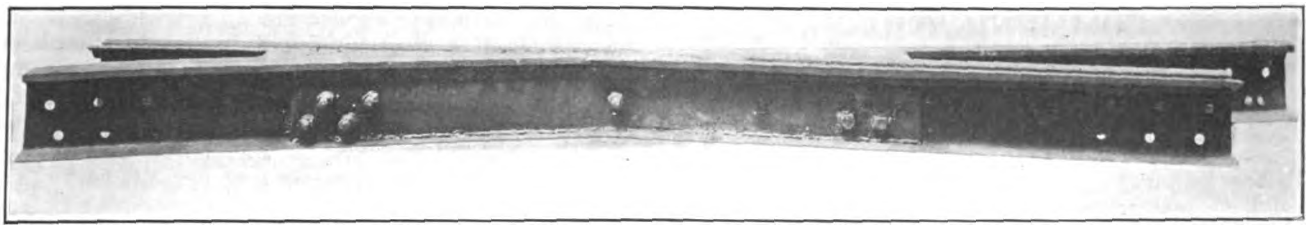
ELECTRICALLY-WELDED JOINTS

The standard rail-joint used by the Cincinnati Traction Company for some time past was of the cast-weld type, and prior to the adoption of the 140-lb. girder-grooved rail section as our standard, we had extremely good results with the cast-welded joint. Out of 10,000 joints installed between 1907 and July, 1913, our percentage of failures was 1.76. However, since the adoption of the 140-lb. rail section, failures of cast welds have greatly increased, and in view of this fact we are of the opinion that the limit of the cast-welded joint is exceeded when it is used on this rail section.

In cases where a cast-welded joint fails we knock off the cast weld and apply a standard channel plate by electrically welding it. This plate is welded to the rail after it has been drawn securely into position by inserting two of the four bolts. If an open joint has developed, due to expansion and contraction, we electrically weld the opening, filling in with hard steel, thus making the rail continuous. Since the electrically-welded plates have been introduced on this property the rail has been made in continuous lengths up to 1000 ft., one piece approximating 1 mile in length.

By the application of the electrically-welded channel-bar and the closed joints, we have not only eliminated joints but also copper bonds. Should a rail break due to contraction after it has been welded in this manner the same method would be used in making the joint at the broken point. It makes little difference whether the opening is 1 in. or 6 in. at the point of the break, because a piece may be inserted and the three sections solidly welded to the plate, thus making the rail continuous, as before.

At the time when the energy consumption was de-

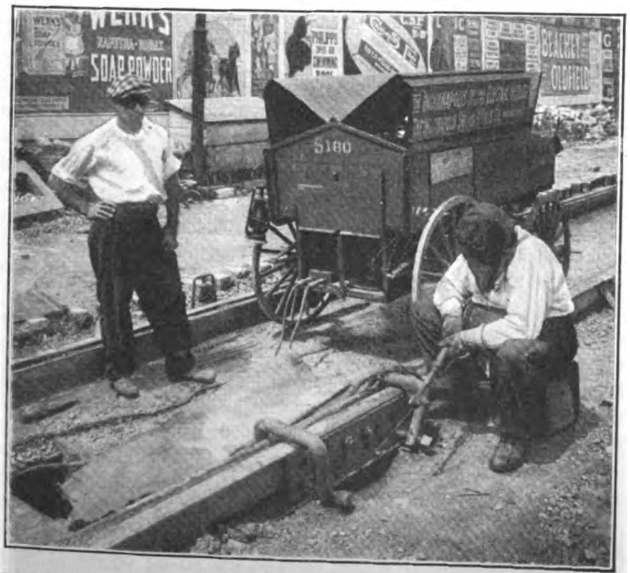


ELECTRIC WELDING IN CINCINNATI—FROG OF 9-IN. TRILBY RAIL—NOTE WELDED PLATE

termined for the electrically-welded frog, a similar test was run on the electrically-welded joint. This joint is made up of standard plates, 32 in. long, designed for the Lorain steel section 140-402. In addition to these plates one-half of a plate taken from a 109-lb. rail section is welded to the base of the rail. In order that the results of this test might be comparable with working conditions on the street, the test weld was made in a section of skeleton track. During the period of the test the ammeters registered at beginning, with resistance of welder cold, 190 to 195 amp. This continued for about ten minutes until the resistance heated, at which time the current settled to a point between 165 and 170 amp, the average consumption for the entire joint being 169.3 amp, with readings taken every minute. The time consumed in welding the joint complete was one hour and ten minutes, thus making the actual energy consumption 79.2 kw-hr. per joint.

WELDED TRACK CONSTRUCTION

Recently we have developed what we consider an ideal track construction in which electric welding largely enters. This may be constructed with either wood or steel ties, but where wood ties are employed tie plates ⅜ in. x 6 in. x 12 in. in size are used on every fourth tie. These tie plates take the form of the combination rail brace and tie plate described in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, on page 1467. Experience has shown that if the plate and brace are purchased separately and the two welded together on the job, considerable saving is made over purchasing the combination plate and brace from the manufacturer. At about 100-ft. intervals, or as often as required, the tie plate is made continuous from rail to rail to take the place of an ordinary cross bond. The same method of cross bonding, if desired, could be used in the devilstrip, thus providing a perfect bond from one track to the other. When steel ties are used the rail braces are welded direct to the tie, and at intervals the tie itself is welded to the base of the rail for cross-bonding purposes. In order to test thoroughly this type of construction, a piece of track 3200 ft. long was constructed of 140-lb. rail laid on steel ties except at curves. At these points the rail was laid on oak ties with ⅜-in. x 6-in. x 12-in. tie plates to which the rail braces were electrically welded. Continuous joints were used on the angle bars, and straight plates or channel plates on the tangent track. Continuous joint plates were welded at the upper surfaces and at the ends of the plates. As shown in one of the illustrations, in preparing plates for welding bolts are inserted in the two upper holes, clamps are applied to the bottom of the plates near the ends and the plates are then pressed in place. The top of the plate is welded and the bottom is spot-welded, after which the clamps are removed and the welding completed.



ELECTRIC WELDING IN CINCINNATI—OPERATORS AT WORK

ELECTRIC WELDING IN CINCINNATI—JOINT AFTER TEST

This new piece of track offered the first opportunity to obtain the exact average cost of welding joints. One pair of 32-in. plates with a 16-in. base plate was applied, at an average cost of $3.98. This included the cost of the plates, all labor, material and electric current sufficient to make a finished joint. This cost is for the channel plate construction. The average cost of welding a continuous joint was only 64½ cents, which, of course, does not include the cost of bolting the joint in place. It merely covers the cost of the laborer's time, welding steel, and the current used. The average cost of welding rail braces to the steel ties or to the tie plate was 6 cents, including labor and material used, but excluding the plates and braces. While we had but one fair day's run on this new welded track construction, one welder operator made ten complete straight plate joints and the other operator twenty continuous joints. With good conditions, it is believed one operator can easily weld from eighteen to twenty rail braces an hour.

At the recent convention of the Roadmasters' and Maintenance of Way Association of America the following officers were elected: President, P. J. McAndrews, of the Northwestern; first vice-president, Coleman King, of the Long Island; second vice-president, M. Burke, of the Chicago, Milwaukee & St. Paul; secretary and treasurer, L. C. Ryan, Northwestern. W. H. Kohmehl, Chicago, Milwaukee & St. Paul, and A. Grills, Grand Trunk, were elected to the executive committee. The next convention will be held in Chicago, beginning Tuesday, Sept. 14, 1915.

COMMUNICATIONS

The Truss Rod Fallacy

L. B. STILLWELL, CONSULTING ENGINEERS
NEW YORK, Oct. 5, 1914.

To the Editors:

I have read with interest the editorial in your publication of Oct. 3 in regard to truss rods on steel cars. While it is conceivable that the application of truss rods to certain steel cars may be found necessary on account of possible errors in the original calculations of the proper strength of the structural members of the specific car in question, their application to new cars, as part of the design, will be recognized as futile, if a little study be given to the subject.

In the diagrammatic illustration of a car shown herewith the load is assumed to be carried by the girder formed by the belt rail, the side sheathing, the side sills, and such portion of the posts as acts to stiffen the side sheathing. For the purpose of ready reference, the main members under consideration are shown in heavy lines.

If the portion of the car between bolsters is considered alone, the belt rail will be found to be under a compression strain and the side sill under a tension strain. When cars are built of wood it is customary to use a truss rod under the side sill, as it is difficult to incorporate the required continuous heavy compression member at the belt rail. In this wooden structure, with a truss rod, the heavy continuous side sill becomes the compression member and the truss rod becomes the tension member. With steel construction, however, it is obviously practical to incorporate a continuous member at the belt rail of such ample section that the stress imposed will be within the maximum desired fiber stress.

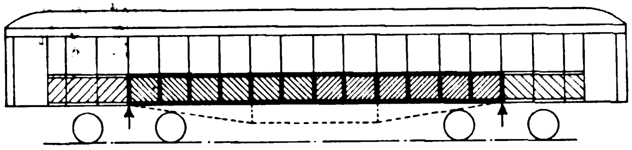


DIAGRAM SHOWING EFFECTIVE MEMBERS IN SIDE-GIRDER CONSTRUCTION

If a truss rod is applied under such a steel girder, both the sill and the truss rod can be in tension if the strain on the truss rod is carefully adjusted. It is obviously possible, however, to draw up the truss rod to such an extent as to reverse the stresses in the sill and the belt rail, producing then compression on the sill and tension at the belt rail.

Returning to the diagram of the car and considering the effects of the weight of the portion of the car body in advance of the trucks, it is observed that the stresses produced in the belt rail and in the side sill at the bolster are the reverse of those first above considered as occurring in the same members between the bolsters. In designing a car frame, the actual effect of this overhanging load must always be considered. In certain designs of cars for city service, having considerable overhang, the side sills may be altogether in compression, and in such cases the use of truss rods must be detrimental. In any case, the practical difficulty of tuning up a truss rod under a steel girder to the point necessary to cause the rod to carry only a definite proportion of the tension, is clearly apparent. Furthermore, the weight of material required for an adequate truss rod will be of greater structural value if incorporated in the proper girder members.

In conclusion, the application of a truss rod to the side girder of a steel car duplicates tension members. For this reason it will eventually create the same impression in the mind of an observer as would the application of a pair of shafts and a whip socket to an automobile.

F. M. BRINCKERHOFF.

BOSTON, MASS., Oct. 5, 1914.

To the Editors:

The "truss rod fallacy" pointed out in your last issue constitutes an interesting paradox. Frankly, it seemed to me hardly possible that the addition of metal to a structure could produce the astonishing result of weakening it instead of providing some little strength, especially when the addition consisted of such a well-known and widely used device as the truss rod. With that idea I developed a concrete case for an example, and judging by the result I have to admit that the truss rod should be relegated to a strategic position in the rear like that now occupied by the New York Giants. Under the circumstances it may be that the details of my example will interest your readers.

Assume an interurban car 60 ft. long and with truck centers of, say, 36 ft., giving an overhang of 12 ft. at each end. The framing between trucks would then have points of zero moment about 27 ft. apart. Assume the weight of body, with passenger load, to be 60,000 lb. and that the section between points of zero moment weighs, say, 27,000 lb., and also that 7000 lb. of equipment is distributed on the body framing between trucks, making the total load to produce moment equal 34,000 lb. Assume further that the side-girder type of construction is used and that the girder between sill and belt rail is 3 ft. high.

Then the load on the section of each side girder between points of zero moment (which constitutes a beam 27 ft. long) is half of the total, or 17,000 lb. Assuming that the neutral axis is midway between the upper and lower members of the girder, the moment in the center of each beam is, according to the well-known formula $\frac{Wl}{8}$, and each of the forces (tension and compression) in the sill and belt rail is (neglecting the web) approximately $\frac{Wl}{8h}$ where W equals the uniformly distributed load, l, the length, and h the height of beam. Substituting actual values, $F = \frac{Wl}{8h} = \frac{17{,}000 \times 27}{8 \times 3} = 19{,}000$ lb.

This is the amount of the compressive force in the upper member and also the amount of the tensile force in the lower member of the girder, and, if a truss rod is of any use, its installation ought to effect a decrease in both these tensile and compressive forces. Certainly it will not increase either one. Nor must it reverse the stresses to the extent that the original compressive stress is replaced by a tensile stress of greater amount or the original tensile stress is replaced by a compressive stress of greater amount. Obviously stress is stress, whether of compression or tension, because structural engineers use the same maximum figures for both, except that the safe compressive stress is reduced in the case of long columns.

Assume, then, that a truss rod is applied to the car in question without any change in the loading in any way. This truss rod assists the girder by introducing upward forces at the queen posts. To produce these forces, however, it must be set up so as to be strongly in tension, and this tension must have a reaction that appears as an equal compressive force in girder, or in other words, the pull from the truss rod tends to compress the beam longitudinally.

Owing to the presence of turnbuckles the ability of a car repairer with more beef than brains to set up the truss is limited only by the strength of the rod. Assume that the rod is 1¼ in. in diameter. Then the area is 1.227 sq. in., and if the elastic limit is 33,000 lb. per square inch the force which it can readily exert is 40,000 lb.

Now let us see what this force can do to the girder when the reaction appears in it as compression. If it is believed that the total force is divided about equally between the upper and lower members of the girder, each member will take 20,000 lb. of compression. Then, assuming that the moment remains unchanged, the original tension of 19,000 lb. in the lower member will be overcome and replaced by a compression of only 1000 lb. In the upper member, however, the original compression of 19,000 lb. will have added to it 20,000 lb., due to the reaction from the pull of the truss rod, so that the maximum stress becomes 39,000 lb., compression, instead of 19,000 before the truss rod was applied.

Now, for the sake of argument, assume that the moment at the center is reduced, by the action of the queen posts, exactly to zero. Then there will be a stress of 20,000 lb. compression, top and bottom, or 1000 lb. more than existed in each member before the truss rod was applied. Again, assume the moment fully reversed. Then the stress in the top member will be only 1000 lb. compression, but in the lower member the stress will go to 39,000 lb. compression. Therefore, in every case the presence of the truss rod, without a change in the load, has actually increased the maximum stress and thus weakened the beam.

In fact, it is impossible to conceive a set of circumstances (that are in accordance with the laws of nature and trigonometry) under which the stress will not be increased. Try a few other hypothetical cases. I did.

AMATEUR.

Insert Special Work Failures

TRANSIT DEVELOPMENT COMPANY

Brooklyn, N. Y., Oct. 2, 1914.

To the Editors:

I have noted with much interest the articles on the subject of insert special work failures in your issues of Sept. 19 and 26, and believe that the articles have served a good purpose in calling attention to the matter.

While I feel that the subject involves too much detail to discuss within the limits of a letter, there are a few points upon which comment may not be out of place. It appears that there are really three parties interested in the question, two of whom have been referred to, viz., the manufacturer and the engineer, the third being the purchasing agent. The first two cannot work together to the best advantage if the latter does not co-operate also. The reason for the failure of the purchasing department to co-operate at all times may possibly be due to the quite general lack of anything like standard specifications, which allows considerable latitude in bidding, with the result that the price often has a marked influence on the type of work ultimately purchased, disregarding, to a considerable extent, the type of construction the engineer has in mind for particular locations.

While it is doubtful whether it would be well to attempt to standardize every feature, there is little doubt but that the general dimensions of most castings and inserts, together with the character of the several metals in them, could be standardized with much benefit to all concerned, and it is therefore thought that the assignment of the subject of special work design and manufacture, for consideration by the committee on way matters of the American Electric Railway Engineering Association, would be productive of good results in this direction.

R. C. CRAM,
Assistant Engineer Way and Structure.

Tests of Automatic Train Speed Control

A public demonstration of the Horne & Crane train-control and train-stop device was held on Sept. 30 at the Cranford Junction yards of the Central Railroad of New Jersey. The tests were witnessed by a large number of engineers representing various railroad companies, signal manufacturers and the Interstate Commerce Commission. These tests were practised on a steam locomotive and were the first public application of this method of automatic train speed control by means of non-magnetic rail sections. Owing to the short stretch of track available the manganese track sections were spaced unusually near together in order to allow the locomotive a permissive speed of only 13 m.p.h. The tests, which proved successful in each case, were conducted to fulfil the three following situations: 1. Block approached occupied. Locomotive exceeded 13 m.p.h.; speed control and brakes were automatically applied. 2. Succeeding block still occupied. Locomotive reduced speed within 13 m.p.h. limit and no automatic brake application occurred. 3. Succeeding block clear. Locomotive passed speed control at fast and slow speeds without causing brake application to occur.

The object of this train-control and train-stop device is to provide a system of speed control which permits an oncoming train to approach the rear of a preceding train provided the speed of the train approaching is properly decreased as the distance separating the trains decreases. By means of the measured spacing of special sections in the running rail the speed of a train approaching an occupied block is automatically timed, and if its speed exceeds any predetermined limit at any point intervening between the distant signal and the home signal the train brakes are automatically applied under either service or emergency pressure until the train is stopped or until its speed is reduced to a certain predetermined rate of travel as may be desired by the railroad company.

The special sections inserted in the running rail are composed of ordinary manganese rolled-steel rail which is absolutely non-magnetic. Electromagnets are installed on the track in conjunction with the manganese control sections. The locomotive apparatus consists of a magnet suspended over the running rail which serves normally to maintain in closed circuit a valve connecting a timing cylinder with a source of compressed air supply. The piston of the timing cylinder times the movement of a contact disc controlling a brake pipe cut-out valve, which operation determines the speed of the train travel between manganese control sections when the block approached is occupied.

The bureau of mines of the Department of the Interior, has issued Bulletin 38 entitled "The Origin of Coal" by David White and Reinhardt Thiessen. The bulletin forms a report on an extensive investigation designed to show from microscopic examinations of coal, how far and in what ways the grouping of coal by types depends on differences in the kinds of plant material from which it was formed and on the conditions of its accumulation. The bulletin contains a chapter by Charles A. Davis on the formation of peat.

ASSOCIATION NEWS

MEETING OF WASHINGTON RAILWAY & ELECTRIC COMPANY SECTION

The first meeting of the Washington Railway & Electric Company section for the season was held on Sept. 28. The commercial department of the Potomac Electric Power Company met with the section. The principal feature was a paper by George C. Whitney, of the accounting department Washington Railway & Electric Company, entitled "The Accounting Department and Its Relations to the Other Departments." The paper provoked a lively discussion, after which informal addresses were made by Dr. Earle Wilsley and Dr. Abram Simon, ministers of local churches. In addition to felicitating the section upon the fine spirit manifested, the ministers gave summaries of recent experiences in Europe. Following the addresses, refreshments were served. E. S. Marlow, manager commercial department Potomac Electric Power Company, presided over the meeting, the minutes of which were forwarded to the ELECTRIC RAILWAY JOURNAL by B. F. Hunter, secretary of the section.

The purpose of Mr. Whitney's paper was to show how the work of the accounting department co-operates with other departments, and that its function is not to pile up a mass of unintelligible figures and reports to be filed away as records for possible future reference by the board of directors or the officers of the road. He showed by definite statements how the department can assist in improving the efficiency of the operation of the system. For example, the claim department can be furnished with facts and figures showing the causes of accidents and the facts bearing upon them, such as kinds of accidents, styles of cars, styles of brakes, service of trainmen, age of trainmen, mileage of cars, together with the cost of different kinds of accidents. Such data should enable the departments concerned to reduce accidents along certain lines. There is a close relation to the construction and maintenance departments also. The employees are apt not to associate the track gangs and their foremen with the accounting department which, however, plays an important part in figuring the cost of work and material and insuring their proper distribution. Many a dollar is lost through loitering on a job, ordering of surplus material and improper distribution of work. Similarly, the accounting department can call attention to economy in the ordering of supplies by the purchasing and stores departments.

In the work of the transportation department, the accounting department can assist by calling attention to statistics regarding accidents, and to the manner in which power is used by motormen. Through this department, the complaints of the power and substation operators to the effect that machinery is being overloaded, and that fuel cost is mounting up, can be brought to the attention of motormen. By giving figures of energy consumption per mile, or per car, on any given line and other data of this kind, the accounting department can help in reducing these costs. Again in the matter of making schedules, information can be furnished as to earnings, wages, hours, miles per line, which with the expression of these items in unit form, per car-mile, per car-hour, per passenger, per ton-mile, per seat-mile, etc., can indicate how schedules can be modified to produce greater economy. In the maintenance of buildings and equipment, the accounting department furnishes carhouse expense statements, comparative statements of operation and maintenance of substations and power plants, etc. These examples all go to show the importance of the accounting department in maintaining efficient operation of a property.

In the discussion of Mr. Whitney's paper, W. S. Ballenger, of the transportation department, stated that the instruction department drills the motormen carefully in regard to economical use of current, and the men have had careful instruction in regard to the coasting recording clocks. Special attention is called to the coasting averages by division notices. The transportation department also solicits suggestions tending to increase efficiency. The data sheets furnished by the accounting department are appreciated and are consulted when the question of increasing or reducing service is under consideration.

J. C. McLaughlin, of the commercial department, emphasized the importance of the accounting department's duty in furnishing accident data. He made a practical suggestion to the effect that a report bureau be established which would receive reports from all employees who notice defects on the property, these to be furnished on postal cards to be supplied by the bureau. George F. Mangan, of the commercial department, made the point that system is not enough in itself to produce results, and that the question in the use of any system is what use is made of the results. F. J. Mersheimer, of the claim department, urged that the accountants furnish simple statistics that can be understood and applied. L. L. Johnston, of the maintenance department, said that many of the foremen do not understand the importance of the data which they are called upon to furnish. If they did they would make a better showing for their work. A man who can do good work but cannot report properly upon it cannot expect to receive proper credit. V. A. Sisler, of the same department, mentioned some of the statements which are found especially useful, principally carhouse expense, operating expense, car accounts, job statements and manufacturing accounts. He stated that the accounting department is of great assistance to the mechanical department. W. F. Dement and C. P. King, president Washington Railway & Electric Company, also spoke.

DENVER TRAMWAY COMPANY SECTION

The September meeting of Company Section No. 3 was held in Denver on Sept. 17, 1914, with President W. M. Casey, trainmaster Denver City Tramway, in the chair. The attendance was 200. The paper of the evening was by A. F. VicRoy, superintendent Union Pacific Railroad, on the topic "Safety First on the Union Pacific Railroad." John A. Beeler, president Denver City Tramway, W. H. McAloney, superintendent of rolling stock of the same company, and others contributed to the discussion.

SECTION MEDAL COMPETITION

The committee on the section medal to be awarded by the American Association for the best paper read during the year before a company section will report on Wednesday afternoon, Oct. 14. The committee is considering the following papers: (Milwaukee section) "Purposes of a Street Railway Traffic Survey," by E. J. Archambault; "Pavements in Street Railway Track Zones," by V. W. Dentz; "Overhead Charges in Valuation," by H. G. Abendroth, and "Some Improvements in Car Design," by C. H. Cross. (Public Service section) "Maintaining the Way," by P. F. Maguire; "Training the Trainmen," by Charles H. Coe; "Some Elements Entering into Time-Table Development," by Alexander Jackson; "Inspecting the Rolling Stock," by John Hauf, and "Keeping the Company Department Store," by Robert S. Inglehart.

ENTERTAINMENT COMMITTEE ANNOUNCEMENT

Mme. Gertrude Auld, prima donna soprano of Milan, the soloist engaged for the officers' reception Monday night, though an American by birth is better known in Europe than in her own country. The foreign papers speak with enthusiasm of the quality of her voice and her great interpretative power. She made a most extraordinary success in Budapest and in Italy, where the Italians thought her singing was a return to the old school of Der Canto. Last winter she succeeded in calling forth enthusiasm of audiences in New York City with a recital on modern song.

PROPOSED INCREASE IN DUES

In the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 3 an editorial commented on the proposed increase in company dues. The proposed and present schedules are as follows:

	Gross Receipts			Annual Dues	Present Dues
Under	$50,000			$25	$15
Between	50,000	and	$100,000	50	25
"	100,000	"	250,000	75	50
"	250,000	"	500,000	125	75
"	500,000	"	1,000,000	175	100
"	1,000,000	"	2,000,000	225	150
"	2,000,000	"	3,000,000	275	200
"	3,000,000	"	4,000,000	325	250
"	4,000,000	"	5,000,000	375	300
"	5,000,000	"	6,000,000	425	350
"	6,000,000	"	7,000,000	475	400
"	7,000,000	"	8,000,000	525	450
"	8,000,000	"	9,000,000	575	500
"	9,000,000	"	10,000,000	650	550
	10,000,000	"	over	750	600

South American Trip

After a two weeks' visit to New York manufacturers, H. N. Douthitt, special agent of the Department of Commerce, has returned to Washington for a short time before leaving for Rio de Janeiro, Brazil. This South American trip by Mr. Douthitt is taken at the personal suggestion of Secretary of Commerce Redfield, who thinks that a government representative will be able to obtain much information of value to American machinery manufacturers. Mr. Douthitt's investigations will be confined entirely to a study of the market in South America for general outside machinery and engineering supplies, including electrical machinery and apparatus. He will look into the matter of equipment for machine shops, but will not make any investigation of markets for textile machinery.

In talking with a representative of the ELECTRIC RAILWAY JOURNAL Mr. Douthitt said that he had lived for some time in Brazil, where he was interested in hydraulic engineering projects. As the result of this experience he concludes that American manufacturers should seek in South America a market based on the high quality of the goods produced. The quality is the best feature of American products, and this is thoroughly appreciated by South American buyers who have traded with our manufacturers. Mr. Douthitt spoke of two Westinghouse generators installed at Bellohorizonte, state of Minas Geras, Brazil, which had been cited all over the country as examples of the superiority of American machinery. They had been in operation about fifteen years, had worn out two sets of blades on the turbines, and when last heard of were as satisfactory as at the beginning. If all companies would do as certain of the large electric manufacturers have done and try, Mr. Douthitt said, to market products on the basis of high quality, they would secure satisfactory results.

While in South America Mr. Douthitt will call on the American consul in each city, with whom he will advise, and also make a personal canvass among the users of heavy machinery. He will obtain as thorough a description as possible of the machinery now in use, together with information concerning the source of manufacture, the cost and the present needs. Mr. Douthitt, with his knowledge of Portuguese, will discuss frankly the financial conditions in the various countries in order to find out whether buyers are in a position to pay cash, or, if not, what terms of credit they expect and what the countries can offer to American manufacturers in exchange for goods. The question now is not how much this country can sell to South American buyers but rather how much South American buyers will want to buy while financial conditions remain as they are.

Unless American manufacturers are prepared to have their representatives remain for a year in South America without showing a profit on sales, Mr. Douthitt does not advise the sending of representatives. If manufacturers desire to enter the South American market on this basis, however, they should secure their own representatives rather than try to do business through English and German commission houses, which already have extended connections with manufacturers in their own countries.

Electrical Openings in South America

Manufacturers of electrical machinery in New York, New Jersey and Pennsylvania have a remarkable field for development in South America, according to P. H. Burnett, industrial commissioner of the Lehigh Valley Railroad, in a bulletin recently sent out for the benefit of manufacturers along the line of the railroad. The latest census figures show that of the $221,000,000 of electrical machinery manufactured in the United States each year, $49,000,000 is produced in New York, $31,000,000 in Pennsylvania and $28,000,000 in New Jersey. The world is recognizing the value of American electrical machinery, for $27,000,000 of electrical goods were exported from the United States in the fiscal year 1913 as compared to $20,000,000 in 1912.

Mr. Burnett believes that South America affords an opportunity greatly to increase American export trade in electrical machinery, on account of three conditions, the absence of coal, the presence of plentiful supplies of water-power and the need of power to operate railways, mines and industrial plants. That the opportunity is being seized is evidenced by the fact that Brazil's importation of electrical manufactures amounted in 1912 to nearly $6,000,000 and Argentina's importation to about $4,500,000. Chile, which has special facilities for obtaining water-power, imported in the same year $2,500,000 of electrical machinery and apparatus, while the imports of other South American countries brought the total to nearly $20,000,000. Of the $4,500,000 of this class of manufactures imported into Argentina only about $130,000 was from the United States, but of Brazil's $6,000,000 of electrical imports about $2,500,000 was from the United States.

Mr. Burnett speaks particularly of the excellent opportunities in the state of Bahia, Brazil. The market there for waterwheels and turbines, electrical motors, cables, etc., is sure to be steady and growing. On the Pacific Coast the opening for the use of electrical machinery is very great. In Chile it may be expected that hydroelectric machinery will be in constant demand in view of the mountainous nature of the whole country and the numerous rivers. American machine makers will find strong competition but will probably have few better openings for future trade. A report from Venezuela emphasizes the fact that further industrial development will mean a demand for turbines and other hydroelectric machinery, and it would be well for electrical manufacturers to study the needs of this country.

Equipment and Its Maintenance

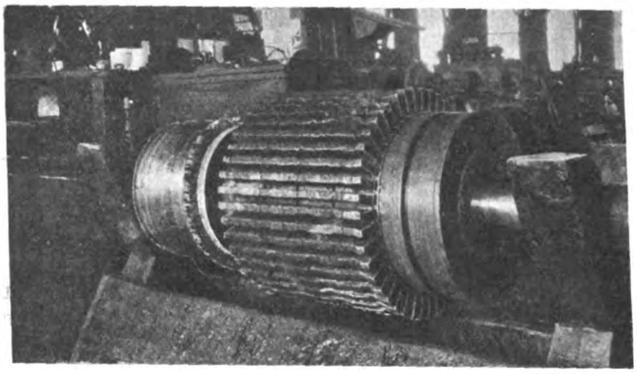
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Welded End Laminations of Armatures

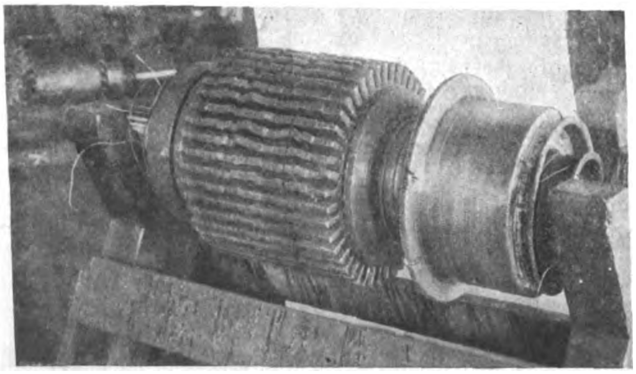
BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAYS

In many of the earlier types of railway motors the laminations of the armature cores were supported and protected by the use of malleable-iron finger plates at each end of the core. These plates prevented any tendency of the core teeth to spread in the direction of the axis of the core. Later types of motors, however, are not provided with finger plates, but the support required at each end of the core is secured by making a few of the laminations of a heavier gage sheet metal than the remainder of the core.



VIEW SHOWING SEVERE TEST OF END LAMINATIONS WITHOUT CRUSHING

Our experience has demonstrated that this method of reinforcement offers a support far inferior to the old finger plates. Until a few months ago the core with flared or spread teeth was a constant annoyance. In some cases the core was made an inch longer because of this spreading effect. In this condition, perfect winding was impracticable since much pressure was necessary to force the coils into the slots, and this pressure often damaged the insulation so badly that some of the coils soon burned out.



VIEW OF ARMATURE SCARRED FOR ITS ENTIRE CIRCUMFERENCE

To prevent this trouble, a suggestion was made that the flaring teeth be pressed back in place and welded together. In this manner the end laminations would form practically a solid piece and furnish the same supporting effect as a finger plate. As an experiment, one core was welded in this manner, and the result was so successful that all spread cores are now being so treated. The process is quite simple, requiring merely that the core be set on end, in which position the laminations are welded, one tooth at a time, with an oxy-acetylene flame fed from our installation of this welding system. The welded section should have a thickness of from ½ in. to ⅝ in.

The accompanying illustrations give some idea of the remarkable strength of these welded ends. One of these cores was damaged by some object which had been carried into the air gap, with the result that a groove about ⅛ in. deep and ½ in. wide was torn around the entire circumference of the core. It will be seen that although the teeth were distorted the welded ends still remain as true and parallel as the day they were welded. The other illustration shows an armature core in which the end laminations have been subjected to a severe test without crushing. The actual cost of the welding is very small when compared to the cost of tearing down and reassembling a core, being about $7 for a core of forty-five slots. This figure includes some experimental work, and could, no doubt, be greatly reduced.

Vineville Avenue Concrete Paving, Macon, Ga.—The Cost

BY CARL H. FULLER, FORMERLY ENGINEER MAINTENANCE OF WAY MACON (GA.) BAILWAY & LIGHT COMPANY

The following is a detailed statement of the labor and material required to build 4290 ft. of track under the conditions described in my article of Oct. 3:

Labor		
Tearing up 4290 ft. of track at 3 cents per ft.		$128.70
Laying and surfacing:		
Fine grading, per foot	$0.02	
Placing ties	0.01	
Spiking and bolting	0.025	
Tamping	0.065	
Final surfacing	0.03	
Total, 4290 ft. at	0.15	$643.50
Policing and lighting		44.51
Hauling 1266 ties from stockyard, loading and unloading from service cars, 2-mile haul, at 4 cents each		51.43
Hauling rail from the stockyard, 76 tons at $0.345, or 160 bars at 10 cents each		26.21
Hauling away old material, miscellaneous hauling, cleaning up and labor not otherwise accounted for, 4290 ft. at 4 cents per ft.		51.56
Installing 266 bonds at 15.4 cents		40.97
Drilling and placing 400 ft. of guard rail, at 5½ cents per ft.		21.95
Total labor on 4290 ft. of track, at 23½ cents per ft.		$1,008.83
Material		
1266 No. 1 loblolly yellow pine ship pine ties, at 60 cents each		$759.60
260 bars 60-lb. A. S. C. E. rail, at $9.72 each ($33.25 per ton, or 59 cents per ft. of track)		2,527.30
400 ft. of guard rail at 53 1/3 cents per foot		213.33
Two pairs compromise joints at $6.70 each		13.40
260 pair 60-lb. angle bars at 58 cents per pair		150.80
266 9-in. concealed No. 0000 stranded bonds at 43 cents each		114.38
1100 nutlocks at 78 cents per 100		8.58
Eighteen kegs 7/16-in. x 5½-in. railroad spikes at $4.87 per keg		87.75
Six kegs track bolts at $4.90 per keg		30.91
Depreciation on tools		20.14
Lanterns and oil		10.64
Total material for 4290 ft. track at 91.7 cents per foot		$3936.83
Total labor and material, 4290 ft. at $1.15 1/3 per foot		4945.66

All rail was 33 ft. long and laid "broken joint" or "joint and center." Ties were placed two under each joint making a suspension joint, with four between, practically 3 ft. centers and requiring 1560 ties for the job. Of these ties, 294 found in the old track were considered sound enough to use again. As we have repeatedly uncovered ties incased in concrete from twelve to sixteen years and found them in fairly good condition we used no wood preserver, believing that because of the rigid monolithic construction of the pavement, which thoroughly incases the ties and rail in the cement, the ties would last as long as the paving itself. As the life of the paving could not exceed the average useful life of railway track, say twenty years, we did not consider it economy at this time to increase the initial cost of the work to obtain a result which would not be warranted by the life of the paving and the rail.

It will be noted in the tabulated costs that labor for laying and surfacing amounting to 15 cents per ft. is further subdivided into the various operations, but these subdivisions can only be considered relatively approximate as the transition from one operation to another is almost imperceptible. The rough grading and hauling away of excavated material by the city convict gangs, a service for which no charge is made against the job by the city, resulted in a saving to the traction company of 1324 yd. of original excavation which would have cost in the neighborhood of 15 cents per ft. of track.

The cost of installing 266 9-in. concealed, stranded No. 0000 bonds with compressed terminals under splice plates, the holes being drilled with a Duntley electric track drill and terminals compressed with a screw press (see article in July 25 issue of this journal) including replacement of two plates and four bolts tight ready for paving averaged 15.4 cents each for the job. On one day with everything in their favor the two men who operated this outfit placed thirty bonds in ten hours at a cost of $2.75, or 9 cents per bond.

The track laying gang averaged fourteen men and foreman. This work was done in forty-nine working days although the paving operations covered 103 days, including Sundays and delays. Track men received $2, $1.50, $1.35 and $1.25 a day of ten hours. No engineering or overhead is charged against the job.

The city paving gang did the actual paving. After one side of the street had been fine-graded for quite a distance, the 12 cu. ft. batch mixer was placed to control from 150 ft. to 200 ft. of paving and the material required was hauled in behind it. All sand was screened to remove foreign matter. Ordinarily, eight men were required to supply the mixer with material, two men to operate the mixer and six men to handle the concrete from mixer to grade, while three men tamped and raked it to grade, smoothing it first with long-handled spades and finishing with a long-handled wood float. There were usually about twenty-six men in the gang, the surplus being disposed as required. All were paid at the rate of $1.25 a day of ten hours.

The total actual area paved amounted to 11,957.8 sq. yd., having a cross section as shown in the sketch in the first article, being 8 in. on the sides and 11 in. thick from the bottom of the tie to the top of the rail in the track. In order to reduce our cost data to surface yard measurement we will change the extra 3 in. in the track to surface yards, which gives us a total of 15,306 sq. yd. The material for this cost appears at the bottom of the preceding column.

3775 bbl. of cement at $1.68, f.o.b. Macon or 0.42 bbl. per yd.	$0.42
Hauling from car to job at 8 cents per barrel in cloth sacks, sub-contract	0.02
1500 yd. of sand delivered on the job at 70 cents	0.07
3500 tons crushed granite, f.o.b. Macon, or 0.23 tons per surface yard, at $1.83 per ton	0.42
Hauling ⅝ mile from car to job at 40 cents	0.09
Material for 7500 ft. of expansion joint	0.02
Miscellaneous material, lumber, gasoline for mixer, etc.	0.01
Giving a total of $16,028.77, or per square yard of	$1.05

Reducing the foregoing figures to cubic yard costs we have 3400 yd. of concrete at $4.71 for material.

The labor to handle, mix and place this material cost in detail per surface yard as follows:

Superintendence (no engineering)	$0.026
Screening sand	0.006
Expansion joints	0.002
Fine grading	0.25
Loading and charging mixer	0.017
Operating mixer	0.009
Placing concrete	0.025
Finishing and surfacing	0.013
Miscellaneous labor, moving mixer, etc.	0.023
Making a total of $2259.65 or per sq. yd.	$0.346

Reducing the foregoing figures to a cu. yd. basis we have 66 1/3 cents for labor. These figures give us a total cost of $5.37 per cu. yd. of concrete or $1.396 per surface yard in place.

The cost of this work was divided among the property holders, city and railway company as follows:

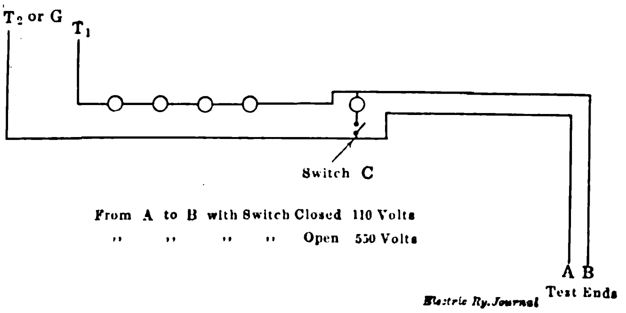
Macon Railway & Light Company, all inside of tracks and 1 ft. on the outside, or 4081.3 sq. yd., at $1.396	$5,694.49
Macon Railway & Light Company, 28 per cent. excess concrete in above	1,595.30
City one-third of remainder, or 2625.5 yd.	3,665.21
Property holders two-thirds of remainder, or 5251 yd.	7,330.42
Or, 11,957.8 sq. yd. of paving	$18,288.42
TOTAL COST FOR MACON RAILWAY & LIGHT COMPANY	
4081.3 yd. paving	$7,292.79
Labor and material for 4290 ft. of track	4,945.66
Total, 4290 ft. of track at $2.85 per lin. ft.	$12,238.45

The city engineer, Col. J. J. Gilliard, prepared the specifications for the paving while his office performed all engineering work required, and during construction the work was subject to his constant personal supervision. Dr. W. G. Lee, chairman of the aldermanic street committee, through his influence and energy made the job possible and also gave the work considerable detail attention. The writer as engineer of way for the railway gave personal supervision to the latter's part of the work and also kept detailed cost records for the job as a whole.

Standard Five-Light Series Cluster for D.C. Test Voltages

BY R. H. PARSONS, ELECTRICAL FOREMAN

A very convenient means for voltage tests is afforded by using a five-light cluster of the type found in most shops and carhouses where 550 volts d.c. is the standard.



WIRING FOR TEST WITH FIVE-LIGHT SERIES CLUSTER

The accompanying sketch shows how either 110 or 550 volts can be obtained by the use of such a cluster. Glancing at the sketch it will be seen that when the switch *C* is open there is no circuit for current, but that the difference of potential of 550 volts between *B* and *A* is available. Should this voltage break down the insulation under test, the circuit thereby created will cause the lighting of the lamps, allowing to pass through the break only as much current as would pass through the five lamps, namely, a little less than ½ amp. At the same time the voltage across *B* and *A* would be reduced to zero.

When switch *C* is closed a complete circuit is formed through the five lamps lighting all at the same time and giving a drop of 110 volts across *A* and *B;* or, to be more exact, the difference of potential would be approximately 100 volts, depending on the line voltage and the resistance of the lamps.

When using the test wires *A* and *B* with the switch closed the five lamps are lighted, and we have 110 volts for testing. Then in case of a breakdown of the insulation, or of placing the ends of these wires across a closed circuit, the lamp nearest the switch *C* will go out. Thus we would get through *AB* that current which would pass through four lamps in series, or a little more than ½ amp. A single-blade snap switch is used.

This plan is convenient for testing circuits at the bench, as on controller work, testing coils and commutators, etc. By using long leads it is also made available for pit work. To adapt a regular cluster for these purposes, remove one of the lamps and replace it with a plug and twin wire cord. Then run the cord to a suitable place over the bench or on the wall where the switch, another lamp, and the test leads can be installed. A convenient method would be to extend a bracket from the ceiling or wall adjacent to the bench and install the switch lamp and leads directly over the bench at a place easily reached by the workman.

Eliminating Crossed Grounding Currents in a Motor-Generator Set

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

The following incident, which occurred during the equipment of a substation at Chambly Basin, Que., for the Montreal & Southern Counties Railway, may be of special interest to those who are connected with such installations. This station was designed to run in parallel with another substation at Ste. Lambert, about 12 miles distant. Energy is received at 25,000 volts three phase, sixty cycles, and transformed through one set of three 185-kva single-phase oil-insulated, self-cooled transformers, with 2300-volt delta-connected secondaries. At the latter voltage energy is delivered to a 600-hp polyphase slip-ring induction motor with stationary primary and revolving secondary, while the d.c. end of the set is a 400-kw commutating-pole, compound wound 600-volt generator.

When everything had been completed to the point of cutting in the current and starting up the machine, a ground wire was connected to the motor-generator frame as a precaution against possible danger, particularly when starting the machine for the first time. As soon as the oil switch was operated to cut the current in the motor a strong flash was visible between the grids in one of the three groups of starting resistance mounted over the starting panel. The oil switch was opened immediately thereafter, but the appearance of the resistance grids failed to indicate that anything was wrong. The manufacturer's representative then asked us to remove the ground wire from the motor-generator frame. The current was then cut in again, and the motor-generator ran all right.

Following a satisfactory test run the motor-generator was placed in regular service, but after operating for two weeks the bearings started to run hot. On starting up the machine one dark morning a long spark was seen to follow the oil rings in the bearings, and when the end cups were removed from the bearing ends a spark was visible around the armature shaft in the bearing ends. The machine was then shut down and the bearings taken apart. It was found that the shaft had been badly roughened while big holes had been burned in the bearing babbitt. A careful investigation disclosed that a ground in one of the resistance grids, namely, at *X* in the accompanying diagram, was responsible for the burns in the shaft and bearing.

The trouble arose as follows: On starting up the machine a certain amount of current would flow to ground from the motor armature, which was star-wound with grounded neutral, and, since the resistance also was grounded, currents of different character and phase were set up in opposite directions. The discharge between these two currents was through the oil film in the bearings. Not only did this arc break down the oil film, but it also burned the bearing and armature shaft enough to cause hot bearings.

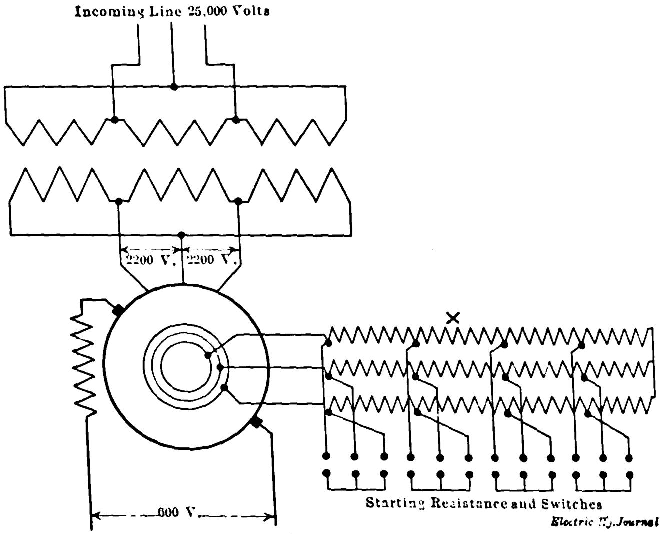


DIAGRAM OF MOTOR-GENERATOR SET, SHOWING LOCATION OF GROUNDING POINT IN STARTING RESISTANCE

To correct the trouble the bearings were scraped, the shaft was polished with carborundum, the oil was replaced with fresh liquid, the ground was removed from the resistance and the motor-generator frame was earthed with a good grounding wire. Finally, we placed in the rotor a grounding brush in a medium-sized brush-holder. This holder was so mounted on the motor-generator frame that the carbon brush could make a sliding contact with the rotating armature shaft. Since these changes were made the motor-generator has run without any arcing or hot bearings.

British Ideas on Cab Signals

The British Board of Trade report upon accidents on railways in the United Kingdom during 1913 draws special attention to the use of electricity in preference to gas in railway carriages, and also to the necessity of adopting means to safeguard against mistakes by signalmen and locomotive engineers. Regarding the latter, a memorandum was prepared towards the end of last year by the inspecting officers and submitted to the various railway companies urging them to extend the use of electric track circuits in connection with the control of signals, and to carry out combined experiments with different systems of cab signaling and automatic control with the object of supplementing the present system of semaphore signaling.

A Complete Progress Profile Used by an Iowa Interurban

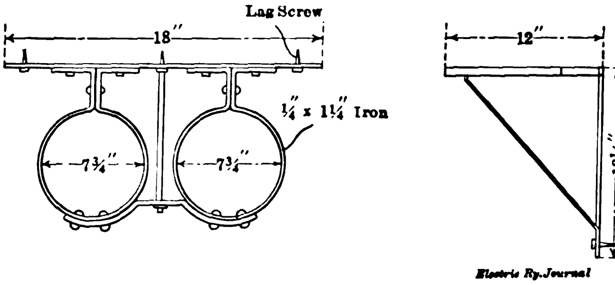
The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, is just completing a 60-mile extension to its lines between Waterloo and Cedar Rapids. In connection with this construction work a complete progress profile was desirable to give the management a diagrammatic record of the work done each week. To meet this requirement a complete form of progress profile has been devised by T. E. Rust, chief engineer of this road.

This profile is shown in the accompanying illustration, and is standard correspondence paper size. In it the entire road is covered by a series of sheets, each including about 6 miles of line. It will be observed that besides containing the usual profile and grade line with a color key for each month's grading, space is provided for actual pay quantities per week, per month and the total. In addition to the concrete openings there are included timber bridges, track laying, ballast overhead lines and an alignment map. Each of these designations is colored by the different resident engineers, in accordance with the progress made on the division in their charge and sent to the chief engineer's office regularly each week.

The record sheet is about 9 3-4 in. wide by 8¼ in. high, with a 1-in. margin at the left for convenience in binding.

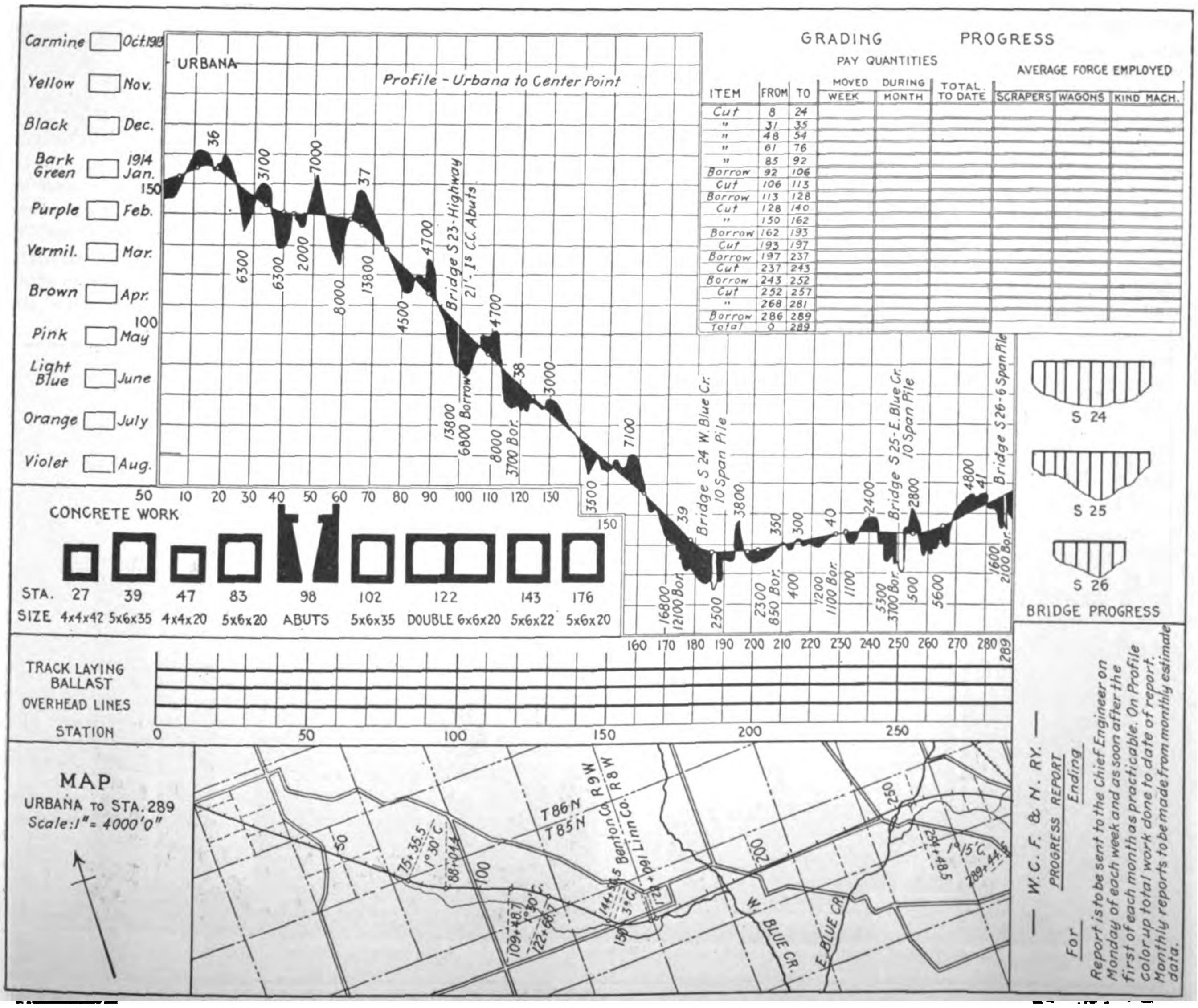
An Effective Fire-Bucket Rack at East St. Louis

An inexpensive and convenient fire-bucket rack has been designed and built by the mechanical department of the East St. Louis & Suburban Railway. It has been standard practice for this company to provide wooden shelves for this purpose throughout its shops and carhouses. In many instances the location of these shelves was such as to form a convenient shopmen's catch-all. In order to make it impossible to utilize these racks for storage shelves, the strap-iron racks shown in the accompanying illustrations were made for two 14-qt. buckets, at a cost of approximately 76 cents each. They are made of forged strap iron riveted together.



Lag Screw
18"
¼" x 1¼" Iron
7¾"
7¾"
12"
13½"
Electric Ry. Journal

EAST ST. LOUIS FIRE-BUCKET RACK



Carmine ☐ Oct. 1913
Yellow ☐ Nov.
Black ☐ Dec.
Dark Green ☐ 1914 Jan.
Purple ☐ Feb.
Vermil. ☐ Mar.
Brown ☐ Apr.
Pink ☐ May
Light Blue ☐ June
Orange ☐ July
Violet ☐ Aug.
URBANA
Profile - Urbana to Center Point
150
100
50
36
3100
7000
37
6300
6300
2000
8000
13800
4500
4700
Bridge S 23-Highway 21'-1s C.C. Abuts
4700
13800 6800 Borrow
38
8000 3700 Bor.
3000
7100
3500
39
Bridge S 24 W. Blue Cr. 10 Span Pile
3800
16800 12100 Bor.
2500
350
2300 850 Bor.
350
400
300
1200 1100 Bor.
40
1100
2400
Bridge S 25-E. Blue Cr. 10 Span Pile
5300 3700 Bor.
2800
500
5600
4800
41
Bridge S 26-6 Span Pile
1600 2100 Bor.
10 20 30 40 50 60 70 80 90 100 110 120 130 150
160 170 180 190 200 210 220 230 240 250 260 270 280 289
CONCRETE WORK
STA. 27 39 47 83 98 102 122 143 176
SIZE 4x4x42 5x6x35 4x4x20 5x6x20 ABUTS 5x6x35 DOUBLE 6x6x20 5x6x22 5x6x20
S 24
S 25
S 26
BRIDGE PROGRESS
TRACK LAYING
BALLAST
OVERHEAD LINES
STATION 0 50 100 150 200 250
MAP
URBANA TO STA. 289
Scale: 1" = 4000'0"
T86N R9W
T85N R8W
Benton Co.
Linn Co.
50
100
200
250
W. BLUE CR.
E. BLUE CR.

GRADING PROGRESS

ITEM	FROM	TO	PAY QUANTITIES MOVED DURING WEEK	PAY QUANTITIES MOVED DURING MONTH	TOTAL TO DATE	AVERAGE FORCE EMPLOYED SCRAPERS	AVERAGE FORCE EMPLOYED WAGONS	AVERAGE FORCE EMPLOYED KIND MACH.
Cut	8	24						
"	31	35						
"	48	54						
"	61	76						
"	85	92						
Borrow	92	106						
Cut	106	113						
Borrow	113	128						
Cut	128	140						
"	150	162						
Borrow	162	193						
Cut	193	197						
Borrow	197	237						
Cut	237	243						
Borrow	243	252						
Cut	252	257						
"	268	281						
Borrow	286	289						
Total	0	289						

— W. C. F. & N. RY. —
PROGRESS REPORT
For Ending

Report is to be sent to the Chief Engineer on Monday of each week and as soon after the first of each month as practicable. On Profile color up total work done to date of report. Monthly reports to be made from monthly estimate data.

PROGRESS PROFILE, INCLUDING DESIGNATIONS FOR CONCRETE WORK, WATERLOO, CEDAR FALLS & NORTHERN RAILWAY

Block Signals on the Kansas City, Clay County & St. Joseph Railway

This 1200-Volt, High-Speed, Interurban Railway Has Recently Placed in Service a Complete System of Automatic Block Signals Which Is Described in Detail by the Author, Who Includes Figures Covering the Total Cost of the Installation

BY ROBERT P. WOODS, CITY MEMBER BOARD OF CONTROL, KANSAS CITY RAILWAYS COMPANY

An automatic block signal system recently completed on the Kansas City, Clay County & St. Joseph Railway, under the direction of the writer, embodies some features of interest in signaling on electric railways. This road is a 1200-volt d.c. line, doing an exclusive interurban business and operating frequent trains at high speed. After about two years of consideration as to the system and the type of signals best adapted to the conditions, J. R. Harrigan, general manager of the company, directed that contracts be entered into for the installation of an absolute automatic block signal system with continuous, alternating-current, track circuits. It was decided also that current should be provided for station and switch lights along the whole route. The Union Switch & Signal Company's apparatus was used.

The road consists of two single-track divisions, both extending from Kansas City, Mo., one northeast 28.35 miles to Excelsior Springs and the other northwest to St. Joseph, a distance of 52.44 miles. The length of track outside of terminals on the Excelsior Springs division is 24.5 miles, all of which has been included in the signal system. This division has been divided into nine blocks varying in length from 6950 ft. to 18,704 ft. The predominant length of block is about 15,000 ft. The length of track under the signal system on the St. Joseph division is 46.6 miles, which also includes all track outside of terminals. This division has been divided into sixteen blocks varying in length from 6154 ft. to 23,201 ft., with about 15,000 ft. as the predominant length of block.

Each block in the signal system, which is of the Union Switch & Signal Company's "T-D-B" type, is a unit in itself, and cars occupying one block have no control over signals in an adjoining block, following movements being provided for by having intermediate signals located about 1000 ft. either side of the center of the block, thus providing for the operation in the same direction of two trains in the same block and both being protected by absolute signals.

At each siding there are placed two semaphore signals, one for each direction of traffic. These semaphores are electrically operated and for night indications are lighted with two 2-cp lamps. The semaphores are of the Style B one-arm, two-position type, operating from 0 deg. to 60 deg. in the upper left-hand quadrant, indicating "Stop" at 0 deg. or horizontal and "Proceed" at 60 deg.

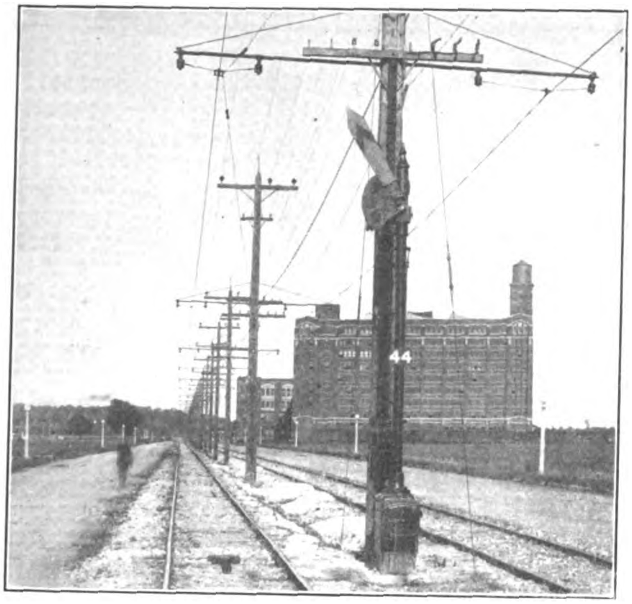
About 1000 ft. on either side of the center of block, depending upon the block length, is located an intermediate light signal of the Model 13 type, provided with one red and one green lens, each about 8 in. in diameter, and hooded for daylight indications. Two 25-watt lamps are used for each of these indications.

At two sidings which are used for light freight operations only, there have been installed switch indicators. These indicators are small unlighted semaphores, each mounted in an iron case on a 4-ft. stand, and they always indicate "Stop" to trains occupying the siding. Before a car leaves one of the sidings the trainman must open the case and throw the indicator into circuit; if the block is not occupied the small semaphore will go to "Proceed" and must be held in this position

K. C., C. C. & ST. J. SIGNALS—INTERMEDIATE LIGHT SIGNAL AT CURVE IN ROCK CUT until the car passes out on the main line, thus setting the home signals at "Stop" and giving the car that leaves the siding the right-of-way in the block. The switch indicators do not indicate any movements into the siding from the main line.

The overhead wiring for this system consists of two No. 6, 40 per cent, copper-clad wires for the transmission system, which is 2200-volt, single-phase, twenty-five-cycle; and three No. 10, copper-clad, 30 per cent wires for the 110-volt control wires. There are two additional wires of the same voltage from the center of the block to each of the intermediate light signals. Where station lights are provided an additional wire from the nearest line transformer is necessary.

Insulated rail joints of the Keystone type are placed in the track at the end of each block, confining the signal track circuits, and impedance bonds of 500-amp capacity are placed in the track to take care of the return propulsion current. All of the old cross-bonds in the track were removed.



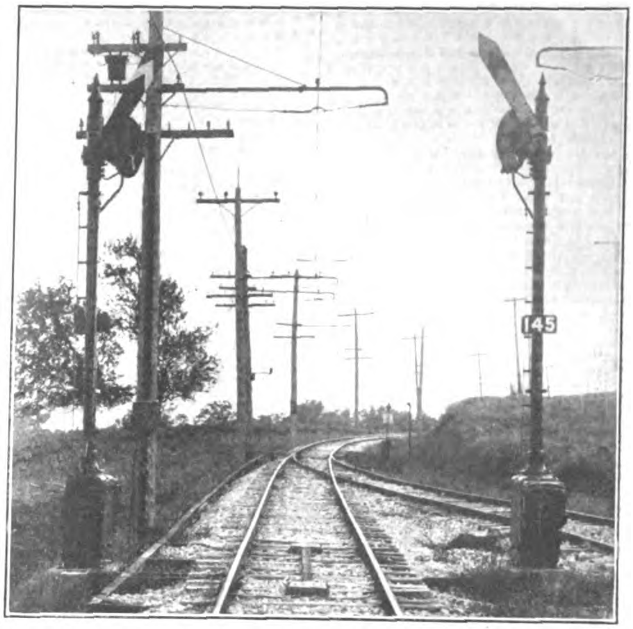
K. C., C. C. & ST. J. SIGNALS—HOME SIGNAL REAR END OF LONG SIDING IN CITY STREET

Power for signal operation is obtained from the 730-volt side of the main substation transformers, a double-throw switch being provided for taking power from either bank. At the substation on the Excelsior Springs division, two 15-kva, 730—2200-volt, twenty-five-cycle, single-phase transformers have been installed with a single panel switchboard for controlling the signal current. Similar installations were placed in the two substations on the St. Joseph division, except that at the second station two 10-kva transformers were used instead of the larger size. Line transformers are installed along the line to step the 2200-volt signal transmission current down to 110 volts for signal controls and to 12 volts for track circuits. Vane type relays are used for the line and galvanometer type for the track circuits.

All shelter stations and switch stands are electrically lighted, the shelter lights being taken from the 110-volt taps on the line transformers and the switch lights from the 12-volt taps of these transformers. The switch lanterns are provided with two 2-cp Mazda lamps. The shelter stations each have one 40-watt Mazda lamp. Individual 2200—110-volt transformers are used at the three depots for lighting these stations.

Trains are operated on orders from the dispatcher and the signals are additional safeguards against misinterpretation or mistaken orders. A red signal light indicates "stop" and a green light "proceed." In case of a signal giving an indication contrary to the train order, the dispatcher is called and the order verified, because a block signal at "stop" may indicate: (a) a train is in the block; (b) an open switch in the main tracks; (c) a car outside of the clearance point on siding; (d) a broken rail; (e) failure of the system; (f) a broken bond.

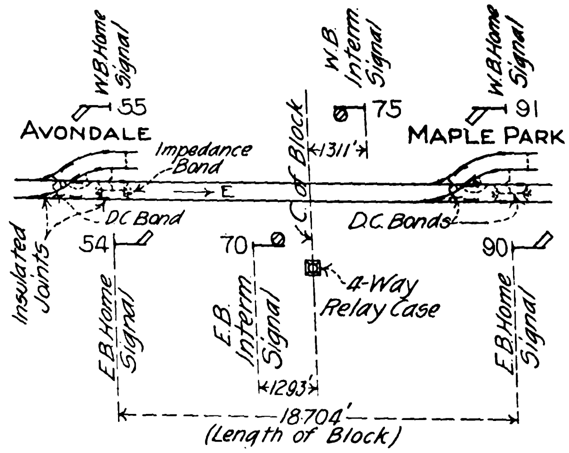
The operation of a typical block may be better understood by referring to the diagram on the next page, which shows the block between Avondale and Maple Park on the Excelsior Springs division. This particular block is 18,704 ft. long and the distance between intermediates is 2604 ft. With no trains occupying the block the signals assume proceed indications. Assuming an east-bound car entering the block at Avondale, east-bound home signal 54 and opposing west-bound home signal 91 and west-bound intermediate signal 75 go to the stop indications. The east-bound intermediate signal 70 will indicate stop when the car is within about 400 ft. of the center of the block, and when the car passes a point about 400 ft. beyond the center of the block east-bound home signal 54 will clear, thereby allowing a following movement from Avondale and at the same time protecting the first car from the rear. East-bound intermediate signal 70 and west-bound home signal 91 will not clear up until the car has passed out of the block or entered the siding at Maple Park, and obtained clearance with the main line. The intermediate signals lend an additional safeguard, as in the case of two trains entering the block, one at Avondale and the other at Maple Park, at one time, both intermediates would indicate "stop" and the trains would be held.



K. C., C. C. & ST. J. SIGNALS—VIEW OF HOME SIGNALS AT SIDINGS, SHOWING FRONT AND REAR ASPECTS

Located at each switch is a switchbox which is connected to the closed point of the switch, and when the switch is opened the signals in the adjoining blocks show stop indications. The box may be so set that any desired opening of the track switch will operate the signals. An illustration shows the circuit plan for a typical block.

In Table I is a detailed estimate of the construction of the entire signal system and, as the work is now practically completed, represents the cost of the work. The Union Switch & Signal Company furnished and installed all semaphore and light signals, line transformers, relays, impedance bonds, trunking and all necessary connections. The concrete foundations were


W.B.Home Signal
55
AVONDALE
Impedance Bond
E
DC Bond
Insulated Joints
54
E.B.Home Signal
W.B. Interm Signal
75
¢ of Block
1311'
70
E.B. Interm Signal
1293'
4-Way Relay Case
W.B.Home Signal
91
MAPLE PARK
DC Bonds
90
E.B.Home Signal
18704'
(Length of Block)

K. C., C. C. & ST. J. SIGNALS—TYPICAL BLOCK ARRANGEMENT

TABLE I—DETAILED COST OF SIGNAL INSTALLATION ON KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY

Material and labor by the Union Switch & Signal Company	$73,000
Material and labor by Kansas City, Clay County & St. Joseph Railway:	
132 cu. yd. crushed stone (delivered), at $2.50	330
66 cu. yd. sand (delivered), at $2.00	132
198 bbl. cement, at $2.00	396
130 miles No. 6 H. D. C. C. 40 per cent bare wire, 50,700 lb., at 16 cents	8,112
262 miles No. 10 H. D. C. C. 30 per cent bare wire, 40,348 lb., at 15 cents	6,052
18 miles No. 10 H. D. C. C. 40 per cent bare wire, 2772 lb. at 16 cents	443
146 70-lb. Keystone insulated rail joints, at $6.00	876
10 75-lb. Keystone insulated rail joints, at $6.40	64
4 transformers for substations, 15 kva, at $200	800
2 transformers for substations, 10 kva, at $150	300
3 single-panel switchboards for controlling signal circuits, at $125	375
325 lb. 24-in. tie wire, at 16½ cents per pound	53
400 lb. 14-in. tie wire, at 16½ cents per pound	66
6300 porcelain insulators (2300-volt line), at 7 cents	441
11,100 porcelain insulators (110-volt line), at 4 cents	444
600 "J" pins at 25 cents	150
Changing feeder cross-arms to obtain clearance for 2200-volt a.c. signal wires:	
2840 three-pin, 3½-in. x 4½-in. x 5-ft. fir arms (replacing present 4-ft. arms), at 34 cents	965
8520 1½-in. x 9-in. locust pins, at 2 cents	170
5680 ¼-in. x 1¼-in. x 18-in. galvanized iron braces, at $50 per thousand	284
Miscellaneous bolts and lags	100
Labor substituting new arms, 71 miles, at $10	710
Labor stringing 410 miles wire at $10	4,100
Labor installing switchboards and transformers at substations	225
Changing poles and guys for clearance	350
Telephone interference	750
Transportation of men and materials	950
Bonding and installing insulated joints	600
Increasing track centers at sidings	750
Engineering and contingencies	4,500
Total	$106,490

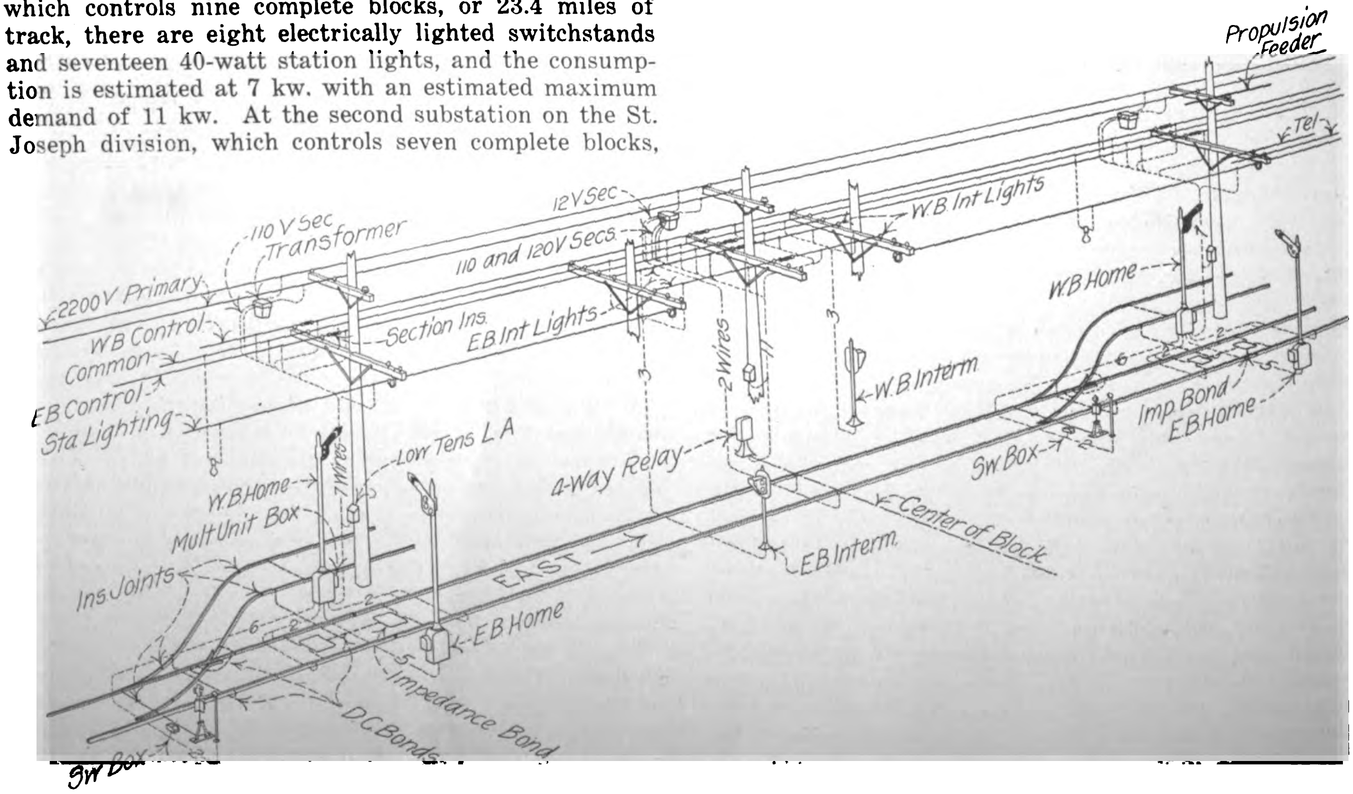
built by the signal company with materials furnished and delivered by the railway company. The railway company furnished transportation for the distribution of all materials and apparatus and did all else including the supplying of poles, wires and line fixtures. All the line-construction labor and the furnishing and erection of all substation transformers, switchboards, and lighting fixtures were also furnished by the railway company. The contract for the equipment was entered into on Feb. 14, 1914, and the signals were placed in operation on the Excelsior Springs division on July 11, 1914, and on the St. Joseph division during the latter part of September, 1914.

The estimated power consumption taken at the switchboard in each substation on the 2200-volt side, is as follows: The Excelsior Springs division, which comprises nine complete blocks, or 24.5 miles of protected track, has nine electrically lighted switchstands and forty-six 40-watt station lights. It will consume under normal conditions 8.1 kw. When all signals are clearing, that is all motors are operating, the maximum demand is estimated at 12.2 kw.

At the first substation on the St. Joseph division, which controls nine complete blocks, or 23.4 miles of track, there are eight electrically lighted switchstands and seventeen 40-watt station lights, and the consumption is estimated at 7 kw. with an estimated maximum demand of 11 kw. At the second substation on the St. Joseph division, which controls seven complete blocks, covering 23.2 miles, there are seven electrically lighted switchstands and twenty-six 40-watt station lights, the estimated power consumed is 6.1 kw normally, or an estimated maximum of 9.7 kw with all signals clearing.

A summary covering the installation of signals and shelter station lighting is as follows:

Total miles of track protected	71.1
Number of blocks operated	25
Number of semaphore signals	50
Number of intermediate light signals	50
Number of switchstands lighted	24
Number of shelter stations lighted (one light each)	51
Estimated cost of lighting	$3,900
Total cost of signal system, including switch lighting, but exclusive of station lighting	$106,490
Cost per mile of track protected	$1,500
Cost per block complete	$4,250


Propulsion Feeder
Tel
12V Sec
110 V Sec
Transformer
110 and 120V Secs
W.B Int Lights
2200V Primary
WB Control
Common
EB Control
Sta Lighting
Section Ins
EB Int Lights
3
2 Wires
3
W.B Interm
WB Home
Low Tens L A
7 Wires
4-Way Relay
W.B.Home
Mult Unit Box
Ins Joints
EAST
6
2
EB Home
EB Interm
Center of Block
Sw Box
Imp Bond
EB Home
5
Impedance Band
D.C.Bonds
Sw Box

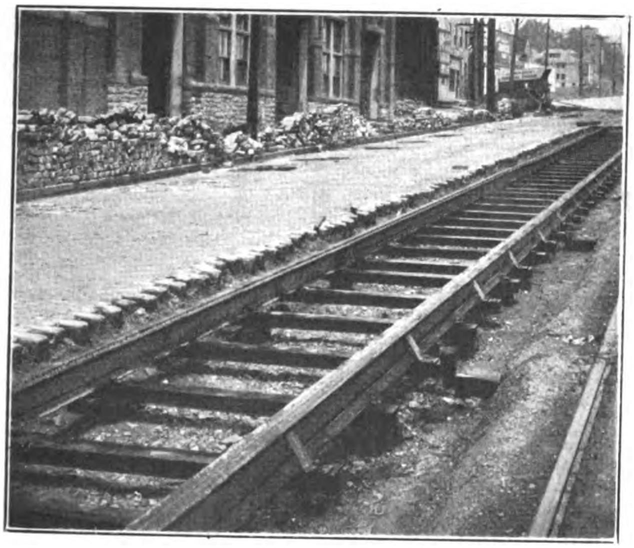
K. C., C. C. & ST. J. SIGNAL—TYPICAL CIRCUIT PLAN

Electric Welding in Track Repairs

The Author Outlines His Experience with Electrically Welded Frogs and Rail Joints, Giving Details of the Time Required and Current Consumed in Completing Different Pieces of Work with a Portable Electric Welding Outfit

BY F. J. VENNING, SUPERINTENDENT OF CONSTRUCTION CINCINNATI TRACTION COMPANY

In July, 1913, the track and roadway department of the Cincinnati Traction Company received its first portable welder from the Indianapolis Switch & Frog Company. A demonstrator was sent to Cincinnati to instruct our man in operating the outfit. We immediately began the building up of manganese centers in frogs, switches and mates with very good success at first, although our men, as their experience increased, became more proficient in the use of the welder and greatly improved the quality of their work. In a very short time we could see the value of the apparatus and secured a second welder in October, 1913. At this time we set about with the new machine to fill up some open joints in a 2-mile piece of double track laid with relay rails in 1910. Every open joint was closed, thus making a continuous rail for the entire distance. In all the joints thus filled, we have had but one failure and that was due to improper plugging before the joint was welded or filled. After this work was done the welders were kept at work continuously and with increased success on worn-out special work and manganese centers in frogs and crossings.

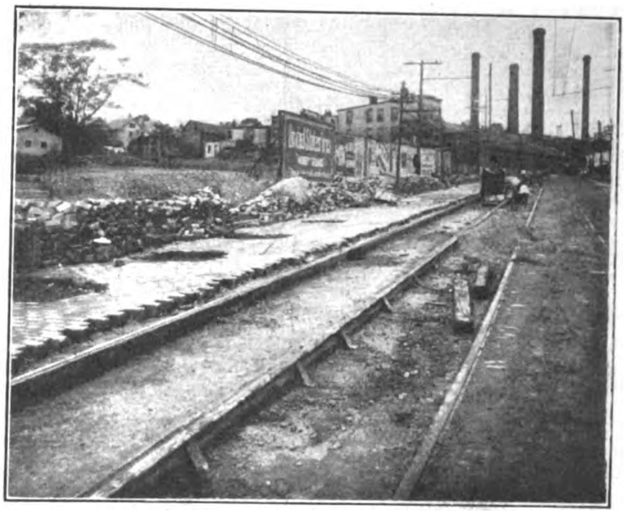


ELECTRIC WELDING IN CINCINNATI—ELECTRICALLY-WELDED RAIL BRACES AND TIE PLATES ON OAK TIES

During the winter I became personally interested in the welder and followed the work carefully. One of our first important jobs included the building up of twenty broken expansion joints on a viaduct. These were originally made by cutting the rail-ends vertically for about 10-in., and lapping the ends. They were badly battered in some cases and one-half of the head was broken off in others. The repair work included building up all joints to their normal section and replacing the missing sections. This work is to-day in as good condition as it was when completed.

On another job we built up and reclaimed two double-track, double crossovers that were in such a dilapidated condition that renewals would have been necessary if the repairs had been unsuccessful. In some instances as much as 10 in. of the head of the rail at the joint was entirely gone. The method used in this instance was to weld two strips of iron on top of the joint plate and then to build a new head on the rail.

Little or no difficulty has been experienced in obtaining successful results where the welding was done on ordinary open hearth or Bessemer steel rails, but on the manganese inserts and in solid manganese layouts the process is somewhat different. After careful study and a number of tests, it has been found that the maximum success is obtained in repairing work of this type when the amount of metal added at one time is small and the whole quenched at frequent intervals. This keeps the temperature of the manganese insert or manganese casting below the critical point, thus insuring that no change takes place in wearing qualities after the new material has been added.



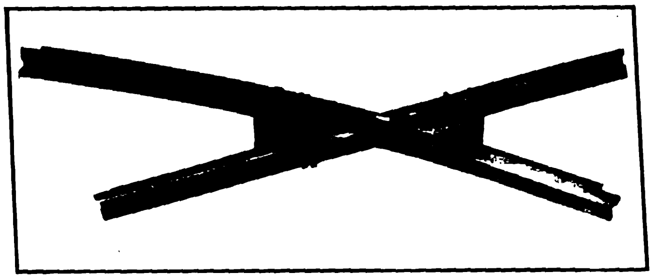
ELECTRIC WELDING IN CINCINNATI—ELECTRICALLY-WELDED TRACK READY FOR CONCRETING

ELECTRICALLY-WELDED FROGS

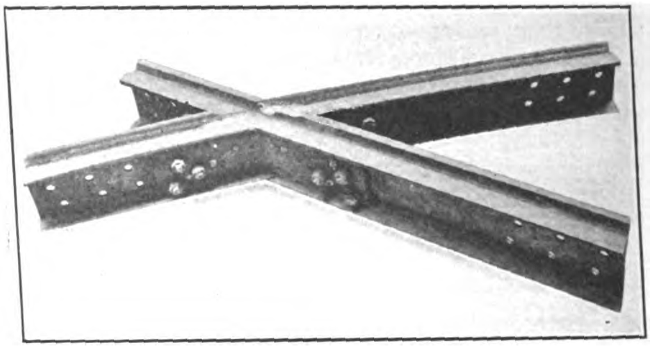
As a rule the Cincinnati Traction Company renews defective insert special work or solid manganese pieces in a large layout with built-up work made of open-hearth standard rail sections. These pieces generally last about as long as the rest of the layout, making it possible to renew the whole at one time. Prior to December, 1913, we had all frogs made at a local shop, the company furnishing the rail and templets from which any piece was to be made. During December, 1913, we concluded that we could make this class of frog cheaper and in much less time, and at the same time could manufacture a better article by using the electric welder, and we found that shop-made frogs which formerly cost us from $45 to $65 could be manufactured for from $16 to $23. Moreover, the shop-made frogs were merely bolted together, whereas our frogs were bolted and welded, making a frog that could not possibly be shaken nor hammered apart, all parts acting as a unit.

Wherever these frogs have to perform heavy duty we burn away the intersecting parts of the head of the rail with the carbon electrodes and build up the parts so removed with hard steel. By this method we supply a harder metal at the excessive wear points and the result has been very satisfactory. Between December, 1913, and May 1, 1914, we built and installed twenty-four electrically-welded frogs, and none have given any evidence of failure in any of the welds. However, if any of these electrically-welded frogs should develop defects, or should begin to show indications of wear or cupping at the intersecting flangeways, we expect to restore the points by welding on hard steel.

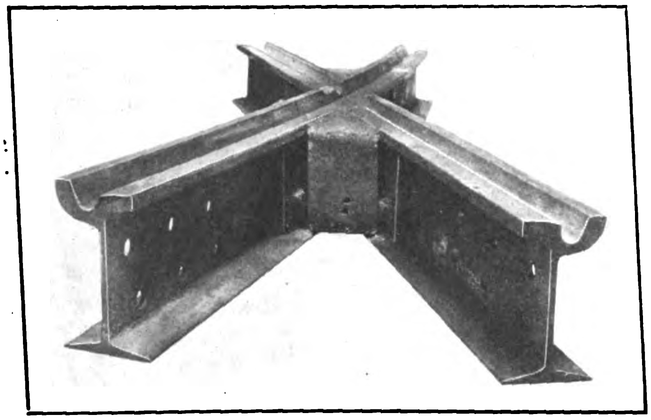
It might be stated that the frogs shown in the illustrations were made practically by two men who did the sawing and fitting, and by a blacksmith bending the plates. All the sawing was done by hand, the only machine work required being that of drilling the few bolt holes. Since this was experimental work no special time was set for the welding, but it was done on rainy days and during extremely cold weather when it was impossible to work men outside.



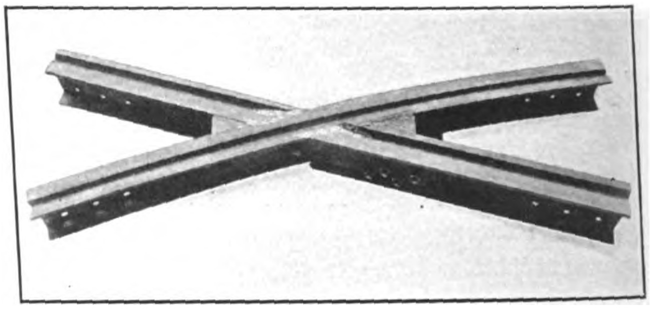
ELECTRIC WELDING IN CINCINNATI—JUMP CROSSING WITH THROUGH RAIL ON CURVE



ELECTRIC WELDING IN CINCINNATI—VIEW OF THROUGH FROG



ELECTRIC WELDING IN CINCINNATI—VIEW OF FROG SHOWING PAVING CHUCK



ELECTRIC WELDING IN CINCINNATI—JUMP CROSSING WITH BUILT-UP FLANGEWAYS

In order to determine accurately the exact cost of frogs built in this manner the Cincinnati Traction Company arranged for an energy-consumption test to be made by the electrical engineering department of the University of Cincinnati. The instruments used were a Westinghouse graphic-recording ammeter, a portable Weston ammeter and a wattmeter. In the test for welding together a frog there was 308 lineal inches of welding. The average current required was 170 amp and the total energy consumption to complete the entire welding process was 161.7 kw-hr. The time consumed in welding the frog was three hours and four minutes, and all of the welding was done with the panels of the welder in parallel. In an experimental run made for a few minutes with only one panel in the circuit, the current consumption was 90 amp. With this, however, the arc was not of sufficient density for heavy welding, but could be used for light welding on thin metal. Other overhead charges added to the total cost of making one of these frogs include that of preparing the drawings and making the templet.

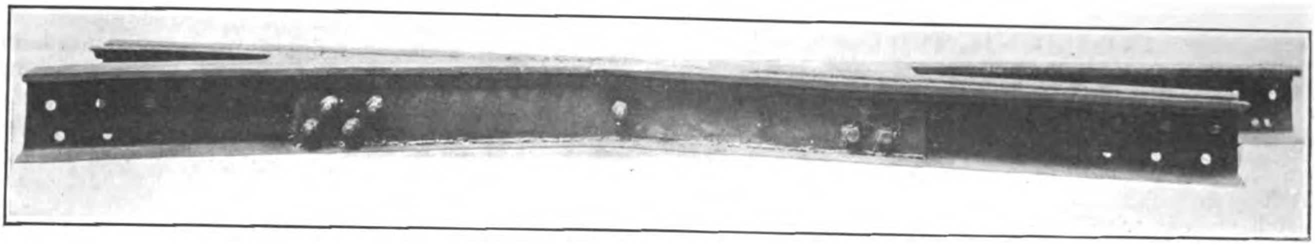
ELECTRICALLY-WELDED JOINTS

The standard rail-joint used by the Cincinnati Traction Company for some time past was of the cast-weld type, and prior to the adoption of the 140-lb. girder-grooved rail section as our standard, we had extremely good results with the cast-welded joint. Out of 10,000 joints installed between 1907 and July, 1913, our percentage of failures was 1.76. However, since the adoption of the 140-lb. rail section, failures of cast welds have greatly increased, and in view of this fact we are of the opinion that the limit of the cast-welded joint is exceeded when it is used on this rail section.

In cases where a cast-welded joint fails we knock off the cast weld and apply a standard channel plate by electrically welding it. This plate is welded to the rail after it has been drawn securely into position by inserting two of the four bolts. If an open joint has developed, due to expansion and contraction, we electrically weld the opening, filling in with hard steel, thus making the rail continuous. Since the electrically-welded plates have been introduced on this property the rail has been made in continuous lengths up to 1000 ft., one piece approximating 1 mile in length.

By the application of the electrically-welded channel-bar and the closed joints, we have not only eliminated joints but also copper bonds. Should a rail break due to contraction after it has been welded in this manner the same method would be used in making the joint at the broken point. It makes little difference whether the opening is 1 in. or 6 in. at the point of the break, because a piece may be inserted and the three sections solidly welded to the plate, thus making the rail continuous, as before.

At the time when the energy consumption was de-



ELECTRIC WELDING IN CINCINNATI—FROG OF 9-IN. TRILBY RAIL—NOTE WELDED PLATE

termined for the electrically-welded frog, a similar test was run on the electrically-welded joint. This joint is made up of standard plates, 32 in. long, designed for the Lorain steel section 140-402. In addition to these plates one-half of a plate taken from a 109-lb. rail section is welded to the base of the rail. In order that the results of this test might be comparable with working conditions on the street, the test weld was made in a section of skeleton track. During the period of the test the ammeters registered at beginning, with resistance of welder cold, 190 to 195 amp. This continued for about ten minutes until the resistance heated, at which time the current settled to a point between 165 and 170 amp, the average consumption for the entire joint being 169.3 amp, with readings taken every minute. The time consumed in welding the joint complete was one hour and ten minutes, thus making the actual energy consumption 79.2 kw-hr. per joint.

WELDED TRACK CONSTRUCTION

Recently we have developed what we consider an ideal track construction in which electric welding largely enters. This may be constructed with either wood or steel ties, but where wood ties are employed tie plates 3/8 in. x 6 in. x 12 in. in size are used on every fourth tie. These tie plates take the form of the combination rail brace and tie plate described in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, on page 1467. Experience has shown that if the plate and brace are purchased separately and the two welded together on the job, considerable saving is made over purchasing the combination plate and brace from the manufacturer. At about 100-ft. intervals, or as often as required, the tie plate is made continuous from rail to rail to take the place of an ordinary cross bond. The same method of cross bonding, if desired, could be used in the devil-strip, thus providing a perfect bond from one track to the other. When steel ties are used the rail braces are welded direct to the tie, and at intervals the tie itself is welded to the base of the rail for cross-bonding purposes. In order to test thoroughly this type of construction, a piece of track 3200 ft. long was constructed of 140-lb. rail laid on steel ties except at curves. At these points the rail was laid on oak ties with 3/8-in. x 6-in. x 12-in. tie plates to which the rail braces were electrically welded. Continuous joints were used on the angle bars, and straight plates or channel plates on the tangent track. Continuous joint plates were welded at the upper surfaces and at the ends of the plates. As shown in one of the illustrations, in preparing plates for welding bolts are inserted in the two upper holes, clamps are applied to the bottom of the plates near the ends and the plates are then pressed in place. The top of the plate is welded and the bottom is spot-welded, after which the clamps are removed and the welding completed.

ELECTRIC WELDING IN CINCINNATI—OPERATORS AT WORK

ELECTRIC WELDING IN CINCINNATI—JOINT AFTER TEST

This new piece of track offered the first opportunity to obtain the exact average cost of welding joints. One pair of 32-in. plates with a 16-in. base plate was applied, at an average cost of $3.98. This included the cost of the plates, all labor, material and electric current sufficient to make a finished joint. This cost is for the channel plate construction. The average cost of welding a continuous joint was only 64½ cents, which, of course, does not include the cost of bolting the joint in place. It merely covers the cost of the laborer's time, welding steel, and the current used. The average cost of welding rail braces to the steel ties or to the tie plate was 6 cents, including labor and material used, but excluding the plates and braces. While we had but one fair day's run on this new welded track construction, one welder operator made ten complete straight plate joints and the other operator twenty continuous joints. With good conditions, it is believed one operator can easily weld from eighteen to twenty rail braces an hour.

At the recent convention of the Roadmasters' and Maintenance of Way Association of America the following officers were elected: President, P. J. McAndrews, of the Northwestern; first vice-president, Coleman King, of the Long Island; second vice-president, M. Burke, of the Chicago, Milwaukee & St. Paul; secretary and treasurer, L. C. Ryan, Northwestern. W. H. Kohmehl, Chicago, Milwaukee & St. Paul, and A. Grills, Grand Trunk, were elected to the executive committee. The next convention will be held in Chicago, beginning Tuesday, Sept. 14, 1915.

COMMUNICATIONS

The Truss Rod Fallacy

L. B. STILLWELL, CONSULTING ENGINEERS
NEW YORK, Oct. 5, 1914.

To the Editors:

I have read with interest the editorial in your publication of Oct. 3 in regard to truss rods on steel cars. While it is conceivable that the application of truss rods to certain steel cars may be found necessary on account of possible errors in the original calculations of the proper strength of the structural members of the specific car in question, their application to new cars, as part of the design, will be recognized as futile, if a little study be given to the subject.

In the diagrammatic illustration of a car shown herewith the load is assumed to be carried by the girder formed by the belt rail, the side sheathing, the side sills, and such portion of the posts as acts to stiffen the side sheathing. For the purpose of ready reference, the main members under consideration are shown in heavy lines.

If the portion of the car between bolsters is considered alone, the belt rail will be found to be under a compression strain and the side sill under a tension strain. When cars are built of wood it is customary to use a truss rod under the side sill, as it is difficult to incorporate the required continuous heavy compression member at the belt rail. In this wooden structure, with a truss rod, the heavy continuous side sill becomes the compression member and the truss rod becomes the tension member. With steel construction, however, it is obviously practical to incorporate a continuous member at the belt rail of such ample section that the stress imposed will be within the maximum desired fiber stress.

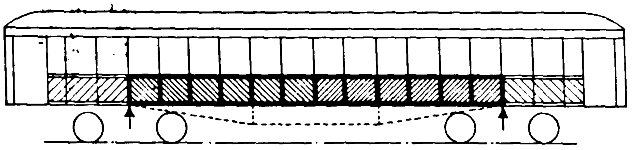


DIAGRAM SHOWING EFFECTIVE MEMBERS IN SIDE-GIRDER CONSTRUCTION

If a truss rod is applied under such a steel girder, both the sill and the truss rod can be in tension if the strain on the truss rod is carefully adjusted. It is obviously possible, however, to draw up the truss rod to such an extent as to reverse the stresses in the sill and the belt rail, producing then compression on the sill and tension at the belt rail.

Returning to the diagram of the car and considering the effects of the weight of the portion of the car body in advance of the trucks, it is observed that the stresses produced in the belt rail and in the side sill at the bolster are the reverse of those first above considered as occurring in the same members between the bolsters. In designing a car frame, the actual effect of this overhanging load must always be considered. In certain designs of cars for city service, having considerable overhang, the side sills may be altogether in compression, and in such cases the use of truss rods must be detrimental. In any case, the practical difficulty of tuning up a truss rod under a steel girder to the point necessary to cause the rod to carry only a definite proportion of the tension, is clearly apparent. Furthermore, the weight of material required for an adequate truss rod will be of greater structural value if incorporated in the proper girder members.

In conclusion, the application of a truss rod to the side girder of a steel car duplicates tension members. For this reason it will eventually create the same impression in the mind of an observer as would the application of a pair of shafts and a whip socket to an automobile.

F. M. BRINCKERHOFF.

BOSTON, MASS., Oct. 5, 1914.

To the Editors:

The "truss rod fallacy" pointed out in your last issue constitutes an interesting paradox. Frankly, it seemed to me hardly possible that the addition of metal to a structure could produce the astonishing result of weakening it instead of providing some little strength, especially when the addition consisted of such a well-known and widely used device as the truss rod. With that idea I developed a concrete case for an example, and judging by the result I have to admit that the truss rod should be relegated to a strategic position in the rear like that now occupied by the New York Giants. Under the circumstances it may be that the details of my example will interest your readers.

Assume an interurban car 60 ft. long and with truck centers of, say, 36 ft., giving an overhang of 12 ft. at each end. The framing between trucks would then have points of zero moment about 27 ft. apart. Assume the weight of body, with passenger load, to be 60,000 lb. and that the section between points of zero moment weighs, say, 27,000 lb., and also that 7000 lb. of equipment is distributed on the body framing between trucks, making the total load to produce moment equal 34,000 lb. Assume further that the side-girder type of construction is used and that the girder between sill and belt rail is 3 ft. high.

Then the load on the section of each side girder between points of zero moment (which constitutes a beam 27 ft. long) is half of the total, or 17,000 lb. Assuming that the neutral axis is midway between the upper and lower members of the girder, the moment in the center of each beam is, according to the well-known formula $\frac{Wl}{8}$, and each of the forces (tension and compression) in the sill and belt rail is (neglecting the web) approximately $\frac{Wl}{8h}$ where W equals the uniformly distributed load, l, the length, and h the height of beam. Substituting actual values, $F = \frac{Wl}{8h} = \frac{17{,}000 \times 27}{8 \times 3} = 19{,}000$ lb.

This is the amount of the compressive force in the upper member and also the amount of the tensile force in the lower member of the girder, and, if a truss rod is of any use, its installation ought to effect a decrease in both these tensile and compressive forces. Certainly it will not increase either one. Nor must it reverse the stresses to the extent that the original compressive stress is replaced by a tensile stress of greater amount or the original tensile stress is replaced by a compressive stress of greater amount. Obviously stress is stress, whether of compression or tension, because structural engineers use the same maximum figures for both, except that the safe compressive stress is reduced in the case of long columns.

Assume, then, that a truss rod is applied to the car in question without any change in the loading in any way. This truss rod assists the girder by introducing upward forces at the queen posts. To produce these forces, however, it must be set up so as to be strongly in tension, and this tension must have a reaction that appears as an equal compressive force in girder, or in other words, the pull from the truss rod tends to compress the beam longitudinally.

Owing to the presence of turnbuckles the ability of a car repairer with more beef than brains to set up the truss is limited only by the strength of the rod. Assume that the rod is 1¼ in. in diameter. Then the area is 1.227 sq. in., and if the elastic limit is 33,000 lb. per square inch the force which it can readily exert is 40,000 lb.

Now let us see what this force can do to the girder when the reaction appears in it as compression. If it is believed that the total force is divided about equally between the upper and lower members of the girder, each member will take 20,000 lb. of compression. Then, assuming that the moment remains unchanged, the original tension of 19,000 lb. in the lower member will be overcome and replaced by a compression of only 1000 lb. In the upper member, however, the original compression of 19,000 lb. will have added to it 20,000 lb., due to the reaction from the pull of the truss rod, so that the maximum stress becomes 39,000 lb., compression, instead of 19,000 before the truss rod was applied.

Now, for the sake of argument, assume that the moment at the center is reduced, by the action of the queen posts, exactly to zero. Then there will be a stress of 20,000 lb. compression, top and bottom, or 1000 lb. more than existed in each member before the truss rod was applied. Again, assume the moment fully reversed. Then the stress in the top member will be only 1000 lb. compression, but in the lower member the stress will go to 39,000 lb. compression. Therefore, in every case the presence of the truss rod, without a change in the load, has actually increased the maximum stress and thus weakened the beam.

In fact, it is impossible to conceive a set of circumstances (that are in accordance with the laws of nature and trigonometry) under which the stress will not be increased. Try a few other hypothetical cases. I did.

AMATEUR.

Insert Special Work Failures

TRANSIT DEVELOPMENT COMPANY

Brooklyn, N. Y., Oct. 2, 1914.

To the Editors:

I have noted with much interest the articles on the subject of insert special work failures in your issues of Sept. 19 and 26, and believe that the articles have served a good purpose in calling attention to the matter.

While I feel that the subject involves too much detail to discuss within the limits of a letter, there are a few points upon which comment may not be out of place. It appears that there are really three parties interested in the question, two of whom have been referred to, viz., the manufacturer and the engineer, the third being the purchasing agent. The first two cannot work together to the best advantage if the latter does not co-operate also. The reason for the failure of the purchasing department to co-operate at all times may possibly be due to the quite general lack of anything like standard specifications, which allows considerable latitude in bidding, with the result that the price often has a marked influence on the type of work ultimately purchased, disregarding, to a considerable extent, the type of construction the engineer has in mind for particular locations.

While it is doubtful whether it would be well to attempt to standardize every feature, there is little doubt but that the general dimensions of most castings and inserts, together with the character of the several metals in them, could be standardized with much benefit to all concerned, and it is therefore thought that the assignment of the subject of special work design and manufacture, for consideration by the committee on way matters of the American Electric Railway Engineering Association, would be productive of good results in this direction.

R. C. CRAM,
Assistant Engineer Way and Structure.

Tests of Automatic Train Speed Control

A public demonstration of the Horne & Crane train-control and train-stop device was held on Sept. 30 at the Cranford Junction yards of the Central Railroad of New Jersey. The tests were witnessed by a large number of engineers representing various railroad companies, signal manufacturers and the Interstate Commerce Commission. These tests were practised on a steam locomotive and were the first public application of this method of automatic train speed control by means of non-magnetic rail sections. Owing to the short stretch of track available the manganese track sections were spaced unusually near together in order to allow the locomotive a permissive speed of only 13 m.p.h. The tests, which proved successful in each case, were conducted to fulfil the three following situations: 1. Block approached occupied. Locomotive exceeded 13 m.p.h.; speed control and brakes were automatically applied. 2. Succeeding block still occupied. Locomotive reduced speed within 13 m.p.h. limit and no automatic brake application occurred. 3. Succeeding block clear. Locomotive passed speed control at fast and slow speeds without causing brake application to occur.

The object of this train-control and train-stop device is to provide a system of speed control which permits an oncoming train to approach the rear of a preceding train provided the speed of the train approaching is properly decreased as the distance separating the trains decreases. By means of the measured spacing of special sections in the running rail the speed of a train approaching an occupied block is automatically timed, and if its speed exceeds any predetermined limit at any point intervening between the distant signal and the home signal the train brakes are automatically applied under either service or emergency pressure until the train is stopped or until its speed is reduced to a certain predetermined rate of travel as may be desired by the railroad company.

The special sections inserted in the running rail are composed of ordinary manganese rolled-steel rail which is absolutely non-magnetic. Electromagnets are installed on the track in conjunction with the manganese control sections. The locomotive apparatus consists of a magnet suspended over the running rail which serves normally to maintain in closed circuit a valve connecting a timing cylinder with a source of compressed air supply. The piston of the timing cylinder times the movement of a contact disc controlling a brake pipe cut-out valve, which operation determines the speed of the train travel between manganese control sections when the block approached is occupied.

The bureau of mines of the Department of the Interior, has issued Bulletin 38 entitled "The Origin of Coal" by David White and Reinhardt Thiessen. The bulletin forms a report on an extensive investigation designed to show from microscopic examinations of coal, how far and in what ways the grouping of coal by types depends on differences in the kinds of plant material from which it was formed and on the conditions of its accumulation. The bulletin contains a chapter by Charles A. Davis on the formation of peat.

ASSOCIATION NEWS

MEETING OF WASHINGTON RAILWAY & ELECTRIC COMPANY SECTION

The first meeting of the Washington Railway & Electric Company section for the season was held on Sept. 28. The commercial department of the Potomac Electric Power Company met with the section. The principal feature was a paper by George C. Whitney, of the accounting department Washington Railway & Electric Company, entitled "The Accounting Department and Its Relations to the Other Departments." The paper provoked a lively discussion, after which informal addresses were made by Dr. Earle Wilsley and Dr. Abram Simon, ministers of local churches. In addition to felicitating the section upon the fine spirit manifested, the ministers gave summaries of recent experiences in Europe. Following the addresses, refreshments were served. E. S. Marlow, manager commercial department Potomac Electric Power Company, presided over the meeting, the minutes of which were forwarded to the ELECTRIC RAILWAY JOURNAL by B. F. Hunter, secretary of the section.

The purpose of Mr. Whitney's paper was to show how the work of the accounting department co-operates with other departments, and that its function is not to pile up a mass of unintelligible figures and reports to be filed away as records for possible future reference by the board of directors or the officers of the road. He showed by definite statements how the department can assist in improving the efficiency of the operation of the system. For example, the claim department can be furnished with facts and figures showing the causes of accidents and the facts bearing upon them, such as kinds of accidents, styles of cars, styles of brakes, service of trainmen, age of trainmen, mileage of cars, together with the cost of different kinds of accidents. Such data should enable the departments concerned to reduce accidents along certain lines. There is a close relation to the construction and maintenance departments also. The employees are apt not to associate the track gangs and their foremen with the accounting department which, however, plays an important part in figuring the cost of work and material and insuring their proper distribution. Many a dollar is lost through loitering on a job, ordering of surplus material and improper distribution of work. Similarly, the accounting department can call attention to economy in the ordering of supplies by the purchasing and stores departments.

In the work of the transportation department, the accounting department can assist by calling attention to statistics regarding accidents, and to the manner in which power is used by motormen. Through this department, the complaints of the power and substation operators to the effect that machinery is being overloaded, and that fuel cost is mounting up, can be brought to the attention of motormen. By giving figures of energy consumption per mile, or per car, on any given line and other data of this kind, the accounting department can help in reducing these costs. Again in the matter of making schedules, information can be furnished as to earnings, wages, hours, miles per line, which with the expression of these items in unit form, per car-mile, per car-hour, per passenger, per ton-mile, per seat-mile, etc., can indicate how schedules can be modified to produce greater economy. In the maintenance of buildings and equipment, the accounting department furnishes carhouse expense statements, comparative statements of operation and maintenance of substations and power plants, etc. These examples all go to show the importance of the accounting department in maintaining efficient operation of a property.

In the discussion of Mr. Whitney's paper, W. S. Ballenger, of the transportation department, stated that the instruction department drills the motormen carefully in regard to economical use of current, and the men have had careful instruction in regard to the coasting recording clocks. Special attention is called to the coasting averages by division notices. The transportation department also solicits suggestions tending to increase efficiency. The data sheets furnished by the accounting department are appreciated and are consulted when the question of increasing or reducing service is under consideration.

J. C. McLaughlin, of the commercial department, emphasized the importance of the accounting department's duty in furnishing accident data. He made a practical suggestion to the effect that a report bureau be established which would receive reports from all employees who notice defects on the property, these to be furnished on postal cards to be supplied by the bureau. George F. Mangan, of the commercial department, made the point that system is not enough in itself to produce results, and that the question in the use of any system is what use is made of the results. F. J. Mersheimer, of the claim department, urged that the accountants furnish simple statistics that can be understood and applied. L. L. Johnston, of the maintenance department, said that many of the foremen do not understand the importance of the data which they are called upon to furnish. If they did they would make a better showing for their work. A man who can do good work but cannot report properly upon it cannot expect to receive proper credit. V. A. Sisler, of the same department, mentioned some of the statements which are found especially useful, principally carhouse expense, operating expense, car accounts, job statements and manufacturing accounts. He stated that the accounting department is of great assistance to the mechanical department. W. F. Dement and C. P. King, president Washington Railway & Electric Company, also spoke.

DENVER TRAMWAY COMPANY SECTION

The September meeting of Company Section No. 3 was held in Denver on Sept. 17, 1914, with President W. M. Casey, trainmaster Denver City Tramway, in the chair. The attendance was 200. The paper of the evening was by A. F. VicRoy, superintendent Union Pacific Railroad, on the topic "Safety First on the Union Pacific Railroad." John A. Beeler, president Denver City Tramway, W. H. McAloney, superintendent of rolling stock of the same company, and others contributed to the discussion.

SECTION MEDAL COMPETITION

The committee on the section medal to be awarded by the American Association for the best paper read during the year before a company section will report on Wednesday afternoon, Oct. 14. The committee is considering the following papers: (Milwaukee section) "Purposes of a Street Railway Traffic Survey," by E. J. Archambault; "Pavements in Street Railway Track Zones," by V. W. Dentz; "Overhead Charges in Valuation," by H. G. Abendroth, and "Some Improvements in Car Design," by C. H. Cross. (Public Service section) "Maintaining the Way," by P. F. Maguire; "Training the Trainmen," by Charles H. Coe; "Some Elements Entering into Time-Table Development," by Alexander Jackson; "Inspecting the Rolling Stock," by John Hauf, and "Keeping the Company Department Store," by Robert S. Inglehart.

ENTERTAINMENT COMMITTEE ANNOUNCEMENT

Mme. Gertrude Auld, prima donna soprano of Milan, the soloist engaged for the officers' reception Monday night, though an American by birth is better known in Europe than in her own country. The foreign papers speak with enthusiasm of the quality of her voice and her great interpretative power. She made a most extraordinary success in Budapest and in Italy, where the Italians thought her singing was a return to the old school of Der Canto. Last winter she succeeded in calling forth enthusiasm of audiences in New York City with a recital on modern song.

PROPOSED INCREASE IN DUES

In the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 3 an editorial commented on the proposed increase in company dues. The proposed and present schedules are as follows:

	Gross Receipts			Annual Dues	Present Dues
Under	$50,000			$25	$15
Between	50,000	and	$100,000	50	25
"	100,000	"	250,000	75	50
"	250,000	"	500,000	125	75
"	500,000	"	1,000,000	175	100
"	1,000,000	"	2,000,000	225	150
"	2,000,000	"	3,000,000	275	200
"	3,000,000	"	4,000,000	325	250
"	4,000,000	"	5,000,000	375	300
"	5,000,000	"	6,000,000	425	350
"	6,000,000	"	7,000,000	475	400
"	7,000,000	"	8,000,000	525	450
"	8,000,000	"	9,000,000	575	500
"	9,000,000	"	10,000,000	650	550
	10,000,000	"	over	750	600

South American Trip

After a two weeks' visit to New York manufacturers, H. N. Douthitt, special agent of the Department of Commerce, has returned to Washington for a short time before leaving for Rio de Janeiro, Brazil. This South American trip by Mr. Douthitt is taken at the personal suggestion of Secretary of Commerce Redfield, who thinks that a government representative will be able to obtain much information of value to American machinery manufacturers. Mr. Douthitt's investigations will be confined entirely to a study of the market in South America for general outside machinery and engineering supplies, including electrical machinery and apparatus. He will look into the matter of equipment for machine shops, but will not make any investigation of markets for textile machinery.

In talking with a representative of the ELECTRIC RAILWAY JOURNAL Mr. Douthitt said that he had lived for some time in Brazil, where he was interested in hydraulic engineering projects. As the result of this experience he concludes that American manufacturers should seek in South America a market based on the high quality of the goods produced. The quality is the best feature of American products, and this is thoroughly appreciated by South American buyers who have traded with our manufacturers. Mr. Douthitt spoke of two Westinghouse generators installed at Bellohorizonte, state of Minas Geras, Brazil, which had been cited all over the country as examples of the superiority of American machinery. They had been in operation about fifteen years, had worn out two sets of blades on the turbines, and when last heard of were as satisfactory as at the beginning. If all companies would do as certain of the large electric manufacturers have done and try, Mr. Douthitt said, to market products on the basis of high quality, they would secure satisfactory results.

While in South America Mr. Douthitt will call on the American consul in each city, with whom he will advise, and also make a personal canvass among the users of heavy machinery. He will obtain as thorough a description as possible of the machinery now in use, together with information concerning the source of manufacture, the cost and the present needs. Mr. Douthitt, with his knowledge of Portuguese, will discuss frankly the financial conditions in the various countries in order to find out whether buyers are in a position to pay cash, or, if not, what terms of credit they expect and what the countries can offer to American manufacturers in exchange for goods. The question now is not how much this country can sell to South American buyers but rather how much South American buyers will want to buy while financial conditions remain as they are.

Unless American manufacturers are prepared to have their representatives remain for a year in South America without showing a profit on sales, Mr. Douthitt does not advise the sending of representatives. If manufacturers desire to enter the South American market on this basis, however, they should secure their own representatives rather than try to do business through English and German commission houses, which already have extended connections with manufacturers in their own countries.

Electrical Openings in South America

Manufacturers of electrical machinery in New York, New Jersey and Pennsylvania have a remarkable field for development in South America, according to P. H. Burnett, industrial commissioner of the Lehigh Valley Railroad, in a bulletin recently sent out for the benefit of manufacturers along the line of the railroad. The latest census figures show that of the $221,000,000 of electrical machinery manufactured in the United States each year, $49,000,000 is produced in New York, $31,000,000 in Pennsylvania and $28,000,000 in New Jersey. The world is recognizing the value of American electrical machinery, for $27,000,000 of electrical goods were exported from the United States in the fiscal year 1913 as compared to $20,000,000 in 1912.

Mr. Burnett believes that South America affords an opportunity greatly to increase American export trade in electrical machinery, on account of three conditions, the absence of coal, the presence of plentiful supplies of water-power and the need of power to operate railways, mines and industrial plants. That the opportunity is being seized is evidenced by the fact that Brazil's importation of electrical manufactures amounted in 1912 to nearly $6,000,000 and Argentina's importation to about $4,500,000. Chile, which has special facilities for obtaining water-power, imported in the same year $2,500,000 of electrical machinery and apparatus, while the imports of other South American countries brought the total to nearly $20,000,000. Of the $4,500,000 of this class of manufactures imported into Argentina only about $130,000 was from the United States, but of Brazil's $6,000,000 of electrical imports about $2,500,000 was from the United States.

Mr. Burnett speaks particularly of the excellent opportunities in the state of Bahia, Brazil. The market there for waterwheels and turbines, electrical motors, cables, etc., is sure to be steady and growing. On the Pacific Coast the opening for the use of electrical machinery is very great. In Chile it may be expected that hydroelectric machinery will be in constant demand in view of the mountainous nature of the whole country and the numerous rivers. American machine makers will find strong competition but will probably have few better openings for future trade. A report from Venezuela emphasizes the fact that further industrial development will mean a demand for turbines and other hydroelectric machinery, and it would be well for electrical manufacturers to study the needs of this country.

Equipment and Its Maintenance

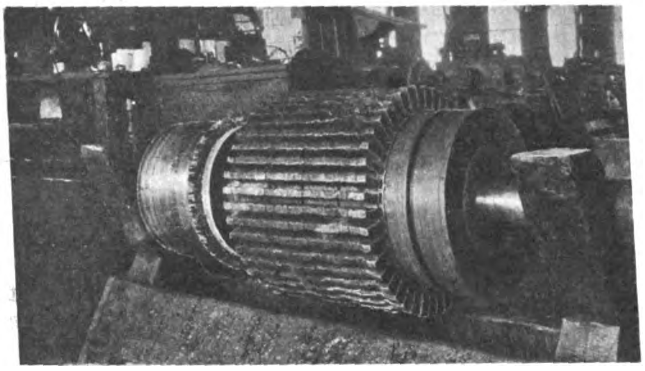
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Welded End Laminations of Armatures

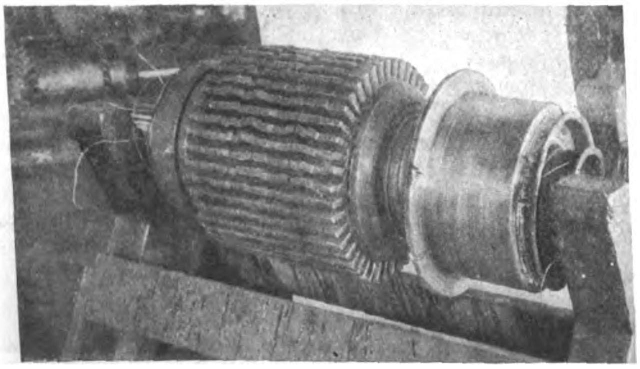
BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAYS

In many of the earlier types of railway motors the laminations of the armature cores were supported and protected by the use of malleable-iron finger plates at each end of the core. These plates prevented any tendency of the core teeth to spread in the direction of the axis of the core. Later types of motors, however, are not provided with finger plates, but the support required at each end of the core is secured by making a few of the laminations of a heavier gage sheet metal than the remainder of the core.



VIEW SHOWING SEVERE TEST OF END LAMINATIONS WITHOUT CRUSHING

Our experience has demonstrated that this method of reinforcement offers a support far inferior to the old finger plates. Until a few months ago the core with flared or spread teeth was a constant annoyance. In some cases the core was made an inch longer because of this spreading effect. In this condition, perfect winding was impracticable since much pressure was necessary to force the coils into the slots, and this pressure often damaged the insulation so badly that some of the coils soon burned out.



VIEW OF ARMATURE SCARRED FOR ITS ENTIRE CIRCUMFERENCE

To prevent this trouble, a suggestion was made that the flaring teeth be pressed back in place and welded together. In this manner the end laminations would form practically a solid piece and furnish the same supporting effect as a finger plate. As an experiment, one core was welded in this manner, and the result was so successful that all spread cores are now being so treated. The process is quite simple, requiring merely that the core be set on end, in which position the laminations are welded, one tooth at a time, with an oxy-acetylene flame fed from our installation of this welding system. The welded section should have a thickness of from ½ in. to ⅝ in.

The accompanying illustrations give some idea of the remarkable strength of these welded ends. One of these cores was damaged by some object which had been carried into the air gap, with the result that a groove about ⅛ in. deep and ½ in. wide was torn around the entire circumference of the core. It will be seen that although the teeth were distorted the welded ends still remain as true and parallel as the day they were welded. The other illustration shows an armature core in which the end laminations have been subjected to a severe test without crushing. The actual cost of the welding is very small when compared to the cost of tearing down and reassembling a core, being about $7 for a core of forty-five slots. This figure includes some experimental work, and could, no doubt, be greatly reduced.

Vineville Avenue Concrete Paving, Macon, Ga.—The Cost

BY CARL H. FULLER, FORMERLY ENGINEER MAINTENANCE OF WAY MACON (GA.) BAILWAY & LIGHT COMPANY

The following is a detailed statement of the labor and material required to build 4290 ft. of track under the conditions described in my article of Oct. 3:

Labor		
Tearing up 4290 ft. of track at 3 cents per ft.		$128.70
Laying and surfacing:		
Fine grading, per foot	$0.02	
Placing ties	0.01	
Spiking and bolting	0.025	
Tamping	0.065	
Final surfacing	0.03	
Total, 4290 ft. at	0.15	$643.50
Policing and lighting		44.51
Hauling 1266 ties from stockyard, loading and unloading from service cars, 2-mile haul, at 4 cents each		51.43
Hauling rail from the stockyard, 76 tons at $0.345, or 160 bars at 10 cents each		26.21
Hauling away old material, miscellaneous hauling, cleaning up and labor not otherwise accounted for, 4290 ft. at 4 cents per ft.		51.56
Installing 266 bonds at 15.4 cents		40.97
Drilling and placing 400 ft. of guard rail, at 5½ cents per ft.		21.95
Total labor on 4290 ft. of track, at 23½ cents per ft.		$1,008.83
Material		
1266 No. 1 loblolly yellow pine ship pine ties, at 60 cents each		$759.60
260 bars 60-lb. A. S. C. E. rail, at $9.72 each ($33.25 per ton, or 59 cents per ft. of track)		2,527.30
400 ft. of guard rail at 53 1/3 cents per foot		213.33
Two pairs compromise joints at $6.70 each		13.40
260 pair 60-lb. angle bars at 58 cents per pair		150.80
266 9-in. concealed No. 0000 stranded bonds at 43 cents each		114.38
1100 nutlocks at 78 cents per 100		8.58
Eighteen kegs 7/16-in. x 5½-in. railroad spikes at $4.87 per keg		87.75
Six kegs track bolts at $4.90 per keg		30.91
Depreciation on tools		20.14
Lanterns and oil		10.64
Total material for 4290 ft. track at 91.7 cents per foot		$3936 83
Total labor and material, 4290 ft. at $1.15 1/3 per foot		4945.66

All rail was 33 ft. long and laid "broken joint" or "joint and center." Ties were placed two under each joint making a suspension joint, with four between, practically 3 ft. centers and requiring 1560 ties for the job. Of these ties, 294 found in the old track were considered sound enough to use again. As we have repeatedly uncovered ties incased in concrete from twelve to sixteen years and found them in fairly good condition we used no wood preserver, believing that because of the rigid monolithic construction of the pavement, which thoroughly incases the ties and rail in the cement, the ties would last as long as the paving itself. As the life of the paving could not exceed the average useful life of railway track, say twenty years, we did not consider it economy at this time to increase the initial cost of the work to obtain a result which would not be warranted by the life of the paving and the rail.

It will be noted in the tabulated costs that labor for laying and surfacing amounting to 15 cents per ft. is further subdivided into the various operations, but these subdivisions can only be considered relatively approximate as the transition from one operation to another is almost imperceptible. The rough grading and hauling away of excavated material by the city convict gangs, a service for which no charge is made against the job by the city, resulted in a saving to the traction company of 1324 yd. of original excavation which would have cost in the neighborhood of 15 cents per ft. of track.

The cost of installing 266 9-in. concealed, stranded No. 0000 bonds with compressed terminals under splice plates, the holes being drilled with a Duntley electric track drill and terminals compressed with a screw press (see article in July 25 issue of this journal) including replacement of two plates and four bolts tight ready for paving averaged 15.4 cents each for the job. On one day with everything in their favor the two men who operated this outfit placed thirty bonds in ten hours at a cost of $2.75, or 9 cents per bond.

The track laying gang averaged fourteen men and foreman. This work was done in forty-nine working days although the paving operations covered 103 days, including Sundays and delays. Track men received $2, $1.50, $1.35 and $1.25 a day of ten hours. No engineering or overhead is charged against the job.

The city paving gang did the actual paving. After one side of the street had been fine-graded for quite a distance, the 12 cu. ft. batch mixer was placed to control from 150 ft. to 200 ft. of paving and the material required was hauled in behind it. All sand was screened to remove foreign matter. Ordinarily, eight men were required to supply the mixer with material, two men to operate the mixer and six men to handle the concrete from mixer to grade, while three men tamped and raked it to grade, smoothing it first with long-handled spades and finishing with a long-handled wood float. There were usually about twenty-six men in the gang, the surplus being disposed as required. All were paid at the rate of $1.25 a day of ten hours.

The total actual area paved amounted to 11,957.8 sq. yd., having a cross section as shown in the sketch in the first article, being 8 in. on the sides and 11 in. thick from the bottom of the tie to the top of the rail in the track. In order to reduce our cost data to surface yard measurement we will change the extra 3 in. in the track to surface yards, which gives us a total of 15,306 sq. yd. The material for this cost appears at the bottom of the preceding column.

3775 bbl. of cement at $1.68, f.o.b. Macon or 0.42 bbl. per yd.	$0.42
Hauling from car to job at 8 cents per barrel in cloth sacks, sub-contract	0.02
1500 yd. of sand delivered on the job at 70 cents	0.07
3500 tons crushed granite, f.o.b. Macon, or 0.23 tons per surface yard, at $1.83 per ton	0.42
Hauling ⅝ mile from car to job at 40 cents	0.09
Material for 7500 ft. of expansion joint	0.02
Miscellaneous material, lumber, gasoline for mixer, etc.	0.01
Giving a total of $16,028.77, or per square yard of	$1.05

Reducing the foregoing figures to cubic yard costs we have 3400 yd. of concrete at $4.71 for material.

The labor to handle, mix and place this material cost in detail per surface yard as follows:

Superintendence (no engineering)	$0.026
Screening sand	0.006
Expansion joints	0.002
Fine grading	0.25
Loading and charging mixer	0.017
Operating mixer	0.009
Placing concrete	0.025
Finishing and surfacing	0.013
Miscellaneous labor, moving mixer, etc.	0.023
Making a total of $2259.65 or per sq. yd	$0.346

Reducing the foregoing figures to a cu. yd. basis we have 66 1/3 cents for labor. These figures give us a total cost of $5.37 per cu. yd. of concrete or $1.396 per surface yard in place.

The cost of this work was divided among the property holders, city and railway company as follows:

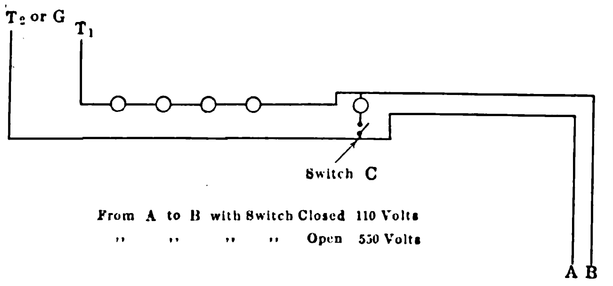
Macon Railway & Light Company, all inside of tracks and 1 ft. on the outside, or 4081.3 sq. yd., at $1.396	$5,694.49
Macon Railway & Light Company, 28 per cent. excess concrete in above	1,595.30
City one-third of remainder, or 2625.5 yd	3,665.21
Property holders two-thirds of remainder, or 5251 yd	7,330.42
Or, 11,957.8 sq. yd. of paving	$18,288.42
TOTAL COST FOR MACON RAILWAY & LIGHT COMPANY	
4081.3 yd. paving	$7,292.79
Labor and material for 4290 ft. of track	4,945.66
Total, 4290 ft. of track at $2.85 per lin. ft.	$12,238.45

The city engineer, Col. J. J. Gilliard, prepared the specifications for the paving while his office performed all engineering work required, and during construction the work was subject to his constant personal supervision. Dr. W. G. Lee, chairman of the aldermanic street committee, through his influence and energy made the job possible and also gave the work considerable detail attention. The writer as engineer of way for the railway gave personal supervision to the latter's part of the work and also kept detailed cost records for the job as a whole.

Standard Five-Light Series Cluster for D.C. Test Voltages

BY R. H. PARSONS, ELECTRICAL FOREMAN

A very convenient means for voltage tests is afforded by using a five-light cluster of the type found in most shops and carhouses where 550 volts d.c. is the standard.



WIRING FOR TEST WITH FIVE-LIGHT SERIES CLUSTER

The accompanying sketch shows how either 110 or 550 volts can be obtained by the use of such a cluster. Glancing at the sketch it will be seen that when the switch *C* is open there is no circuit for current, but that the difference of potential of 550 volts between *B* and *A* is available. Should this voltage break down the insulation under test, the circuit thereby created will cause the lighting of the lamps, allowing to pass through the break only as much current as would pass through the five lamps, namely, a little less than ½ amp. At the same time the voltage across *B* and *A* would be reduced to zero.

When switch *C* is closed a complete circuit is formed through the five lamps lighting all at the same time and giving a drop of 110 volts across *A* and *B;* or, to be more exact, the difference of potential would be approximately 100 volts, depending on the line voltage and the resistance of the lamps.

When using the test wires *A* and *B* with the switch closed the five lamps are lighted, and we have 110 volts for testing. Then in case of a breakdown of the insulation, or of placing the ends of these wires across a closed circuit, the lamp nearest the switch *C* will go out. Thus we would get through *AB* that current which would pass through four lamps in series, or a little more than ½ amp. A single-blade snap switch is used.

This plan is convenient for testing circuits at the bench, as on controller work, testing coils and commutators, etc. By using long leads it is also made available for pit work. To adapt a regular cluster for these purposes, remove one of the lamps and replace it with a plug and twin wire cord. Then run the cord to a suitable place over the bench or on the wall where the switch, another lamp, and the test leads can be installed. A convenient method would be to extend a bracket from the ceiling or wall adjacent to the bench and install the switch lamp and leads directly over the bench at a place easily reached by the workman.

Eliminating Crossed Grounding Currents in a Motor-Generator Set

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

The following incident, which occurred during the equipment of a substation at Chambly Basin, Que., for the Montreal & Southern Counties Railway, may be of special interest to those who are connected with such installations. This station was designed to run in parallel with another substation at Ste. Lambert, about 12 miles distant. Energy is received at 25,000 volts three phase, sixty cycles, and transformed through one set of three 185-kva single-phase oil-insulated, self-cooled transformers, with 2300-volt delta-connected secondaries. At the latter voltage energy is delivered to a 600-hp polyphase slip-ring induction motor with stationary primary and revolving secondary, while the d.c. end of the set is a 400-kw commutating-pole, compound wound 600-volt generator.

When everything had been completed to the point of cutting in the current and starting up the machine, a ground wire was connected to the motor-generator frame as a precaution against possible danger, particularly when starting the machine for the first time. As soon as the oil switch was operated to cut the current in the motor a strong flash was visible between the grids in one of the three groups of starting resistance mounted over the starting panel. The oil switch was opened immediately thereafter, but the appearance of the resistance grids failed to indicate that anything was wrong. The manufacturer's representative then asked us to remove the ground wire from the motor-generator frame. The current was then cut in again, and the motor-generator ran all right.

Following a satisfactory test run the motor-generator was placed in regular service, but after operating for two weeks the bearings started to run hot. On starting up the machine one dark morning a long spark was seen to follow the oil rings in the bearings, and when the end cups were removed from the bearing ends a spark was visible around the armature shaft in the bearing ends. The machine was then shut down and the bearings taken apart. It was found that the shaft had been badly roughened while big holes had been burned in the bearing babbitt. A careful investigation disclosed that a ground in one of the resistance grids, namely, at *X* in the accompanying diagram, was responsible for the burns in the shaft and bearing.

The trouble arose as follows: On starting up the machine a certain amount of current would flow to ground from the motor armature, which was star-wound with grounded neutral, and, since the resistance also was grounded, currents of different character and phase were set up in opposite directions. The discharge between these two currents was through the oil film in the bearings. Not only did this arc break down the oil film, but it also burned the bearing and armature shaft enough to cause hot bearings.

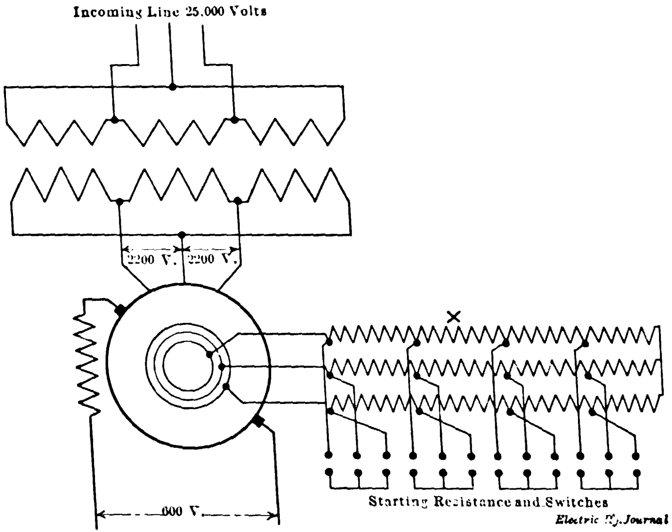


DIAGRAM OF MOTOR-GENERATOR SET, SHOWING LOCATION OF GROUNDING POINT IN STARTING RESISTANCE

To correct the trouble the bearings were scraped, the shaft was polished with carborundum, the oil was replaced with fresh liquid, the ground was removed from the resistance and the motor-generator frame was earthed with a good grounding wire. Finally, we placed in the rotor a grounding brush in a medium-sized brush-holder. This holder was so mounted on the motor-generator frame that the carbon brush could make a sliding contact with the rotating armature shaft. Since these changes were made the motor-generator has run without any arcing or hot bearings.

British Ideas on Cab Signals

The British Board of Trade report upon accidents on railways in the United Kingdom during 1913 draws special attention to the use of electricity in preference to gas in railway carriages, and also to the necessity of adopting means to safeguard against mistakes by signalmen and locomotive engineers. Regarding the latter, a memorandum was prepared towards the end of last year by the inspecting officers and submitted to the various railway companies urging them to extend the use of electric track circuits in connection with the control of signals, and to carry out combined experiments with different systems of cab signaling and automatic control with the object of supplementing the present system of semaphore signaling.

A Complete Progress Profile Used by an Iowa Interurban

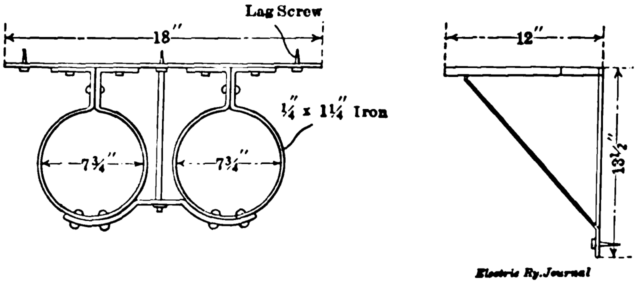
The Waterloo, Cedar Falls & Northern Railway, Waterloo, Iowa, is just completing a 60-mile extension to its lines between Waterloo and Cedar Rapids. In connection with this construction work a complete progress profile was desirable to give the management a diagrammatic record of the work done each week. To meet this requirement a complete form of progress profile has been devised by T. E. Rust, chief engineer of this road.

This profile is shown in the accompanying illustration, and is standard correspondence paper size. In it the entire road is covered by a series of sheets, each including about 6 miles of line. It will be observed that besides containing the usual profile and grade line with a color key for each month's grading, space is provided for actual pay quantities per week, per month and the total. In addition to the concrete openings there are included timber bridges, track laying, ballast overhead lines and an alignment map. Each of these designations is colored by the different resident engineers, in accordance with the progress made on the division in their charge and sent to the chief engineer's office regularly each week.

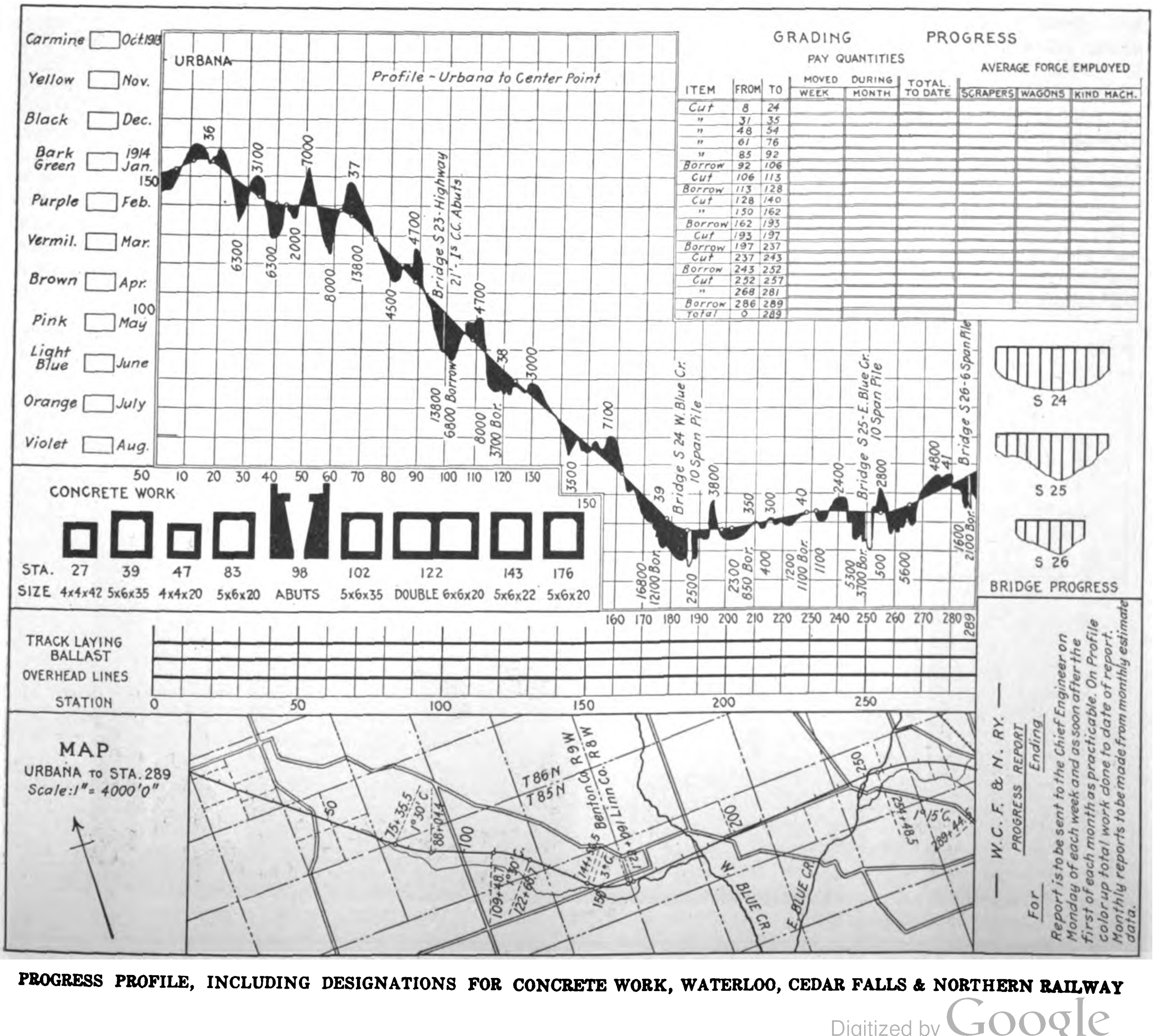
The record sheet is about 9 3-4 in. wide by 8¼ in. high, with a 1-in. margin at the left for convenience in binding.

An Effective Fire-Bucket Rack at East St. Louis

An inexpensive and convenient fire-bucket rack has been designed and built by the mechanical department of the East St. Louis & Suburban Railway. It has been standard practice for this company to provide wooden shelves for this purpose throughout its shops and carhouses. In many instances the location of these shelves was such as to form a convenient shopmen's catch-all. In order to make it impossible to utilize these racks for storage shelves, the strap-iron racks shown in the accompanying illustrations were made for two 14-qt. buckets, at a cost of approximately 76 cents each. They are made of forged strap iron riveted together.


Lag Screw
18″
¼″ x 1¼″ Iron
7¾″
7¾″
12″
13½″
Electric Ry. Journal

EAST ST. LOUIS FIRE-BUCKET RACK


Carmine ☐ Oct. 1913
Yellow ☐ Nov.
Black ☐ Dec.
Bark Green ☐ 1914 Jan.
Purple ☐ Feb.
Vermil. ☐ Mar.
Brown ☐ Apr.
Pink ☐ May
Light Blue ☐ June
Orange ☐ July
Violet ☐ Aug.
150
100
50
URBANA
Profile - Urbana to Center Point
36
3100
7000
37
6300
6300
2000
8000
13800
4500
4700
Bridge S 23-Highway 21'-1s C.C. Abuts
13800 6800 Borrow
4700
38
8000 3700 Bor.
3000
3500
7100
39
Bridge S 24 W. Blue Cr. 10 Span Pile
16800 12100 Bor.
2500
3800
2300 850 Bor.
350
400
300
1200 1100 Bor.
40
1100
2400
5300 3700 Bor.
Bridge S 25-E. Blue Cr. 10 Span Pile
2800
500
5600
4800
41
1600 2100 Bor.
Bridge S 26-6 Span Pile
10 20 30 40 50 60 70 80 90 100 110 120 130
160 170 180 190 200 210 220 230 240 250 260 270 280 289
CONCRETE WORK
S 24
S 25
S 26
BRIDGE PROGRESS
TRACK LAYING
BALLAST
OVERHEAD LINES
STATION 0 50 100 150 200 250
MAP
URBANA TO STA. 289
Scale: 1″ = 4000′0″
T86N T85N
R9W R8W
Benton Co. Linn Co.
50
75+35.5
1° 30′ C.
88+04.4
100
109+48.7
1° 30′ C.
122+68.7
144+38.5
3° C.
150
160+72
200
W. BLUE CR.
E. BLUE CR.
250
254+48.5
1° 15′ C.
289+44.5
— W. C. F. & N. RY. —
PROGRESS REPORT
For
Ending

GRADING PROGRESS

ITEM	FROM	TO	PAY QUANTITIES MOVED DURING WEEK	PAY QUANTITIES MOVED DURING MONTH	TOTAL TO DATE	AVERAGE FORCE EMPLOYED SCRAPERS	AVERAGE FORCE EMPLOYED WAGONS	AVERAGE FORCE EMPLOYED KIND MACH.
Cut	8	24						
"	31	35						
"	48	54						
"	61	76						
"	85	92						
Borrow	92	106						
Cut	106	113						
Borrow	113	128						
Cut	128	140						
"	150	162						
Borrow	162	193						
Cut	193	197						
Borrow	197	237						
Cut	237	243						
Borrow	243	252						
Cut	252	257						
"	268	281						
Borrow	286	289						
Total	0	289						

STA.	27	39	47	83	98	102	122	143	176
SIZE	4x4x42	5x6x35	4x4x20	5x6x20	ABUTS	5x6x35	DOUBLE 6x6x20	5x6x22	5x6x20

Report is to be sent to the Chief Engineer on Monday of each week and as soon after the first of each month as practicable. On Profile color up total work done to date of report. Monthly reports to be made from monthly estimate data.

PROGRESS PROFILE, INCLUDING DESIGNATIONS FOR CONCRETE WORK, WATERLOO, CEDAR FALLS & NORTHERN RAILWAY

Welding Plant of Omaha Street Railway

The car shops of the Omaha & Council Bluffs Street Railway, which care for the maintenance on 420 cars and which have built twenty-five double-truck cars during the present year, are obtaining excellent results from the use of an oxy-acetylene welding plant. This has been operated about a year. T. J. Woods, master mechanic, points out that so many new uses for the welding outfit have been found that it is kept in operation nearly all the time.

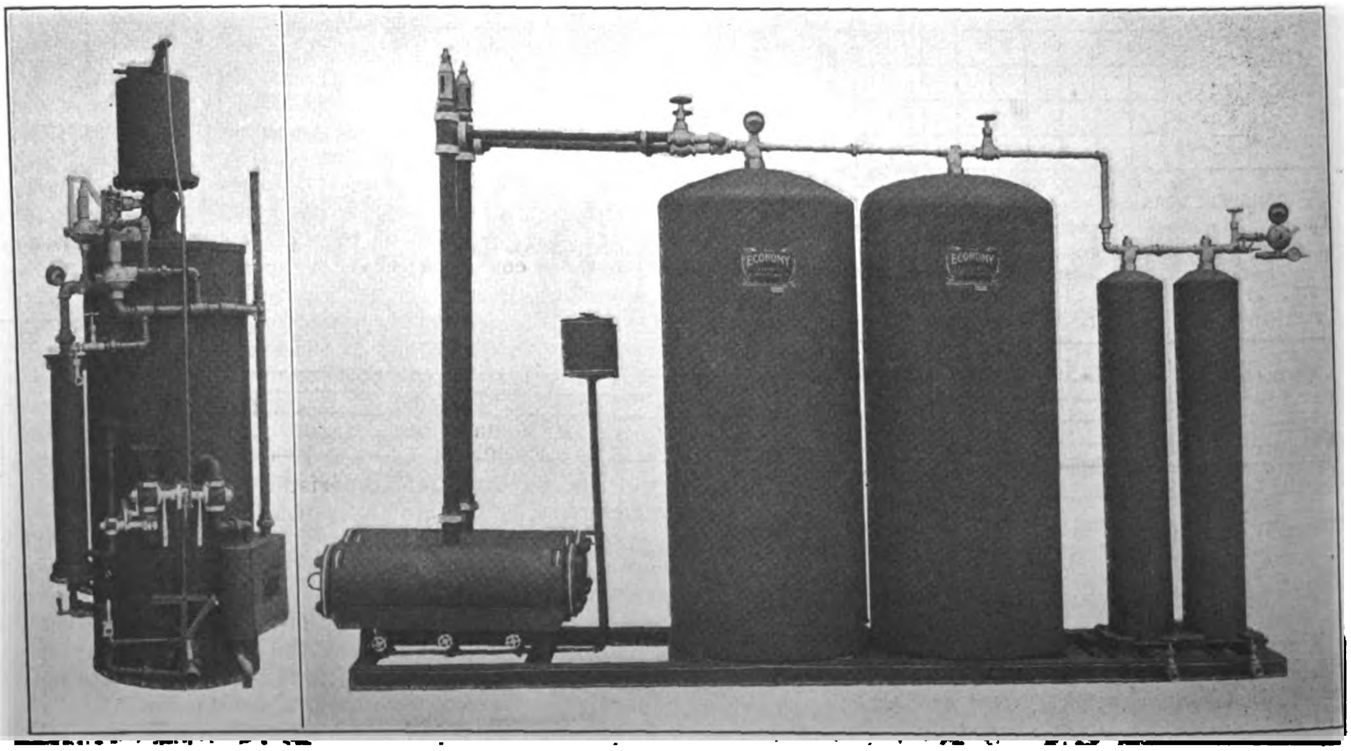
This plant is of the generator type and was manufactured and installed by the Economy Welding Machine Company, Kansas City, Mo. It consists of two oxygen retorts and an automatic acetylene generator, together with scrubbing and storage tanks, regulators, piping and blowpipes. The generating plant is installed in a sheet-steel building 7 ft. x 10 ft. in plan located just outside the erecting shops. The exterior of the building has been sheathed with wood, and electric heaters have been installed to provide against freezing.

From the generating apparatus oxygen and acetylene pipes lead to the wheel shop and to the machine shop, where provision is made for attaching cutting or welding blowpipes. A special welding table is used in the machine shop. This has a brick floor and on it are built brick ovens for use when preheating is necessary to protect against cracks from uneven temperature.

The first welding done was on pieces taken from the scrap heap. Fifty malleable-iron gear cases were reclaimed at small cost. They were patched or the cracks were filled in and the cases were made serviceable by using Tobin bronze as a welding material. This alloy is readily handled in the oxy-acetylene flame and it unites firmly to malleable iron parts. Tobin bronze is put to a great many uses on malleable iron parts where straight welding would be more difficult. For example, it is used to build up wearing surfaces in such malleable iron castings as brake-hanger brackets.

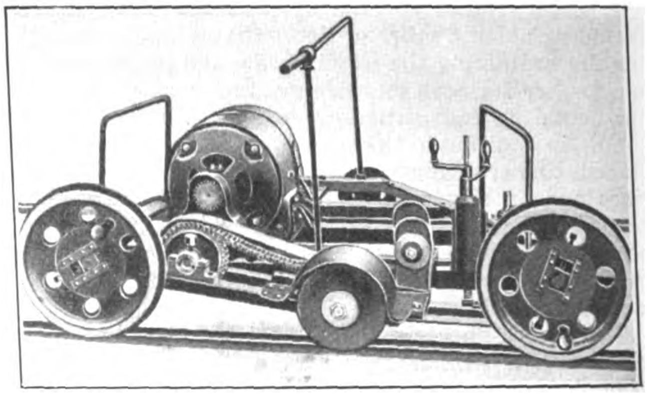
In addition to the kind of work just mentioned this oxy-acetylene blowpipe is used for many construction and repair purposes in this shop, and when fed from portable cylinders has been used for heavy machine repairs at the power station.

The oxy-acetylcne welding is done by a blacksmith who became proficient after short instruction and practice.



ACETYLENE GENERATOR, OXYGEN RETORTS AND ACCESSORIES USED BY OMAHA & COUNCIL BLUFFS RAILWAY

Performances of Portable Rail Grinder



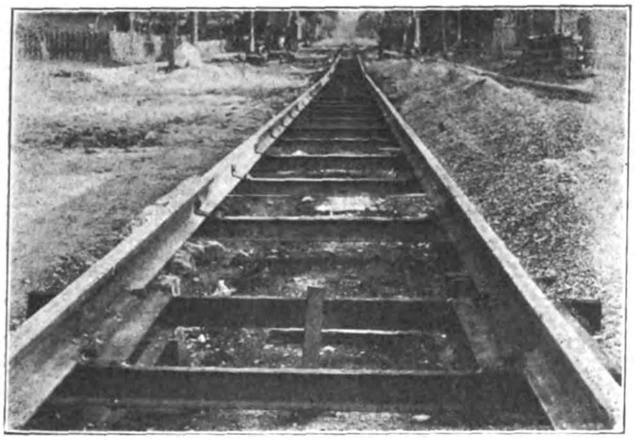
PORTABLE RAIL GRINDER WITH SILENT CHAIN DRIVE

The accompanying halftone shows the standard form of portable electric rail grinder built by E. P. Seymour, Waltham, Mass. Several of these machines are now in use on a prominent electric railway of New England. This grinder can be operated on switches, mates, frogs, curves or tangent track, and, in general, is adjustable to all conditions of grinding. It is driven through a silent chain by means of a 3-hp, 550-volt d. c. motor, geared for 2500 r.p.m. The maker states that with this grinder joint depressions averaging 3/16 in. in depth were removed in twenty minutes by grinding 24 in. on each side of joint. Again in repairing battered joints with an electric arc welder, where forty-eight joints with an average depression of 1/8 in. were built up with the electric welder for 12 in. in length and 1/8 in. above the true surface of rail, the average grinding cost per joint was only 37 cents with this machine, as against 70 cents for two other grinders. One of these machines also ground a manganese centered frog after the battered depression had been built up with the electric arc welder. The surplus steel, which was 12 in. in length and 3/16 in. above the true surface of the rail, was removed in fifteen minutes, leaving the frog practically as good as new. Rail corrugations have also been removed by this grinder at an average cost of 20 cents per lineal foot for corrugations of 1/16 in.

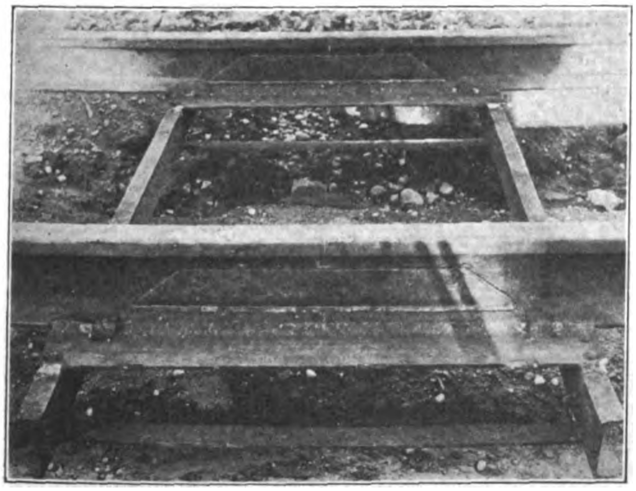
While the weight of this machine is 800 lb., its construction is such that it can be quickly and easily removed from place to place on the rail. The total time required for moving the machine on and off track is about one minute, and it has therefore been found entirely practicable to use it in locations where cars pass every ten minutes.

American Railways All-Steel Track on Concrete

A recent development in permanent track construction is that employed by the American Railways Company. Essentially this construction includes 100-lb. A.R.A. standard T-rail in 60-ft. lengths, mounted on Carnegie steel ties, to which it is fastened by brace slips. The joints are supported on International steel ties. This track structure in turn is supported on a concrete foundation, the concrete being carried continuous from the bottom of a prepared trench to the sand cushion under the granite block pavement. The granite block, however, is used only in the track allowance, that adjoining it being sheet asphaltum.



VIEW OF WELDED JOINT AND STEEL TIE CONSTRUCTION



SIDE VIEW OF WELDED JOINT AND STEEL TIE CONSTRUCTION

In an endeavor to obtain a construction which would give maximum service, it was believed that not only a permanent type of foundation and track should be employed but also that joints should be eliminated as far as possible. To this end this company adopted Indianapolis "Simplex" welded joints, which also serve as bonds while providing greater strength and conductivity than do bonds with mechanical joints. As shown in an accompanying illustration, the base of the rail is also welded to the bearing plate of the International tie, while the joint is welded to the base and web of the rail. This welding was done by the metal electrode process with current from the trolley line. Only one man was required to operate the welder. The energy consumed for welding on the two joint plates, welding the bases of the rails on each side of the tie bearing plate and for welding the tie members cost approximately 40 cents per joint. This cost, including the cost of the joint plate, is, therefore, less than bolted and bonded joints. In other words, a permanent construction was obtained at a low initial cost.

Non-Corrosive Heater Wire

The Consolidated Car-Heating Company announces that it has developed and adopted as standard a non-corrosive heater wire for the resistance coils on all of its electric heaters. The trade name given to this new wire is "Nokoro." The development of this wire marks an important advance in electric heater practice inasmuch as its use will prolong the life of the heater under normal conditions of service almost indefinitely.

When electric car heating came into general use several years ago the so-called alloy resistance wires then available were hardly suited for heater resistance coils because they were of nickel-steel composition, which rendered them particularly susceptible to corrosion, or else of such high resistance that it was necessary to use a wire of such large cross-section that the best construction of coil for effective radiation could not be employed. For many years a special grade of galvanized iron wire was used for the heater coils with very satisfactory results. In fact there are many heater equipments which have been in continuous service for from ten to fifteen years and which are still equipped with the original coils. Tests of some of these equipments have shown that the original characteristics of the coil have in no way altered during this time. The iron coils depended, of course, on the quality of the iron for accuracy of resistance, and on the galvanized coating to prevent corrosion. Under certain conditions where the galvanized coating was scraped or flaked off in the coil winding machines, where the coils were run at too high a temperature or where the climate was exceedingly moist, the iron coils would show tendencies toward corrosion. It is to overcome troubles arising from these conditions that the "Nokoro" wire is to be used.

The development of low-resistance wires, particularly those of the copper-nickel group, has shown wonderful progress in the past few years. In determining the alloy best adapted for use in heater coils extensive tests have been made by the company with heaters for 600-volt and for 1200 and 1800-volt service. The following characteristics were kept in view in determining the best alloy obtainable:

A wire of relatively low resistance, thereby permitting a considerable length of wire to be used, in gages of from Nos. 16 to 20, with which the best conditions for radiation of the heat, ventilation of the supporting spindle and low temperature of the coil can be obtained.

A wire of high melting point so that the coil will not be destroyed in case of accidental overloading.

A uniform resistance and heat coefficient so that the coils will be entirely accurate.

Genuinely non-corrosive qualities.

The new wire is said to combine all of these desirable characteristics, and in addition it is of such a composition that it can be used in coils which are for repairs in series with iron resistance coils in all heaters without affecting the heating capacity for which the equipments were originally planned. It also is a wire which in the spool form is of dead soft temper but which is brought to a marked spring temper in going through the coil forming process. The result is that the coil binds firmly to the porcelain supporting spindle, rendering the coil free from vibration and from sagging. The forming of the coils is accomplished on ingenious coil-winding machines and the predetermined resistance of the coils is accurately measured and the coil automatically cut off by special magnetic relay cut-off machines which the company has developed.

New Trailer Connector

A 75-amp trailer connector as shown in the accompanying illustration has just been placed on the market by the Electric Service Supplies Company. Its design is identical to that of the standard 10-amp type originated by this company about five years ago. The new type has been brought out to meet the demand for a connector with sufficient capacity to supply current for both lights and heaters in the trailer.

TRAIL CONNECTOR

All the safety features of the 10-amp connector are also embodied in the one of greater capacity. When the connectors are not in use the exposed metal parts are automatically disconnected, thus absolutely eliminating possible danger of shock to employees and passengers. The shells are of hard maple thoroughly impregnated with insulating material and waterproofed to avoid the breakage which often occurs when hard rubber compositions are used. The connecting tongues are of heavy brass equipped with phosphor-bronze retaining springs. Sockets for holding the connectors when they are not in service are of either the same material as the shells of the connectors or of cast iron, black enameled. In the cast-iron socket no further insulation is necessary owing to the automatic disconnecting feature of all exposed parts in this type of trailer connector. In general, the development of this fitting is another proof of the increased attention which is now being given toward making trail car equipment modern in every particular.

Germiston (Transvaal), South Africa, has recently inaugurated a railless traction system. The Cedes-Stoll system is used, the special feature being a flexible trolley which is kept automatically taut. The power is delivered from a substation containing two Peebles motor-converters, the a.c. supply being furnished by the Victoria Falls & Transvaal Power Company.

Emergency Valve for Straight Air-Brake Equipments

A new emergency valve, designated type E form J, has recently been developed by the General Electric Company. This valve can be furnished with all new straight air-brake equipments or added to existing equipments. The use of the device not only increases greatly the safety factor of the straight air brake on city cars, but also provides a means for operating safely two-car trains during rush hours.

Brakes can be applied more quickly when the motorman's valve handle is placed in the emergency position, for the emergency valve then operates and admits main reservoir air direct to the brake cylinder without passing through the motorman's valve. An emergency application of the brakes can also be made by the conductor from the rear platform, or from any part of the car or train, by opening the conductor's valve, which vents the emergency line pressure to the atmosphere. An automatic application of the brakes is thus made should a rupture occur in any part of the emergency line. This assures maximum braking power if the pipe connections at the ends of the car are accidently broken. Likewise the brakes are automatically applied in the event of cars pulling apart while operating in trains.

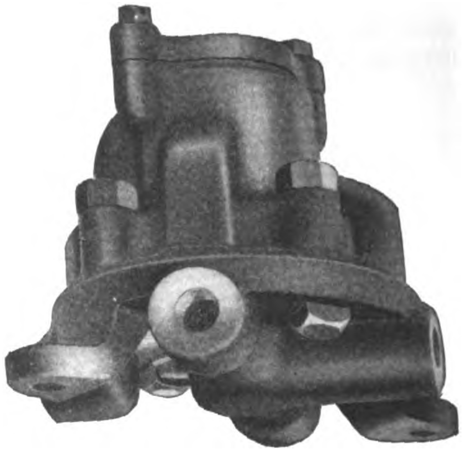


FIG. 1—EMERGENCY VALVE

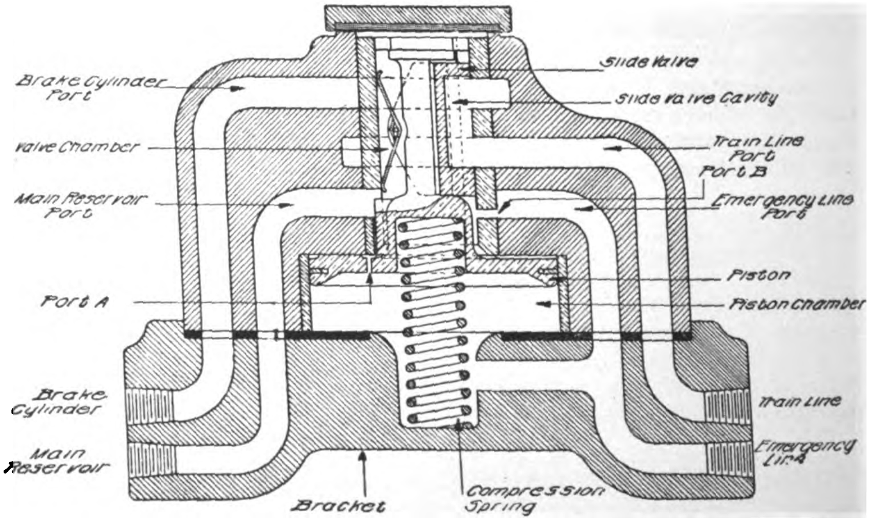


FIG. 2—DIAGRAM OF EMERGENCY VALVE IN NORMAL POSITION

The emergency valve is of the pipeless type and of very simple construction. The working parts consist of a piston, slide valve and compression spring. Pipe connections to the main reservoir, emergency line, train line and brake cylinder enter the bracket or head to which the valve body is bolted.

Figs. 2 and 3 are diagrams, not actual sections, indicating the operation. In the normal position of the emergency valve, Fig. 2, the train line and brake cylinder are connected through the slide valve cavity. The main reservoir and emergency line are connected through the restricted port *B* drilled in the slide valve seat. When a service application of the brakes is made air flows from the main reservoir to the valve chamber through port *B* to the emergency line, thence through the motorman's valve, the train line, slide valve cavity and brake cylinder port to the brake cylinder.

When the brakes are set through an emergency application in any of the several ways described, pressure in the emergency line is suddenly reduced, unbalancing the pressure on the emergency valve piston, which causes it to move, as shown in Fig. 3, to the emergency position. Communication between the train line and brake cylinder is then cut off and established between the main reservoir and brake cylinder.

After an emergency application has been made, the brakes may be released by closing the opening in the emergency line. Main reservoir air will then flow to the emergency line through the restricted port *A* drilled in the piston, charging the latter to the main reservoir pressure and allowing the compression spring to return the piston and slide valve to normal position. Brake cylinder air can then be exhausted by placing the motorman's valve handle in the release position.

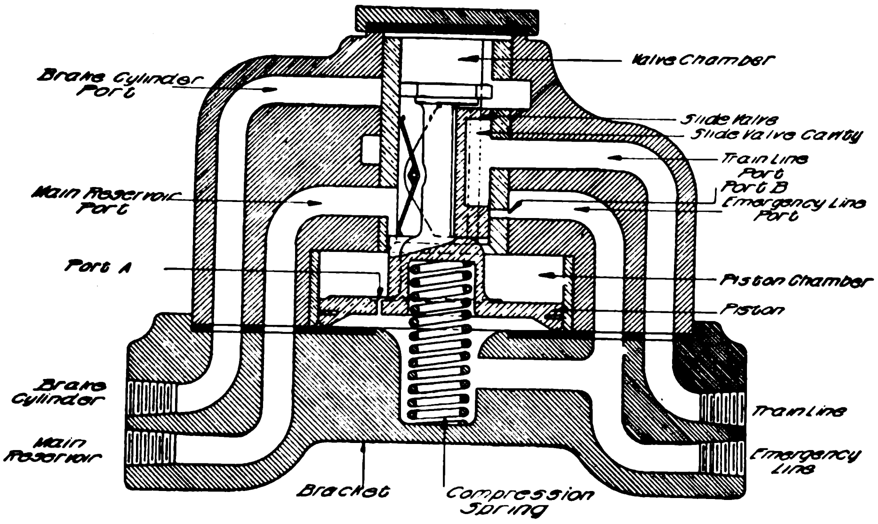


FIG. 3—DIAGRAM OF EMERGENCY VALVE IN EMERGENCY POSITION

Molded Insulation Cover for Connectors

There has been a great demand for a connector with an insulated cover for use without solder for the small sizes of wires. Heretofore this demand has been largely met by the Special No. 1 connector of Dossert & Company, New York, but as this connector was designed to take all sizes of wires and cable from No. 1 to No. 14, the range was believed to be wider than necessary. The manufacturers now announce the production of a molded insulation cover for use on the regular No. 4 connector. This connector will take all sizes of wire from No. 4 to No. 14. Many thousands are in use for transformers, motors, meters, sectionalizing cases for signal apparatus and other connections where it is desired to use a connector without solder, one that may be disconnected when desired but which when in place provides a joint of high conductivity, speed and safety.

By making the insulating cover for the regular No. 4 connector, the fitting is reduced in size and material. There is also a reduction of about 20 per cent in cost to users as compared with the cost of the connector and cover heretofore supplied for small sizes of wire. With these connectors various size bushings are provided, the outside diameters of which fit the connector while the inside diameters correspond to the size of wire that it is desired to connect.

MOLDED INSULATION COVER FOR CONNECTOR

A Full Day's Work for Extra Men

The Portland (Ore.) Railway, Light & Power Company, of which F. W. Hild is general manager and Fred Cooper is superintendent of transportation, has found it practicable to employ nearly all the extra platform men for a full day by assigning them to other work between rush-hour periods. Before the plan was tried out some doubt was felt as to how the proposition would appeal to the men, but it has been found that the extra runs are now not infrequently chosen by regular men. In other words, a day made up of platform service during rush-hour periods and manual labor in between is preferred by some of the regular platform men. The lower wage rate paid for the hours devoted to manual labor seems to be compensated for by the advantages of leaving evenings free. Between rush hours the company is now assigning about fifty-five platform men to regular duties in washing or sweeping cars, doing other light work in the carhouses, or delivering bills for the lighting department. The company now delivers all bills by messenger at a saving of 50 per cent of the mailing cost, besides gaining the advantage of including as much advertising literature with the bill as may be desired.

Steady employment for the extra list is particularly desirable on this company's system, because the traffic in Portland has two daily peak loads, morning and evening, which are usually high and sharp for the amount of traffic carried during the middle of the day. Thus it has formerly been necessary to maintain a large extra list, and some of these men were needed only for very short periods twice a day. Their earnings did not amount to a living wage and they had to find means of supplementing the income from this source or seek other employment. Wages paid platform men vary from 25 cents to 31 cents per hour, according to length of service. Extra men are taken on at the lower rate and are employed with the understanding that whenever not needed on the platform they will be assigned to duties in the depots or distributing bills at the rate of 22½ cents per hour. Thus they regularly put in a full day and have their evenings free.

The Brockton & Plymouth Railway and the Bay State Street Railway recently carried two carloads of live cattle. This is the first shipment of live cattle over these roads.

News of Electric Railways

WORKING OUT KANSAS CITY DETAILS

A Résumé Is Presented of the Steps Being Taken Toward Complying with the New Kansas City Franchise

The many bodies which through court action or by municipal enactment have been made parties to the reorganization of the street railway in Kansas City are working out the many problems that confront the company, the city, the court and the new company. Under the terms of the franchise the Kansas City Railways, the successor company to the Metropolitan Street Railway, can have no ownership or control of the street railway system until the terms of the contract as to mortgages are complied with. These terms prescribe that all the many mortgages shall be liquidated and the property turned over unincumbered except for one new instrument, approved by the city. When the new company finally does take charge, the contract will be as of date of July 7, 1914. This made it expedient, therefore, that the books from July 7, 1914, should be possible of continuance without interruption after the new company was finally given formal ownership. This consideration is one of many which brought about the following apparently rather involved, but in fact very simple, inter-relation between the old and the new companies, the city and the court officers.

The court is the head of the street railway organization in Kansas City. Acting under the orders of the court are Robert J. Dunham and Ford F. Harvey, receivers of the Metropolitan Street Railway, who from the beginning have operated the street railway system through the officers who had previously been in charge of the Metropolitan Street Railway, including John M. Egan, president, and James E. Gibson, general superintendent. When the new franchise was granted by the people of Kansas City there could be no immediate assumption of authority by persons and officials mentioned in the franchise as being the managers and operators of the system under this instrument. All concerned felt it advisable, however, that the persons and officials mentioned in the franchise should at once get in touch with the work that was finally to devolve upon them. The matter of a uniform set of books from the nominal beginning of the contract on July 7 also entered into the consideration. Therefore, when the Kansas City Railways, the recipient of the franchise, held its first election, it named as officers the two men who were operating the Metropolitan Street Railway as receivers and who would continue to operate it as receivers, regardless of the officials nominally at the head of the company. Robert J. Dunham was elected president of the Kansas City Railways, Ford F. Harvey was elected vice-president of the company; E. E. Ball, connected with the office of Frank Hagerman, was elected secretary and treasurer, and Mr. Hagerman and Clyde Taylor, attorneys for the receivers and for the Metropolitan Street Railway, were elected to the board of directors.

The officers of the Kansas City Railways, being the receivers of the Metropolitan Street Railway, naturally would be best able to work out harmoniously the problems of both companies. The most delicate situation that would have confronted separate groups of officers was in respect to the board of control, which the franchise declared should have large authority over the operation of the system after the contract became finally effective. In order that the franchise requirements might be met most expeditiously P. J. Kealy was named a member of the board of control for the company, and R. P. Woods was named for the city, and they were "put to work" at once for the receivers, investigating and solving the problems that would later confront a board of control and informally, but none the less effectively, assisting the receivers in installing the methods and ways which they at a later date will use officially. The board of control has its reason for temporarily acting at this particular stage, through assignment to specific duties under the receivers. The board of control as an agent of the receivers, is going right ahead with the work that the franchise imposes on it, such as arranging car routings, overseeing the character of the equipment, etc., and is also completing its reinventories as the basis of adjusting the differences in the Arnold-Ash estimates, for use in connection with future capital charges.

The rearrangement of the financing of the lines in Kansas City under the title of the Kansas City Railways must be completed by February unless there is reasonable excuse for delay on the part of the company. The many merely technical details of the franchise are gradually being complied with, and the operation of the system is proceeding very much as though the affairs had already been straightened out.

BOYLSTON STREET SUBWAY OPENED AT BOSTON

Tunnel Contains 3 Miles of Single Track and Was Built in About Two Years—Cost $4,500,000

The Boylston Street subway was opened for traffic by the Boston Elevated Railway on Oct. 3. On the preceding day about 300 invited guests made the trip from Kenmore Street to Park Street by special cars, the party including members of the Boston Transit Commission, various state officials, municipal department heads, and officers of the company headed by President Bancroft. The general relation of the subway to the Boston surface line and rapid transit system has already been outlined in these columns. The subway has been built in about two and one-half years by the Boston Transit Commission and its contractors. It is a double-tracked tunnel throughout and contains 15,870 ft. of single track. The total cost, including property taken for construction, was about $4,500,000.

The subway differs from the Tremont Street tube in many particulars, the most important being the operation of a single type of cars on its tracks. Only the company's latest type of semi-convertible steel car with four-motor equipments geared for a maximum speed of approximately 35 m.p.h. is used, and from the junction with the Public Garden incline tracks beneath Charles Street to the westerly end of the subway at the Kenmore Street incline, the movement of all cars is governed by automatic block signals, forty-three blocks of the Union Switch & Signal Company's make being installed. The signals are placed to permit the operation of cars on a minimum headway of thirty seconds. At the stations at Copley Square and at Massachusetts Avenue two berths are provided on each track. The platforms are each 350 ft. long, and as only two cars are permitted to occupy an inbound or outbound track at a station at any one time, ample track space is available to permit quick acceleration and deceleration. It is planned to operate trailers when the growth of traffic necessitates it. The block signals are of the three bull's-eye type, giving a yellow distant indication in addition to the usual proceed and stop lights. On the opening day the normal-hour service was maintained on a two-minute interval in each direction and this was increased to forty-five cars an hour in the rush period. In this connection it should be noted that the Park and Boylston Street stations are in the Tremont Street subway, a short section of which is traversed by Boylston Street subway cars. The service during the rush hour period in the new subway is maintained on schedule time, with little or no reduction in speed. The subway saves about seven minutes in normal hours to through passengers and from ten to twelve minutes in rush hours.

In addition to the service changes previously mentioned in relation to the new subway, the company has scheduled all Harvard Square-Viaduct cars formerly running through the Tremont Street subway to Pleasant Street to a new terminus at Copley Square, where a loop has been provided. This arrangement contributes to frequent service over the surface to and from the downtown district. The Newton Highlands line of the Middlesex & Boston Street Railway will hereafter terminate at Lake Street, there connecting with inbound cars, and the Auburndale-Park Street service has been transferred to Beacon Street, relieving outer Commonwealth Avenue of comparatively small and slow rolling stock units.

The track is of 85-lb. A.S.C.E. 5-section laid in broken stone ballast. At stations the roadbed is grouted with concrete poured flush with the tops of the ties, platforms and roadbed being drained to enable the entire station to be washed down with hose. The platform edges are flush with the top of the rail, and a ramp 16 in. wide, of carborundum to prevent slipping, borders the rail. A light-colored safety strip 6 in. wide is also provided. The maximum grade is on the Kenmore Street incline, 5 per cent, and 32 per cent of the trackage is curved, the radii varying from 400 to 5000 ft., the total deflection being 152 degrees. The maximum depth below the surface is 39 ft. As in other lately built subways at Boston fireproof material has been used throughout, and wooden slabs have been provided on top of concrete seats at stations. Seventy per cent of the subway volume lies below ground water level. The interior lighting is by 23-watt tungsten lamps wired in series circuits of ten each. Motor-driven International fare boxes are used at stations.

TRANSIT CONSTRUCTION PROGRESS IN NEW YORK

Some 17,000 Men Engaged in Construction—Fifty-nine Contract Sections Let, Aggregating $140,516,385

According to the progress reports for September made by the division engineers to Alfred Craven, chief engineer of the Public Service Commission for the First District of New York, there are now about 17,000 men engaged in construction work on the dual system subway and elevated railroad contracts. Of this total about 14,000 are employed by contractors building the lines to be owned by the city and about 3000 by contractors building the elevated extensions and additions to be owned by the companies. The dual system is divided by the commission into eighty-three contract sections. Contracts have been awarded for fifty-nine of these sections, leaving only twenty-four yet to be made. Of those already awarded thirty-one are on lines to be operated by the Interborough Rapid Transit Company and twenty-eight on lines to be operated by the New York Municipal Railway Corporation. Of those remaining to be let, eight are on Interborough lines and sixteen on New York Municipal lines, the latter including six sections of the Eastern District route. All told, the city of New York now has outstanding contracts for dual system construction on city-owned lines aggregating $140,516,385, of which $69,462,918 is on lines for operation by the Interborough Rapid Transit Company and $71,073,466.54 on the New York Municipal lines. A portion of the total in each case will be paid for by the companies out of the contributions made by them toward the construction of city-owned lines, namely, $58,000,000 by the Interborough and $13,500,000 by the New York Municipal. Roughly speaking, the dual system agreements call for the construction of about 80 miles of new subway and elevated roads on city-owned lines, with about 260 miles of single track. The contracts already let cover about 50 miles of the total road mileage, so that it may be said that about five-eighths of the contracts on city-owned lines have been awarded.

During the week ended Oct. 3 a fire occurred in the underground portion of the Lenox Avenue division of the existing subway near 142nd Street. A work-train, loaded with papers and other refuse which were being taken out of the subway, was run into by another train and caught fire as a result of the collision. The subway for blocks was filled with smoke, and the fire department had difficulty in extinguishing the fire. Some apprehension was caused by the occurrence, and Commissioner Milo R. Maltbie, acting chairman of the Public Service Commission for the First District, issued a statement calling attention to the fireproof character of the subway and the precautions which the commission has taken to prevent fires. The theory of the commission is to make the subway fireproof and to keep it free of inflammable materials, so that if a fire should start it would have little or nothing to feed upon. The occurrence in question was most unusual, and was really due to the efforts made by the company to prevent fire, for the work-train was carting away papers and other refuse which, if allowed to remain in the subway, would become a fire menace. The commission's engineers are investigating the recent accident, and if it is found that anything further is needed as a fire precaution to protect the subway travel the commission will take prompt action.

Timothy S. Williams, president of the New York Municipal Railway Corporation, has notified the Public Service Commission for the First District that the entire Liberty Avenue extension of the Fulton Street elevated railroad in Brooklyn will be completed about the first of next year, after which it will require two or three months to finish the stations. He, therefore, holds that it would be inadvisable to attempt the operation of that portion of the line running as far as Ozone Park before the entire line is completed and ready for operation. The company had been asked by the commission, in response to requests from residents of the Ozone Park section, whether that portion of the line could not be placed in operation as soon as it is completed.

LABOR RELATIONS IN LOS ANGELES

At the recent session of the United States Commission on Industrial Relations in Los Angeles, Cal., G. J. Kuhrts, chief engineer of the Los Angeles (Cal.) Railway Corporation, summarized the attitude of the company toward labor as follows:

"As a public service corporation responsible to the public for efficient and regular service, we cannot submit to the general good feeling and interest of our employees to maintain efficiency and allay strife, and as we cheerfully accord the men interviews if they have grievances and uniformly give them fair treatment, the best of feeling rules. We recognize that the contented man is a business asset. We have never had a general strike, we have never called on the city authorities for protection, and we have never asked for an injunction. We operate as an open shop; I presume it would be called such. We do not discriminate against union men. In the mechanical departments, in construction and repair work, we have many union men. There is no organization of our men except a recreation association. Officials and men get together in picnic, dances, smokers, and sometimes discuss matters of general interest to us. We are always ready to consider complaints, to hear any employee and make amends if a mistake has been made. As responsible heads we have to be the final judges, but all the heads of departments have worked up from the bottom and are in sympathy with the employees. Since 1901 our schedule of wages has been raised voluntarily five times, without request of the employees. We keep in close touch with economic conditions and whenever they justify it we raise our standards."

At the same hearing A. B. Merrihew, assistant superintendent, described conditions of hiring and discharging trainmen in his department. He said he began as a conductor. He said the average run was nine and a half to ten hours. Certain runs were not operated Sundays, but if a man wanted to he could work 365 days in the year. Mr. Merrihew described the record kept of each man, which he called a "record suspension only," a modification of the Brown system. Violations of rules are entered on the record and men are suspended, but there is no system of fines. Every man was encouraged to aspire to a higher position. Mr. Merrihew stated that he had had no experience with strikes except one in 1903 that lasted "about fifteen minutes," a strike of thirteen men.

NEGOTIATIONS FOR POLE REMOVALS AT SPRINGFIELD, MASS.

The city planning commission of Springfield, Mass., has submitted a report to the Board of Aldermen recommending that the trolley poles on Main Street between the Union Station and State Street be removed and span suspension substituted, with wires attached to buildings. The board was informed through C. V. Wood, vice-president of the Springfield Street Railway, that if the public authorities so request the company will co-operate by removing the poles at its own expense, on condition that the property owners whose buildings are to be utilized grant the company perpetual right of wire attachment. The company also desires that the negotiations with the property owners shall be conducted by the city and will require an agreement freeing the road from all liabilities in connection with these wire attachments. Fifty-eight poles are located in the district, which is in the heart of the business section, and the company reports that all but nine poles can be removed. Four of the latter are located on Court Square, with no available buildings for span wire attachments in the immediate vicinity, while the other five poles are equipped with electric switch connections, which may in some cases be changed. Royal B. Daggett, chief of the Springfield fire department, has informed the planning commission that he sees no objection to the installation of span suspension with building attachments in the above district, and in response to a recent inquiry the New England Insurance Exchange, Boston, has informed the board that it will make no objection to the change if double strain insulators are inserted in the span wires on each side of the trolley wire, one being at a point near the trolley and one near the building. The Exchange prefers that, as a rule, span wires shall not be attached to frame buildings, but will make no objection if such attachments are required in a few instances.

REDRAFTING THE PROPOSED TOLEDO ORDINANCE

Following a meeting of the franchise committee of the City Council in the office of Mayor Keller, at Toledo, Ohio, on Oct. 1, the announcement was made that members would give all their time to the work until the draft of a franchise is completed and ready to present to the Toledo Railways & Light Company. Mr. Hasenzahl, Vice-Mayor, said that Councilman Dotson was working out the fare clause, while City Solicitor Thurstin was engaged on the provision for municipal ownership. Mr. Dotson said members had found that they could make no headway in the preparation of a draft by holding occasional meetings. In the former franchise draft, Mr. Dotson said, the fare clause was very brief, because it provided for flat 3 cents, but now conditions were different, as a rate must be fixed until the 3-cent fare is tried out, and in addition provision must be made for a rearrangement of the rate every five years. It would seem from this that the committee has taken up the suggestion made by the Toledo Citizens' Franchise Committee relating to the readjustment of the rate of fare at stated periods and that the 3-cent rate is to form a basis upon which to make these readjustments. Mr. Dotson said that the clauses which had been agreed upon by the committee and the company will not be changed and that the only important matters remaining relate to the rate of fare and the clause providing for municipal ownership.

On Sept. 30 the Toledo *News-Bee* published a statement to the effect that the contempt cases against its editor and business manager had been dismissed by Federal Judge John M. Killits. Judge Killits is quoted as saying that the step taken by the paper "is a distortion and perversion of an act of courtesy accorded counsel in the case." Instead of dismissing the charges the court directed the district attorney to file papers adding to the charges already made, but in no way changing the previous order.

SURFACE RAILWAY TRAFFIC IN CHICAGO

Henry A. Blair, chairman of the board of operation of the Chicago Surface Lines, controlling all the surface railroads of Chicago, was quoted recently in part as follows:

"We feel that the surface lines are doing fine in view of general prevailing conditions. Our traffic is running a fraction of 1 per cent above last year, which showed a normal gain. We have been able to reduce operating expenses to a point where the charge for the year has been at the rate of 72.76 per cent. This will enable us to show an increase in net earnings over last year. The decrease in traffic is due almost wholly to a falling off in the manufacturing districts.

"The trunk lines of the system continue to show increases. The situation is perhaps better in Chicago than some other centers from which we have heard. We shall put on the entire system about 155 new cars between now and the first of the year. And we are keeping up the lines to the maximum of efficiency. It will be necessary, however, to watch closely all expenditures.

"What we shall be able to do in the way of extensions next year must depend in considerable measure upon money market conditions. The companies could not afford to bring out bonds in a market like this. The prices they would command would be so low as to make the financing appear necessitous. Such a condition does not obtain. The necessary expenditures are well within proper appropriations for the same and we shall plan with the view of maintaining this policy.

"Speaking for the Chicago Railways alone, our shareholders have no reason to feel other than comfortable. While the fact has never been announced in connection with issues of securities, we have a renewal fund of $1,700,000. This is cash in bank and is inviolate except for the purposes for which it is appropriated. We are able to keep the property in the condition it should be."

EMPLOYEES AS STOCKHOLDERS

Outline of Plan Under Which American Cities Company Employees Subscribe for Preferred Stock

The plan of the American Cities Company, New Orleans, La., to have the employees of its subsidiary companies become holders of preferred stock has been carried to a conclusion with subscriptions to approximately 1850 shares of stock, averaging two shares to each subscriber. The subscriptions to the stock were voluntary on the part of the employees. Employees receiving a salary of $1,000 or less were entitled to a maximum of two shares each, while employees receiving more than $1,000 were entitled to an amount of stock at par value equivalent to 40 per cent of the annual salary, this percentage to be adjusted to the nearest even $100. The plan provides that on successive pay days at intervals of a month a minimum of $2 a share shall be deducted from the salary of the subscriber. The subscriber, on the other hand, has the privilege of increasing his monthly instalments to an amount not to exceed 25 per cent of his monthly wages. Dividends declared on the stock held by subscribers are to be credited to the holders of the stock, except that 6 per cent a year is to be charged on the unpaid monthly balance of the purchase price of the stock. The plan contemplates an extension of credit in the case of sickness to employees purchasing stock, such employees being excused from not more than three successive payments. Where this extension is taken advantage of the period of payment is extended to make up the deficit. The stock of course remains in the hands of the company until fully paid for. Monthly payments of $2 a share contemplate the liquidation of the total subscription in twenty-six months, payments of $3 a month contemplate liquidation in eighteen months, $4 a month contemplate liquidation in fourteen months, $5 a month in eleven months, and $6 a month in nine months. Subscriptions are to be cancelled at the request of the subscriber, by the subscriber leaving the service, or by failure of the subscriber to make payments when due on two successive pay days unless excused on account of illness.

It is planned in the case of subscriptions which are cancelled to return to the subscriber the exact amount of the payments made on account, with interest at the rate of 4 per cent a year. Stock fully paid for will be issued in the name of the subscriber, without restriction as to its subsequent sale by him. As an inducement to subscribers to retain their stock the company has offered on Jan. 1 following the delivery of the stock to the subscriber and on each succeeding Jan. 1 for four years, to pay the holder a bonus in the nature of wages for each share up to a total of five shares, such payment to be made as follows: on the first succeeding Jan. 1, $2 a share, on the second succeeding Jan. 1, $3 a share, on the third succeeding Jan. 1, $4 a share, and on the fourth succeeding Jan. 1, $5 a share. The right is extended to subscribers to designate the person or persons to whom, in the event of their death, they desire the company to pay all amounts in connections with subscriptions which otherwise would be payable to their estates. In making a settlement in the case of death the company will account not only for the payments which have been made, including such amounts as had been applied from dividends, but also for any increased value in the stock at the time of the death of the subscriber.

The circular from the American Cities Company containing the offer to its employees was dated June 22 and was addressed to the officers and employees of the American Cities Company and its subsidiary companies. It was headed "First Annual Allotment of Stock to Employees," and was signed by J. S. Pevear, vice-president of the company.

SIR ALBERT STANLEY HONORED

Sir Albert Stanley, managing director of the Underground Railways, was presented with a testimonial recently. The fund emanated entirely from the staff. It was stipulated that no man could contribute a larger sum than 1d. The employees of the Metropolitan District Railway, London Electric Railway, Central London Railway, City & South London Railway, London General Omnibus Company, Associated Equipment Company and the London United Tramways contributed approximately 20,000d. The presentation took the form of a silver tea and coffee service, and a handsome album containing 20,000 signatures of the staff. The inscription was as follows: "Sir Albert Stanley. From nearly 20,000 employees of the T. O. T. companies, in appreciation of the honor conferred by His Majesty the King—June 22, 1914." The album has been divided into T. O. T. sections, the first section of the book under the letter "T" containing the names of the employees on the railways; the second section under "O" the names of the London General Omnibus Company and the Associated Equipment Company's employees, and the third section under "T" the signatures of the London United Tramways employees. In acknowledging the gift Sir Albert stated that he had been much assisted in his work by the support which he had received from the employees and had always striven to do what he could for them. His greatest satisfaction in connection with the honor recently bestowed upon him had been in the universal expression of satisfaction and congratulation on the part of the men.

Washington Valuation Partially Completed.—With the valuation of the properties of the Capital Traction Company practically completed, the Public Utilities Commission of Washington, D. C., awaits information as to the holdings of the Washington Railway & Electric Company to enable it to begin investigation of the reasonableness of the rates maintained by the companies. Headed by Edward W. Bemis, Chicago, the investigators have been at work since the middle of May.

Maine Accepts Public Utilities Act.—The public utilities act, passed by the last Legislature and suspended under the referendum act so that the voters might pass upon it, was adopted by a vote of nearly two to one at the recent state election in Maine, according to a tabulation of unofficial returns from two-thirds of the State. The tabulation showed 43,717 in favor and 23,757 opposed to the new law, which when it becomes effective following Governor Haines' proclamation of the result of the vote, will create a commission to control all the public utilities of Maine.

Bus Line Not a Common Carrier.—The Idaho Public Utilities Commission has decided that an auto bus line does not come under the definition of a common carrier. Parties who established an auto bus line in Pocatello applied for a certificate of public convenience and necessity to operate the line. The commission did not write a formal opinion, but gave the applicants to understand that a certificate was not necessary. Since then a second application for a certificate has come from other parties wishing to establish a similar system in the same city.

New Railway in Pernambuco.—According to P. Merrill Griffith, American Consul at Pernambuco, Brazil, a new electric railway and light company was installed in that city recently. As the result of the general scheme on the part of the present administration of beautifying and modernizing the city, numerous blocks of old buildings were also being torn down and rebuilt with up-to-date structures and new avenues and parks were being laid out. On account of the European war, however, construction and engineering work has been temporarily suspended.

Turnstile at Cleveland Union Station.—In order to accommodate passengers at the Union Station and make it possible for cars to leave on schedule time, the Cleveland Railway will put in a turnstile in the shelter house that has been maintained there for some time. Passengers will then pay their fares before boarding the cars. The city desired this improvement so that people coming in would be able to pay the 3-cent fare and thus give the low-fare idea more publicity through the traveling public. Visitors to the city usually would pay the 5-cent fare without thinking anything about the matter of the 3-cent fare in Cleveland.

Terms of Service in Cleveland.—At a meeting in Acme Hall on the evening of Sept. 30, attended by 800 of the platform men of the Cleveland (Ohio) Railway, the proposition of J. J. Stanley, president of the company, regarding terms of service, was voted down for the second time. The men then decided to submit the matter to arbitration. International President W. D. Mahon, Patrick J. Shea, chairman of the international executive board, and a committee of local men will ask Mr. Stanley to join in arranging for arbitration at an early date. The men contend that the present schedules are not in conformity with the old agreement.

Pittsburgh Subway Franchise Ordinance Introduced.—An ordinance for a subway franchise was presented to the Pittsburgh City Council on Sept. 29 and was at once referred to the committee of public service and surveys. The measure was prepared by the city law department and A. E. Anderson, counsel for the Pittsburgh Subway Company, which is bidding for the franchise. The company is creating sentiment in favor of the granting of a subway franchise by direct advertising at the Pittsburgh Exposition Building, in which the annual exposition of the products of eastern Pennsylvania is held. Approximately 200,000 persons visit the place during each of the six or seven weeks it is open each fall. The company has rented wall space near the entrance to the music hall. The appeals are brief. They set forth what the company wants and what it intends to give in return for the franchise it asks.

President Callery on Traffic in Pittsburgh.—J. D. Callery, president of the Pittsburgh (Pa.) Railways, has sent a lengthy communication to Mayor Joseph G. Armstrong, replying to the demands made by the city for better service by the company. Mr. Callery asserts that most of the improvements have already been made. Some of the proposed changes are objected to, but Mr. Callery says that he and the other officers of the company are willing to go into a full discussion of the improvements with the Mayor and the City Council. He says that a universal transfer system would not be just to the company, and adds that on the average the patrons of the company are now more than justly treated as to the mileage secured for one fare. In the matter of routing, Mr. Callery says it is not feasible to route cars through the city, as the routes cannot be balanced when this method is attempted. Improvements, it is admitted, could be made, but it is asserted that they depend upon the granting of new franchises.

Kercheval Avenue Extension, Detroit.—After a delay of several months the Common Council of Detroit, Mich., has adopted a resolution providing for the construction of an extension of the Kercheval Avenue line to the St. Jean Road. The delay was caused by the opposition of one of the Aldermen representing the ward through which the line will run. He wanted the line extended a considerable distance further through unimproved property, a condition which the Detroit United Railway refused to meet. The extension of the line to the St. Jean Road is in accordance with the agreement entered into last April at the time of the adoption of the resolution providing for the construction of the Grand Belt line, one of the conditions of the construction of the latter being that the company would not go beyond the St. Jean road with the Kercheval line. The Grand Belt line is being held up pending a decision by Judge Murphy in circuit court as to the right of the company to construct a clearance curve at Junction and Dix Avenue. Suit to restrain the company from constructing such a curve because it would overhang the sidewalk at this point was begun by a property owner in the vicinity.

PROGRAM OF ASSOCIATION MEETING

National Association of Railway Commissioners

The twenty-sixth annual convention of the National Association of Railway Commissioners will be held in Washington beginning Nov. 17. The association is composed of the members of the Interstate Commerce Commission and of all the state railway commissioners. Chairman Harlan and C. A. Prouty, director of the physical valuation work of the federal commission, will address the convention, while the remainder of the session will be given over to a discussion of special reports.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The general outlook continues good. Not one or two, but many factors enter as contributing causes. Securities are being traded in in increasing numbers. Dealings through the Stock Exchange Clearing House at or above the final figures of July 30 amount to around 6000 shares a day, while unlisted stocks, dealt in on a freer basis, are in some instances being purchased at an advance. Bond transactions are being made in amounts considered very encouraging. As yet there has been little trading in public utilities. In this connection *Financial America* says that brokers with utility orders in hand are rigidly adhering to the agreement not to sell at prices under July 30 quotations.

During September less than $15,000,000 of securities was put out, and all but $1,500,000 of these was necessary to meet maturing securities. In September, 1913, corporate financing totaled $187,000,000. Dividends and interest due on Oct. 1, for which checks were mailed, amounted to $159,500,000 as compared with $160,000,000 a year ago. Of this total, public utilities contributed $16,985,326. Fourteen corporations passed, deferred or reduced their respective dividends during the week ended Oct. 3. Of these five were companies controlling electric railways, the Porto Rico Railways, the Aurora, Elgin & Chicago Railroad, the American Public Utilities Company, the West Penn Traction Company and the Puget Sound Traction, Light & Power Company. According to the *Wall Street Journal*, since Jan. 1, 1913, 160 corporations have either passed, reduced or deferred their dividends. Of this number, sixty-nine companies have reduced, passed or deferred action on their dividends since Aug. 1, the date of the declaration of war.

CLEVELAND RAILWAY STOCK ISSUE AND OPERATING RESULTS

The directors of the Cleveland (Ohio) Railway on Sept. 28 authorized the sale, subject to the approval of the Ohio Public Utilities Commission, of additional capital stock at not less than par in an amount equal to 10 per cent of the stock outstanding on Oct. 1. The proceeds will be used for extensions, betterments and improvements already approved or proposed by the City Council. Stockholders of record on Oct. 1 are offered the right up to Oct. 15 to subscribe for the new stock pro rata, payable one quarter or more each on or before Nov. 1, 1914, and Jan. 1, 1915, and the remainder in one or more installments on sixty days' notice. The company reserves the right to limit the amount of the first two payments. As noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19, the commission recently authorized the sale of not less than $1,068,500 of stock at par, but this is not being offered to stockholders.

The income statement of the company for August, based on ordinance allowances, contains the following items: operating revenue, $652,696; car-mile allowances for maintenance and operation, $546,963; net operating revenue, $105,733; non-operating income, $2,716; gross income, less allowances, $108,449; taxes, $38,813; income, less allowances and taxes, $69,636; interest, $141,726; deficit, $72,090; special allowances, $18,000, and net deficit, $90,090. Based on actual expenses items are charged as follows: maintenance and operating expenses, $559,934; net operating revenue, $92,762; gross income less expenses, $95,578; income, less expenses and taxes, $56,655; deficit, $85,661; obsolete property, $12,000, and net deficit, $97,061.

The deficit of $97,061, based upon actual experience, compares with $5,041 last year. Under the ordinance allowances the deficit of $90,090 compares with $16,093 for the previous year. The actual amount spent in maintenance and operation was much larger than the allowance, but the proportion of last year was very nearly kept. The interest fund at the end of August was $222,654, which is a material reduction from the amount reported at the end of the previous month. The charge of 1 cent for transfers beginning on Sept. 1 will make a difference in this fund, but in all probability a long period will elapse before it reaches $700,000, the amount necessary before the fare can be reduced to 3 cents.

ANNUAL REPORTS

The American Railways

The statement of income, profit and loss of The American Railways, Philadelphia, Pa., for the fiscal year ended June 30, 1914, follows:

Income from sub-companies	$981,943
Miscellaneous income	54,418
Gross income	$1,036,361
General expenses	$18,839
Legal expenses	375
Depreciation of office furniture and engineering instruments	1,279
Taxes	15,000
Interest on funded debt	407,039
Total deductions from income	$442,532
Net income	$593,829
Dividends paid and accrued on preferred capital stock	$140,000
Dividends paid on common stock	402,789
Total dividends	$542,789
Surplus for the year	$51,010
Surplus at the beginning of the year	648,436
Additions to surplus through the profits from sale of the Johnstown Passenger Railway	548,469
Total	$1,247,945
Deduct:	
Contributions to the reserve for depreciation of the subsidiary companies	$500,000
Amount set aside for United States income tax arising from the profits on sale of property	5,485
Other adjustments within the year	187
Total	$505,672
Surplus at close of the year	$742,273

The gross receipts for the subsidiary companies for the year ended June 30 were $5,563,289, a gain of $399,281, or 7.73 per cent over the previous year. After payment of all operating expenses, interest and taxes, the net income was $593,829. Dividends amounting to $542,789, an increase of $50,940, were paid, leaving a balance of $51,040. During the year the Johnstown Traction Company exercised its option to purchase the Johnstown Passenger Railway, which resulted in a net profit of $548,469. Of this $500,000 was set aside as a special depreciation fund to be apportioned among the different properties of the company; $5,485 to cover the contingency on this profit, subject to the federal income tax, and $187 for adjustment of interest, leaving $42,797 to be added to surplus. A combination of this with the above balance of $51,040 gave a surplus for the year of $93,837 and a total surplus as of June 30, 1914, of $742,273.

During the year the company spent on maintenance of track, roadway and equipment (including depreciation) 19.4 per cent of the gross receipts. There was charged out of earnings to payments for sinking fund $26,769. Taxes amounting to $239,752 were paid—more than 4.3 per cent of the gross receipts. The insurance and contingencies reserve fund is now $82,242, an increase of $8,636. The employees' pension fund has an investment of $10,127. During the year $832,995 of new capital was spent for sundry improvements. The total number of passengers carried was 106,825,683, an increase of 6,482,632, or 6.46 per cent.

The report gives brief descriptions of the progress of the subsidiaries. During the year the gross receipts of the Altoona & Logan Valley Electric Railway, Altoona, Pa., increased $47,186. One new snow sweeper was bought; orders were placed for nine new cars, and eight cars were altered to the pay-within type. The Bridgeton & Millville Traction Company, Bridgeton, N. J., purchased four new cars. The receipts of the Chicago & Joliet Electric Railway, Joliet, Ill., increased $25,010. Ten new steel cars were bought and eleven double-truck cars were changed to the prepayment type. The Lynchburg Traction & Light Company, Lynchburg, Va., showed a gross gain of $37,855, or 8 per cent, divided among the departments as follows: Railway, $16,324; electric light and power, $15,005; gas, $6,526.

The gross business of the Ohio Valley Electric Railway, Huntington, W. Va., increased more than $68,000 during the year, of which the railway department gained $38,900 and the lighting companies more than $29,000, a combined gain of nearly 12 per cent. Two 30-ton freight cars were bought and one 35-ton freight car was built in the company's own shops. The receipts of the Peoples Railway, Wilmington, Del., increased $61,696 during the year. The earnings of the Roanoke Railway & Electric Company, Roanoke, Va., increased $59,464. Thirteen cars were rebuilt to the pay-within type. The Scranton (Pa.) Railway and the Springfield (Ohio) Railway showed satisfactory increases during the year. The Scranton Railway purchased five new all-steel cars and orders were placed for ten additional. The Springfield Railway purchased and put into service ten new all-steel cars with motor equipment. Besides the above information the report contains various details regarding the track, power house and other improvements made by each company.

The Westinghouse Air Brake Company

According to the condensed financial statement of the Westinghouse Air Brake Company, Wilmerding, Pa., for the fiscal year ended July 31, the net earnings from all sources fell from $6,064,778 in 1913 to $3,482,994 this year, owing to the general business depression and the present railroad situation. The inventories totaled $5,625,024, as compared to $4,307,505 last year, while cash on hand decreased from $4,050,495 to $2,479,096 and accounts and bills reecivable from $4,865,762 to $3,132,723.

Depreciation charges have been governed largely by net earnings, varying in recent years from $43,960 in 1908 to $429,824 in 1910. After appraisals this year, however, the present actual values of factories has been increased $550,165, and this value credited to a general reserve account, with which the various reserves of all the companies have been consolidated. This will provide for renewals, replacements, adjustments of inventories and all extraordinary losses. Depreciation charges for the year are included in the adjustment, but hereafter depreciation of buildings and machinery will be charged at a predetermined rate against current earnings as a part of the cost of production.

Last summer a committee inspected the foreign brake plants in which the company is interested and found that the company's holdings of their stocks are carried on the books at conservative valuations. The unexpected outbreak of the war injected uncertain factors, but the directors believe that, barring a temporary dividend reduction for the companies in question, no further loss need be apprehended.

UTAH PURCHASE COMPLETED

Utah Securities Corporation Through New Subsidiary Gains Control of Electric Business in Salt Lake City and Ogden

The Utah Securities Company, as predicted in the Electric Railway Journal of Sept. 12 and Sept. 26, has purchased a 98 per cent interest in the stock of the Utah Light & Railway Company. The property of the latter company is now owned by the Utah Light & Traction Company, all of whose stock other than that which accrues to the minority holders of the Utah Light & Railway Company is now owned by the Utah Securities Corporation. The Utah Light & Traction Company was formed Sept. 18 by a consolidation of the Utah Light & Railway Company and the Salt Lake Light & Traction Company, which was recently organized by the same interests with a paid capital of about $1,000,000. The capital stock of the new company will approximate $1,000,000 in $25 shares. The minority stock of the Utah Light & Railway Company has been offered in exchange either cash or stock in the new company.

The Utah Light & Traction Company has issued a mortgage to the Bankers Trust Company, New York, as trustee, to secure an unlimited issue of first and refunding 5 per cent thirty-year gold bonds, dated Oct. 1 and callable on any interest date at 105 and interest, par $1,000, $500 and $100 (coupon) and $1,000 (registered). The bonds are protected by a sinking and improvement fund of 1 per cent of the bonds outstanding from 1917 to 1919, 2 per cent from 1920 to 1934, and 2½ per cent from 1935 to 1943. Of the bonds, $11,661,000 have been issued, of which $3,816,000 are reserved to provide for underlying liens as follows: $745,000 of Utah Light & Power Company first mortgage gold 5's; $1,113,000 of Utah Light & Power Company consolidated mortgage gold 4's; $1,472,000 of Consolidated Railway & Power Company first mortgage gold 5's, and $486,000 of Utah Light & Railway Company first consolidated 5's. The remainder of the bonds were sold to cancel the large floating debt of the Utah Light & Railway Company and to provide the necessary cash to pay the Utah Light & Railway Company and the Salt Lake Light & Traction Company stockholders who elected to take cash in payment or exchange for their holdings after the merger. The bonds were not sold to bankers and it is expected that none will be offered to the public. The $993,000 of Utah Light & Railway Company first consolidated 5's and $2,000 of Utah Light & Power Company consolidated 4's, formerly owned by the Oregon Short Line Railway, have been turned over as part consideration for the property acquired and have been deposited as additional security for the new first and refunding mortgage.

Just how the properties will be handled by the new interests is a matter yet to be worked out. It is still undetermined whether the Utah Light & Traction Company will be merged into the Utah Securities Corporation, or again whether the gas and electric light business of the new property will be turned over to the Utah Power & Light Company, which is also controlled by the Utah Securities Corporation, and the new company left to operate merely the traction property.

Chicago & Oak Park Elevated Railroad, Chicago, Ill.—Judge Kohlsaat in the United States District Court has ordered Samuel Insull, receiver of the Chicago & Oak Park Elevated Railroad, to present within ten days a petition for permission to issue receivers' certificates to raise funds for elevating the tracks near the western terminus at a cost between $1,500,000 and $2,000,000. Federal Judge Kohlsaat, taking further action in the suit brought by the Public Utilities Commission of Illinois to enforce its order to compel the Chicago & Oak Park Elevated Railroad to elevate its tracks in Oak Park, Ill., has issued a temporary injunction. This restrains the commission from proceeding with its suit in the Superior Court by writ of mandamus and thus prevents it from prosecuting its suit.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The Commonwealth Power, Railway & Light Company has declared its regular dividend of 1½ per cent, preferred, and 1 per cent, common, payable on Nov. 2 to holders of record on Oct. 16. It is reported authoritatively that the company in August showed increases of 5.88 per cent in gross earnings and 12.6 per cent in net earnings over August, 1913. The totals for the twelve months ended Aug. 31 were the largest gross and net earnings in the history of the ocmpany. This showing is said to indicate the strength of public utilities whose operations cover a large number of communities.

Indianapolis, Columbus & Southern Traction Company, Columbus, Ind.—The Bartholomew Circuit Court on Sept. 22 appointed the Commercial Trust Company, Philadelphia, Pa., as trustee under the mortgage of 1903 in place of the Trust Company of North America, resigned.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—The Common Pleas Court at Cincinnati has appointed Charles S. Thrasher of Cleveland and Charles N. Leslie of Cincinnati as receivers of the Interurban Railway & Terminal Company on the application of the Westinghouse Electric & Manufacturing Company. The manufacturing company charged that the railway had defaulted in the payment of its interest on its bonds and was insolvent. The railway joined in the application. Frank Dinsmore, one of its attorneys, stated that among the various causes for the financial trouble was the franchise obligation requiring the company to charge no more than five cents as the fare between Kennedy Heights and Pleasant Ridge, and Cincinnati. With three cents of this going to the Cincinnati Traction Company the interurban company suffered a loss.

New York (N. Y.) Railways.—It has been decided that the interest payment on the New York Railways adjustment income bonds for the six months ended Oct. 1 should be 1.288 per cent instead of 1.24 per cent, as provided for in the summarized net income statement originally prepared by the company. This decision was reached by the board of arbitration composed of H. H. Porter, James Warwick and W. G. Ross, whose selection was noted in the ELECTRIC RAILWAY JOURNAL of Sept. 19. Charles F. Cushman, secretary of the proxy committee, has sent a circular to the holders of the adjustment income bonds, notifying them that at the annual meeting in December they are entitled to elect five of the eleven directors. The following committe has consented to receive proxies for this meeting: Darwin P. Kingsley, president New York Life Insurance Company, New York; William A. Day, president Equitable Life Assurance Company, New York; Haley Fiske, vice-president Metropolitan Life Insurance Company, New York, and Allan Forbes, president of the State Street Trust Company, Boston.

New York City Railway.—Judge Lacombe on Sept. 28 filed two opinions in the Federal District Court regarding the old surface railway litigation. In one opinion he affirmed the conclusion of the special master in the matter of the petition of the receiver of the New York City Railway for an accounting by the receiver of the Metropolitan Street Railway. In regard to the sale of scrap and payments made to the so-called controlled companies aggregating $169,694, Judge Lacombe disallowed the payment of $55,000 by the Union Railway and stated that some of the other items have been disposed of by mutual concessions. In the second opinion, which concerned the claim of the Metropolitan Street Railway for $2,000,531 against the New York City Railway for damages for breach of lease, he allowed $1,700,452 for keeping the tracks and roadway in good condition and $15,000 because the old coal conveyor was not put in proper condition. He disallowed the off-set of $63,821 for the expense of renting buildings, because of fire destruction, and permitted the Farmers' Loan & Trust Company to share in the proceeds of the claim.

Northern Electric Railway, Chico, Cal.—On Oct. 1 the General Railway Signal Company applied to Judge Dooling in the San Francisco United States District Court for the appointment of three receivers for the Northern Electric Railway. The company, which joined in the application, has defaulted interest on the $3,750,000 of first mortgage fifty-year 5 per cent bonds due on Oct. 1. Interest on $6,652,000 of first and consolidated mortgage 5's was defaulted on June 1. The company (Marysville and Colusa branch) recently filed an application with the California Railroad Commission requesting approval of $37,079 of notes previously issued.

Ohio Service Company, Columbus, Ohio.—The Ohio Public Utilities Commission has authorized the Ohio Service Company to issue $630,000 of capital stock to be used in the purchase of electric railway and light properties at Coshocton, Canal Dover, Cambridge, New Philadelphia, Uhrichsville and Dennison. Of this $350,000 is to be paid to the Midland Power & Traction Company, Cambridge, for a railway line between that place and Pleasant City, together with a light and an ice plant; $270,000 for light plants at Canal Dover, New Philadelphia, Uhrichsville and Dennison and $10,000 to the Lafayette Light & Power Company for a transmission line connecting all the towns mentioned above. The sale of the properties was authorized on June 4.

Porto Rico Railways, Ltd., Toronto, Ont.—The directors of the Porto Rico Railways, which controls the Porto Rico Railway, Light & Power Company, San Juan, Porto Rico, have decided to pass the quarterly dividend payable on Oct. 1 on the $3,000,000 of common stock. From October, 1911, to July, 1914, 1 per cent was paid.

Second Avenue Railroad, New York.—The Second Avenue Railroad has defaulted on the payment of the principal of the $3,140,000 of 6 per cent certificates due on Oct. 1. The semi-annual interest due on that date was paid. The default of principal is in effect a forced extension of the note issue, which is expected to continue to bear 6 per cent interest. In this connection it may be noted that plans for the reorganization of the company, which has been operated by George W. Linch as receiver for some years, were disclosed on Oct. 3 when Justice Platzek of the Supreme Court denied an application for an order directing the receiver to account for his acts and permitting the collection of a judgment for personal injuries through an execution against the railroad. The receiver showed that at the meeting of the reorganization committee, when it was determined not to extend the receiver's certificates, it was decided to present to the Public Service Commission for its approval a plan for the reorganization of the company, and to put such a plan into effect as soon as normal financial conditions are restored. The court said that in view of this plan it would be unreasonable to direct an accounting and to issue an execution.

DIVIDENDS DECLARED

Cincinnati, Newport & Covington Light & Traction Company, Covington, Ky., quarterly, 1⅛ per cent, preferred; quarterly, 1½ per cent, common.

City Railway, Dayton, Ohio, quarterly, 1½ per cent, preferred; quarterly, 2 per cent, common.

Columbus, Newark & Zanesville Electric Railway, Cincinnati, Ohio, quarterly, 1½ per cent, preferred.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich., quarterly, 1½ per cent, preferred; quarterly, 1 per cent, common.

Dayton & Troy Electric Railway, Dayton, Ohio, 1¼ per cent, preferred.

Georgia Light, Power & Railways Company, Macon, Ga., quarterly, 1½ per cent, preferred.

Green & Coates Streets Passenger Railway, Philadelphia, Pa., quarterly, $1.50.

Kentucky Securities Corporation, Lexington, Ky., quarterly, 1½ per cent, preferred.

Northampton (Mass.) Street Railway, 2½ per cent.

Ottawa (Ont.) Electric Railway, quarterly, 3 per cent.

Ottumwa Railway & Light Company, Ottumwa, Ia., quarterly, 1¾ per cent, preferred.

Porto Rico Railways, Ltd., Toronto, Ont., quarterly, 1¾ per cent, preferred.

Springfield & Xenia Railway, Springfield, Ohio, quarterly, 2 per cent, preferred.

United Railways & Electric Company, Baltimore, Md., quarterly, 50 cents, common.

Virginia Railway & Power Company, Richmond, Va., 1½ per cent, common.

Youngstown & Ohio River Railroad, Leetonia, Ohio, quarterly, 1 per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.							
1m.,	July,	'14	$188,715	*$104,801	$83,914	$26,009	$57,905
1 "	"	'13	180,931	*101,097	79,834	24,166	55,668
12 "	"	'14	2,169,475	*1,215,255	954,220	303,435	57,904
12 "	"	'13	2,039,355	*1,090,251	949,104	296,461	662,643
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.							
1m.,	July,	'14	$24,250	*$16,658	$7,592	$7,505	$87
1 "	"	'13	23,988	*15,926	8,052	7,583	479
12 "	"	'14	308,279	*197,248	111,031	91,546	19,485
12 "	"	'13	288,317	*192,354	95,963	88,344	7,619
PENSACOLA (FLA.) ELECTRIC COMPANY							
1m.,	July,	'14	$24,405	*$15,449	$8,956	$7,162	$1,794
1 "	"	'13	24,545	*15,643	8,902	6,767	2,136
12 "	"	'14	285,522	*178,167	107,355	86,103	21,252
12 "	"	'13	285,988	*181,533	104,455	77,142	27,213
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.							
1m.,	July,	'14	$726,374	*$423,156	$303,217	$177,882	$125,335
1 "	"	'13	736,695	*416,736	319,959	172,609	147,350
12 "	"	'14	8,691,638	*5,065,592	3,626,047	2,101,887	1,524,160
12 "	"	'13	8,400,734	*4,903,129	3,497,605	2,035,398	1,462,207
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.							
1m.,	Aug.,	'14	$256,524	*$150,941	$105,583	$83,359	$22,214
1 "	"	'13	261,648	*160,424	101,225	85,723	15,502
12 "	"	'14	3,083,372	*1,861,311	1,222,061	1,008,668	213,393
12 "	"	'13	2,911,033	*1,800,878	1,110,156	972,544	137,611
SAVANNAH (GA.) ELECTRIC COMPANY							
1m.,	July,	'14	$73,627	*$48,294	$25,333	$22,932	$2,401
1 "	"	'13	71,126	*46,007	25,119	22,756	2,263
12 "	"	'14	850,681	*566,457	284,224	273,958	10,266
12 "	"	'13	796,749	*559,993	236,755	230,992	5,763
TAMPA (FLA.) ELECTRIC COMPANY							
1m.,	July,	'14	$83,683	*$44,939	$39,044	$4,457	$34,587
1 "	"	'13	71,406	*39,877	31,529	4,531	26,998
12 "	"	'14	945,837	*519,540	426,297	55,627	370,670
12 "	"	'13	787,660	*420,927	366,733	55,307	311,426
TWIN CITY RAPID TRANSIT, MINNEAPOLIS, MINN.							
1m.,	Aug.,	'14	$798,560	$412,597	$385,963	$232,155	$153,808
1 "	"	'13	776,841	393,109	383,732	239,558	144,174
8 "	"	'14	6,141,176	3,210,079	2,931,096	1,823,040	1,108,056
8 "	"	13	5,780,872	2,945,867	2,832,005	1,880,630	951,374

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*Includes taxes.

Traffic and Transportation

ROCHESTER SUBURBAN FARES

A Summary Is Presented of the Changes in Fare Effective on the Rochester & Eastern and the Rochester & Sodus Bay Lines

Previous to Jan. 1, 1914, tariffs of the Rochester & Eastern and the Rochester & Sodus Bay lines of the New York State Railways granted the following types of fare:

One way tickets between all points	$0.0175	per mile
Round trip tickets between all points	.0150	per mile
Interchangeable coupon ticket books containing transportation to the value of $12, sold for $10	.0145	per mile
School ticket books, containing $5 worth of transportation, sold for $2.50	.00875	per mile

Effective on Jan. 1, 1914, tariffs were filed with the Public Service Commission of the Second District of New York granting the following types of fare:

One way tickets, between all points	$0.02	per mile
Round trip tickets, between all points	.02	per mile
Interchangeable coupon ticket books, containing transportation to the value of $12, sold for $10	.0166	per mile
Fifty-four-trip commutation ticket books	.0185	per mile (shortest haul)
Between all points 3 miles or more apart—limited to use for calendar month	.0079	per mile (longest haul)
Forty-six-trip school commutation books	.0163	per mile (shortest haul)
Between all points 3 miles or more apart—limited to use for calendar month	.0070	per mile (longest haul)

Effective on July 10, 1914, Supplement No. 1 to tariff was filed with the Public Service Commission changing rulings as to time limit of the fifty-four-trip commutation ticket books and the forty-six-trip school commutation books as follows:

Previous to July 10, the fifty-four-trip commutation tickets were governed by the following ruling as to time limit: "Limited to use during calendar month for which purchased." This was changed to read:

"Limited to use from the date of sale to and including corresponding date of the following month; if there should be no corresponding date in such following month, the ticket will be limited to use within thirty days from and including date of sale."

Previous to July 10 the forty-six-trip school commutation ticket books were governed by the following ruling on time limit: "Limited to use during calendar month for which purchased." This was changed to read:

"Limited to use for one year from date of sale, excepting that they will not be honored during months of July and August."

The above changes were made with the object of satisfying complaints or objections made by patrons to the Public Service Commission on account of the increases in fares which were called for in the tariff filed on Jan. 1, 1914.

The Public Service Commission held several hearings and finally disposed of the complaints by ordering the company to make the following changes in the tariffs by an order which is to be complied with Nov. 1, 1914.

Fifty-four-trip commutation ticket books are to be reduced in price such that, starting with mileage of 5 miles, a reduction of 25 cents is to be made on the price of each book for distance from 5 to and including 7 miles; 20 cents from 8 to and including 17 miles, and 15 cents from 18 miles to and including 43 miles.

The forty-six-trip school ticket books are to be computed on the basis of 75 per cent of the charges made for fifty-four-trip books, for the corresponding mileage.

The order also called for discontinuing the practice of charging an excess fare to passengers paying cash fare on its cars. The tariffs effective previous to Jan. 1, 1914, contained the following ruling as regards cash fares paid on cars:

"Passengers paying cash fares on the cars where fare is more than 5 cents will be charged an excess fare of 10 cents, which will be refunded if duplex fare receipt is presented within ninety days of date of issue to ticket agent at any Rochester & Eastern or Rochester & Sodus Bay line station, where a ticket office is maintained; such excess fare will not apply or be charged to passengers boarding at and destined to points where ticket agency is not maintained, conditioned that said points are not within the city or village limits where ticket office is maintained."

This same ruling was contained in tariffs, effective on Jan. 1, 1914.

Complying with the order of the commission, the company filed a supplement to its passenger tariff, effective on Sept. 1, 1914, covering the above mentioned changes in passenger fares. The passenger tariff which is now effective calls for a 2-cent rate per mile for one way and round trip fares.

NEW JERSEY TRANSFER CASE

Transfer Request Refused, but Petition for Elevated Shelters Allowed

The Board of Public Utility Commissioners of New Jersey has refused the request of the city that the Public Service Railway be compelled to honor transfers at its terminal building in Hoboken between its various surface lines, but holds that the company should be compelled to provide suitable waiting sheds at Washington Street, Willow Avenue and Henderson Street upon its elevated line. Unless the company accepts the latter recommendations an order will issue compelling the erection of waiting sheds in accordance with suggestions contained in the report of the board. In this connection the board draws a distinction between the obligations of a railway to provide waiting accommodations on elevated and surface lines.

The first part of the complaint was directed against the present rule of the company not to honor transfers at its terminal building. For many years the company made a practice of issuing such transfers from Washington Street to the Grove Street and Willow Avenue lines, from Willow Avenue to the Grove and Washington Street lines, and from Grove Street to the Willow Avenue and Washington Street lines. It was admitted in behalf of the city that the present points of transfer offer the shortest route, the quickest passage and are entirely the most convenient places to the transferring passengers. The complaint, therefore, was based upon the ground that while shelter is afforded at the terminal building, it is not provided at the present points of transfer.

There being no complaint involving the running of cars under proper headway and the furnishing of proper service, the board said it was thus stripped of the only grounds upon which it would be justified in making the order requested. In this connection the board added:

"The uniform practice on street railway lines is to transfer at the point of intersection or, if the lines do not intersect, at the most convenient point for the passenger, which usually is that point which will save the passenger time and send him along the shortest route to his destination. The board does not feel justified in granting the prayer of the complaint upon the ground urged, namely, the lack of shelter at these transfer points. Conditions at the present transfer points in Hoboken do not seem to be any different from those in every other city. No shelter is ordinarily provided at transfer points on surface lines in any city.

"The company in this case does not own property at any of the transfer points where shelter might be erected. As the complaint does not allege and the evidence has not established inadequacy of service or failure to give proper service on the part of the respondent, the application upon this phase of the case is denied."

In considering the conditions at the three points complained of as lacking proper waiting-room facilities on the elevated line, the board held that the present accommodations do not afford proper shelter and are incapable of accommodating the crowds waiting for cars. Distinguishing between elevated and surface lines, the board said:

"These elevated stations are four or five blocks apart, and passengers accumulate at them in greater numbers, of course, than at points on surface lines. The boarding points on surface lines, being only one block apart, passengers on such lines usually have an opportunity to avoid inclement weather by availing themselves of the protection of some building. A waiting shed on an elevated railway is of no use unless it accomplishes the purposes for which it was erected, namely, to protect waiting passengers. The failure to provide waiting sheds which will afford protection to persons whom the company invites upon its platforms as passengers, is, in our judgment, a failure to provide either adequate or proper service."

STUDYING TRAFFIC IN KANSAS CITY

The board of control of the Kansas City Railways is making a thorough study of service conditions. The approaching opening of the new union station presents important problems, since traffic currents will be changed in ways hard to anticipate. The new Twelfth Street viaduct is also nearing completion. The company will probably begin laying rails on it within thirty days, and the viaduct will be open to traffic about Jan. 1. This structure provides access to the stockyards district and the jobbing section of the south part of the west bottoms, which has depended upon rather circuitous street car facilities from the business district of Kansas City since the Twelfth Street cable line was shut down. The subject of adjusting service to the proposed Twenty-third Street viaduct and of arranging for the possible reconstruction of the Central Avenue viaduct have not yet reached the point of announcement by the company.

Service Order by Court.—The Court of Appeals handed down a decision on Sept. 21 requiring the Western Ohio Railway to give the people of Cridersville hourly service. The limited cars have used a cut-off which does not pass through the town.

Middlesex & Boston Fare Increase Postponed.—The Massachusetts Public Service Commission has ordered the Middlesex & Boston Street Railway to postpone its proposed increase in fares from a 5-cent to a 6-cent unit, with an additional charge of 1 cent for transfer, until Nov. 2. It is expected that the board will reach a decision in October.

Accident in Springfield.—Nineteen persons were injured, nine seriously, and others more or less shaken up and cut by flying glass when a double truck car on the Westfield division of the Springfield (Mass.) Street Railway left the tracks at the curve at the foot of Tubbs Hill, corner of Elm and Westfield Streets, West Springfield, recently, and turned over on its side.

Skip-Stop in Albany.—Announcement has been made by the United Traction Company, Albany, N. Y., of the elimination of certain stops in Albany and Rensselaer with a view to improving the service. Recommendations to curtail the number of stops were continued in the report of Charles R. Barnes, expert of the Public Service Commission of the Second District of New York, who investigated the service of the company last winter.

Harvard Bridge Transfers Approved.—Supplementing a recent order of the board approving various transfer facilities associated with the opening of the Boylston Street subway in Boston, the Massachusetts Public Service Commission has approved the issue of transfers between inward-bound Harvard Bridge and outward-bound subway cars and between inward-bound subway cars and outward-bound Harvard Bridge cars at the Massachusetts station of the Boston Elevated Railway.

Car Shipment Rate Fixed.—In a decision handed down by the Illinois Public Utilities Commission on Oct. 1 in the case of C. E. Hazlett versus the Illinois Traction Company, the rate for the shipment of street cars over interurban railways when the cars are mounted on trucks and run on their own wheels is fixed. The rate per car for a minimum of 50 miles is 30 cents a mile and for the trailer 15 cents a mile. The plaintiff charged that he had been required to pay what he considered an exorbitant rate for the shipment of two cars from Decatur to Springfield.

State Traffic Commission in New Jersey.—Uniformity in traffic regulations of cities and towns throughout New Jersey is the goal of a movement given definite impulse when Governor Fielder named a commission to draft a proposed uniform measure for adoption all over New Jersey. Job H. Lippincott, State motor vehicle commissioner, is chairman, the two other members being J. V. Hamburg, of Newark, president of the Newark Board of Trade and the Automobile Club of Essex County, and George B. LaBarre, commissioner of public safety at Trenton.

Company Sustained in Revere (Mass.) Transfer Case.—The Massachusetts Public Service Commission has dismissed the petition of residents of Revere, a suburb of Boston, for the establishment of free transfers on the Bay State Street Railway at the junction of Park Avenue and Broadway. The petitioners sought a 5-cent fare to Lynn. The commission states that if the petition should be granted the residents of Lynn would naturally demand transfers from all lines to Revere Beach. This the board deems unreasonable, since the company maintains a 7-cent rush hour fare through the sale of tickets good over the line in question. The petition was dismissed with the recommendation that the company advertise the tickets and make them more readily available to patrons.

Chicago Elevated Railways' Safety Movement.—At the weekly luncheon of the Chicago Jovian League, held at the Hotel Sherman on Sept. 28, J. H. Mallon, assistant superintendent of transportation, delivered an illustrated talk on the "safety first" movement of the Chicago Elevated Railways. This was followed by an address by Dr. H. E. Fisher, special medical examiner of the elevated railways regarding the company's plan in furnishing first aid to the injured. A number of first-aid stations have been established over the railway system at the different carhouses and shops and squads of employees have been trained in first-aid work. In connection with Dr. Fisher's address, a first-aid squad demonstrated the methods used in connection with various kinds of injuries needing attention.

Objection to Running Board.—On Oct. 1 the Ontario Railway & Municipal Board heard the objections of the street railwaymen's union to the continuance of the use of the open cars with running board. The men desire a center aisle substituted for the running board. R. J. Fleming, general manager of the Toronto Railway, said that to abolish the step on the cars would so reduce the seating capacity that it would be necessary to put on an additional 300 cars to maintain the service. This the company could not afford to do. In consequence of the unsettled conditions caused by the war, the receipts were falling off. Even during the exhibition period the decrease was more than $20,000 compared with previous years. The board decided to defer action until its own experts have reported on the matter.

The Hocking Valley Railroad Case.—Interesting developments may grow out of the controversy between the State Public Utilities Commission and the Hocking Valley Railroad over the suspension of electric car service on the Wellston & Jackson Belt Line. The commission ordered the company to resume electric service on Sept. 15. Instead, the company undertook to furnish a steam train service on the old electric schedule. It was announced at the time that this would be done if it was found that the power house was not capable of furnishing power to operate electric cars. The company then appealed the commission's order to the Ohio Supreme Court on the ground that it does not have authority to dictate the kind of service that shall be given. Suit has now been instituted at Jackson, Ohio, to collect $1,000 a day as penalty from the company for refusing to comply with the commission's order, as provided in the latest law governing the duties of that body.

Service Hearing in Washington.—The Public Utilities Commission of the District of Columbia will hold a formal hearing on Oct. 26 for the purpose of considering the adoption of standards of street railway service in the District of Columbia. The object of such standards is formally to establish what service the utilities will be required to furnish, and to simplify the procedure of the utilities in changing their schedules to meet the varying conditions of traffic. The standards which the commission will present for discussion are as follows: Seventy-five seats per 100 passengers during the half hour of maximum traffic during each of the two rush periods of the day; 125 seats per 100 passengers during every hour of the non-rush periods of the day. These figures are the result of a study of the conditions of traffic obtaining in the district and are based on the requirement that the utilities furnish during non-rush hours a seat per passenger and furnish during the half hour of heaviest traffic of rush hours enough cars so that the standing room will not be overcrowded.

Personal Mention

Dr. Arthur W. Elting has been appointed chief surgeon of the United Traction Company and of the Hudson Valley Railway, with headquarters at Albany, N. Y.

Mr. F. E. Whitlock, for nine years superintendent of overhead, third-rail and bonding for the Northern Electric Railway, Chico, Cal., has resigned to devote his attention to his other business interests.

Mr. Charles H. Pegler, Elgin, Ill., has been appointed general attorney for the Aurora, Elgin & Chicago Railway. He assumes the new position on Oct. 1, and will have offices in Elgin and Wheaton.

Mr. George D. Rice, who retired as general superintendent of the Omaha & Lincoln Railway & Light Company, Omaha, Neb., on Oct. 1, was presented with a cut glass water service by the train men in the employ of the company as a token of esteem.

Mr. Eugene F. McKinley has been appointed general counsel for its street railway holdings in the State of New York by the New York, New Haven & Hartford Railroad. This places him in charge of all the legal work of the New York & Stamford Railway and the Westchester Street Railroad.

Mr. B. I. Spock, counsel for the New York, New Haven & Hartford Railroad for Connecticut, has been appointed general solicitor of the company. Mr. Spock reports to Mr. E. G. Buckland, general counsel for the company and vice-president. Mr. Spock's office continues at New Haven, and counsel for the several states will report to General Solicitor Spock.

Mr. S. H. Bennett, for some years auditor of the Hagerstown & Frederick Railway, Frederick, Md., has been appointed general auditor of the company in charge of all the accounting of the road, and also for the Frostburg Electric Company, which was recently acquired by the railway company. Mr. Bennett has long been engaged in railway work, and has been with the railway at Frederick since its inception.

Albert E. Peirce

Mr. Albert E. Peirce, formerly assistant general manager of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., has been elected vice-president of the Wisconsin-Minnesota Light & Power Company, formed to take over the properties of the Chippewa Valley Railway, Light & Power Company, the Chippewa Valley Construction Company and the La Crosse Gas & Electric Company. Mr. Peirce began his electrical career with the Brooklyn Heights Railroad in 1898, where he worked in the shops and the line department. He later served a year and a half in the testing department of the Westinghouse Company at East Pittsburgh ,Pa. After a short experience with the Christensen Engineering Company, installing air brakes in the New England States, he went with Rossiter, McGovern & Company, New York, and for about two years installed apparatus in the East. Mr. Peirce became connected with the Pennsylvania Steel Company, Steelton, Pa., as electrical engineer of the bridge and construction and the frog and switch departments. In 1905 he took charge of the Indian Territory Traction Company at South McAlester, I. T., remaining during the reorganization of that company into the Choctaw Railway & Light Company. Later he entered the General Electric Company power and mining department in the Chicago office. Until the fall of 1907 he was located in Minneapolis, Minn. He became connected with the Chippewa Valley Railway, Light & Power Company at the commencement of its development work.

Mr. L. C. Morris has been appointed traveling passenger and freight agent of the Empire United Railways, with offices at Rochester, N. Y. Mr. Morris is twenty-seven years of age and has been engaged in railroad work for the last nine years. His first work was as stenographer at the Ithaca freight office of the Lehigh Valley Railroad and later assistant cashier at that office. He was subsequently transferred to the office of the district passenger agent in Ithaca as assistant city ticket agent. This position he held for four years. He was then appointed to the Lehigh Valley Railroad as city passenger and ticket agent at Rochester, which position he has held for more than two years.

Mr. Russell Gould, who for the last two years has been superintendent of substations of the Northern Electric Railway, Chico, Cal., has been appointed superintendent of power with jurisdiction over the substations, overhead, third-rail and bonding. Mr. Gould was graduated in 1903 from a five-year course in civil and electrical engineering at the University of Georgia. He spent the next four years at the Schenectady works of the General Electric Company, being employed in the testing and in the drafting departments. For a year he was engaged in life insurance work in Mexico, and during the next four years was connected with the Texas Traction Company as electrical engineer on its Dallas-Sherman-Denison interurban line. This last position he resigned two years ago to become superintendent of substations with the Northern Electric Railway.

OBITUARY

Augustus Wilder Sexton, Jr., treasurer of Westinghouse, Church, Kerr & Company, New York, is dead. Mr. Sexton was born in Staten Island thirty-nine years ago. He is survived by his widow and one daughter.

Arthur W. Jordan, traffic agent and park manager of the Chicago & Joliet Electric Railway, Joliet, Ill., is dead. Mr. Jordan was born in St. Joseph, Mich., on Nov. 28, 1865, and virtually spent his entire life in electric railway traffic and park work. He began his career with the Grand Rapids (Mich.) Street Railway, and in 1904 was appointed assistant general agent and freight agent of the Ohio Electric Railway, Columbus, Ohio. In January, 1908, Mr. Jordan became traffic agent and superintendent of Dellwood Park, controlled by the Chicago & Joliet Electric Railway. For several years he was active in traffic matters and served as chairman of the traffic committee of the Illinois Electric Railways Association.

Gardiner M. Lane, of Lee Higginson & Company, Boston, Mass., is dead. Mr. Lane was at one time assistant to President Charles Francis Adams, of the Union Pacific Railway. He advanced from a clerk in the office of Lee Higginson & Company to partnership in the firm. Mr. Lane was a director in many industrial, railroad and public service corporations, among them the Interborough Rapid Transit Company, New York; Massachusetts Electric Company, Boston, Mass.; Pennsylvania Water & Power Company, Holtwood, Pa.; Puget Sound Electric Railway, Seattle, Wash.; Puget Sound Traction, Light & Power Company, Seattle, Wash.; Rapid Transit Subway Construction Company, New York, and the Seattle (Wash.) Electric Company.

Frank Caum, general manager of the Scranton (Pa.) Railway, is dead. Mr. Caum was born in Harrisburg, Pa., about forty-eight years ago. After attending the public schools he entered the shops of the Pennsylvania Railroad at Harrisburg. Subsequently he went to Rochester, N. Y., and was eventually appointed superintendent of the street railway power station there. He afterwards held similar positions in Jersey City and in Meriden. At the solicitation of Mr. Norman McD. Crawford, now president and general manager of the Reading Transit & Light Company, Reading, Pa., who was manager of the Hartford (Conn.) Street Railway, Mr. Caum entered the service of the company at Hartford eleven years ago as superintendent of the power station on Commerce Street. Afterwards he became superintendent of the Hartford Street Railway, succeeding Mr. John Deloury. When the Connecticut Company absorbed the Hartford Street Railway, Mr. Caum continued with the new owners as manager of the Hartford division about a year. He then accepted the position of manager of the system in Scranton.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***California Terminal Railway, Sacramento, Cal.**—Application for a charter has been made by this company in California to build an electric railway to go by ferry from San Francisco to some point on the shore of San Francisco Bay or San Paolo Bay and thence through Marin, Sonomo, Napa, Solano, Yolo and Sacramento counties. Branch lines to Petaluma and Napa are also planned. Capital stock, $200,000. Incorporators: C. W. Conlisk, San Francisco, and W. M. Rank and C. H. Lind, Alameda.

***Lula-Homer Railway, Lula, Ga.**—Application for a charter has been made by this company to build a 15-mile interurban railway from Lula to Homer. Headquarters: Lula. Capital stock, $200,000. Incorporators: S. A. Carter, W. A. Boling, B. E. Chapman, Joel Coffee and E. F. Whitworth, Lula; C. H. Chambers and E. A. Mize, Homer.

FRANCHISES

Gadsden, Ala.—Plans have been worked out for the preliminary survey for the proposed electric railway from Gadsden to Centre through a part of Cherokee County. It is planned to build a bridge across the Coosa River and extend the line to East Gadsden.

Calgary, Alta.—The Chestermere & Calgary Suburban Railroad has asked the Council for an extension of time on its franchise in which to build its projected electric railway from Calgary to Chestermere Lake, Alta. Griffiths, Ford, Wright & Miller, Calgary, solicitors.

Benecia, Cal.—The Benecia Land & Terminal Company has asked the Council for a franchise to the city limits on the Vallejo Road in Benecia. A franchise in Vallejo will be applied for at an early date of the City Council, and the Supervisors at their next meeting, in October, will also be asked to grant permits over certain county roads. This is part of a plan to build an electric line from Benecia to Vallejo and a line from Benecia to Winters, via the Berryessa Valley. [E. R. J., Aug. 22, '14.]

Fresno, Cal.—The Fresno Interurban Railway has asked the Council for a franchise to extend its line out Fresno Avenue to Mahoney, thence to Blackstone, north to Weldon and out that street to the Normal school, a distance of 1½ miles. As soon as the line to the school is completed, work will begin on the unit to Clovis from Alvina Heights.

Los Angeles, Cal.—The Pacific Electric Railway has received a twenty-one-year franchise from the Council over certain sections of Sixth Street and Central Avenue in Los Angeles.

San Francisco, Cal.—Members of the North Beach Promotion Association have asked the Board of Supervisors to authorize the San Francisco Municipal Railway to extend its line down Stockton Street to the Embarcadero.

Stockton, Cal.—The Tidewater Southern Railway has asked the Council for a franchise to extend its tracks in Stockton to connect its warehouses, manufactories and other industries and enterprises within its line of railway and for the purpose of connecting its line with the tracks of other railroad companies in Stockton.

Franklin, Mass.—The Milford, Attleboro & Woonsocket Street Railway has asked the Council for a franchise to relocate its tracks on Central Street in Franklin.

Swampscott, Mass.—The Bay State Street Railway has received permission from the Council to double track Humphrey Street from the Lynn line to Commonwealth Avenue in Swampscott.

***Ypsilanti, Mich.**—The Ypsilanti Street Railway has asked the Council for a franchise to build an electric belt line in Ypsilanti and to arrange to use the tracks of the Detroit, Jackson & Chicago Railway on Michigan Avenue, Washington, and West Cross Streets in Ypsilanti. Frederick H. Zeigen, Detroit, president.

TRACK AND ROADWAY

Edmonton (Alta.) Radial Railway.—Arrangements have been made by this company with the Hudson's Bay Company to have the work of paving and laying tracks for the line on Portage Avenue begun at once.

Pacific Electric Railway, Los Angeles, Cal.—Right-of-way has been secured by this company from Riverside to Corona via Yorba Linda, Brea and Whittier. The Harbor Commission has requested this company to remove certain tracks crossing the northern end of Municipal Dock No. 1 and serving the Miner fill and docks of the Outer Harbor Dock & Wharf Company. In the event of the removal of these tracks the Miner fill people will be expected to construct tracks on their own property up to the adjoining city lands.

Marin County Electric Railway, Mill Valley, Cal.—The Railroad Commission has issued an order granting this company an extension of time until April 1, 1915, in which to sell the stock previously authorized for the construction of an electric railway in Mill Valley, Marin County. W. Wesley Hicks, 320 Market Street, San Francisco, chief engineer. [E. R. J., June 13, '14.]

***Redlands, Cal.**—Plans are being considered to build an electric railway from Redlands Junction to Yucaipa via Redlands. G. S. Biggin and E. A. Warner are among those interested.

Stockton (Cal.) Electric Railway.—All legal preliminaries having been completed actual construction of the extension of the El Dorado Street line of this railway to Tuxedo Park will begin within the next few days.

Danbury & Bethel Street Railway, Danbury, Conn.—The Public Utilities Commission has approved the plan of this company for the reconstruction of its track on White Street, Danbury, and the construction of a turnout at that place.

Washington Railway & Electric Railway, Washington, D. C.—By unanimous consent the House has passed a Senate bill authorizing this company to extend its tracks from the point where its present tracks intersect Portland Street Southeast, thence along Portland Street in a westerly direction to Fourth Street Southwest in Washington, D. C.

St. Petersburg & Gulf Railway, St. Petersburg, Fla.—The extension of this railway on Ninth Street north and eastward on the Johns Pass Road half way to Coffee Pot Bayou is completed and will soon be placed in operation. This extension is the first part of a loop that will be completed eventually to connect the former North Street terminus and the Coffee Pot terminus.

St. Elmo, Springfield & Northern Traction Company, Springfield, Ill.—This company, incorporated in 1907 for the purpose of building an electric railway from St. Elmo to Springfield, Ill., has filed notice of dissolution with the State Public Utilities Commission.

***East Dubuque, Ill.**—Plans are being made to form a company to build an electric railway to connect Platteville with Lancaster, the county seat of Grant County, the inland villages west and north, and also to connect with the Chicago, Milwaukee & St. Paul Railroad and the Chicago, Northwestern Railroad at Shullsburg, the Illinois Central Railroad at Apple River, Ill., the Chicago, Great Western Railroad at Stockton and the several lines at Freeport, where connections will be made with the Illinois Traction System, thus giving Grant County a direct route with Chicago. This is not a new railway project, it having been in process of promotion for several years by Engineer Palmer, who has been working on the proposition ever since the Fox line to Platteville was abandoned.

Tri-City Railway, Davenport, Ia.—The new line on Thirty-eighth Street from Eighteenth Avenue to Seventh Avenue connecting with the Fourth Avenue line in Rock Island has been placed in operation by this company.

Manhattan City & Interurban Railway, Manhattan, Kan.—It is reported that this company will operate its cars into Junction City over its own tracks and that work on the addition to the line to Fort Riley into Junction City will be begun at once. The managements of the Manhattan and Junction City companies were unable to come to an agreement for the use of the Junction City to Fort Riley electric line.

New Orleans Railway & Light Company, New Orleans, La.—Elaborate improvements will soon be made by this company on its property along the New Basin Canal at West End to facilitate the landing of passengers for the city's West End Park, which is to be opened next spring. The company will remove the old bridge and in its stead will erect a new passenger bridge, 250 ft. nearer the lake than the old one. This structure will cost about $45,000. The whole improvements, including the bridge, will cost $65,000 or $70,000.

Quebec Extension Railway, Presque Isle, Maine.—Surveys have been completed and plans are being made by this railway to begin construction in 1915 for its 100-mile line between Washburn and Quebec. It will extend across the northern part of Maine to connect the existing lines at Quebec and New Brunswick, and across New Brunswick to the Quebec border. [E. R. J., Aug. 15, '14.]

Wahpeton-Breckenridge Street Railway, Breckenridge, Minn.—Work has been begun by this company tearing down the old wooden poles along its lines and replacing them with new steel posts.

St. John (N. B.) Railway.—This company is asked to consider plans to extend its lines through Simonds, St. John County.

Frontier Electric Railway, Niagara Falls, N. Y.—If the necessary franchises are obtained from the Councils of Tonawanda and North Tonawanda this fall this company will begin work on the line which plans to parallel the International Railway's new line which will enter Niagara Falls over a private right-of-way paralleling the Erie Railroad. It will extend over the private property to Portage Road and along Portage Road to Niagara Street, where it will connect with the present Niagara Street line.

Durham, N. C.—Preliminary arrangements are being made to organize a company to build the 12-mile electric line between Durham and Chapel Hill. C. G. Creighton, Durham, is interested. [E. R. J., March 14, '14.]

Cleveland (Ohio) Railway.—This company is asked to consider plans to extend its Madison Avenue line from its present terminus at West 117th Street to Rocky River in Cleveland.

Columbus, Delaware & Marion Railroad, Columbus, Ohio.—The city of Columbus has granted this company the right to use T-rails on Hudson Street and Indianola Avenue. The improvement had been delayed because of the franchise provision demanding the use of grooved rails. Residents of the vicinity petitioned the City Council to allow the company to use T-rails on condition that the work be completed this fall.

Dayton, Middletown, Reading & Cincinnati Company, Middletown, Ohio.—If the property can be secured, it is possible that this company will use the Miami & Erie canal bed for its right-of-way. The plan, however, is yet unmatured. The engineers are at work on Reading Road, the original route contemplated, and the officers state that they are in no hurry to begin actual construction and would prefer to wait until the European war is over to finance the proposition. This will give time to consider the use of the canal bed. [E. R. J., June 13, '14.]

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio.—It is reported that Close Brothers, of London, England, will furnish $100,000 for the completion of this line between Nelsonville and Athens. This firm is building a large central station in the coal field at Floodwood, which will be near the new traction line. It will furnish power and light to a number of towns in the Hocking and Sunday Creek valleys and in other sections of the State.

Sudbury-Copper Cliff Suburban Electric Railway, Sudbury, Ont.—This company, which plans to build an electric railway from Sudbury westerly to Copper Cliff and from Sudbury easterly to Coneston, has elected the following officers: J. J. Mackey, president; J. H. Morin, vice-president, and M. J. Powell, secretary. [E. R. J., July 11, '14.]

Toronto, Ont.—The series of thirty meetings organized in the various municipalities interested in the project of building an electric railway from Toronto to Markham, Port Perry, and other points, is being held, and the final meeting is being arranged for Oct. 17. The vote will be taken in the various municipalities Oct. 19. The question to be submitted to the ratepayers will be whether authority shall be given to the various Councils to raise the amounts which will make up the $3,954,914, which is the estimated cost of the building and equipment of the 77½ miles of proposed railway. [E. R. J., Oct. 3, '14.]

Toronto & Suburban Railway, Toronto Junction, Ont.—The Toronto-Woodbridge extension of this company's lines, which has been under construction for nearly two years, is nearing completion, and it is expected will be in operation in October. An hourly service will be inaugurated to Woodbridge with a fifteen-minute schedule to Weston.

Uxbridge, Ont.—A by-law to raise $202,665 for the construction of an electric railway in Uxbridge will be submitted and voted on, Oct. 19, by the ratepayers in Uxbridge.

***Waterford, Ont.**—The Hydro-Electric Power Commission of Ontario is contemplating the construction of an electric line from Brantford to Waterford via Burford, Scolland and Oakland. It is the intention to build a substation in Waterford this winter. W. W. Pope, Continental Life Building, Toronto, secretary. F. A. Gaby, engineer.

Berks & Lancaster Railway, Lancaster, Pa.—Work has been begun by this company on its line which will extend from Lititz to Womelsdorf and from Clay to Kleinfeltersville. V. J. McGlesney, Phoenixville, is interested. [E. R. J., June 27, '14.]

Conestoga Traction Company, Lancaster, Pa.—A 3-mile extension from Marietta to Maytown is being planned by this company.

Philadelphia (Pa.) Rapid Transit Company.—This company is asked to consider plans to build an extension on Fifty-sixth Street in Philadelphia.

Nashville (Tenn.) Traction Company.—Track laying for this railway has been begun on additional streets by the Detroit & Nashville Traction Company, organized to do the construction work. Tracks have been laid on the Shelby Avenue line, and it is announced that rails will be laid on the McGavock Avenue bridge in the next two or three weeks. The tracks have been completed on Fifth Avenue from Crawford Street to Mulberry Street and on Lafayette from Second Avenue to the city limits, and it is expected that cars will begin to operate the latter part of November. [E. R. J., Sept. 5, '14.]

***West Virginia Electric Company, Owensport, W. Va.**—This company is being organized to build a 50-mile electric railway from Owensport to Weston, W. Va.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Plans are being made by this company to begin work soon on the construction of its new depot in Gardena.

Moncton Tramways, Electricity & Gas Company, Ltd., Moncton, N. B.—This company's carhouse at Moncton was destroyed by fire on Sept. 14. The loss is estimated to be about $10,000. Plans are being made to rebuild at once.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—Plans are being considered by this company to build a large modern carhouse in Portsmouth in the spring.

Salt Lake & Ogden Electric Railway, Salt Lake City, Utah.—Plans are being considered by this company and the Ogden Rapid Transit Company to build soon a joint interurban terminal on Twenty-fourth Street between Grant Avenue and Lincoln Avenue in Ogden. The structure will be two stories high with a frontage of 50 ft. on Twenty-fourth Street and will extend 270 ft. from Twenty-fourth Street north into the center of the block. Entrance to the terminal by the cars of both companies will be from Lincoln Avenue.

Southern Traction Company, Dallas, Tex.—This company has opened a new passenger station at Alma. Its new brick depots at Palmer, Milford and Forreston are nearing completion.

POWER HOUSES AND SUBSTATIONS

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company will add to the equipment of the West Allis substation two 5000-kva water-cooled transformers, switches, current transformers and accessories. The contract for the apparatus has been placed with the General Electric Company.

Manufactures and Supplies

ROLLING STOCK

Charleston (S. C.) Consolidated Railway & Lighting Company is reported to have purchased twelve all-steel city cars from the Cincinnati Car Company.

TRADE NOTES

Walter B. Snow, Boston, publicity engineer, has removed his offices to Rooms 511-516, in the new Federal Street Building, 136 Federal Street.

C. W. Lee Company, New York, has moved its offices from 90 West Street to 56 Pine Street. C. W. Lee, the active head of the concern, has handled many important public utilities during the past ten years.

D. M. Donnan of the Boston sales office of the Westinghouse Electric & Manufacturing Company, has resigned, effective Oct. 1, 1914, to become the manager of the Electrical Engineering & Manufacturing Company, with offices in the First National Bank Building, Pittsburgh, which will represent the Morgan Crucible Company, Ltd., in the Pittsburgh district for the sale of Morganite and Battersea carbon brushes. Mr. Donnan before he went to Boston was connected for a number of years with the New York and East Pittsburgh offices of the Westinghouse Electric & Manufacturing Company.

A. M. Byers, Pittsburgh, Pa., has recently completed a new galvanized plant at its mills in Pittsburgh which contains modern equipment for manipulating its wrought-iron pipe galvanizing process. The Byers galvanizing specifications call for a hot metal process, a coating of high-grade prime Western spelter, and a deposit 100 per cent heavier than that required in government galvanizing specifications. A careful weighing and inspection before galvanizing; the device for turning the pipe in the baths; the extra long cleansing period; the pyrometer regulated kettles; the superior quality and absolute purity of the spelter, and the final weighing that assures the proper coating—each of these steps are specialized and handled by experts. The spelter bites down deeply into the porous uniform texture of the wrought-iron pipe, coating it thickly and evenly, thus minimizing possibility of flaking.

Esterline Company, Indianapolis, Ind., reports the shipment of "Golden Glow" headlights to the following electric railways in the month of September: Texas Traction Company, Dallas, Tex.; Standard Steel Car Company for cars being built for the Mahoning & Shenango Railway & Light Company; Lynchburg (Va.) Traction & Light Company, Muskegon (Mich.) Traction & Lighting Company; Georgia Railway & Power Company, Atlanta, Ga.; Roanoke (Va.) Railway & Electric Company; Pacific Gas & Electric Company, Sacramento, Cal.; Meridian (Miss.) Light & Railway Company; Corry & Columbus Street Railway, Corry, Pa.; Tidewater Power Company, Wilmington, N. C.; Memphis (Tenn.) Street Railway; Jewett Car Company for cars being built for the Geary Street Municipal Railway, San Francisco, Cal.; Lincoln (Ill.) Railway & Light Company; Seattle Car & Foundry Company, Seattle, Wash.; Virginia Railway & Power Company, Norfolk, Va., and Cleveland & Eastern Traction Company, Cleveland, Ohio.

ADVERTISING LITERATURE

American Electrical Works, Phillipsdale, R. I., has issued a price list, effective Sept. 24, of its wire and cable materials.

Prepayment Car Sales Company, New York, has issued an advertising card in regard to its booth at the A. E. R. A. Convention.

Monarch Pneumatic Tool Company, St. Louis, Mo., has issued Bulletin 18-A, describing its various types of pneumatic tools.

Arnold Company, Chicago, engineers, have issued a postcard photograph of the new car shops of the Chicago & Eastern Illinois Railroad at Danville, Ill.

Railway & Industrial Engineering Company, Pittsburgh, Pa., has issued a booklet which contains a discussion, accompanied by diagrams, showing the advantages of raising the voltage for d.c. distribution for electric railways.

St. Louis Car Company, St. Louis, Mo., has issued a folder describing the Thompson slack adjuster; lined and unlined rattan for seating; longitudinal cushions and backs, upholstered in rattan, leather, carpet and plush and vertical wheel brakes.

Van Dorn & Dutton Company, Cleveland, Ohio, has distributed among its friends and patrons in the traction field an attractive and instructive wall hanger. In halftone illustrations this shows the evolution that has taken place in cars for street and interurban railway transportation service. It also contains a message on gears and pinions and a short story on economical operation.

Harrison Safety Boiler Works, Philadelphia, has issued a folder describing its Cochrane metering heater, precision meter, multiport safety exhaust outlet valve, flow valve, steam-stack and cut-out valve heater and receiver, separator and Sorge-Cochrane hot-process, water-softening system for steam-power plants. A diagram in the folder indicates the location of this company's exhibit at the A. E. R. A. convention.

Sprague Electric Works of General Electric Company, New York, has issued Bulletin No. 48,700 describing its electric monorail cranes for efficiency in modern industrial plants. The catalog contains a complete description of these cranes and shows many illustrations of actual installations. This bulletin is supplemented by a small folder describing electric hoists for the efficient handling of all loads. Bulletin No. 48,701, which supersedes Bulletin No. 112, describes in detail electric dynamometers for measuring horse-power, generated or absorbed. Actual values of torque and speed can be measured at any loads and speeds within the range of the machine under test.

Union Electric Company, Pittsburgh, Pa., has issued a bulletin descriptive of the Melobeam headlight, the latest development made by the Crouse-Hinds Company in incandescent headlights for either surface or flush mounting. The flush type is the same size as the Crouse-Hinds type "Z" and is therefore interchangeable. It may be equipped with either clear or Noglare doublet lens and will accommodate any concentrated filament mazda lamps from 23 to 94 watts by merely adjusting the receptacle in the case. Lamps are mounted in a vertical position, insuring the longest possible life. The lamps are intended to be burned in the headlight in series with the car lighting circuit usings lamps of the same wattage and voltage as those burned in the car. However, in cases where a larger lamp is desired in the headlight than those used in the car, a special resistance can be furnished in the headlight, making it possible to use larger lamps independent of the car-lighting circuit. This company has also issued a folder on Keystone porcelain strain insulators, guy wire type, for requirements of high insulation and great mechanical strength.

Railway Appliances Company, Chicago, has issued an attractive catalog describing the Ray snow flanger, important changes in which have been made in its lifting mechanism which make it automatic in action. In the improved design the flanger is forced to the lowered position under air pressure, and as soon as the engineer or engineman release the air the auxiliary springs automatically and quickly raise the flanger to the uppermost position, where it remains until the air pressure is again applied. An illustration in the catalog shows a flanger attached to the body of a General Electric locomotive. Other illustrations show an application of the flanger to an interurban car of the Davenport & Muscatine Railway, Davenport, Ia. Flangers can be either mounted on the truck or to the car body. Flanging blades can be made to take a considerable depth of snow and thus eliminate to a large extent the use of wedge plows and other heavy snow-fighting equipment. The whole mechanism is so designed that it will clear bridges and guard rails, and cars can be run over city pavements, as the flanging blades do not extend below the head of the rail. In a special design adapted for third-rail lines the blades are so arranged that the snow at all times is thrown to one side of the right-of-way and away from the third-rail. When flangers are required for light interurban service the application may be made directly upon the truck. In this position it is possible to neck the cutter knives, allowing the flanger blades to project below the ball of the rail, thus effecting a clean flangeway and full tractive effort.

Electric Railway Journal

DAILY EDITION

Published at the Annual Conventions of the American Electric Railway Association and Its Affiliated Associations

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PROGRAM FOR TO-DAY

CONVENTION MEETINGS

9:00 a.m.	Meeting of the Transportation & Traffic Association, Greek Temple, Convention Pier.
9:30 a.m.	Joint Session of Engineering Association with Claims and Transportation & Traffic Associations, Greek Temple, Convention Pier.
9:30 a.m.	Opening meeting of Accountants' Association, Accountants' Hall, Second Floor of Convention Pier
11:00 a.m.	Session of Claims Association, Claims Hall, Convention Pier.
11:00 a.m.	Joint Session of Engineering Association with Transportation & Traffic Association, Greek Temple, Convention Pier.
2:00 p.m.	Opening meeting of American Association, Greek Temple, Convention Pier.

ENTERTAINMENT

10:00 a.m.	Obstacle Golf, Marlborough-Blenheim Lawn.
11:00 a.m.	Concert by Engel's Orchestra, Lobby, Convention Pier.
11:00 a.m.	Trapshooting Practice, End of Convention Pier.
3:00 p.m.	Ladies' Cards, Parisian Garden. Convention Pier.
4:00 p.m.	Obstacle Golf. Marlborough-Blenheim Lawn.
9:00 p.m.	Informal Dancing, Ball Room, Convention Pier.

The Opening of the Convention

The association is again fortunate in weather conditions for its annual convention. Atlantic City can do no better, and while the pier is well protected against rain, the kind treatment afforded by the weather bureau this year, at least so far, during convention week has certainly been appreciated. The exhibits show no sign, either in number or quality, of any financial stringency, and in point of individual and collective interest, are equal, if not superior, to those of preceding conventions. It is yet too early to say much that is definite in regard to the number of attendants. According to the secretary's office the advance registration was as large as usual, namely about 700, and as the sessions of the American and Accountants' Associations do not begin until to-day it is hard to tell how many others will arrive until this afternoon. This year's arrangements for both the exhibits and the technical sessions are exceptional and there is every reason to expect as successful a convention as any of previous years.

The Association and the Colleges

We do not usually think of the American Electric Railway Association as closely related to the colleges, and it is true that the relation has not been as close as it can be made. It would be an excellent plan for the railway association to co-operate with the National Electric Light Association in the effort which is being made to bring the industry and the schools closer together. It is understood that a much larger number of teachers than usual will attend the Atlantic City convention at the suggestion of the association. If they receive a hearty welcome they will want to come again. Let some of our good "mixers" show the newcomers that the practical man is in sympathy with the efforts of the teacher.

Standard Codes Now in Permanent Form

With the report of the committee on rules which was presented yesterday, the standard codes for city and interurban service have at last taken practically permanent form. The fact that during the last five years both codes have been made subject to extended annual changes has militated against their general adoption, but now that they have reached the point where the probability of further extended revisions is exceedingly slight there exists no longer any reason why they should not be accepted in toto by every electric railway in the country. Such minor changes as may be made from time to time in future may easily be included by the insertion of printed slips. Indeed, it is to be hoped that this procedure will be followed promptly by all those now using the city code in connection with the revision of rule 55 which was approved at yesterday's meeting, and which was the only change in the city code. The rule, as it stood before revision, was opposed by a number of well-known railway companies upon the plea that it gave offense to passengers, and we are glad that a greater latitude has been permitted in the information which employees are permitted to give out to patrons.

The Exhibits

It is not difficult for the experienced observer of the annual exhibits of the American Electric Railway Manufacturers' Association to see how the latest problems of the industry are reflected in the elaborate displays of specific groups of apparatus. This year the signal manufacturers deserve to be pointed out for exceptionally good work. Not only have they made many improvements in their apparatus during the past year, but they have also demonstrated that a signal system can be used for other purposes than elimination of accidents. Thus one type has lately been set up temporarily to replace flagmen on construction jobs, while another has accelerated traffic by eliminating train orders. It is also complimentary to the work of the American Electric Railway Engineering Association that several of the manufacturers are announcing their adoption of the standard A. E. R. A. aspects. The signal exhibits find a close second in the variety and ingenuity of fare-recording apparatus. In this line the latest developments have been in the direction of quicker transfer distribution and combination fare boxes for coins, metal tokens and tickets. Thus, while the prepayment method has long been an accomplished fact, there is still much room for apparatus which will enable one conductor to handle more readily the two hard conditions peculiar to American electric railway operation—the long big-capacity city car and the rush hour. Closely related to the fare-recording devices are some marvelous machines which sort, count and bag all the coin that an electric railway may be fortunate enough to collect.

The apparatus maintenance end of the electric railway business is represented this year by an extraordinary development of welding systems which are doing wonders to prolong the life of special work and to simplify the work of the trackmen in the installation of welded joints, while the handy portable welders now available for car shop use should cut down the scrap pile to still smaller proportions. It is almost needless to point out the numerous betterments in car equipment. The truckless car and the radial axle truck have taken another step forward in aiding the production of light-weight cars of "double-truck" length. The ventilated motor, lighter contactor control, voltage regulators for car lighting, headlights and heaters are among the electrical features which are still making advances toward greater economy and usefulness. The varieties in ventilators, the increased use of glazed sanitary fittings and the advent of illuminated route number signs in place of the exasperating block destination indicator are among the changes that show how the immediate comfort of the public is being looked after by the electric railway operator.

Conventionalities

Go to Abrahams and get fitted for a coat.

"Break we our watch up." Al "Shakespeare" Green.

Archbold, of Archbold-Brady, is piering about as arch and bold as ever.

Phoney Films No. 27: Beau Brummel McConnaughy in a straw hat on Oct. 12.

On the committee on taxation matters—W. F. Ham and F. W. Bacon. There's a team!

On Sunday Mr. and Mrs. S. S. Crane arrived from Altoona. Altoona's loss is a big gain for us!

The committee on entertainments has requested that all delegates and guests wear their badges at all times.

Champions may come and champions may go, but Pop Wilkinson still remains commander-in-chief of the roller chair brigade.

The Palmer family, so ably represented by G. W. and L. H., is long on convention honors, holding chairmanships in two committees.

J. S. Speer denies that his brushes are used for dusting clothes. He says they are intended for removing currants from electric plants.

An epigram sent in by the conductors of the Indiana Union Traction: "Take care of your Nicholls and the inspectors won't get you."

Have you seen Tom Casey's Million Dollar Pier on the Million Dollar Idea? Or is it the Million Dollar Idea on the Million Dollar Pier?

No, Clarisse, the name of the white-haired gentleman at the front door is not Paul Dohrman nor does he come from the Detroit United Railways.

At 3:20 p. m. Monday we lamped presidentissimo C. N. Black at the illuminated scoreboard of the Braves-White Elephants. Fans, fancy that!

Well, anyway, T. D. B. Griffin says that it's good practice to operate without train orders. If you'll go 'round to the booth he'll prove it with his little model.

J. P. Barnes of the Syracuse Interurban is reputed to be a singer but we don't believe it. Where is the mop of hair which invariably accompanies musical talent?

W. C. Callaghan, who resides in the shadow of the historic Last Chance Gulch, is inviting all of his old friends to go to Helena with him after the convention.

Nate Garland and Tom Mullaney got inside the money at the Engineers' Club golf tournament last week, the latter taking thirty-one putts on the second. Some golf!

No formal golf tournament is planned for this convention, but the usual arrangements have been made with the Atlantic City Country Club for those desiring to play.

Mr. and Mrs. George A. Barnes stopped at our booth on Sunday but not long enough so that all of us had a chance to meet the delightful Mrs. Barnes. Please come in again.

E. S. Fassett and his green velour hat are welcome visitors. The hat is bright green. Mr. Fassett is also bright (no, not green) from head to foot.

We were more than flattered on Sunday to learn that Mrs. H. M. Sperry is a constant reader of the Electric Railway Journal. It is indeed delightful to have secured the interest of so charming a scientist.

The kindly smile and keen gray eyes of our Engineering president, J. H. Hanna, illuminated the Boardwalk on Sunday, so we knew in advance that yesterday would mark the beginning of the best convention ever held.

H. G. Stott and Mrs. Stott, together with their son and daughter were among the very early arrivals on Saturday. Mr. Stott is responsible for the delivery of more power to electric railways than any other man in the world.

Newton W. Bolen, the banquet king of New Jersey, is snuffing the salt sea air like a Patagonian stallion to get up an appetite worthy of the next series of testimonial dinners given to him by his employees. We love you, too, Newt!

Be sure to try your skill at skee-ball at the Aquarium Court. It's the latest craze. Play as often as you like, but come early so everyone will have a chance. Prizes will be awarded to ladies and gentlemen who make the highest score.

Direct evidence as to the real value of the convention: B. J. Denman, assistant general manager of the United Light & Railways Company, has come here to investigate and get suggestions on several problems that have come before him recently.

When Messrs. Hackett and Renshaw, who are attending their first electric railway convention and who were introduced by Joe Renton to the industry via the Brighton punch route, they complained about the rocky road. These Federals aren't up to big league stuff yet.

Handsome Joe Alexander, chief engineer of the Cleveland Street Railway Commission, is having a hard time walking alone on the Boardwalk; commissioner Pete Marktwain Witt having been compelled to remain in Cleveland to explain the single tax to J. J. Stanley.

Having organized his work down to the finest detail, Secretary Burritt is now enjoying life. Yesterday, before breakfast, we saw him racing on horseback with Harlow Clark. He won by a length because his horse was sharper in front than the editor's and offered less resistance to the wind.

The genius which inspired the Bulletin Board placed on the ramp at the entrance to the Convention Pier certainly is entitled to credit for the position and prominence of it. Here every day will appear the entertainment provided that day for the members and guests and any special notices or added features that have presented themselves.

No more sailing. Yo! Ho! Nor a bottle of rum. No! For Dan Smith's good ship Virginia which has carried many a good railway friend on a pirates raid, now rests on the bottom of the Detroit River. On her last eventful voyage it is whispered that George Radcliffe of Cleveland and Frank Coates of Toledo played prominent parts.

H. H. Adams, the guy who stopped the holes in the sieve of receivership on the old Metropolitan, arrived on Sunday. He is now chairman of the committee on standards and, in addition to his other manifold duties, is also a member of another committee which has some important work to do at this convention. Ask him what that little book in his pocket is for—Martin Schreiber has one just like it, and so have several others.

General Manager Mutt and Little Jeff, the master mechanic, became separated yesterday from their genial friend and mentor, Miles Lambert, the prominent Irish engineer. "Jeff," remarked the general manager, "where is good old Lamb?" "Boss," replied Jeff, "You'll find him in the Shelburne grill, matching pennies with Miss LeGould." "This is the life," returned the general manager. "Let us join the game. We can see those pressed-steel motors when we get back home."

The convention opened yesterday morning with a good-sized attendance amid an outburst of patriotic music and colored lights in the foyer. F. Pincus presented Engel and his orchestra, which played "A Day at West Point," a blending of the famous music of the North and the South. The delegates remained standing while the strains of the Star-Spangled Banner were played, and the American flag, outlined in electric lights overhead, flashed its message of success to the 1914 convention.

CORNELL A. E. R. A. REUNION

Following the precedent establishment last year Cornell men of all classes '69 to '14 will gather for lunch at the Marlborough-Blenheim at or about 12:30 o'clock on Thursday. Men are requested to register promptly for the lunch at the Manufacturers' Association desk with Wylie Brown or W. L. Wright.

THE ST. LOUIS TRAIN

Fifty-five railway and supply men from St. Louis and the southwest, and a few ladies, arrived at Atlantic City at 3 p. m. Sunday. Elaborate preparations were made for a special train, but at the last minute it was found that quicker time could be made if special cars were attached to one of the regular fast trains going east. As a result of this decision the four special all-steel cars were set in with the regular seven-car train of the Pennsylvania's "New Yorker," which is a 24-hour train from St. Louis to New York City. At Harrisburg the four cars were made up and came through as a special train. In this way the conventionites reached here two hours earlier than would have been possible under the original plan.

The trip from St. Louis was made without unusual incident, and aside from the fact that some of the regular patrons of the "New Yorker" persisted in referring to the electric railway men as electricians no one would have known but that the train was a convention special. Several delegates picked up at Indiana and Ohio points came through on the train.

LADIES' AUCTION BRIDGE TOURNAMENT

The Parisian Garden has been especially provided for the afternoon card games, concerts and thé dansants. The ladies who intend to participate in the card games this afternoon are asked to be present for play promptly at 3 p. m., Oct. 13. The finals will be played to-morrow at the same place and same hour.

The prizes to be awarded for the winners of the contests are quite up to the standard set in past years, and will be given to the highest two teams or pairs of the fourth round. Full information in regard to the conditions of the games are published on page 20 of the entertainment program.

TRAP SHOOTING

All those who have brought guns are probably keen for the sport awaiting them on the end of the convention pier this morning at 11 o'clock, when the clay pigeons commence to fly over the waters of the Atlantic. Competition is open to wearers of the official badge, and the committee is hoping that this contest will bring out the lady shots of the convention. Practice shooting will be held on Tuesday from 11 a. m. to 1:30 p. m. and on Wednesday from 8 a. m. to 9:30 a. m. This promises to be an annual event. The tournament shoot will start Wednesday at 2 p. m., and there will be three contests, namely, for novices, supply men and railway men.

A professional trap shot will supervise the shooting and give instruction and advice. Guns and ammunition are provided to those that did not bring their own.

GETS 'EM GOING AND COMING!

We have heard of pay-as-you-enter cars and also of pay-as-you-leave cars, but P. N. Jones, of Pittsburgh, expects to put in operation a pay-as-you-enter, pay-as-you-leave car. Three-quarters of the space in this car will be run on the pay-as-you-enter principle and the other quarter on the pay-as-you-leave principle. This is the plan which will be applied to Mr. Jones' double-deck cars, which have been described in this paper, and beginning on Friday of this week the full service on the Fifth and Highland route in Pittsburgh will be furnished by these cars.

In these cars the entrance and exit are widely separated, and there are separate staircases leading to and from the upper deck. The conductor is placed between these stairways so that all of the passengers who use the upper deck and the passengers at one end of the car who use the lower deck have to pass him. These are the passengers who pay as they enter. The passengers in the rear lower deck are near the entrance door and pass the conductor only when they leave the car. These are the pay-as-you-leave patrons.

The idea is a novel one and Mr. Jones is curious to know how it will work out but is sanguine of the result. He has issued a folder to explain the system and has asked the cooperation of the public in making a success of this type of car.

YESTERDAY'S TEA DANCE

The afternoon concert and thé dansant, given in the Parisian Garden at 3 p. m. yesterday afternoon, made an instantaneous hit, and this feature will be continued up to and including Thursday. The setting followed yesterday in the foyer was very attractive, and the graceful tables, chairs and summery awnings bore a striking resemblance to those to be found on the boulevards of Paris and in the Champs d'Elysée and which are ever popular with the French crowds. The general effect fully justified the name of the Parisian Garden, selected by the entertainment committee.

THE CHICAGO SPECIAL TRAIN

There was a lot of fun and a fine crowd of jolly people, nearly 100 in number, on the Chicago Convention Special. This train ran from Chicago to Atlantic City over the Pennsylvania lines in less than twenty-two hours. The equipment was the counterpart of the Broadway limited. Friend Bixby, of the Chicago office of the Pennsylvania line, started the party eastward and mingled with the crowd until a doubtfully late hour. Some claim he detrained at Warsaw and others at Lima. At any rate he had the thanks of the crowd. This year's Chicago convention train brought a larger proportion of railway men than ever before.

This paragraph is about the ladies. There were twelve charming ones on the train, and it should be said that "a pleasant time was had by all." Most of the ladies played cards Saturday evening and watched the scenery Sunday. Through the courtesy of H. E. Chubbuck, vice-president executive, Illinois Traction System, packs of playing cards were distributed. There were several gentlemen, we desire to record, who brought their own cards, and one who brought some rattley things in a little black grip. Five gentlemen passed these little things back and forth until nearly morning, when one man had most of them.

Under the guidance of E. H. Noyes, whose middle name is Aluminum, a pool was organized, collected, posted, won and distributed. It was arranged to give three prizes to those who came nearest to having the time at which the observation platform passed the Pennsylvania shore abutment of the Delaware River bridge. Before announcing the winners, let us say that this was a contest of luck, not guessing ability. Now the winners were: Harry Monroe, General Electric Company, or Mrs. Monroe, for first prize. Certain people say Harry kept the money and others say they saw him give it to his wife. The second prize was drawn by No. 13, Eugene Soules, manager publicity department Illinois Traction System, and the third prize went to John F. Decker, general manager Auto Utilities Manufacturing Company, Chicago.

On the arrival of the train at Atlantic City at 3:39 o'clock Sunday afternoon, the Chicago contingent scattered to their various hotels and took up their individual parts of the busy convention life.

THE WEEK'S ENTERTAINMENTS

Each year the entertainment committee, with past records to exceed, has had a harder task in presenting a new, interesting and entertaining program, but this year there need be no doubt that that ideal has been fully accomplished. Carnival night, which has been arranged for Wednesday, is the exceptionally novel offering of this year, and regarding it the committee states euphoniously that surprises galore will be in store. The music, which has always been excellent, is quite up to the standard of previous years, with Engel's Orchestra playing for the concerts, as well as for the formal and informal affairs. Special attention has been given to the arrangement of the musical programs so that selections from grand opera, modern dances and the season's latest musical successes will be included.

Obstacle golf has been revived this year by special permission of the Messrs. White of the Marlborough-Blenheim, who have given the entertainment committee permission to use the entire front lawn of that hotel. An exceptional and interesting course has been laid out through the courtesy of Gimbel Brothers, of Philadelphia and New York, who assisted in its arrangement. This is a game that everyone can play, and the large crowds that have taken advantage of the opportunity to play this game in previous years suggest an early handing in of names. The bulletin board will announce the hour when the members of the committee in charge may be found on the course.

Entirely new to the convention this year will be the trapshooting contest. A number of experts have brought their own guns, and a lively and interesting event is promised. Novices are invited to join and guests will be provided with plenty of guns and ammunition. Skee-ball alleys, installed through the courtesy of J. D. Este Company, Philadelphia, have been located in the Aquarium Court, and prizes are offered for the ladies and gentlemen securing the highest number of points.

The dances, which have been so generally popular, have been arranged for Wednesday and Thursday afternoons. Alternating with the dances, tea will be served, and, in addition, an excellent concert program has been arranged. Special dancing features will be introduced at the formal promenade concert and ball which will take place on Thursday night in the ballroom of the Convention Pier.

The special privileges accorded the delegates and their guests at the convention and a program of the entertainments for the week have been published in an official program, copies of which are distributed from the registration booth.

MONDAY AFTERNOON CONCERT

The second concert presented by F. Pincus, of Philadelphia, with Engel's Symphony Orchestra in connection with the dansant Monday afternoon offered a most charming program. This included the overture "Triumphant Banner," Paull; Selection from "Faust," Gounod; Intermezzo "Eleanor," Deppen; overture "Zampa," Herold; selection from "Baron Trenck," Albini.

CARNIVAL NIGHT

It is intended that Wednesday's Carnival Night shall surpass all previous attempts at furnishing fun for the delegates and their guests. Many surprises are in store. There will be contest dances and the judges will be the audience, who will vote for their favorite dancers by ballot, insuring an absolutely popular choice. This is an opportunity for those with new steps to try them out. Kee-No dances will occur at different periods during the evening, and when the big dial is spun on the wheel of fortune, anybody may be the lucky one. It is hoped that every one will be sure to be on hand and help in the enjoyment of the evening.

FREE ROLLING CHAIRS

The rolling chairs will be available between the hours of 9 a. m. and 7 p. m., October 12 to 16 inclusive, and are free to the wearers of the official badges. A rate of 25 cents per person will be charged in the evening for direct runs from Convention Pier to hotels or from hotel to hotel. The rolling chair service is again in charge of W. H. Wilkinson, of the Pressed Steel Car Company.

THE ANNUAL RECEPTION

The annual reception opened the social activities of the convention last evening. The visiting delegates and their guests were received by President Charles N. Black, of the American Association, assisted by the officers and ladies of the affiliated associations. The receiving line formed to the left of the entrance, and the usual large number of the members and guests passed along the line. This is an opportunity that is being more and more appreciated, as an acquaintance with the heads of the various associations is bound to lend additional interest to the meetings. The reception opened with a concert by Engel's Orchestra. Promptly at 10 o'clock the officers and their ladies who had assembled in the booths around the ballroom were escorted to their position in the receiving line.

Madame Auld charmed everyone with her selections and provoked much enthusiasm and applause, responding gracefully to the audience's request for encores.

The general setting with the myriads of soft lights fused together with the handsome gowns of the ladies, presented a fairyland. Informal dancing continued until an hour consistent with the work ahead on the morrow, and all agreed that the dance program outlined for the week would share honors with the convention work.

HIGH SCORES IN SKEE-BALL CONTEST

The popularity of the skee-ball game in the Aquarium Court is shown by the fact that 1345 people played during the first day of the contest. The high scores up to 6 p. m. were as follows:

Mrs. W. E. Bryan	180	D. H. Ackerson	240
Mrs. George Allison	150	J. R. Ong	240
Mrs. C. Chamberlain	150	A. K. McCarthy	240

OBSTACLE GOLF

One of the popular diversions at the convention this year promises to be obstacle golf. One advantage of this game is that it does not require an expert knowledge of golf. Everybody can play obstacle golf, and if a person has never handled a golf club in his, or her, life, this presents an opportunity to take back a prize to show the real golfing friends at home. Judgment plays the principal part in covering this course with the smallest number of strokes, but everyone has a real chance to be a winner. The play is conducted on real grass costing $1 per blade—a privilege permitted through the courtesy of Messrs. White, of the Marlborough-Blenheim.

The competition is open to all ladies and gentlemen wearing the official badge. The only essential preliminary is for the contestant to register with the attendant, who will furnish each player with a special scorecard, balls and clubs. Attested scores are to be handed in on completion of play. The play opens on Monday at 2 p. m. and closes Thursday afternoon at 6 p. m.

Cardenas, a thriving city on the north coast in Matanzas Province, Cuba, expects work on its trolley to begin soon. The sale of the concession was effected recently. The cars will accommodate thirty-two passengers, and will run by storage batteries. There will be five branches traversing various parts of the city.

YESTERDAY'S SESSION OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

The first session of the Transportation & Traffic Association was held yesterday afternoon at the Greek Temple. Vice-President Brush called the meeting to order at 2:15. The first order of business was the presentation of the annual address of President Hegarty. This is published elsewhere in this issue.

Vice-President Brush then referred to the fact that on the resignation of Mr. Hegarty the executive committee of the association had appointed the first vice-president of the association acting president to serve out the time. An address from him was unnecessary and superfluous, but he would simply say that on March 1, 1914, he had followed the wishes of the executive committee, and it had been a pleasure for him to carry out so far as he could the work planned by Mr. Hegarty. He said it was extremely unfortunate for the association that Mr. Hegarty had found it necessary to resign and equally unfortunate that he was not able to be present at the convention.

Secretary Burritt then read the report of the executive committee which consisted of minutes of the meetings of the executive committee. The report was approved.

Secretary Burritt then presented the report of the secretary-treasurer. This was also approved.

Vice-President Brush then appointed the committee on resolutions consisting of Charles F. Hewitt, C. Loomis Allen and C. B. Buchanan.

Vice-President Nicholl then took the chair and appointed the following committee on nominations: J. N. Shannahan, H. C. Donecker and J. V. Sullivan.

REPORT OF COMMITTEE ON RULES.

L. H. Palmer then presented the report of the committee on rules and suggested that the changes recommended by the committee be considered rule by rule. He then referred to rule No. 55 in the City code which read "Motormen or conductors must not under any circumstances give any information whatever concerning any accident, delay, blockade, mishap to any person except to a properly authorized representative of the company." The committee recommended the following substitute: "Motormen or conductors may when necessary, however, advise passengers as to the general cause and probable duration of a blockade."

The committee strongly urged that this change should be made. The motion was seconded and carried.

Mr. Palmer then passed to the interurban code. Consideration of this code began with a general discussion as to how far it was desirable to change the diction of the old rules at the present time. This discussion was carried on by Messrs. Palmer, Henry, Shannahan, Bolen, Nicholl, Ching, Van Zandt, Choate, Donecker, Storrs and Allen. It was decided finally to consider each of the changes recommended by the committee as a separate matter. This procedure resulted in the approval of practically all of the revisions suggested by the committee, the exceptions being as follows: The definitions referring to signals were retained in the code. The suggestion that markers should be carried at the top of the rear end of the train and that classification signals should be carried at the middle of the front end of the train was rejected, the old arrangement of markers and classification signals being retained. A change in present rule 159 permitting a train to proceed on its time-table rights from an initial station when unable to reach dispatcher and a suggested new rule regarding the display of signals by trains which are annulled were also rejected. The suggested change for rule 185 was approved with an amendment as made by H A. Nicholl providing for protection at all times for trains which run by and back into double-end sidings. A suggested rule also failed of approval in which the responsibility of conductors and motormen was specifically defined, it being held that both members of the train crew should be held at all times responsible for the safe operation of the train. Minor amendments were made in some cases.

At the conclusion of the presentation of the revised rules by Chairman Palmer of the rules committee, Secretary Burritt read resolutions to the effect that both codes of rules as approved by the meeting should be adopted as the standard of the association. In the discussion of these resolutions J. K. Choate spoke on the desirability of getting joint action on operating rules with the American Railway Association and protested against the adoption of the resolutions for that reason, although he appreciated the high character of the work that had been done by the committee on rules. W. H. Collins, Edward Dana and J. W. Brown then spoke briefly in favor of the adoption of the rules as standard without further discussion, Mr. Dana suggesting that joint action could be easily effected by the ensuing committee. When put to vote the resolutions as read were carried.

N. W. Bolen then moved a vote of thanks to the committee on rules for its admirable work, and in particular to Chairman L. H. Palmer for his clear presentation of the work of the committee. This motion was carried by a rising vote and the association adjourned to meet at 9 a. m. Tuesday, certain matters which were to have been brought up by the committee on rules being postponed until that time.

MONDAY AFTERNOON SESSION ENGINEERING ASSOCIATION

The first session of the Engineering Association was held on Monday afternoon. President Hanna called the meeting to order at 2:15 p. m. The first order of business was the presidential address as printed elsewhere in this issue. Secretary Burritt then presented the annual report of the executive committee, consisting of the minutes of the executive committee meetings held Nov. 20, 1913, and Oct. 12, 1914. After the acceptance of this report that of the secretary-treasurer was read and also formally accepted. President Hanna then appointed as a nominating committee Martin Schreiber, chairman; H. H. Adams, Paul Winsor, A. S. Richey and C. S. Kimball; and as a committee on resolutions, F. Kingsley and C. R. Harte.

In the absence of Mr. Litchfield, chairman, the report of the committee on revision of constitution and by-laws was presented by H. H. Adams. Upon inquiry raised by G. W. Palmer, Jr., the chair ruled that the constitution could not be amended at the present meeting as the chair did not think that thirty days had elapsed since notices had been sent to the members, in accordance with the old constitution. However, the by-laws could be approved at this time while the constitution could be approved informally and held over until the next meeting for formal approval. Mr. Palmer then moved that the proposed amendment to the by-laws be approved by those present. The motion was seconded and carried unanimously. On motion of J. G. Smith the constitution was approved informally.

The next order of business was the report of the general standards committee. The report itself had not been distributed but the chairman, Mr. Adams, pointed out that the committee's action on a given subject would be found in the reports of the several committees on the respective subjects. President Hanna then explained that the several reports of the different committees would be handled in this way: First the chairman would take the abstract of his report in general; then each item would be considered separately and with each would be read the action of the standards committee on that particular item.

G. W. Palmer, Jr., chairman, then presented the report of the committee on power distribution.

On motion the recommendation of the committee for a 20 per cent and 30 per cent Para rubber compound specification for rubber-insulated wire and cable was approved.

The specifications for No. 00, No. 000 and No. 0000 round and grooved high-conductivity trolley wire to supersede the specification for No. 00 hard-drawn copper trolley wire and recommendations of the committee regarding reinforced concrete poles and sundry line materials were also approved.

On motion the recommendation of the committee that conditions did not warrant a continuation of the study of influence of large short-circuit currents on multiphase cables and the dynamic force exerted between conductors during the time the short-circuit exists was approved. The meeting also adopted the recommendations of the committee on specifications for high-voltage, three-conductor, paper-insulated, lead-covered cable, and for galvanizing and sherardizing of iron and steel.

Following this the meeting approved the committee's report on copper wire tables, on stranding, on wire and cable terminology and sections 51, 54 and 61 for 600 volts d. c. overhead trolley construction as also approved by the committee on standards. The recommendations on the revision of sections 81 and 82 were referred back to the committee as the committee on standards had recommended that section 82 be so referred and the approval of section 81 alone would have left the wording of the two sections inconsistent.

The report as a whole was then adopted and a unanimous vote of thanks was tendered the committee for its arduous and successful efforts.

The general report of the committee on standards, abstracted elsewhere, was adopted after presentation by Chairman H. H. Adams.

The report of the committee on electrolysis was presented by the chairman, Professor A. S. Richey, and adopted. This report is abstracted elsewhere in this issue also.

DATA SHEET ON MAIL SERVICE

F. W. Doolittle, director bureau of fare research, American Electric Railway Association, has just issued a data sheet to member companies relating to compensation for carrying United States mails. This information is being requested for the committee which has been investigating this subject under the chairmanship of M. C. Brush.

In the report of the joint congressional committee on postage on second-class mail matter and the compensation for the transportation of mail, of which Hon. Jonathan Bourne, Jr., is chairman, there were certain criticisms in regard to the lack of statistics of the cost of carrying steam railroad mail, supplied to the committee by both the Post-office Department and the steam railroads. The electric railway companies do not wish to be under a similar criticism when the question of the cost of transporting mail on electric cars comes to be considered. For this reason the committee wants to have full information on the subject from all the electric roads.

The information particularly desired by Senator Bourne is as follows:

I. Mileage made by railroad post-office cars during year ending June 30, 1914. (a) over postal route; (b) between postal routes and carhouses, not carrying mail; (c) total mileage; (d) hours layover at post-office.

II. Mileage made by freight[1] cars, during year ending June 30, 1914; (a) total mileage whether carrying mail or not; (b) mileage made carrying mail.

III. Mileage made by passenger cars during year ending June 30, 1914; (a) total mileage, whether carrying mail or not; (b) mileage made carrying mail.

IV. All other revenue[2] car mileage during year ending June 30, 1914; (a) total mileage whether carrying mail or not; (b) mileage made carrying mail.

V. Total revenue car mileage during year ending June 30, 1914; (a) total mileage whether carrying mail or not; (b) mileage made carrying mail.

Of the total mileage shown under V (a) how much do you estimate to have been made without revenue load, going to and from carhouses, etc.?

VI. Mileage made by revenue trains (a train to be taken as one or more cars); (a) total mileage whether carrying mail or not; (b) mileage made carrying mail.

The report of the second assistant postmaster general for the year ending June 30, 1913, shows (page 19) the rate of annual payments for electric and cable car service as of June 30, 1913, at various rates. Senator Bourne is also particularly anxious to have from each company a statement of the services rendered and the payments received under each of the various rates: (1) at 3 cents per mile; (2) at 4 cents per mile; (3) under special provision (4) at schedule rates other than 3 cents or 4 cents per mile; (5) at apartment and independent car regular rates; (6) at apartment and independent car maximum rates; (7) at special agreement rates less than regular rates.

Senator Bourne has also especially requested a statement showing the routes, with termini, the service over which is paid for at railroad rates, together with the amount of such payments.

In addition to these questions the committee asks a number of its own in the data sheet for use in presenting its case before the congressional committee.

EXPEDITING CLAIMS

The following is a copy of a letter written by a man in Arkansas to the general freight agent of a Western road as published in a lumber journal:

"In response to my application for indemnity for damage while in transit to one folding bed, I received some time since a postal from you, giving me the interesting information that my claim is number 100909, and suggesting that, if necessary to communicate with you further, I refer to this number.

"I was very glad to get this postal. It is a nice postal and, if not patented, I think I will have some printed myself for the benefit of my creditors. This thing of responding to a dun by giving a reference number in lieu of cash never struck me before. It ought to prove a new factor and a valuable object lesson in the economics of living expenses.

"However, as I am not especially desirous of practicing the theory upon myself, I would be greatly pleased to hear something a little more definite regarding claim 100909.

"If it had been an illegitimate pig metamorphosed by accident and sudden death into a pedigreed Poland China Porker, or a Ban-tailed Mule descended, on the principle of '*de mortuis nil nisi bonum*' from the dear departed Dexter or the late lamented Longfellow, this matter would, doubtless, have met with prompt adjustment, but, being only a bed, just a plain wooden bed, barring the fragments, I fear the claim I am so courteously invited to refer to again, if necessary, has been filed away with the other archives of a like nature, where moth and rust may corrupt, but thieves certainly do not break through and steal, for even a burglar's time is too valuable to be thus wasted.

"If, however, No. 100909 will prove an 'Open Sesame' to the dusty doors of the rusty recess wherein this claim is deposited, I adjure you let the light of day once more fall upon it before mold and moth destroy, and let me know whether it is collectible in the near future, or whether I shall bequeath it, hoary with venerable antiquity, as a relic of the long past nineteenth century to my posterity and for myself trust to meeting it again only on the shore beyond."

[1] Express, baggage, mail, freight, etc.;

[2] Combination—express and passenger, mail and passenger, etc.;

IIb, IIIb, IVb, Vb, VIb—All mileage made carrying mail whether full car or not, and whether car had other revenue load or not should be shown.

COMMITTEE ON SCHEDULES AND TIME-TABLES

The committee on schedules and time-tables of the Transportation & Traffic Association reported yesterday on limited express service, checking car mileage, detention reports and set-backs. As to the first subject it is believed that the best method of improving the running time in city operation is to have stops established at standard spacings with proper signs; the "skip-stop" or odd and even method is considered confusing and annoying to the public. The committee believed that the most feasible method of checking car mileage, short trips and lost trips is by providing space for that purpose on the conductor's day or register card. It opposed any standard form of detention report on the ground of differences in local conditions. It stated that the operation of set-backs should be discouraged and restricted, if possible, to rush-hour conditions, a set-back being defined as a car which left the terminal on the schedule time of a car which had exceeded its running time and layover; then when the set-back car met the delayed car it changed crews, thus placing the belated crew on its schedule. The reason given for this decision was that the plan necessitates holding a crew on the bench under pay, subject to call; it offers opportunity for abuse by trainmen in the way of performing less actual service than is required of them; and it encourages a condition that will eventually have a tendency to slow down the schedule speed and increase platform cost.

Of the four appendices to this report, "A" dealt with limited express service; "B," with train dispatching in city operation as by telephone at Rochester (described in the ELECTRIC RAILWAY JOURNAL for April 18, 1914); "C," with set-backs; and "D," with fundamental factors covering the construction of time-tables, such as distribution and habits of population, physical characteristics of the lines, distribution of hours of platform work, and method of checking changes in travel.

REPORT OF COMMITTEE ON ELECTROLYSIS

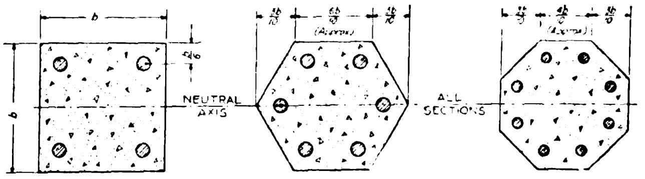
The committee on electrolysis of the Engineering Association reported yesterday on the organization of the joint national committee on electrolysis. The organization of this committee was described in the issues of the ELECTRIC RAILWAY JOURNAL for May 24, 1913, page 934, and April 4, 1914, page 763. The association committee has done some work during the present year along the following lines: (1) a simple presentation on Kelvin's law in easily workable form for the determination of the economic voltage drop in d.c. feeders; (2) the development of a formula and graphic chart showing the economic replacement resistance of rail bonds; (3) a consideration of the proper values to be used in discussing the energy saving to be effected by the addition of feeder; (4) a discussion of the limitations of potential and return circuit, and (5) a bibliography on the subject of electrolysis. This material was not published in the report as the committee wishes to continue the study, but the results are accessible at any time to member companies.

REPORT OF COMMITTEE ON POWER DISTRIBUTION

The report of the committee on power distribution of the Engineering Association, presented on Monday afternoon, contained recommendations as follows: that specifications for rubber-insulated wire and cable for power distribution purposes, as submitted, be adopted as standard; that a new set of specifications for round and grooved trolley wire, as submitted, be substituted for the present standard specification for No. 00 hard-drawn copper trolley wire; that a revision of the specification for galvanizing on iron and steel, as submitted, be adopted; that certain specified changes be made in the recommended specification for 600-volt d.c. overhead trolley construction, and that certain minor changes be made in tables, etc., in the Engineering Manual. The conclusions reached on other matters that were considered by the committee were as follows: that it be given further time to investigate the subject of concrete poles; that further time be allowed for investigation preliminary to the preparation of specifications for sundry line materials, and that further consideration of short-circuit currents is not warranted in view of a theoretical and practical study which has been made by I. W. Gross of the Interborough Rapid Transit Company.

The bulk of the committee's report is taken up with appendixes containing the specifications already referred to. A complete set of wire tables, revised to conform with the recommendations of the American Institute of Electrical Engineers, is included.

One appendix is entitled "Reinforced Concrete Poles of Hexagonal and Octagonal Sections." This article continues the study of the properties of concrete poles as reported in the 1913 Proceedings of the Engineering Association, page 82. The useful data finally arrived at are given below:



COMMITTEE ON POWER DISTRIBUTION—TYPICAL CONCRETE POLE SECTIONS

SQUARE POLE:

$$\text{Deflection } x = \frac{30\ Pl^3}{E_s\ b^4}$$

where x = deflection in inches, 18 in. from top of pole. This is the theoretical value which should be increased 25 per cent.

P = horizontal pull 18 in. from top of pole.

l = length of pole from point of application of P to ground line (6 ft. from base end) in inches.

E_s = modulus of elasticity of steel used.

b = side of square pole or distance between parallel faces in hexagonal or octagonal poles.

also

$$\text{Area} = b^2.$$

$$\text{Safe load, } P_1 = \frac{1750\ d^2b}{L\ (\text{ft.})}\ \text{(Approximate)}$$

where d = diameter of steel rods in inches.

$L = l/12$.

The corresponding values for the other sections are these:

Hexagonal Column	Octagonal Column
$x = \frac{40\ Pl^3}{E_s\ b^4}$	$x = \frac{47\ Pl^3}{E_s\ b^4}$
$\text{Area} = \frac{9b^2}{10}$ (Approximate)	$\text{Area} = \frac{8b^2}{10}$ (Approximate)
$P_2 = \frac{9P_1}{10}$	$P_3 = \frac{8P_1}{10}$
$= \frac{1575d^2b}{L}$ (Approximate)	$= \frac{1400d^2b}{L}$ (Approximate)

where P_2 and P_3 are the respective safe loads.

Per cent of steel equals 4 in all sections, approximately.

COMMITTEE ON STANDARDS

The report of the committee on standards of the Engineering Association presented in tabular form the recommendations of the committee on standards with regard to the standards and recommended practices submitted by the various standing committees of the Engineering Association. In accordance with the custom established last year, detailed statements of the findings of the standards committee accompanied the respective reports of the several standing committees and these are printed in the digests of the reports.

REPORT OF COMMITTEE ON CHANGES IN CONSTITUTION AND BY-LAWS

The report of the committee on changes in constitution and by-laws, presented yesterday to the Engineering Association, contained in general such changes as were necessary to eliminate contradictory points and to revise the articles according to the conditions existing under the present organization of the American Association. The chief sections redrafted dealt with the membership, the nomination of officers and the offices of secretary and treasurer.

The old designation of "active" and "associate" members has been dropped and the membership of the Engineering Association is now to consist of "company members" and individual members of the American Electric Railway Association who have elected to ally themselves with the Engineering Association. The individual members will not be entitled to vote and may hold office only if in the employ of company members. They are granted the following rights: Attendance at meetings and participation in discussions; membership on committees; receipt of association proceedings and other general publications, including *Aera* and advance convention papers, and the wearing of the official emblem.

Provision is made in the new constitution for a nominating committee of five members, two to be past presidents and the other two not members of the executive committee, to be appointed by the president at the time of the formation of standing committees. This nominating committee is to secure the names and consents of nominees and forward the names to the secretary on or before July 1. The list of nominees is to be published in the August *Aera*. A written communication to the secretary, signed by twenty company members and accompanied by the nominee's acceptances also constitutes a nomination. The nominating committee is given power to fill any vacancy in the list of nominations prior to election.

The old constitution provided that the duties of secretary and treasurer should be performed by the same person, but under the new provisions this doubling up of duties is optional. Hence, in the section dealing with the duties of the secretary and treasurer these are divided to come under the proper head. Each of the two officers may be paid a sum fixed by the executive committee.

YESTERDAY'S SESSION OF THE CLAIMS ASSOCIATION

The first session of the Claims Association was held in Claims Hall on the pier and was well attended. The first order of business was the address of President Weh, which is published in abstract elsewhere in this issue. This was followed by the reports of special committees. Mr. Drown's committee reported on the claims index bureau. He followed the report of his committee with a written discussion which indicated that the member companies were not taking the interest they should in the bureau. As a result of this report a committee was appointed to set a time for a general discussion of the subject and to report to the executive committee of the parent association This committee included Messrs Tichenor, Drown and Walsh. Immediately following this session this committee held a meeting and arranged for an open discussion of the advisability of the executive committee parent body continuing to pay $500 a year for the service of the bureau. This open discussion of the value of the claims index bureau will be held Tuesday morning immediately after the joint session with the Engineering, Transportation & Traffic associations.

Continuing the program, E. P. Walsh, attorney United Railways, St. Louis, read a paper entitled "How Investigations Should Be Conducted from a Legal Point of View, Having in Mind Defense as Well as Adjustment." This paper was followed by written discussions by L. S. Hoffman, general solicitor Public Service Railway, and Wallace Muir, claim agent Kentucky Traction Terminal Company.

The session closed about 5 p. m.

COMMITTEE ON RULES

The committee on rules of the Transportation & Traffic Association stated in its report that the standard city and interurban codes of rules have come into general use, no fundamental objections to them apparently existing. The city code was said to have reached the stage where further radical revision was unnecessary, and a final revision for the interurban code was submitted as an appendix, thus placing both codes in practically permanent form. The committee recommended that, where all operation was of one-car trains, no markers should be used by day, but, where trains of more than one car were operated, all trains should carry green-flag markers. Classification signals located at the middle of the first car on a train were also recommended, as well as markers on the top of the rear car. The committee further recommended the following addition to the much-discussed rule 55, of the city code, on the subject of trainmen giving out information in case of accidents or delays: "Conductors may, when necessary, however, advise passengers as to the general cause and probable duration of a blockade." This addition was believed to be in accordance with the interests of the traveling public.

GERMAN MANUFACTURERS IN ENGLAND

The present war between two countries which have conducted commercial affairs with each other so long as Germany and England has brought about situations which seem peculiar as well as problems which are difficult to solve. Some of those are discussed at length in our English technical contemporaries. Thus an extended discussion appears in several successive issues of the London *Electrical Review* in regard to the proper status of certain electrical manufacturing concerns of whose capital stock a considerable part is said to be owned in Germany. One of the most prominent of these is Siemens Brothers & Company. A number of closely printed pages are devoted in the paper in question to discussions as to whether the British electrical trade ought to boycott such manufacturers because of their stockholders or should continue to patronize them because of the British employees who would be thrown out of employment if a boycott was instituted. The majority were in favor of no boycott. The discussion on this point, however, elicited the statement that some of the concerns engaged in the electrical business in Great Britain and owned almost entirely in Germany rejoice in names of a purely British character. This is additional corroboration to the truth of Shakespeare's remark, "What's in a name?"

Other "war news" in the same periodical include correspondence between a British firm and a German collection agency in which the former declines to pay its account unless required to do so by the British courts, statements in regard to orders for equipment originally placed in Germany but canceled and now being supplied by home concerns, contributions by different companies to the Red Cross funds, and reports in regard to the number of employees from different tramways and other electrical companies who have joined the colors. Several corps of engineers have been raised, and service in them has been very popular among the electrical engineers.

The Galena-Signal Oil Company extends a most cordial welcome to all convention delegates and their wives and children to its reception tearoom at booth 24. Its tea, like good wine, needs no bush.

ADDRESS OF PRESIDENT HANNA OF THE ENGINEERING ASSOCIATION

In the opening part of his address yesterday President Hanna referred to the proposed revision of the association by-laws and constitution so as to make them conform more with those of the American Association and of the other affiliated associations. The most important change, he said, was in the provision for a new method of nominating officers whereby the members will have an opportunity to know in advance who are to be the nominees and suggest others if they see fit.

President Hanna then referred in detail to the work of the various committees of the association as shown by their reports and mentioned some of the principal conclusions reached. Among other points he referred to the fact that during the past year the Lorain Steel Company had cut rolls for the standard 7-in. and 9-in. grooved girder rails recommended by the way committee last year, and these rails had now been adopted by railway companies in Montreal, Boston and Columbus. He said that during the coming year it was the plan to reduce the number of subjects assigned to each committee, partly to relieve the task imposed upon committee men but also on account of limited time at the disposal of the association to consider these reports at the annual convention.

The address then mentioned the Engineering Manual, a result of the standard committee's activity, which had been distributed to all members during the past year. A yearly revision of this Manual will keep it up to date. Up to the present time 1097 copies have been distributed to members and eighty-one have been sold. Mr. Hanna urged all members to assist in the distribution and sale of this Manual, not only on account of the financial help it would be to the association but also so that the work of the association in establishing standards would be utilized and appreciated to its fullest extent. It had been decided to extend the free distribution of this Manual to all individual members allied with the Engineering Association who joined prior to Jan. 1, 1915.

The address then stated that during the past year the Engineering Association had kept within its appropriation of $4,000 and had also been able to clear up the deficit for the past two of three years.

The address then mentioned the co-operative work of the association with other associations, particularly the arrangement with the Central Electric Railway Association providing for the prompt reference to the standards committee of any standards adopted by that association, and of the joint commitee on overhead crossings.

Mr. Hanna then urged that the membership in the association be increased and mentioned the many direct benefits which accrue from membership including the receipt of *Aera*. He concluded by expressing his thanks for the assistance which he had received from the executive committee and each chairman of the different committees and also from the secretary-treasurer and his able staff.

EMBRYO SCHEDULE MAKERS

An almost continuous cause of complaint among trainmen is the way in which schedules are arranged. Unless a man has actually attempted to make out a time-table he little realizes the difficulties of arranging the runs to meet the requirements of travel and at the same time allow the men to complete their day's work within reasonable hours. For this reason the United Railroads, San Francisco, Cal., has offered, through President J. W. Lilienthal, a prize of $25 to the platform man submitting the best time-table for the company's Haight Street line. The announcement was made in the *United Railroads' Magazine* for September, 1914, and a table of headways from the ferry was furnished for the benefit of the men. The competition closes Nov. 1.

ADDRESS OF PRESIDENT WEH OF THE CLAIMS ASSOCIATION

In his address at the opening of the Claims Association yesterday afternoon, President Weh called attention to the fact that this was the tenth annual convention of the Association and to the progress which has been made by the claims department of the different companies during this period. For the Claims Association to grow, he said, it must have the hearty real co-operation of the membership, and this should not be limited to what is done at the conventions. He then referred to the report of the joint committee of the Claims Association and the Accountants' Association on claim accounting as a most important matter and one which could well have been taken up earlier.

President Weh then spoke of the improvements in electrical appliances and equipment which had taken place during the past fifteen years and said that they had been no more startling than those made in the conduct of electric railway claim departments during the same time. The companies now realized that they must improve their relations with the public. The effort is being made to do so, but the mistakes of the past are not to be undone in a day. Public sentiment is so strongly for better things that it is easily led from regulation to oppression, and this attitude is reflected in large verdicts in damage suits, in common law defence and changes in jury systems.

The claim department on any public service company comes in direct contact with many individuals, and the more justly it treats with them the more justly will it be treated. President Weh recommended that the companies deal fairly with those who have legitimate claims, but to use an iron hand for crooks. The most essential defence against the latter is to have all the facts. No case is so trivial but the company can use all the information available.

President Weh then referred to the service of the Hooper-Holmes Index Bureau. The arrangement with this bureau was made only after a number of years of discussion and after the value of such a service to the association had been fully determined upon. Now it was found that only a small percentage of the member companies availed themselves of service furnished by this bureau and that this patronage was made up almost entirely of the larger companies. He believed that there was no way in which it was possible for the member companies to secure a service equal to or better than that furnished by the bureau, and if this service was discontinued the member companies would be left without any clearing house of this nature except by paying the individual subscription fee direct, which many of the smaller companies could not afford to do.

Mr. Weh then referred to accident prevention, which had become a very important phase of the work of the claim agents. Great progress had already been made in this direction, but he believed a greater accomplishment was possible and really in sight. He mentioned the appointment at the last convention of a board of accident prevention, made up of the past presidents and present officers of the Claims Association with representatives from the Transportation & Traffic Association and the Engineering Association. This committee had prepared a report which would be presented at this convention.

In closing, Mr. Weh extended his wish to all for a successful and pleasant week and thanked the members of the executive committee of the association for their loyalty and kindly feeling during his year of office.

In order to secure information regarding the relative business done by steam and electric roads during the State Fair recently the Ohio Public Utilities Commission had the arrivals on each counted during the forenoons of two days. On one day the electric lines carried 27 per cent and the other 34 per cent of the passengers.

ADDRESS OF PRESIDENT HEGARTY, OF THE TRANSPORTATION AND TRAFFIC ASSOCIATION

Secretary Burritt read yesterday the address prepared and sent to the Transportation & Traffic Association by D. A. Hegarty, who was elected president of the association last year but resigned March 1. After expressing his regret that he was not able to continue the office of president, Mr. Hegarty briefly reviewed the progress made during the short period when he was in office. He described the mapping out of the year's committee work by the executive committee in December, 1913, and also the joint committee work undertaken between the various associations. In the latter connection, Mr. Hegarty stated that the amicable manner in which joint committees had worked in harmony showed the cordial feelings that existed between the different associations and made for increased efficiency and service.

Mr. Hegarty suggested that a joint committee be formed between the Transportation & Traffic Association and the Claims Association to take up the subject of platform operating doors and gates, as to which is the most efficient and economical, manually, mechanically, electrically or air-operated doors. This committee should also determine what would be the best way for the motormen or conductors or both to operate the doors or gates. In view of the importance of the "safety first" movement and the prevention of boarding and alighting accidents, this study was, in Mr. Hegarty's opinion, a most important one for the two associations named.

Mr. Hegarty called attention to the discussion of the flagging rule that has been commented on several times in the ELECTRIC RAILWAY JOURNAL, and stated that this work was eliminated at the meeting of the association in 1911, but that a thorough discussion should be had so as to reach a definite conclusion. As regards the committee on fares and transfers, he felt that in spite of the highly valuable reports previously received sufficient time had never been given for a thorough discussion of this subject, especially in connection with transfers and their checking.

In closing his address, Mr. Hegarty emphasized the importance of perfecting the safest and most economical method of handling traffic and developing more cordial relations with the public. He believes that conscientiousness is necessary on the part of the employees who deal with the public, from the highest official down to the last graded employee, for it produces a public conscience that results in a spirit of fairness and confidence.

BE AS "AISY" AS YOU CAN

In connection with the work on one of the chapters for the souvenir edition of this paper it became necessary to solicit some material by mail. The following reply to one of the letters is too good to be lost to view in the letter files:

"Your letter of Aug. 21 was received. It has been impossible for me to reply sooner, by reason of the fact that time was not at my disposal. When a man is acting as assistant to the general manager of this company, and editing the * * * * writing editorials, culling out bunc and rounding pearls of thought into readable form, he don't git no time for flights into other journalistic realms. As a writer, I hate to put a story together for the pleasure of the thing, but as a tramway employee, I should like to oblige you. You probably know how you'd feel, if I should ask you for a story on power economy, for instance.

"Please let me know when you have to get this story. I am going down on my ranch for the next two weeks, where I can wear old clothes, turn my debonair map up to the sun and commune with Nature and the family dog. When I return it will be necessary to throw 'er over onto the loop and get out the October issue. People don't realize how much work there is on a forty-page street car blatter.

"You can see what I'm up against, therefore, be as aisy as you can."

MADAME AULD

The entertainment committee was exceptionally fortunate in securing the services of Madame Auld, the prima donna soprano from Milan, as soloist for the reception last evening. The audience received her opening selection, the aria from the mad scene of "Lucia Di Lammermoor," with great favor. Her encore "Un Bel 'di'" met with equal enthusiasm. Madame Auld has recently returned from Europe where she is well known, having sung in Milan, Rome, Budapest, Paris, London and Berlin. Von Strauss, director of Royal Opera of Berlin, has said that she had possibly the most beautiful voice he had ever heard, and Knehbiel, critic of the New York *Tribune*, has praised the rich, natural qualities and warmth of her tones.

RAILWAY MEN AN EXACTING LOT

According to the Philadelphia *Public Ledger* the railway men in attendance at the convention are "an exacting lot." At least that is what the correspondent of that paper said in his Atlantic City column in the issue of Oct. 12. After referring to the prevailing fall fashions as seen on the Boardwalk the writer said:

"In the throng were many glad-to-be-free delegates to the annual convention here this week of the American Electric Railway Association, snappy-looking men of affairs upon whose broad shoulders and astute minds depends very largely the maintenance of rapid transit in cities both large and small throughout the country. Hotel exchanges resounded with their merry greetings, and North met South and East the West in the midst of the Wooden Way throng. Philadelphia also contributed battalions to swell the procession and give the rolling chair barons a better day's business than has been their lot for several weeks. Once more there is a bath famine in the big Boardwalk hotels, for the holiday-making railway men are an exacting lot."

In a separate story almost a column long the general activities of the association in connection with the convention were reviewed.

FOR CLAIM AGENTS

A reporter on a Kansas City paper was among those on a relief train that was being rushed to the scene of a railway wreck in Missouri. About the first victim the Kansas City reporter saw was a man sitting in the road with his back to a fence. He had a black eye, his face was somewhat scratched and his clothes were badly torn—but he was entirely calm.

The reporter jumped to the side of the man against the fence.

"How many hurt?" he asked of the prostrate one.

"Haven't heard of anybody being hurt," said the battered person.

"What was the cause of the wreck?"

"Wreck? Haven't heard of any wreck."

"You haven't heard of any wreck? Who are you, anyhow?"

"Well, young man, I don't know that that's any of your business, but I am the claim agent of this road."—*Harper's Magazine*.

The Manila Electric Railroad & Light Company, Manila, P. I., has opened a lunch room for its employees in its carhouse on Calle San Marcelino.

NEW ARRANGEMENT OF MEETING HALLS

Through the efforts of the exhibit committee, the comfort of the delegates at the technical sessions should be greatly enhanced this year in connection with the arrangement of meeting halls. Two new halls have been built, and other changes have been made to provide better accomodations for the various sessions. One of the improvements, which will be most welcomed by the delegates will be in connection with the meeting rooms for the affiliated associations. All of the associations will now have comfortable, well-lighted rooms at the end of the pier.

Two new rooms have been built during the past summer for this purpose. One is designed for the Accountants' Association. This is at the end of the Annex near the Greek Temple and on the south side of the pier. Here a special hall has been partitioned off with chairs to accommodate about eighty delegates. It is festooned with flags and provided with window curtains and floor covering. There is no long flight of steps to mount as last year.

The American Electric Railway Claims Association has been accommodated with a similar hall also adjoining the Greek Temple and on the north side of the pier. This hall is large enough to accomodate the number of delegates which it is expected will attend the meeting of the Claims Association.

The American Association and the Transportation & Traffic Association will meet as usual in the Greek Temple. The Transportation & Traffic Association will meet in the morning and the American Association in the afternoon. The decorations here typify the international character of the association.

The hall to be used by the Engineering Association is the same as used last year, but Mr. McConnaughy has had a floor covering laid over the passageway for the public at the side of the hall so that there should be no disturbance from the noise from passers-by, even if the windows are open. All of the halls are well lighted.

CHANGES IN PIER ARRANGEMENTS

A number of changes in the arrangement of the convention pier and the exhibits will be noticed by the visitors to the convention this year. These have been worked out by H. G. McConnaughy, director of exhibits, and add very much to the comfort of the delegates and others in attendance, as well as to the attractive appearance of the exhibits. They include improved facilities for technical sessions, exhibits and entertainments.

The first change which the visitor to the pier will see this year is at the entrance. A neat pair of posts each of which is surmounted by a vase with ferns, flanks the main entrance. The registration desks are directly inside the front door, the desk for the railway delegates being at the right and that for the manufacturers at the left. Here the delegates register, but this preliminary has been greatly simplified this year by the system of advance registration which both the American Association and the Manufacturers' Association have encouraged. Those who took the precaution to send in their advance registration cards need lose little time in securing the proper badge. In the case of a member of the Manufacturers' Association these badges are obtained after he passes through the gateway and turns to the left.

The foyer of the pier this year is entirely different from that of last year. The alabaster columns surmounted by lights in globes, which were a feature of the entrance of the 1913 convention, have disappeared. In their place is a series of very graceful standing electroliers of gilt surmounted by ten or a dozen single lights with colored shades. These electroliers also line the grand aisle leading to the end of the hall and are supplemented by colored lights in the hedges.

The foyer bore three separate guises yesterday. The first was apparent in the morning during the concert, when the space was opened and occupied by those who were listening to the music. Between 1:30 and 2:30 a rapid transformation took place. The bare floor was covered as by magic with grass. Tables, surmounted by individual awnings, appeared in place, and tea was served during the thé dansant. In the evening another change was made, and the foyer became a ball room with gold decorative effect during the annual reception.

Passing now to other parts of the hall, another striking improvement which the visitor saw yesterday when he entered the hall was the change in Machinery Hall. Formerly this was separated from the main hall by a rough board partition, and no attempt was made at decoration. This year the partition has given place to a cedar and box hedge. The floor of Machinery Hall has been laid throughout with Crex, and windows have been draped with curtains. In addition, the different exhibits are separated by graceful pedestals and, in the case of most of the exhibits, by flowers and shrubs in pots. Machinery Hall seems now as much a part of the general decorative effect of the exhibit as any other. Finally a reception room has been located at the west end of Machinery Hall to afford a place for rest and conferences during convention week.

The improvements made in the pier this year are not confined to the first hall. An important change has been made in the rear of the annex by installing glass frames so that all of the annex is under cover. This was done as a protection against possible rain, and, while the indications are toward a pleasant week, this is an improvement which will be greatly appreciated. Changes have also been made in the meeting halls, as described in another column.

DEATH OF MR. WHITTLESEY

Curtis E. Whittlesey, for many years treasurer and secretary of the McGraw Publishing Company, Inc., died at his home in Madison, N. J., on Friday, Oct. 9, 1914, in his seventy-second year. Though he had been ill of pneumonia for several days, the end came suddenly.

Mr. Whittlesey was born near Rochester in 1842. As a young man he entered business in Corfu, N. Y., where his industry and capacity brought him early success. In 1890 he joined James H. McGraw as a member of the firm which was the publisher at that time of the Street Railway Journal, and which, as the present McGraw Publishing Company, Inc., became also the publisher of the *Electrical World*, *Engineering Record* and *Metallurgical and Chemical Engineering*.

During the twenty-four years of association with this publishing enterprise Mr. Whittlesey had become widely known as a man of great experience in business affairs, and his wisdom and unerring judgment were constantly consulted not only in the affairs of the company, which he had done so much sucessfully to establish, but by many individuals who had come thoroughly to value his opinions on commercial and financial questions. Although his passing came with the ripeness of years, it is deeply lamented by a host of friends, many of them close business associates, who loved and honored him. It was impossible to have even the most cursory relationship with him without being impressed by his lovable qualities and sterling character.

Mr. Whittlesey was keenly interested in church work, and was for years an elder and the treasurer of the Presbyterian Church at Madison, N. J.

He leaves a widow and three daughters, Mrs. Carl A. Felt, wife of the Rev. Carl A. Felt, of the Pekin University, China; Mrs. James H. McGraw, wife of the president of the McGraw Publishing Company, Inc., and Mrs. Robert E. Harned, wife of the Rev. Robert E. Harned, librarian of the Drew Theological Seminary, Madison, N. J.

CIRCUMSTANTIAL ACCIDENTS

A singular feature of many accidents, when carefully analyzed, is the part played in such events by a chain of circumstances leading to the untoward result. On such occasions relationships between conditions and objects are brought out which would otherwise remain undetected for long periods. Thus, in a recent carhouse fire which, fortunately, was extinguished by the employees of the local company before it gained headway, the sequence of events was most illuminating. The trolley wheel of a car that was being run into the house with the trolley pole in the reversed position, left the wire and swung around sufficiently to clear the wooden guard on the overhead timbers, struck the beams and came in contact with an iron conduit carrying a lighting circuit. At the same time the trolley pole buckled, making simultaneous contact with the wire, and thereby grounding the latter. Current passed over the conduit to the ground at the rear of the building. In contact with the grounded pipe was a metal ash barrel. As a result the conduit was melted where it entered a junction box on the ceiling and a fire was started at that point; the ground wire at the rear of the building was melted off and the ash barrel was melted at points of contact with the pipe; and current also passed to the second floor, where connections of soil pipes at metal sinks were burned off and a fire started among some towels on an adjacent side wall. Quick work saved the company a heavy loss.

Obviously it is often very difficult to forestall the interrelation of circumstances in connection with the prevention of fires and accidents, but in all such work the efficiency of prevention is largely a matter of putting factors together which may cause trouble and mentally sizing up their possibilities for harm. In other words there is a sort of accident chemistry, with some elements which must be kept apart and others which are better kept together. Clearances, insulation, temperatures, speeds, momentum of masses, lost motion, unnecessary contacts and many other points need to be considered by the constructive imagination, trained by analysis of causes and effects to sense the opportunities for danger to enter the situation. Carelessness in some small particular so often sets in motion a whole train of evils that in carrying forward a broad campaign for safe operation no better work can be done by employees and officials directly responsible for handling rolling stock and plant than to forecast the results of all sorts of slips and errors and to take steps in time to restrict their effects to the harmless field. By paying heed to the man with the alarmist type of mind in such work a great many troubles can be prevented.

GENERAL RAILWAY SIGNAL COMPANY'S PAST PERFORMANCES

The General Railway Signal Company has made its record of installations the keynote of its exhibit. A number of views of signals on various railways are shown in large colored pictures that are remarkable for their artistic effect as well as for their accuracy of detail. The installations include that made at the Grand Central Terminal in New York City, where an interlocking plant of extraordinary magnitude is in service as are also automatic signals governing train movements on the electrically operated lines leading into the terminal. The installation on the San Francisco-Oakland Terminal Railways is also shown. This is unique in that it has automatic stops consisting of overhead trips which are operated directly by the semaphore arms, the trip being engaged when the semaphore is in horizontal or stop position and being lifted out of the way when the semaphore moves up into proceed position. A view is also shown of the automatic stop of the track-trip type that is installed on the Centre Street Loop and Williamsburg Bridge line of the New York Municipal Railway.

MODERN POWER HOUSE SPECIALTIES

At spaces 158 and 160 of the Harrison Safety Boiler Works water is pumped through a Cochrane metering heater, showing just how the water is broken up in the tray section, where it is heated by the exhaust steam, after the steam has been cleaned of oil by means of the Cochrane oil separator on the inlet to the heater, which is equipped with a compact and fool-proof cut-out and by-pass arrangement. Then it can be seen how the water passes over the V-notch built in the heater, and how the height of water flowing over this weir is transcribed into a graphic record of the amount at which the water is fed to the boilers, affording means for checking boiler efficiency, heat value of coals, the most desirable methods of firing, etc. These metering heaters are built in units up to 20,000-hp capacity.

The Cochrane precision meter, also shown in operation, measures water by automatically filling and emptying two chambers of known capacity. The distinctive feature of this meter is that it is necessary for one chamber to be absolutely empty and the other chamber to be completely filled before the inlet and discharge valves are operated. Other exhibits include the Cochrane multiport safety exhaust outlet valve, which is essentially a safety valve for low-pressure work; the Cochrane multiport flow valve, which is a modification of the Cochrane multiport relief valve, and is designed to act as a vacuum check valve between low-pressure cylinders of engines and low-pressure or mixed-flow turbines; and the Sorge-Cochrane Hot-process system, which is designed for preventing scale formation and corrosion by boiler feed water. The company's chemist is present to give demonstrations on various hard waters, showing the results obtained by treating the water cold, and then by treating it hot by this company's method.

A SUB-STATION ON THE PIER

The Railway & Industrial Engineering Company, Pittsburgh, Pa., has taken space 609 in the Annex, on the way to Engineering meeting room, for a display of Burke horn gap switching and protective apparatus for all voltages from 2,200 to 66,000 volts. In addition to the apparatus exhibited photographs and drawings picture various applications and installations designed to meet different requirements. In this booth can be seen the new Burke series horn gap lighting arrester with Koppat resistance in the ground circuit. A three-pole Burke horn gap switch mounted complete on a wood pole; also the Burke horn gap switch with the new flexible Butt contact, which makes the switch absolutely weatherproof and overcomes entirely the possibility of the switch freezing up. The company has oscillograph records which were taken during the opening of Burke horn gap switches under 4000 kw. and 5000 kw loads at 50,000 volts, also the standard 45,000 volt switch used to open these loads. It also has for inspection a 2200-volt and 6600-volt suspension type lighting arrester with resistance in the ground circuit, horn gap fuses, T. E. line clips, which make it possible to tap transformers and other high-voltage apparatus to live lines, and commutator slotting tools. Just outside the Annex near the Engineering meeting room is installed a complete steel outdoor transformer substation of a new design built to meet interurban requirements. The station is absolutely complete in every respect. The switching and protective equipment for the high-voltage side consists of a Burke horn gap switch and a combination lighting arrester, choke coil and fuse. A 2500-volt automatic weatherproof oil circuit breaker and suspension type lighting arresters protect the low-voltage side of the transformers, and a steel cabinet box houses the metering equipment. This type of substation is particularly adapted for tapping high-voltage transmission lines for small amounts of power. The new T. E. lattice steel pole is also shown here.

WESTINGHOUSE MACHINE COMPANY SHOWS TURBO-EXCITERS

The Westinghouse Machine Company is showing an A-50 kw, 125-volt d.c. unit, which is being widely used for exciter service. Three units built at present in sizes from 25 to 200 kw consist of a high-speed, single-wheel impulse type of turbine connected by means of a Westinghouse reduction gear to a standard inter-pole generator. By means of reversing chambers the steam passes through the blades two or more times, depending on the operating conditions. The reduction gear and pinion are of the split helical type mounted in ring-oiled bearings and inclosed in a horizontally split oil-tight case. These units are adapted for both condensing and non-condensing service for steam pressures of 100 lb. or more. By using a high speed turbine a low water rate is obtained over a wide range of load.

GENERAL ELECTRIC COMPANY FEATURES

The General Electric Company's display of railway motors this year features some notable improvements. These motors represent six classes of electric traction work; the GE-239 motor, rated 1200-2400 volts, 150 hp, on the Michigan & Chicago and Canadian Northern for heavy through service and tunnel electrification; GE-240 motor, rated 600-1200 volts, 80 hp, on the Willamette Valley Southern for high-speed interurban service; GE-242 motor, rated 65 hp at 600 volts and 55 hp at 500 volts, for the Chicago Surface Railways; GE-243 600-volt motor, for the Chicago Elevated Railways; GE-248 motor, rated 160 hp at 600 volts, for subway service on the New York Municipal Railways; GE-247 motor, rated 35 hp at 600 volts and 30 hp at 500 volts, for low, 24-in. wheel car, city service on the Pittsburgh Railways. The GE-247 motor is exhibited in operation, while the armatures of the remaining motors are removed to afford an opportunity for easy inspection of the interior construction.

The Sprague-General Electric type MK all-electric control equipment shown embodies new connections and is designed for four 30 hp motors. A chart shows the circuit connections established. Four K patform controllers are also displayed, which are types K-51, K-36, K-35 and K-201.

A combined straight and automatic air-brake equipment is mounted on a rack as on a car. The CP-27-B compressor with this equipment has a special glass cover and lamps in order to illuminate the interior and show the flow of oil. The recent, light-weight CP-25-C, 600-volt compressor is also included. A complete assortment of line material, including catenary, is attractively grouped on a large frame. Many of these devices are mounted as in actual service. A number of separate valves and devices entering into car equipment also form part of the company's exhibit.

Forged-steel treated gears and also cast-steel split and solid gears for both city and heavy interurban service are shown, as well as several grades of forged steel treated pinions. The new sheet steel gear cases have each of their upper and lower halves pressed out in a single integral piece. The steel supports for the top and bottom halves are fastened by welding.

An extensive exhibit of headlamps for various classes of electric railway service is shown. The line comprises type D-18, 4-amp, luminous arc lamp with semaphore lens for high-speed interurban service, dimming being effected by incandescent lamps; type D-12, 4-amp, luminous arc lamp with plain glass door and parabolic reflector for slow-speed interurban service, reversed polarity dimming; type D-11, 2-amp, portable luminous arc lamp with semaphore lens for city and suburban service; type J-7, incandescent headlamp with parabolic reflector for city and suburban service; type J-9, incandescent lamp with parabolic reflector for city service; and type J-15, incandescent lamp with semaphore lens and guard door for city service.

The display of railway lamps demonstrates how much more effective results have been obtained through the new systems of illumination in railway cars. Both the old style carbon lamps and the modern Mazda lamps that are now generally employed figure in the display. Improvements in the wiring arrangement as well as the selection of lamps and the use of reflectors are clearly illustrated. Shadow boxes and photometric curves demonstrate the relative values of the illuminating units. An exceptionally interesting feature of this part is a new boron car lighting regulator outfit to maintain the voltage on car lamps approximately constant for a wide variation in trolley voltage. Thus there has been recently developed the boron filament lamp with a decided negative temperature coefficient, which has the valuable characteristic that the voltage across the terminals of the lamp remains practically constant for a wide variation in current. A tungsten resistor has also been developed, which has a very high positive temperature coefficient and a characteristic such that the voltage drop across the filament increases very much faster than the current that produces the drop. While both the regulator and resistor are made in the form of lamps of various current capacities, the filaments are intended to run at a relatively low temperature, so that they cannot be used directly for lighting. If, however, the proper number of boron filament lamps are connected in multiple with the proper number of circuits of car lights and the proper number of tungsten resistors are connected in series with this combination, a regulator outfit is obtained that will maintain the voltage across the car lamps within about 3 per cent either way from normal for a variation in trolley voltage between 400 and 625. The principle of operation is very simple. The high positive temperature coefficient of the tungsten resistors prevents very wide fluctuations of current for changes in trolley voltage, and whatever fluctuations of current do result are automatically taken by the boron regulator lamps connected in multiple with the car lamps, so that the current through the car lamps, and consequently their candle-power, remains practically constant.

INDEPENDENT LAMP & WIRE COMPANY'S EXHIBIT OF ASBESTOS-COVERED WIRE

The Independent Lamp & Wire Company, in space 527, has a very instructive exhibit designed to demonstate the superiority of asbestos-covered wire over cotton-covered wire. One piece of apparatus consists of a field-coil testing transformer around the core of which are placed loops of wire made up of short lengths of asbestos-covered and cotton-covered wires connected in series and short-circuited. When the primary switch is closed the wires promptly heat up and after the cotton is burned off the asbestos remains as good as new. A coil of asbestos-covered wire is then placed around the core of the transformer in a pan of salt water. An incandescent lamp connected to the coil lights up to full brilliancy, indicating that the coil is not short-circuited by the water. Another piece of apparatus is a heating-element coil around which are wrapped turns of cotton-covered and asbestos-covered wire. The coil is heated up until the cotton insulation burns off. To indicate the temperature of the coil, solder wire is applied to a metal band surrounding it, and the melting of the solder gives a convincing demonstation of high temperature. An important element of the activities of the company is the reinsulating of "roasted" magnet coils of all kinds. When such a coil is received the old insulation is first removed and the wire is annealed. The wire is then welded up and reinsulated with asbestos and either rewound in the original form or returned to the customer on reels. A large collection of pictures is shown to illustrate the many kinds of work for which coils have been reinsulated and several actual coils are exhibited. There is also a sample board and numerous separate samples showing the company's work. Wires are insulated in sizes from No. 31 to No. 0000.

U. S. SIGNALS WITH A. E. R. A. ASPECTS—NON-SPLASHING ELECTRIC TRACK SWITCH

At space 401 the United States Electric Signal Company is exhibiting its standard line of apparatus, including the Type K and Type K^2 counting signals, the Type G signal, which allows but one car in a block at a time; the crossing bell, the S C signal, the Type M signal, the No. 9 contactor, the new current regulator and the Collins Type A electric track switch.

The S C signal is a counting type of signal, differing from the Type K and the Type K^2 signals in that it uses the indications recommended by the signal committee of the A. E. R. A. These indications are an all-light indication. The green light burns normally when there is no car in the block. The red light indicates danger and a red light staggered with a yellow light indicates a car in the block going away from the signal.

The new features which have never been exhibited before are the Type M signal, the No. 9 contactor, the current regulator and the Collins Type A electric track switch.

The Type M signal is an all-light signal, and is made practicable for use on electric roads where the trolley voltage is used for the signal by the use of a current regulator which keeps the lights constant, regardless of the fluctuation in voltage. One of the most novel features of this signal is the fact that the car is counted out of the block by a peculiar yet simple sequence of electro-mechanical actions. These actions cannot be reproduced by any combination of line wire troubles. This is a matter of greatest importance as a safety feature, for the most dangerous thing that can happen to a signaling system is to have the car counted out by line troubles while the car is still in the block. This signal shows no lights when there is no car in the block, shows a yellow light when a car is in the block going from the signal and a red light for danger.

The new No. 9 contactor has the novel feature that the contact finger is mechanically locked into the open non-contacting position, and cannot be jarred into contact by a trolley pole or any external jar.

The current regulator is a simple laminated wire solenoid device for regulating the current so that the amperage remains constant in the signal lights, regardless of the fluctuation in voltage. This is accomplished by the core of the solenoid shunting steps on a resistance tube for increasing or reducing the resistance in the line as the voltage rises or falls.

The new Collins Type A electric track switch has many new features never before incorporated in an electric track switch. Some of these points are that the switch cannot splash mud and water on pedestrians. The switch cannot be thrown between the trucks of a car by a following car. A most positive anti-straddling device is also a feature. The street box is automatically sealed without the necessity of making up any gaskets or pipe joints. Only 110 volts is used in the street box.

Messrs. Gammons, Bowen and Collins are representing the company.

PROTEAN COUPLER AT WESTINGHOUSE TRACTION SHOW

The success of the Westinghouse Traction Brake Company in meeting the requirements of modern electric train operation appears again in the present operating exhibit of its tight-lock car, air and electric coupler which automatically couples the electrical and air connections as well as the cars. Aside from this remarkable device, the company is making its usual extensive display of air-brake apparatus.

Jacks of all types, but all good, are shown by the Duff Manufacturing Company, including street railway emergency jacks, Duff high-speed ball-bearing screw jacks, Barrett Jacks, Duff-Bethlehem hydraulic jacks.

SAFETY DOOR DEVICE OF PREPAYMENT CAR SALES COMPANY

The Prepayment Car Sales Company, space 414, is displaying here for the first time its new line switch, safety device door control. This idea was first suggested by Harold Rowntree, treasurer of the company, who took out a patent on it in 1906. The late Frederick H. Lincoln, of the Philadelphia Rapid Transit Company, suggested another improvement on the Rowntree device and also took out a patent, which the Prepayment Car Sales Company acquired. These two patents may, perhaps, be best understood by referring to them as "the horse" which, of course, was not very useful without a harness or saddle. In 1913 J. S. McWhirter, superintendent of equipment Third Avenue Railway, New York, put the idea in practical use by devising the needed "saddle." At this time Mr. McWhirter took out a third patent which was duly assigned to the Prepayment Car Sales Company.

The Third Avenue Railway Company has used this safety device on all of its prepayment cars, which are being equipped with folding doors and steps. This covers 487 cars to date, and the railway expects to convert the rest of its rolling stock—about 1000 cars in all. By the use of this device, a car cannot be started until all the doors are closed. On new equipment, it saves the use of circuit breakers and canopy switches and prevents rapid acceleration and very materially lessens gear, pinion and motor troubles, as well as pull-ins of all kinds. The idea has long passed the experimental stage, is proving highly efficient and satisfactory on the Third Avenue System, has recently been adopted for new cars at Springfield and Worcester, Mass., and is expected to come into general use when its merits are thoroughly understood by the electric railway fraternity.

The Prepayment Car Sales Company allows its licensees to make free use of all of these patents and this device without any additional charge above the usual prepayment royalty. A special invitation is extended to engineers and mechanics to investigate the practical workings of the "Million Dollar Idea."

A THERMIT CRANKSHAFT REPAIR

Quite a remarkable crankshaft repair is being shown by the Goldschmidt Thermit Company in Machinery Hall. This shaft is 9¼ in. in diameter and was broken through one of the crankpins, near the crankweb. The fracture was opened up 1 in. by cutting away that amount of metal, then the two parts were aligned in V blocks and welded by the thermit process. After the weld was completed the shaft was placed on a planer and a large section cut out to show how thoroughly the two parts had been amalgamated by the thermit steel.

The Goldschmidt Thermit Company states that it has welded a great many such shafts for electric railways, electric light plants and refrigerating concerns and that the results have been uniformly successful. It seems that in practically all cases the breaks in the shafts are originally due to some flaw in the material. Often an old forged weld will give way in the case of built-up shafts. If the flaw is eliminated by means of a thermit weld the shaft will be better than ever, as the rest of the shaft will have been thoroughly tested while the weak point will have been discovered and remedied. Such crankshaft repairs are inexpensive and can be completed within a period of two or three days.

The company has many other exhibits of interest, as it is showing a new method for welding rails, which permits the railways to do their own welding for large jobs or small. A new model rail grinder is also on exhibition, equipped with a power derailing attachment which permits its derailment and removal from the path of traffic and replacement again in less than a minute.

NEW CONTROL SYSTEM AND PRESSED STEEL MOTORS AT WESTINGHOUSE ELECTRIC EXHIBIT

Probably the most striking feature of the exhibit of the Westinghouse Electric & Manufacturing Company is the actual operation of newly developed types PK and HL control. These control equipments operate motor racks equipped with 40-hp motors. The PK operating control head can be applied to any standard controller. The latest developments in HL control reduce the number of parts, make the form of equipment more compact, and permit a simpler arrangement of wiring. In connection with this control system a number of essential parts such as line switches, release valves, etc., are shown.

A complete line of commutating-pole motors including the box and split frame types for various voltages from 600 to 1500 are displayed aside from a preliminary sample of the new pressed steel motor and the "baby" motor developed for 24-in. wheels.

An extensive line of motor details including brush-holders, pressed steel gear case, commutators, armature and field coils, grid resistors, circuit breakers, fuse boxes, lightning arresters, and a model portable substation for rotary converter service are among other interesting features.

SIGNALS AS TRAFFIC ACCELERATORS

The exhibit of the Union Switch & Signal Company in space 133 includes a working model of the new "T.D.B." system of signaling which has enabled the Scranton & Binghamton Railway to dispense with dispatcher's orders for train movement, as described in the Electric Railway Journal for Oct. 3. By eliminating the time spent in transmitting train orders and in waiting for delayed trains against which the dispatcher has not advanced meeting points this railway has succeeded in materially increasing its schedule speed and in operating multiple-unit trains at fifteen-minute intervals in both directions. The model of the signal system that is exhibited is provided with miniature cars which may be moved in any desired manner or in accordance with any desired combination of movements, the signals changing their indications automatically just as is done under actual operating conditions. No possible sequence or combination of car movements has been found whereby two cars can get together. As the model embraces three double-ended sidings, and is completely equipped with semaphore and light signals, an excellent opportunity is afforded to railway men to study the features of protection and traffic acceleration that are provided by the signals. It should be said that the "T.D.B." or traffic direction block system was introduced only eighteen months ago, but since that time it has been installed on eight different electric railways.

WESTINGHOUSE LITERATURE AT THE CONVENTION

The Westinghouse Electric & Manufacturing Company has issued quite an elaborate lot of literature in connection with the convention as follows:

Railway Data Exchange No. 10 containing data dealing more particularly with improvements of voltage on interurban lines, effect of voltage on performance of motors, cost of stops and trailer operation, saving energy and train operation in city and interurban service. Heavy Traffic Centers, Circular 1549, shows a large number of handsome engravings illustrating the heavy traffic centers in various large cities where surface lines are equipped with Westinghouse apparatus. No. 1550, on 1500-volt direct current substation equipments, contains descriptions of different roads using this type of equipment. Maps are also given of the properties to show the territory covered, and much operating data are also included. Switchboards and accessories for use on 1500-volt d. c. lines are also illustrated and described.

Train Operation for City, Suburban and Interurban Service, No. 1546, is a collection of illustrations with brief notes showing the advantages to be derived from the use of multiple-unit trains. Several curves show the small amount of current required for a high-speed interurban car when handled in a careful manner.

Following its usual custom, the Westinghouse Company has this year issued a progress leaflet, No. 1552, in which is outlined the progress made by the company in electric railway apparatus. Among the items included are the Philadelphia terminal electrification of the Pennsylvania Railroad; the electrification of the Norfolk & Western Railway of the Bluefield Division in Virginia, and the recent addition to the New York, New Haven & Hartford Railroad.

The Westinghouse exhibit itself is described in circular 1551, with an art cover, representing "Joe and the General Manager" leaving for Atlantic City. This scheme is followed throughout the book in which they discuss the various pieces of apparatus in the Westinghouse exhibit.

PORTABLE CROSSOVERS AND MANGANESE PIECES AT WHARTON EXHIBIT

Among the new types of track work shown by Wm. Wharton, Jr., & Company this year are extra heavy switch pieces for portable crossovers, used more particularly in reconstruction work. These crossovers are of much larger radius than the old type, as they are made 75 ft. to the inside rail as against the 60 ft. radius used in previous designs. The rail used weighs 110 lb. per yard, the heaviest flat guard section rolled, while the switch pieces are of solid cast steel with pockets into which the adjoining rail is securely fastened. Two types of frogs in this construction are on exhibition, one that can be adjusted for variations of 9 in. in the devil strip and the other for use where the devil strip remains the same.

Also on exhibition are the company's well-known standard switches, the H. C. B. in solid "Tisco" manganese steel, and the H. T. in "Tisco" manganese steel keyed center construction. With these are shown different types of throwing attachments. "Tisco" manganese steel castings for use on car trucks where the wear is excessive are also on view. The "Tisco" brand is made by the Allied Taylor Iron & Steel Company, High Bridge, N. J., the only American company making manganese steel under the original patent of the inventor, R. A. Hadfield.

Beside the foregoing the company shows interesting pictures of complicated layouts, which it has furnished to roads in different parts of the country.

BRILL GRADUATED SPRING TRUCK

What is probably the newest truck in the electric railway field is the No. 76-E type of The J. G. Brill Company which is exhibited this year in the spaces where the company has been located for a number of years. This truck is a center pivotal two-motor type with the new Brill graduated spring system for light and heavy loads. This spring system originated in the Brill single motor truck No. 39-E and is the standard arrangement in that truck. It consists of a coil spring mounted on a semi-elliptic spring under each end of the bolster; the coil spring is limited to a play of ⅜-in. by means of a seat casting which contacts with the bolster when compressed that amount. When the coil springs stop acting, which occurs when the car has between half and a full load of seated passengers, the spring action is transferred to the semi-elliptics. Therefore, the lightly-loaded car body is carried on soft acting soil springs and is given a singularly smooth motion; the semi-elliptic springs being friction springs are incapable of absorbing the minor vibrations and shocks which are commonly felt in a lightly-loaded body, but are, of course, entirely suitable for the heavily-loaded body. A number of cars mounted on this type of truck with both 33-in. and 24-in. wheels are shown in an illuminated photograph stand in the booth.

Among the Exhibits

A miniature section through a boiler house is being shown by the American Engineering Company to illustrate the boiler, stoker, ash hopper, air duct, fan equipment and the proportions of a modern plant. The section is one-quarter size.

* * *

A new trolley catcher and also a new trolley retriever will be exhibited for the first time at space 328 of the Sterling Fare Register Company with which their maker, the New Haven Trolley Supply Company, is associated. The latter company also manufactures and handles the Sterling fare registers and recording fare registers.

* * *

The Yarnall-Waring Company is showing at the association convention for the first time new unloaders for both steam and motor-driven compressors. These include suction and pressure unloaders. A 4-in. starting unloader has been sectioned so that the working parts can be clearly seen. The Lea water meter, which was shown last year in operation, is again displayed.

* * *

The International Steel Tie Company is showing its new method of straight and cross-bonding track by electric welding the rails to the plate on the top of the tie and the plate to the transverse channels. This method of bonding is used with its standard track tie and makes unnecessary any other kind of bond. This practice is also shown by the Indianapolis Switch & Frog Company, which is displaying a piece of track laid on International steel ties.

* * *

A machine and chemical process for the cleaning and restoration of cane or rattan cushions is being shown by the Imperial Car Cleaner Company, Newark, N. J., in practical operation for the first time at a convention. Cushions are taken in all stages of discoloration and restored to their original brightness and cleanliness. The process is very simple and the chemicals used in conjunction with the machine can also be used by hand if desired.

* * *

The first all-light signal, operated by overhead contactors, having the official A. E. R. A. aspects is shown at spaces 117, 119 by the Street Railway Signal Company, Inc., Philadelphia, Pa. The accessibility of parts and inability to put the signals out of step by improper car operation are asserted to be special features of this company's apparatus. Its mechanical type contactors are also said to be the highest speed contactors yet put upon the market.

* * *

Among the valves which the Nelson Valve Company is showing is the Nelson-Erwood swing check and gate valve which is especially adapted for back pressure work. Another interesting valve is an iron body bronze mounted balanced control float valve which is designed to be absolutely tight. The large 16-in. steel Monel mounted gate valve is for use on high pressure superheated steam, total temperature of 800 deg. Fahr. Other valves of interest are iron-body gate, globe and throttle valves; also bronze gate, globe and check valves.

* * *

The Elastic Car Waste Company, space 576, is exhibiting for the first time at the convention sample rolls of its journal box packing made of a shape and size to fit the boxes closely. The rolls are made of carpet waste yarn adaptable to the size of the car journal boxes and are interwoven throughout with a fine brass spring wire which gives permanent elasticity and keeps it in contact with the journal bearings. It is sold in several grades. Two bearings are shown packed to give a practical idea of its application for both steam and electric railway service.

A novel type of electric railway car is shown by the Laconia Car Company opposite the entrance to the steel pier. It is the first car of this type built and is shown completely equipped. This car is of center-entrance, low-level, truckless type, and seats more passengers than any other car of its length, and the weight per seated passenger is also said to be less than that of any other car yet shown. A model is presented to illustrate the action of the non-oscillating levers, together with a model of a double-truck, center-entrance trail car seating sixty-four passengers.

* * *

The Nachod Signal Company, Inc., is showing for the first time at the convention the new A. E. R. A. light signal, using three line wires, with normally closed signal circuits, and giving indications by lights only. The light case is fitted with deep hoods and mounted for adjustment to grade and curve on a bracket bolted to a separate signal pole. The counting relay, which is of the following ratchet type, and the neutral relay are separate units mounted in an iron box made a part of the pole. The signal is demonstrated on a miniature track plan by moving cars over it at will.

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Owing to the increasing interest of electric railway engineers in transmission line construction, Hubbard & Company of Pittsburgh are showing for the first time their complete line of standard pole line hardware and Peirce specialties. The new articles which include the Presteel pole, a box channel bracket arm, a forged steel feeder pin and the Steelwing screw anchor, with the Hubbard Bo-Arrow arms, forged-steel pins and a variety of fixtures and cross-arms, indicate the extent to which galvanized steel is replacing wood and cast iron in overhead line construction.

* * *

The Automatic Ventilator Company is exhibiting, in addition to its well-known line of car ventilators, a line of trolley wheels and harps, the product of the Universal Trolley Wheel Company of Northampton, Mass., for which company it is general sales agent. These wheels are of interest in that they are of the self-lubricating type, using hard grease contained in a pocket in the hub, which, by an ingenious and simple arrangement, is automatically fed to the bearing, as needed. The grease pocket contains enough lubricant to last during the life of the wheel and the user is thus relieved of the expense and trouble of wheel lubrication.

* * *

A really worth-while souvenir of the Speer Carbon Company exhibit is its book on carbon brushes issued as Price List No. 7, a title which does not do justice to its contents. It is not usual to find a catalog on carbon brushes contain more than lists of dimensions and prices. This book is an exception to the rule in explaining just how a brush should be ordered and showing how the manufacturer has classified the grades for different sets of conditions after elaborate tests to fix the electrical and physical characteristics desirable for each kind of service. The permanent record of these tests is found in the great number of load curves reproduced.

* * *

This year instead of exhibiting aluminum models the National Brake Company decided to use the actual brakes just as they are shipped out to its customers. The company has on exhibition beside the regular sizes of the Peacock brakes all the different sizes of the Peacock improved brake, the Ackley adjustable brake, and four or five designs of special brakes, several of which have never been shown before. In all there are sixteen or seventeen different brakes, the purpose being to illustrate the extent to which the company has gone in designing brakes to meet special requirements. The company also has on exhibition a full line of parts manufactured by it.

This year the Star Brass Works are showing only Kalamazoo wheels and harps, but the exhibit includes a new type of wheel 10 in. in diameter, which is shown for the first time.

* * *

The American Car & Foundry Company has handsomely furnished quarters, where visitors may rest comfortably in the vicinity of the company's exhibit of wheels as used on some of the largest railways in the United States.

* * *

The new Schutte mechanical trolley wire clamp, which is made for all sizes of round and grooved trolley wire, is meeting with considerable success, particularly for overhead trolley construction. These clamps are manufactured and sold exclusively by the H. W. Johns-Manville Company, and are exhibited at space 336.

* * *

The Globe Ticket Company is showing several improved forms of the Pope patent P. M. coupon transfer as well as other new styles of transfers and tickets which have recently been adopted by many companies. One of the most interesting of its exhibits is a unique collection of tickets of every description from all over the world.

* * *

The American Mason Safety Tread Company, space 358, is showing a fine assortment of Mason lead and carborundum filled safety treads and Karbolith sanitary car flooring, as well as its well-known self-cleaning, non-slipping Stanwood car steps. It is also presenting a new type of filled Stanwood step, which is especially designed for closed vestibule cars.

* * *

The Nungesser Carbon & Battery Company, Cleveland, Ohio, is showing a complete line of high-grade carbon brushes for traction and power-house service. These brushes are manufactured according to a new method of electrical tempering. They are reported to be giving very satisfactory operation in actual service.

* * *

The Sauvage-Ward Brake Company, New York, is displaying at space 501 a full line of automatic slack adjusters and solid adjustable bottom rods. These adjusters give an increase in shoe mileage of from 25 per cent to 100 per cent, and an absolutely uniform brake action. They eliminate the necessity of any hand adjustment, automatically taking up slack as fast as it develops. They are applicable to all types of trucks.

* * *

The Lord differential staffless brake and the new Perfected Giant brake described in the Oct. 3 issue of the Electric Railway Journal are on view for the first time at space 577. One of the noticeable gains in the differential staffless brake is its space-saving feature as only 6½ in. extended space is taken up on the car platform. The differential principle, which has never been applied to car braking heretofore, offers a simple means for obtaining any power required in the use of a hand brake. The Perfected Giant brake is said to be the lightest geared brake yet designed. One of its new features is an adjustable automatic stop to eliminate lost motion when the motorman applies the hand brake.

* * *

The Johnson Fare Box Company is showing for the first time, in connection with its standard registering fare box, a new ticket cancelling and counting device on which it has been experimenting for the past two years. This device is attached to the company's regular fare box and is operated by electric motor, so that the tickets are passed through two rolls and automatically cancelled and registered at the same time; and run into a separate compartment from the coin. The company is also exhibiting its electrically driven fare box with special examination attachment for use in elevated stations. This machine was designed for the Chicago elevated roads and has many unique features specially adapted for elevated and subway station service.

* * *

The American Brake Shoe & Foundry Company offers at the Convention the improved types of brakeheads, association standards for narrow tread and broad tread wheels. These brakeheads are of what is termed the "plate" type, which make a much stronger brakehead and give a better distribution of metal on the wearing parts of the brakehead. This construction also permits the use of a shorter brakehead key, which is desirable in many cases. The company also shows various types of association standard brakeshoes, with and without brakehead guides; also some of the flange filled composition brakeshoes, which have been successful in reducing the noise incident to the brake application, in conformity with the requirements of the Public Service Commission of the New York District.

* * *

Among the several features exhibited by the Bayonet Trolley Harp Company, Springfield, Ohio, are some important improvements in trolley base construction designed to reduce maintenance costs. It is also showing in connection with its well-known standards in detachable trolley harps some new ideas in trolley wheels and trolley axles, designed to carry a maximum amount of lubricant with provision for its proper distribution on the bearing surfaces, being especially adapted to high-speed service. "Trolley Equipment Defects and Their Remedy" is the title of a very interesting little booklet the company is giving out. This booklet presents some very important information on trolley inspection, repairs and lubrication. It is based in part on articles contributed by C. W. Squier to the Equipment and Its Maintenance department of the Electric Railway Journal.

* * *

The Jennison-Wright Company, Toledo, Ohio, a newcomer at this convention, is showing the different types of wood block for paving between street railway tracks and on bridges. Its Kreolite lug block is designed to eliminate the three objections hitherto urged against the ordinary rectangular creosoted wood block, namely, bulging, bleeding and slipperiness. The lugs on the side of each block provide a strong foothold for traffic. The lug in the center of one end of each block is wedge-shaped or pointed, so that any expansion is concentrated on the point of the collapsible lug. These features are especially desirable for paving between rails, for should the blocks expand the rails are not pushed out of alignment. Different types of nose and filler block for paving adjacent to rails are also displayed. The Kreolite Hex block is another design which is said to be superior to the usual rectangular block, especially for bridge flooring.

* * *

The "Nokoro" demonstration of the non-corrosive heater wire which has been developed after many years of careful research by the Consolidated Car-Heating Company and which is being shown at space 22 is attracting much attention. To demonstrate the non-corrosive qualities of the wire a coil of the same is shown suspended in a glass tube, and is overloaded with electric current until it runs at a red heat. The test is made more severe by a steam bath in which the red hot coil operates. A pyrometer attachment gives the coil temperature, and inasmuch as under normal operating conditions the temperature of the coil rarely exceeds 450 deg. the test shows conclusively the non-corrosive qualities of the wire, The Consolidated Car-Heating Company is using this coil as standard on all of its heaters and is also furnishing same for repairs on old heaters. A complete description of this wire was given in the Oct. 10 issue of the Electric Railway Journal.

In space 313 the Whittier Mills Company is displaying U. S. Spiral and Silver Lake waterproof trolley and signal cords.

* * *

The Universal Lubricating Company in space 370 is showing its Tulc lubricant for armature and motor axle bearings, journals, trolley wheels and air compressors. This product is furnished in six different grades in quantities of 5 lb. or more.

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The "Ce-Ve" process of varnishing cars of wood and steel as well as retouching and resurfacing where the color has faded are the principal topic of conversation in spaces 574 and 575, where the Chicago Varnish Company is exhibiting. Samples of the various kinds of surfacing which are familiar to practically every railway master mechanic are also shown.

* * *

A complete line of electric specially-ground steel gears and pinions is being shown by the Edgar Allen American Manganese Steel Company at space 500. The peculiar characteristics of manganese steel are clearly shown by a sample gear and pinion which have been distorted cold without a sign of a fracture on the rim of the gear. The pinion was subjected to 245-tons pressure and the gear to 125-tons pressure to produce the results shown.

* * *

The feature of the exhibit of The O. M. Edwards Company, Inc., in spaces 519 and 420 is a trapdoor with a non-slipping tread. A diamond steel plate is used so that no floor covering is required. Among the articles shown are a metal sash with sash locks and a top tightening device; a high station platform door, giving an extension threshold; a window entirely of steel construction with the exception of the wood sill, and an all-steel desk, illustrating the company's line of all-steel office furniture.

* * *

The Trolley Supply Company, in spaces 366 and 367, is featuring its No. 5 retriever, the Simplex trolley stand and its No. 3 detachable fender. The reliability of the No. 5 retriever has been demonstrated and its principal claim is the ease of making repairs in case of a broken trolley rope. The Simplex roller-bearing trolley base is constructed on strictly practical lines and is so designed that increased tension is obtained as the pole goes up. All working parts are made of vanadium steel, case hardened, thus insuring maximum strength and long life.

* * *

Something new in trolley stands is the center of attraction at space 613 where the Wasson Engineering & Supply Company is exhibiting. This new type air retrieving trolley base has recently been developed and put on the market as an ingenious combination of the current-collecting merits of the trolley wheel and the non-jumping qualities of the pantograph for high-speed interurban work. The principal feature of this device is the combination of an air-operated receiving cylinder and auxiliary springs to maintain uniform tension when the pole is in the normal position on the wire. The major part of this base is made of cast iron but those parts which are subjected to the greatest strain are made of annealed carbon steel. Brass, bronze and leather also enter into its construction.

* * *

The great number of uses to which an electric welder may be applied are demonstrated by the Indianapolis Switch & Frog Company in space 173. The demonstrations include track welding and grinding, and reclaiming shop and rolling stock equipment. The Indianapolis electrically-welded joints and bonding plates are of special interest in this exhibit since they, in conjunction with the portable electric welder, make it possible for a road of any size to install welded joints in either large or small quantities and to apply compromise joints by a method which does not simply melt but perfectly welds without heating the rail appreciably. Already thousands of these joints are being installed by roads having the Indianapolis welder, and the joints have been thoroughly tested for several years through all changes of temperature and under all traffic conditions.

* * *

The American Lock Nut Company in space 512 is making its debut this year. This company is introducing the Absolute lock nut which has been thoroughly tested by several electric and steam railways where it demonstrated its claims. In principle the lock is somewhat similar to that of a roller clutch, consisting of a tapered recess machined on the inside of a nut so that one side of it will be closed by the bolt when the nut is in place. A small bobbin-shaped pin is set in this recess and the direction of the flare in the recess depends on whether the threading is right or left hand. In either case the forward motion of the nut carries the locking pin along with it into the deeper portion of the recess where it revolves free. If the movement is reversed the bobbin is forced toward the shallower portion of the recess where the angle is so designed that it automatically wedges the locking pin into the thread of the bolt. This locking device is made for all sizes of nuts.

* * *

The Golden Glow railway fog penetrating and non-dazzling incandescent headlights and reflectors are proving an unusal drawing card in the Esterline Company's space 318. Among the new things this company has to show at this exhibition is the type T-128 electric interurban railway headlight equipped with a dimmer for city service. Like the other headlights shown this new one is an incandescent type employing as a source of light a concentrated filament Mazda bulb of high power and intensity which is said to give a steady, uniform roadway and right-of-way illumination. The parabolic glass reflector, manufactured of glass colored so as extract the blue and violet rays, renders the golden light which gives this lamp its name and which makes its rays less blinding without detracting from the illuminating qualities. It is further asserted that numerous tests on interurban lines demonstrated that this lamp when fitted with a concentrated bulb will enable a motorman to see light-colored objects on the track a distance of 1200 ft. and dark-colored objects at 900 ft. to 1000 ft. The same size of lamp is shown with deck stand and bracket; also the Golden Glow locomotive headlight.

* * *

The Simmen speed control and automatic stop device exhibited in spaces 153 and 155 by the Simmen Automatic Railway Signal Company is certainly worthy of study. This device was shown for the first time at the National Railway Appliances Association exhibition held in Chicago last March. In general it is designed to control the movement of trains over any railroad according to a predetermined adopted maximum speed. For instance, freight trains may be limited to a maximum speed of 30 m. p. h. and passenger trains to 70 or 80 m. p. h. In either case when a train approaches a block indicating danger, the engineer is forced to lower his speed from the predetermined maximum to either zero or some minimum speed under control, say 10 m. p. h. or less as elected by the railway company. If a train enters a block and exceeds the pretermined minimum speed, the air brakes are automatically applied to bring the actual speed of the train again below the minimum. This device is also designed to control the speed of trains around curves and may be installed to inforce any particular speed established suitable for any part of a curve. This company is also showing its dispatcher's recording apparatus for automatically recording the movement of trains. This device is used with the well-known Simmen cab signals which are controlled from the dispatcher's office.

Bonney Vehslage Tool Company, New York, displays in space 328 in a neatly constructed case forty-five different styles of standard ticket punches.

* * *

Various types and designs of brakeshoes for all kinds of railway service, in conjunction with its overhead trolley switch, form the features of the Railway Materials Company's exhibit in space 535. A portion of this company's booth is fitted with attractive furniture for the comfort of its guests.

* * *

E. P. Sharp, manager of the railway department Lumen Bearing Company, Buffalo, N. Y., is attending the convention in the interest of the Ideal trolley wheel. Samples of the Ideal trolley wheel are exhibited by the R. D. Nuttall Company, spaces 140 and 144 Machinery Hall.

* * *

J. W. Griffin of the Wheel Truing Brake Shoe Company, who is one of the oldest regular exhibitors at the convention, is showing samples of his product in space 505. Not only is Mr. Griffin a familiar character but his wheel truing brakeshoe has become equally well known.

* * *

Back in its old spaces 101, 103 and 105 the Chicago Pneumatic Tool Company is attracting attention with its line of portable electric drills, grinders and portable pneumatic tools. The feature exhibits include the Duntley screwspike driving machine, along with this company's electric track drill in operation. A case of sample spikes driven by this electric driving machine on several street and interurban railways is also on exhibition.

* * *

Northern white cedar cross-ties that have been in actual service from five to twenty-nine years, and sections of cedar poles that have been in service twenty years, as well as sections of cedar poles that have been treated by the open tank process are being exhibited by the Naugle Pole & Tie Company in spaces 332 and 334. This company recently has installed an open-tank treating plant and is now prepared to sell treated or untreated cedar poles.

* * *

One of the best and most brilliantly lighted booths in Exhibition Hall is that of the Western Electric Company. The lighting here is accomplished by means of four 500-watt gas filled Type C Sunbeam Mazda lamps suspended from the ceiling. This type of lamp is commercially new this year and burns at a very high efficiency (½ watt per candle). It is manufactured in 500, 750 and 1000-watt sizes for either series or multiple burning and is adapted for either indoor or outdoor service when used with the proper fixtures.

* * *

The well-known F. C. S. brand chilled-iron car wheels for city and interurban service are being shown in various types and sizes by the Griffin Wheel Company in spaces 143, 145, 147 and 149. The combined capacity of this company's plants, which are situated in Chicago, Detroit, Boston, St. Paul, Kansas City, Denver and Vancouver, is approximately 1,500,000 wheels a year. In addition to its wheel business this company makes axles for various classes of railway service. This company is also showing its wheel grinder which is designed for use without removing the wheels from the truck.

* * *

The Eclipse Railway Supply Company at spaces 571 and 573 is showing the Eclipse trolley retriever. It is said that this retriever has been in hard service for the past eighteen months and has proved its substantial and reliable qualities. It retrieves the pole with less than a 3-in. jump and is so constructed that the tension of the springs may be readily controlled. The number of parts in this device are said to be less than in any other retriever and the maintenance cost is correspondingly decreased. In addition to this retriever the company is also showing its various types of fenders and wheel guards.

* * *

The Massachusetts Chemical Company products manufactured by the Walpole Tire & Rubber Company are exhibited in space 333. In glass containers are shown samples of Walpole shellac white; Resistolac, a permanently plastic homogeneous black insulating compound; Enamelac, a black insulating varnish for painting surface exposed to the action of acids, gases and water; Insulac, a transparent quick-drying insulating varnish; Armalac, for the permanent reinforcement of the insulation of cotton covered magnet wire in field and armature coils. Walpole friction tape and other insulating specialties are also displayed.

* * *

Hauck Manufacturing Company, Brooklyn, N. Y., is a newcomer to this convention, displaying, in Aquarium Court, various types of kerosene torches for railway work. One interesting part of the exhibit is an adjustable tire heater for expanding and shrinking on truck and locomotive steel tires. This is operated by a 12-gal. pressure kerosene tank. Another equipment of a similar nature is used for melting the spelter in repairing special track work in manganese center inserts. Preheating oil burners preparatory to electric, thermit or oxy-acetylene welding are also shown. Besides these there are exhibited various small torches for armature repairs and repair shop work.

* * *

The Van Dorn Coupler Company is showing several types of its favorably known couplers in space 533. This company has developed several new drawbar heads of the M.C.B. and automatic type during the past two or three years and is now prepared to build the best type of coupler that can be had for any service. In the latest design provision is made in the head for the automatic coupling of the air-line and electric control cables at the same time that the automatically-operated heads are coupled together. W. T. Van Dorn, the inventor of the Van Dorn couplers, which have been standard equipment on most of the leading electric railways of the country for twenty-five years, is in personal charge.

* * *

With the exhibit of the Mark Manufacturing Company the products of the National Formed Metal Products Company are being shown by J. W. MacDonald. These include a new light-weight conduit and fittings which have been especially designed for car work. In the average four-motor car the conduit weighs about 1200 lb. if of the old kind and 310 lb. if of the new. The manufacturer has developed a process by which it is possible to produce a light-weight threadless conduit on a commercial basis. He has overcome the collapsing of pipes in the cooling process, the one feature which prevented pipe manufacturers from marketing conduit of lighter weight than merchant weight in the earlier days. By this improved process no scale is formed on either the interior or exterior of pipe during its manufacture.

* * *

The Elleon Company, New York, William Wampler on board, has a great exhibit. If you like variety don't miss it. There is something of interest there also for the ladies. Bill has discovered a new metal as clear as silver, as light as wood, as strong as steel and for practical purposes as good as gold. He has samples of every conceivable size and shape for every purpose from kitchen utensils and knives and forks to car trimmings. This metal is made by the Garford Engineering Company, Elyria, Ohio, which has acquired the exclusive right for its manufacture in the United States from its originators in England. There is also exhibited by this company a fine class of white enameled car trimmings, such as has been installed on the new center-entrance cars of the Brooklyn Rapid Transit System.

The Thew Automatic Shovel Company exhibit consists of photographs, blueprints, specifications and circulars illustrating its electric shovels designed especially to meet the particular requirements of electric railways.

* * *

The General Railway Signal Company has on exhibition, in spaces 604 and 606, a photographic record of a number of continuous track-circuit installations, with both light and semaphore type signals, as recently installed on several electric railways.

* * *

American Railway Supply Company, New York, showing its line of badges, conductor punches and buttons, will be found in the Annex, space 526. It also shows, for the first time, a self-adjustable folder rack, with movable partitions, by which folders of any width may be accommodated. This is a unique feature, worthy of examination. For the nineteenth consecutive convention Walter Chur is in charge.

* * *

The Pennsylvania Steel Company has issued a special book to describe its exhibit. Thus page 7 relates to the Manard hard center frog, page 9 to the improved interior joint used by this company for all types of solid manganese crossings, pages 20 and 21 to physical testing of Mayari heat-treated chromium nickel steel and page 22 to Mayari steel shovels. With regard to the last attention is called to the economy that the way engineer can effect by the use of this type of shovel.

* * *

The Seymour portable rail grinder, exhibited in Machinery Hall by E. P. Seymour, of Waltham, Mass., is a newcomer at the convention. This is a light portable machine of simple construction for grinding corrugated rails and rail joints. Although the machine is operated by a motor it weighs less than 800 lb. and can be easily removed from the track by two men. A number of these machines are in use on electric railways in the New England States.

* * *

In addition to its regular line of products, the Dayton Fare Recorder Company exhibits a special combination fare box designed for elevated and subway stations. This device comprises its regular standard fare box equipped with special coin display mechanism to enable the operator or attendant to examine the coins more carefully before they pass from view into the fare box hopper. The company regards this as the ideal fare registering equipment for elevated and subway stations.

* * *

A first showing of an improved type of the Utility honeycomb ventilator is made by the Railway Utility Company. The metal composing the top, front and bottom of the ventilator is pressed into rows of cup-shaped louvers which are so formed that air currents passing over them from any direction cause a powerful exhaust. The ventilator is double-seamed and is galvanized after manufacture. It has no riveted or soldered seams whatever. Several varieties to suit various types of cars are shown. One type is a combined ventilator and lighting fixture in which the fixture is supported from a condulet fitting inside the ventilator.

* * *

A new register for steam and interurban service is displayed by the Ohmer Fare Register Company. This register is designed to indicate, record and print a record of fares in multiples of cents from one cent up to $10. It will meet the requirements of large interurban and steam railroad properties. It is operated by the conductor from any part of the car. This company is exhibiting also, for the first time, its tubular fare box for prepayment cars. This box is simple in construction and takes up very little space on the platform. The fares are deposited in an inner tube which is automatically locked each time it is removed from the outer casing.

Thayer & Company, Inc., space 511, are showing the Chillingworth seamless drawn-steel case commonly referred to as the "one-piece gear case" on account of each half being drawn from one piece of sheet steel, thereby eliminating seams and rivets. Aside from their new designs of bracket construction on the side-suspended cases for General Electric motors, they are exhibiting a case suspended from the ends that is used on Westinghouse motors but can also be adapted to General Electric motors. This case is entirely rivetless and is 50 per cent lighter than malleable-iron cases. Probably the most unusual case exhibited is one that has been sawed in two through the brackets, illustrating the uniformity of metal thickness of the case and the thickness and construction of brackets and reinforcing plate behind the bracket inside the case. The company is represented by G. K. Wannemacher, secretary.

* * *

During the year the Columbia Machine Works & Malleable Iron Company has added a new line to its already extensive and varied products. In space 620 in the Annex is displayed a complete line of N. W. renewable fuses and N. W. connectors. Various sizes and capacities of fuses from 50 amp 600 volts to 10 amp 600 volts; 600 amp 250 volts to 10 amp 250 volts. N. W. cable connectors of all sizes and shapes are exhibited. Of the standard line of repair shop and car equipment specialties there are on exhibition a coil-winding machine, Columbia car replacer, sectional trolley cars and ratchet brake handles. The many friends of John G. Buehler, the president of the company, will regret to learn that he is unable to be present at the convention this year. James Grady, the vice-president and general manager, and W. R. Kerschner, sales agent, are taking care of the interests of the company at the convention.

* * *

Among a general line of solid managanese track special work, the St. Louis Steel Foundry Company in space 14 is showing its special undercut steel tongue switch in both the tadpole and standard designs. The tadpole switch is designed with special provision against the loosening of the tongue under the severest operating conditions, with the resultant tendency to form a lip on the runway rail as well as to overturn under wheel pressure. This switch is cast of solid manganese ground so that the tongue fits accurately, and the heel of the tongue is so designed that a new tongue may always be fitted with the old socket in case it becomes defective. By providing an undercut socket bearing at the heel this switch conforms to St. Louis Steel Foundry Company's original design, but the bearing area has been materially increased and the tongue proper has been reinforced by a web which forms the throatway for the whole length of the tongue.

* * *

Among the new exhibitors is the Sattley Manufacturing Company, Detroit, Mich., spaces 378 and 379. This company demonstrates its various advanced coin sorting, counting and packaging machines which are designed to save time as well as reduce the cost of counting coins. These machines make possible a quick calculation of the receipts of individual conductors or lines, and eliminate disputes and discussions in regard to the correct amount of coin sent in by conductors or given them for change. The machine sorts cents, nickels, dimes, quarters and half dollars, counts them in separate denominations and packages or sacks them, as desired. The operation of the machine may be so controlled that all coins may be sacked or packaged, or any combination of these operations may be made as desired. These machines also detect and throw out mutilated coins without counting them. Money in different denominations may be placed in the machine and a count will be registered in dollars and cents, showing accurately the amount of each denomination and the sum total of all denominations.

The Curtain Supply Company's exhibit at space 638 includes various types of Ring curtain fixtures for both closed and open cars; Rex all-metal rollers, Rex steel sash balance, bulkhead sliding-door curtains, friction roller curtains, and Acme and Climax cable fixtures for open cars.

* * *

Among the exhibits of the American Steel and Wire Company in spaces 558, 559, 560 and 561, are a spindle drill electrically operated and a hydraulic compressor. A varied display is offered of electrical wires and cables, together with a right-of-way fence on steel posts, rail-bonds and a rail-bond testing apparatus.

* * *

Besides a great number of types and shapes of low voltage glass insulators the Brookfield Glass Company, New York, N. Y., features two high-voltage glass insulators, one of 33,000 volts and another of 40,000 volts. A large number of these latter types are installed on high-voltage transmission lines in California. One glass insulator of 18,000 volts is shown similar to an installation of the same type by the United States government on the Sun Reclamation Irrigation Project in Utah.

* * *

The Atlas Railway Supply Company is showing for the first time the Atlas track grinder. This grinder has been tried out by one of the railways in the Central States for about a year, and is notable for ability to operate efficiently under one man. The motor is mounted above the grinding wheel, thereby preventing all chattering. The two auxiliary wheels mounted on the motor side enable one man to remove the grinder from the track to permit a car to pass. The company also presents a complete line of rail joints, braces and tie plates.

* * *

The Lutz-Webster Company is exhibiting a full line of Lutz compression tools and the Lutz universal adjustable watertight floor box. The compression tools include a universal compression wrench for use on all finished or rough surfaces without marring or slipping. It is used in conjunction with the Lutz no-set screw lathe dog, compression ratchet, single-piece ratchet, solid and swivel arm, self-feeding drilling post and nut and bolt sockets. The Lutz floor box gives full adjustability in every direction and is perfectly watertight.

* * *

The Automatic Cashier Corporation, Norfolk, Va., is making its first convention display of the Automatic Cashier for the collection of fares. The machine is so constructed that by simply pressing a lever for the desired number of fares to be taken out of any coin inserted in the slot of the machine by a passenger, the operator delivers the change, simultaneously indicating and registering the transaction. Features of the machine are, that the machine is locked until a coin has been inserted, accepts coin for its face value only, keeps in sight the last coin inserted and ejects spurious coin.

* * *

The Bemis Car Truck Company, Springfield, Mass., has added to its exhibit of last year the Royal Worcester track broom. This is a renewable wire broom especially suited for track cleaning. High efficiency case-hardened and manganese steel brake pins are also exhibited. Samples of these pins, which have been in service for more than 100,000 miles with hardly any noticeable wear, are shown. There is a display of other manganese steel specialties such as sweeper chains, car replacers, brake levers, brake heads, bushings for brake pins and controller handles and manganese bronze check plates.

* * *

The Tool Steel Gear & Pinion Company, Cincinnati, is showing with the U. S. Metal & Manufacturing Company, New York, a collection of gears and pinions which have been in railway service for a number of years and which have made very satisfactory mileage records. One of the most interesting is a gear and a pinion from Denver, which are still good for considerable additional life after having run 191,222 miles in service where untreated pinions averaged only 45,000 miles. This is one from a set of four which went in on the original test. The rest of the material is still in service, having given the same mileage as the gear and pinion shown in the exhibit. The company is also showing an exceptionally large and heavy gear and pinion of the type being furnished to the London & South-Western Railway, London, England, for heavy electrification. The gears weigh approximately 575 lb.

* * *

The New York Switch & Crossing Company has on exhibit a number of switch pieces embodying its latest improvements in girder rail track work. Among them is its new type tongue switch for heavy service constructed of 9-in. 150-lb. rail and equipped with a universal device. The bed and tongue of this switch are manganese steel. The tongue is reinforced on both sides, has an enlarged circular heel, is absolutely pinless and is designed for the heaviest traffic. A separate tongue casting, exactly like the one in the switch, shows the beveled end and full bearing at the heel, and it is this feature which gives the switch its distinguishing character. The company also shows a girder rail mate with manganese insert, a hard center frog, iron-bound construction, and a solid manganese switch with the well-known anti-locking attachment to prevent cars straddling the track.

* * *

The new part of the exhibit of the Taylor Electric Truck Company, Troy, N. Y., is a Taylor maximum traction truck, especially designed by Mr. Taylor to meet the demand for this type of truck. The essential feature of one-half of this truck is the same as that of the Taylor M.C.B. long-base truck with the two pony wheels added. The brake rigging is hung between the wheels and designed so that the brakeshoe is applied below the center of the journal, thus eliminating the tendency in this type of truck of the small wheels lifting or creeping upward when the brakes are applied. The fulcrum of the brake leverage is equally balanced with the hang and weight of the motor. To give easy riding qualities the wheelbase is slightly longer than is customary in this type of trucks. There is also shown an M.C.B. triple-spring truck with improved inside-hung brakes and a Taylor long-base truck. Of this latter type there are 350 in use on the Boston Elevated Railway. Other parts of the exhibit are elliptic and spiral springs and a newly designed improved wrought metal bolster with adjustable chafing plates and self-lubricating center bearings.

* * *

An interesting part of the Pantasote Company's exhibit is a piece of Agasote taken from a shipment to Barney & Smith, Dayton, Ohio, two years ago. This shipment was lost in the flood. When it was found it had been water-soaked for nearly a month, but the headlining was in perfect condition and after being cleaned it was used in the construction of the cars for which it was ordered. A new composition board called Vehisote is also exhibited. This board is similar to Agasote in that it is waterproof and will not warp but it is lighter and can be used in the construction of cars where the elimination of weight is an important factor. There is also exhibited a piece of Agasote flooring which has been in service in front of one of the ticket booths of the Hudson & Manhattan tunnels. Although approximately 700,000 passengers have passed over this piece of flooring, very little wear is shown. To illustrate the flexibility of Agasote, the platform hood of a car is shown. This part of the exhibit also shows how Agasote can be used for the roof of a car as well as headlining and interior finish. The rest of the exhibit comprises car seats upholstered in Pantasote and Pantasote for car curtains.

The Pittsburgh Steel Company is exhibiting at spaces 162 and 164 a sample of its galvanized wire fencing, a more heavily-coated style of which has recently been put on the market. This company is also displaying an ornamental station ground fencing with rounded top.

* * *

The exhibit of the National Lock Washer Company, space 539, consists primarily of models of car curtains, curtain fixtures, sash locks and sash balances for all types of electric railway cars. There are also shown National lock washers for trucks, motors and track and Hipower nut locks for track.

* * *

The Rail Joint Company, spaces 350 to 357, has a full line of the well-known Wolhaupter, Continuous and Weber joints. The very large booth is fitted up for demonstrating the various kinds of joints, and for making the friends of the company comfortable. As is well known, the Continuous joint will be used on the track of the new subways in New York City.

* * *

The Railway Track Work Company is back in its old location at spaces 161 and 163, where it is showing its well-known reciprocating track grinder in operation. This machine is built in a rugged manner with the aid of the best materials and workmanship. A feature of merit in this machine is the facility with which it may be employed in removing corrugations on curves.

* * *

Space 611 used by the Watson-Stillman Company shows hydraulic machinery, including a 125-ton girder rail bender, a 3000-lb. telescopic motor-lift jack, a 20-ton wrecking jack with a removable claw and photographs of tools suitable for shop use. An interesting feature is the emergency car jack designed to meet the requirements of the Pennsylvania Public Service Commission law for use on city cars.

* * *

Although without an exhibit this year, W. J. Jeandron is attending the convention in his own interests, as United States agent of Le Carbone Company of Paris, France. He has recently returned from Europe and states that war conditions in Europe have in no way affected the production and shipment to this country of carbon brushes in ample quantities to take care of his extensive business in American railway and lighting industries.

* * *

A combination anti-slip and open-work type of car step tread is a new feature of the Universal Safety Tread Company's exhibit at space 568. The open-work rear of the tread has all its metal intersections locked, thus eliminating the possibility of springing open. The front part of the tread is composed of a homogeneous none-slipping mass, rather than of vertical steel ribs, so that wearing off of the surface does not in any way decrease its abrasiveness.

* * *

Among the newcomers in the electric railway field, yet well known to steam roads, is Edwin S. Woods & Company, in space 537. This company is exhibiting its anti-friction, flat-sided, ball-center bearing. This unique mechanical combination gives ample travel and two and one-half times more carrying capacity than the use of full-sized roller or ball bearings. A side-bearing with a support feature which takes lateral thrust when the car is riding on tangent track and provides a roller bearing on curves is also shown. Both of these devices result in an easier riding car and a saving in rail and wheel flange wear.

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Drouvé "Anti-Pluvius" puttyless skylights are to be used on the Superior Avenue shops of the Cleveland (Ohio) City Railway. This, together with the Harvard Road Shop group, for which an additional order was also placed, makes a total of more than 50,000 sq. ft. on these buildings. In the Holyoke Street Railway new shops, now nearing completion at Holyoke, Mass., about 1000 lin. ft. of "Straight Push" sash operator has been installed. Other contracts now being finished are additional Drouvé skylights for the Boston Elevated Railway, Stone & Webster Engineering Corporation, H. M. Byllesby & Company, Chicago City Lines and an order for 10,000 sq. ft. for the new shops of the Springfield (Ohio) Railway.

* * *

Consolidated Car Fender Company, Providence, R. I., is using space 589 in the Annex to show its Type A and Type C extension fenders, the H. B. and the Providence life guard and the Mellen snow broom. Several important improvements were made in all of these equipments last year as described in the Oct. 15 issue of the Electric Railway Journal Daily last year. It is interesting to note the popularity of the H. B. life guard for city service. All the city surface cars in New York, Brooklyn, Philadelphia, Chicago, Buffalo and many other cities are equipped with these guards. More than 94,000 equipments are now in daily service in the United States, and more than 200 foreign systems are also equipped with H. B. guards.

* * *

Interest in track special work in the Cleveland Frog and Crossing Company's spaces 585 and 587, is centering on the new types of rail-bound, solid manganese center interurban frogs and switches. In this construction standard 80-pound A. S. C. E. rail is so formed and bolted to a solid manganese steel insert as to permit a very easy approach to a wheel flange bearing at the intersecting flangeways. The depth of the insert eliminates peening or cold rolling, and any of the parts are readily renewable in case failures occur. This company also is exhibiting for the first time the Cleveland motor-driven splice-bar off-setting machine with a range to meet practically any track condition. This machine is similar in principle to this company's well-known hand-power machine.

* * *

The Pyrene Manufacturing Company, space 215 Aquarium Court, has an exhibit designed to demonstrate not only the fire extinguishing properties of Pyrene but also its electrical non-conductivity. The former is demonstrated by means of a large 550-volt, 100-lamp arc which is broken with the liquid. The latter quality is shown by the operation of an electric motor submerged in Pyrene and by an incandescent lamp with all of its terminals submerged. An effective mechanical sign, duplicates of which are in operation all over the country, shows a man extinguishing an automobile fire. Among other exhibits are samples of the latest tamper-proof box for holding extinguishers, the latest types of brackets for attaching extinguishers to cars, and a complete assortment of the parts of the extinguisher.

* * *

The L. S. Brach Supply Company, at space 141, has on exhibition an automatic flagman for crossing protection and samples of the smaller products of the company. It also shows the Brach "Hydro-Ground" consisting of a number of metal bowls with perforated tops mounted on a stem, and designed to create a moist area for grounding. A lightning arrester and static discharger, together with various fittings, are shown in attractive form. A feature of particular interest is the track contact device, which was designed primarily for the control of the automatic flagman and which is also used for announcing trains, etc. It is operated by the depression of the rail under the weight of the car. The box rests on the ties and a finger hooks under the rail operating a switch through a train of levers. One hundred of the automatic flagmen are already out, some of which are on the Public Service Railway, the Scranton & Binghamton Railway, the Long Island Railroad (where it is used in connection with the signal system) and others.

In space 330 the Fonger Fender Company is demonstrating the reliability and effectiveness of the tip-tilting car fender. The claims for the fender are light projection, neat appearance, durable and substantial construction, light weight and adjustability for any type of car.

* * *

A new type 10-ft. air-brake compressor of a design distinctly new from those formerly shown is being exhibited this year in space 15 by the National Brake & Electric Company. This company is also showing a general line of apparatus for railway air-brake and industrial service, all of which is attracting many visitors.

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The United States Wood Preserving Company has on exhibit at space 107 a sample block taken from a section of wood block pavement which was laid down fourteen years ago on Fremont street, Boston, and which now shows a wear of only ⅛ in. Another block, taken from Warren street, New York, shows a wear of only ¼ in. after eleven years of service.

* * *

The Prince-Groff Company, a newcomer at the convention, is featuring in spaces 384 and 385 an interesting line of drills, including power driven "Wedglock" track drills, hand-track drills and hand-signal drills. The exhibit also includes "Kwikgrip" pipe wrenches with straight jaws and the "Pressurlockd" water-gage system, complete with gage, valves, connections to boiler and lamp bracket.

* * *

Among the new things being exhibited in spaces 154 and 156, where the Schutte & Koerting Company is located, is an air washer and cooler for generator sets. In this air is drawn through a pair of spray nozzles to a set of baffle plates which serves to remove the moisture. This device is made for any size generator desired. This company is also showing for the first time its multiple jet condenser.

* * *

Valentine & Company, spaces 580 and 581, present the results of a number of tests of Valspar and other varnishes designed to show the qualities of the company's product. A large number of test samples are shown and one test is under way during the convention. Exhibits of the Valentine car painting systems, showing the results of the application of successive coats, and of enameled signals, form an interesting part of the display.

* * *

The Electric Railway Improvement Company, spaces 570 and 572, is showing a new oil furnace for melting copper used in the installation of rail bonds, negative feeders and return circuits. The apparatus is light and portable and is especially adapted for work on steam roads under electrification when electric power is not available. Any size bond or cable may be installed by this method, which gives the apparatus a very large range of usefulness.

* * *

Although the Morgan Crucible Company, Ltd., London and New York, has been in business in the United States for five years, it is making its first extensive exhibit at this convention. The booth in Machinery Hall is attractively decorated. One of the features of the exhibit is a very large piece of natural pure graphite dug out of one of the company's mines in Ceylon, India, and shipped direct from there for exhibit at this convention. A special display is made of EG3 electro-graphitic Battersea traction brushes; Morganite brushes for generators, copper-filled brushes for collector rings and Battersea screwless connectors. Gland packing graphite rings for the steam and boiler room are also exhibited.

* * *

The specialty exhibited by the Albert & J. M. Anderson Manufacturing Company in spaces 374 and 375 is the Lindall brush-holder, which has the following advantages: better commutation and reduced motor flashing, constant brush pressure, no pig-tails, ease of inspection and renewal and economy of maintenance. The company is also displaying an alligator jaw testing clamp for us in testing watt-hour meters, insulating sleeves made of Aetna insulation for covering incoming conduits, an Anderson-Little switch for controlling light and heating currents and giving a quick break at two points, and a lock type of disconnecting switch for high-tension compartments.

* * *

Richard Russell, Toronto, Canada, and Niagara Falls, N. Y., has an interesting exhibit in Machinery Hall. During the year he has made a number of improvements on his trigger-lock reversible controller fingers. The fingers are more pear-shaped than formerly, giving them a better contact surface. One part of the exhibit is a 35-K controller equipped with trigger-lock reversible controller fingers. The interchangeability of the fingers and the quickness with which they can be changed is shown. All the electric railways in Canada use these fingers on their controllers, and more than 400 roads in the United States are now employing them. Most of the business done is in repeat orders.

* * *

A new type, light-weight seat and a vertical wheel brake requiring minimum platform space make up the principal features of the St. Louis Car Company's exhibit in space 588. This seat is much lighter than former designs, the weight reduction being accomplished by the use of sheet-steel pressings. Extra seating space of 1 in. is also obtained by the use of an especially designed reversible mechanism which is three-prong with a self-setting feature and also provides a positive stop. In addition to the small amount of space occupied by the vertical wheel brake, this type avoids the danger to passengers when a set brake comes loose. At the same time, the diameter of the wheel and the transmission gearing give the motorman greater purchase and a flywheel action.

* * *

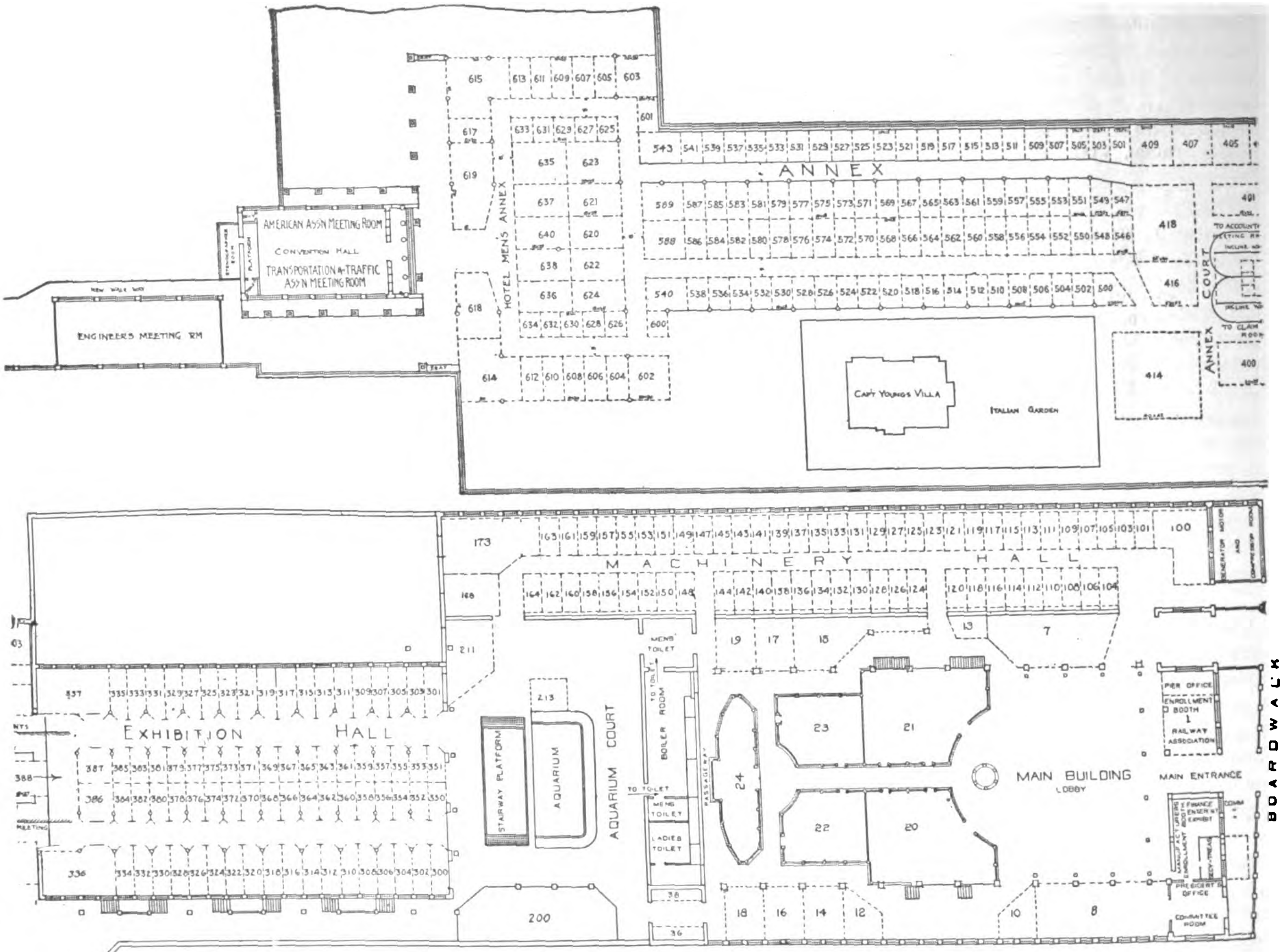
The Gold Car Heating & Lighting Company, spaces 306 and 308, has a working exhibit showing the operation of the thermo control for electrical heaters designed to economize current. The exhibit is designed to particularly attract attention to the ventilated porcelain cores of the heaters by means of which wire temperatures are kept down, and to the coils which are wound of Gold's standard non-corrosive wire. The Fahnestock clip connector is used on a number of heaters to permit the easy removal of units. For use on the older heaters a new ventilated porcelain core has been substituted for the enameled rods previously used. Samples of this are shown. Other exhibits include covers for the new 1200-volt heaters, designed primarily to protect the public and the Cyclone induction ventilator as used on the New York, Westchester & Boston Railroad, the Baltimore & Ohio Railroad and others.

* * *

S. K. F. ball bearings are exhibited at space 532 this year for the first time. This exhibit consists of a pair of 33-in. solid steel wheels and axle mounted on S. K. F. self-aligning ball bearings. The journal boxes are made of cast-steel and are designed for use on the Standard Type 0-50 Truck. The bearings are made in Sweden and are so designed that the two rows of balls run in a spherically-ground outer raceway. Two bearings are used in each journal; the outside bearing, while it has the same outside diameter as the inner bearing, is heavier, has larger balls, a slightly smaller bore, and in addition to taking its proportion of the radial load carries all of the thrust in one direction. These bearings have been successfully adopted in Europe on the journals of heavy railway cars and tramcars. The S. K. F. people are also showing an assortment of heavy bearings suitable for railway work, and several sizes of ball bearing shaft hangers for use in railway shops.

List of Exhibits

The exhibits at the American Electric Railway Association at Young's Pier are so arranged that a systematic trip can easily be made to see them all. The best route for a delegate to take is that leading to the right into Machinery Hall directly upon entrance from the Boardwalk. Here, ranged on the left and right sides respectively, will be found booths 104-164 and 100-163. Turning the corner then, past the aquarium on the left and booths 173-211 on the right, the delegate will find his way into the right hand aisle of Exhibition Hall, past booths 301-337 and 351-387. An incline at the end of this aisle leads into the Annex Court, from which another incline, leading backward, opens into the Claim Hall and the Accountants' Hall. Going ahead from the first incline, however, the delegate will see exhibits 405-543 on his right and 547-589 on his left on the right-hand aisle of the Annex. Around the corner to the right from booth 543 in the Hotel Men's Annex, in booth 603, will be found a gentlemen's smoking and rest room. In the rear, right-hand corner in booth 614, is the ladies' reception and rest room. Turning to the left at this point, the delegate comes to the entrance on his right, which he may take in getting out to the Greek Temple, the home of the American Association, or farther out to the Engineering Hall. The exhibits, however, lead straight ahead, and with the first turn to the left the trip back on the other side of the pier is begun—past booths 612-602 and 634-626 in the Hotel Men's Annex. Booths 540-500 and 500-546 in the Annex, and booths 330-300 in Exhibition Hall. At this point the aquarium is passed on the other side and the delegate may wander down the side aisle of the Main Building past booths 18-2, or else first visit booths 24-20 in the center and 19-15 on the opposite side or vice versa, and thus find himself back at the main entrance from the Boardwalk.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Manufacturers Enrollment Booth
Finance Entertainment Exhibit
Secy-Treas
President's Office
Committee Room
Boardwalk

Abrahams & Company, S., Philadelphia, Pa., space 323, Exhibition Hall. Uniforms. Represented by William Abrahams, Simon Abrahams, Louis A. Hirsch, Julius Weintraub.

Acme Supply Company, Chicago, Ill. Regal revolving curtain box, Crown and Gem pinch handle curtain fixtures, Kass safety step treads, duplex weather proof windows, car fittings and supplies, including full size metal doors and trims for New York Municipal subway cars. Represented by Stanley W. Midgeley, H. V. Morton, Mr. Munro.

Allen American Manganese Steel Company, Edgar, Chicago, Ill., space 500, Annex. Electric special ground gears and pinions of manganese steel for railway motors; also samples of material showing peculiar hardness, toughness and wearing quality of "Stag" brand manganese steel. Represented by Walter H. Evans, Walter S. McKee, W. G. Nichols.

Alloy Steel Forging Company, Pittsburgh, Pa., space 569, Annex. Forged manganese steel chafing plates, pedestal gibs, suspension horn wear plates, brake pins, locomotive spring hangers and draw-bar coupler yokes, steam shovel friction band strap, chain parts, woven manganese steel screen, rolled manganese steel T-rail. Represented by W. S. Potter.

American Brake Shoe & Foundry Company, Mahwah, N. J., space 416, Annex. A. E. R. A. Standard brake heads and brakeshoes. Represented by F. W. Sargent, E. B. Smith, E. L. Janes, C. P. Wright, A. G. Delaney.

American Car & Foundry Company, Chicago, Ill., space 619. Special cast iron chilled wheels. Represented by Messrs. Blewett, Eaton, Wilson, McDowell.

American Engineering Company, Philadelphia, Pa., space 12, main building. The Taylor stoker. Represented by E. G. Marble, general sales manager; M. Alpern, assistant sales manager; R. O'Shea, C. E. Harrison.

American Lock-Nut Company, Pullman, Chicago, Ill., space 512. Lock-nuts. Represented by Fred M. Bobo, H. W. Radcliffe.

American Mason Safety Tread Company, Lowell, Mass., space 538. Mason safety treads, Karbolith flooring, Stanwood steps, ladder shoes. Represented by Henry C. King, president; Ralph C. Davidson.

American Railway Supply Company, New York, N. Y., space 526, Annex. Cap badges, coat convention badges, police shields, self-adjusting timetable and folder rack. Represented by Walter Chur.

American Steel & Wire Company, Chicago, Ill., spaces 558, 561. Rail bonds, electrical wires and cables, right-of-way fence on steel posts, four-spindle drill electrically operated, rail-bond testing apparatus, hydraulic compressor. Represented by B. H. Ryder, F. A. Keyes, C. S. Knight, R. C. Moeller, Henry Rose.

Anderson Manufacturing Company, Albert & J. M., Boston, Mass., spaces 374-375. Overhead line materials, rotary sand boxes, Lindell brushholders, motor-operated end cell switch, Anderson automatic time switches, contact rail insulators, special switches for railway service, etc. J. M. Anderson, A. E. Anderson, A. H. Burns, J. F. Stout, Ernst Woltmann, G. B. Crane, W. W. Hincher.

Atlas Railway Supply Company, Chicago, Ill., spaces 502-504. Atlas rail joints, Atlas compromise joints, Atlas, special joints, Atlas tie plates and braces, Atlas guard rail braces, Vixen rail planer, and a demonstration of a new track grinder. J. G. McMichael, Daniel Thomson.

Automatic Cashier Corporation, The, Norfolk, Va., space 525, Annex. Automatic cashier. Represented by J. F Hibner, E. J. Hibner, Paul Garrett.

Automatic Ventilator Company, New York, N. Y., space 317, Exhibition Hall. Ventilators for monitor and arch roof cars, self-lubricating and renewable trolley wheels, trolley harps and renewable contact springs. George H. Ford, Wm. J. Fleming, Jr., F. J. Hayez.

Auto Utilities Company, Chicago, Ill., space 316.

Bayonet Trolley Harp Company., Springfield Ohio, space 511, Annex. Trolley bases with detachable pole clamp, detachable trolley harps, Bayonet special trolley wheels, sleet cutters. Bayonet self-lubricating trolley axles. Represented by Messrs. Olinger and Garlough.

Bemis Car Truck Company, Springfield, Mass., space 503. Case-hardened brake pins, case-hardened bushings, trolley pins, manganese steel castings, Vim bronze bearings, brake-heads, brooms (wire and corn), etc. Represented by Warren L. Boyer, Theodore S. Adams, David L. Beaulieu.

Blake Car Step Works, Inc., The, Charlotte, N. C., space 600. Blake safety car step, for Interurban and steam railway coaches. Represented by John S. Blake, W. W. Watt and Fred D. Blake.

Brach Supply Company, L. S., New York, N. Y., space 141, Machinery Hall. Brach automatic flagman, Brach vacuum and non-air-gap lightning arresters. Hydro-ground cable boxes, track contacts and signal accessories, Solderall and Solderall torch. L. S. Brach, G. Gort.

J. G. Brill Company, The, Philadelphia, Pa., space 8, Main Building. Radiax El Truck, No. 76-E two-motor pivotal truck, solid forged side frames, center plates, wide-wing journal box, half-ball brake hangers, car seats, motormen's seats, twill-woven cane, lined and unlined. Represented by S. M. Curwen, J. W. Rawle, W. H. Heulings, Jr., G. M. Haskell, A. N. Hargrove, R. B. Liddell, J. E. Brill, F. L. Markham, H. A. Heulings, W. S. Adams, W. M. Smith, M. J. Oswald, C. J. McPherson, J. H. Ohlsson, D. B. Dean, G. H. Tontrup, E. Bronenkamp, C. F. Johnson, S. M. Wilson.

Brookfield Glass Company, New York, N. Y. Insulators. Represented by H. C. Law, Arthur Lockwood.

Buda Company, The, Chicago, Ill., space 311, Exhibition Building. Models of track special work, frogs, switches, crossings, etc., photographic illustrations of completely assembled intersection layouts. Represented by H. S. Evans, S. G. Llewellyn, R. B. Fisher, F. W. Marvel, George K. Reel.

Carnegie Steel Company, Pittsburgh, Pa., spaces 546 to 553 inclusive, Annex. Piece of street railway track, illustrating method of placing steel cross ties in concrete: Duquesne rail joints, Braddock insulated joints; heavy steel cross tie, same as those on which test is being made by Pennsylvania Railroad; rolled steel wheels for interurban and other street railway service; rolled steel gear blanks; finished gears; steel sheet piling. Represented by W. P. Siebert, L. C. Lustenberger, Robert Coe, N. B. Trist, T. W. Williams, W. W. Scott, Jr., N. M. Hench, H. P. Tiemann, L. W. Conroy, R. W. Steigerwalt.

Cheatham Electric Switching Device Company, Louisville, Ky., space 159. Automatic electric switching device, designed to operate switch points by motorman from his controller without having to stop car. Represented by E. S. Olmsted, J. D. Augustus.

Chicago Pneumatic Tool Company, Chicago, Ill., spaces 101-103-105. Duntley portable electric tools, consisting of portable drills, grinders, track drills, spike drivers, track grinders and portable pneumatic tools of the Boyer and Keller types. W. O. Duntley, Thomas Aldcorn, C. B. Coates, J. W. Smith, F. S. Eggleston.

Chicago Varnish Company, Chicago, Ill., spaces 574, 575. Examples of CeVe process finishes on wood and steel. Represented by Messrs. Bigelow, Gundrum, Buckman, Porter.

Cleveland Frog & Crossing Company, Cleveland, Ohio, spaces 585 and 587, Annex. Track special work and motor-driven splice offsetting machine. Represented by George Stanton, L. G. Parker.

Columbia Machine Works & Malleable Iron Company, Brooklyn, N. Y., space 620, Hotel Men's Annex. Automatic winding machines, standard armature and field coil winding machines, standard and renewable fuses, copper connection terminals, car replacers, brake handles, controller handles, trolley line material, knife-blade switches, bearings, commutators. Represented by J. G. Buehler, James Grady, W. R. Kerschner, M. R. Jarvis.

Consolidated Car Fender Company, Providence, R. I., space 589, Annex. Street car fenders and life guards. A. J. Thornley, George H. Hollingsworth, H. E. Oesterreich.

Consolidated Car-Heating Company, Albany, N. Y., space 22, Main building. Electric heaters and switches for 600-1800 volt operation, heater ventilating units, thermostatic control of car heaters, signal systems, highway crossing signals, gong ringers, emergency lighting relays, special jumper plugs and sockets, push-button switches, pneumatic and mechanical door operators, special relays and contactors, tilting heat deflectors, trap door operators. Represented by Thomas Farmer, Jr., C. C. Nuckols, H. L. Hawley, G. E. Oakley, W. S. Hammond, Jr., J. H. McElroy, C. A. Eggert, F. Avery.

Cooper Heater Company, The, Carlisle, Pa., space 325, Exhibition Hall. Forced ventilation hot-air car heaters and pressed-steel hot-water car heaters. Represented by W. Stuart, Caleb S. Brinton, Thomas MacDonald, Thomas Green, Jr.

Curtain Supply Company, The, Chicago, Ill., space 638, Hotel Men's Annex. Car curtains, ring curtain fixtures, Rex all-metal curtain rollers, curtain materials, Rex sash balances, Rex friction curtain rollers, etc. Represented by R. F. Hayes, Eastern manager; G. E. Fox, Eastern and Southern representative; F. M. Egolf, Southwestern representative.

Dayton Fare Recorder Company, The, Dayton, Ohio, spaces 386-387. Dayton fare recorder, Dayton registering fare boxes, Dayton combination fare-box recorders, Dayton special combination fare-box recorders for elevated and subway stations. Represented by Will I. Ohmer, P. J. Mitten, D. B. Whistler.

Joseph Dixon Crucible Company, Jersey City, N. J., space 16. Graphite products, including lubricating graphites, graphite grease, boiler graphite, silica graphite paint, crucibles, foundry facings, dynamo brushes, belt dressings, etc.; the products in a crude and finished state; also a set of gears which have run more than 300,000 miles with Dixon graphite wood grease only. H. W. Chase, W. M. Willitts, J. A. Condit, L. H. Snyder.

Drew Electric & Manufacturing Company, Indianapolis, Ind., space 315, Exhibition Hall. Overhead line material, car equipment and safety devices, including Samson trolley splicers and splicing ears, protective and reclaiming sleeves for iron poles, motorman's safety mirror, Samson pipe insulators, overhead switches, crossings, clinch ears, adjustable trolley crossings, section insulators, linemen's tools, high-tension insulators. Represented by James H. Drew.

G. Drouve Company, The, Bridgeport, Conn., space 607, Annex. Anti-pluvius puttyless skylights, straight-push sash operator, Lovell window operator (regular and dreadnought). Represented by William V. Dee, Earl H. Hauserman.

Duff Manufacturing Cimpany, Pittsburgh, Pa., space 637. Street car emergency jacks, genuine Barrett track and automatic lowering jacks, Duff high-speed ball-bearing screw jacks, Duff-Bethlehem hydraulic jacks. Represented by E. A. Johnson, C. A. Methfessel.

DuPont Fabrikoid Company, Wilmington, Del., space 307. Fabrikoid car window material, Fabrikoid car seat upholstery material. Represented by C. Hallock Silkman, H. W. Wivel.

Eclipse Railway Supply Company, Cleveland, Ohio, spaces 571-573, Annex. Eclipse life guard, Eclipse wheel guard, Acme fender, Eclipse trolley retriever. Represented by Ross Forward.

O. M. Edwards Company, Inc., The, Syracuse, N. Y., spaces 591, 521, Annex. Window fixtures, sash balances, metal sash, metal extension platform trap doors, shade rollers, padlocks. O. M. Edwards, W. A. LeBrun, E. F. Chaffee, C. H. Rockwell, T. P. O'Brian, W. C. Bradbury.

Elastic Car Waste Company, Philadelphia, Pa., space 576, Annex. Patented elastic car waste of carpet yarn interwoven with fine brass spring wire for journal boxes. Represented by Frank B. Birch, president, Arthur B. Birch, William S. J. Wetherill.

Electric Railway Improvement Company, Cleveland, Ohio. spaces 570-572, Annex. Electric weld rail-bonding car in operation, coal oil furnace for copper weld rail bonding, rail bonding apparatus. Represented by Stanton. Howatt, Schmid, Rinker, Huber.

Electric Railway Journal, New York, N. Y., space 7, Building No. 1. Reception booth and office of Convention Daily. On display and for distribution: copies of Convention Number, Convention Daily and regular weekly editions. Other publications of McGraw Publishing Company on display are: *Electrical World; Engineering Record; Metallurgical & Chemical Engineering; McGraw Electrical Directories* (Electric Railway and Lighting & Power editions); *McGraw Electric Railway Manual* (Annual Red Book); and *Electric Railway Dictionary*. Represented by Messrs. McGraw, Wilson, Henry, Kucera, Blake, Norris, Babtiste, Beard, Hunt, Gould, Kingsley, Jackson, Henley, Haas, MacMurray, Bruster, Grinnell, Schoch, Coburn, and Misses Vannett and Johnson.

Electric Service Supplies Company, Philadelphia, Pa., space 414, Annex. Keystone car destination signs, Garton-Daniels lightning arresters, Keystone truss pins, Locke insulators, Keystone triangle cross arms and fittings, Keystone trailer connectors, lamp guards, Never-Creep guy anchors, Peerless universal armature machines, Melo-Beam incandescent headlights, Keystone steel gear cases, Keystone motorman's seats, Samson spot cordage, Safety car lighting fixtures and other new electric railway specialties, most of it in actual operation. Represented by C. J. Mayer, A. H. Englund, J. W. Porter, J. V. E. Titus, W. A. Armstrong, Jr., W. J. Bryan, G. W. Cox, L. H. Pike, H. G. Lewis, J. R. McFarlin, T. F. McKenna, T. H. Henkle, F. C. Peck, G. E. Watts.

Electric Traction, Kenfield-Davis Publishing Company, Chicago, Ill., space 10. Reception booth. Represented by W. J. Field, H. E. Ross, H. J. Kenfield.

Electro-Mechanical Brake Company, West Bromwich, England, space 610. E.M.B. unbreakable jointless grid resistances for traction and industrial work; specimens of the equipments used by the London County Council, Birmingham, Adelaide and other street railways, as well as a typical resistance as used by the British Admiralty, iron and steel works, etc. The resistances will be shown on test. Represented by A. W. Maley.

Ellcon Company, The, New York, N. Y., spaces 536-538. Safety control interlocks, car height adjuster device, porcelain enameled pipes and fittings, switches, conduit fittings, Aero metal castings, Aero metal in sheet and cast form, ball-bearing door hangers. William Wampler.

Esterline Company, Indianapolis, Ind., space 318, Exhibition Hall. Golden Glow fog penetrating, non-dazzling railway headlights; locomotive headlights; marine and emergency wagon searchlights; Golden Glow mirrored glass reflectors; Esterline graphic efficiency recording instruments. W. McK. White, sales manager; F. O. Grayson, St. Louis, Mo.; E. R. Mason, New York, N. Y.

Federal Signal Company, Albany, N. Y., space 131, Machinery Hall. Automatic signals, a. c. and d. c. bottom post and top post types; three-position light signal; single-phase and polyphase relays; neutral, interlocking and polarized relays; track transformers; switch circuit controllers and switch indicator; reactance bonds, etc. J. T. Cade, J. W. Hackett, M. H. Loughridge, J. F. Kelly.

Flood & Conklin Company, Newark, N. J., space 18. Simplex system for finishing wooden and steel passenger equipment. Represented by L. Atwood Williams.

Fonger Fender Company, Chicago, Ill., space 330, Exhibition Hall. Fonger tip-tilting automatic fender mounted on a truck on wheels to be pushed against a live person every few minutes to show how it will pick him up automatically without the slightest injury. Represented by Robert V. Fonger, Malcolm W. Fonger.

Galena-Signal Oil Company, Franklin, Pa., space 24, Main building. No exhibit, but will have a reception and tea room. Represented by C. C. Steinbrenner, vice-president; E. H. Baker, second vice-president; G. A. Barnes, assistant manager electric railway department; E. V. Sedgwick, C. H. Thomas, W. A. Trubee, L. R. Speare, C. A. Record, L. J. Drake, Jr., W. A. McWhorter, E. G. Beatty, R. H. Craig, A. O. Fletcher, J. C. Glair, A. Green, W. H. Lee, W. A. Love, George J. Smith, W. O. Stieff, J. E. Southwell, W. C. West, D. A. J. Sullivan, H. C. Mason, W. H. Pape.

General Electric Company, Schenectady, N. Y., space 20, Main building. Six types of commutating pole motors, comprising; G.E.-239 rated 1200-2400 volts, 150 hp G.E.-240 motor, rated 600-1200 volts, 80 hp G.E.-242 motor, rated 65 hp at 600 volts and 55 hp at 500 volts, G.E.-243, 600-volt motor, G.E.-248 motor rated 160 hp at 600 volts, G.E.-247 motor rated 35 hp at 600 volts and 30 hp at 500 volts; M.K. control for operating four 30 hp motors; four types of K controllers including the new K-201; combined straight and automatic air brake equipment with CP-27-B compressor; CP-25-C, 600 volt new light weight compressor; line materials, part as installed in service; display boards of air brake details, circuit breakers, fuse boxes, rheostats, etc.; forged steel treated gears and cast-steel split and solid gears with forged steel treated pinions; sheet-steel gear cases; complete line of headlights; exhibit of modern car lighting including boron car lighting regulator outfit and boron filament lamp, tungsten registers, etc.; lantern slide exhibition showing progress in electric railway field during the past year. Represented by J. G. Barry, W. B. Potter, F. E. Case, G. H. Hill, E. D. Priest, C. E. Eveleth, J. F. Layng, W. T. Stanton, E. P. Waller, W. G. Carey, F. H. Gale, W. J. Clark, S. W. Trawick, C. B. Keyes, W. H. Sigourney, H. C. Grier, C. C. Pierce, C. E. Sprague, R. E. Moore, R. P. H. Staub, W. A. Woolford, E. H. Ginn, H. L. Monroe, C. A. Ives, J. A. Cranston, O. E. Turner, L. W. Shugg.

General Railway Signal Company. Rochester, N. Y., spaces 604, 606. Photographic record of block signal installations using continuous track circuit with both light and semaphore type signals. Represented by H. M. Sperry, S. M. Day, H. W. Lucia, W. W. Coleman.

General Vehicle Company, Inc., Long Island City, N. Y., space 603. Two-ton emergency wagon (electric), one-ton industrial truck (electric). Represented by F. Nelson Carle, F. B. Fink, J. R. C. Armstrong.

Globe Ticket Company, Philadelphia, Pa., spaces 380, 382. Transfers, cash fare receipts, tickets in book form, strips, rolls for city and interurban electric railways. Pope patent p. m. coupon transfers, ticket punches. Represented by W. C. Pope, P. C. Snow, R. C. Osman, E. Elliott, C. Elliott, C. W. Zieber.

Gold Car Heating & Lighting Company, New York, N. Y., spaces 306, 308, Exhibition Hall. Ventilated core electric heaters, thermostatic control for electric heaters, electric thermostatic control for steam heating, Cyclone ventilators. Represented by F. H. Smith, A. B. Strange, F. T. Kitchen, F. O. Bailey.

Goldschmidt Thermit Company, New York, N. Y., spaces 114, 116, 118, 120, 13, Machinery Hall and Main Building. Improved apparatus for making Thermit insert fully welded rail joints from start to finish; sample welds of rail joints, crank shafts and other sections; Goldschmidt thermit rail grinder with power derailing feature in operation on track; a full line of metals and alloys free from carbon and thermit pipe welding materials. Wm. C. Cuntz, general manager; F. W. Cohen, chief engineer; W. R. Hulbert, sales manager; H. S. Mann, H. D. Kelly, J. G. McCarty, William Aldrich.

Griffin Wheel Company, Chicago, Ill., spaces 143, 145, 147, 149, Machinery Hall. Chilled iron car wheels, F. C. S. wheels for city and interurban service. Represented by A. A. Hale, H. N. Scott, A. W. Brown, W. A. Bennett.

Hale & Kilburn Company, Philadelphia, Pa., spaces 407, 409, Annex. Pressed steel Walkover seats for city and interurban cars; steel interior car finish; steel integral window construction; steel car doors, mouldings and other pressings for steel cars. Parlor car chairs; rattan seat covering; 40 ft. section of steel car interior, complete from floor to roof equipped with Walkover steel seats as supplied for every first-class steel passenger car used in the United States. Represented by A. F. Old, C. W. Laskay, R. H. Pilson, F. C. Edson, F. R. Robb, J. K. Hoffman, I. Lubersky, W. F. LaBonta.

Harrison Safety Boiler Works, Philadelphia, Pa., spaces 158, 160, Machinery Hall. The Cochrane metering heater, Cochrane precision meter, Sorge-Cochrane hot process water softening system, Cochrane multifort safety exhaust outlet valve, Cochrane multifort flow valve, Cochrane steam stack and cut-out valve heater and receiver, Cochrane steam and oil separators. Represented by H. E. Libson, J. Russell Hibbs,

Hauck Manufacturing Company, Brooklyn, N. Y., space 200, Aquarium Court. Demonstrating portable oil burners for steel car repairs, kerosene blow torches, lead, babbitt and zinc melting furnaces, oil rivet forges, kerosene bonding torches, furnace burners, tire heaters, brazing outfits, kerosene burners for taking up center plates, portable heaters for straightening and bending rails, preheating torches for use with oxy-acetylene and electric welding machines, paint burners and linemen's torches. Represented by George P. Kittel, A. Busch Hauck.

Heywood Brothers & Wakefield Company, Wakefield, Mass., space 566, Annex. Railway car seats with pressed steel features; reed parlor-car chairs, canvas-lined rattan car seat webbing. Represented by Bertram Berry, Scot Wade, E. C. Lang.

Hubbard & Company, Pittsburgh, Pa., space 618, Hotel Men's Annex. Pole line hardware, Peirce brackets, Bo-Arrow arms, channel-iron arms, angle-iron arms, forged steel high-tension insulator pins, steel poles, anchor braces, drop forgings, construction tools and shovels, Hunt nut locks. Represented by C. L. Peirce, Jr., J. A. McLaughlin, Jr., Richard M. Kerschner.

Hunter Illuminated Car Sign Company, Flushing, N. Y., spaces 36, 38. Destination car signs. Represented by Lytle J. Hunter, Fenley Hunter, Gale Hunter, Harry Reisiger.

Independent Lamp & Wire Company, Inc., New York, N. Y., space 527, Annex. Salamander Asbestos insulated magnet wire, fireproof armature and field coils, asbestos tape. Represented by R. Bingham Dana, secretary, Frank A. Duff, superintendent coil department.

Index Visible, Inc., New York, N. Y., space 523, Annex. Visible card index files and systems. Represented by LeRoy M. Wightman.

Indianapolis Switch & Frog Company, Springfield, Ohio, space 173. Manganese frogs and track work; continuous railway crossings; Indianapolis portable electric track welder, Indianapolis portable electric track grinder, track drills, electric welded joints, electric welded steel tie construction. Represented by E. C. Price, W. H. Thomas, H. H. Murray, J. A. Feulks.

International Register Company, Chicago, Ill., spaces 300, 302, 304. Electrically-operated station coin register, standard coin register and fare box, standard International single and double registers, car fittings, Heeren enamel badges, International conductors' punches. Represented by A. H. Woodward, president; John Benham, vice-president.

International Steel Tie Company, Cleveland, Ohio, space 148, Machinery Hall. Steel crossing substructure with crossing section fastened in place, insulated steel tie for open track with rail fastened in place, steel plate tie with rail fastened in place. Represented by William P. Day, J. J. O'Donnell, L. C. Shank.

Jennison-Wright Company, Toledo, Ohio, space 110, Machinery Hall. Kreolite lug wood block track paving, Kreolite Hex-wood block factory shop floors, creosoted ties, cross arms, cross-arm pins, creosoted structural timbers. Represented by H. G. Jennison, F. W. Cherrington, L. P. Drinker.

J. N. Johns Manufacturing Company, New York, N. Y., space 371, Exhibition Hall. Pivot journal bearings and wedges, standard journal bearings and wedges, check plates guaranteed type, Flower brush holders, air brakes and controller handles with steel tube bushings, steel tube bushings for air brake and controller handles and stems, replaceable center trolley wheels, general line of castings brass, bronze and malleable, babbitt metal three grades, Col-R-01 car curtain and hand strap renewer, rub-on varnish cane seat preserver. Represented by F. W. Roth, D. B. Flower.

H. W. Johns-Manville Company, New York, N. Y., space 336. Overhead line material, molded insulation, ebony asbestos wood for switchboards, fiber conduit, Noark protective devices, including boxes, fuses, cut-outs and accessories, hard fiber tubing and sheets, expander rings, Niagrite cable wrapping, friction tape and splicing compound, "J-M" sand hose, electric car heaters, rail bonds, asbestos roofing, pipe covering and packing. Represented by J. W. Perry, general manager electric department; S. G. Meek, assistant manager electric department; J. H. McManus, New York, N. Y.; H. M. Voorhis, Philadelphia, Pa.; E. B. Hatch, president The Johns-Pratt Company, Hartford, Conn.; R. C. Buell, secretary The Johns-Pratt Company, Hartford, Conn.; George Christensen, New York, N. Y.

Johnson Fare Box Company, Chicago, Ill., spaces 320, 322, 324, Exhibition Hall. Johnson standard fare box, Johnson registering fare box with penny lock-up. Johnson registering fare box with penny lock-up and trip cyclometer, Johnson registering fare box with automatic ticket cancelling and counting device, Johnson automatically operated examination top and registering fare box designed for elevated and subway stations. Represented by C. H. Birdsall, W. P. Butler, J. M. Johnson, H. J. Baur.

Kerite Insulated Wire & Cable Company, New York, N. Y., spaces 130, 132, Machinery Hall. Kerite insulated wires and cables and insulating tape. Represented by Major A. Ames, P. W. Miller, J. Warren Young.

Laconia Car Company, Boston, Mass., space opposite entrance to Pier. Center-entrance car, length 23 ft. over buffers, seats forty-four passengers, weight completely equipped but 500 lb. per seated passenger, being lightest motor car yet shown. Model shown inside the car to illustrate the non-oscillating features. Represented by Cernell S. Hawley, J. E. Johnson, Peter M. Kling, E. J. Fitzgerald.

Lorain Steel Company, Johnstown, Pa., space 418. Track special work, samples of girder, guard and high T-rails including the new standard A. E. R. A. sections, electrically welded joints. Represented by H. C. Evans, New York, N. Y.; John A. Stacey, New York, N. Y.; E. M. Noonan, New York, N. Y.; A. S. Littlefield, Chicago, Ill.; S. P. McGough, Chicago, Ill.; A. L. Verner, Cleveland, Ohio; W. W. Kingston, Atlanta, Ga.; J. Thomas Moore, Atlanta, Ga.; Staats J. Cotsworth, Philadelphia, Pa.; Joseph MacCarroll, Jr., Philadelphia, Pa.; H. L. Gleeson, Pittsburgh, Pa.; and H. C. Stiff, George W. Reese, Edward Ott, James E. Decker, William Lynam, S. C. Weeks, W. Milt Brown, Carroll Burton, E. B. Entwisle, H. F. A. Kleinschmidt, P. M. Boyd, Johnstown, Pa.

Lord Manufacturing Company, Brooklyn, N. Y., space 577. Lord differential staffless brake, Giant perfected brake, Earll retriever, Earll catcher, Sterling trolley base, Sterling sander, Lord screenless air cleaner, Abacot static discharger, Hydroground, Sterling Fender, Sterling and Rhode Island wheelguards, Sterling ticket punches. Represented by E. A. Lightner, secretary and sales manager; L. W. Horne, chief engineer.

Lutz-Webster Engineering Company, Inc., Philadelphia, Pa., space 509. Lutz compression tools, consisting of compression wrench, compression ratchet, one-piece Ratchet, self-feed "Old Man" or drilling post with solid or full swivel arms, nut and bolt sockets and extension sockets, Lutz adjustable watertight floor box. Represented by W. H. Lutz, Sam Mason.

McGraw Publishing Company, Inc., New York, N. Y. (See ELECTRIC RAILWAY JOURNAL.)

McQuay-Norris Manufacturing Company, St. Louis, Mo., space 319, Exhibition Hall. "Leak-Proof" piston head packing rings. Represented by W. K. Norris, E. H. Hill, H. P. Marsh.

McRae's Blue Book Company, Chicago, Ill., space 10 B, Main building. *McRae's Blue Book*, with which is consolidated *The Railway Supply Index*. Represented by A. Smith, New York.

Mark Manufacturing Company, Chicago, Ill., space 617, Annex. Mark cold-drawn steel union. Represented by B. G. Calloway, J. K. Saville.

Maryland Steel Company, Philadelphia, Pa., space 23. See notice under the Pennsylvania Steel Company. Represented by Messrs. Jay, Tackaberry, Clark, Belknap, Gillispie, Davis, Balsich, Vickery, Henderson, Alden.

Midvale Steel Company, Nicetown, Philadelphia, Pa., space 640, Hotel Men's Building. Rolled-steel wheels, steel-tired wheels, axles. Represented by H. M. Deemer, D. V. Foster, W. S. Edger, A. E. Goodhue, T. W. Illingworth, Thomas Price, E. F. Berger.

Morgan Crucible Company, Ltd., New York, N. Y., spaces 104, 106, Machinery Hall. Morganite and Battersea carbon brushes. Represented by H. W. Knott, E. F. Dickieson, Jr., T. U. Franklin, H. W. Gudmens.

Nachod Signal Company, Inc., New York, N. Y., space 124, Machinery Hall. Track model of single track disk signals, single track light signal, highway crossing bell with flashing lights, high-voltage relays, high-speed trolley contactors, automatic headway recorders. Represented by Messrs. Nachod, Stone, Knerr, Guthorn.

National Brake Company, Buffalo, N. Y., spaces 368, 369, Exhibition Hall. Peacock improved brakes, Peacock brakes, Ackley adjustable brakes, Tiger brakes, accessories. Represented by Frank D. Miller, W. D. Brewster.

National Brake & Electric Company, Milwaukee, Wis., space 15, Main Building. National air brake compressors of the direct suspended type, new National low-type air brake compressor and a complete line of automatic governors and motorman's valves, "3VS" motor-driven compressor for industrial and shop service, together with other types of both stationary and portable compressors with special automatic controlling system for alternating current. Various types of belt-driven compressors.

National Car Wheel Company, Pittsburgh, Pa., spaces 578, 579, Annex. Cast-iron wheels of Star special quality and special design for electric railway service. Represented by John Howard Yardley, vice-president; E. H. Chapin, J. F. Weisbrod, H. E. McClumpha, J. D. Cunningham.

National Lock Washer Company, The, Newark, N. J., space 539, Annex. Models of car curtains, curtain fixtures, window fixtures, National lock washers, Hipower nut locks. Represented by F. B. Archibald, R. F. Horsey, J. H. Horn.

National Tube Company, Pittsburgh, Pa., spaces 554, 555, 556, 557. "National" tubular street poles; short sections of "National" tubular street poles with windows, curtained to show construction of joints; Shelby seamless trolley poles machined to show construction; trolley pole testing machine; one 17-ft. length of National casing, telescoped into three thicknesses, also a 2-ft. length machined to show telescoping; Shelby table top made from hundreds of pieces of Shelby tubing; pair of andirons showing in actual material and line of process of the making of Shelby seamless tubing from billet to finished tube; Kewanee unions, N. T. C. regrinding valves and Kewanee specialties. Represented by L. F. Hamilton, W. S. Bitting, W. A. Phillis and others.

Naugle Pole & Tie Company, Chicago, Ill., spaces 332-334, Exhibition Hall. Cedar ties in actual service from ten to twenty-nine years; sections of poles in service for twenty years; sections of poles treated with a hot preservative by Naugle open tank method; sections of new cedar ties and poles. Represented by L. E. Morier, A. T. Naugle.

Nelson Valve Company, Chestnut Hill, Philadelphia, Pa., space 126, Machinery Hall. An 18-in. steel gate valve for superheated steam; steel throttle valves for superheated steam; bronze gate, globe, angle and check valves; iron body gate, globe, angle and check valves; automatic non-return stop check valves; balanced control valves; Nelson-Erwood swing gate valve. Represented by H. C. Baynard.

New York Switch & Crossing Company, Hoboken, N. J., spaces 562, 563, Annex. Improved type pinless, big heel tongue switch with manganese bed and tongue and universal spring attachment, reinforced switch tongue, solid manganese tongue switch with anti-straddle attachment, girder rail mate with manganese insert, hard center girder rail frog. Represented by H. R. Sherman, C. L. Wood, E. S. Fassett, D. R. Payne.

Nungesser Carbon & Battery Company, The, Cleveland, Ohio, space 513, Annex. Carbon, graphite and metal brushes. Represented by Hibbard S. Greene, Warner Jones, E. C. Hastings.

Nuttall Company, The R. D., Pittsburgh, Pa., spaces 140, 142, 144, Building No. 1. Complete line of motor gears and pinions, and current collecting devices, including pantographs, for street railway, interurban and trunk line multiple unit cars and electric locomotives; electric furnace with quenching baths in which steel will be treated and a thorough demonstration given of the methods of manufacturing gears and pinions; machine for breaking and testing pieces; new abrasive testing machine for demonstrating the resistance to wear of the different types of gears; 24-in. tooth carbonized and etched to show relation between the depth of the case and core of a case-hardened gear; Metcalfe test showing evolution in production of case-hardened gears; also a trolley in which the spring leverage is balanced to give minimum wire pressure when the pole is in horizontal position while the maximum wire pressure occurs at about 60 deg. angle from the horizontal. Represented by F. A. Estep, president; W. L. Allen, commercial manager; L. H. Keim, mechanical engineer.

Ohio Brass Company, Mansfield, Ohio, spaces 358 to 365 inclusive. In operation: Tomlinson couplers, O-B air sander system, O-B car lighting regulator, O-B trolley bases, retrievers and catchers, O-B electric car signal system, Melobeam headlights, rail bond apparatus and test of insulation. On display: O-B trolley guard, O-B catenary material, O-B porcelain insulators, O-B overhead trolley fixtures, O-B third-rail insulators, etc. Represented by C. K. King, A. L. Wilkinson, E. F. Wickwire, C. C. Beck, J. R. Brown, A. L. Price, G. H. Bolus, W. C. Starkey, J. E. Slimp, N. M. Garland, G. W. Cooper, G. A. Kroener, Nathan Shute, P. A. Hinds, W. H. Bloss, G. E. Willis, F. A. Strail, C. H. Tomlinson.

Ohmer Fare Register Company, Dayton, Ohio, spaces 301, 303, 305. Indicating recording and printing fare registers for registering from one up to sixty classifications; two types of cash totalizing registers for city service; new Universal register for interurban service, covering from 1 cent in multiples of cents to $10; new Safe Deposit fare box; model registering gate. Represented by John F. Ohmer, Grank G. Colby, J. H. Stedman, C. W. Ketteman, John F. Ohmer, Jr., C. V. Funk, E. H. Chapin, E. R. Diehl.

Okonite Company, The, New York, N. Y., space 168. Okonite insulated wires and cables (including steel taped and steel braided) for all conditions of service, Okonite insulating tape, Manson tape, Candee potheads, etc. Represented by W. L. Candee, F. J. White, W. M. Candee, L. G. Martin, W. T. Kyle, R. Mace.

Pantasote Company, The, New York, N. Y., space 400. Agasote headlining, wainscoting, exterior and interior trim, flooring, Pantasote upholstery material, Pantasote car curtain material. Represented by John M. High, William A. Lake, William Anderson.

Penn Metal Company, Boston, Mass., space 108. "Penco" improved smooth bottom culvert, "Penco" "Nestite" wire-bound culvert, "Penco" "Nobolt" flat bottom culvert or railway drain, "Colonial" all-round corrugated culvert, "Penco" metal shingles, "Penco" "Lox-on" tile. Represented by L. J. Rouleau.

Pennsylvania Steel Company, The, Philadelphia, Pa., space 23. Street railway special work, Hook heel tongue switches, double connected tongue switches for MCB wheels, rapid renewable hard center frog, New Century switch stands, main line switch stands, tensile tests Mayari bolts, vibratory tests Mayari bolt steel, solid manard crossing interior joint, Mayari shovels. Represented by Messrs. Jay, Tackaberry, Clark, Belknap, Gillispie, Davis, Salsich, Vickery, Henderson, Alden.

Pittsburgh Steel Company, Pittsburgh, Pa., spaces 162, 164. Railroad fencing, galvanized barb wire, wire nails, plain galvanized wire, etc. Represented by M. E. Johnson, assistant general manager of sales; George W. Jones, assistant manager New York office; E. Sidney Lewis, special sales agent.

Prepayment Car Sales Company, New York, N. Y., space 114. Pneumatically and electrically-operated door mechanism, coasting relays, signal and safety devices, manually-operated door and step mechanism, line switch circuit-breakers and contactors for safety devices, etc. Represented by Duncan McDonald, chairman board of directors; Thomas W. Casey, president; A. H. Englund, vice-president; Harold Rowntree, treasurer; P. R. Forman, chief engineer, and Willard A. Cockley, Thomas H. Henkle, Nelson P. Hall, J. W. Porter, M. A. Berg, special representatives.

Prest-O-Lite Company, Inc., Indianapolis, Ind., space 543, Annex. Prest-O-Oxy-acetylene welding and cutting equipment and all accessories; specimens of actual welding as applied to electric railway repair shop practice; specimens of bonded rails made by process; flare lamps; demonstrations of welding and cutting. Represented by H. Sidney Smith, Stanley D. Winger, C. R. Sutton.

Prince-Groff Company, New York, N. Y., spaces 384-385, Exhibition Hall. "Wedglok" track drilling systems, "Pressurlokd" water gage systems, "Kwikgrip" pipe wrenches. Represented by Sherman W. Prince, Clarence B. Groff, Harold Prince, Dwight Prince.

Pyrene Manufacturing Company, New York, N. Y., space 215, opposite aquarium. Approved Pyrene fire extinguishers, bracket for attaching to cars, tamper proof boxes for holding extinguisher, demonstrations on electric arcs daily and various other demonstrations of the non-conductivity of Pyrene liquid. Represented by E. L. Krut, J. P. Maloney, O. E. Meske.

Rail Joint Company, The, New York, N. Y., spaces 350 to 357 inclusive, Exhibition Hall. Types of T, high T, girder and compromise joints manufactured for practically every section of rail rolled. Represented by L. F. Braine, V. C. Armstrong, J. A. Greer, E. A. Condit, Jr., R. R. Seward, McLeod Thomson, Alexander Chapman, W. A. Chapman, J. C. Barr.

Railway Improvement Company, New York, N. Y., spaces 584, 506, Annex. Coasting recorders, terminal clocks, current clocks, meters, sanitary strap covers, anti-climbers. Represented by Andrew J. Pizzini, W. O. Wade, E. B. McKinney, C. W. Hall, S. Clark Morrell.

Railway & Industrial Engineering Company, Greensburg, Pa., space 609, Annex. Burke horn gap switches, lightning arresters, choke coils, and fuses for all voltages from 11,000 to 66,000; suspension type 6600-volt lightning arresters; T. E. line clips; commutator slotting tools; photographs and drawings showing installations and applications of Burke equipment; in space outside the Annex near the engineering meeting room outdoor transformer substation and T. E. lattice steel pole. Represented by L. C. Hart, G. N. Lemmon, W. Barnes, Jr.

Railway Materials Company, Chicago, Ill., space 534. Samples of brakeshoes and overhead trolley switch.

Railway Roller Bearing Company, Syracuse, N. Y., space 134, Machinery Hall. Rollway journal boxes, motor bearings, car wheels. Represented by Raymond H. Carhart, John W. Hulburt.

Railway Track-work Company, Philadelphia, Pa., spaces 161, 163, Machinery Hall. Track grinding machinery, reciprocating track grinder, unit design flexible shafting. Represented by William D. Gherky, William B. Goodall, Anthony M. Nardini.

Railway Utility Company, Chicago, Ill., spaces 372, 373. Ventilators and ventilating systems, thermostats. Represented by William J. Pine, Lee P. Haynes, James H. Denton, Frank O. Grayson, George E. Pratt.

Roebling's Sons Company, John A., Trenton, N. J., spaces 17, 19, Main Building. Samples of Roebling wire products including bare wire, iron, steel and copper wire, wire rope and fittings, Alligator wrenches, wire cloth and netting, factory-made car cables and insulated wire and cables for every purpose. Represented by F. J. Newbury, G. W. Swan, D. Foster Ivens, F. J. Whelan, W. L. Doyle, George I. Gheen, G. F. Atlee, J. E. Nolan, A. B. Conover, T. N. Hall, J. W. Whelan, A. V. Errickson.

Rooke Automatic Register Company, Providence, R. I., space 321, Machinery Hall. Rooke automatic fare collector (hand-held type) in capacities to receive and register coins of various denominations and tickets. Represented by George F. Rooke, Jilson J. Coleman, R. S. Rooke.

SKF Ball Bearing Company, New York, N. Y., space 532. Railway axle on wheels with ball bearing journal boxes in operation, assortment of bearings. Represented by H. E. Walker, H. H. Gildner, F. H. Poor.

St. Louis Car Company, St. Louis, Mo., space 588. Seats, rattan for car seating, vertical wheel brakes, illustrations and models of latest steel and semi-steel car designs. Represented by Edwin B. Meissner, Nic Le Grand, George L. Kippenberger, W. L. Alt.

St. Louis Steel Foundry Company, St. Louis, Mo., space 14, Main Building. Manganese steel tadpole switches and parts, manganese steel special U-section crossings. Represented by J. H. Steedman, vice-president; E. S. Harrison, sales engineer.

Sattley Manufacturing Company, Detroit, Mich, spaces 378, 379. One Type B coin-sorting, counting and packaging machine, one Type E coin-counting and packaging machine, one Type F coin-counting and packaging machine, two "Coinometers." Represented by F. L. Sattley, F. S. Strattan, E. C. Malo, M. W. Van Husan.

Sauvage-Ward Brake Company, Inc., New York, N. Y., space 501, Annex. Two types of brake automatic slack adjusters; special brake adjusting bar; also demonstration of adjusters in service on Atlantic City & Shore Railway, as at South Carolina Avenue and Boardwalk a car will be jacked up with truck pulled out to permit ready inspection. Represented by Frank D. Ward, M. E., vice-president; George P. Smith, secretary; H. M. Weaver, Eastern traveling rep.; B. B. Ringo, traveling engineer.

Schutte & Koerting Company, Philadelphia, Pa., spaces 154, 156, Machinery Hall. Valves, jets and special apparatus such as engine stops, trip throttle valves in operation; and boiler non-return valves, and reducing valves; steam jet syphon, injectors, blowers and exhausters, multi-jet condenser and air washer (for generator sets) in operation; spray cooling nozzles and oil separator, etc. Represented by J. J. Gessleman, in charge; G. Heinemann, P. W. Knauf, T. H. Johnson.

Seymour Portable Rail Grinder, Lowell, Mass., space 138, Machinery Hall. Seymour portable rail grinder. Represented by E. P. Seymour.

Simmen Automatic Railway Signal Company, Buffalo, N. Y., spaces 153, 155, Machinery Hall. Speed control apparatus for automatically controlling the speed of trains: dispatcher's table for controlling signals in cabs of moving trains and for making automatic record of the movement of all trains on the division equipped; movable car showing operation of cab signal and signal shoe on third-rail. Represented by P. J. Simmen, L. Ringer, E. Moore, C. E. Chatfield.

Simmons-Boardman Publishing Company, New York, N. Y., space 10-A, Main Building. *Railway Age Gazette, Railway Age Gazette*, mechanical edition, *The Signal Engineer*. Represented by Henry Lee, C. R. Mills, George L. Fowler.

Smith Heater Company, The, Peter, Detroit, Mich., spaces 376, 377, Exhibition Hall. No. 1-S Peter Smith forced ventilation magazine hot air heater, No. 2-P Peter Smith forced ventilation hot air heater, No. 3-P Peter Smith forced ventilation hot air heater. Represented by Daniel W. Smith, president; Elmer J. Smith, vice-president and general manager; M. J. Phelan, secretary; W. E. Hinmon, Western sales manager; W. M. McKee, Eastern sales manager.

Speer Carbon Company, St. Marys, Pa., space 8-A, Main building. Carbon and metal brushes for railway motors and generators. Represented by John S. Speer, Charles Lyon.

Standard Corporation, Philadelphia, Pa., space 10-C, Main building. Lefax engineers' loose-leaf pocket book, self-indexing reference library, condensed catalog file, Lefax filing boxes, blank sheets, traveling case, etc. Represented by J. C. Parker, William C. Wells, Jr.

Standard Paint Company, New York, N. Y., space 507, Annex. P & B insulating varnishes and compounds, "Imp" cement floor finishes, preservative paints, "Amiwud" wall board, prepared roofings and waterproofing compounds. Represented by C. E. Smith, J. H. Thomas, W. S. Noble.

Standard Underground Cable Company, Pittsburgh, Pa., space 388, Exposition Hall. Bare and insulated electric wires and cables of all kinds, cable terminals for indoor and outdoor service, cable junction boxes, joints and joining material and other cable accessories. Represented by C. J. Marsh, F. O. Hoyt, R. S. Hopkins, New York; Edward Kerschner, R. M. Hirst, Philadelphia; J. H. Lytle, J. C. Bowman, Pittsburgh.

Star Brass Works, Kalamazoo, Mich., space 506, Annex. Kalamazoo trolley wheels and harps. Represented by O. P. Johnson.

Sterling Fare Register Company, New Haven, Conn., space 328, Exhibition Hall. Fare registers, register fittings, fare boxes, trolley retrievers, trolley catchers, trolley wheels, conductors' punches. Represented by Frank B. Kennedy, Charles E. Gierding.

Sterling Varnish Company, Pittsburgh, Pa., space 567, Annex. Insulating varnishes and impregnating compounds, structural steel paints. Represented by J. H. Shugg, W. V. Whitfield, Alvin S. King.

Street Railway Signal Company, Inc., Philadelphia, Pa., spaces 117, 119. Automatic signals for single-track facing protection, and allowing following movements; automatic signals for rear and double-track protection. Represented by F. W. Kulicke, H. R. Stadelman, W. V. Moon.

Taylor Electric Truck Company, Troy, N. Y., spaces 109, 111, 113, 115, Machinery Hall. New Taylor maximum traction single motor truck for city and suburban service; Taylor M.C.B. triple spring truck for high-speed interurban service; Taylor L.B. double truck with inside-hung brakes for city and interurban service; Taylor extra heavy non-teetering single truck 8 ft. wheelbase for heavy long single truck vestibule car bodies; also a full line of elliptic and coil springs for any type and make of truck and T. M. C. steel-tired wheels. Represented by John Taylor, president; G. A. Tupper, superintendent; Walter E. Taylor, assistant superintendent.

Templeton, Kenly & Co., Ltd., Chicago, Ill., space 636. Simplex emergency jacks, Simplex pole pulling jacks, Simplex car jacks, Simplex track jacks. Represented by A. E. Barron, C. A. Crane, Jr., H. M. Hood, W. B. Templeton.

Thayer & Company, Inc., New York, N. Y., space 510. Chillingworth seamless drawn-steel gear case. Represented by G. K. Wannemacher.

Thew Automatic Shovel Company, Lorain, Ohio, space 309, Exhibition Hall. Catalogs, blueprints, circulars, photographs, etc., of the Thew electric shovel especially designed for electric railways. Represented by C. B. Smythe, G. T. Glover.

Thompson, Ernest H., Waverly, Mass., space 314, Exhibition Hall. Combination fare box and automatic coin changer, operated electrically by means of solenoids. Represented by E. H. Thompson.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, space 624. "Tool Steel" split, solid and forged gears, and "Tool Steel" pinions; also samples to illustrate the hardening and toughening process responsible for their long life and strength; in addition a large collection of "Tool Steel" gears and pinions, that have been in service for a number of years and made interesting mileage records as compared with other grades. Represented by C. E. Sawtelle, E. S. Sawtelle, Leroy Brooks, Jr.

Transportation Utilities Company, New York, N. Y., spaces 582, 583. Treated duck roofing, composition flooring, Chanarch metal flooring, curtain fixtures, brass sash, trap doors for interurban service, metallic steel sheathing, safety step and treads, insulation against heat and cold, sash locks, weatherstripping, steel doors and revolving curtain roller box, Eclipse deck sash ratches. Represented by W. L. Conwell, H. B. Chamberlain, F. N. Grigg, W. S. Midgley, R. C. Monroe.

Trigger-Lock Reversible Controller Finger, Niagara Falls, N. Y., and Toronto, Ont., space 151, Machinery Building. Trigger-Lock reversible controller fingers. Represented by Richard Russell, E. W. Bennett, R. V. Russell.

Trolley Supply Company, The, Canton, Ohio, spaces 366, 367. Peerless No. 10 trolley base, Simplex trolley base; No. 5 and No. 2 Knutsen retrievers, Ideal trolley catcher, detachable fender, pressed-steel headlights, Peerless check valve. J. E. McLain, president; Jos. Hollis, supt.

Union Switch & Signal Company, The, Swissvale, Pa., spaces 133, 135, 137, 139. Track model of block signaling, track transformer, vane type relay, galvanometer type relay, Model 12 polyphase relay. Photographs of installations. Represented by H. W. Griffin, J. W. White, W. W. Talbert, S. E. Gillespie, J. P. Coleman, L. F. Howard, C. E. Denney, J. E. Saunders, H. A. Hamilton, T. W. Siemon, J. S. Hobson, H. McCready.

United States Electric Signal Company, West Newton, Mass., space 401, Annex. Automatic block signals, automatic car counting signals, automatic block light signals, automatic crossing signals, electric track switches, automatic current regulator, trolley contactors. Represented by Roland F. Gammons, second, Roy V. Collins, R. S. Bowen.

U. S. Metal & Manufacturing Company, New York, N. Y., spaces 622, 624, Hotel Men's Annex. Ball-bearing journal jacks, Texoderm seat upholstering, Columbia lock nuts, Anglo-American varnishes, tool steel gears and pinions, multiple unit puttyless skylight. Represented by B. A. Hegeman, Jr., Charles C. Castle, H. A. Hegeman, H. A. Stone, H. S. Norris, H. K. Porter.

United States Wood Preserving Company, New York, N. Y., space 107, Machinery Building. Treated and untreated wood paving blocks. Represented by G. O. Strother.

Universal Lubricating Company, Cleveland, Ohio, space 370, Exhibition Hall. Reception room. Represented by C. B. Arthur, J. C. Daigen, H. T. Curtis.

Universal Safety Tread Company, Waltham, Mass., space 568, Annex. Safety car step treads for car steps, stations, platforms, etc. F. W. Langford, H. Dougherty.

Valentine & Company, New York, N. Y., spaces 582, 583, Annex. Valspar ("The varnish that won't turn white"). Systems of painting railway equipment. Represented by L. B. Valentine, I. H. Munford, Capt. C. Van de Watering.

Van Dorn Coupler Company, Chicago, Ill, spaces 531, 533. Van Dorn makes of standard couplers. Represented by W. T. Van Dorn, H. E. Van Dorn, W. E. Van Dorn.

Waclark Wire Company, New York, N. Y., spaces 381, 383, Exhibition Hall. A "whip" of wire drawn in one piece from a ⅜-in. rod to 0.001-in.; weatherproof cable, bare cable and American standard grooved trolley wire; also a sample board. E. L. Goldschmidt, C. P. Lyman.

Walpole Tire & Rubber Company, Walpole, Mass., space 333. Insulating tapes, insulating varnishes. Represented by F. Y. Stewart, general sales manager; I. W. Penniman, Western sales manager; R. F. Norvell, C. O. Anthony, E. C. Green, general purchasing agent.

Wasson Engineering & Supply Company, Santa Rosa, Cal., distributing point, Milwaukee, Wis., space 613, Annex. Air retrieving trolley base. F. A. Wasson, C. Pfeiffer.

Watson Stillman Company, Aldene, N. J., space 611. Telescopic motor lift jack; 20-ton wrecking jack, 20-ton claw 18 in.; 5-ton special street car jack, No. 4 mounted girder rail bender. Represented by Edwin A. Stillman, A. F. Stillman, Francis T. West, Sterling G. Turner, P. R. Ketzer, Carl Wigtel, R. R. Harrison.

Western Electric Company, New York, N. Y., space 337. Telephone apparatus consisting of telephones for car operation including portable and siding telephones and standard exchange equipment of both wall and desk types, telephone selective apparatus for car dispatching service, telephone switchboards; electric railway material, high-tension insulators, Pyrene fire extinguishers, Western Electric insulating tapes and compounds, trolley wheels and harps, rail bonds and miscellaneous trolley line construction material, car buzzers and signal bells, Shelby trolley poles, arc and incandescent headlights, out-door electric light fixtures; vacuum cleaners for cars. Represented by M. A. Oberlander, P. L. Thomson, F. D. Killion, O. E. Stevens, E. V. Adams, A. G. Kingman, J. C. Enders, J. C. Maxon, New York, N. Y.; J. D. Kennedy, A. L. Hallstrom, S. Greenfield, L. C. Coller, F. C. Jaeger, J. R. Stuard, G. F. Livezey, J. W. Alexander, Philadelphia, Pa.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., space 21. New types PK and HL control systems in actual operation, line switches, relays, commutating pole motors of the split and box frame types for various capacities and voltages from 600 to 1500, motor parts, pressed steel gear case, commutators, armature and field coils, resistors, circuit breakers, lightning arresters, fuse boxes, line and insulating material, model of a portable rotary converter substation. Represented by L. A. Osborne, S. L. Nicholson, C. S. Cook, M. B. Lambert, B. W. Stemmerich, G. B. Griffin, J. G. Miles, H. L. Garbutt, T. A. McDowell, J. C. McQuiston, H. W. Beaumont, A. B. Cole, East Pittsburgh; C. C. Ewing and L. P. Morris, Boston; O. T. Smith, H. N. Ransom, New York; Thomas Cooper, Philadelphia; T. R. Langan, Baltimore; E. A. Thornwell, Atlanta; J. A. Brett, Cincinnati; D. E. Parsons, Pittsburgh; G. S. Vail, Cleveland; P. H. Smith, Buffalo; A. W. Lomis, St. Louis; W. G. Brooks, Chicago; F. F. Rossman, Kansas City; S. J. Keese, Los Angeles.

Westinghouse Lamp Company, space 21. Mazda lamps illustrating the latest developments in the lamp field; concentrated filament headlight lamps for trolley car service; standard Mazda lamps for electric railway service, and also for ordinary uses. T. G. Whaling, C. A. Dostal, A. Larney, W. H. Rolinson, A. A. Ross.

Westinghouse Machine Company, space 21. Turbo-exciter of 50 kw capacity. Represented by E. H. Sniffen, vice-president, in charge of sales; L. L. Brinsmade, Eastern sales manager; H. P. Childs, special representative; M. C. McNeil, commercial engineer.

Westinghouse Traction Brake Company, space 21. Exhibits of various forms of air brake devices and appliances, comprising motor-driven air compressors; motorman's brake valves; electric compressor governors; air compressor synchronizing system; electro-pneumatic train signal system; complete car equipments with electro-pneumatic brakes of most improved construction; slack adjuster; air strainers; extra quality pipe fittings; case hardened bushings, etc. Represented by A. L. Humphrey, Pittsburgh; Walter V. Turner, Pittsburgh; C. J. Olmstead, Chicago; C. C. Farmer, Chicago; H. S. Clark, San Francisco; J. S. Siegrist, Portland; J. R. Ellicott, New York; C. R. Ellicott, New York; W. G. Kaylor, New York; C. P. Cass St. Louis; C. H. Beck, St. Louis; E. A. Craig, Pittsburgh; C. P. Billings, Pittsburgh; S. D. Hutchins, Columbus, Ohio; R. W. Williams, Atlanta, Ga.

Wharton, Jr., & Company, Inc., Wm., Philadelphia, Pa., spaces 621, 623, Annex. Several styles of girder rail work, including a switch of the Wharton new solid manganese steel H.C.B. type, switch pieces of a new heavy construction for portable crossovers and turnouts, miscellaneous manganese steel castings for cars, a new switch rod for split switches, switch locks, models, pictures of complicated layouts, etc. Represented by V. Angerer, vice-president; W. L. Wright, vice-president; R. C. McCloy, general sales agent; and the following district sales managers: R. D. Chapman, San Francisco; R. C. Hoffman, Baltimore; J. T. Hill, Baltimore; G. R. Lyman, Chicago; H. F. McDermott, Atlanta; J. S. Morrison, Pittsburgh; J. C. Robinson, Boston; C. N. Shaffner, Philadelphia; William C. Wilson, New York.

Wheel Truing Brake Shoe Company, Detroit, Mich., space 505, Annex. Abrasive brakeshoes for operating upon different conditions of wheel wear, including double flanges, flat spots, uneven diameters, long flanges, tread wear, etc. Represented by J. M. Griffin, F. F. Griffin.

Whitmore Manufacturing Company, Cleveland, Ohio, spaces 121, 123, 125. Gears and pinions lubricated with Whitmore's gear protective composition. William Beaser, Jr., Henry Stuckenholt, W. M. Lawyer, S. W. Whitmore.

Whittier Mills Company, Chattanooga, Ga., space 313. Waterproof trolley cord, bell cord. Represented by G. H. Thomas.

Wilson Remover Company and Imperial Car Cleaner Company, Newark, N. J., space 213, Aquarium Court. Wilson paint and varnish removers, Imperial cane cushion cleaning machine and process. Represented by J. Whitney Wilson, J. MacNaull Wilson.

Wood Company, Charles N., Boston, Mass., space 129, Machinery Hall. Chapman automatic signals. Represented by Charles N. Wood, W. M. Chapman, O. E. Chapman.

Woods & Company, Edwin S., Chicago, Ill., space 537, Annex. Roller side bearings and center plates for interurban car equipment. C. D. Jenks, H. M. Perry, A. A. Weigel.

Wyoming Shovel Works, Wyoming, Pa., space 608. Track, and concrete shovels and scoops. G. E. Geer.

Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa., space 128. Lea V-Notch recording liquid meter, Simplex seatless blow-off valves; Simplex pipe joint clamps, Richards unloaders for air compressors, Simplex Caskey hydraulic valves. Represented by J. Esherick, E. G. Jay, Jr.

Electric Railway Journal

DAILY EDITION

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Railway Association and Its Affiliated Associations

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PROGRAM FOR TO-DAY

CONVENTION MEETINGS

9:30 a.m.	Meeting of Accountants' Association, Accountants' Hall, Convention Pier.
9:30 a.m.	Meeting of Engineering Association, Engineers' Hall, Convention Pier.
9:30 a.m.	Meeting of Claims Association, Claims Hall, Convention Pier.
9:30 a.m.	Meeting of Transportation & Traffic Association, Greek Temple, Convention Pier.
11:00 a.m.	Joint Session of Accountants' and Claims Associations, Accountants' Hall, Convention Pier.
2:00 p.m.	Meeting of American Association, Greek Temple, Convention Pier.

ENTERTAINMENT

8:00 a.m.	Trapshooting Practice, End of Convention Pier.
10:00 a.m.	Obstacle Golf, Marlborough-Blenheim Lawn.
11:00 a.m.	Morning Concert by Engel's Orchestra, Lobby, Convention Pier.
2:00 p.m.	Trapshooting Tournament, End of Convention Pier.
3:00 p.m.	Afternoon Concert and Thé Dansant, Parisian Garden, Convention Pier.
3:00 p.m.	Finals Auction Bridge Tournament, Reception Room, Convention Pier.
4:00 p.m.	Obstacle Golf, Marlborough-Blenheim Lawn.
9:00 p.m.	Carnival Night, Ball Room, Convention Pier.

The President's Address

President Black's address, delivered yesterday, presents a comprehensive survey of the status of the various activities of the association. He naturally takes up first the work for the year of the committee on public relations but follows this with a short account of what has been done by each of the other committees. In connection with the plans of these committees, but particularly with the work of bureau of fare research, he points out that the proposed increase of dues, if adopted, will provide about $16,000 of additional revenue. After urging the formulation of definite plans for the 1915 convention at San Francisco the address concludes with a discussion of the financial problems before the industry. President Black's address is a thoughful consideration of the problems now confronting the electric railway field and the best means of their solution. These questions are generally understood, but it is of help to have them so clearly stated as in the president's address. Through the plans proposed by the committee on public relations and the work being done by the bureau of fare research, the plan of campaign has been formulated. There remain now only the tasks of mobilization and actual engagement. To be successful, however, the actual fighting should be carried out not only *en masse* but individually, and each company should do its best to prove to the public by precept and example, but especially by the latter, that it is doing its best to provide what the public wants in the way of service.

Standards for Signal Apparatus

That the committee on block signals was able to present yesterday in its report recommendations for two standard designs is a matter whose importance can hardly be exaggerated. Essentially the art of signaling deals with apparatus of considerable complexity. The possible variations in design are innumerable, and these variations, if introduced, add enormously to the cost. This has, unfortunately, been the experience on the steam railroads, where the multiplicity of designs and arrangements fairly baffles description. On the electric railways, however, signaling is in its infancy, and a vast amount of material will be manufactured for their needs during the next decade. The sooner that this can be standardized, the better will it be for all concerned, for cost is the one thing standing between the electric railway industry and complete signal systems. The committee has made an excellent beginning, and it is to be hoped that ensuing committees will continue this phase of the work with as much energy. There is hardly anything they can do that will produce results more directly beneficial to the industry.

Better Air-Brake Hose Wanted

The report of the committee on equipment of the American Electric Railway Engineering Association breaks new ground this year with a first specification for air-brake hose. The full text of this specification will be found elsewhere in this issue. That a specification of this character should have been found necessary at this time is significant of the arduous conditions which are imposed upon air-brake hose by the operation of electric trains over short radius curves, more especially on city and suburban rapid transit lines. The impetus for this specification is to be traced to the experiences of the Brooklyn Rapid Transit System with the regular M.C.B. product. The frequency of hose trouble despite the use of the best products obtainable led, two years ago, to a systematic study of hose defects by W. G. Gove, superintendent of equipment of the Brooklyn company and also vice-chairman of the committee on equipment. One reason for the quick cracking of air-brake hose was found in the large number of sharp curves on the elevated lines. Another existed in the weakening of the hose due to the presence of oil carried over from the compressors. The present specification is planned to correct the first trouble, but the committee recommends that further studies be made before formulating a specification for hose with an oil-resisting tube. The active aid of all train operators should be given to this committee to demonstrate to the manufacturers of air-brake hose that there is a real need and a large market for a grade which will meet the exceptional requirements of electric railway train service.

Step Heights and Loading Time

The youngest of the committees, that on transportation engineering, which has replaced the former committee on two-car train operation, brought out in its report yesterday the fact that a change from the customary step arrangement with three rises to one with four reduced the loading time from three seconds to 1¾ seconds per passenger. In the former arrangement the heights of the steps were 16 in. and 14 in. respectively. While no one of these is excessive, according to street railway standards, any architect with whom the design of stairs is an exact science would be horrified at the mere suggestion to extend the rise of a step beyond 8 in. The use of even a 10-in. rise would, according to architectural ideas, work an extreme hardship upon the user, and yet to our minds—influenced as they are by customs of the railway—a 10-in. step seems extraordinarily moderate. The fact that a four-step combination, having 15-in., 10-in., 10-in. and 10-in. rises, can cut the loading time almost in half, notwithstanding the extra rise that is introduced, will undoubtedly come as a surprise. Nevertheless, the point is an important one, and the new committee is to be congratulated for bringing it out so clearly.

Conventionalities

Mac's lid is alfalfa, also unique.

There are some well-bred axles on exhibit. They have more polish than any other axles we ever met.

Born to blush unseen! MacMurray and Grinnell of the JOURNAL staff in the printing office in Philadelphia.

The official list states that the honor of having Badge No. 1 has fallen to Allen C. Loomis. Who is he, anyway?

The sympathy of the convention goes to George (Doc) Allen, who sprained his knee severely while diving through a big wave.

Charles E. Fritz, engineer of power, Kansas City Railway & Light Company, was routed here over the Chicago special. He is looking 'round.

M. B. Rosevear, superintendent of listribution Public Service Railway, is a proper subject for the "spot light." Less than six years ago he was cadet engineer.

This year our only visitors from foreign shores are W. F. Rainforth, assistant chief engineer of the London General Omnibus Company, and W. G. Gove, of Brooklyn.

C. C. Castle, the cotton broker, has a sign in his booth that says: "This is one bale of cotton. Have you bought yours? Every bale counts." Educated bales, Charley?

In reply to numerous frantic inquiries, Miles Lambert wishes to state that Miss Le Gould, while at Atlantic City, it being chaperoned by Mrs. Mutt, the general manager's wife.

Instead of coming to the convention in comfort Charlie Clark and Terrance Scullin, of Cleveland, drove through from Pittsburgh in Clark's gasoline, sea-going hack. Never again!

In the Detroit United party which came to enjoy the convention are Mr. and Mrs. George Parker and Mr. and Mrs. A. D. B. Van Zandt. Both gentlemen admit that they are in good hands.

An anonymous contributor advises that Bedwell, of the way department of Public Service Railway, say, "If you want your sleepers and track to stay put, bed well." Oof! That's awful!

Don't you feel embarrassed wearing those yellow gloves, storm spectacles, golf skypiece and carrying the big yellow cane? Betcha haven't the nerve to wear them all at once in the home town.

L. F. Howard spent most of yesterday afternoon trying unsuccessfully to get the cars to collide on his own model signal installation. He'd bet S. E. Gillespie a company cigar that it could be done.

Skee-ballers have found the game so fascinating that in order to further studious thought on the subject of the real intricacies of play the skee-ball cocktail has been invented. The line forms on the right.

The Jackson family announces that the Palmer family has nothing in the way of convention honors, on it, Alexander being on the committee on schedules and Walter being on the ELECTRIC RAILWAY JOURNAL.

Great is the man who can make two blades of grass sprout where but one perked up before, but far greater is he who can make one car do the work of two. Take 'em off, Jack Dempsey, take 'em off. We knew you!

Have you seen the exhibits of wooden paving blocks showing that a block in Boston wears ⅛ in. in fourteen years and that one from New York wears twice as much in eleven years? Life in New York must be very wearing, eh?

C. B. Fairchild, Jr., formerly a technical journalist but now a railway operator, is one of the representatives of the Philadelphia Rapid Transit Company at this convention, the nineteenth at which he has been in attendance.

We were glad to see our collaborator and co-editor of last year, Col. Stedman of Rochester, arrive in Atlantic City on Monday. We have not been favored with any contributions for this year's dailies yet, but we have hopes.

Edward H. Chapin lost some of his Rhode Island Reds last week on account of a young flood in his chicken yard. At last reports he was out in the Aquarium bargaining for turtle eggs so that his Reds could hatch out waterproof pullets.

George Smith, of K. C., Missoo, than whom no one is happier, says that the Kansas City Railway & Light Company holds the palm for the biggest delegation west of the Ohio River. There are seven of these representatives of the Road of Franchise Fite.

The Union Traction Company of Indiana is here in full force. Its delegation includes Mr. and Mrs. Arthur W. Brady, H. A. Nicholl, G. H. Kelsay, Walter Shroyer, S. R. Dunbar and Frank Norviel. Frank brought Mrs. Norviel and their son and daughter.

Did you know that the convention is honored by the presence of the Secretary of State? Presumably he is here to negotiate a peace treaty between the Engineering Association and the American Society of ———— (deletion by censor). His badge is 3715.

Prof. Wildman says some men are cut out for accountants and some for motormen, but sometimes the records get mixed and the railway loses an ideal motorman.—Wonder why everybody looked at everybody else when this was sprung in the accountants' meeting yesterday?

H. M. Wheeler, engineer electrical distribution Chicago Surface Lines, and Ralph H. Rice, principal assistant engineer Board of Supervising Engineers, Chicago, Traction, are chumming together this year and make their headquarters at the Dennis. Regulation, where is thy sting!

The entertainment committee has taken a step in advance this year and arranged a large number of fine comfortable opera chairs for the balcony overlooking the main hall of the pier. These seats should be popular with members and guests who don't dance because they know only last year's steps.

The registration office this year is receiving the assistance of two men delegated from the force of the Brooklyn Rapid Transit Company, two men from the Interborough Rapid Transit Company of New York, two men from the Public Service Railway and two men from the American Railways of Philadelphia.

A block-signal enthusiast has sent us a civil war bulletin via Sayville wireless of fifty years ago to-day. Here it is: GENERAL NACHOD directed the FEDERAL army to effect a UNION with the other UNITED STATES forces in a WOOD of perSIMMEN trees to protect the STREET RAILWAY, its sole line of communications from the NORTHEAST. Wow!

The trap shoot opened on Tuesday morning to the whirring of wings, both man-made and natural, as a flock of geese appeared in sight simultaneously with the firing of the first shot by Mr. Castle. A moment later Jaquith, with his hydro-aeroplane, came in sight and made a graceful sweep near the pier. The firing line was kept well filled all morning, the sound of continuous shooting bringing many out to see if the warships could be seen as well as heard.

Several of the delegates took advantage of the trip to Atlantic City to stop over in Philadelphia on Friday and witness the Braves trim the Athletics. One delegate who did not do this was J. H. Wilson, president of the Mobile Light & Railroad Company. He reached Philadelphia with Mrs. Wilson Friday afternoon, but owing to the game he found every hotel crowded with visitors on account of the game, and although he took a taxi and drove to a large number of hotels, could secure no room. Finally he was obliged to go to Wilmington for the night.

The four o'clock train on the Reading Railroad from Philadelphia to Atlantic City is said to be the fastest regular train in the world. It leaves Camden at 4.10 p. m. and reaches the Reading Station at Atlantic City at 5.05 p. m., making the 55½ miles in fifty-five minutes, or at a greater scheduled speed than 60 m.p.h. This means that the train on part of the run has to reach a speed of 80 m.p.h. It may be a surprise to some to learn that anything so fast should be found near Philadelphia. It might be pointed out, however, that this train undoubtedly represents the demand for a fast train to carry people away from that city. Trains going the opposite direction, or to Philadelphia, operate at only moderate speed.

The play-off game between the White Elephants of the Public Service Railway of New Jersey and the Braves of Brooklyn Rapid Transit System was held at Ebbets Field on Saturday, October 10. More than 5,000 people were on hand to root as only deadhead rooters can. Noted in the boxes behind the home plate were Messrs. Bolen, Boylan, Danforth, Donecker and Schreiber, of the Public Service Railway, and Messrs. Cram, Isaacson, Matthewson, Menden and Siebert of the Brooklyn Rapid Transit System. Much excitement was caused by the efforts of Messrs. Donecker and Siebert to protect their respective hats and as first aids to the hats Mr. Donecker appointed Mr Schreiber as his bodyguard while Mr. Siebert delegated Mr. Cram to protect his interests. The defense in each case was so strong that no casualties resulted. Previous to the game Harry Bullock entertained all officers of the Public Service Railway at the Hamilton Club. Oh, Yes! The score was 6-3 in favor of Brooklyn. Roy Cram says that the teams were composed of actual employees. We know that, Roy. But how were they classed in the payrolls?

E. F. Schneider, president of the Central Electric Railway Association and general manager of the Cleveland, Southwestern & Columbus Railway, was one of the first arrivals among the delegates this year. He is accompanied by Mrs. Schneider and reached Atlantic City last Friday. He did not come entirely for the convention but is combining the trip with a vacation and expects to remain in Atlantic City for some time. It may not be generally known that Mr. Schneider was one of the very early pioneers in the present popular "safety first" movement. Long before these words were coined, Mr. Schneider was impressed with the extreme importance of taking every possible precaution against accidents and the necessity of securing not only the assistance of every railway employee but also of the public on this important matter. In consequence, he began an extended campaign of lectures to his men, the school children and the public generally on the necessity of avoiding all chance for accidents. Most of this work was done by him personally, but he also trained several assistants to help him. A number of these early lectures were printed at the time in the columns of the Electric Railway Journal and are evidences of the early date at which Mr. Schneider began this work.

S. B. Broomer, East St. Louis, of the membership committee of the Railway Storekeepers' Association, has announced that the association, which embraces a membership in nearly every country in the civilized world, has decided to encourage membership by officers of electric railways. He says that the association already includes in its membership a number of purchasing agents, general storekeepers and division storekeepers of large electric railroads. According to Mr. Broomer, the principal benefit to be derived by the electric railway men from affiliation with the association is the ability of members to secure the years of experience which steam railroad men have had along the lines of purchasing and taking care of the stock.

GETTING THE MOST FROM THE CONVENTION

One prominent railway manager at this convention has adopted a systematic plan to secure the greatest amount of good possible from it for his company. As it was impossible for the company to send to Atlantic City all of the heads of the departments which it wished, this manager asked those who were to remain at home to give him a statement of the exhibits in which they were particularly interested and the points which they would like to have him look up at the convention. In consequence, he has been visiting the booths of the different manufacturers, asking about the new developments, looking up the new apparatus and making the inquiries requested by the members of his staff. He then is planning to take this information back with him or else he requests the manufacturer to forward it direct to the staff officer.

A NEW CLAIMANT FOR THE BANNER

The broadminded policy of President C. P. King of the Washington Railway & Electric Company is well demonstrated by the large delegation of representatives in attendance, among whom are the following: W. F. Ham, R. W. King, William L. Clarke, C. S. Kimball, F. J. Whitehead, J. N. Stevens, G. G. Whitney, W. F. Dement, W. N. De Neal, E. C. Elliott, William S. Ballenger, J. W. Wenner, Charles Reich, Warren Anderson, J. E. R. Shaw and J. Tipton. All of the foregoing are members of the Washington Railway & Electric Company Section No. 4 of the American Electric Railway Association, and six of them, division superintendents, are here as guests of the company section. The Washington Railway & Electric Company, with its sixteen delegates, claims the banner for the largest delegation that has come to the convention from any part of the world east or west of the Ohio River. It challenges all rival claimants to produce, as it has done, the actual names of delegates.

LOST AND FOUND COLUMN

Lost—A lady's silver watch, with gold fob, was lost yesterday before noon, somewhere on the pier. Finder will kindly return to Mr. R. W. Spofford, room 191, Marlborough-Blenheim.

Lost—Manufacturers' Association Badge No. 4134 has been lost. Finder will kindly return to the secretary's office or to room 238, Brighton Hotel.

Lost—Badge No. 4217 of the Manufacturers' Association, belonging to E. P. Waller, General Electric Company, has been lost. Finder will please return to Electric Railway Journal booth on the pier.

MANUFACTURERS' ASSOCIATION MEETING TO-DAY

The annual meeting of the Manufacturers' Association will be held at 4 p. m. to-day, in the Engineers' Meeting Hall. Important work is carried on at these meetings and a full attendance of manufacturers' representatives is urged.

The program for to-day includes remarks by the president, a report on the condition of the association and the election of five new members of the executive committee.

To simplify the voting, it is requested that the members who will cast the votes for their respective companies will take seats on the right-hand side of the hall and other members on the left-hand side.

Samuel Insull, president of the Commonwealth Edison Company, Chicago, has recently founded for The Franklin Institute, Philadelphia, the Franklin medal, to be awarded from time to time in recognition of distinguished achievements in science and technology. The medal was designed by Dr. R. Tait McKenzie, of The University of Pennsylvania.

THE CARNIVAL TO-NIGHT

Kee-no dances, contest dances, all sorts of dances with everybody dancing, will be in the air to-night at the carnival. In the prize contest no fair dancers need fear detailed criticism, because a definite plan has been worked out by the committee for taking a ballot. The crowd as the judge will be influenced in the selection of the prize winners not only by the correctness of the steps, but also by the element of personal appeal so that it is not necessary to be an expert to win one of the prizes. Surprises will also be provided, according to the committee.

For the information of the uninitiated it may be said that the Kee-no dance originated 'way back in the dark ages before numbers other than circles were known. Each tribe, to the music of its tom-toms, went forth seeking a lucky circle. Sometimes they reached the Arctic or Antarctic circles and were never heard of again, therefore being unlucky. Others, after many wanderings, in search for this lucky figure returned to their own land and there discovered the family circle. The circle has been handed down from generation to generation through children using rings for games, hoops and wheels, and now it is found on the ballroom floor as a simple means of discovering among a great crowd those to whom Fate points kindly.

SURPRISES AT TUESDAY'S DANCE

A number of surprises were in store for those present at the informal dance last evening. Miss Edna Van Ripper, an amateur dancer, appeared in a fox trot with Mr. Stark, who introduced this dance the first of last May at the Nassau Hotel, Long Beach. The dance brought forth much applause for its ingenious steps and lively tune. Miss Burdick and Mr. Steve Matthews, Atlantic City's Own, gave their repertoire of dances and then met with a most enthusiastic reception. During the intermission, through the courtesy of the Public Service Railway of New Jersey, a picture film entitled "How Most Street Accidents Occur," was thrown on the screen at the end of the ballroom.

DAILY PRIZES FOR SKEE-BALL

Daily prizes for the highest score on the skee-ball alleys will be given beginning to-day through the courtesy of the J. D. Este Company. These will be boxes of candy to the ladies and boxes of cigars to the gentlemen. In addition there will be the grand prize that is offered by the committee for the high score for the week.

The high scores on Tuesday were as follows:

Mrs. T. W. Connette....	220	Mr. C. G. Chamberlain..	310
Mrs. W. E. Bryan.......	180	Mr. T. M. Cluley........	290
Mrs. R. M. Kerschner...	180		

The number of games rolled on Tuesday up to 6 p. m. were 3350 and at this time the crowd at the alleys was thicker than ever.

YESTERDAY'S CARD PARTIES

The first and second rounds of the auction bridge tournament, the second round not being completed, were held yesterday afternoon in the Parisian Garden, Convention Pier. These resulted in the selection of the following ladies who, together with the additional winners of the second round, will play to-day's final round for the prizes: Table 1, Mrs. W. P. Goff, Mrs. S. M. Gallaher; table 2, Mrs. P. E. Wish, Mrs. H. B. Logan; table 3, Mrs. T. Casey, Mrs. J. S. Speer; table 4, Mrs. Tenney, Mrs. Cook; table 5, Mrs. E. Dana, Miss Bright; table 6, Mrs. Thomas, Miss Hurd; table 7, Mrs. Smaw, Mrs. Sofford; table 8, Mrs. Mailand, Mrs. E. D. Priest.

Winners in second-round play not completed: Table A, Mrs. W. P. Goff, Mrs. S. M. Gallaher; table B, Mrs. Cook, Mrs. Tenney; table C, Miss Bright, Mrs. E. Dana.

The following are the winners of the "500" game: First, Mrs. J. A. Cadle; second, Mrs. A. T. Naugle; of pinochle, Mrs. J. E. Brill.

The play will start promptly at 2:30 o'clock in order to finish the second round, which time did not permit being played. Prizes will be announced for the "500" and pinochle games in connection with the announcement of winners at the auction bridge.

A SAFETY GAME

The Pittsburgh Railways, which were pioneers in the "safety first" movement, known in Pittsburgh as the "safety always" movement, have recently put into effect a new plan for interesting school children in "safety always." This is a board game which is played somewhat like parcheesi, but every part of the game has a railroad significance. It is called the "Pla-Safe" game and is intended to represent the route from the boy's home in one corner of the board to Colfax School at the other end of the board and back home again. There are 118 steps or squares on the trip out and 114 on the way home.

Each square is marked with some wording which is significant. At several points on the route the player has to cross an electric railway track. If he lands on square No. 14, which is that on the electric railway track, he is "struck by the car" and is penalized by being obliged to "go home." This means that he has to start at the beginning again. If he remains on square No. 101, which is where he crosses the steam railroad track, he is "struck by the train" and must go to the hospital for five days. This means that he must lose five turns and then must go back to square No. 82, where he is told that next time he must be more careful.

There are a number of safety squares marked in green. Each provides a certain reward, such as an advance of three squares or one more play. On the other hand, there are certain danger squares marked red, where the player is penalized by being obliged to wait for various lengths of time. Every player must stop at each danger square regardless of whether the number of the die thrown, or of the number shown on the dial spun, would carry him beyond that square.

The game is played either with dice or by spinning a dial to indicate the number of squares each player can move on each turn. Mr. Jones has several of these charts with him, and they are attracting a great deal of attention.

TUESDAY'S SESSIONS OF THE CLAIMS ASSOCIATION

Following its joint session on Tuesday morning with the Engineering and Transportation & Traffic Associations the Claims Association reconvened in the Claims Hall on the Pier, where were exhibited "safety first" lantern slides by H. B. Bennett, claim agent Fitchburg & Leominster Street Railway. Following this the Association again took up the discussion of increasing interest in the claims index bureau. Upon motion Messrs. Brown, Walsh and Rice were appointed a committee to correspond with all the member companies urging the more general use of the bureau. Secretary Davis was instructed to request Secretary Burritt of the parent association to send out reporting blanks to all member companies.

In the municipal court at Dorchester, Mass., one Foster was found guilty recently of the novel offence of unlawfully appropriating a street car. The defendant and several companions climbed aboard a River Street car of the Boston Elevated Railway at Milton Lower Mills carhouse and assumed the role of conductor and motorman, to the dismay of the passengers and distress of the local employees. After a brief "joy ride" the cries of the passengers to persons on the sidewalks led to the abandonment of the car, with the sequel of a $15 fine after the trial of the principal offender.

OPENING SESSION OF THE AMERICAN SESSION

The American Association began its annual convention yesterday afternoon in the Greek Temple. President Black called the convention to order at 2 p. m., and delivered his annual address, which appears elsewhere in this issue.

He then introduced Hon. Frank W. Stevens, chairman valuation committee, New York Central Lines, who delivered an address on "Mooted Principles in Valuation." This address will be published in a later issue of this paper.

At the conclusion of Mr. Stevens' address, Arthur W. Brady, Anderson, Ind., moved a vote of thanks to Mr. Stevens for his address. The motion was carried unanimously.

The report of the secretary-treasurer was then read. It appears in another column and was accepted and placed on file.

The report of the committee on subjects was then read. It mentioned the topics which had been selected for the current meeting. The president then called for a report of the committee on education.

EDUCATION

The report of the committee on education was presented by H. H. Norris. It appears elsewhere in this issue.

P. S. Young, Public Service Railway, Newark, asked the cause for the difference in charge for the different courses. Thus, courses *A* and *B* cost approximately $30 each, but together they cost $37. *C* and *D* cost respectively $30 and $37 each, but together they cost $45. He asked if there was any error.

Mr. Norris replied that the figures given in the report were correct. Each is based on the experience of the instruction schools, which cannot handle any course for less than $30.

Prof. V. Karapetoff, Cornell University, explained that the correspondence schools were run on the same basis as accident insurance companies. They depend upon a certain number dropping out. Again, if all of the students should send their problems to the school for correction, it would be bankrupt.

H. A. Bullock believed that it was very advisable for the electric railway companies to provide some form of educational facilities for its employees. This could be done either by the companies taking the matter up individually or as an association. The simplest way was for the association to do it and to turn it over to one of the reputable and recognized correspondence schools. Mr. Bullock traced the steps in the development of the committee's recommendations showing that the present plan is the result of study of all possible methods several other examples of which he cited.

Upon motion the report was adopted.

REPORT OF THE JOINT COMMITTEE ON THE JOINT USE OF POLES

The report of the joint committee on the joint use of poles was then presented by Mr. Harvie. This report is published elsewhere in this issue. Mr. Harvie recounted how the need for joint pole use had developed in New York State some three and a half years ago. It had been first taken up by the state association, but later the matter had been turned over to the American Association. The work had been prosecuted vigorously ever since. The proposed agreement and specification should be a compromise. He thought that the points which had come up most frequently in letters had been cared for but with optional methods, so that members or companies entering into the agreement could fill out blanks provided in the agreement in any way in which they saw fit. The principal items considered were safety and the definite location of wires and circuits. The agreement was very general and left ample latitude for individuality and the exercise of judgment in regard to local conditions, which must always obtain on any properties. He asked that the committee report be accepted and the committee discharged.

President Black then asked the secretary to read a communication from T. D. Mortimer, Milwaukee, which related to this subject. Mr. Mortimer's main point was that the impression might go forth that the proposed joint pole construction was a standard. In that event, those who used non-standard construction would have imposed upon them a heavier burden in defending legal actions. It would be unwise for a company to accept the agreement blindly without bearing in mind the exceptions required by local conditions. If strictly interpreted the adoption of the committee's report would do no harm, but the danger lurked in the separation of the recommendations of the committee from the suggested forms and in the loose reading of the report.

W. J. Harvie said he did not want anyone to feel that the joint pole agreement was intended as a standard of the association. It was simply to be considered as a suggested form subject to modifications according to individual conditions.

After further discussion it was voted that the report be received, filed and promulgated as a guide to member companies but not that it was to be understood as a standard.

The next order of business was a paper by H. C. Donecker on "Organization of a Valuation Staff." This paper appears elsewhere in this issue. The discussion on this paper was confined to Philander Betts and Henry Floy.

According to Mr. Betts, chief engineer of the Board of Public Utility Commissioners of New Jersey, the make-up of such a staff depends upon the purposes for which the valuation is made. If the purpose is to determine just and reasonable rates it is necessary not only to ascertain the reasonable cost of efficiently reproducing the existing properties, but also to determine if possible by an analysis of construction records the original cost and the revenues and expenses from the time of organization to the date of inquiry. It is especially desirable to have the inventory of the property made up by a joint force of employees of the company and the commission. On the valuation staff itself there should be engineers, accountants, operating men and men acquainted with corporation finance. The man best equipped for a complete valuation report is one with an underlying technical education, a later experience in operation and a still later administrative experience with the principles of corporation finance.

Mr. Floy stated that to follow the outline suggested by Mr. Betts was the best way for utility to undertake valuation work. He remarked, however, that the ordinary construction and operating engineer was no more fit to prepare such a valuation for a court or commission than a corporation lawyer was fitted to appear in a criminal court. Another point mentioned by Mr. Floy was that public utilities had not co-operated in valuation work. They should be more interested in all appraisals and valuations of public utility properties, even if they are not directly concerned financially.

President Black then announced the following committees:

Commitee on nominations: Arthur W. Brady, J. H. Pardee and Gen. George H. Harries.

Committee on resolutions: Charles L. Henry, John A. Beeler and Frank Hedley.

Mr. Schreiber then presented the report of the committee on company sections and individual membership. This report is published elsewhere in this issue.

The report of the committee on company membership, of which Frank Hedley is chairman, was then read by the secretary.

President Black then asked all members to be punctual in their attendance at opening of the meeting at 2 p. m. tomorrow. The meeting then adjourned.

TUESDAY'S MEETING OF THE ACCOUNTANTS' ASSOCIATION

The annual meeting of the Accountants' Association was called to order yesterday morning at 10 o'clock by its president, M. W. Glover, Mobile Light & Railroad Company. After the approval of last year's minutes, the annual address of the president, abstracted elsewhere in this issue, was read by Mr. Glover. M. R. Boylan, Public Service Railway, Newark, N. J., then read the report of the executive committee and afterward his own report as secretary-treasurer of the association, both of which were approved.

Mr. Glover read a letter from L. T. Hixson, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., who is chairman of the committee on interline accounting, to the effect that no changes in interline business had occurred during the year sufficient to justify a report. In regard to the committee on co-operating with the United States bureau of the census, President Glover stated that it had been continued at the request of W. M. Steuart of the bureau of the census, to be called upon by the latter if so desired, but that chairman W. H. Forse, Jr., Union Traction Company of Indiana, Anderson, Ind., had advised that no report would be submitted this year except that the committee had looked over the advance copies of the census report for 1912.

The report of the committee on express and freight accounting was read by E. L. Kasemeier, Ohio Electric Railway, Springfield, Ohio, as published elsewhere in abstract form. In discussing this report O. H. Bernd, Des Moines (Iowa) City Railway, said that his company maintained a through billing arrangement with all the connecting steam railroads, and that it used all the forms recommended by the committee and a few additional ones. He believed that electric railways should conform to steam railroad forms, for the time was coming when the railroads would fully recognize electric railways in the interchange of freight traffic. W. G. Nicholson, Omaha & Council Bluffs Street Railway, Omaha, Neb., moved that the report be accepted and the motion was duly seconded and carried. W. F. Ham, Washington Railway & Electric Company, Washington, D. C., chairman of the committee representing the association at the national annual convention of railway commissioners, read his report covering the activities of the committee during the year and its experiences at that convention last year. He appended the report of the committee on electric railway statistics and accounting submitted to the National Association of Railway Commissioners at that time. Asked by President Glover to explain the connection between the two associations, Mr. Ham said that the National Association of Railway Commissioners was composed of the state and national commissioners. Steam railroad accountants many years ago were given honorary membership in this association. Ten years ago electric railway accountants got into communication with the association on the subject of uniform classification of accounts and a little later were also admitted to honorary membership. Efforts were made some years ago to consolidate into one committee the association's committees handling steam railroad and electric railway accounting problems, but in view of different conditions and the different jurisdiction of the Interstate Commerce Commission over steam lines and electric railways, the delegates of the latter class strenuously objected so that the committee on electric railway statistics and accounting was continued as a separate body. At present there is not much active interest in electric railway accounting in the National Association, but Mr. Ham believes that the Accountants' Association is fortunate in enjoying the present relations with it.

The report of the committee on the standard classification of accounts, abstracted elsewhere in this issue, was read by the chairman, H. L. Wilson, Boston, Mass., Elevated Railway. It was moved by T. P. Kilfoyle, Cleveland (Ohio) Electric Railway, and seconded by H. B. Cavanaugh, Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, that the report of the committee recommending the adoption of the Interstate Commerce Commission uniform accounting classification be accepted by the association. In response to a call by President Glover, George Geekie, examiner Interstate Commerce Commission, said that two copies each of the new classification had been sent out to 879 parties, including 800 electric railways and 79 commissions and steam railroads. From these only thirty-two or thirty-three replies had been received, although these were helpful and many were incorporated in the accounting system. Mr. Geekie remarked that the delay in getting out the system was not caused by the failure of the commission to appreciate the need of early action but was the result of an overwhelming amount of congressional work being at that time imposed upon the government printer. The commission is now working upon a new bulletin, and bulletin No. 7 is to be reissued under a new number. The cases will be placed under the same numbers but the titles of the accounts will be changed to conform to the new classification. Of the 350 cases to be included the last fifty will be important as showing decisions of the commission under the new classification. Mr. Geekie expressed the appreciation of the Interstate Commerce Commission for the assistance and co-operation that had been shown by the Electric Railway Accountants' Association, for he considered it invaluable in the promulgation of the new uniform system.

H. S. Lyon, Board of Public Utility Commissioners of New Jersey, said that the New Jersey law required the commission to follow the Interstate Commerce Commission system. In January, 1913, it adopted its own schedule for income, profit and loss, and balance sheet accounts. This is not materially different from the Interstate Commerce Commission's new classification, but changes will probably be incorporated so as to comply fully with the latter's new rules. H. C. Hasbrouck, representing the Public Service Commission for the Second District of New York, stated that while he was unable to say anything authoritative, he believed that this commission felt the classification already in use to be better suited for its purposes than the new classification. Experience had shown that a number of points in the New York system could be improved upon by revision, but no complete substitution was likely. In Mr. Hasbrouck's opinion the point most in need of revision was that of depreciation.

In reply to a question from Mr. Kilfoyle as to how many states or commissions have actually adopted the new classification, Mr. Wilson said that the new Massachusetts public utility act required the commission to conform as nearly as possible to the Interstate Commerce Commission system but that the state law made some modifications necessary. Mr. Ham read an extract from the last year's report of the committee on electric railway statistics and accounting of the National Association of Railway Commissioners to the effect that up to the beginning of the present year seventeen states and the national government had conferred upon commissions the authority to prescribe accounting systems. About one-half of these had adopted certain classifications for electric railways, although only New York, Wisconsin and Maryland had adopted complete systems. Supplementing this extract Mr. Ham remarked that twelve years ago individual companies had sacrificed their own ideas in order to secure a uniform accounting system for the association, and that now state commissions should be as willing to give up minor points in order to secure as far as possible absolute uniformity. After this discussion the question of adopting the Interstate Commerce Commission system as the official system of the Accountants' Association was carried.

In the absence of Frederic Nicholas, chairman of the committee on accounting definitions, the report of this committee was read by R. N. Wallis, Fitchburg & Leominster Street Railway, Fitchburg, Mass. An abstract of this report is published elsewhere in this issue. President Glover emphasized the importance of standardized accounting definitions and said that the committee should be continued. A motion by C. S. Mitchell, Pittsburgh (Pa.) Railways, seconded by Mr. Kilfoyle, to the effect that the report be accepted and that the committee be made a standing one, was carried.

At this point the address of the morning on "The Education of To-day" was delivered by John R. Wildman, professor of accounting, New York University School of Commerce, Accounts and Finance. Mr. Glover, after expressing his appreciation for the very instructive address and stating that all the delegates were destined to become better acquainted with Professor Wildman through his conducting the correspondence accounting course, gave a recess of five minutes for the delegates to meet him personally. It was afterward moved by Mr. Cavanaugh and seconded by W. J. Mead, Cleveland (Ohio) Railway, that the association extend a rising vote of thanks to Professor Wildman for his paper.

In the temporary absence of F. J. Pryor, Jr., American Railways, Philadelphia, Pa., Mr. Boylan read the report of the committee on education. The enrollment in the correspondence course is now of sufficient number to insure its inauguration, although Professor Wildman did not hold the committee strictly to the time limit set. The committee sent out two letters but did not endeavor to use continuous circularizing methods because it desired to be more dignified in its appeal. The demand thus far has been mainly with the smaller companies, the enrollments from the larger companies being disappointing. The prospectus of the course remains unchanged and the first lecture is to be mailed on Oct. 19. Professor Wildman left a few copies of this lecture with Mr. Pryor for distribution to interested parties. The committee expressed thanks to P. S. Young, Public Service Railway, Newark, N. J.; H. H. Norris, Electric Railway Journal, and E. B. Burritt, American Electric Railway Association, for assistance given. Mr. Wallis moved that the committee be commended for the successful completion of its work and the report was duly accepted. President Glover stated that applications for the correspondence course were available and might be taken by association members to be filled out by their employees.

Mr. Wilson recommended the election of W. B. Brockway and F. E. Smith to honorary membership in the association. After President Glover had asked for the names of other past presidents who should be similarly honored, the two candidates were elected.

Mr. Kilfoyle then mentioned the recommendations that President Glover had made in his address and the latter supplemented his former remarks by stating that the committees were in an unsettled condition upon the election of a new president, and although the executive committee had power to abolish any committees it would be advisable for the association directly to express its wishes regarding committee activity. It should say what committees should be standing and what number of members of such committees should be continued over until the next year, which in Mr. Glover's opinion should be two. Mr. Glover believed that the committee on interline accounting should be consolidated with the freight and express committee, and that there should be a standing committee on passenger accounting and three standing joint committees. It was moved by Mr. Ham and carried that the entire matter should be referred to a special committee consisting of the president, secretary and Mr. Kilfoyle to report this morning.

In reply to a question from President Glover, Mr. Wilson stated that he supposed the association would have the uniform classification printed later in complete form with cases, but that now the association might secure the classification from the government printer and sell it at a low price. Mr. Ham suggested that each member company purchase a liberal supply, at $12 a hundred copies for distribution among its employees.

L. S. Cloud, Peoples Railway, stated that his company was going to use the system of accounts adopted by the association. Upon a show of hands it developed that thirteen companies represented had adopted the Interstate Commerce Commission classification. William Hosking, Butte (Mont.) Electric Railway, said that the system used in Montana was governed by the state commission. President Glover then called upon Lloyd Lyon, who had recently returned from Spain. Mr. Lyon remarked that Spain, as the home of antiquity, was naturally deficient in accounting procedure. The chief accountants there were all foreign, mostly French or Belgian. The system of railway accounts used by Mr. Lyon's company was the uniform system of accounting adopted in 1908. For electric lighting accounts the company used a cumbersome continental standard. According to Mr. Lyon there is an annual audit made by public auditors, in some cases very complete, but in others covering only a condensed income statement and a condensed balance sheet. England, France, Belgium and Spain have no regulatory commissions and if the banks and other financial interests are satisfied with such condensed reports, Mr. Lyon deems these sufficient. The signature of the auditor is a guarantee of the correctness and proper form of the report.

President Glover appointed as the committee on resolutions G. G. Whitney, H. A. Gidney and Walter Shroyer. The following committee on nominations was appointed, R. N. Wallis, J. C. Collins, H. A. Culloden, C. Lahr and T. P. Kilfoyle. The meeting was then adjourned to meet this morning.

JOINT SESSION OF THE ENGINEERING, TRANSPORTATION AND CLAIMS ASSOCIATIONS

The joint session of the Engineering, Claims and Transportation Associations opened on Tuesday morning at 9:30 o'clock, with President W. F. Weh of the Claims Association in the chair.

The report of the board of accident prevention, of which P. C. Nickel is chairman, was the first order of business. An abstract of this report, which was read by S. B. Hare, is printed elsewhere in this issue. F. C. Henderschott, manager bureau of education New York Edison Company, then presented an address on "Accident Prevention," an abstract of which also appears in this issue.

After a vote of thanks had been extended to the authors of the communications, C. L. S. Tingley of the Accountants' Association called attention to the educational campaign of that association, particularly in securing the services of Professor Wildman, New York University, to conduct a correspondence course for employees of electric railways on both the detailed and broader aspects of accounting.

He said that to make this course permanent and efficient it was very desirable to have as many companies as possible interested in it. While enough enrollments, slightly less than 400, had been obtained to insure the course, it was desirable that as many as possible should join. Mr. Tingley then distributed some explanatory literature. Following this the delegates from the Claims Association adjourned to their own session while the meeting was continued as a joint session of the Engineering and Transportation & Traffic Associations. This meeting is reported elsewhere in this issue.

JOINT SESSION OF ENGINEERING AND TRANSPORTATION & TRAFFIC ASSOCIATIONS

The joint session of the Engineering and Transportation & Traffic Associations was called to order by Acting President Brush of the latter association on Tuesday morning at 11 o'clock. The first order of business was the report of the joint committee on block signals for electric railways, J. M. Waldron, chairman.

In presenting the report of the committee on block signals Mr. Waldron stated that a sub-committee was to work with the one from the Railway Signals Association during the next year to select from among the standards designs of the Railway Signals Association such ideas as could be properly adopted as standard by the American Electric Railway Association. This would eliminate conflicting designs with a minimum of lost time.

The two standard designs proposed by the committee, namely, a spectacle casting and a standard clearance diagram for semaphore signals were then presented to the association for its consideration. The former was approved as standard but the latter was referred back to the committee so that co-operation with the power distribution committee could be effected and certain limiting dimensions regarding the height of trolley wire could be agreed upon.

Suggested rules for signals were then approved by the association as they appeared in the committee report, and new signal rules for operation under contactor signals were approved with certain recommendations, excepting that Rule 10 appearing in the report was withdrawn by the committee for further consideration after an extended discussion. This rule dealt with the procedure when a train failed to set the signal upon entering a block.

All of the rules as changed were then approved as standards of the Engineering Association, and after this the recommendation that lenses of not less than 8⅜-in. diameter for high speed and 5⅜-in. diameter for moderate speed should be adopted as good present practice. The report as a whole was then approved and a vote of thanks was extended to the committee.

Mr. Stewart, Mahoning & Shenango Valley Railway, then read the report of the committee on transportation engineering, as abstracted elsewhere in this issue. This report was approved and the thanks of the association were extended to the committee. The meeting then adjourned.

ADDRESS OF PRESIDENT GLOVER OF THE ACCOUNTANT'S ASSOCIATION

President Glover, in opening his address yesterday before the Accountants' Association, mentioned at first the marvelous development of the electric railway industry since the association was organized on March 23, 1897. He called attention to the fact that the *Street Railway Review* was instrumental in calling the meeting of the association, and that for the last eighteen years the electric railway press had given to the association support and encouragement that was worthy of acknowledgment and appreciation.

The first suggestion made by Mr. Glover was that a rearrangement should be made of the committees so as to provide for certain standing committees and the forming of special committees from time to time as needed. He recommended that in order to secure continuity of work some members of each standing committee be held over from year to year, but that the other members be changed to bring new life and new ideas into the committee work. This suggestion, however, did not refer to the classification committee, which, in Mr. Glover's opinion, should not suffer a change in membership from year to year.

Mr. Glover said that although the Accountants' Association had adopted a uniform system of accounts, less than one-third of the electric railways in the United States used this classification as it stood. The reasons for this were that a number of state commissions prescribed different classifications, and although the association classification agreed with the Interstate Commerce Commission classification, many companies did not report to this commission and therefore were not required to use its classification. Moreover, in some cases companies were not required by law to follow any special classification. Mr. Glover believed that a uniform system of accounts should be adopted by all state commissions and companies, and he hoped that the meeting of W. F. Ham, H. J. Davies and C. L. S. Tingley with the National Association of Railway Commissioners on Nov. 17, 1914, would accomplish much good along this line.

Mr. Glover mentioned the co-operation and sympathy that had been shown between the Central Electric Railway Accountants' and the American Electric Railway Accountants' Associations during the last year on the subject of the tentative uniform system. He then took up three subjects to which he thought the association should devote attention: overhead charges, segregation of freight and passenger expenses and cost accounting. In connection with the first topic, he advised the delegates to read the address of Judge Cooley before the 1911 convention. To Mr. Glover's mind the division of expenses between freight and passenger business was of vital importance in all questions relating to rate increases, and as electric railways must secure higher prices for service or give poorer service, some plan should be devised to obtain such information. In view of the regulations recently prescribed by the Interstate Commerce Commission for a system of cost accounting to be kept showing in detail the cost of all improvements, extensions and changes of physical property, he deemed it desirable for the association to adopt a uniform cost system for maintenance expenses as well as for road and equipment expenditures. Unfortunately certain engineers were apparently unwilling to co-operate with the accounting department on this subject, but Mr. Glover stated emphatically that statements concerning the lack of value of accounting department cost data should not go unchallenged. In his opinion the best results could be obtained only through the co-operation of the two departments, and no interested department should have the right to prepare a cost statement without having it verified by the accounting department.

Mr. Glover recommended that electric railway accountants take the correspondence course arranged for by the committee on education. He also said that accountants should realize the importance of co-operation in adopting a uniform system not only of accounts but also of statistics and of methods of doing business. Such reforms as the securing of uniform monthly and annual reports would have to be and should be brought about by the accountants, but the co-operation of the three other associations should be secured.

In closing his remarks, Mr. Glover deplored instances of unjust public utility regulation, and in expressing optimism for the electric railway future quoted President Wilson's recent remarks regarding the economic indispensability of American railway systems. Mr. Glover was pleased to report that instead of the usual deficit there remained $456.75 out of the appropriation of $2,141.68 for the current year, exclusive of $136.10 properly chargeable to the previous year's expenses.

As a part of its shop equipment the Shanghai (China) Electric Construction Company, which operates an electric railway there, has installed a complete oxy-acetylene welding and cutting outfit. The company finds considerable economy in generating its own acetylene. The whole of this plant is mounted on a flat trolley which can be transferred to any part of the system. Electric arc welding is also carried out by a small plant designed by the shop staff.

TUESDAY MORNING'S SESSION OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

The Tuesday morning's session of the Transportation & Traffic Association was called to order by Acting President Brush at 9:15 o'clock. The first order of business was the reading of the following communication on flagging which L. H. Palmer, chairman of the committee on rules, had received from Frank Kingsley, associate editor ELECTRIC RAILWAY JOURNAL:

In 1911 this association eliminated from the standard code old rule 203a that permitted trains to proceed under flag protection when they could not reach the despatcher. This rule was considered to be bad practice. However, it is a fact at present that at least a half-dozen interurban roads have reintroduced the old rule or its equivalent in their codes of signal rules. In a communication by John Leisenring printed in the ELECTRIC RAILWAY JOURNAL for Sept. 12, it is indicated that this has been done because conditions have changed since 1911 (owing to the wide introduction of signals) and because some such rule is necessary to avoid occasional serious interruptions to traffic by defective signals in stop position. In consequence the committee will, no doubt, agree that a definite expression of opinion should be given at once by the association to relieve the present contradictory situation.

Mr. Palmer said that the matter was a very important one, but agreed with the chair that it should be referred to the incoming committee on rules. Upon motion by Mr. Duffy the matter was disposed of by thus referring Mr. Kingsley's communication.

J. J. Dempsey, chairman, then presented the report of the committee on schedules and time-tables, an abstract of which appears elsewhere in this issue. Mr. Duffy commended the good work which this committee had done during the past five years and agreed with its recommendation that the work on schedules and time-tables should be continued in some form. He doubted whether the arbitrary stop method would be of great value in the smaller cities, although it had worked well in a fair-sized town like Rochester. As to setbacks, the schedule should be so arranged that their use should be dispensed with as far as possible.

R. E. Danforth, Newark, believed that the committee's work next year should include the problem of producing able schedule makers. There were few real schedule makers in the country, and it took much training as well as natural ability to do the work.

R. B. Stearns, Milwaukee, said that some discussions which his company had had recently with the public regulating authorities pointed out the advisability of using the term "designated stop" instead of "arbitrary stop." The use of such a word as "arbitrary" was distressing in the wrong conception that it conveyed. He also suggested that the incoming committee might well occupy its time with the construction of "base schedules," by which he meant the attempt to establish a schedule founded on the minimum service requirements to which, with the use of morning and evening gap schedules, cars could be taken from or added to the schedules at minimum expense. Seasonal changes of schedules should be sufficient and could be determined in advance.

Alexander Jackson, Public Service Railway, said the skip-stop idea had its advantages, but he thought that if the near-side stop could be standardized it would save two to three stops per mile on most properties. To save three stops per mile would save two or three minutes on a round trip which, on a two-minute headway, meant the elimination of one car and on a one and a half-minute headway the possible elimination of two cars.

Upon motion the report of the committees on schedules and time-tables was approved. The meeting was then adjourned in order to permit the joint session with the Engineering and Claims Associations which is reported elsewhere in this issue.

HOW ACCIDENTS MAY BE PREVENTED

F. C. Henderschott, manager bureau of education New York Edison Company, in his paper on the prevention of accidents before the Transportation & Traffic Association stated in substance as follows:

A casual examination of the subject of accidents in industry leads to the conclusion that conditions are indeed very serious. In the late civil war, according to figures from the adjutant general's office, the number of Union men killed in battle during the four years was 67,058. It is probable that the total number of Confederate soldiers actually killed in battle did not exceed much, if any, the losses of the Union forces, but the most conservative estimate places the total of persons killed by accident in the United States, at the present time, at not less than 75,000 in a single year.

The 1913 report of United States Commissioner of Labor, Hon. Charles P. Neill, upon the conditions of employment in the iron and steel industry states:

"On the one hand for a large group of plants in which the work of organized accident prevention is well developed, the rate falls as low as 167.1 per thousand 300-day workers, while at the other extreme for a group of plants in which organized safety work has not yet been developed, the rate rises to 507.9 per thousand, and in the case of individual plants in the group considerably higher." This is a reduction of 67.1 per cent, or of two accidents out of every three.

To quote Arthur Williams, president of the American Museum of Safety: "No measure of value can be applied to the suffering of individuals who are injured or to the anguish of those who have lost relatives through industrial accidents. There is not only this immediate economic loss, but that which accrues in the future to dependents who, as a result of accident, are left without the means of either sustenance or education. The grief and pain arising from deaths and permanent disabilities wrought from this country's industries, and from carelessness outside of industry—as, for example, upon our highways—far exceed any suffering or sacrifice of life that have occurred or ever could happen through war."

Again he says, in a recent discussion of the subject of industrial accidents: "Perhaps not sentimentally, but practically, human health and life have been held most cheap, not only in our country's industrial development, but in our social order as well. And until recently in industry the most ordinary physical and sanitary precautions have been lacking; in social life we have permitted the development of slums—breeding spots of unhappiness, disease and crime; in our entire industrial system we have neglected to the utmost degree essential elementary protection of health and life."

That Mr. Williams has not overdrawn the picture is proved when we turn to some recent reports by corporations of accomplishments they have made, along the line of accident reduction, during the past year.

The bureau of efficiency of the Northern Pacific Railway, while but a little more than a year old, was able to reduce deaths due to operating accidents on that railway system during the first six months of 1914 as compared with a similar period of 1913 by 73 per cent. The Carnegie Steel Company has been able to reduce its accidents about 71 per cent. Reports from many other industrial corporations lead to the conclusion that it is possible to reduce accidents, where no effort has yet been made in this direction, anywhere from 80 per cent down to 20 per cent, according to the character of the business.

But, as J. L. Murrie, safety engineer, and J. C. Robinson, chief of the bureau of adjustment of The New York Edison Company, have pointed out in a recent paper on "Safety in the Electric Light Industry": "No device ever has been invented and none ever will be invented that will operate with unvarying success, under all conditions in saving life or limb. The human equation enters too strongly into the proposition and must not be ignored or eliminated. Intelligent co-operation by the employee is a vital essential, and such co-operation is the gospel we must preach. We may reach the extreme limit of ingenuity in the making of a machine that protects a man against danger, but if no mental impulse be exerted the danger is not averted. We can demonstrate the peril of the live wire and the protective value of the rubber glove, but without co-operation between the human mental and the physical material, the warning as to the one and the advice as to the other are alike useless."

In the New York Edison Company 85 per cent of accidents are due to employees, carelessness or negligence, 6 per cent due to carelessness of fellow-servants, 2 per cent due to outside contractors and 7 per cent are chargeable to the company.

The Au Sable Electric Company of Michigan, in a recent report, states that 75 per cent of the accidents in that company are due to carelessness, and Mr. Williams in a recent summary, based, no doubt, upon data gathered by the American Museum of Safety, states that: "Between 70 per cent and 90 per cent of all accidents are the result not of physical defects in our urban industries relating, say, to manufacture, transportation and kindred subjects, but to carelessness and oversight on the part of persons injured, their fellow-workers, or those in control of the means of injury."

The subject of accident prevention was first approached largely from the standpoint of safeguarding machinery. For some time industry devoted its efforts toward accident prevention largely along this line. But the Westinghouse Electric & Manufacturing Company, in a report for 1913, showed that less than 0.5 per cent of the accidents occurring in its plant was due to lack of safeguarding. In this report, Dr. Lauffer attributed a goodly proportion of the accidents directly to the influence of the saloon and predicts that the present generation will wipe out the saloon.

It is not my purpose to discuss prohibition, but surely no analysis of the causes of industrial accidents, deaths and disease would be complete without reference to the evil influence of the intemperate use of liquor. And industry has not been slow in recent years to recognize this fact. Many of the large railroad companies prohibit the sale of liquor upon their trains, and any employee seen in an intoxicated condition is immediately discharged. It is perhaps due, at least in some degree, to the fact that transportation companies have taken this stand, that some of the larger transportation systems have not killed a single passenger in the past five years. But while this condition is gratifying, we are disheartened when we learn that 25,000 children under eighteen years of age have been killed upon railroad tracks during the past twenty years. It is not the fault of the transportation companies that children are upon their tracks, and this leads to the inevitable conclusion that accidents and deaths cannot be reduced to the minimum until there is co-operation upon the part of the public, upon the part of the press, the pulpit, educational institutions and all along the line.

Physical examination of employees is already playing an important part in the reduction of industrial accidents. Dr. Lauffer, in the report, says: "In our opinion the good health campaign is more result-producing in the line of accident prevention than much additional safeguarding of machines."

In a paper on "safety first," presented before the last convention of the National Electric Light Association, Paul Lupke pointed out two important facts. "Newspaper men and other publishers and writers know that the people do not learn facts and arguments on any subject by one announcement, and that it needs constant effort of iteration and reiteration to send the matter home to the people it is wished to reach." And the second point: "The greatest factor operating toward the prevention of accidents is not the prevention device but the 'prevention spirit'."

Several years ago a commission appointed by the federal government visited the big manufacturing industries of Germany, and it was shown by a tabulation of 80,000 cases investigated by them that 80 per cent to 84 per cent of the total number of accidents were chargeable to the employees. This would seem to indicate that about the same degree of negligence on the part of the employees exists the world over; that it is one of the chief characteristics of human nature to be careless.

It is obvious in a paper to consume but twenty minutes very little detail can be given. However, the picture is not so dark as it might appear at first glance. In excess of 1000 industrial institutions have instituted accident prevention systems in the industries of the United States, and while the annual toll paid by this country on account of industrial accident amounts, at the present time, to in excess of $250,000,000 exclusive of loss of time and efficiency of those injured, a good beginning has been made in the direction of improvement.

Recognition has been accorded to the safety engineer and to his collaborator, the efficiency engineer. Industrial corporations are beginning to add the third, and perhaps the most important factor in the entire movement, the educational engineer. More than eighty industrial institutions, including among the number several of the larger railway systems, the larger manufacturing companies, financial, insurance, publishing and retailing institutions have established educational courses on behalf of their employees, and in connection with the better training systems compulsory physical examination is being urged, and due recognition is being given to fatigue, intemperance, worry and the other contributory causes to accidents, diseases and death.

A campaign designed to prevent accidents must be based upon the natural tendency of the human being to be careless. To be effective, the work must be carried on with enthusiasm but not spasmodically.

Since instruction on the subject of safety, by lectures, was introduced into the schools of New Jersey, accidents to school children for the six months ending Sept. 1, 1912, were 44 per cent less than they were during the same period in the previous year.

Once instituted, the safety department of a corporation should be considered a permanent feature and the effort should not be allowed to lapse. This association can render no more valuable service to its members and to the public than by placing its prestige squarely behind its safety board and to co-operate with similar committees from other organizations to the end that industrial accidents, industrial disease and untimely deaths shall be reduced to the lowest possible number throughout the industries of the United States.

HOWLING FROM THE HOUSE-TOP

Electric Railway Service, published in the interest of the Detroit United Railway for general distribution, recently contained the following item which will be of interest to electric railway men generally:

"W. H. Woodbury, whoever he is, writes the Detroit *Journal* calling the attention of people to the fall styles of ladies' hosiery as revealed during the entrance to and exit from Detroit street cars. If such inspection constitutes Mr. Woodbury's form of entertainment he should not endeavor to divert the attention of others from their work."

PRESIDENT BLACK'S ADDRESS TO THE AMERICAN ASSOCIATION

The past year has been a strenuous one for the majority of our members. Our industry is passing through a most crucial and critical period, not so much by reason of any changes in the art of transportation as because of the attitude of the general public towards all public utilities, as well as from the problems arising through the evolution of governmental regulation. And now we have added to the above the serious economic conditions resulting from the European war. But I cannot help feeling greatly impressed with the vigor and enthusiasm of the men engaged in the electric railway industry; they have met and overcome the difficulties of the past and will unquestionably be able successfully to cope with those of the future.

During the past twenty-five years we have witnessed an industrial development unparalleled in the world's history, and no factor in this development has played a more important part than the electric railway. Cities have been enabled to expand their boundaries far beyond what was deemed possible before the advent of the trolley car, thus eliminating to a great extent the congestion so common to the cities of the old world, and making it possible for workers to find comfortable homes at reasonable cost in the suburbs. For every dollar of profit realized from electric railways, the community at large has gained at least one hundred dollars in taxable values, while the individual owners of suburban real estate have enjoyed increases in the so-called unearned increment aggregating enormous sums.

These results have been brought about largely through the establishment in this country of a flat 5-cent fare, or less, enabling a passenger to travel from any one point in a city to any other regardless of the distance, and, in fact, oftentimes to points far beyond the corporate limits. Owing to the undeveloped system of accounting generally in use by electric railways, and the more than vague ideas of the actual cost of the service, the fact that this long-haul travel was carried on at a considerable loss was far from realized until a comparatively recent period. The more the public received the more it demanded, and at the same time there commenced to be a marked decrease in the value of the token or fare received.

Finally, in 1910, the association appointed a committee to report on the proper basis of rates and fares, which committee was succeeded in 1912 by the committee on cost of transportation. This committee reported to the 1913 convention, recommending the establishment of a bureau of fare research, which culminated in the appointment, on May 1 of this year, of F. W. Doolittle as director of the bureau to work under the direction of the committee on cost of transportation. Mr. Doolittle, from his education and past experience, is peculiarly fitted for the work he has undertaken. An idea of the scope of this work and of its importance and value can be gained by reference to the June, 1914, *Aera.*

THE COMMITTEE ON PUBLIC RELATIONS

When you bestowed upon me at our last convention the honor of the presidency of the association, it devolved upon me not only to direct through its committees and officers what might be styled the routine work, but also, if possible, to enlarge the value of the association to its members.

It appeared to me that no more fertile field presented itself than that occupied by the committee on public relations. This was a regular committee of the association, and had been in existence for a number of years, but its work had been more ornamental than useful.

In the past the association has never experienced any difficulty in finding men for the various committees who were fully capable of dealing with the problems which have arisen from time to time. But the question of public relations is very different from the subjects generally considered by these committees, and the ideas of even those men who had given the matter the most careful and thorough study were vague and indefinite. Everyone recognized the fact that our public relations were in a most unsatisfactory condition and that the improvement of this condition was of vital importance to the industry. But how to tackle the problem was another question. It seemed to me, therefore, important that we should call upon the very best talent at our command, and a committee was appointed, including not only representatives of the electric railways proper but also men from the manufacturing, banking and engineering interests who are identified with our industry. Thomas N. McCarter, president of the Public Service Corporation of New Jersey, was appointed chairman.

Several meetings have been held during the past year and, on the evening of Jan. 29 Mr. McCarter gave a dinner to the members of his committee and also had as his guests several members of the public policy committee of the National Electric Light Association and other gentlemen identified with public utilities.

The results of the discussion which followed the dinner, and of the several meetings of the committee which have been held, are crystallized in the code of principles embodied in the report of the committee to the association, and which it is confidently expected all members of the association will heartily indorse.

The report also recommends the establishment by the association of a bureau of public relations and outlines a comprehensive plan for a publicity and educational campaign which, I trust, will receive most careful thought and study.

While it may not be practicable, under the existing financial stress, for the association to raise any large sum of money to carry out the broader plan outlined, the member companies can and should start the ball rolling in their own localities. The association can point the way and make suggestions and furnish ammunition, but all of these will be in vain, unless the member companies themselves take hold of their own local problems. Electric railways have one peculiar advantage over all other public utilities in the fact that their employees, the motormen and conductors, come into close and intimate daily contact with the public. Here is a tool ready at hand to commence the work which every electric railway should make use of. But, first, it is absolutely essential to establish cordial and harmonious relations between the companies and their employees.

By the establishment of company sections, two important objects will be attained: first, the employees of the company can and will be brought into closer and more intimate contact with the general officers and will obtain a much more comprehensive understanding of their duties, which will result in greater loyalty to the company and better service to the public; second, the individual membership of the association will be materially increased, thus adding strength through members to the organization, as well as increasing its financial resources.

PROPOSED INCREASE IN DUES

In connection with this last matter, I desire particularly to call your attention to the report and recommendations of the executive committee contained in the circular letter dated Sept. 10, 1914, which was sent to all of the company members, and the approval of which I strongly urge. As the work of the association broadens, its usefulness to its members increases. We now have 400 electric railways enrolled, representing approximately 90 per cent of the capital invested in the business, and we cannot hope for any material increase in dues from new company members. The revised schedule of dues will provide about $16,000 of additional revenue, which will enable the association to meet the added expenses incurred in connection with the estab-

THE CARNIVAL TO-NIGHT

Kee-no dances, contest dances, all sorts of dances with everybody dancing, will be in the air to-night at the carnival. In the prize contest no fair dancers need fear detailed criticism, because a definite plan has been worked out by the committee for taking a ballot. The crowd as the judge will be influenced in the selection of the prize winners not only by the correctness of the steps, but also by the element of personal appeal so that it is not necessary to be an expert to win one of the prizes. Surprises will also be provided, according to the committee.

For the information of the uninitiated it may be said that the Kee-no dance originated 'way back in the dark ages before numbers other than circles were known. Each tribe, to the music of its tom-toms, went forth seeking a lucky circle. Sometimes they reached the Arctic or Antarctic circles and were never heard of again, therefore being unlucky. Others, after many wanderings, in search for this lucky figure returned to their own land and there discovered the family circle. The circle has been handed down from generation to generation through children using rings for games, hoops and wheels, and now it is found on the ballroom floor as a simple means of discovering among a great crowd those to whom Fate points kindly.

SURPRISES AT TUESDAY'S DANCE

A number of surprises were in store for those present at the informal dance last evening. Miss Edna Van Ripper, an amateur dancer, appeared in a fox trot with Mr. Stark, who introduced this dance the first of last May at the Nassau Hotel, Long Beach. The dance brought forth much applause for its ingenious steps and lively tune. Miss Burdick and Mr. Steve Matthews, Atlantic City's Own, gave their repertoire of dances and then met with a most enthusiastic reception. During the intermission, through the courtesy of the Public Service Railway of New Jersey, a picture film entitled "How Most Street Accidents Occur," was thrown on the screen at the end of the ballroom.

DAILY PRIZES FOR SKEE-BALL

Daily prizes for the highest score on the skee-ball alleys will be given beginning to-day through the courtesy of the J. D. Este Company. These will be boxes of candy to the ladies and boxes of cigars to the gentlemen. In addition there will be the grand prize that is offered by the committee for the high score for the week.

The high scores on Tuesday were as follows:

Mrs. T. W. Connette....	220	Mr. C. G. Chamberlain..	310
Mrs. W. E. Bryan.......	180	Mr. T. M. Cluley........	290
Mrs. R. M. Kerschner...	180		

The number of games rolled on Tuesday up to 6 p. m. were 3350 and at this time the crowd at the alleys was thicker than ever.

YESTERDAY'S CARD PARTIES

The first and second rounds of the auction bridge tournament, the second round not being completed, were held yesterday afternoon in the Parisian Garden, Convention Pier. These resulted in the selection of the following ladies who, together with the additional winners of the second round, will play to-day's final round for the prizes: Table 1, Mrs. W. P. Goff, Mrs. S. M. Gallaher; table 2, Mrs. P. E. Wish, Mrs. H. B. Logan; table 3, Mrs. T. Casey, Mrs. J. S. Speer; table 4, Mrs. Tenney, Mrs. Cook; table 5, Mrs. E. Dana, Miss Bright; table 6, Mrs. Thomas, Miss Hurd; table 7, Mrs. Smaw, Mrs. Sofford; table 8, Mrs. Mailand, Mrs. E. D. Priest.

Winners in second-round play not completed: Table A, Mrs. W. P. Goff, Mrs. S. M. Gallaher; table B, Mrs. Cook Mrs. Tenney; table C, Miss Bright, Mrs. E. Dana.

The following are the winners of the "500" game: First, Mrs. J. A. Cadle; second, Mrs. A. T. Naugle; of pinochle, Mrs. J. E. Brill.

The play will start promptly at 2:30 o'clock in order to finish the second round, which time did not permit being played. Prizes will be announced for the "500" and pinochle games in connection with the announcement of winners at the auction bridge.

A SAFETY GAME

The Pittsburgh Railways, which were pioneers in the "safety first" movement, known in Pittsburgh as the "safety always" movement, have recently put into effect a new plan for interesting school children in "safety always." This is a board game which is played somewhat like parcheesi, but every part of the game has a railroad significance. It is called the "Pla-Safe" game and is intended to represent the route from the boy's home in one corner of the board to Colfax School at the other end of the board and back home again. There are 118 steps or squares on the trip out and 114 on the way home.

Each square is marked with some wording which is significant. At several points on the route the player has to cross an electric railway track. If he lands on square No. 14, which is that on the electric railway track, he is "struck by the car" and is penalized by being obliged to "go home." This means that he has to start at the beginning again. If he remains on square No. 101, which is where he crosses the steam railroad track, he is "struck by the train" and must go to the hospital for five days. This means that he must lose five turns and then must go back to square No. 82, where he is told that next time he must be more careful.

There are a number of safety squares marked in green. Each provides a certain reward, such as an advance of three squares or one more play. On the other hand, there are certain danger squares marked red, where the player is penalized by being obliged to wait for various lengths of time. Every player must stop at each danger square regardless of whether the number of the die thrown, or of the number shown on the dial spun, would carry him beyond that square.

The game is played either with dice or by spinning a dial to indicate the number of squares each player can move on each turn. Mr. Jones has several of these charts with him, and they are attracting a great deal of attention.

TUESDAY'S SESSIONS OF THE CLAIMS ASSOCIATION

Following its joint session on Tuesday morning with the Engineering and Transportation & Traffic Associations the Claims Association reconvened in the Claims Hall on the Pier, where were exhibited "safety first" lantern slides by H. B. Bennett, claim agent Fitchburg & Leominster Street Railway. Following this the Association again took up the discussion of increasing interest in the claims index bureau. Upon motion Messrs. Brown, Walsh and Rice were appointed a committee to correspond with all the member companies urging the more general use of the bureau. Secretary Davis was instructed to request Secretary Burritt of the parent association to send out reporting blanks to all member companies.

In the municipal court at Dorchester, Mass., one Foster was found guilty recently of the novel offence of unlawfully appropriating a street car. The defendant and several companions climbed aboard a River Street car of the Boston Elevated Railway at Milton Lower Mills carhouse and assumed the role of conductor and motorman, to the dismay of the passengers and distress of the local employees. After a brief "joy ride" the cries of the passengers to persons on the sidewalks led to the abandonment of the car, with the sequel of a $15 fine after the trial of the principal offender.

OPENING SESSION OF THE AMERICAN SESSION

The American Association began its annual convention yesterday afternoon in the Greek Temple. President Black called the convention to order at 2 p. m., and delivered his annual address, which appears elsewhere in this issue.

He then introduced Hon. Frank W. Stevens, chairman valuation committee, New York Central Lines, who delivered an address on "Mooted Principles in Valuation." This address will be published in a later issue of this paper.

At the conclusion of Mr. Stevens' address, Arthur W. Brady, Anderson, Ind., moved a vote of thanks to Mr. Stevens for his address. The motion was carried unanimously.

The report of the secretary-treasurer was then read. It appears in another column and was accepted and placed on file.

The report of the committee on subjects was then read. It mentioned the topics which had been selected for the current meeting. The president then called for a report of the committee on education.

EDUCATION

The report of the committee on education was presented by H. H. Norris. It appears elsewhere in this issue.

P. S. Young, Public Service Railway, Newark, asked the cause for the difference in charge for the different courses. Thus, courses *A* and *B* cost approximately $30 each, but together they cost $37. *C* and *D* cost respectively $30 and $37 each, but together they cost $45. He asked if there was any error.

Mr. Norris replied that the figures given in the report were correct. Each is based on the experience of the instruction schools, which cannot handle any course for less than $30.

Prof. V. Karapetoff, Cornell University, explained that the correspondence schools were run on the same basis as accident insurance companies. They depend upon a certain number dropping out. Again, if all of the students should send their problems to the school for correction, it would be bankrupt.

H. A. Bullock believed that it was very advisable for the electric railway companies to provide some form of educational facilities for its employees. This could be done either by the companies taking the matter up individually or as an association. The simplest way was for the association to do it and to turn it over to one of the reputable and recognized correspondence schools. Mr. Bullock traced the steps in the development of the committee's recommendations showing that the present plan is the result of study of all possible methods several other examples of which he cited.

Upon motion the report was adopted.

REPORT OF THE JOINT COMMITTEE ON THE JOINT USE OF POLES

The report of the joint committee on the joint use of poles was then presented by Mr. Harvie. This report is published elsewhere in this issue. Mr. Harvie recounted how the need for joint pole use had developed in New York State some three and a half years ago. It had been first taken up by the state association, but later the matter had been turned over to the American Association. The work had been prosecuted vigorously ever since. The proposed agreement and specification should be a compromise. He thought that the points which had come up most frequently in letters had been cared for but with optional methods, so that members or companies entering into the agreement could fill out blanks provided in the agreement in any way in which they saw fit. The principal items considered were safety and the definite location of wires and circuits. The agreement was very general and left ample latitude for individuality and the exercise of judgment in regard to local conditions, which must always obtain on any properties. He asked that the committee report be accepted and the committee discharged.

President Black then asked the secretary to read a communication from T. D. Mortimer, Milwaukee, which related to this subject. Mr. Mortimer's main point was that the impression might go forth that the proposed joint pole construction was a standard. In that event, those who used non-standard construction would have imposed upon them a heavier burden in defending legal actions. It would be unwise for a company to accept the agreement blindly without bearing in mind the exceptions required by local conditions. If strictly interpreted the adoption of the committee's report would do no harm, but the danger lurked in the separation of the recommendations of the committee from the suggested forms and in the loose reading of the report.

W. J. Harvie said he did not want anyone to feel that the joint pole agreement was intended as a standard of the association. It was simply to be considered as a suggested form subject to modifications according to individual conditions.

After further discussion it was voted that the report be received, filed and promulgated as a guide to member companies but not that it was to be understood as a standard.

The next order of business was a paper by H. C. Donecker on "Organization of a Valuation Staff." This paper appears elsewhere in this issue. The discussion on this paper was confined to Philander Betts and Henry Floy.

According to Mr. Betts, chief engineer of the Board of Public Utility Commissioners of New Jersey, the make-up of such a staff depends upon the purposes for which the valuation is made. If the purpose is to determine just and reasonable rates it is necessary not only to ascertain the reasonable cost of efficiently reproducing the existing properties, but also to determine if possible by an analysis of construction records the original cost and the revenues and expenses from the time of organization to the date of inquiry. It is especially desirable to have the inventory of the property made up by a joint force of employees of the company and the commission. On the valuation staff itself there should be engineers, accountants, operating men and men acquainted with corporation finance. The man best equipped for a complete valuation report is one with an underlying technical education, a later experience in operation and a still later administrative experience with the principles of corporation finance.

Mr. Floy stated that to follow the outline suggested by Mr. Betts was the best way for utility to undertake valuation work. He remarked, however, that the ordinary construction and operating engineer was no more fit to prepare such a valuation for a court or commission than a corporation lawyer was fitted to appear in a criminal court. Another point mentioned by Mr. Floy was that public utilities had not co-operated in valuation work. They should be more interested in all appraisals and valuations of public utility properties, even if they are not directly concerned financially.

President Black then announced the following committees:

Commitee on nominations: Arthur W. Brady, J. H. Pardee and Gen. George H. Harries.

Committee on resolutions: Charles L. Henry, John A. Beeler and Frank Hedley.

Mr. Schreiber then presented the report of the committee on company sections and individual membership. This report is published elsewhere in this issue.

The report of the committee on company membership, of which Frank Hedley is chairman, was then read by the secretary.

President Black then asked all members to be punctual in their attendance at opening of the meeting at 2 p. m. tomorrow. The meeting then adjourned.

TUESDAY'S MEETING OF THE ACCOUNTANTS' ASSOCIATION

The annual meeting of the Accountants' Association was called to order yesterday morning at 10 o'clock by its president, M. W. Glover, Mobile Light & Railroad Company. After the approval of last year's minutes, the annual address of the president, abstracted elsewhere in this issue, was read by Mr. Glover. M. R. Boylan, Public Service Railway, Newark, N. J., then read the report of the executive committee and afterward his own report as secretary-treasurer of the association, both of which were approved.

Mr. Glover read a letter from L. T. Hixson, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., who is chairman of the committee on interline accounting, to the effect that no changes in interline business had occurred during the year sufficient to justify a report. In regard to the committee on co-operating with the United States bureau of the census, President Glover stated that it had been continued at the request of W. M. Steuart of the bureau of the census, to be called upon by the latter if so desired, but that chairman W. H. Forse, Jr., Union Traction Company of Indiana, Anderson, Ind., had advised that no report would be submitted this year except that the committee had looked over the advance copies of the census report for 1912.

The report of the committee on express and freight accounting was read by E. L. Kasemeier, Ohio Electric Railway, Springfield, Ohio, as published elsewhere in abstract form. In discussing this report O. H. Bernd, Des Moines (Iowa) City Railway, said that his company maintained a through billing arrangement with all the connecting steam railroads, and that it used all the forms recommended by the committee and a few additional ones. He believed that electric railways should conform to steam railroad forms, for the time was coming when the railroads would fully recognize electric railways in the interchange of freight traffic. W. G. Nicholson, Omaha & Council Bluffs Street Railway, Omaha, Neb., moved that the report be accepted and the motion was duly seconded and carried. W. F. Ham, Washington Railway & Electric Company, Washington, D. C., chairman of the committee representing the association at the national annual convention of railway commissioners, read his report covering the activities of the committee during the year and its experiences at that convention last year. He appended the report of the committee on electric railway statistics and accounting submitted to the National Association of Railway Commissioners at that time. Asked by President Glover to explain the connection between the two associations, Mr. Ham said that the National Association of Railway Commissioners was composed of the state and national commissioners. Steam railroad accountants many years ago were given honorary membership in this association. Ten years ago electric railway accountants got into communication with the association on the subject of uniform classification of accounts and a little later were also admitted to honorary membership. Efforts were made some years ago to consolidate into one committee the association's committees handling steam railroad and electric railway accounting problems, but in view of different conditions and the different jurisdiction of the Interstate Commerce Commission over steam lines and electric railways, the delegates of the latter class strenuously objected so that the committee on electric railway statistics and accounting was continued as a separate body. At present there is not much active interest in electric railway accounting in the National Association, but Mr. Ham believes that the Accountants' Association is fortunate in enjoying the present relations with it.

The report of the committee on the standard classification of accounts, abstracted elsewhere in this issue, was read by the chairman, H. L. Wilson, Boston, Mass., Elevated Railway. It was moved by T. P. Kilfoyle, Cleveland (Ohio) Electric Railway, and seconded by H. B. Cavanaugh, Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, that the report of the committee recommending the adoption of the Interstate Commerce Commission uniform accounting classification be accepted by the association. In response to a call by President Glover, George Geekie, examiner Interstate Commerce Commission, said that two copies each of the new classification had been sent out to 879 parties, including 800 electric railways and 79 commissions and steam railroads. From these only thirty-two or thirty-three replies had been received, although these were helpful and many were incorporated in the accounting system. Mr. Geekie remarked that the delay in getting out the system was not caused by the failure of the commission to appreciate the need of early action but was the result of an overwhelming amount of congressional work being at that time imposed upon the government printer. The commission is now working upon a new bulletin, and bulletin No. 7 is to be reissued under a new number. The cases will be placed under the same numbers but the titles of the accounts will be changed to conform to the new classification. Of the 350 cases to be included the last fifty will be important as showing decisions of the commission under the new classification. Mr. Geekie expressed the appreciation of the Interstate Commerce Commission for the assistance and co-operation that had been shown by the Electric Railway Accountants' Association, for he considered it invaluable in the promulgation of the new uniform system.

H. S. Lyon, Board of Public Utility Commissioners of New Jersey, said that the New Jersey law required the commission to follow the Interstate Commerce Commission system. In January, 1913, it adopted its own schedule for income, profit and loss, and balance sheet accounts. This is not materially different from the Interstate Commerce Commission's new classification, but changes will probably be incorporated so as to comply fully with the latter's new rules. H. C. Hasbrouck, representing the Public Service Commission for the Second District of New York, stated that while he was unable to say anything authoritative, he believed that this commission felt the classification already in use to be better suited for its purposes than the new classification. Experience had shown that a number of points in the New York system could be improved upon by revision, but no complete substitution was likely. In Mr. Hasbrouck's opinion the point most in need of revision was that of depreciation.

In reply to a question from Mr. Kilfoyle as to how many states or commissions have actually adopted the new classification, Mr. Wilson said that the new Massachusetts public utility act required the commission to conform as nearly as possible to the Interstate Commerce Commission system but that the state law made some modifications necessary. Mr. Ham read an extract from the last year's report of the committee on electric railway statistics and accounting of the National Association of Railway Commissioners to the effect that up to the beginning of the present year seventeen states and the national government had conferred upon commissions the authority to prescribe accounting systems. About one-half of these had adopted certain classifications for electric railways, although only New York, Wisconsin and Maryland had adopted complete systems. Supplementing this extract Mr. Ham remarked that twelve years ago individual companies had sacrificed their own ideas in order to secure a uniform accounting system for the association, and that now state commissions should be as willing to give up minor points in order to secure as far as possible absolute uniformity. After this discussion the question of adopting the Interstate Commerce Commission system as the official system of the Accountants' Association was carried.

In the absence of Frederic Nicholas, chairman of the committee on accounting definitions, the report of this committee was read by R. N. Wallis, Fitchburg & Leominster Street Railway, Fitchburg, Mass. An abstract of this report is published elsewhere in this issue. President Glover emphasized the importance of standardized accounting definitions and said that the committee should be continued. A motion by C. S. Mitchell, Pittsburgh (Pa.) Railways, seconded by Mr. Kilfoyle, to the effect that the report be accepted and that the committee be made a standing one, was carried.

At this point the address of the morning on "The Education of To-day" was delivered by John R. Wildman, professor of accounting, New York University School of Commerce, Accounts and Finance. Mr. Glover, after expressing his appreciation for the very instructive address and stating that all the delegates were destined to become better acquainted with Professor Wildman through his conducting the correspondence accounting course, gave a recess of five minutes for the delegates to meet him personally. It was afterward moved by Mr. Cavanaugh and seconded by W. J. Mead, Cleveland (Ohio) Railway, that the association extend a rising vote of thanks to Professor Wildman for his paper.

In the temporary absence of F. J. Pryor, Jr., American Railways, Philadelphia, Pa., Mr. Boylan read the report of the committee on education. The enrollment in the correspondence course is now of sufficient number to insure its inauguration, although Professor Wildman did not hold the committee strictly to the time limit set. The committee sent out two letters but did not endeavor to use continuous circularizing methods because it desired to be more dignified in its appeal. The demand thus far has been mainly with the smaller companies, the enrollments from the larger companies being disappointing. The prospectus of the course remains unchanged and the first lecture is to be mailed on Oct. 19. Professor Wildman left a few copies of this lecture with Mr. Pryor for distribution to interested parties. The committee expressed thanks to P. S. Young, Public Service Railway, Newark, N. J.; H. H. Norris, Electric Railway Journal, and E. B. Burritt, American Electric Railway Association, for assistance given. Mr. Wallis moved that the committee be commended for the successful completion of its work and the report was duly accepted. President Glover stated that applications for the correspondence course were available and might be taken by association members to be filled out by their employees.

Mr. Wilson recommended the election of W. B. Brockway and F. E. Smith to honorary membership in the association. After President Glover had asked for the names of other past presidents who should be similarly honored, the two candidates were elected.

Mr. Kilfoyle then mentioned the recommendations that President Glover had made in his address and the latter supplemented his former remarks by stating that the committees were in an unsettled condition upon the election of a new president, and although the executive committee had power to abolish any committees it would be advisable for the association directly to express its wishes regarding committee activity. It should say what committees should be standing and what number of members of such committees should be continued over until the next year, which in Mr. Glover's opinion should be two. Mr. Glover believed that the committee on interline accounting should be consolidated with the freight and express committee, and that there should be a standing committee on passenger accounting and three standing joint committees. It was moved by Mr. Ham and carried that the entire matter should be referred to a special committee consisting of the president, secretary and Mr. Kilfoyle to report this morning.

In reply to a question from President Glover, Mr. Wilson stated that he supposed the association would have the uniform classification printed later in complete form with cases, but that now the association might secure the classification from the government printer and sell it at a low price. Mr. Ham suggested that each member company purchase a liberal supply, at $12 a hundred copies for distribution among its employees.

L. S. Cloud, Peoples Railway, stated that his company was going to use the system of accounts adopted by the association. Upon a show of hands it developed that thirteen companies represented had adopted the Interstate Commerce Commission classification. William Hosking, Butte (Mont.) Electric Railway, said that the system used in Montana was governed by the state commission. President Glover then called upon Lloyd Lyon, who had recently returned from Spain. Mr. Lyon remarked that Spain, as the home of antiquity, was naturally deficient in accounting procedure. The chief accountants there were all foreign, mostly French or Belgian. The system of railway accounts used by Mr. Lyon's company was the uniform system of accounting adopted in 1908. For electric lighting accounts the company used a cumbersome continental standard. According to Mr. Lyon there is an annual audit made by public auditors, in some cases very complete, but in others covering only a condensed income statement and a condensed balance sheet. England, France, Belgium and Spain have no regulatory commissions and if the banks and other financial interests are satisfied with such condensed reports, Mr. Lyon deems these sufficient. The signature of the auditor is a guarantee of the correctness and proper form of the report.

President Glover appointed as the committee on resolutions G. G. Whitney, H. A. Gidney and Walter Shroyer. The following committee on nominations was appointed, R. N. Wallis, J. C. Collins, H. A. Culloden, C. Lahr and T. P. Kilfoyle. The meeting was then adjourned to meet this morning.

JOINT SESSION OF THE ENGINEERING, TRANSPORTATION AND CLAIMS ASSOCIATIONS

The joint session of the Engineering, Claims and Transportation Associations opened on Tuesday morning at 9:30 o'clock, with President W. F. Weh of the Claims Association in the chair.

The report of the board of accident prevention, of which P. C. Nickel is chairman, was the first order of business. An abstract of this report, which was read by S. B. Hare, is printed elsewhere in this issue. F. C. Henderschott, manager bureau of education New York Edison Company, then presented an address on "Accident Prevention," an abstract of which also appears in this issue.

After a vote of thanks had been extended to the authors of the communications, C. L. S. Tingley of the Accountants' Association called attention to the educational campaign of that association, particularly in securing the services of Professor Wildman, New York University, to conduct a correspondence course for employees of electric railways on both the detailed and broader aspects of accounting.

He said that to make this course permanent and efficient it was very desirable to have as many companies as possible interested in it. While enough enrollments, slightly less than 400, had been obtained to insure the course, it was desirable that as many as possible should join. Mr. Tingley then distributed some explanatory literature. Following this the delegates from the Claims Association adjourned to their own session while the meeting was continued as a joint session of the Engineering and Transportation & Traffic Associations. This meeting is reported elsewhere in this issue.

JOINT SESSION OF ENGINEERING AND TRANSPORTATION & TRAFFIC ASSOCIATIONS

The joint session of the Engineering and Transportation & Traffic Associations was called to order by Acting President Brush of the latter association on Tuesday morning at 11 o'clock. The first order of business was the report of the joint committee on block signals for electric railways, J. M. Waldron, chairman.

In presenting the report of the committee on block signals Mr. Waldron stated that a sub-committee was to work with the one from the Railway Signals Association during the next year to select from among the standards designs of the Railway Signals Association such ideas as could be properly adopted as standard by the American Electric Railway Association. This would eliminate conflicting designs with a minimum of lost time.

The two standard designs proposed by the committee, namely, a spectacle casting and a standard clearance diagram for semaphore signals were then presented to the association for its consideration. The former was approved as standard but the latter was referred back to the committee so that co-operation with the power distribution committee could be effected and certain limiting dimensions regarding the height of trolley wire could be agreed upon.

Suggested rules for signals were then approved by the association as they appeared in the committee report, and new signal rules for operation under contactor signals were approved with certain recommendations, excepting that Rule 10 appearing in the report was withdrawn by the committee for further consideration after an extended discussion. This rule dealt with the procedure when a train failed to set the signal upon entering a block.

All of the rules as changed were then approved as standards of the Engineering Association, and after this the recommendation that lenses of not less than 8⅜-in. diameter for high speed and 5⅜-in. diameter for moderate speed should be adopted as good present practice. The report as a whole was then approved and a vote of thanks was extended to the committee.

Mr. Stewart, Mahoning & Shenango Valley Railway, then read the report of the committee on transportation engineering, as abstracted elsewhere in this issue. This report was approved and the thanks of the association were extended to the committee. The meeting then adjourned.

ADDRESS OF PRESIDENT GLOVER OF THE ACCOUNTANT'S ASSOCIATION

President Glover, in opening his address yesterday before the Accountants' Association, mentioned at first the marvelous development of the electric railway industry since the association was organized on March 23, 1897. He called attention to the fact that the *Street Railway Review* was instrumental in calling the meeting of the association, and that for the last eighteen years the electric railway press had given to the association support and encouragement that was worthy of acknowledgment and appreciation.

The first suggestion made by Mr. Glover was that a rearrangement should be made of the committees so as to provide for certain standing committees and the forming of special committees from time to time as needed. He recommended that in order to secure continuity of work some members of each standing committee be held over from year to year, but that the other members be changed to bring new life and new ideas into the committee work. This suggestion, however, did not refer to the classification committee, which, in Mr. Glover's opinion, should not suffer a change in membership from year to year.

Mr. Glover said that although the Accountants' Association had adopted a uniform system of accounts, less than one-third of the electric railways in the United States used this classification as it stood. The reasons for this were that a number of state commissions prescribed different classifications, and although the association classification agreed with the Interstate Commerce Commission classification, many companies did not report to this commission and therefore were not required to use its classification. Moreover, in some cases companies were not required by law to follow any special classification. Mr. Glover believed that a uniform system of accounts should be adopted by all state commissions and companies, and he hoped that the meeting of W. F. Ham, H. J. Davies and C. L. S. Tingley with the National Association of Railway Commissioners on Nov. 17, 1914, would accomplish much good along this line.

Mr. Glover mentioned the co-operation and sympathy that had been shown between the Central Electric Railway Accountants' and the American Electric Railway Accountants' Associations during the last year on the subject of the tentative uniform system. He then took up three subjects to which he thought the association should devote attention: overhead charges, segregation of freight and passenger expenses and cost accounting. In connection with the first topic, he advised the delegates to read the address of Judge Cooley before the 1911 convention. To Mr. Glover's mind the division of expenses between freight and passenger business was of vital importance in all questions relating to rate increases, and as electric railways must secure higher prices for service or give poorer service, some plan should be devised to obtain such information. In view of the regulations recently prescribed by the Interstate Commerce Commission for a system of cost accounting to be kept showing in detail the cost of all improvements, extensions and changes of physical property, he deemed it desirable for the association to adopt a uniform cost system for maintenance expenses as well as for road and equipment expenditures. Unfortunately certain engineers were apparently unwilling to cooperate with the accounting department on this subject, but Mr. Glover stated emphatically that statements concerning the lack of value of accounting department cost data should not go unchallenged. In his opinion the best results could be obtained only through the co-operation of the two departments, and no interested department should have the right to prepare a cost statement without having it verified by the accounting department.

Mr. Glover recommended that electric railway accountants take the correspondence course arranged for by the committee on education. He also said that accountants should realize the importance of co-operation in adopting a uniform system not only of accounts but also of statistics and of methods of doing business. Such reforms as the securing of uniform monthly and annual reports would have to be and should be brought about by the accountants, but the co-operation of the three other associations should be secured.

In closing his remarks, Mr. Glover deplored instances of unjust public utility regulation, and in expressing optimism for the electric railway future quoted President Wilson's recent remarks regarding the economic indispensability of American railway systems. Mr. Glover was pleased to report that instead of the usual deficit there remained $456.75 out of the appropriation of $2,141.68 for the current year, exclusive of $136.10 properly chargeable to the previous year's expenses.

As a part of its shop equipment the Shanghai (China) Electric Construction Company, which operates an electric railway there, has installed a complete oxy-acetylene welding and cutting outfit. The company finds considerable economy in generating its own acetylene. The whole of this plant is mounted on a flat trolley which can be transferred to any part of the system. Electric arc welding is also carried out by a small plant designed by the shop staff.

TUESDAY MORNING'S SESSION OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

The Tuesday morning's session of the Transportation & Traffic Association was called to order by Acting President Brush at 9:15 o'clock. The first order of business was the reading of the following communication on flagging which L. H. Palmer, chairman of the committee on rules, had received from Frank Kingsley, associate editor Electric Railway Journal:

In 1911 this association eliminated from the standard code old rule 203a that permitted trains to proceed under flag protection when they could not reach the despatcher. This rule was considered to be bad practice. However, it is a fact at present that at least a half-dozen interurban roads have reintroduced the old rule or its equivalent in their codes of signal rules. In a communication by John Leisenring printed in the Electric Railway Journal for Sept. 12, it is indicated that this has been done because conditions have changed since 1911 (owing to the wide introduction of signals) and because some such rule is necessary to avoid occasional serious interruptions to traffic by defective signals in stop position. In consequence the committee will, no doubt, agree that a definite expression of opinion should be given at once by the association to relieve the present contradictory situation.

Mr. Palmer said that the matter was a very important one, but agreed with the chair that it should be referred to the incoming committee on rules. Upon motion by Mr. Duffy the matter was disposed of by thus referring Mr. Kingsley's communication.

J. J. Dempsey, chairman, then presented the report of the committee on schedules and time-tables, an abstract of which appears elsewhere in this issue. Mr. Duffy commended the good work which this committee had done during the past five years and agreed with its recommendation that the work on schedules and time-tables should be continued in some form. He doubted whether the arbitrary stop method would be of great value in the smaller cities, although it had worked well in a fair-sized town like Rochester. As to setbacks, the schedule should be so arranged that their use should be dispensed with as far as possible.

R. E. Danforth, Newark, believed that the committee's work next year should include the problem of producing able schedule makers. There were few real schedule makers in the country, and it took much training as well as natural ability to do the work.

R. B. Stearns, Milwaukee, said that some discussions which his company had had recently with the public regulating authorities pointed out the advisability of using the term "designated stop" instead of "arbitrary stop." The use of such a word as "arbitrary" was distressing in the wrong conception that it conveyed. He also suggested that the incoming committee might well occupy its time with the construction of "base schedules," by which he meant the attempt to establish a schedule founded on the minimum service requirements to which, with the use of morning and evening gap schedules, cars could be taken from or added to the schedules at minimum expense. Seasonal changes of schedules should be sufficient and could be determined in advance.

Alexander Jackson, Public Service Railway, said the skip-stop idea had its advantages, but he thought that if the near-side stop could be standardized it would save two to three stops per mile on most properties. To save three stops per mile would save two or three minutes on a round trip which, on a two-minute headway, meant the elimination of one car and on a one and a half-minute headway the possible elimination of two cars.

Upon motion the report of the committees on schedules and time-tables was approved. The meeting was then adjourned in order to permit the joint session with the Engineering and Claims Associations which is reported elsewhere in this issue.

HOW ACCIDENTS MAY BE PREVENTED

F. C. Henderschott, manager bureau of education New York Edison Company, in his paper on the prevention of accidents before the Transportation & Traffic Association stated in substance as follows:

A casual examination of the subject of accidents in industry leads to the conclusion that conditions are indeed very serious. In the late civil war, according to figures from the adjutant general's office, the number of Union men killed in battle during the four years was 67,058. It is probable that the total number of Confederate soldiers actually killed in battle did not exceed much, if any, the losses of the Union forces, but the most conservative estimate places the total of persons killed by accident in the United States, at the present time, at not less than 75,000 in a single year.

The 1913 report of United States Commissioner of Labor, Hon. Charles P. Neill, upon the conditions of employment in the iron and steel industry states:

"On the one hand for a large group of plants in which the work of organized accident prevention is well developed, the rate falls as low as 167.1 per thousand 300-day workers, while at the other extreme for a group of plants in which organized safety work has not yet been developed, the rate rises to 507.9 per thousand, and in the case of individual plants in the group considerably higher." This is a reduction of 67.1 per cent, or of two accidents out of every three.

To quote Arthur Williams, president of the American Museum of Safety: "No measure of value can be applied to the suffering of individuals who are injured or to the anguish of those who have lost relatives through industrial accidents. There is not only this immediate economic loss, but that which accrues in the future to dependents who, as a result of accident, are left without the means of either sustenance or education. The grief and pain arising from deaths and permanent disabilities wrought from this country's industries, and from carelessness outside of industry—as, for example, upon our highways—far exceed any suffering or sacrifice of life that have occurred or ever could happen through war."

Again he says, in a recent discussion of the subject of industrial accidents: "Perhaps not sentimentally, but practically, human health and life have been held most cheap, not only in our country's industrial development, but in our social order as well. And until recently in industry the most ordinary physical and sanitary precautions have been lacking; in social life we have permitted the development of slums—breeding spots of unhappiness disease and crime; in our entire industrial system we have neglected to the utmost degree essential elementary protection of health and life."

That Mr. Williams has not overdrawn the picture is proved when we turn to some recent reports by corporations of accomplishments they have made, along the line of accident reduction, during the past year.

The bureau of efficiency of the Northern Pacific Railway, while but a little more than a year old, was able to reduce deaths due to operating accidents on that railway system during the first six months of 1914 as compared with a similar period of 1913 by 73 per cent. The Carnegie Steel Company has been able to reduce its accidents about 71 per cent. Reports from many other industrial corporations lead to the conclusion that it is possible to reduce accidents, where no effort has yet been made in this direction, anywhere from 80 per cent down to 20 per cent, according to the character of the business.

But, as J. L. Murrie, safety engineer, and J. C. Robinson, chief of the bureau of adjustment of The New York Edison Company, have pointed out in a recent paper on "Safety in the Electric Light Industry": "No device ever has been invented and none ever will be invented that will operate with unvarying success, under all conditions in saving life or limb. The human equation enters too strongly into the proposition and must not be ignored or eliminated. Intelligent co-operation by the employee is a vital essential, and such co-operation is the gospel we must preach. We may reach the extreme limit of ingenuity in the making of a machine that protects a man against danger, but if no mental impulse be exerted the danger is not averted. We can demonstrate the peril of the live wire and the protective value of the rubber glove, but without co-operation between the human mental and the physical material, the warning as to the one and the advice as to the other are alike useless."

In the New York Edison Company 85 per cent of accidents are due to employees, carelessness or negligence, 6 per cent due to carelessness of fellow-servants, 2 per cent due to outside contractors and 7 per cent are chargeable to the company.

The Au Sable Electric Company of Michigan, in a recent report, states that 75 per cent of the accidents in that company are due to carelessness, and Mr. Williams in a recent summary, based, no doubt, upon data gathered by the American Museum of Safety, states that: "Between 70 per cent and 90 per cent of all accidents are the result not of physical defects in our urban industries relating, say, to manufacture, transportation and kindred subjects, but to carelessness and oversight on the part of persons injured, their fellow-workers, or those in control of the means of injury."

The subject of accident prevention was first approached largely from the standpoint of safeguarding machinery. For some time industry devoted its efforts toward accident prevention largely along this line. But the Westinghouse Electric & Manufacturing Company, in a report for 1913, showed that less than 0.5 per cent of the accidents occurring in its plant was due to lack of safeguarding. In this report, Dr. Lauffer attributed a goodly proportion of the accidents directly to the influence of the saloon and predicts that the present generation will wipe out the saloon.

It is not my purpose to discuss prohibition, but surely no analysis of the causes of industrial accidents, deaths and disease would be complete without reference to the evil influence of the intemperate use of liquor. And industry has not been slow in recent years to recognize this fact. Many of the large railroad companies prohibit the sale of liquor upon their trains, and any employee seen in an intoxicated condition is immediately discharged. It is perhaps due, at least in some degree, to the fact that transportation companies have taken this stand, that some of the larger transportation systems have not killed a single passenger in the past five years. But while this condition is gratifying, we are disheartened when we learn that 25,000 children under eighteen years of age have been killed upon railroad tracks during the past twenty years. It is not the fault of the transportation companies that children are upon their tracks, and this leads to the inevitable conclusion that accidents and deaths cannot be reduced to the minimum until there is co-operation upon the part of the public, upon the part of the press, the pulpit, educational institutions and all along the line.

Physical examination of employees is already playing an important part in the reduction of industrial accidents. Dr. Lauffer, in the report, says: "In our opinion the good health campaign is more result-producing in the line of accident prevention than much additional safeguarding of machines."

In a paper on "safety first," presented before the last convention of the National Electric Light Association, Paul Lupke pointed out two important facts. "Newspaper men and other publishers and writers know that the people do not learn facts and arguments on any subject by one announcement, and that it needs constant effort of iteration and reiteration to send the matter home to the people it is wished to reach." And the second point: "The greatest factor operating toward the prevention of accidents is not the prevention device but the 'prevention spirit'."

Several years ago a commission appointed by the federal government visited the big manufacturing industries of Germany, and it was shown by a tabulation of 80,000 cases investigated by them that 80 per cent to 84 per cent of the total number of accidents were chargeable to the employees. This would seem to indicate that about the same degree of negligence on the part of the employees exists the world over; that it is one of the chief characteristics of human nature to be careless.

It is obvious in a paper to consume but twenty minutes very little detail can be given. However, the picture is not so dark as it might appear at first glance. In excess of 1000 industrial institutions have instituted accident prevention systems in the industries of the United States, and while the annual toll paid by this country on account of industrial accident amounts, at the present time, to in excess of $250,000,000 exclusive of loss of time and efficiency of those injured, a good beginning has been made in the direction of improvement.

Recognition has been accorded to the safety engineer and to his collaborator, the efficiency engineer. Industrial corporations are beginning to add the third, and perhaps the most important factor in the entire movement, the educational engineer. More than eighty industrial institutions, including among the number several of the larger railway systems, the larger manufacturing companies, financial, insurance, publishing and retailing institutions have established educational courses on behalf of their employees, and in connection with the better training systems compulsory physical examination is being urged, and due recognition is being given to fatigue, intemperance, worry and the other contributory causes to accidents, diseases and death.

A campaign designed to prevent accidents must be based upon the natural tendency of the human being to be careless. To be effective, the work must be carried on with enthusiasm but not spasmodically.

Since instruction on the subject of safety, by lectures, was introduced into the schools of New Jersey, accidents to school children for the six months ending Sept. 1, 1912, were 44 per cent less than they were during the same period in the previous year.

Once instituted, the safety department of a corporation should be considered a permanent feature and the effort should not be allowed to lapse. This association can render no more valuable service to its members and to the public than by placing its prestige squarely behind its safety board and to co-operate with similar committees from other organizations to the end that industrial accidents, industrial disease and untimely deaths shall be reduced to the lowest possible number throughout the industries of the United States.

HOWLING FROM THE HOUSE-TOP

Electric Railway Service, published in the interest of the Detroit United Railway for general distribution, recently contained the following item which will be of interest to electric railway men generally:

"W. H. Woodbury, whoever he is, writes the Detroit *Journal* calling the attention of people to the fall styles of ladies' hosiery as revealed during the entrance to and exit from Detroit street cars. If such inspection constitutes Mr. Woodbury's form of entertainment he should not endeavor to divert the attention of others from their work."

PRESIDENT BLACK'S ADDRESS TO THE AMERICAN ASSOCIATION

The past year has been a strenuous one for the majority of our members. Our industry is passing through a most crucial and critical period, not so much by reason of any changes in the art of transportation as because of the attitude of the general public towards all public utilities, as well as from the problems arising through the evolution of governmental regulation. And now we have added to the above the serious economic conditions resulting from the European war. But I cannot help feeling greatly impressed with the vigor and enthusiasm of the men engaged in the electric railway industry; they have met and overcome the difficulties of the past and will unquestionably be able successfully to cope with those of the future.

During the past twenty-five years we have witnessed an industrial development unparalleled in the world's history, and no factor in this development has played a more important part than the electric railway. Cities have been enabled to expand their boundaries far beyond what was deemed possible before the advent of the trolley car, thus eliminating to a great extent the congestion so common to the cities of the old world, and making it possible for workers to find comfortable homes at reasonable cost in the suburbs. For every dollar of profit realized from electric railways, the community at large has gained at least one hundred dollars in taxable values, while the individual owners of suburban real estate have enjoyed increases in the so-called unearned increment aggregating enormous sums.

These results have been brought about largely through the establishment in this country of a flat 5-cent fare, or less, enabling a passenger to travel from any one point in a city to any other regardless of the distance, and, in fact, oftentimes to points far beyond the corporate limits. Owing to the undeveloped system of accounting generally in use by electric railways, and the more than vague ideas of the actual cost of the service, the fact that this long-haul travel was carried on at a considerable loss was far from realized until a comparatively recent period. The more the public received the more it demanded, and at the same time there commenced to be a marked decrease in the value of the token or fare received.

Finally, in 1910, the association appointed a committee to report on the proper basis of rates and fares, which committee was succeeded in 1912 by the committee on cost of transportation. This committee reported to the 1913 convention, recommending the establishment of a bureau of fare research, which culminated in the appointment, on May 1 of this year, of F. W. Doolittle as director of the bureau to work under the direction of the committee on cost of transportation. Mr. Doolittle, from his education and past experience, is peculiarly fitted for the work he has undertaken. An idea of the scope of this work and of its importance and value can be gained by reference to the June, 1914, *Aera.*

THE COMMITTEE ON PUBLIC RELATIONS

When you bestowed upon me at our last convention the honor of the presidency of the association, it devolved upon me not only to direct through its committees and officers what might be styled the routine work, but also, if possible, to enlarge the value of the association to its members.

It appeared to me that no more fertile field presented itself than that occupied by the committee on public relations. This was a regular committee of the association, and had been in existence for a number of years, but its work had been more ornamental than useful.

In the past the association has never experienced any difficulty in finding men for the various committees who were fully capable of dealing with the problems which have arisen from time to time. But the question of public relations is very different from the subjects generally considered by these committees, and the ideas of even those men who had given the matter the most careful and thorough study were vague and indefinite. Everyone recognized the fact that our public relations were in a most unsatisfactory condition and that the improvement of this condition was of vital importance to the industry. But how to tackle the problem was another question. It seemed to me, therefore, important that we should call upon the very best talent at our command, and a committee was appointed, including not only representatives of the electric railways proper but also men from the manufacturing, banking and engineering interests who are identified with our industry. Thomas N. McCarter, president of the Public Service Corporation of New Jersey, was appointed chairman.

Several meetings have been held during the past year and, on the evening of Jan. 29 Mr. McCarter gave a dinner to the members of his committee and also had as his guests several members of the public policy committee of the National Electric Light Association and other gentlemen identified with public utilities.

The results of the discussion which followed the dinner, and of the several meetings of the committee which have been held, are crystallized in the code of principles embodied in the report of the committee to the association, and which it is confidently expected all members of the association will heartily indorse.

The report also recommends the establishment by the association of a bureau of public relations and outlines a comprehensive plan for a publicity and educational campaign which, I trust, will receive most careful thought and study.

While it may not be practicable, under the existing financial stress, for the association to raise any large sum of money to carry out the broader plan outlined, the member companies can and should start the ball rolling in their own localities. The association can point the way and make suggestions and furnish ammunition, but all of these will be in vain, unless the member companies themselves take hold of their own local problems. Electric railways have one peculiar advantage over all other public utilities in the fact that their employees, the motormen and conductors, come into close and intimate daily contact with the public. Here is a tool ready at hand to commence the work which every electric railway should make use of. But, first, it is absolutely essential to establish cordial and harmonious relations between the companies and their employees.

By the establishment of company sections, two important objects will be attained: first, the employees of the company can and will be brought into closer and more intimate contact with the general officers and will obtain a much more comprehensive understanding of their duties, which will result in greater loyalty to the company and better service to the public; second, the individual membership of the association will be materially increased, thus adding strength through members to the organization, as well as increasing its financial resources.

PROPOSED INCREASE IN DUES

In connection with this last matter, I desire particularly to call your attention to the report and recommendations of the executive committee contained in the circular letter dated Sept. 10, 1914, which was sent to all of the company members, and the approval of which I strongly urge. As the work of the association broadens, its usefulness to its members increases. We now have 400 electric railways enrolled, representing approximately 90 per cent of the capital invested in the business, and we cannot hope for any material increase in dues from new company members. The revised schedule of dues will provide about $16,000 of additional revenue, which will enable the association to meet the added expenses incurred in connection with the establishment of the fare research bureau, as well as the other increased activities mentioned in the letter.

FEDERAL RELATIONS

The past year has been an active one for our committee on federal relations. Matters of great importance to our industry have been pending in Congress and numerous hearings have been held before congressional committees. Under the able chairmanship of one of our ex-presidents, Arthur W. Brady, this committee succeeded in securing the exemption of electric lines from the requirements of the steel car, and other bills relating to physical and operating conditions, some of which were most drastic in character.

As a result of the hearing before the Senate committee on interstate commerce, the railway securities bill, which had been passed by the House of Representatives in such form as to include electric railways engaged in interstate commerce, was reported with an amendment eliminating all electric lines except those forming part of a railway system operated in part by steam. This bill is still pending, but apparently is not being pressed for passage at the present session of Congress.

You are all no doubt more or less familiar with the bill introduced by Congressman Crosser of Ohio, providing for the public ownership of all street railways in the District of Columbia. The passage of this bill would unquestionably give a great impetus to the municipal ownership agitation. While the bill has been favorably reported by the committee having it in charge, by a majority of one, no further action has been taken. This result was unquestionably due to the able arguments presented at the hearings before the committee by General Harries, Thomas N. McCarter, William J. Clark and others, to whom the thanks of of the association are due.

It is appropriate at this point to refer to the efficient work of our Washington representative, the firm of Clark, Prentiss & Clark, and particularly to Horace F. Clark, who rendered especially valuable assistance to the committee on federal relations at the Congressional hearings.

OTHER COMMITTEE ACTIVITIES

No report which will be made to the convention embodies more painstaking time and labor than that of the committee on joint use of poles. Consisting of representatives of this association, the American Institute of Electrical Engineers, the National Electric Light Association, and with a representative of the American Telephone & Telegraph Company conferring, this committee has revised the report submitted to the convention last year and has prepared a form of agreement and specification which, it is believed, the member companies will find most valuable in any negotiations they may enter into covering this subject.

The committee on education has also shown most commendable activity. Several courses in electric railway engineering have been arranged for at moderate cost with one of the well-known correspondence schools and a serious effort made to induce college and university faculties to have representatives attend meetings of the association, so that they may better understand the requirements in the education of a young man who desires to enter the electric railway field.

In 1913, our association received an invitation from the American Institute of Electrical Engineers to participate in the organization of a national committee to consider the question of electrolysis. This invitation was accepted and, during the past year, a joint committee was formed with representatives from the following organizations: American Electric Railway Association, American Electric Railway Engineering Association, National Electric Light Association, American Telephone & Telegraph Company, American Institute of Electrical Engineers, National Bureau of Standards, National Gas Association and American Gas Institute. Several meetings of the committee have been held and the work is well organized and now under way.

This matter is one of great importance; the questions involved are not only highly technical from an engineering standpoint, but also involve serious economic considerations, and the association is to be congratulated upon having such able men as R. P. Stevens, A. S. Richey and Calvert Townley as its representatives on the committee.

The results of the work of the other committees of the association are fully set forth in the reports they will submit, all of which are most interesting and unquestionably will prove of great value to the member companies.

THE AFFILIATED ASSOCIATIONS

But while the work of the parent association has been of a very important character during the past year, that of the affiliated associations has hardly been less so. In the Engineering Association, the issuance of the Engineering Manual was an epoch-marking event. This valuable work contains all the standards and recommendations which have been adopted by the association and a quantity of other important information, presenting in concise form the best thought in electric railway engineering practice.

In the promulgation this year of the revised classification of accounts by the Interstate Commerce Commission, the Accountants' Association can congratulate itself upon the culmination in a most satisfactory manner of three years of hard work by one of its most important committees.

Through its education committee this association has arranged for a course in electric railway accounting under Prof. John R. Wildman, of New York University, and has already secured in the neighborhood of 400 enrollments.

The "safety first" movement, which has become a slogan from the Atlantic to the Pacific, will be one of the principal subjects for the Claims Association when the report of the board of accident prevention, which will be presented at a joint session of the Claims, Engineering and Transportation & Traffic Associations, is discussed.

Before the Transportation & Traffic Association many matters of current interest and importance are coming up, such as studies of motor-bus operation and its relation to electric railways, fare boxes and their maintenance costs, etc. This association, during the past year, has had the misfortune to be called upon to accept the resignation of its president, D. A. Hegarty, which was necessitated under the constitution by reason of the severance of his connection with a member company.

MID-YEAR MEETING

Thanks to the efforts of our committee on subjects, under the very efficient management of James D. Mortimer, our members who attended the wid-winter conference held in New York last January enjoyed papers of exceptional value and interest. In the past it had been customary for the Manufacturers' Association to tender a banquet to the parent association at this mid-winter meeting, but the parent association, feeling some embarrassment in accepting this courtesy year after year, decided at our last convention that, in future, this banquet shall be given jointly by the American Association and the Manufacturers' Association. This plan was carried out last January with satisfactory results to both associations. Over 700 of our members and guests attended the dinner and enjoyed the able papers presented by the Hon. Halford Erickson, of the Public Service Commission of Wisconsin, Henry W. Anderson, vice-president and general counsel of the Virginia Railway & Power Company, and Guy E. Tripp, chairman of the board of directors Westinghouse Electric & Manufacturing Company.

AERA

Aera, which has just completed its second year, has admirably fulfilled the purpose for which it was established. The objects of the magazine are threefold; first, to act as a medium of communication between the association and its members; second, to educate electric railway officers and employees in the problems affecting the industry; and third, to present to the public the aspects of these problems from the electric railway standpoint. The increasing interest which the members are taking in the magazine may, I think, be best illustrated by the constantly increasing number of contributors. Altogether, during the past year, more than 360 railway men, interested in the association, prepared material for *Area* and expressions of commendation have been received from many sources. Through the means of clipping sheets sent to more than 1200 daily newspapers throughout the United States, much of the pertinent matter which *Area* contains has been laid before the general public. To the members of the association who have given freely of their time and thought in the preparation of articles, credit for the success which has attended the magazine must be given.

Commencing the first of last January advertising was resumed and while, up to the present time, a sufficient amount is not realized from the sale of this advertising to make *Aera* self-supporting, the revenue from this source is steadily increasing, and it is confidently expected that, in the comparatively near future, the magazine will be absolutely on a self-supporting basis. On behalf of the association I wish to extend thanks to those manufacturers who, through their support of the advertising columns in *Aera*, have lent such material aid to one of the association's important activities. I also, on behalf of the association, desire to extend thanks to the Manufacturers' Association for its hearty co-operation, both financially and morally, in the association's work. The committees of the Manufacturers' Association have worked in perfect harmony with the committees of the parent association in connection with all preparations for our present convention, and the success not only of this convention, but of those held in the past has been due to the able management of that association.

Indebtedness to the Technical Press

We are also greatly indebted to the technical press of the country for the co-operation and support which has been so generously extended to the association in all its activities, and it is a great pleasure to express our hearty appreciation for this assistance.

The 1915 Convention

At our mid-winter conference, after considerable discussion, it was finally decided to hold our 1915 convention in San Francisco. Unquestionably, a large number of our members will wish to visit the Pacific Coast during the coming year to see the Panama-Pacific International Exposition which is to be held in San Francisco commencing Feb. 20 next, and, consequently, if we are ever to hold a convention in the Far West, this is the opportune time to do so. In view of the great number of conventions planned to be held in San Francisco, as well as the large number of people who will unquestionably visit the fair, it will be absolutely necessary to make definite plans for our convention at an early date, in order to insure comfortable hotel accommodations for our members and suitable halls for holding our meetings. It will also be necessary for member companies to advise our secretary promptly as to the probable number of delegates which each company will send. This will be the first convention ever held by the association west of the Rocky Mountains and it is due the member companies from that section of the country that the association make every effort to secure a full attendance from the East.

Problems Before the Electric Railway Industry

At every convention and at every meeting of our association its value to the electric railway industry becomes more and more apparent. The field for its activities broadens and its usefulness increases. At our coming convention several papers will be read dealing with the question of valuations and the rate of return.

Since 1910 there has been a marked falling off in new construction and a reluctance on the part of investors generally to place their money in electric railway securities. In a large measure this has been brought about, no doubt, through governmental regulation. Capital is inherently shy, and always ceases to flow readily when any radical changes occur. In other industries, such as banking, manufacturing, mining, etc., a rate of return ranging from 10 per cent to 20 per cent, or even more, is not considered either remarkable or unreasonable, while in the case of public utilities the state commissions generally have limited the rate of return to a maximum of 8 per cent, and this oftentimes on a depreciated valuation. The reasons given for this comparatively small allowance are based upon the assumption that the business of a public utility is more stable and less subject to competition than other industries.

While it is true that, under the laws in many states at the present time, public utilities are not as subject to competition as other industries, they are not entirely free from it, and it is not true that they are not fully as subject to many other contingencies which may radically affect their income. A striking example is found in the inauguration of motor-bus service in a number of cities and, whether or not these prove successful in the long run, they certainly for the time being materially affect the income of the street railways. Furthermore, all our public utilities, with possibly the exception of water supply, are subject to radical changes in the art, making it necessary oftentimes to discard or scrap large parts of the investment long before it is worn out. Provision for this obsolescence cannot possibly be made without setting up reserves far in excess of what would be permitted by any of the commissions.

Capital naturally will seek those investments in which the rate of return is the highest, due consideration being given to the security of the investment. Unless this fact is recognized by the state commissions and a rate of return allowed commensurate with the risks involved and with the returns which can reasonably be expected from other lines of industry, it will be absolutely impossible to secure fresh capital either for extending present plants or for exploiting new ones.

The European war has, of course, very largely increased the difficulties of securing fresh capital, as is vividly illustrated by the fact that the city of New York recently was obliged to pay 6 per cent for money obtained on notes exempt from many forms of taxation and to run for from one to three years.

We are still a debtor nation. If there was any doubt upon this subject, it surely has been dispelled by the recent course of exchange on London. The money centers of Europe have in the past absorbed vast quantities of our public service securities, but these markets have now been absolutely cut off, and it is hardly probable that they will again be available for a long time to come. This means that we must depend upon American capital for future development, but it will take more than the possibility of an 8 per cent return to secure this capital, especially under the conditions of junior financing, which must be resorted to in many instances. Our task is to convince the public and the commissions that these are facts, not theories, and that, until they are recognized, no further development is possible.

In closing, I personally desire to express to the association my appreciation of the high honor bestowed upon me at our last convention, and my only regret is that I was not so situated as to be able to devote more time to the association's work. I also wish to thank the other officials and various committees for their hearty co-operation and assistance, as whatever success has attended my administration is very largely due to their work.

THE EDUCATION OF TO-DAY

In the address on modern education, delivered yesterday before the Accountants' Association, John R. Wildman, professor of accounting New York University, drew some analogies between primitive and modern conditions and methods of education in making clear the significance of certain phases of the educational situation as it exists to-day. Primitive education is supposed to have been almost without conscious aim and not to have possessed any genuine ideals, either political, social or moral. In the case of modern education, developed under an ever-increasing complexity of civilization, ideals do exist, but opinions differ greatly as to what is the central aim. Proponents are found for moral character, culture and mental development. Professor Wildman is not opposed to the attainment of these personal attributes, but he takes exception to the worship of these ends as such and to some of the means whereby they are attained.

In Professor Wildman's opinion the ideal education is that which enables one to adapt himself harmoniously to his environments and to utilize natural forces to serve him and his fellows in their needs. Young men should be taught how to get enough money to enable them to provide the necessities, both physical and intellectual. The modern educational system should educate primarily for business but in a way conducive to a strong mind and a fine moral character. The primitive educational method of imitation has been largely abandoned. Modern business education necessitates determining exactly what young men should know and then teaching them this in accordance with the latest and most improved methods for actually conducting business.

Business education, however, is not confined to a study of simply one profession, for every true business man must know certain fundamentals of commerce, accounts and finance. The accountant must naturally study the theory and practice of accounting, but not without regard to the relations which accounting bears to economics, law, finance and business organization. Professor Wildman believes that accountants who have been thus trained perform their work with a clear consciousness of what they are doing instead of serving in a merely routine and perfunctory manner. Moreover, such an education cannot be said to be devoid of rewards, for the knowledge of the subject and the rendering of maximum service to the employer result not only in financial but also in intellectual and moral betterment.

REPORT OF COMMITTEE ON EDUCATION

The work of the committee on education of the American Association has comprised two parts: (1) a study of existing practice in regard to apprentice training by member companies, and (2) preliminary arrangements for courses of instruction to be given by a correspondence school under the general auspices of the association. The committee found that very few companies have regular apprentice systems for training mechanics and that those which have apprentice systems do not, in general, have regular courses of training. There is apparently no instruction of a school nature given in the electric railway industry, nor is there any extensive co-operation with trade, vocational or night schools. There was a general interest manifested by the membership in the proposed correspondence courses and there is a good prospect of a reasonable enrollment as soon as the courses are put into operation. The committee presented a statement of the tuition fees for four courses: (a) mechanical shop course, (b) electrical shop course, (c) line and track-work course, and (d) power house and substation course. With the exception of the last-named, the fee for which is $37, the tuition fee is $30 for each course. Combinations of two courses can be taken at reduced rates. The committee proposes to follow closely the work of the students.

REPORT OF THE JOINT COMMITTEE ON TRANSPORTATION ENGINEERING

The joint committee on transportation engineering (Engineering and Transportation & Traffic Associations) reported yesterday on train operation in passenger service, train operation in freight and express service, and effect of car and equipment design on duration of stops. The report on train operation in passenger service does not amplify the arguments of last year's committee, but does present figures to show that on a 6600-volt single-phase line in the Middle West, the use of trains on a holiday permitted an increase of 158 per cent in seating capacity and of 122 per cent in ton-miles at an increase of only 76 per cent in energy consumption.

As to freight and express service, the committee found that with the increased length of trains and runs for the permissible lower schedule speeds the tendency is to use a single-motor car or electric locomotive with trailers instead of multiple-unit equipment. Train operation saved platform expense and energy while it was safer than single cars. In studying the effect of interurban car and equipment design on the duration of stops, the committee made eight plans of passenger, and six plans of freight cars. It found that the double-end two or three-compartment car was generally conceded to be the most flexible design, and it believed that end doors should be incorporated in all cars to meet possible train operation even if the end doors were not available to passengers on the short curves of city sections. Excessively large rear platforms were a mistake, and far less essential than easy steps. All bulkhead doors, except those at the baggage compartment, should swing instead of slide in order to permit stronger bulkheads and less cost for door maintenance. As to freight and express car design, the committee favored two large doors on either side, particularly where less-than-carload shipments are to be handled. In conclusion, the committee said that if electric railways are to take advantage of train operation economies they must be prepared to adapt their terminal facilities for longer trains.

REPORT OF COMMITTEE ON EXPRESS AND FREIGHT-ACCOUNTING

The committee on express and freight accounting in its first report presented yesterday before the Accountants' Association outlined in detail what are considered the best methods for keeping freight accounts in both agents' and auditors' offices. The system proposed covers in brief the entire field, not only for those companies who are already conducting an interline freight business but also for those who will eventually have such a source of revenue and those who now do only a local business but will in the future exchange shipments with other companies. The committee suggests thirty-one forms that are needed and explains in detail the accounting procedure that is to be applied from the time freight is accepted from shippers until all entries, reports and summaries are completed. The committee considers that the settling of balances due other roads for traffic accounts by allowing them to draw for such is the simplest method and involves the least work.

REPORT OF COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS

The eighteenth annual report of the committee on the standard classification of accounts presented yesterday before the Accountants' Association constitutes in general a résumé of the committee's activities from the inception of the Accountants' Association in 1897 up to the present date. Its influence in bringing about a standard classification of accounts and the development of this to suit the growth of the industry are briefly described. During the past two years, in co-operation with representatives of the Interstate Commerce Commission, the committee has been considering new classifications covering operating, revenue and road and equipment accounts, as well as schedules and text for income, profit and loss, and general balance sheet accounts. The committee held two protracted sessions last year with representatives of the commission and worked out the uniform system of accounts prescribed by the commission as effective July 1, 1914. This system, which has already been adopted by interstate electric railways and in many cases by state commissions, is recommended for adoption by the Accountants' Association. The report of the committee concludes with a list of all its past and present members with their respective periods of service.

COMMITTEE ON BLOCK SIGNALS

The joint committee on block signals of the Engineering and the Transportation & Traffic Associations presented in its report a digest of laws or rulings issued by the various states relative to block signals, a bibliography on signaling, and a summary of installations of block signals made during the year preceding July 1, 1914. A design for a semaphore spectacle casting was submitted for approval by the Engineering Association as standard, as was also a clearance diagram for semaphore signals. A set of rules for operation under trolley contact signals was included, and certain definitions now appearing in the standard block signal rules were revised to make them applicable to the requirements of trolley contact signals. The subject of light signals was discussed at length, and recommendations were made to the effect that, for light signals in high-speed interurban service, a lens of not less than 8⅜-in. diameter should be used and that in moderate-speed service a lens of not less than 5⅜-in. diameter should be used. In an appendix detailed descriptions of two types of automatic train stops were given.

The summary of replies to questions in the data sheet sent out each year by this committee included information as to the contemplated mileage of track to be protected by signals during the coming year and data upon the cost of signal maintenance and the efficiency of signal operation. Condensed data regarding the block signal installations made during the last year were also included. In another appendix the committee presented a study upon braking distance for trains at varying speeds, including a diagram with which any given problem of this nature could be solved by graphical means. Another appendix furnished brief descriptions of installations made by the various signal manufacturers during the last year.

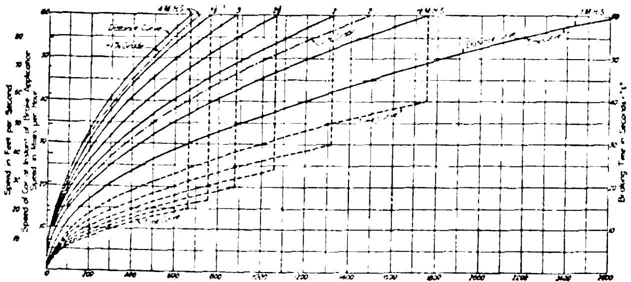

DIAGRAM FOR DETERMINING BRAKING DISTANCES AT VARIOUS SPEEDS

The above-mentioned diagram for determining braking distances at various speeds is shown in the accompanying illustration. To show how the chart is to be used assume that such a braking force has been applied to a car so as to produce a retardation of 3 m.p.h.p.s. It is desired to know how long a time will be required for the car to come to a stop and in what distance it will do so from a speed of say, 50 m.p.h. The solid line for 3 m.p.h.p.s. shows that a speed of 50 m.p.h. corresponds to a braking distance of 600 ft. Directly below this is a point where a vertical line intersects the distance-time curve for 3 m.p.h.p.s. and, reading on the right-hand scale, it is found that the time required for the stop is 16.5 seconds. A similar procedure shows that from 60 m.p.h. the same braking rate will stop the car in twenty seconds and 800 ft. The braking forces necessary to produce the various rates of deceleration are as follows:

Rotation	Braking force
1 m. p. h. p. s	91 lb. per ton
1½ m. p. h. p. s	137 lb. per ton
2 m. p. h. p. s	182 lb. per ton
2½ m. p. h. p. s	227 lb. per ton
3 m. p. h. p. s	273 lb. per ton
3½ m. p. h. p. s	318 lb. per ton
4 m. p. h. p. s	364 lb. per ton

The forces given above are those which must be applied tangentially at the car-wheel tread, the pressure from the brakeshoe being from four to eight times as great, depending on the coefficient of friction between the brakeshoe and the tire. As the forces are calculated for level track they must be increased 20 lb. per ton for each 1 per cent of upgrade and correspondingly reduced for each 1 per cent of downgrade. Referring to the chart the two dot-and-dash lines show the times and distances resulting from the application of forces on a 1 per cent downgrade which on the level would produce 4 m.p.h.p.s. and 2 m.p.h.p.s. retardation respectively. They are shown merely to give a practical concept of the effect of a familiar grade.

REPORT OF THE JOINT COMMITTEE ON THE JOINT USE OF POLES

The special committee on the joint use of poles, comprising representation from the American Institute of Electrical Engineers, the National Electric Light Association, the American Telephone & Telegraph Company and the American Electric Railway Association, presented its final report yesterday. It was the unanimous recommendation of the committee except that the telephone companies do not agree to enter into joint use of poles in any case where the voltage exceeds:

(a) 5000 volts constant potential, neither side grounded.

(b) 5000 volts constant current series alternating metallic (except when current does not exceed 7.5 amp, in which case the voltage may be not more than 10,000 volts).

(c) 7500 volts constant direct current series metallic.

(d) 700 volts constant potential, direct current, one side grounded.

The report comprises a form of agreement covering the joint use of wood poles on a rental basis and a set of recommended specifications for the joint use of wood poles. These take up in detail the placing of attachments and wires for various classes of circuits, including railway span wires and brackets. Included with the report are a number of dimensioned diagrams illustrating the principal specifications.

REPORT OF COMMITTEE ON COMPANY SECTIONS AND INDIVIDUAL MEMBERSHIP

The American Association committee on company sections and individual membership reported yesterday to the effect that two company sections had been organized during the year; the Washington Railway & Electric Company section, No. 4, and the Manila Electric Railway & Light Company section, No. 5. Several companies have taken steps in the direction of organizing sections. Sub-Chairman Martin Schreiber's midwinter convention paper entitled "A Plea for Company Sections" was a part of the year's campaign. (See Electric Railway Journal, Jan. 31, 1914, page 250.) An active and successful campaign for individual members has also been conducted continuously throughout the year.

The public utilities commission was discussing carload lots and less than carload lots, abbreviated to c. l. and l. c. l. Finally one of the commission (so the story runs) inquired: "Where is this C. L. and L. C. L. railroad?"

REPORT OF COMMITTEE ON COMPANY MEMBERSHIP

The American Association committee on company membership which met yesterday reported that an active canvass of possible members had been made throughout the year and that more than 400 members are now enrolled. These represent more than 80 per cent of the capital invested in the business. The remainder are principally small companies, and the committee reported the opinion that many of these will soon be enrolled. The committee has used a pamphlet, "Applying the Test," and the association year book in correspondence with prospective members.

REPORT OF THE COMMITTEE ON ACCOUNTING DEFINITIONS

The Accountants' Association committee on accounting definitions which reported yesterday was formed to present for consideration definitions that should promote a standardized use of various terms employed in accounting discussion and literature. The suggestion that such terms be defined arises from the confusing, sometimes misleading, use of words required in accounting. When the committee was asked to give attention to this subject it was with the understanding that the committee on a standard classification of accounts of the associations, then conferring with the Interstate Commerce Commission over the uniform system of accounts, would necessarily define certain terms. So far as terms are defined in the new classification of accounts, agreed upon by the classification committee and the Interstate Commerce Commission, they are of course binding on the Accountants' Association.

While the standard classification is therefore the logical starting point for part of the work of the committee on Accounting Definitions another consideration should be borne in mind. That is that since the standard classification is promulgated by the Interstate Commerce Commission it is the prescribed legal system for carriers which do an interstate business. Its definitions are binding on such carriers.

Similarly, intrastate carriers located in states where commissions have prescribed uniform accounts are bound by the text of those accounts and accompanying definitions. Various state commissions have adopted the Interstate classification, the association classification. Several years before the present classification was issued, however, some of the state commissions had adopted systems that, however little they differ in principle from the standard, contain differences in detail.

For the information of the association the committee showed in an appendix to the report certain definitions which it had compiled. So far as the commission definitions are concerned it does not present these as a full compilation of all of the definitions of all of the commissions. Some of the commissions which have prescribed forms of accounts have not included therein any definitions of terms which are of interest in the work assigned to the committee.

The committee expressed the hope that the compilation may be useful for reference and that it will serve to direct more general attention to the desirability of a uniform use of terms. The definitions quoted were from the uniform classifications of the Interstate Commerce Commission, The New York Public Service Commission, First District, the Board of Public Utility Commissioners of New Jersey, and the Public Service Commission of Maryland. The Century Dictionary and the Board of Supervising Engineers, Chicago Traction are also quoted. The committee realized that all definitions of this kind are somewhat arbitrary, and that a compilation of this character may be extended much further so as to include definitions, especially on the questions raised by public valuation of the property of public

The committee expressed appreciation of the great desirability of a standardized use of terms, and of the fact that the standardized use of terms is somewhat dependent on standardization of the practices underlying the terms which it is desired to define accurately. With the adoption of the new classification of accounts the ideal of complete standardization in electric railway accounts is brought nearer to realization and there will be a corresponding advance in the standardized use of terms. For the realization of this ideal time will be required.

The committee decided to present the data which it secured and to leave the question of future activities to the association or the executive committee. Whether or not it is the desire of the association that independent definitions shall be formulated or adopted, the committee believed that a service can be rendered to the association by the presentation from time to time of rulings or other information that will tend to make accounting terms clearer.

REPORT OF THE BOARD OF ACCIDENT PREVENTION

At a joint meeting of the Claims, Engineering and Traffic & Transportation Associations held yesterday morning, the board of accident prevention presented the results of an investigation by a sub-committee. These related to practical accident prevention through the employment of physical agents such as equipment, safety devices, ordinances, traffic regulations and laws; and to educational methods designed for the general public, school children and employees and utilizing safety committees, the press, lectures, bulletins, moving pictures and slides. A series of twenty-four questions were addressed to the member companies and thirty-five contributed to the report. As a result the committee reported that practical accident prevention is being accomplished through the use of improved equipment, and of safety devices, and through the education of employees. It urges co-operation with municipal authorities in regard to safety zones, traffic regulation, etc., and emphasizes the duty of state and municipality to educate the public along safety lines. The committee appended to its report a list of the answers to the questions received from the thirty-five co-operating companies.

REPORT OF THE COMMITTEE ON EDUCATION

The Accountants' Association committee on education reported yesterday morning. The report stated that the enrollments in the correspondence course in electric railway accounting were of sufficient number to assure its establishment. This course is to be conducted by Professor John R. Wildman, of New York University. An outline of the course was printed in the issue of the ELECTRIC RAILWAY JOURNAL for May 30, 1914, page 1214. In promulgating this plan the committee sent out two letters describing the course but, desiring to treat the project from a dignified standpoint, after placing the appeal and prospectus of the course before the member companies, the committee sought to develop local interest through personal solicitations.

An analysis of the enrollments indicated that the demand for wider knowledge of the subject through this course lies with the smaller companies. The large corporations did not furnish their expected quota. The committee stated that the successful outcome, apart from the individual efforts of each member of the committee, was largely due to the interest and material assistance given by P. S. Young, treasurer Public Service Railway; H. H. Norris, ELECTRIC RAILWAY JOURNAL, and Secretary E. B. Burritt. Particular recognition was given Mr. Burritt for his continued support and services.

The first lecture will be mailed to subscribers on or about Oct. 19, 1914. The prospectus of the course is unchanged from that presented in our previous report. The committee will award a prize of $25 for the best work done on the course during the current year.

THE ORGANIZATION AND FUNCTIONS OF A VALUATION STAFF

An interesting paper on this subject was presented at the session of the American Association yesterday by H. C. Donecker, assistant general manager Public Service Railway, Newark, N. J. The author first referred and quoted from various authors on the subject, including Henry E. Riggs, who delivered a paper on the valuation of public service corporation property before the American Society of Civil Engineers in January, 1911, from the books of Horatio Foster, Henry Floy and H. P. Gillette, and from magazine articles or reports of J. Shirley Eaton, Professor Pence, and others. He then discusses the organization of a company valuation staff. An abstract of his remarks on this subject follow:

ORGANIZATION OF A COMPANY VALUATION STAFF

The advantages of a home organization are apparent, as undoubtedly the members of the various departments who would be required to engage in the work, granted their competency, are, through their greater familiarity with the growth and history of the component parts which go to make up the entity of the operating company, in a position better to determine the real value of the property under their jurisdiction than outsiders without this intimate personal knowledge, could possibly be.

It is not surprising that in actually planning the organization to take care of such work, companies which have utilized the committee plan to good advantage in dealing with other important matters should look with favor on this method of conducting the work. Such a committee would embrace representatives from the accounting, way, equipment, transportation, power, purchasing and legal departments, each member being held responsible for that portion of the work which would logically come under his direction. Regular meetings of the staff would be held at which opportunity would be afforded for a discussion of important problems. Detailed minutes of the proceedings would be kept and periodical progress reports would be submitted to the management.

Although considerable time would probably be consumed in reaching a decision as to governing principles, in outlining distinctly the methods to be followed and in definitely planning the details, yet the work, when once organized, could be carried out more expeditiously than by a corps of experts who must of necessity spend considerable time in drawing upon the fund of information of the company's employees. It must be borne in mind also that in any appraisal by professionals the company must co-operate in no small degree, and the placing of data in their hands entails no trifling expense.

It may be true, also, as has been frequently stated, that departmental heads show comparatively little interest in the work of outside appraisers, with the consequence that there is a lack of understanding as to methods pursued, and the progress of the work not being closely followed dissenting views are not expressed until the final results are presented. Then arise questions as to the conclusions reached, and much effort is subsequently expended to make such corrections, modifications and additions as seem advisable and maybe essential. Such complications would be avoided to a large extent were the work directed by the company's valuation staff.

Of paramount importance is the foundation work connected with appraisals, that is, the inventory itself. Mr. Floy states that "nothing is more important than the inventory." In fact the whole valuation fails if the inventory is not complete and accurate. To make a proper and reliable inventory of a large property involves an amount of detail that will seem unduly laborious with an accompanying unwarranted expense to those inexperienced in appraisal work. Ordinarily it is the most difficult and expensive part of the work and will run from 50 to 75 per cent of the total cost of the appraisal. Under the committee plan of organization each departmental head will naturally assume the responsibility of completing an inventory of his own property. The general methods of conducting an inventory have been given in more or less detail heretofore and, of course, will have been considered by the valuation staff in general conferences before the work is started and while it is in progress.

As an illustration of a concrete instance where a company has itself undertaken the actual details of the work of an inventory of its property, we might quote from R. B. Rifenberick's description of the methods followed in Detroit:

"The track, mechanical and power departments are the ones which would have particularly to do with an inventory, as the physical property is in the direct charge of these departments. * * * Therefore the inventory was divided into the three general headings of inventory, track department; inventory, mechanical department: and inventory, power department, to which I added 'inventory general' to take care of real estate and buildings. * * * I concluded that the men who were in constant every-day connection with the property itself would be more capable than anyone whom I could secure from the outside, as such outside assistance could not possibly be as familiar with the property as must be the men in the regular employ of the company, who had in many cases been with the property for years. I took this subject up with each of the heads of the general departments and had them assign men out of their departments who were most familiar with the different schedules of the property to be inventoried, and they were put to work inventorying every item of physical property that they could ascertain. These men went into every schedule in as great detail as they could and were instructed to be sure and get everything that they could see and to be very careful not to put anything in their inventories that they could not at any time put their hands on and say 'There is that in the inventory'. * * *

"Our experience in this work fully confirms the conclusion I reached before getting up the organization for the purpose of taking the inventory, and I know of no better plan or organization that could be provided. * * *

"After arriving at material and labor cost * * * then should be added: (1) contingency item; (2) incidentals of construction item; (3) employers' and public liability insurance item; (4) builder's risk or casualty insurance; (5) architect's fee; (6) appreciation item; (7) acquiring land item; (8) contractor's profit item."

In addition, Mr. Rifenberick would include in the total reproduction cost overhead charges covering brokerage charge, discount on bonds, development cost, engineering charge, franchise value, going concern value, "hazard" charge, interest during construction charge, legal expense charge, organization and administration charge, promotion charge, taxes during construction charge and working capital charge.

Upon the completion of the inventory, the accounting and engineering departments must confer as to the value to be assigned to the various items. The operating department's knowledge of the present-day value and efficiency of the property also aids materially in reaching a right decision, while the purchasing department is called upon to furnish information as to past prices, details as to the circumstances under which the contracts for materials were made, etc. The accounting department is informed as to any unusual circumstances which may have attended the construction of the particular unit, all of which must be given weight in any equitable determination of its value. Thus no value appears on the inventory which cannot be substantiated by the company's records of cost are upheld by the experience of its engineers.

The legal department must be in close touch with the development of the valuation, and to it is relegated the preparation of evidence to establish a value upon the basis which has been adopted, also the rendering of opinions as to the value of easements, contracts, franchises and such other intangibles as may be involved.

When the original valuation has been finally completed, the problem of keeping it up to date arises. This means that as soon as any piece of construction is completed, the engineers and accountants must examine all the records of cost of that particular job and correct any errors or improper charging of labor, material or expense. The actual unit costs of the job must be determined and reconciled with previous estimates. Just as careful attention must be given to an accurate determination and record of the amount to be written off in reconstruction work. It is then a comparatively simple matter to bring the completed appraisal, as previously made, up to date each year.

PROBLEMS BEFORE STAFF

At the risk of some repetition, we here touch upon some of the practical problems to the proper solution of which the valuation staff, in conference, must give serious consideration. These involve:

1. Permanent inventory records. Where inventories are to be of value to the purchasing department, the operating department, the accounting department, and the valuation staff, the practical problem arises as to the most satisfactory form of inventory to serve such divers uses in a permanent manner.

2. Present-day and cost prices. There have been variations in the unit costs of construction since the company's property has been placed in operation and a study of these changes is essential. If the basis of prices is to be the reasonable cost of construction to the company, the question arises as to whether the company is not entitled in any fair appraisal to the difference between actual unit costs and those normally obtaining because of its superior bargaining ability and economical construction. If the basis of prices is to be the price of duplication, the question as to whether such prices should be present-day or average prices for an arbitrary period, such as the past five years, requires similar study.

3. The increased cost of piecemeal over completed construction. Properties built up part by part have not and could not be built with the same efficiency and economy that would be possible if the entire property were rebuilt, as a whole.

4. The increased cost of construction of property, such as track, while under operation, as compared with new construction without the difficulties of operation.

5. The inter-department charges making up the total cost of labor and material, including the cost of handling materials and stock and its transportation to the construction work, its incurrence while work is in process of construction, the cost of obtaining labor, the cost of employee's liability during construction, losses due to inclement weather and sickness, the cost of experimental work, and numerous similar problems, arising out of the diversity of construction conditions.

6. The overhead charges and their application; supervision of material and labor during construction and the inspection of the completed work prior to its being placed in operation.

7. The legal expenses involved during construction and the cost of money tied up in materials and supplies during the period of time which is needed to complete the work.

8. If the appraisal takes into account present, or depreciated, value of the property, the problems arising are numerous and involve the inspection of each unit of equipment and the determination of its remaining value as a part of the entire operating property.

The prime function of a valuation staff is to provide the company with an accurate and up-to-date appraisal, and while we may question the desirability of valuations in themselves, those who have given the subject deep consideration and have actual experience along this line point to certain incidental purposes which a valuation staff may serve. Aside from the features to which reference has already been made, as, for instance, the proper recording of costs, values, etc., involved in the reconstruction of the property as well as in its original installation, another important advantage is said to accrue, namely, the assistance which such a valuation staff can afford the legal department, particularly in cases where the question of reasonable return is involved.

It would also seem to be fair to assume that the contact of each department with every other as afforded by the committee form of valuation staff organization, is certain not only to broaden the viewpoint and make the employee of greater value to the company itself, but also to result in greater reliability of records where such a committee performs conscientiously its proper functions in checks and balances before the final figure enters into the property account of the company.

In conclusion, we reiterate the statement made early in this discussion, that we are facing definite conditions and not untried theories, in substantiation of which it might be well to call attention to an order of the Railroad Commission of the State of California that the electric railways within its jurisdiction file within 120 days inventory and appraisals of the cost and value of their property.

Finally, let it be understood that the object of this paper is not to provide an argument on the subject of valuation, but merely to cite certain attendant conditions of which the writer has some knowledge. There is, and perhaps always will be, honest differences of opinion as to the ultimate benefits to be derived from the application of the valuation theory.

ELEVATED RAILWAY TRAFFIC IN NEW YORK

The Public Service Commission of the First District of New York has just published the results of the operations of the four elevated lines of Manhattan and the Bronx for the year ending June 30, 1914. From this it appears that, although there was a considerable decrease on the Sixth Avenue line, there was, on the whole, an increase of 4,626,562 passengers carried for the year, and that the total number of passengers carried on the elevated lines during the year was 311,473,568. With these figures may be compared the record made by the subway for the same period. It carried 340,413,103 passengers, or 1,001,215 a day, which means that the Interborough system is used every day of the year by 1,917,315 passengers, or 651,886,671 in the year, counting 340 days to the year. Taking the four elevated lines separately, the Third Avenue carried 4,260,856 more passengers in 1914 than in 1913, a daily increase of 12,532, almost three times as heavy an increase as that of the preceding twelve months. The Sixth Avenue carried 497,248 fewer passengers than in 1913, and its record of 255,173 passengers a day was not only 1463 less than in 1913, but 721 less than in 1912. Both the Second Avenue and the Ninth Avenue lines gained moderately last year, the former scoring a 595,660 and the latter a 269,294 increase total over the preceding twelve months.

A red band or signal, which can be displayed diagonally across the illuminated route number on the front of the car, is being installed by the Philadelphia Rapid Transit Company to indicate when a car is destined to turn "short" of the usual run or is scheduled to go into a depot before reaching the end of the line. The cars of Routes 20, 21 and 53 have been equipped with this red band. The red band can be dropped into place by the motorman for the purpose of calling the attention of prospective passengers to the fact that the car is carrying a "short" destination sign immediately beneath the route number so that passengers may avoid boarding a car which is designated to turn before reaching the through terminal. If the new device proves to be a convenience to the traveling public it will be installed on all cars having the illuminated sign system.

REPORT OF THE SECRETARY-TREASURER OF THE AMERICAN ASSOCIATION [*]

The question of membership is always a vital one, and it is a pleasure to state that the growth of the association in this respect has been steady. We are slowly, but surely, gathering into the fold those companies which yet remain outside. It is interesting to note that our organizaion includes 36,000 of the 43,000 miles of electric railways in the United States and that of the $533,000,000 in revenues received by the companies in 1913, $500,000,000 were received by our member companies. This indicates that the association is truly representative of the electric railway industry of this country.

The individual membership has increased during the past year in a very satisfactory manner. This branch of membership is a potent factor for good and the recruiting should be aided in every possible way by every individual connected with the organization. The individual members should number many thousands.

The company section movement continues to spread. Two new sections were formed during the year, the Washington Railway & Electric Company section and the Manila Electric Railway & Light Company section, and two others are in process of formation. The organization of company sections should be encouraged as a sure means of increasing this membership. The value of the company section is difficult to overestimate. Each of our larger member companies should have a section among its employees, and executives of these companies should lend their support to the movement.

CASH STATEMENT

RECEIPTS

(Fiscal year ended Sept. 30, 1914)

Cash in bank, Oct. 1, 1913		$5,012
Admission fees	$230	
Company annual dues	38,328	
Individual membership dues	13,810	
Interest on bank deposits	369	
Sale of annual reports	330	
Sale of rule books	322	
Sale of classifications	82	
Sale of pamphlets	24	
Sale of membership emblems	458	
Index bureau	1,531	
Miscellaneous	435	
Aera advertisements and cuts	6,367	
Aera subscriptions	241	
Sale of *Aera* binders	75	
Manufacturers' Association contribution to support of *Aera*	5,970	
Sale of Engineering Manual and binder	519	
Contribution to fare bureau	1,000	
Refund of petty cash	600	
Proportional share of convention reporting from ELECTRIC RAILWAY JOURNAL	344	
Checks redeposited	114	
Receipts during fiscal year ended Sept. 30, 1914		71,156
Total cash, including balance of Oct. 1, 1913		$76,168

EXPENDITURES

(Fiscal year ended Sept. 30, 1914)

Salaries	$12,362
Printing and stationery	2,976
Postage	1,807
Miscellaneous office expenses	490
Rent of office	3,073
Telephone, telegraph and messengers	690
Express, freight and cartage	1,286
Traveling expenses, secretary	254
Traveling expenses, executive committee	37
Traveling expenses, other committees	1,346
Miscellaneous general expenses	2,085
1913 convention	996
1914 convention	95
Publicity for 1913 Convention	200
Annual report	2,724
Return of active membership dues	75
Return of individual membership dues	85
Furniture and equipment	459
Exchange	52
Accountants' Association, annual report	1,071
Accountants' Association, other expenses	1,705
Engineering Association, annual report	5,066
Engineering Association, other expenses	3,531
Claims Association, annual report	906
Claims Association, other expenses	903
Transportation & Traffic Association, annual report	2,427
Transportation & Traffic Association, other expenses	1,437
Petty cash fund	600
Index bureau	779
Washington Representative	491
Aera	14,594
Fare bureau	2,433
Badges	265
Money refunded later	174
Engineering Manual and binder	3,217
Checks returned from bank	115
Gold medal	171
Total expenditures, fiscal year ended Sept. 30, 1914	$70,993

RECAPITULATION

Cash on hand Oct. 1, 1913	$5,012	
Receipts during fiscal year ended Sept. 30, 1914	71,156	
Total cash		$76,168
Expenditures during fiscal year ended Sept. 30, 1914		70,993
Balance in bank Sept. 30, 1914		$5,175
Bills receivable Sept. 30, 1914:		
Contributions to fare bureau	$1,000	
Outstanding company and individual membership dues	250	
Aera advertising	850	
Convention receipts (estimated)	6,000	
		8,100
		$13,275
Bills payable Sept. 30, 1914		8,006
Balance as of Sept. 30, 1914		$5,269

[Statements were added from the Security Bank, New York, verifying the bank statement submitted, and from M. R. Boylan, general auditor Public Service Railway, Newark, N. J., as auditing the report and finding it correct.]

RECAPITULATION OF COMPANY MEMBERS

Sept. 30, 1914

Company members Oct. 1, 1913			391
Resigned		15	
Consolidated		5	
Delinquent		12	
			32
Total 1913 company members in good standing			359
Company members reinstated during fiscal year ended Sept. 30, 1914			2
Total old company members in good standing Oct. 1, 1914			361
New company members admitted during the year ended Sept. 30, 1914		23	
Delinquent	4		
Resigned	1		
		5	
New company members in good standing Sept. 30, 1914			18
Total company members in good standing Sept. 30, 1914			379

RECAPITULATION OF INDIVIDUAL MEMBERS

Sept. 30, 1914

Individual members, Oct. 1, 1913			2,885
Resigned		598	
Deceased		23	
Delinquent		265	
Membership cancelled owing to individual's affiliation with non-member companies		98	
			884
Total old members in good standing Sept. 30, 1914			2,001
Individual members reinstated during fiscal year		10	
Delinquent	4		
Withdrawn	2		
		6	
Total reinstated members in good standing Sept. 30, 1914			4
Total 1913 members in good standing Sept. 30, 1914			2,005
New individual members			893
Total individual membership Sept. 30, 1914			2,898

The value of the association magazine, *Aera*, has been thoroughly demonstrated. Its circulation has increased with the increase in membership, and it is maintaining a standard befitting the official organ of this association. Mention should be made of the publicity work which is being accomplished through the magazine. Newspapers to the number of 1196 are supplied each month with clippings from *Aera*. By this means much enlightening information relative to the operation of electric railways is published throughout the country and the effect cannot help but be beneficial.

A noteworthy step was taken during the year in the establishment of the Bureau of Fare Research under the direction of the committee on cost of passenger transportation service. F. W. Doolittle was selected by the committee as the bureau's director and took charge some five months ago. He is eminently well qualified for the important work devolving upon the bureau.

The new method of distributing the proceedings, as authorized by the executive committee was put into operation for the first time this year. This plan has resulted in a considerable saving in the cost of printing and express charges, the total amount saved over last year being approximately $1,500.

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[*] Abstract of report for the fiscal year ended Sept. 30, 1914, presented at the meeting of the American Association, Atlantic City, N. J., Oct. 13, 1914.

Another innovation this year was the association's Year Book. In this is presented in convenient form a great deal of information bearing on the organization and work of the association.

Still another departure, and a very important one in its value to the members of the association, was the publication of the Engineering Manual. This book contains all standards and recommendations adopted to date, together with much other important information. It has been favorably received and its usefulness to the electric railway man is established.

The bureau of information has at times this year been heavily taxed and it has been difficult to keep up with the many requests for information of one sort or another. There were received during the year about 325 requests for information on a large variety of subjects, which received attention at the hands of the bureau. It is satisfactory to note that this important feature of association work is being taken advantage of by a constantly increasing number of member companies. It is appropriate to acknowledge here the active co-operation on the part of member companies in the supplying of data in connection with the work of this bureau.

During the past year eighty-four committee meetings were held. Co-operation of our companies has likewise been given freely in response to requests for information from various committees in the course of their work.

I desire to express my earnest appreciation of the loyal support accorded me by the members of our office force. They have been at all times faithful to the association's work.

I also wish to express my appreciation of the assistance which has been extended to me during the year by my predecessor, H. C. Donecker, and of the whole-hearted support accorded me by the membership generally.

UNIVERSAL STANDARD BOILER SPECIFICATIONS

During the month of September the committee appointed by the American Society of Mechanical Engineers to prepare specifications for the construction and care of steam boilers held several meetings for the purpose of bringing out discussion on a proposed draft for the specification. Mention of the first of these meetings, which was held Sept. 15, was made in the ELECTRIC RAILWAY JOURNAL for Sept. 5. At this hearing numerous representative users of steam boilers spoke in favor of the general adoption of a single standard boiler code, and this attitude was heartily concurred in by representatives of the Babcock & Wilcox Company, the National Tubular Boiler Manufacturers' Association, the American Boiler Manufacturers' Association, and the National Association of Steam & Hot Water Fitters.

The technical part of the hearing was opened with a general discussion on the proposed code with special reference to the matters of license and inspection laws. A discussion upon safety valves occupied a considerable portion of the afternoon but this was finally discontinued to enable a delegation from the National Association of Thresher Manufacturers to be heard. Following this, a committee of the American Society of Heating and Ventilating Engineers was heard, and then the meeting was thrown open to the discussion of the question of boiler material. This discussion was continued without recess until the adjournment at 8.30 p. m.

A committee composed of the representatives of the American Boiler Manufacturers' Association and the National Tubular Boiler Manufacturers' Association conducted a private meeting that lasted throughout the day of Sept. 16. In this the preliminary report was discussed from all standpoints and very carefully considered for its application to the boiler manufacturing industry. The result of their work was a comment on the specification for boiler material suggested by the Association of American Steel Manufacturers, some further criticism of the details of the report and finally the formation of a permanent organization for the purpose of taking definite action for the introduction of the code, after its acceptance by the society, into the legislatures of the various states. This meeting was finally adjourned until Tuesday, Sept. 29, on which date a general meeting of boiler manufacturers was called at Pittsburgh, Pa., for the purpose of furthering the work initiated in New York.

On Sept. 26 the committee representing the boiler-tube interests met in a second conference with the boiler specifications committee and presented a complete specification that is proposed for boiler tubes, both lap-welded and seamless. A representative of the National Association of Master Steam and Hot Water Fitters appeared before the committee and expressed the approval of that association of the committee's work and particularly the changes recommended by the National Boiler & Radiator Manufacturers' Association and the American Society of Heating & Ventilating Engineers. Following this, conferences were held with representatives of the railroad associations and the safety valve manufacturers, both of which were, however, adjourned to later dates at which specific recommendations yet to be formulated will be presented.

BERLIN TRAFFIC LOSSES ON ACCOUNT OF WAR

That the effect of the war is beginning to make itself felt in Germany is shown by the August statements of the Berlin rapid transit and surface companies. The Berlin Elevated & Underground Railway Company (exclusive of the Schöneberg, Wilmersdorf and Dahlem municipal leased lines) carried 4,951,792 passengers in August of this year, compared with 5,610,011 for the same month in 1913. There was a corresponding reduction in revenue during the month from $184,993 to $160,541. This company recently turned over to the army sixty auto buses which it had just purchased for feeder service.

The August revenue of the Allgemeine Berlin Omnibus Company decreased from $276,294 to $213,540. One reason for the reduction is that the number of vehicles was cut down two-thirds because many buses and horses were taken for war purposes.

The report of the Grosse Berliner Strassenbahn shows a loss of about $75,000 compared with August, 1913, when the earnings were $913,849. The company not only lost a large number of regular riders but made a further sacrifice in voluntarily refunding credits for the unexpired commutation of all patrons called to the colors. Immediately after mobilization many women from the families of employees took their places, but this condition was temporary as men are now being trained to enter the service at regular wages.

The annual report of the Singapore Electric Tramways & Power Company for 1913 presents "for the first time a balance on the right side," the year's profits having been $45,672. The tramway has 15 miles of track, and carried more than 16,00,000 passengers last year, an increase of nearly 2,200,000 over the previous year. Receipts per car-mile were 19 cents in 1913, against 17 cents in 1912. No dividend was paid, the concern having purchased at various discounts $260,843 of its own debentures, of which $163.513 have been canceled and $97,330 kept alive and carried as a credit. The capital now stands at $486,650. The chairman states that the company anticipates starting annual dividends next year.

HISTORICAL NOTES ON HORSE AND ELECTRIC CAR SERVICE IN ATLANTIC CITY

By George F. Faber, General Superintendent Atlantic City & Shore Railroad.

In view of the description of the new shops of the Atlantic City & Shore Railroad printed in the issue of the Electric Railway Journal for Oct. 10, the following historical notes may prove of interest.

The Camden & Atlantic Railroad Company was organized on June 24, 1852, and the construction of a railroad between Camden and the shore was begun a few weeks later. Tracks were laid on Atlantic Avenue in 1854. About 1865 two brothers secured from the railroad company the right to run cars on this avenue from the Inlet to South Carolina Avenue. The equipment comprised two cars and four horses, the owners acting as driver and conductor. After a short time their lease was taken over by another individual, but in 1869 the railroad refused to continue the lease and since that year has been operating the line.

In 1869 the Atlantic City Horse Car & Railway Company was organized and, after much difficulty, secured from the City Council the right to construct a line from a point on New Hampshire Avenue near the Inlet, in the center of that avenue to Atlantic Avenue, thence to Ohio Avenue, thence on Ohio Avenue to Pacific Avenue and on Pacific Avenue to the Excursion House at the foot of Missouri Avenue; also, from the intersection of Michigan and Pacific Avenues, via Michigan and Atlantic Avenues to Ohio Avenue, joining the other track at that point. The Camden & Atlantic Railroad, however, secured an injunction and stopped the construction on Atlantic Avenue and put an end to the enterprise excepting that the organization was continued.

In 1889 the electric trolley system was introduced and four years later the line was extended to Longport. Experiments with electric heating on the Burton system were begun in 1892, and the present, now known as the Consolidated, system was installed on a small scale in 1895 and completely in 1898.

The next venture in traction lines was the Atlantic City & Suburban Traction Company, organized in 1902 with a 33-year franchise. The company has a single track extending from the foot of Florida Avenue to the bridge across the Thoroughfare at Georgia Avenue, and thence across the Meadows to Pleasantville, Somer's Point and Absecon. Service on this line commenced in 1903.

The Central Passenger Railway Company secured a franchise for tracks on Virginia, Adriatic and South Carolina Avenues in 1903. After being held up by injunction the construction was completed on the first-named avenue only and the first car was operated the following year. It was planned to use the Pullen underground contact system on this line.

The above statements bring this historical sketch down to the year 1904. The more recent developments were covered in the Electric Railway Journal article already referred to. The property is now owned or controlled by the Pennsylvania Railroad through the West Jersey & Seashore Railroad, the direct owner of the larger portion of the property. The system is operated by the Atlantic City & Shore Railroad, which leases the rights of other companies having franchises and physical property in the city and immediate vicinity. The organization of the underlying companies are, however, maintained intact.

C. N. Duffy, vice-president and general manager Manila Electric Railroad & Light Company, was chairman of the arrangement committee at a reception given to Rev. J. J. Harty, archbishop of Manila, upon his return to the Philippine Islands on Aug. 3. The speakers at the reception included Governor General, Francis Burton Harrison and the Mayor of Manila.

BRILL'S LOW LEVEL HIGH-LIFE CARS ON RADIAL TRUCKS

The J. G. Brill Company is exhibiting one of the Third Avenue Railway Company's splendid low-level cars on the Boardwalk opposite the Pier, and electric railway men who want to see what conveniences can be incorporated in the once-despised "single-trucker" should not fail to go over it. Although this car is but 22 ft. 11½ in. over the corner posts and 34 ft. 11¾ in. over the buffers, it has a seating capacity of 46; thirty-seven passengers are accommodated in the body and nine on the platforms. There are no steps to the platforms as the height from pavement to patform is only 13 in.; from the platform to the car floor is 10½ in., and the floor of the car has a ramp of 3 in. in 5 ft. 1½ in. from the sill at each end. The car has a steel bottom frame and continuous steel posts; the sides are convertible, the arrangement being the "Third Avenue convertible system," which consists of panels with sashes interchangeable with wire screens.

The car is mounted on the Brill "Radiax" type of truck, which has a 10 ft. wheelbase and 24 in. wheels. The weight of the body, less electrical equipment, is 12,840 lb.; weight of truck, with two gears, 6140 lb.; the weight per seated passenger is 522 lb., and by lengthening the car 2 ft. 5 in., or one window, the weight per seated passenger will be 500 lb. The Brill Company has built forty-nine of these cars in two orders, all being mounted on "Radiax" trucks. A "Radiax" truck of 11 ft. 6 in. wheelbase is exhibited in the company's space on the pier.

SOME CONSOLIDATED LEADERS

The thermostat cabinets shown in operation by the Consolidated Car-Heating Company at space No. 22 demonstrated by graphic recording thermometer charts and by current consumption clocks the accuracy of temperature regulation and the economy in electric current which is effected by the use of this device. The thermostat employs the "Sylphon" flexible metallic bellows and is operated by the expansion of a liquid against atmospheric pressure. Break-down tests on both the thermostat and the magnetic switch controlled by the former show that they will operate more than 200,000 times without showing appreciable wear.

The electric heater features include the all-steel, lightweight construction with glazed porcelain, ventilated spindle for the coils which are made of the company's new non-corrosive wire "Nokoro." Fahnestock connectors for simplifying the wiring of the heaters are also employed. The company also shows an electric ventilating heater in which the outside air is blown by means of a fan over the resistance coils, and after being heated in this manner is distributed by means of a ventilating duct extending along the truss plank of the car. Another exhibit is a coal-burning type of ventilating unit. This heater is said to have absolutely no joints in the fire pot, the heater dome or the smoke jack nipple to permit the escape of coal gas. Fresh air to be heated is taken in by the fan either from the side or from the roof of the car, thus doing away with the objection of dust and odors which are drawn in when the air is taken through a hole in the car floor. The proportion of outside air can be regulated by a special damper according to temperature conditions.

One of the electric emergency trucks which the General Vehicle Company has supplied to both the New York and Third Avenue Railways has been installed for direct inspection at space 603 in company with ont of the company's 6-ft. industrial trucks. An idea of the various uses which an electric railway can make of the electric vehicle truck is obtainable from the company's reprint of the Electric Railway Journal's article of Sept. 5, 1914, on "Electric Motor Trucks for New York Railways."

THE EDUCATION OF TO-DAY

In the address on modern education, delivered yesterday before the Accountants' Association, John R. Wildman, professor of accounting New York University, drew some analogies between primitive and modern conditions and methods of education in making clear the significance of certain phases of the educational situation as it exists to-day. Primitive education is supposed to have been almost without conscious aim and not to have possessed any genuine ideals, either political, social or moral. In the case of modern education, developed under an ever-increasing complexity of civilization, ideals do exist, but opinions differ greatly as to what is the central aim. Proponents are found for moral character, culture and mental development. Professor Wildman is not opposed to the attainment of these personal attributes, but he takes exception to the worship of these ends as such and to some of the means whereby they are attained.

In Professor Wildman's opinion the ideal education is that which enables one to adapt himself harmoniously to his environments and to utilize natural forces to serve him and his fellows in their needs. Young men should be taught how to get enough money to enable them to provide the necessities, both physical and intellectual. The modern educational system should educate primarily for business but in a way conducive to a strong mind and a fine moral character. The primitive educational method of imitation has been largely abandoned. Modern business education necessitates determining exactly what young men should know and then teaching them this in accordance with the latest and most improved methods for actually conducting business.

Business education, however, is not confined to a study of simply one profession, for every true business man must know certain fundamentals of commerce, accounts and finance. The accountant must naturally study the theory and practice of accounting, but not without regard to the relations which accounting bears to economics, law, finance and business organization. Professor Wildman believes that accountants who have been thus trained perform their work with a clear consciousness of what they are doing instead of serving in a merely routine and perfunctory manner. Moreover, such an education cannot be said to be devoid of rewards, for the knowledge of the subject and the rendering of maximum service to the employer result not only in financial but also in intellectual and moral betterment.

REPORT OF COMMITTEE ON EDUCATION

The work of the committee on education of the American Association has comprised two parts: (1) a study of existing practice in regard to apprentice training by member companies, and (2) preliminary arrangements for courses of instruction to be given by a correspondence school under the general auspices of the association. The committee found that very few companies have regular apprentice systems for training mechanics and that those which have apprentice systems do not, in general, have regular courses of training. There is apparently no instruction of a school nature given in the electric railway industry, nor is there any extensive co-operation with trade, vocational or night schools. There was a general interest manifested by the membership in the proposed correspondence courses and there is a good prospect of a reasonable enrollment as soon as the courses are put into operation. The committee presented a statement of the tuition fees for four courses: (a) mechanical shop course, (b) electrical shop course, (c) line and track-work course, and (d) power house and substation course. With the exception of the last-named, the fee for which is $37, the tuition fee is $30 for each course. Combinations of two courses can be taken at reduced rates. The committee proposes to follow closely the work of the students.

REPORT OF THE JOINT COMMITTEE ON TRANSPORTATION ENGINEERING

The joint committee on transportation engineering (Engineering and Transportation & Traffic Associations) reported yesterday on train operation in passenger service, train operation in freight and express service, and effect of car and equipment design on duration of stops. The report on train operation in passenger service does not amplify the arguments of last year's committee, but does present figures to show that on a 6600-volt single-phase line in the Middle West, the use of trains on a holiday permitted an increase of 158 per cent in seating capacity and of 122 per cent in ton-miles at an increase of only 76 per cent in energy consumption.

As to freight and express service, the committee found that with the increased length of trains and runs for the permissible lower schedule speeds the tendency is to use a single-motor car or electric locomotive with trailers instead of multiple-unit equipment. Train operation saved platform expense and energy while it was safer than single cars. In studying the effect of interurban car and equipment design on the duration of stops, the committee made eight plans of passenger, and six plans of freight cars. It found that the double-end two or three-compartment car was generally conceded to be the most flexible design, and it believed that end doors should be incorporated in all cars to meet possible train operation even if the end doors were not available to passengers on the short curves of city sections. Excessively large rear platforms were a mistake, and far less essential than easy steps. All bulkhead doors, except those at the baggage compartment, should swing instead of slide in order to permit stronger bulkheads and less cost for door maintenance. As to freight and express car design, the committee favored two large doors on either side, particularly where less-than-carload shipments are to be handled. In conclusion, the committee said that if electric railways are to take advantage of train operation economies they must be prepared to adapt their terminal facilities for longer trains.

REPORT OF COMMITTEE ON EXPRESS AND FREIGHT-ACCOUNTING

The committee on express and freight accounting in its first report presented yesterday before the Accountants' Association outlined in detail what are considered the best methods for keeping freight accounts in both agents' and auditors' offices. The system proposed covers in brief the entire field, not only for those companies who are already conducting an interline freight business but also for those who will eventually have such a source of revenue and those who now do only a local business but will in the future exchange shipments with other companies. The committee suggests thirty-one forms that are needed and explains in detail the accounting procedure that is to be applied from the time freight is accepted from shippers until all entries, reports and summaries are completed. The committee considers that the settling of balances due other roads for traffic accounts by allowing them to draw for such is the simplest method and involves the least work.

REPORT OF COMMITTEE ON STANDARD CLASSIFICATION OF ACCOUNTS

The eighteenth annual report of the committee on the standard classification of accounts presented yesterday before the Accountants' Association constitutes in general a résumé of the committee's activities from the inception of the Accountants' Association in 1897 up to the present date. Its influence in bringing about a standard classification of accounts and the development of this to suit the growth of the industry are briefly described. During the past two years, in co-operation with representatives of the Interstate Commerce Commission, the committee has been considering new classifications covering operating, revenue and road and equipment accounts, as well as schedules and text for income, profit and loss, and general balance sheet accounts. The committee held two protracted sessions last year with representatives of the commission and worked out the uniform system of accounts prescribed by the commission as effective July 1, 1914. This system, which has already been adopted by interstate electric railways and in many cases by state commissions, is recommended for adoption by the Accountants' Association. The report of the committee concludes with a list of all its past and present members with their respective periods of service.

COMMITTEE ON BLOCK SIGNALS

The joint committee on block signals of the Engineering and the Transportation & Traffic Associations presented in its report a digest of laws or rulings issued by the various states relative to block signals, a bibliography on signaling, and a summary of installations of block signals made during the year preceding July 1, 1914. A design for a semaphore spectacle casting was submitted for approval by the Engineering Association as standard, as was also a clearance diagram for semaphore signals. A set of rules for operation under trolley contact signals was included, and certain definitions now appearing in the standard block signal rules were revised to make them applicable to the requirements of trolley contact signals. The subject of light signals was discussed at length, and recommendations were made to the effect that, for light signals in high-speed interurban service, a lens of not less than 8⅜-in. diameter should be used and that in moderate-speed service a lens of not less than 5⅜-in. diameter should be used. In an appendix detailed descriptions of two types of automatic train stops were given.

The summary of replies to questions in the data sheet sent out each year by this committee included information as to the contemplated mileage of track to be protected by signals during the coming year and data upon the cost of signal maintenance and the efficiency of signal operation. Condensed data regarding the block signal installations made during the last year were also included. In another appendix the committee presented a study upon braking distance for trains at varying speeds, including a diagram with which any given problem of this nature could be solved by graphical means. Another appendix furnished brief descriptions of installations made by the various signal manufacturers during the last year.

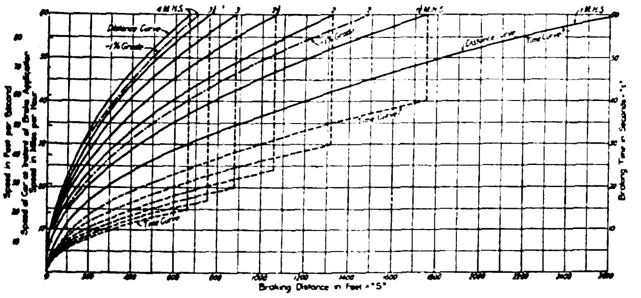

DIAGRAM FOR DETERMINING BRAKING DISTANCES AT VARIOUS SPEEDS

The above-mentioned diagram for determining braking distances at various speeds is shown in the accompanying illustration. To show how the chart is to be used assume that such a braking force has been applied to a car so as to produce a retardation of 3 m.p.h.p.s. It is desired to know how long a time will be required for the car to come to a stop and in what distance it will do so from a speed of say, 50 m.p.h. The solid line for 3 m.p.h.p.s. shows that a speed of 50 m.p.h. corresponds to a braking distance of 600 ft. Directly below this is a point where a vertical line intersects the distance-time curve for 3 m.p.h.p.s. and, reading on the right-hand scale, it is found that the time required for the stop is 16.5 seconds. A similar procedure shows that from 60 m.p.h. the same braking rate will stop the car in twenty seconds and 800 ft. The braking forces necessary to produce the various rates of deceleration are as follows:

Rotation	Braking force
1 m. p. h. p. s	91 lb. per ton
1½ m. p. h. p. s	137 lb. per ton
2 m. p. h. p. s	182 lb. per ton
2½ m. p. h. p. s	227 lb. per ton
3 m. p. h. p. s	273 lb. per ton
3½ m. p. h. p. s	318 lb. per ton
4 m. p. h. p. s	364 lb. per ton

The forces given above are those which must be applied tangentially at the car-wheel tread, the pressure from the brakeshoe being from four to eight times as great, depending on the coefficient of friction between the brakeshoe and the tire. As the forces are calculated for level track they must be increased 20 lb. per ton for each 1 per cent of upgrade and correspondingly reduced for each 1 per cent of downgrade. Referring to the chart the two dot-and-dash lines show the times and distances resulting from the application of forces on a 1 per cent downgrade which on the level would produce 4 m.p.h.p.s. and 2 m.p.h.p.s. retardation respectively. They are shown merely to give a practical concept of the effect of a familiar grade.

REPORT OF THE JOINT COMMITTEE ON THE JOINT USE OF POLES

The special committee on the joint use of poles, comprising representation from the American Institute of Electrical Engineers, the National Electric Light Association, the American Telephone & Telegraph Company and the American Electric Railway Association, presented its final report yesterday. It was the unanimous recommendation of the committee except that the telephone companies do not agree to enter into joint use of poles in any case where the voltage exceeds:

(a) 5000 volts constant potential, neither side grounded.

(b) 5000 volts constant current series alternating metallic (except when current does not exceed 7.5 amp, in which case the voltage may be not more than 10,000 volts).

(c) 7500 volts constant direct current series metallic.

(d) 700 volts constant potential, direct current, one side grounded.

The report comprises a form of agreement covering the joint use of wood poles on a rental basis and a set of recommended specifications for the joint use of wood poles. These take up in detail the placing of attachments and wires for various classes of circuits, including railway span wires and brackets. Included with the report are a number of dimensioned diagrams illustrating the principal specifications.

REPORT OF COMMITTEE ON COMPANY SECTIONS AND INDIVIDUAL MEMBERSHIP

The American Association committee on company sections and individual membership reported yesterday to the effect that two company sections had been organized during the year; the Washington Railway & Electric Company section, No. 4, and the Manila Electric Railway & Light Company section, No. 5. Several companies have taken steps in the direction of organizing sections. Sub-Chairman Martin Schreiber's midwinter convention paper entitled "A Plea for Company Sections" was a part of the year's campaign. (See Electric Railway Journal, Jan. 31, 1914, page 250.) An active and successful campaign for individual members has also been conducted continuously throughout the year.

The public utilities commission was discussing carload lots and less than carload lots, abbreviated to c. l. and l. c. l. Finally one of the commission (so the story runs) inquired: "Where is this C. L. and L. C. L. railroad?"

REPORT OF COMMITTEE ON COMPANY MEMBERSHIP

The American Association committee on company membership which met yesterday reported that an active canvass of possible members had been made throughout the year and that more than 400 members are now enrolled. These represent more than 80 per cent of the capital invested in the business. The remainder are principally small companies, and the committee reported the opinion that many of these will soon be enrolled. The committee has used a pamphlet, "Applying the Test," and the association year book in correspondence with prospective members.

REPORT OF THE COMMITTEE ON ACCOUNTING DEFINITIONS

The Accountants' Association committee on accounting definitions which reported yesterday was formed to present for consideration definitions that should promote a standardized use of various terms employed in accounting discussion and literature. The suggestion that such terms be defined arises from the confusing, sometimes misleading, use of words required in accounting. When the committee was asked to give attention to this subject it was with the understanding that the committee on a standard classification of accounts of the associations, then conferring with the Interstate Commerce Commission over the uniform system of accounts, would necessarily define certain terms. So far as terms are defined in the new classification of accounts, agreed upon by the classification committee and the Interstate Commerce Commission, they are of course binding on the Accountants' Association.

While the standard classification is therefore the logical starting point for part of the work of the committee on Accounting Definitions another consideration should be borne in mind. That is that since the standard classification is promulgated by the Interstate Commerce Commission it is the prescribed legal system for carriers which do an interstate business. Its definitions are binding on such carriers.

Similarly, intrastate carriers located in states where commissions have prescribed uniform accounts are bound by the text of those accounts and accompanying definitions. Various state commissions have adopted the Interstate classification, the association classification. Several years before the present classification was issued, however, some of the state commissions had adopted systems that, however little they differ in principle from the standard, contain differences in detail.

For the information of the association the committee showed in an appendix to the report certain definitions which it had compiled. So far as the commission definitions are concerned it does not present these as a full compilation of all of the definitions of all of the commissions. Some of the commissions which have prescribed forms of accounts have not included therein any definitions of terms which are of interest in the work assigned to the committee.

The committee expressed the hope that the compilation may be useful for reference and that it will serve to direct more general attention to the desirability of a uniform use of terms. The definitions quoted were from the uniform classifications of the Interstate Commerce Commission, The New York Public Service Commission, First District, the Board of Public Utility Commissioners of New Jersey, and the Public Service Commission of Maryland. The Century Dictionary and the Board of Supervising Engineers, Chicago Traction are also quoted. The committee realized that all definitions of this kind are somewhat arbitrary, and that a compilation of this character may be extended much further so as to include definitions, especially on the questions raised by public valuation of the property of public

The committee expressed appreciation of the great desirability of a standardized use of terms, and of the fact that the standardized use of terms is somewhat dependent on standardization of the practices underlying the terms which it is desired to define accurately. With the adoption of the new classification of accounts the ideal of complete standardization in electric railway accounts is brought nearer to realization and there will be a corresponding advance in the standardized use of terms. For the realization of this ideal time will be required.

The committee decided to present the data which it secured and to leave the question of future activities to the association or the executive committee. Whether or not it is the desire of the association that independent definitions shall be formulated or adopted, the committee believed that a service can be rendered to the association by the presentation from time to time of rulings or other information that will tend to make accounting terms clearer.

REPORT OF THE BOARD OF ACCIDENT PREVENTION

At a joint meeting of the Claims, Engineering and Traffic & Transportation Associations held yesterday morning, the board of accident prevention presented the results of an investigation by a sub-committee. These related to practical accident prevention through the employment of physical agents such as equipment, safety devices, ordinances, traffic regulations and laws; and to educational methods designed for the general public, school children and employees and utilizing safety committees, the press, lectures, bulletins, moving pictures and slides. A series of twenty-four questions were addressed to the member companies and thirty-five contributed to the report. As a result the committee reported that practical accident prevention is being accomplished through the use of improved equipment, and of safety devices, and through the education of employees. It urges co-operation with municipal authorities in regard to safety zones, traffic regulation, etc., and emphasizes the duty of state and municipality to educate the public along safety lines. The committee appended to its report a list of the answers to the questions received from the thirty-five co-operating companies.

REPORT OF THE COMMITTEE ON EDUCATION

The Accountants' Association committee on education reported yesterday morning. The report stated that the enrollments in the correspondence course in electric railway accounting were of sufficient number to assure its establishment. This course is to be conducted by Professor John R. Wildman, of New York University. An outline of the course was printed in the issue of the Electric Railway Journal for May 30, 1914, page 1214. In promulgating this plan the committee sent out two letters describing the course but, desiring to treat the project from a dignified standpoint, after placing the appeal and prospectus of the course before the member companies, the committee sought to develop local interest through personal solicitations.

An analysis of the enrollments indicated that the demand for wider knowledge of the subject through this course lies with the smaller companies. The large corporations did not furnish their expected quota. The committee stated that the successful outcome, apart from the individual efforts of each member of the committee, was largely due to the interest and material assistance given by P. S. Young, treasurer Public Service Railway; H. H. Norris, Electric Railway Journal, and Secretary E. B. Burritt. Particular recognition was given Mr. Burritt for his continued support and services.

The first lecture will be mailed to subscribers on or about Oct. 19, 1914. The prospectus of the course is unchanged from that presented in our previous report. The committee will award a prize of $25 for the best work done on the course during the current year.

THE ORGANIZATION AND FUNCTIONS OF A VALUATION STAFF

An interesting paper on this subject was presented at the session of the American Association yesterday by H. C. Donecker, assistant general manager Public Service Railway, Newark, N. J. The author first referred and quoted from various authors on the subject, including Henry E. Riggs, who delivered a paper on the valuation of public service corporation property before the American Society of Civil Engineers in January, 1911, from the books of Horatio Foster, Henry Floy and H. P. Gillette, and from magazine articles or reports of J. Shirley Eaton, Professor Pence, and others. He then discusses the organization of a company valuation staff. An abstract of his remarks on this subject follow:

Organization of a Company Valuation Staff

The advantages of a home organization are apparent, as undoubtedly the members of the various departments who would be required to engage in the work, granted their competency, are, through their greater familiarity with the growth and history of the component parts which go to make up the entity of the operating company, in a position better to determine the real value of the property under their jurisdiction than outsiders without this intimate personal knowledge, could possibly be.

It is not surprising that in actually planning the organization to take care of such work, companies which have utilized the committee plan to good advantage in dealing with other important matters should look with favor on this method of conducting the work. Such a committee would embrace representatives from the accounting, way, equipment, transportation, power, purchasing and legal departments, each member being held responsible for that portion of the work which would logically come under his direction. Regular meetings of the staff would be held at which opportunity would be afforded for a discussion of important problems. Detailed minutes of the proceedings would be kept and periodical progress reports would be submitted to the management.

Although considerable time would probably be consumed in reaching a decision as to governing principles, in outlining distinctly the methods to be followed and in definitely planning the details, yet the work, when once organized, could be carried out more expeditiously than by a corps of experts who must of necessity spend considerable time in drawing upon the fund of information of the company's employees. It must be borne in mind also that in any appraisal by professionals the company must co-operate in no small degree, and the placing of data in their hands entails no trifling expense.

It may be true, also, as has been frequently stated, that departmental heads show comparatively little interest in the work of outside appraisers, with the consequence that there is a lack of understanding as to methods pursued, and the progress of the work not being closely followed dissenting views are not expressed until the final results are presented. Then arise questions as to the conclusions reached, and much effort is subsequently expended to make such corrections, modifications and additions as seem advisable and maybe essential. Such complications would be avoided to a large extent were the work directed by the company's valuation staff.

Of paramount importance is the foundation work connected with appraisals, that is, the inventory itself. Mr. Floy states that "nothing is more important than the inventory." In fact the whole valuation fails if the inventory is not complete and accurate. To make a proper and reliable inventory of a large property involves an amount of detail that will seem unduly laborious with an accompanying unwarranted expense to those inexperienced in appraisal work. Ordinarily it is the most difficult and expensive part of the work and will run from 50 to 75 per cent of the total cost of the appraisal. Under the committee plan of organization each departmental head will naturally assume the responsibility of completing an inventory of his own property. The general methods of conducting an inventory have been given in more or less detail heretofore and, of course, will have been considered by the valuation staff in general conferences before the work is started and while it is in progress.

As an illustration of a concrete instance where a company has itself undertaken the actual details of the work of an inventory of its property, we might quote from R. B. Rifenberick's description of the methods followed in Detroit:

"The track, mechanical and power departments are the ones which would have particularly to do with an inventory, as the physical property is in the direct charge of these departments. * * * Therefore the inventory was divided into the three general headings of inventory, track department; inventory, mechanical department; and inventory, power department, to which I added 'inventory general' to take care of real estate and buildings. * * * I concluded that the men who were in constant every-day connection with the property itself would be more capable than anyone whom I could secure from the outside, as such outside assistance could not possibly be as familiar with the property as must be the men in the regular employ of the company, who had in many cases been with the property for years. I took this subject up with each of the heads of the general departments and had them assign men out of their departments who were most familiar with the different schedules of the property to be inventoried, and they were put to work inventorying every item of physical property that they could ascertain. These men went into every schedule in as great detail as they could and were instructed to be sure and get everything that they could see and to be very careful not to put anything in their inventories that they could not at any time put their hands on and say 'There is that in the inventory'. * * *

"Our experience in this work fully confirms the conclusion I reached before getting up the organization for the purpose of taking the inventory, and I know of no better plan or organization that could be provided. * * *

"After arriving at material and labor cost * * * then should be added: (1) contingency item; (2) incidentals of construction item; (3) employers' and public liability insurance item; (4) builder's risk or casualty insurance; (5) architect's fee; (6) appreciation item; (7) acquiring land item; (8) contractor's profit item."

In addition, Mr. Rifenberick would include in the total reproduction cost overhead charges covering brokerage charge, discount on bonds, development cost, engineering charge, franchise value, going concern value, "hazard" charge, interest during construction charge, legal expense charge, organization and administration charge, promotion charge, taxes during construction charge and working capital charge.

Upon the completion of the inventory, the accounting and engineering departments must confer as to the value to be assigned to the various items. The operating department's knowledge of the present-day value and efficiency of the property also aids materially in reaching a right decision, while the purchasing department is called upon to furnish information as to past prices, details as to the circumstances under which the contracts for materials were made, etc. The accounting department is informed as to any unusual circumstances which may have attended the construction of the particular unit, all of which must be given weight in any equitable determination of its value. Thus no value appears on the inventory which cannot be substantiated by the company's records of cost are upheld by the experience of its engineers.

The legal department must be in close touch with the development of the valuation, and to it is relegated the preparation of evidence to establish a value upon the basis which has been adopted, also the rendering of opinions as to the value of easements, contracts, franchises and such other intangibles as may be involved.

When the original valuation has been finally completed, the problem of keeping it up to date arises. This means that as soon as any piece of construction is completed, the engineers and accountants must examine all the records of cost of that particular job and correct any errors or improper charging of labor, material or expense. The actual unit costs of the job must be determined and reconciled with previous estimates. Just as careful attention must be given to an accurate determination and record of the amount to be written off in reconstruction work. It is then a comparatively simple matter to bring the completed appraisal, as previously made, up to date each year.

PROBLEMS BEFORE STAFF

At the risk of some repetition, we here touch upon some of the practical problems to the proper solution of which the valuation staff, in conference, must give serious consideration. These involve:

1. Permanent inventory records. Where inventories are to be of value to the purchasing department, the operating department, the accounting department, and the valuation staff, the practical problem arises as to the most satisfactory form of inventory to serve such divers uses in a permanent manner.

2. Present-day and cost prices. There have been variations in the unit costs of construction since the company's property has been placed in operation and a study of these changes is essential. If the basis of prices is to be the reasonable cost of construction to the company, the question arises as to whether the company is not entitled in any fair appraisal to the difference between actual unit costs and those normally obtaining because of its superior bargaining ability and economical construction. If the basis of prices is to be the price of duplication, the question as to whether such prices should be present-day or average prices for an arbitrary period, such as the past five years, requires similar study.

3. The increased cost of piecemeal over completed construction. Properties built up part by part have not and could not be built with the same efficiency and economy that would be possible if the entire property were rebuilt, as a whole.

4. The increased cost of construction of property, such as track, while under operation, as compared with new construction without the difficulties of operation.

5. The inter-department charges making up the total cost of labor and material, including the cost of handling materials and stock and its transportation to the construction work, its incurrence while work is in process of construction, the cost of obtaining labor, the cost of employee's liability during construction, losses due to inclement weather and sickness, the cost of experimental work, and numerous similar problems, arising out of the diversity of construction conditions.

6. The overhead charges and their application; supervision of material and labor during construction and the inspection of the completed work prior to its being placed in operation.

7. The legal expenses involved during construction and the cost of money tied up in materials and supplies during the period of time which is needed to complete the work.

8. If the appraisal takes into account present, or depreciated, value of the property, the problems arising are numerous and involve the inspection of each unit of equipment and the determination of its remaining value as a part of the entire operating property.

The prime function of a valuation staff is to provide the company with an accurate and up-to-date appraisal, and while we may question the desirability of valuations in themselves, those who have given the subject deep consideration and have actual experience along this line point to certain incidental purposes which a valuation staff may serve. Aside from the features to which reference has already been made, as, for instance, the proper recording of costs, values, etc., involved in the reconstruction of the property as well as in its original installation, another important advantage is said to accrue, namely, the assistance which such a valuation staff can afford the legal department, particularly in cases where the question of reasonable return is involved.

It would also seem to be fair to assume that the contact of each department with every other as afforded by the committee form of valuation staff organization, is certain not only to broaden the viewpoint and make the employee of greater value to the company itself, but also to result in greater reliability of records where such a committee performs conscientiously its proper functions in checks and balances before the final figure enters into the property account of the company.

In conclusion, we reiterate the statement made early in this discussion, that we are facing definite conditions and not untried theories, in substantiation of which it might be well to call attention to an order of the Railroad Commission of the State of California that the electric railways within its jurisdiction file within 120 days inventory and appraisals of the cost and value of their property.

Finally, let it be understood that the object of this paper is not to provide an argument on the subject of valuation, but merely to cite certain attendant conditions of which the writer has some knowledge. There is, and perhaps always will be, honest differences of opinion as to the ultimate benefits to be derived from the application of the valuation theory.

ELEVATED RAILWAY TRAFFIC IN NEW YORK

The Public Service Commission of the First District of New York has just published the results of the operations of the four elevated lines of Manhattan and the Bronx for the year ending June 30, 1914. From this it appears that, although there was a considerable decrease on the Sixth Avenue line, there was, on the whole, an increase of 4,626,562 passengers carried for the year, and that the total number of passengers carried on the elevated lines during the year was 311,473,568. With these figures may be compared the record made by the subway for the same period. It carried 340,413,103 passengers, or 1,001,215 a day, which means that the Interborough system is used every day of the year by 1,917,315 passengers, or 651,886,671 in the year, counting 340 days to the year. Taking the four elevated lines separately, the Third Avenue carried 4,260,856 more passengers in 1914 than in 1913, a daily increase of 12,532, almost three times as heavy an increase as that of the preceding twelve months. The Sixth Avenue carried 497,248 fewer passengers than in 1913, and its record of 255,173 passengers a day was not only 1463 less than in 1913, but 721 less than in 1912. Both the Second Avenue and the Ninth Avenue lines gained moderately last year, the former scoring a 595,660 and the latter a 269,294 increase total over the preceding twelve months.

A red band or signal, which can be displayed diagonally across the illuminated route number on the front of the car, is being installed by the Philadelphia Rapid Transit Company to indicate when a car is destined to turn "short" of the usual run or is scheduled to go into a depot before reaching the end of the line. The cars of Routes 20, 21 and 53 have been equipped with this red band. The red band can be dropped into place by the motorman for the purpose of calling the attention of prospective passengers to the fact that the car is carrying a "short" destination sign immediately beneath the route number so that passengers may avoid boarding a car which is designated to turn before reaching the through terminal. If the new device proves to be a convenience to the traveling public it will be installed on all cars having the illuminated sign system.

REPORT OF THE SECRETARY-TREASURER OF THE AMERICAN ASSOCIATION *

The question of membership is always a vital one, and it is a pleasure to state that the growth of the association in this respect has been steady. We are slowly, but surely, gathering into the fold those companies which yet remain outside. It is interesting to note that our organizaion includes 36,000 of the 43,000 miles of electric railways in the United States and that of the $533,000,000 in revenues received by the companies in 1913, $500,000,000 were received by our member companies. This indicates that the association is truly representative of the electric railway industry of this country.

The individual membership has increased during the past year in a very satisfactory manner. This branch of membership is a potent factor for good and the recruiting should be aided in every possible way by every individual connected with the organization. The individual members should number many thousands.

The company section movement continues to spread. Two new sections were formed during the year, the Washington Railway & Electric Company section and the Manila Electric Railway & Light Company section, and two others are in process of formation. The organization of company sections should be encouraged as a sure means of increasing this membership. The value of the company section is difficult to overestimate. Each of our larger member companies should have a section among its employees, and executives of these companies should lend their support to the movement.

CASH STATEMENT

RECEIPTS

(Fiscal year ended Sept. 30, 1914)

Cash in bank, Oct. 1, 1913		$5,012
Admission fees	$230	
Company annual dues	38,328	
Individual membership dues	13,810	
Interest on bank deposits	369	
Sale of annual reports	330	
Sale of rule books	322	
Sale of classifications	82	
Sale of pamphlets	24	
Sale of membership emblems	458	
Index bureau	1,531	
Miscellaneous	435	
Aera advertisements and cuts	6,367	
Aera subscriptions	241	
Sale of *Aera* binders	75	
Manufacturers' Association contribution to support of *Aera*	5,970	
Sale of Engineering Manual and binder	519	
Contribution to fare bureau	1,000	
Refund of petty cash	600	
Proportional share of convention reporting from ELECTRIC RAILWAY JOURNAL	344	
Checks redeposited	114	
Receipts during fiscal year ended Sept. 30, 1914		71,156
Total cash, including balance of Oct. 1, 1913		$76,168

EXPENDITURES

(Fiscal year ended Sept. 30, 1914)

Salaries	$12,362
Printing and stationery	2,976
Postage	1,807
Miscellaneous office expenses	490
Rent of office	3,073
Telephone, telegraph and messengers	690
Express, freight and cartage	1,286
Traveling expenses, secretary	254
Traveling expenses, executive committee	37
Traveling expenses, other committees	1,346
Miscellaneous general expenses	2,085
1913 convention	996
1914 convention	95
Publicity for 1913 Convention	200
Annual report	2,724
Return of active membership dues	75
Return of individual membership dues	85
Furniture and equipment	459
Exchange	52
Accountants' Association, annual report	1,071
Accountants' Association, other expenses	1,705
Engineering Association, annual report	5,066
Engineering Association, other expenses	3,531
Claims Association, annual report	906
Claims Association, other expenses	903
Transportation & Traffic Association, annual report	2,427
Transportation & Traffic Association, other expenses	1,437
Petty cash fund	600
Index bureau	779
Washington Representative	491
Aera	14,594
Fare bureau	2,433
Badges	265
Money refunded later	174
Engineering Manual and binder	3,217
Checks returned from bank	115
Gold medal	171
Total expenditures, fiscal year ended Sept. 30, 1914	$70,993

RECAPITULATION

Cash on hand Oct. 1, 1913	$5,012	
Receipts during fiscal year ended Sept. 30, 1914	71,156	
Total cash		$76,168
Expenditures during fiscal year ended Sept. 30, 1914.		70,993
Balance in bank Sept. 30, 1914		$5,175
Bills receivable Sept. 30, 1914:		
Contributions to fare bureau	$1,000	
Outstanding company and individual membership dues	250	
Aera advertising	850	
Convention receipts (estimated)	6,000	
		8,100
		$13,275
Bills payable Sept. 30, 1914		8,006
Balance as of Sept. 30, 1914		$5,269

[Statements were added from the Security Bank, New York, verifying the bank statement submitted, and from M. R. Boylan, general auditor Public Service Railway, Newark, N. J., as auditing the report and finding it correct.]

RECAPITULATION OF COMPANY MEMBERS
Sept. 30, 1914

Company members Oct. 1, 1913			391
Resigned		15	
Consolidated		5	
Delinquent		12	
			32
Total 1913 company members in good standing			359
Company members reinstated during fiscal year ended Sept. 30, 1914			2
Total old company members in good standing Oct. 1, 1914			361
New company members admitted during the year ended Sept. 30, 1914		23	
Delinquent	4		
Resigned	1		
		5	
New company members in good standing Sept. 30, 1914			18
Total company members in good standing Sept. 30, 1914			379

RECAPITULATION OF INDIVIDUAL MEMBERS
Sept. 30, 1914

Individual members, Oct. 1, 1913			2.885
Resigned		598	
Deceased		23	
Delinquent		265	
Membership cancelled owing to individual's affiliation with non-member companies		98	
			884
Total old members in good standing Sept. 30, 1914			2,001
Individual members reinstated during fiscal year		10	
Delinquent	4		
Withdrawn	2		
		6	
Total reinstated members in good standing Sept. 30, 1914			4
Total 1913 members in good standing Sept. 30, 1914			2.005
New individual members			893
Total individual membership Sept. 30, 1914			2.898

The value of the association magazine, *Aera*, has been thoroughly demonstrated. Its circulation has increased with the increase in membership, and it is maintaining a standard befitting the official organ of this association. Mention should be made of the publicity work which is being accomplished through the magazine. Newspapers to the number of 1196 are supplied each month with clippings from *Aera*. By this means much enlightening information relative to the operation of electric railways is published throughout the country and the effect cannot help but be beneficial.

A noteworthy step was taken during the year in the establishment of the Bureau of Fare Research under the direction of the committee on cost of passenger transportation service. F. W. Doolittle was selected by the committee as the bureau's director and took charge some five months ago. He is eminently well qualified for the important work devolving upon the bureau.

The new method of distributing the proceedings, as authorized by the executive committee was put into operation for the first time this year. This plan has resulted in a considerable saving in the cost of printing and express charges, the total amount saved over last year being approximately $1,500.

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* Abstract of report for the fiscal year ended Sept. 30, 1914, presented at the meeting of the American Association, Atlantic City, N. J., Oct. 13, 1914.

Another innovation this year was the association's Year Book. In this is presented in convenient form a great deal of information bearing on the organization and work of the association.

Still another departure, and a very important one in its value to the members of the association, was the publication of the Engineering Manual. This book contains all standards and recommendations adopted to date, together with much other important information. It has been favorably received and its usefulness to the electric railway man is established.

The bureau of information has at times this year been heavily taxed and it has been difficult to keep up with the many requests for information of one sort or another. There were received during the year about 325 requests for information on a large variety of subjects, which received attention at the hands of the bureau. It is satisfactory to note that this important feature of association work is being taken advantage of by a constantly increasing number of member companies. It is appropriate to acknowledge here the active co-operation on the part of member companies in the supplying of data in connection with the work of this bureau.

During the past year eighty-four committee meetings were held. Co-operation of our companies has likewise been given freely in response to requests for information from various committees in the course of their work.

I desire to express my earnest appreciation of the loyal support accorded me by the members of our office force. They have been at all times faithful to the association's work.

I also wish to express my appreciation of the assistance which has been extended to me during the year by my predecessor, H. C. Donecker, and of the whole-hearted support accorded me by the membership generally.

UNIVERSAL STANDARD BOILER SPECIFICATIONS

During the month of September the committee appointed by the American Society of Mechanical Engineers to prepare specifications for the construction and care of steam boilers held several meetings for the purpose of bringing out discussion on a proposed draft for the specification. Mention of the first of these meetings, which was held Sept. 15, was made in the Electric Railway Journal for Sept. 5. At this hearing numerous representative users of steam boilers spoke in favor of the general adoption of a single standard boiler code, and this attitude was heartily concurred in by representatives of the Babcock & Wilcox Company, the National Tubular Boiler Manufacturers' Association, the American Boiler Manufacturers' Association, and the National Association of Steam & Hot Water Fitters.

The technical part of the hearing was opened with a general discussion on the proposed code with special reference to the matters of license and inspection laws. A discussion upon safety valves occupied a considerable portion of the afternoon but this was finally discontinued to enable a delegation from the National Association of Thresher Manufacturers to be heard. Following this, a committee of the American Society of Heating and Ventilating Engineers was heard, and then the meeting was thrown open to the discussion of the question of boiler material. This discussion was continued without recess until the adjournment at 8.30 p. m.

A committee composed of the representatives of the American Boiler Manufacturers' Association and the National Tubular Boiler Manufacturers' Association conducted a private meeting that lasted throughout the day of Sept. 16. In this the preliminary report was discussed from all standpoints and very carefully considered for its application to the boiler manufacturing industry. The result of their work was a comment on the specification for boiler material suggested by the Association of American Steel Manufacturers, some further criticism of the details of the report and finally the formation of a permanent organization for the purpose of taking definite action for the introduction of the code, after its acceptance by the society, into the legislatures of the various states. This meeting was finally adjourned until Tuesday, Sept. 29, on which date a general meeting of boiler manufacturers was called at Pittsburgh, Pa., for the purpose of furthering the work initiated in New York.

On Sept. 26 the committee representing the boiler-tube interests met in a second conference with the boiler specifications committee and presented a complete specification that is proposed for boiler tubes, both lap welded and seamless. A representative of the National Association of Master Steam and Hot Water Fitters appeared before the committee and expressed the approval of that association of the committee's work and particularly the changes recommended by the National Boiler & Radiator Manufacturers' Association and the American Society of Heating & Ventilating Engineers. Following this, conferences were held with representatives of the railroad associations and the safety valve manufacturers, both of which were, however, adjourned to later dates at which specific recommendations yet to be formulated will be presented.

BERLIN TRAFFIC LOSSES ON ACCOUNT OF WAR

That the effect of the war is beginning to make itself felt in Germany is shown by the August statements of the Berlin rapid transit and surface companies. The Berlin Elevated & Underground Railway Company (exclusive of the Schöneberg, Wilmersdorf and Dahlem municipal leased lines) carried 4,951,792 passengers in August of this year, compared with 5,610,011 for the same month in 1913. There was a corresponding reduction in revenue during the month from $184,993 to $160,541. This company recently turned over to the army sixty auto buses which it had just purchased for feeder service.

The August revenue of the Allgemeine Berlin Omnibus Company decreased from $276,294 to $213,540. One reason for the reduction is that the number of vehicles was cut down two-thirds because many buses and horses were taken for war purposes.

The report of the Grosse Berliner Strassenbahn shows a loss of about $75,000 compared with August, 1913, when the earnings were $913,849. The company not only lost a large number of regular riders but made a further sacrifice in voluntarily refunding credits for the unexpired commutation of all patrons called to the colors. Immediately after mobilization many women from the families of employees took their places, but this condition was temporary as men are now being trained to enter the service at regular wages.

The annual report of the Singapore Electric Tramways & Power Company for 1913 presents "for the first time a balance on the right side," the year's profits having been $45,672. The tramway has 15 miles of track, and carried more than 16,00,000 passengers last year, an increase of nearly 2,200,000 over the previous year. Receipts per carmile were 19 cents in 1913, against 17 cents in 1912. No dividend was paid, the concern having purchased at various discounts $260,843 of its own debentures, of which $163,513 have been canceled and $97,330 kept alive and carried as a credit. The capital now stands at $486,650. The chairman states that the company anticipates starting annual dividends next year.

HISTORICAL NOTES ON HORSE AND ELECTRIC CAR SERVICE IN ATLANTIC CITY

By George F. Faber, General Superintendent Atlantic City & Shore Railroad.

In view of the description of the new shops of the Atlantic City & Shore Railroad printed in the issue of the Electric Railway Journal for Oct. 10, the following historical notes may prove of interest.

The Camden & Atlantic Railroad Company was organized on June 24, 1852, and the construction of a railroad between Camden and the shore was begun a few weeks later. Tracks were laid on Atlantic Avenue in 1854. About 1865 two brothers secured from the railroad company the right to run cars on this avenue from the Inlet to South Carolina Avenue. The equipment comprised two cars and four horses, the owners acting as driver and conductor. After a short time their lease was taken over by another individual, but in 1869 the railroad refused to continue the lease and since that year has been operating the line.

In 1869 the Atlantic City Horse Car & Railway Company was organized and, after much difficulty, secured from the City Council the right to construct a line from a point on New Hampshire Avenue near the Inlet, in the center of that avenue to Atlantic Avenue, thence to Ohio Avenue, thence on Ohio Avenue to Pacific Avenue and on Pacific Avenue to the Excursion House at the foot of Missouri Avenue; also, from the intersection of Michigan and Pacific Avenues, via Michigan and Atlantic Avenues to Ohio Avenue, joining the other track at that point. The Camden & Atlantic Railroad, however, secured an injunction and stopped the construction on Atlantic Avenue and put an end to the enterprise excepting that the organization was continued.

In 1889 the electric trolley system was introduced and four years later the line was extended to Longport. Experiments with electric heating on the Burton system were begun in 1892, and the present, now known as the Consolidated, system was installed on a small scale in 1895 and completely in 1898.

The next venture in traction lines was the Atlantic City & Suburban Traction Company, organized in 1902 with a 33-year franchise. The company has a single track extending from the foot of Florida Avenue to the bridge across the Thoroughfare at Georgia Avenue, and thence across the Meadows to Pleasantville, Somer's Point and Absecon. Service on this line commenced in 1903.

The Central Passenger Railway Company secured a franchise for tracks on Virginia, Adriatic and South Carolina Avenues in 1903. After being held up by injunction the construction was completed on the first-named avenue only and the first car was operated the following year. It was planned to use the Pullen underground contact system on this line.

The above statements bring this historical sketch down to the year 1904. The more recent developments were covered in the Electric Railway Journal article already referred to. The property is now owned or controlled by the Pennsylvania Railroad through the West Jersey & Seashore Railroad, the direct owner of the larger portion of the property. The system is operated by the Atlantic City & Shore Railroad, which leases the rights of other companies having franchises and physical property in the city and immediate vicinity. The organization of the underlying companies are, however, maintained intact.

C. N. Duffy, vice-president and general manager Manila Electric Railroad & Light Company, was chairman of the arrangement committee at a reception given to Rev. J. J. Harty, archbishop of Manila, upon his return to the Philippine Islands on Aug. 3. The speakers at the reception included Governor General, Francis Burton Harrison and the Mayor of Manila.

BRILL'S LOW LEVEL HIGH-LIFE CARS ON RADIAL TRUCKS

The J. G. Brill Company is exhibiting one of the Third Avenue Railway Company's splendid low-level cars on the Boardwalk opposite the Pier, and electric railway men who want to see what conveniences can be incorporated in the once-despised "single-trucker" should not fail to go over it. Although this car is but 22 ft. 11½ in. over the corner posts and 34 ft. 11¾ in. over the buffers, it has a seating capacity of 46; thirty-seven passengers are accommodated in the body and nine on the platforms. There are no steps to the platforms as the height from pavement to patform is only 13 in.; from the platform to the car floor is 10½ in., and the floor of the car has a ramp of 3 in. in 5 ft. 1½ in. from the sill at each end. The car has a steel bottom frame and continuous steel posts; the sides are convertible, the arrangement being the "Third Avenue convertible system," which consists of panels with sashes interchangeable with wire screens.

The car is mounted on the Brill "Radiax" type of truck, which has a 10 ft. wheelbase and 24 in. wheels. The weight of the body, less electrical equipment, is 12,840 lb.; weight of truck, with two gears, 6140 lb.; the weight per seated passenger is 522 lb., and by lengthening the car 2 ft. 5 in., or one window, the weight per seated passenger will be 500 lb. The Brill Company has built forty-nine of these cars in two orders, all being mounted on "Radiax" trucks. A "Radiax" truck of 11 ft. 6 in. wheelbase is exhibited in the company's space on the pier.

SOME CONSOLIDATED LEADERS

The thermostat cabinets shown in operation by the Consolidated Car-Heating Company at space No. 22 demonstrated by graphic recording thermometer charts and by current consumption clocks the accuracy of temperature regulation and the economy in electric current which is effected by the use of this device. The thermostat employs the "Sylphon" flexible metallic bellows and is operated by the expansion of a liquid against atmospheric pressure. Break-down tests on both the thermostat and the magnetic switch controlled by the former show that they will operate more than 200,000 times without showing appreciable wear.

The electric heater features include the all-steel, lightweight construction with glazed porcelain, ventilated spindle for the coils which are made of the company's new non-corrosive wire "Nokoro." Fahnestock connectors for simplifying the wiring of the heaters are also employed. The company also shows an electric ventilating heater in which the outside air is blown by means of a fan over the resistance coils, and after being heated in this manner is distributed by means of a ventilating duct extending along the truss plank of the car. Another exhibit is a coal-burning type of ventilating unit. This heater is said to have absolutely no joints in the fire pot, the heater dome or the smoke jack nipple to permit the escape of coal gas. Fresh air to be heated is taken in by the fan either from the side or from the roof of the car, thus doing away with the objection of dust and odors which are drawn in when the air is taken through a hole in the car floor. The proportion of outside air can be regulated by a special damper according to temperature conditions.

One of the electric emergency trucks which the General Vehicle Company has supplied to both the New York and Third Avenue Railways has been installed for direct inspection at space 603 in company with ont of the company's 6-ft. industrial trucks. An idea of the various uses which an electric railway can make of the electric vehicle truck is obtainable from the company's reprint of the Electric Railway Journal's article of Sept. 5, 1914, on "Electric Motor Trucks for New York Railways."

THE LORAIN SWITCH THAT MISSED BRUSSELS

Probably the most interesting feature of the Lorain Steel Company's exhibit is a solid manganese steel tongue switch which was to have been a part of an order made for Brussels, Belgium. A portion of this order has gone forward, the exhibit being one of the pieces which could not be shipped on account of the European war. The design of this tongue provides a narrow tread which corresponds to a standard split switch. All the gage lines are straight, which is quite unusual in tongue-switch design. The tongue is of the tadpole type standard with this company. Recently however, certain parts of the tadpole design have been improved, particularly the holding-down device at the heel. Heretofore a special bronze bolt has been used for this purpose. In the improved device an ordinary track bolt has been substituted for the special bolt. While the bronze bolt was satisfactory it was too tempting as junk, which resulted in the removal of many of them from the piece in shipment. Slight changes have also been made in the tadpole switch lever and a yoke adjustment has also been applied. All of these improvements are shown and may be applied to any switch of the tadpole pattern now in use. One switch shown is equipped with a self-locking ground-throw mechanism which is provided with a spring to permit trailing movement. For the first time this company is showing the new 9 in. 134-lb. girder trilby section with the 150-lb guard, also a 7-in. 122-lb. girder trilby section with the 140-lb. guard as recently adopted by the American Electric Railway Engineering Association.

REMARKABLE TEST OF DOOR OPERATOR

At space 22 the Consolidated Car-Heating Company is continuing the breakdown test on its door operator. At the close of last year's convention the operator had performed 250,000 complete cycles of operation with no attention whatever. Then the exhibit was boxed, and this year the identical machine with no alterations, repairs or changes in any parts whatsoever, with the exception of lubricating the leather packing, is continuing this test. The remarkable feature is the small amount of wear shown by the machine. This fact, however, is explained by the company as being due to the babbitted crossheads and to the small bore, long stroke design of the door engine which gives an exceptional ease and flexibility of operation.

Various other types of door operators, especially the single-tube type which is being installed on the cars of the New York Municipal Railway, are also shown in operation in addition to a new type magnetic air valve employing needle valves instead of the rotary principle. These valves are unusually efficient, and will operate on as low as 9 electrical watts. Push-button switches for controlling the opening and closing of car doors are also shown.

WESTERN ELECTRIC HEADLIGHTS AND TELEPHONE DISPATCHING SYSTEM

The Western Electric Company is exhibiting for the first time at this convention the "Melobeam" headlight adapted for all classes of electric railway service. This headlight consists of a cast-iron frame fitted with a dustproof hinged door in which is fitted two lenses. The outer or front lens is of special construction and is known as the Spreadlite semaphore type which throws a wide beam of light across the tracks, enabling the motorman to see objects at a greater distance on either side. The inner lens, or doublet, is of amber colored Noglare glass which extracts all the violet rays from the light, thus removing the objectionable feature of white light when used in foggy or misty weather. A small spherical silvered glass reflector approximately 4 in. in diameter is set in the back of the case. The lamp socket of this headlight can be adjusted to bring the light center of any 23 to 100-watt concentrated filament Mazda lamp or any 23-watt to 56-watt regular Mazda lamp to the focal point of the reflectors. Several other types of standard arc headlights are also shown.

The company also exhibits this year a telephone dispatching system adapted for use on interurban lines. This system requires but one pair of wires for its operation and enables the dispatcher to call selectively any station along the line without ringing any of the others. At sidings or where no attendant is stationed there is a semaphore which automatically sets at danger as soon as the proper call is sent out over the line by the dispatcher and remains in that position until reset by the car crew after talking with the dispatcher.

Other exhibits are telephones and switchboards, composition and porcelain insulators, trolley wheels, bushings and harps insulating tapes and splicing compounds, line material, poles, car buzzers, fuses, Orangeburg fiber conduit and vacuum cleaners.

NATIONAL TUBE COMPANY SHOWS PANAMA-PACIFIC EXPOSITION STUNTS

The National Tube Company is exhibiting at spaces 554-557 a novel suite of furniture made of Shelby seamless tubing. This furniture, which has been made up for use at the Panama-Pacific Exposition, consists of one settee, one table and six chairs. These, together with the famous Shelby table top, impress every spectator with the variety of uses to which Shelby seamless tubing is adapted. Another exhibit for the Panama-Pacific Exposition is a rack of sectional specimens of Shelby trolley poles. Mounted on this is a complete trolley pole, including base, etc., and the tension is shown on a dial scale. This exhibit is attracting much favorable attention.

Living up to its reputation for exhibiting curious specimens of "National" products as taken from actual service the company is displaying several lengths of 8¼-in. "National" casing telescoped one within the other. This peculiar sample was obtained when a 1600-ft. string of this casing slipped from the elevators in an oil well and fell 200 feet to bedrock. The impact was terrific and resulted in three lengths of the same size casing telescoping one within the other. There is no trace of buckling nor opening at the weld. Aside from being a freak it is a remarkable demonstration of the quality of the steel used in "National" casing.

ADDITIONS TO THE LIST OF EXHIBITS

Acme Supply Company, Chicago, Ill., spaces 582, 583. Crown and Gem curtain fixtures, brass window sash, sash locks, Duplex weatherproof windows, Kass safety step treads, Regal revolving or hinged shade boxes, Chanarch steel flooring, friction roller curtains, safety step box, steel car doors, Acme weather stripping. Represented by Stanley W. Midgley, Roy C. Munro, John T. Morton.

Railway Materials Company, Chicago, Ill. Brakeshoes, Rymco high-speed automatic trolley switch. Represented by G. F. Allen, E. C. Folsom, I. B. Lesh.

National Carbon Company, Cleveland, Ohio. space 326. Fifty-four different grades of carbon brushes, carbon-graphite brushes, graphite brushes and metal-graphite brushes. Carbon of various types for headlights, flaming arcs, arc welding, etc., Duplex, multiple and other types of dry cells. Represented by F. D. Kathe, O. T. Weaver, E. H. Martindale.

The new attraction at spaces 376 and 379, the convention home of the Peter Smith Heater Company, is its new No. 1-S-C. magazine heater. This heater has been developed to meet the needs of interurban service, having a magazine of sufficient capacity to hold coal for a day's run. This heater will occupy floor space 22½ in. square, weighs 555 lb. and will heat cars ranging in length from 32 ft. to 45 ft.

NEW ACME SUPPLY PRODUCTS

Quite a number of new devices have been developed and are now on exhibit in spaces 582 and 583, where the Acme Supply Company and the Transportation Utilities Company are located. Among the newest features are the Crown and Gem curtain fixtures. The Acme Supply Company recently has gone into the business of curtain fixtures, including a pinch handle or compression curtain fixture and the Regal revolving or hinged shade boxes for side window curtains. The shade boxes permit free adjustment or curtain replacement and facilitate cleaning. They are made in two styles, a plain one for street cars and an ornamental box for interurban cars.

A light-weight and efficient type of safety step tread, known as the Kass safety step tread, is also shown. This is a punched steel tread which may be manufactured in any gage or shape. In fact, in may be formed to eliminate wooden treads, and at the same time is much lighter than other treads now in use. Other steel pressings shown are several styles of one-piece all-steel doors which were manufactured for the New York Municipal all-steel cars. The well-known Acme brass sash, which is now being generally used in all-steel car construction, is prominently displayed.

NEW MAYARI STEEL SERVICE TESTS

To demonstrate the extraordinary fiber stress values of Mayari steel the Pennsylvania Steel Company and the Maryland Steel Company are exhibiting this product under various serviceability tests. An 80-lb. A. S. C. E. rail-bound manganese steel center frog, bolted with Mayari chrome-nickel steel bolts which have been given a severe service test, is the center of attraction. This frog was installed in the yard of the company. As a draft of ingot cars was being taken through the turnout of which the frog was a part, a hook attached to a chain which was dragging along the track engaged one of the rail arms and bent it to an angle of 90 deg. The bolts held firm and no indication of fracture under this severe test appeared although the rail broke.

A vibratory testing machine employed to show the toughness of heat-treated Mayari steel under alternate stress or fatigue tests is also on exhibition. This alternate stress condition exists in the track bolts, in joints and connections, hence a very high elastic limit is desired. Heat-treated Mayari steel bolts in rail joints and frogs give the high elastic limit of 75,000 lb. per square inch.

Another feature in this exhibit is a test of a Mayari steel bolt under continuous tensile stress. For the purpose of the test a 1-in. bolt has been turned down to 5-32-in. diameter and then loaded with 2300 lb. of pig iron. This bolt was put under this test at the National Railway Appliances Association exhibition in Chicago last March and is shown again here without any evidence of elongation or that it has approximated its elastic limit.

EVER-SHARP STELLITE CUTTING TOOLS

Probably the most wonderful achievement of recent times in the metallurgical art is being shown by the Midvale Steel Company, and is known as Stellite. This wonderful new cutting metal which is not steel but an alloy of rare elements, contains characteristics which are revolutionizing machine-shop practice. Primarily it is intended to increase machine tool capacity or cutting speed 50 to 300 per cent. Its chief characteristic is abrasive hardness, and it is largely used as a cutting tool in lathes, since it is not adapted to planers or work which is subject to shock. Cutting tools made of Stellite are especially adapted in turning down commutators, since they may be run at extremely high speeds and do not require grinding. In an actual test a high-speed steel tool had to be ground after turning one commutator. A Stellite tool doing similar work turned four commutators without grinding, and at the close of the operation was in good condition. Moreover, this was true after the Stellite tool had run at a speed three times greater than had ever been attained in the shop where the test was made. A peculiar characteristic of this metal is that it has no temper and is cast in different shapes, namely, flats, squares and rounds, and ground to finish.

THE CARNEGIE EXHIBIT

In addition to the Carnegie Steel Company's exhibit of steel products it is showing special materials which are of vital interest to the street railway fraternity. It is making a special joint tie which is a combination of standard steel cross-tie sections fabricated in such a manner as to make a firm structure immediately under the joint. It is displaying a tie of this character to be used with concrete construction as well as ballasted construction, the only difference being the weight of the section which enters into its make-up. The company has specimen ties section M 28 weighing 28 lb. per foot, both insulated and non-insulated, similar to that being tested on the Pennsylvania Railroad. A new product in the shape of the Braddock insulated joint is being shown for the first time. Hanging in the space facing the Boardwalk is a very interesting set of photographs illustrating a special machine designed by Charles H. Clark of the Cleveland Railways for tearing up pavement preparatory to reconstruction. The carhouse name of this machine is a "rooter." Its record is 4500 ft. of pavement removed in twenty-eight minutes by four men, some "pork." This track was afterward laid with Carnegie steel cross-ties.

Rolled steel blanks from which motor gears are cut are also an interesting feature of the Carnegie exhibit. These blanks were brought out to replace castings which, owing to their nature, are not of sufficient strength and reliability to be used with the high-powered motors of to-day. The rolled steel blanks on exhibit are made from an ingot 22 in. x 22 in. and about 7 ft. long. The ingot is first rolled into a round of about 15-in. diameter, giving a reduction in the first mechanical treatment of about 60 per cent. After sufficient discard has been made to insure freedom from piping and undue segregation, this cylindrical bloom is cut into discs of the proper weight to produce the blank desired and is rolled in the same general way as a steel wheel into the blanks shown. The advantages of rolled steel gears are that they contain no hidden blow holes and that the metal has a fine grain owing to its mechanical treatment. The teeth on a finished gear are on the periphery of the disk so that there is very little variation of strength. Rolled gears are used almost exclusively on 75-hp motors and larger, and for difficult service are destined to replace castings.

This year the Railway Improvement Company is attracting considerable attention with its "Rico" terminal clock, which meets a long-felt requirement of modern railroading. This clock is installed at terminals or time points along the line and serves as a conductor's standard clock and at the same time gives an accurate printed record of the running time at these time points. In conjunction with this clock each motorman uses a daily card or envelope on which he automatically records his arrival and leaving time at all time points. These clocks are now in use on the Interborough Rapid Transit Company's lines, where the running time record envelope has been substituted for the daily time card. Another argument in favor of this clock is that on interurban lines it serves as a check on motormen who are inclined to turn back without going to the extreme end of the line. It is also asserted that to a great extent it eliminates the tendency to disregard orders for lay-over. This company is also exhibiting several types of its well-known Hedley anti-climbers and "Rico" sanitary straps.

IMPORTANCE OF BRAKE CYLINDER PISTON TRAVEL

Have you seen the machine gun in the Westinghouse booth? An exhibit of striking similarity in appearance to a rapid-fire machine gun is being shown by the Westinghouse Traction Brake Company to demonstrate the saving in operating expenses and improving the handling of cars in making stops, by insuring a proper and automatically adjusted piston travel.

The reasons why an efficient slack adjuster should be applied to every car are summed up in the following statements among others:

Prevents power being consumed by dragging brakeshoes.

Does away with shoe wear caused by shoes dragging upon the wheels.

Makes possible longer coasting periods, because brakeshoes clear the wheels.

Permits a higher schedule speed because of the decreased energy consumption.

Prevents loss of brakes on account of piston striking the cylinder head.

Saves time in making a stop.

Insures that the brakes will be promptly responsive to the motorman's intention.

Shortens the distance required for a stop.

Makes possible a higher maximum speed because a shorter stop can be secured.

Reduces the skill required of the motorman because of the uniform brake action.

When several cars are operated together, insures that all will be retarded uniformly.

Finally, proper piston travel is expensive and difficult to obtain. By means of the slack adjuster, it is obtained automatically, and in addition, the cost of maintenance and inspection is reduced, the trouble and annoyance resulting from improper slack adjustment are eliminated and the revenue car-miles made by the car between repair periods are increased.

A "SAFETY FIRST" SLIDING DOOR

The Prepayment Car Sales Company, in space 414, has on exhibit a sliding door that embodies several interesting features. It is designed to be used as a center door for interurban subway or elevated cars, although it can be used to equally good advantage at any point where a sliding door is desired. The door is equipped with the latest type pneumatic engine with electrically-controlled valve. All working parts of the engine are fully inclosed and packed with lubricant, which gives a splash lubrication during the operation of the door.

One of the most interesting features is the "safety shoe" which is mounted on the forward edge of the door. By means of this shoe the door can be closed on a crowd of children without danger of catching and hurting them. As soon as the shoe touches an obstruction it collapses on the door, reversing the operating air in the engine to make the door recede from the obstruction. As soon as the door is clear the shoe falls into place and the door again moves in a closing direction. If the obstruction has been moved the door closes at its normal speed. If the obstruction is still in the doorway the door again recedes. This is repeated until the doorway is clear to permit the door to close with safety. The advantage of this feature can be readily seen when it is borne in mind that usually the man operating the door is half a car length away from it. During rush hours it is generally found necessary to place a platform man at the center doors to assist passengers into the cars. Arrangements are provided whereby the platform man can close and lock the door by hand when the passengers are aboard.

ARMATURE BANDING MACHINE A FEATURE OF ELECTRIC SERVICE EXHIBIT

A universal armature banding machine is a new feature of the Electric Service Supplies Company at space 414. This machine embodies an important advantage over the ordinary method of treating armatures in avoiding the necessity of removing armatures from a separate lathe, because it constitutes a single piece of apparatus for winding, banding and painting armatures and for truing, slotting and grooving commutators. This company is displaying a new line of flatter and wider insulators of greater strength, mechanically and electrically, than its former high-pin type.

Another improvement has been made in the design of Garton-Daniels lightning arrester box, the opening door to which is now constructed with a hinge at the top of the box instead of at the side, as formerly. This arrangement, in case of a direct stroke of lightning, enables the hot gases produced within the box to escape more readily, without injuring the device. A high-frequency apparatus for artificially simulating a lightning disturbance is operated for those who desire to test the efficiency of the arresters. Still another innovation exhibited by the company is its "Melobeam" headlight, in which violet and ultra-violet rays are suppressed by means of an amber-colored glass lens, leaving only the rays of longer wave length, which penetrate better and without glare through fog, dust and darkness. This company is exhibiting its complete line of Keystone car destination signs in a novel way by means of a device which revolves the sign curtain, and makes it pause for a moment at each destination lettering.

GEAR TREATING AT THE NUTTALL PLANT

The R. D. Nuttall Company, showing at spaces 140, 142 and 144, for more than a quarter of a century has been supplying the railway trade with gears, pinions and trolleys. This company not only makes gearing for the railway field, but practically every gear application of the industrial world can be fulfilled in its extensive and complete plant.

The railway gear department is devoted exclusively to the cutting of gears and pinions for railway use. The heat treating department works in conjunction with this department, in that it receives gearing for heat treatment after having been cut. This heat treating department is fully equipped with heating furnaces which allow the heat to become gradually absorbed by the steel until it is of uniform temperature throughout. The pyrometers used for measuring temperatures are of the most improved type of water-cooled cold junction, rare metal couple. These are so constructed that if any one of them is out of order at all no temperature is recorded. This eliminates any slight discrepancies in the recording of the temperature. As an additional safeguard, however, these pyrometers are checked from time to time.

The quenching baths are large enough to permit continuous operation throughout the day without the loss of cooling efficiency. Several tanks of different solutions provide a good range of cooling mediums through which the desired rate of cooling can be obtained. Low temperature furnaces and drawback baths permit uniform tempering at any desired temperature. This insures a material of uniform hardness.

The heat treating department is under the constant supervision of an experienced metallurgist who works closely in touch with the research department toward the development of high-grade gears and pinions.

George Scott, of the Cleveland Fare Box Company, is attending the convention in the interest of his company. The company has no exhibit this year but Scott says the growing demand for locked fare boxes is such that his company will make an exhibit at future conventions.

Among the Exhibits

Easy and safe access to interurban cars is demonstrated by the folding step shown here for the first time by the Blake Car Step Works.

* * *

E. H. Hauserman, Cleveland representative of the G. Drouvé Company, arrived this morning to attend the convention. He is some baseball fan.

* * *

F. N. Root, of the Root Spring Scraper Company, arrived here Monday. He has no exhibit this year but is chuck full of efficiency talk about his six types of spring scrapers.

* * *

H. B. Logan, President of Dossert & Company, is attending the convention in the interest of Dossert cable connectors for electric railway power and substations. He is stopping at the Marlborough-Blenheim.

* * *

Jim Patton, of St. Louis, is reported to be carrying his arm in a sling. It is reliably reported that too frequent pushing of Pullman buttons often causes temporary paralysis, but of course this has nothing to do with Jim.

* * *

Tom K. Bell and E. Walter Jansen of the Atlantic Welding Company, New York, are here in the interests of an absolutely new method of electric rail welding. This method has met with remarkable success abroad and is now available to meet the most arduous conditions of American electric railway service.

* * *

Barnes & Kobert Manufacturing Company, Milldale, Conn., reserved space at the convention, but was unable to exhibit, largely on account of a rush of business for the fall season and the fact that it has recently moved into its new plant at Milldale, Conn., which it is now equipping with new machinery.

* * *

The interests of Arthur D. Little, Inc., Boston, Mass., are looked after at the convention by C. F. Woods, engineer of the Little laboratory. He is stopping at the Dennis. As chemists and engineers of tests this organization is rendering valuable service to a number of electric railway properties in the purchase of materials, from the coal pile to the track, line and car outfits.

* * *

The Manganese Steel Rail Company, New York, is represented at the convention by W. S. Potter and A. Aigeltinger, chief engineer and metallurgist of the company. This company has for some years marketed manganese steel T-rails to steam and electric railways. It is now preparing to manufacture girder manganese steel rails which will be ready for the market within the next three or four months.

* * *

The Pyrene Manufacturing Company had an opportunity to demonstrate the effectiveness of the Pyrene fire extinguisher Tuesday afternoon. A fire started in the exhibit of the Indianapolis Switch & Frog Company but, thanks to quick action and the extinguisher, the blaze was quenched before it had a chance to do any damage. "They're handy things to have around," says Mr. Maloney, the sales manager.

* * *

While the man who said "it can't be did" has been nursing his despair, the Westinghouse Traction Brake Company has gone ahead and done it. The problem of providing an automatic coupling of all control and other wires between cars has been worked out in a thoroughly practical manner. A complete equipment of automatic car and air coupler combined with the electric coupler is being demonstrated in the Westinghouse booth for the benefit of all convention visitors who may be interested.

The feature of the Railway Roller Bearing Company in space 134 is its Rollway oil-tight bearings for railway trucks and motors. The bearing has a fixed end-thrust adjustment and its main parts are reversible so that it is easily assembled on the axle through screwing all nuts tight. There is also displayed a model of solid roller-bearing, free-running wheels on a stationary axis, as well as models of roller-bearing shields, roller-bearing center-plates with cone-disked rollers and roller-bearing interchangeable journal boxes.

* * *

In space 507 in the Annex the Standard Paint Company, New York, is showing for the first time the "Imp" shingle for roofing. This shingle is made of the same composition as the well-known Rubberoid roofing, a non-brittle fire resisting material, with great toughness and strength estimated to last from two to three times as long as the best cedar shingle. The New York Central, Virginia Railway, and the C. C. & O., have recently completed installations on a number of new stations along their lines with "Imp" shingles. There is also exhibited a composition board for interior finish and decoration called "Amiwud." The board is shown in various finishes. Besides these, P. & B. insulating specialities are displayed.

* * *

The G. Drouvé Company, space 607, is again in the same location, the hotel men's annex, near the meeting halls of the American and Engineering Associations. Welcome is written on the mat and first aid service can be rendered to those desiring permanent fireproof and weatherproof ("Anti-Pluvius" puttyless) skylights. The "straight-push" sash operator meets the problem for the regulation of natural ventilation and is designed for difficult and unexpected service. Mr. Dee, Bridgeport, Conn., and Mr. Hauserman, Cleveland office, are in attendance, and when it comes to daylight and natural ventilation matters they have dozens of references to cite and "to help the man who wants to know and profits through the experience of others."

* * *

In addition to the exhibition of Nuttal standard railway material, including gears and pinions and trolleys, the R. D. Nuttall Company demonstrates the practical heat treating of steel as applied to its various grades of gears and pinions. In addition to this, it demonstrates the use of machines for determining the hardness, abrasive qualities and resistance to impact, with special machines for this purpose. It also shows the latest development in railway gearing, including flexible gears as used on the motor cars of the Pennsylvania Railroad electrification, Paoli Division. Further, it presents the latest developments in current collecting devices, including pantograph trolley, such as will be used on Pennsylvania electrification, and other types of pantograph current collectors for a. c. and d. c. electrifications.

* * *

In connection with its exhibit of electric railway overhead materials, rail bonds, third-rail insulators, car equipment devices and "Hi-Tension" insulators, the Ohio Brass Company, in spaces 358-365, is planning to have in continuous operation during the convention several tests and demonstrations of the various devices under working conditions. Electrical tests will be conducted on several different forms of strain insulators for electric railway circuits and also on the high-voltage transmission line insulators. Any who are interested in the study of insulating materials can undoubtedly acquire some valuable data at this booth. Tomlinson couplers and several other car equipment devices will be so demonstrated as to show clearly their behavior under operating conditions. The plan is to have something going on at the O-B booth at all times.

In space 18, Main building, the Flood & Conklin Company, Newark, N. J., is demonstrating the efficiency painting and varnishing of railway cars, in its Simplex one, two, three and four coat varnishing process.

* * *

The American Steel & Wire Company has a working exhibit which includes Ben Ryder and an electrically operated four-spindle motor drill for applying their twin-terminal bonds. An interesting feature of this drill is that it does not clamp to the track.

* * *

Ramapo Iron Works, of Hillburn, N. Y., is represented at the convention by James B. Strong. T-rail special work, electric and steam railway crossings, manganese frogs and switches and Ramapo patent safety switch stands for interurban service are manufactured by the company at Hillburn.

* * *

Henderson W. Knott ought to be happy because a representative of the Chicago Surface Lines has said that Morganite E-G-3 brushes, the highest priced and best brush that Knott sells, will hereafter be used on the surface line cars in Chicago, where there are more than 3500 of these cars. Hence Henderson's happiness.

* * *

Mr. Mason is representing his own interests, E. R. Mason Company, New York, at the convention. As Eastern representative of the Johnson Fare Box Company, Hunter Illuminated Car Sign Company and the Esterline Company, he is busy showing his railway customers and friends the exhibits of these companies on the pier.

* * *

The old hickory bower swing is just in the rear of the Drew Electric & Manufacturing Company exhibit of line supplies. James Drew is talking about the motorman's safety mirror, protective and reclaiming pole sleeves, Sampson pipe insulation for the prevention of electrolysis, Drew type trolley frogs and a lot more good overhead and line material. Walter Healy is here, too.

* * *

R. M. Campbell is present at the convention, representing the railway department of the Detroit Graphite Company. His headquarters are at 135 Broadway, New York. The Detroit Graphite Company is a maker of general paints for every purpose where paints are used. Mr. Campbell is concentrating on sales of paints for cars, trucks, poles, bridges, power-houses, stations, buildings, for electric and steam railways.

* * *

Forged manganese steel bolster and transom shifting plates, transom gibs and brakepins are the features in the Alloy Steel Forging Company's exhibit in space 569. Tests of these materials extending over one year are being conducted on twenty electric roads, but none have been completed because no parts have worn out or broken. The claims for this company's products are that they do not crumble and parts may be made much lighter with greatly increased life.

* * *

The Electro-Mechanical Brake Company, Ltd., West Bromwich, England, in space 610 is showing E M B unbreakable jointless grid resistances for traction and industrial use. These resistances, as recently described in the Electric Railway Journal, represent a great advance over ordinary cast types by reason of their jointless, rustless construction and other features. Specimens are displayed of the equipment used by the London County Council and the Birmingham, Adelaide and other electric railways.

* * *

The Index Visible, Inc., is displaying in space 523 a card system which is devised to eliminate all hunting through cabinets for cards. The cards are all placed in the index in plain sight with the keyword of each shown in the visible margin so that it is impossible to misfile a card. The flexibility of the system allows it to take care of 100,000 cards just as easily as of 1000. It is particularly adapted for use by electric railways in connection with subsidiary ledgers, stock records, cost records, purchasing agents' lists and payrolls.

* * *

The result of a remarkable gear and pinion service test is shown by the Joseph Dixon Crucible Company at exhibit space 16. This company is showing a half-section of a G. E. gear which has been in service continuously for the past six years on the Northampton, Easton & Washington Traction Company, and which was recently removed from a car after having made more than 300,000 miles; also a pinion, which has been in continuous service on the same road for five years and which made more than 250,000 miles. Dixon's graphite wood gear grease was the only lubricant ever used on these gears.

* * *

In space 314 Ernest H. Thompson is displaying an electrically operated fare box with an attached change-maker as an integral part. Six electrical connections are made through the base of the box, which is removable. The deposit of the exact fare is recorded on the totalizer and also by one hand of the overhead register, while the presentation of a transfer results in the conductor pressing a plunger to work another totalizer and to turn the other hand of the overhead register. The change-maker, the slot of which may be kept closed at the will of the conductor if desired, gives change for dimes, quarters, and half dollars directly to the customer. The object is to eliminate the conductor from the coin-handling process and to perform his fare collecting functions mechanically.

* * *

The Hale & Kilburn Company has a unique exhibit in the shape of a 40-ft. steel car interior equipped with its steel finish doors and seats, of the various standards used by the leading railways, thus affording the visiting officials opportunity to examine and test as in actual service in the car itself, the important features included in this company's product. One end of the car is equipped with its new steel transverse seating adopted for the New York Municipal Railway cars now under construction. The windows of the entire car open on the ocean, and a delightful view can be had while enjoying the very comfortable seats arranged opposite each car window. The exhibit has excited many favorable comments and it is referred to as the finest and most unusual ever seen at any convention.

* * *

In spaces 36 and 38 the Hunter Illuminated Car Sign Company, Flushing, N. Y., has a most extensive exhibit of illuminated car signs. Over the center of the aisle is suspended an illuminated sign operated by a motor. In this sign is a 30-ft. curtain with thirty-five destinations printed on it. The 175 new center-entrance cars on the New York Railways are equipped with this type of sign. A sign is also displayed similar to that furnished for the 125 new cars recently put into operation by the Municipal Railway of San Francisco. This is an open-front sign, so constructed that the curtain can be taken out as a unit, the curtain being interchangeable for other cars, whenever rerouting is necessary. There is also exhibited a route number sign of right-angle construction, one side of which faces the front of the car and the other the side of the car. In this are numbers from "1" to "99" printed on the curtain. The Pittsburgh Railways have 200 cars equipped with this type. One sample sign is shown of those furnished—four to a car—on the 228 new cars of the Chicago Railways. Also a twin-operated sign for the side of the car similar to those recently furnished to the Rhode Island Company, Providence, and the Bay State Railway, Boston. Other types of illuminated signs are also shown.

J. N. Johns Manufacturing Company, New York, is exhibiting bearings of all types, brush-holders, trolley wheels and other maintenance specialties.

* * *

Heywood Brothers & Wakefield Company are exhibiting in space 566, car seats with steel construction throughout, upholstered in rattan; light steel reversible seats with plush and wood cushions, and reed parlor car chairs.

* * *

Lefax loose-leaf engineering data, pocketbooks, filing boxes, blank sheets, and other specialties comprising the Lefax service are shown by the Standard Corporation at space 10c, in care of J. C. Parker, Bernard Dieckhaus and William C. Wells, Jr.

* * *

A full-sized car cable of unusual flexibility is the feature attraction of the exhibit of the John A. Roebling's Sons Company at spaces 17 and 19. The flexible quality of the cable is secured by lining it up like a regular cable, thus making it easy to handle and to install.

* * *

In space 319 the McQuay-Norris Manufacturing Company is showing a complete line of its well-known leak-proof piston rings. These rings are made in sizes from 1 in. to 34 in. in diameter. This company has recently moved into its new factory and is now better prepared than ever to make prompt deliveries.

* * *

Various styles and sizes of Penco culverts are on exhibit in space 108, occupied by the Penn Metal Company. The well-known merits of this company's culverts are that the metal is non-corrosive and that the shape of the culvert is designed to give a smooth bottom. This culvert pipe is furnished knock-down and the sections are bolted together at the point of installation.

* * *

The Acme Supply Company, Chicago, has become a full-fledged member of the Manufacturers' Association and now has a lot to say about several new car supplies, fittings and materials. Its products have been exhibited, as they are this year, with the Transportation Utilities Company, its Eastern agent. Several brand-new products ought to get a good reception by rolling stock engineers who are anxious to keep a little bit ahead of the procession. These new products include Regal revolving curtain box, Crown and Gem pinch handle curtain fixtures, Kass safety step treads and duplex weather-proof windows. There are a lot of other old reliable products to be seen, and also this company is showing full size metal doors and trims as built for the 200 New York Municipal subway cars.

* * *

Most everybody knows of Prest-o-lite. That is, every automobilist or motorcyclist does. And now many will see for the first time the application of the chief product of the Prest-o-lite Company to electric railway construction, operation and manufacturing industry. This company, a new member, has a working exhibit of welding and cutting. It shows portable oxy-acetylene outfits for shop, track and line use. A most convincing part of this display is a group of broken parts such as truck frames, journal boxes, motor housings, grids, etc., that have been welded. The oxy-acetylene process of applying rail bonds is also shown. Demonstrations of the cutting and welding of various metals will be made at frequent intervals. Among those in attendance are H. Sidney Smith, engineer, and S. D. Winger, railway salesman.

* * *

The Federal Signal Company at space 131 has several working signals and is making a particular feature of application to a.c. signaling. The light signal similar to that used in the Brooklyn Rapid Transit installation is shown in operation. The exhibit includes also an interurban signal of three-position, 4-A, bottom post type. In this the mechanism is entirely inclosed and room is allowed in the case for auxiliary apparatus, such as the track and line relays, terminals, lightning arresters, etc. This auxiliary apparatus is shown on separate racks, and in addition there are displayed a track transformer, single and polyphase relays, heavy reactance bond, etc. A standard Type 4, low-voltage universal signal is also shown. This type can be used either as top-post, bottom-post or dwarf signal.

* * *

A station coin register having features entirely new is shown by the International Register Company, spaces 300, 302 and 304. This machine was designed to meet conditions in the subway and elevated stations at Boston and eliminates the sale of tickets. The lower part looks like a ticket-chopper and receives in a hopper, 10-in. square, nickels, dimes or cents. These fall on a revolving cylinder, where they may be inspected by the attendant and are then automatically registered on a fare register mounted on a column above the machine. The registering mechanism is driven by an electric motor running continuously. Three thousand to 4000 fares per hour can be taken in one of these machines, at a large saving in the cost of tickets and the wages of ticket sellers. In its operation change is provided at a separate booth, where only a small percentage of passengers are received. Thus the time saved to the public in having exact change reduces change making to a minimum. These machines may be seen in operation in the new Boylston Street subway at Boston.

* * *

The Graphite Lubricating Company, oil-less bearing specialists, Bound Brook, N. J., are represented at the convention by George O. Smalley, assistant general manager. This company plans to make a change in the graphite insert of its trolley wheel bushings commencing Jan. 1, 1915. After that date all inserts will be made to form the words "Bound Brook," which is the trade mark of the company. The word "Bound" will be formed by the insert on one-half of the bushing, and the word "Brook" by the other half. This change will be inaugurated as a further protection for its customers and as a means of affording a definite way of knowing whether or not they are securing the genuine "Bound Brook" bushing. Advance samples of the revised bushing are shown in the booths of R. D. Nuttall Company, Electric Service Supplies Company, Sterling Fare Register Company, Star Brass Works, A. & J. M. Anderson Manufacturing Company, Western Electric Company, and the Bayonet Trolley Harp Company.

* * *

Charles N. Wood Company, Boston, is showing the Chapman automatic signal. In this signal all indications are given by a three-position semaphore arm (non-inclosed) and the method of operation is such as to prevent any misunderstanding of signals by the motorman. At night the indications are given the same as in the daytime, the arm being illuminated. Colored lenses may be attached to the semaphore arm if desired as in steam railroad practice. Only two line wires are required. This is a very important feature, as a multiplicity of line wires makes for an increase in line and signal troubles and adds greatly to the cost of installation, as well as maintenance. This is a car-counting signal, the counting mechanism being very simple and reliable, with few parts. Even if cars enter and leave the block at the same time a correct count in maintained. The signal indication given to allow a car to enter the block follows only after the actual operation of counting in the car has been completed. The lights to illuminate the arm at night are all independent local circuits and not connected with operating circuits, therefore any failure of light does not affect the operation of the signal.

The Cooper Heater Company, Carlisle, Pa., is showing its forced ventilation hot-air heaters and pressed steel hot-air heaters.

* * *

The Sterling Varnish Company, Pittsburgh, is exhibiting samples of insulating varnishes, impregnating compounds and iron enamel paints.

* * *

The National Car Wheel Company offers the Star Special, a chilled cast-iron car wheel of special design and special quality for city and interurban service.

* * *

S. Abrahams Company, Philadelphia, has a full line of uniforms and caps of all descriptions to make the electric railway employee spic and span as any man.

* * *

In Aquarium Court the Wilson Remover Company is demonstrating in a practical way the application and efficiency of its paint and varnish remover.

* * *

J. F. Decker, of the Auto Utilities Manufacturing Company, maker of the Peerless ventilator, is attending the convention but is not making an exhibit this year.

* * *

The Kerite Insulated Wire & Cable Company, in spaces 130 and 132, has on display various sizes of submarine, aerial and underground wire. The particular features are Kerite signal and high-tension wires.

* * *

An attractive reception room has been arranged by The Okonite Company in space 168. The company is exhibiting a varied assortment of Okonite wires and cables, Candee potheads and Okonite and Manson tapes.

* * *

P. Edw. Wisch, of the P. Edw. Wisch Service, New York, is attending the convention in the interest of his own business,—secret service work for street and interurban railways. He is stopping at the Marlborough-Blenheim.

* * *

The Dupont Fabrikoid Company has on exhibition Fabrikoid artificial leather as well as railway car seat upholstery and Fabrikoid car curtain material. These goods are shown in the loose form, and also on car seats upholstered with Fabrikoid as well as car curtain models.

* * *

The Buda Company's representatives, in space 311, are extending a cordial welcome to all visitors and incidentally have on exhibit models of this company's iron-bound bolted-down manganese insert special track work set in partially machined pockets. Also a number of large photographs of complicated layouts in various parts of the country are being shown.

* * *

The Wyoming Shovel Works are exhibiting Wyoming Mayari nickel chrome steel shovels, not alone track shovels but concrete shovels, scoops for power-house purposes, etc. The use of nickel chrome steel in shovels is so revolutionary that the claims made for it seem highly exaggerated, but the works have some elaborate testing machines in operation to prove the tremendous wear-resisting powers of the Wyoming Mayari shovels.

* * *

F. F. Stockwell, W. W. Field and F. H. Ellis of the Barbour Stockwell Company, Cambridge, Mass., together with a contingent of railway men arrived on Monday morning to attend the convention. Although the company has no exhibit, its representatives can tell you all about special track work manufactured of solid manganese steel, manganese insert work in steel and iron-bound or its well-known forged steel insert frogs and crossings.

The Standard Underground Cable Company at "The Sign of the Reel," space 388, is featuring "Standard Special Bronze (SSB) trolley wire," a trolley side feeder subway switch box, Colonial copper clad wire for guy wires, etc., and other products of particular interest to railway companies. Its exhibit also includes a complete showing of bare and weatherproof wires, lead-covered and armored cables, jointing materials, indoor and outdoor cable terminals and subway junction boxes.

* * *

The Rooke Automatic Register Company is exhibiting two cases containing fifty automatic collectors. These cases are similar to those in use on electric railways using Rooke registers. On the inside of the door of these cabinets are complete directions on how to use the register. The adaptability of these registers to take care of nickels, dimes and metal tickets is also being demonstrated. On one system about $5,500,000 is collected annually with Rooke registers without the loss of a fare. The company has lately equipped the Hazleton (Pa.) division of the Lehigh Valley Traction Company. The Hillside Transportation Company, Inc., Jamaica, N.Y., is also equipping its line with this register.

ARTICULATED CARS AT BOSTON

The Boston Elevated Railway began the use of articulated cars in 1912 in the belief that this method of construction would relieve the company from the drawbacks of operating rolling stock of small capacity on lines subject to a growing traffic. The type of car thus developed by John Lindall, superintendent of rolling stock and shops, has been thoroughly successful. Thirty-two articulated cars are now in service, and thirty-seven more are to be constructed in the near future, including six assembled from 25-ft. car bodies. Car bodies 20-ft. long have been utilized up to the present time in the formation of the complete articulated cars.

No complaints of importance regarding these cars have been received, boarding and alighting accidents have been greatly reduced by their use, and they have shown particular value in runs on short lines to and from terminals where quick loading without collection of fares by conductors is desirable. The step height of 14-in. above ground with a 6-in. step from the intermediate platform into the car body was provided to facilitate safe and convenient ingress and egress, this feature having been adopted many months before the question of step heights was taken up by the Public Service Commission of Massachusetts. The prepayment feature also has been found as valuable in these cars as in other types. In fact, as an economical means of utilizing good rolling stock whose capacity is fast being outgrown, the Boston articulated car is very successful.

The Department of Liberal Arts enjoys the distinction of having the first completely installed exhibit at the Panama-Pacific International Exposition. This is a "working exhibit" in the Palace of Liberal Arts by the Star Electric Company, Binghamton, N. Y., and forms the central fire and police alarm signal station for the entire exposition grounds.

A novel device for electrocuting rats was rigged up recently by the crew of the railroad station at Fort Wayne, Ind., where they believe in "doing it electrically." Not long ago rats entered the basement of the new station through the coal chute and gave trouble until the stationmen got together and constructed an electric chair especially designed for rats. The "chair" consists of an iron plate with a steel spike suspended above it, both the plate and spike being connected to the two wires of an electric circuit. With the spike baited with a piece of cheese, the rodents which venture upon the plate and reach upward complete an electrical circuit through their bodies and thus become their own circuit through their bodies.—*Electrical World.*

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PROGRAM FOR TO-DAY

CONVENTION MEETINGS

9:30 a.m.	Joint Session of Accountants' with Engineering Association, Engineers' Hall, Convention Pier.
9:30 a.m.	Meeting of Claims Association, Claims Hall, Convention Pier.
9:30 a.m.	Meeting of Transportation & Traffic Association, Greek Temple, Convention Pier.
11:30 a.m.	Meeting of Accountants' Association, Accountants' Hall, Convention Pier.
11:30 a.m.	Meeting of Engineering Association, Engineers' Hall, Convention Pier.
2:00 p.m.	Meeting of American Association, Greek Temple, Convention Pier.

ENTERTAINMENT

10:00 a.m.	Obstacle Golf, Marlborough-Blenheim Lawn.
11:00 a.m.	Morning Concert by Engel's Orchestra, Lobby, Convention Pier.
3:00 p.m.	Afternoon Concert and Thé Dansant, Parisian Garden, Convention Pier.
4:00 p.m.	Obstacle Golf, Marlborough-Blenheim Lawn.
9:00 p.m.	Promenade Concert and Ball, Ball Room, Convention Pier.

The Report of the Committee on Public Relations

The long-awaited report of the committee on public relations was submitted yesterday and outlined a definite plan of action before the association. It cannot be put into operation too soon. For years the need of some general plan of publicity on the part of the association has been urged at conventions. It has been felt that if the public really knew what the companies were doing practically all hostility would disappear. Various suggestions have been made at past conventions, all good in their way, but there has been no earnest and systematic consideration of the entire subject. The committee yesterday came before the association with a co-ordinated plan of publicity involving five general methods, any one of which, or all of which, can be undertaken as the funds of the association permit. As a basis for all of these suggested plans the committee prepared a code of ten principles which, in its opinion, form the proper standard under which the general campaign is to be waged. Viewed in its entirety, the report of the public relations committee this year is the most constructive piece of work which has ever been presented to the association in the way of establishing the right kind of relations between the companies and the public. It is the fruition of effort covering a period of more than ten years on the part of a number of the members to have a comprehensive plan of this kind laid before the association. But a beginning only has been made. A program is of no value unless it is followed. The recognition of the necessity of action along these lines is spreading. Most railway companies now realize the desirability of taking the public into their confidence. What is true of individual properties is true of the industry as a whole. We hope that the adoption by the association yesterday of the report of the public relations committee will mean real co-operative publicity on the part of the association and of individual companies during the coming year.

The Code of Principles

In its code the committee followed the logical plan of placing the obligations which the companies owe the public before enumerating those which the members of the committee believe the public owes the companies. The code recognizes the necessity first of all of good service, and the first essential of service is safety. Unless an electric railway can furnish a service which is as safe as human skill and the financial ability of the company can make it, it has no excuse for existence. The quality of service in other respects, however, as well as its quantity, must necessarily depend upon the amount paid for transportation. This is self-evident. No company and no individual for any great length of time can pay out more than is taken in, and no amount of legislative enactment or commission rulings can ever make permanent the delivery of an article for less than its cost or secure a 5-cent service for a 3-cent fare. Following the declaration of the first principle in the code are nine others which we believe will commend themselves as a whole to the industry. These principles have been prepared with great care and thought by the sub-committee in charge of the drafting of the code and have been indorsed by the committee as a whole. In brief they describe the conditions under which electric railway companies can give the best service at the least cost, and they demand in return only a fair interest on a just capitalization under such conditions of full publicity that all conditions of operation and profits may be known to the public.

Joint Tenancy of Poles

The action of the American Electric Railway Association in accepting the recommendation of the committee on the joint use of poles that its report be received and made accessible to the membership gives recognition to splendid work which has been done by this committee since its appointment several years ago. At first glance it would seem like a simple thing to draw up an agreement and specifications under which two or more transmission interests could occupy a pole with due regard for the rights of each other. That this is not so is evident from an examination of the report, and a consideration of the fact that the present recommendations are the outcome of several years of study and many years of experience. The facts are that the question was one of the most serious, from an engineering standpoint, which has been taken up by the association because it required the harmonizing of the ideas of a number of conflicting interests. Perhaps to no other committee has been assigned as complicated a task, if we except the work of the present electrolysis committee, which is somewhat similar in scope. It is clear that joint tenancy should be the practice to the greatest possible extent from consideration of economy and of appearance. The problem is to provide such terms of agreement that the desired advantage can be gained with minimum risk to life and property. The companies operating weak-current circuits are naturally the ones most cautious in this matter because their wires ramify over the country so generally and into the homes of the people so intimately. Their apparatus also is very sensitive to interference. Hence it has not as yet been possible to secure agreement for joint use of poles with these companies where high voltage is involved. In other cases, however, the joint committee has been able to come to terms, and it deserves the gratitude and support of the several interests involved. It is for this kind of work that these national societies primarily exist. The acceptance of the report by the electric railway association is an important step in the movement. While the acceptance of the report does not bind anyone, companies contemplating joint pole tenancy would be short-sighted not to appropriate for their own use and at no cost the results of the arduous work which has been done.

Conventionalities

Anyone know a good wheeze on Nic Le Grand?

Where's this C. W. T. Ry's that has badge 4524?

W. H. Sauvage is here wearing his winter uniform, the same consisting of a flaming tie.

Don't you like Matt Brush's snappy method of running the T. & T. meetings? "Tis a vote!" Bang!

Did Ed Besuden tell you about his center-rear-entrance cars? We're not joking—the doors are in the center of the rear.

Edward Dana of the committee on rules and Mrs. Dana have, as their guest at the convention, Miss Bright of Boston. Must be great to be cultured and bright, too!

Tam Mather of Syracuse wants it clearly understood that he is a real native of ye banks and braes o' Bonnie Scotland (pronounced Scutland) and not a descendant from Cotton Mather.

The capable chairman of the equipment committee, F. R. Phillips, who has held that honor for so long that he can afford to joke about serious matters, seems to be the guy that put the quip in equipment.

We'd have given you the names of the winners in the Auction Bridge Tournament yesterday, except that H. N. Ransom is a charleyross after the game. Charleyross? That means ducked his nut.

Mr. and Mrs. G. A. Barden came all the way from Philadelphia for the convention and they are having such a good time that they hope the convention will stay for another week. Same here!

Senator C. L. Henry evidently believes in the good old American theory that a militant opposition is the safeguard of the nation. The Senator's humor, however, takes most of the sting out of his punches.

H. V. Drown at the Claims Association meeting yesterday claimed that there was no collision when a car struck a pedestrian. Guess he doesn't know Cyrus Ching of the Boston Elevated. We pity the car that hits Cyrus.

By Our Own Gellett Burgess

We never saw a purple cow
(We think the sight would kill one);
But there are purple trucks, we know,
Because we've lamped a Brill one.

The man behind the pocketbook at this convention is Wylie Brown, chairman of the finance committee of the Manufacturers' Association and no end of comment has been created by his skilful handling of funds and his many intricate schemes for benefiting the association. Wiles of Wylie, so to speak.

Henry Gulick, the Boardwalk inspector, picked up a jinx last spring when he moved to New York. First he broke his ankle, then his cook quit, then he got pneumonia and then the war broke out. But the first time he left the house in six months he found that the Middletown (Pa.) mills were working three shifts so that he thinks the effects of the hoodoo don't apply to other people.

A large number of Cornellians have registered for the luncheon to be held to-day in the Forest Room, Marlborough-Blenheim. Other names should be added promptly to the list in possession of Wylie Brown at the Manufacturers' Association office. Added starters, however, will be accepted up to 1 p. m. Men of other colleges will be welcome also. The price of the luncheon is $2 per copy.

This records our bet of two cigars with C. L. Cadle, the genial electrical engineer of the New York State Railways, that he will be operating his Rochester interurban lines on the signals alone, and without train. orders, within six months. Inasmuch as Mr. Cadle suggested this scheme himself eighteen months ago, we think this bet is like taking candy away from little children.

J. F. Layng did one turn around the floor at yesterday's fox-trot and then lost his breath completely. Perhaps the principles of the ventilated motor might be advantageously applied to his lungs, but we rather think instead that they ought to be removed from his feet, which appeared to suffer from excessive cold. At that, he's a pretty good fox-trotter.

Shortly after Wednesday's issue went to press the Washington Railway & Electric Company representatives reported the arrival of two additional members of their staff, bringing the total now in attendance upon the convention to eighteen. The latest arrivals are W. A. Wenner and H. G. Torbet. Can you beat it? The Washington Railway & Electric people insist that no hollow claims for the banner can be considered in the absence of a complete list of names.

The argument was so hot at the Engineering Association meeting this morning that the floor caught fire. Fact! It smouldered all afternoon and broke out violently at 6.30 p. m. last night, but four brave fire boys and two cops got after it with a hose and the engineers will be able to meet this morning. The damage to the building was negligible and the property loss would have been trifling if one of the cops had not lost his breath running to the fire.

Ernest Gonzenbach is registered as general manager of the Empire United Railways of Syracuse, but he is eligible for a number of the engineering associations, for the Diplomats' Club, the Authors' Society and a number of other equally diverse organizations. One of the first books which we ever published on electric railway construction bore his name on its back, and the contributions from his pen have appeared in several popular magazines. In fact, he has as wide a point of view as his native country, Switzerland.

Major H. C. Evans has undoubtedly a longer record in the way of attendance at electric railway conventions than anyone else here. This is the twenty-ninth consecutive convention at which he has been present, and he is regarded as the Nestor of the supply business. Major Evans joined the forces of the Lorain Steel Company thirty years ago this week, and in commemoration of this fact the sales organization of that company is to extend a dinner to him at the Bellevue-Stratford on Friday. Those who have been going to conventions for a great part of the time during the past twenty-five years say that the Major looks just as young now as he did when they first knew him. This is something of which he should be as proud as of his association record and the length of his connection with one company in the electric railway field.

The moving pictures, which were a feature of last evening's entertainment, were furnished through the courtesy of J. H. Van Brunt, director of safety education of the Public Service Railway and the other officials of that company, and it may be of interest to know that last night's reel, entitled "The Making of a Convert," was staged by the most famous movie dramatist in the profession. This reel has just been "released" by the Edison Company and sent to all moving picture exchanges throughout the world. To-morrow night the Public Service Railway will show a reel prepared by the Edison Company and entitled "The Life of a Motorman." It depicts the procedure followed by a motorman in securing a position, the subsequent education which is given to him, and finally the work which he does upon the platform and at terminals. The Public Service Railway certainly is to be congratulated upon the enterprise it has shown in the preparation of such moving pictures as these. Its courtesy in presenting the films before the delegates is greatly appreciated.

CLAIMS LARGEST DELEGATION FROM ANY POINT WITHIN SOLAR SYSTEM

In connection with the present close contest for the banner which is to be presented for the largest delegation to the convention, the Connecticut Company reports that it has not only a large attendance but a thoroughly representative one as well. Headed by L. S. Storrs, president, his secretary, R. E. Martin, and H. F. Hewett, manager, it should be noted that Auditor I. A. May and his general assistant, William Deegan, represent the accountants, while Chief Engineer of Power and Equipment P. W. Ripple, Assistant Engineer H. M. Gould, and Line Foremen G. S. Buttrick, George Pfuri and Joseph J. Brady do the same for the electrical engineers. Engineer W. R. Dunham, Jr., Assistant Engineer A. L. Donnelly and Roadmasters P. Ney Wilson and F. P. McKaig are in the track maintenance department, and Master Mechanics C. S. Symonds, E. E. Mott, H. J. Connelly, J. E. Dooley and W. F. McCoy, and Storekeepers C. A. Harris, F. C. Dunsmoor, W. J. Phelps, J. W. Ingman and L. McGrath represent the shops. The construction department has Construction Engineer Charles Rufus Harte and his chief clerk, H. B. White, Assistant Construction Engineer H. L. Bates and Assistant Engineer R. E. Eakin, and the transportation department is covered by M. G. Young, Superintendent Transportation W. J. Flickner, chief clerk to the president, bring the total up to twenty-nine delegates, with several others expected later. The Connecticut Company therefore claims the banner as having the largest delegation from any road south of the North Star, the above certified list proving the futility of all previous claims.

STILL ANOTHER CLAIMANT

The Boston Elevated delegation desires to announce loudly but emphatically that the Washington Elevated Railway & Electric Company delegation has no more chance for that banner for the largest attendance at the convention than had the proverbial wax dog that chased the asbestos rabbit through Hades. It is stated by no less an authority than M. C. Brush, himself, that the Boston Elevated delegation exceeds that from Washington by at least ten members, and that the pennant, gonfalon, or other means for signifying victory, should go to Boston, the land of the bean and the home of the Braves. Rival claimants who wish to dispute this claim should do so in writing, strongly supported by facts and figures. These, we understand, will be forthcoming later from the Boston crowd, the claim having been presented informally as Mr. Brush brushed through the Electric Railway Journal booth on his way to count up his delegation. He said it would take a long time owing to the enormous numbers involved.

A DELEGATE'S LETTER HOME

October the 14th, 1914.

My Dearest Rib:

This Day our Stint duly done, Master Barnes, my bully Companion, doth propose that we waste not ye Night in riotous Revel with Dancers of ye Trot of ye Fox but repair unto some Haven of more godly pleasure. "For," with seeming Wisdom, saith he, "Men of such Dignity as doth hedge a Master of Toll Roads do but ill to sort freely with the Mercers of Copper, of Iron and of Brazenry." Therefore, proposeth he that we hie unto one Master Keith, his Theater, forasmuch as he did quaintly phrase it: "They had a good Show."

Full well thou knowest, dearest Chuck, how I have ever for such Entertainment been but of a lukewarmish Stomach. Yet marry, thou knowest to thy Profit that it doth ever irk me to give a Nayword.

To the Playhouse then where we came in Season to miss ye Feats of two Men of Might; but for this, our Loss, we were soon thankful. Of the Doings in our Ken, surely the strangest were those of two Jacks who Master Keith did announce were singers. Yet whilst they did shout and run, never ventured they either Carol or Roundelay.

"My Ladye Gossip" the Stage doth take anon. It seemeth my Ladye long ago hath been wronged by Scandalmongers and now doth she piece out a scanty Pittance by scrivening Scandal about her Acquaintance. Methought the few bright Sayings did savour mostly of ye "School for Scandal" by Master Sheridan; but of this enough.

Came then some Troubadours with black Faces, and a Female who smirketh and singeth like unto Eva Tanguay ("I careth naught"), Eddie Foy, Harry Lauder, et cetera. Yet it seemeth but a poor Glory to mimick others as doth the Ape who mimicketh that which the Lord hath created in his own Image. At the last a Tango, which hath but little on ye Minuet, ye Sarabande and ye Gigue. Thence to ye Highway of Wood and unto ye Inne to Bedde.

Affectionately thine,

Obadiah.

AL GREEN ATTENDS HIS TWENTY-FIFTH CONVENTION

Time brings marked changes, and it was even so with our good friend Al Green of the Galena-Signal Oil Company who began attending street railway conventions twenty-five years ago. He was youthful and with as fine a head of hair as ever grew, when he first claimed membership. But now, poor Al belongs to the billiard-ball class, with but one lone hair to remind him of his verdant days. Hope endureth, however, and as a last resort, it is said, he will use a Galena lubricant as a hair restorer.

In commemoration of this most auspicious occasion, a number of his Galena friends presented him with a handsome rosewood cane, silver mounted and appropriately engraved. W. G. Gove, superintendent of equipment Brooklyn Rapid Transit, officiated. As usual, Al, or "Sunny Jim," as he is best known to his friends, was much surprised but responded in glowing terms and is more than ever proud of his record attendance from 1889 to 1914. He is now looking forward to the occasion of his passing the half century mark. When last seen he was on parade, and the new cane was most prominently displayed.

SKEE-BALL RECORDS AND PRIZES

The prizes given yesterday for the best skee-ball score were won by Mrs. T. W. Connette with 240 points and D. L. Clement with 290 points. The convention high scores to date are as follows:

Mrs. T. W. Connette...	240	C. G. Chamberlain.....	310
Mrs. W. E. Bryan......	200	T. M. Cluley..........	290
		D. L. Clement........	290

The number of games rolled to date has reached the total of 5500, an increase of 2250 for the day.

DINNER TO EDUCATORS

A dinner to the members of the committee on public relations and officers of the associations in attendance at the convention was given last night at the Marlborough-Blenheim Hotel by James H. McGraw in honor of the visiting educators. Among the educators in attendance were A. J. Rowland, dean of the engineering department Drexel Institute; Harold Pender, professor of electrical engineering University of Pennsylvania; James T. Rood, professor of electrical engineering University of Pennsylvania; V. Karapetoff, professor of electrical engineering Cornell University; W. E. Dickinson, professor of electrical engineering West Virginia University; H. B. Dates, professor of electrical engineering Case School of Applied Science, and W. I. Slichter, professor of electrical engineering Columbia University.

A CONDUCTOR'S LOT IS NOT A HAPPY ONE

(Perpetrated with the connivance of Gilbert and Sullivan's "Pirates of Penzance")

When a fellow's not engaged in his employment,
Or hanging 'round the carhouse schedule plans,
His capacity for innocent enjoyment
Is just as great as any other man's.
His feelings he with difficulty smothers
When heavy platform duty's to be done.
Taking one consideration with another
A conductor's lot is not a happy one.

When the ever-kicking rider ain't a-riding
When there's no one 'round to pass a pluggéd dime
He loves to hear the little brook a-gurgling
And listen to the merry village chime.
When his trip-sheet's true as anybody's mother
He loves to lie a-basking in the sun.
Yet, take one consideration with another
A conductor's lot is not a happy one.

RED CROSS WEEK

This is Red Cross week in Atlantic City. Anyone desiring to contribute to this fund, which is to be used by the Red Cross Society to furnish nurses and relief for the soldiers who are dying in Europe because of neglect after being wounded, will find a box in the booth of Miss Marvel, the official stenographer, at the left of the registration booth, for the reception of such contributions.

"ENGINEER OF GOOD-WILL"

Many of those in attendance at the convention may not realize that one of the prominent members of the association received a degree during the present week. This degree was conferred Tuesday evening on the popular third vice-president of the association, Charles L. Henry, president and general manager of the Indianapolis & Cincinnati Traction Company. In the form of a parchment diploma it granted to him the right during the rest of his life to the title of "Engineer of Good-Will." Those who presented the diploma were his fellow representatives of the American Electric Railway Association on the joint committee on the joint use of poles. The diploma was given in behalf of all the other members of that committee.

A story hangs on this function. When Mr. Henry was first appointed as one of the representatives of the association on this joint committee he demurred somewhat because he said he was not an engineer and believed that he could not be of much assistance for this reason. His well-known willingness to work for the association, however, led him to accept the office. The proceedings of the committee were naturally of a highly technical character, and Mr. Henry asserted on several occasions that he thought upon the conclusion of the work he would be entitled to an engineer's degree. His associates were of the same opinion and, without the knowledge of Mr. Henry, decided to award such a diploma. The degree itself is engrossed on parchment and at its head bears medallions showing the badges of the four interests represented on the committee, namely: the American Electric Railway Association, the American Institute of Electrical Engineers, the National Electric Light Association and the American Telephone & Telegraph Company.

The diploma reads as follows: "The National Committee on the Joint Use of Poles by this diploma declares that Charles Lewis Henry, loved by us all for his unfailing delightful personality, consummate tact, nice discernment and ready power of appreciating and doing that which is required, is hereby elected to the degree of 'Engineer of Good-Will,' and is entitled to all the rights, honors and privileges to that degree appertaining or otherwise within our power to bestow. Given at Atlantic City this thirteenth day of October, in the Year of our Lord, nineteen hundred and fourteen." The diploma is signed by all of the other members of the committee, namely: Messrs. Osgood, Thomas, Paine, Richey, Allen, Oviatt, Sproull, Bethel, Twining and Harvie.

LOST AND FOUND COLUMN

Found.—An initial watch fob has been found. Loser will please apply to Secretary McConnaughy at the office, Convention Pier.

CARNIVAL NIGHT A BIG SUCCESS

The carnival last night was a distinct success. Excitement was in evidence during the Kee-no and contest dances, reaching the highest pitch with the event of the evening in which Mlle. Mome and LeRoy Roberts who came direct from the Rose Garden in New York presented their "whirl-wind dance," followed by the thrilling "pony trot" in costume. This was received with great favor by those present and the applause was in keeping with the spirit of the evening. The contest dances brought out a number of couples and the large vote showed the interest in the popular dance. G. E. Chamberlin, chairman of the committee that had this feature in charge, is to be congratulated on the successful manner in which the evening's program was carried out. The first prize was won by Mr. S. S. Crane, general manager of the Altoona & Logan Valley Railway, and Mrs. Crane, the second by Miss Hazel Whitney and Mr. R. E. Rogers, and the third by Mrs. E. M. Walker and Mr. Jerry Stanton.

BLEEDER TURBINES IN COMBINED MANUFACTURING AND GENERATING PLANT

An effective method of apportioning the exhaust steam from the high-pressure stages of bleeder turbines to brine evaporators and the low-pressure stages of the same turbines is employed in a combined salt-manufacturing and electrical generating plant at Runcorn, England. Three 725-kw turbine-driven generators having the high-pressure and low-pressure stages separated by a diaphragm are used to supply electricity to plant pumps and to an electric-service system. When the generators are only partially loaded all of the exhaust steam from the high-pressure casings is utilized to heat the brine evaporators. At higher loads an automatic valve in the exhaust pipes allows the excess steam to flow through the low-pressure stages of the same turbines and thence to the condensers. By this arrangement all of the steam is used to the best advantage. The position of each steam-distributing valve is determined by the pressure in the main leading to the evaporators. If steam in excess of the amount required by the brine evaporators is discharged into the main, the pressure will rise, causing the steam-distributing valve to open ports feeding the low-pressure stages of the turbine.

F. W. Whitridge, president of the Third Avenue Railway, New York, who returned from Europe by the *Mauretania* recently, was asked: "What, in your opinion, led up to the European war?" Mr. Whitridge replied: "A gentleman in shining armor has stubbed his toe. In other words, he did not watch his step."

The following incomplete figures of revenues and operating expenses of carriers of the United States have just been made public by the Interstate Commerce Commission: Operating revenues, August, 1914, $261,662,484, against $273,725,097 in 1913; operating expenses, $175,844,653, against $188,550,834; net operating revenue, $85,317,831, against $85,174,263 in August, 1913.

The Metropolitan Street Railway, Kansas City, Mo., is reported to have sent out specifications for forty new cars.

YESTERDAY'S MEETING OF THE ACCOUNTANTS' ASSOCIATION

The meeting yesterday of the Accountants' Association was called to order in Accountants' Hall at 10:15 o'clock. An address on the subject of "Investment Bankers and Public Service Accountants," which is abstracted elsewhere in this issue, was delivered by H. S. Swift, West Penn Traction Company, Pittsburgh, Pa. Upon its conclusion a vote of thanks was tendered to Mr. Swift.

The report of the committee on overhead charges, which is also abstracted elsewhere in to-day's issue, was read by Secretary M. R. Boylan, Public Service Railway, Newark, N. J. F. H. Sillick, Hudson & Manhattan Railroad, New York, said that his company was required to work out some unique problems in apportioning the overhead charges for the Hudson Tunnels. Most electric railway construction is made for present traffic, but in the case of these tunnels provision had to be made for ultimate capacity from the outset. When the company began to operate only a portion of its tunnel system, it was necessary to utilize the construction done for its future traffic capacity. The company worked out a plan of apportioning the overhead charges according to the value of the property then in operation, but Mr. Sillick said that it was too big then to be described in detail. In conclusion he asked why the committee had dealt with overhead charges in connection with power houses only. Edwin Gruhl, The North American Company, New York, a member of the committee, replied that the report summarized all the available data. Track construction was continuous and complete statements of original construction costs for track were difficult to secure. Generally, such data had not been submitted, and the few statistics actually received could not be clearly subdivided under the headings of the report.

C. L. S. Tingley, American Railways, Philadelphia, Pa., mentioned some of the baffling conditions in connection with overhead charges that he had encountered in Ohio valuation work, and made a plea for the establishment of overhead percentages that might be used merely as a yardstick for measuring the guesses that had to be made for individual companies. Harold Almert, consulting engineer, Chicago, brought out the difference that exists between submitting to commissions data dealing with the plant equipment, labor and material costs and other purely physical aspects of the business, and presenting to them data concerning overhead charges and intangible elements. Certain advocates of the public and economists had been shrewd enough to pass the estimates of physical plant value as correct, knowing the availability of ample proof on this subject. In the matter of overhead charges and intangible elements, however, on account of the little thought on such subjects in the past and the large variations in percentages, these men had not hesitated to oppose company estimates. Moreover, new commissions had been too content to be guided by the older commissions, even looking upon former estimates as liberal or excessive. That this subject offered a great ground for investigation was shown by the fact that the Wisconsin commission allowed 12 per cent for overhead charges on electrical property, while independent investigators had found overhead charges as high as 40 per cent, or 60 per cent, including intangible values. Mr. Albert commented upon the opportunities of the remark made by Hon. Frank W. Stevens, chairman valuation committee, New York Central Lines, before the American Association on Tuesday to the effect that all overhead charges legitimately incurred should be included in the cost of construction.

P. L. King, San Antonio (Tex.) Traction Company, stated that his company was adding this year 20 per cent of the former value through construction and reconstruction, and asked what percentage of the executive officers' expenses should be charged to construction. Mr. Gruhl and President Glover replied that present Interstate Commerce Commission rulings permit a reasonable amount of such expenses to be charged if time is actually spent on construction work. Mr. Tingley moved that the report be accepted, that its recommendations be adopted and that the committee itself be continued and instructed to continue its studies with the idea of formulating broad, basic principles to show the proper process for calculating overhead charges. The motion was duly carried.

At this point J. F. Fogarty, The Milwaukee Electric Railway & Lighting Company, New York, delivered his address on the "Accounting Treatment of Bond Discount," which was followed by a vote of thanks moved by John J. Landers, York (Pa.) Railways. In view of the completeness of Mr. Fogarty's paper, several members expressed their inability to supplement it and the meeting of the Accountants Association was adjourned to give way for the joint session of the Claims Association and the Accountants' Association.

JOINT SESSION OF CLAIMS AND ACCOUNTANTS' ASSOCIATIONS

The joint session of the Claims Association and the Accountants' Association was called to order by President Glover of the latter association at 11:45 o'clock yesterday morning, with President W. F. Weh, Cleveland (Ohio) Railway, presiding for the Claims Association. Mr. Glover stated that the Accountants' executive committee had approved the continuation of the claims-accounting committee and he hoped that yearly meetings would be arranged between the two associations.

In the absence of H. J. Davies, Cleveland (Ohio) Railway, chairman of the claims-accounting committee, the report was read by H. K. Bennett, Fitchburg & Leominster Railway, Fitchburg, Mass. Mr. Bennett expressed his regret that Mr. Davies was not present, inasmuch as he had made the bulk of the investigation and had prepared both the original report presented to the committee in August and the later report placed before the association. The report is abstracted on another page of this issue.

Before the discussion began Mr. Kilfoyle and W. Tichenor, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., took the places of Mr. Glover and Mr. Weh respectively as presiding officers. H. V. Drown, Public Service Railway, Newark, N. J., criticised the committee report as not being sufficiently elastic. He believed that a classification could be made that would be less disturbing to sub-classifications now used by the member companies, and he made various suggestions and criticisms with a view of establishing better coherence among the proposed accounts and clearing up alleged ambiguities. Mr. Drown filed with the secretary a classification of accident accounts formulated according to his views.

P. L. King, San Antonio (Tex.) Traction Company, believed that there should be headings for the shop and track departments. Mr. Bennett asked Mr. Drown if the suggested classification could not be used by the Public Service Railway without materially disturbing its general classification, but Mr. Drown averred that not only his company but also others could not comply with the new classification without a serious upsetting of their books and records. A. J. Jack, Wilmington & Philadelphia Traction Company, Wilmington, Del., raised a question concerning damages to company property, but Mr. Kilfoyle explained that under the new accounting rulings such expenses must be charged to the maintenance accounts.

Mr. Bennett next read some comments from Mr. Davies, to the effect that the report was merely a basis that would probably be modified by the two associations after discussion. Mr. Davies made some suggestions concerning the accounts and submitted various forms of reports that could be made up by the claims and accounting departments.

J. S. Harrison, Jacksonville (Fla.) Traction Company, said that in his state collisions with animals was an important item. B. B. Davis, Columbus Railway & Power Company, Columbus, Ohio, questioned the use of an account for employees' injuries in his state, where such injuries are by law necessarily handled by the Industrial Commission.

Chairman Tichenor suggested a motion to adopt, reject or recommit the claims-accounting report. L. F. Wynne, Georgia Railway & Power Company, Atlanta, Ga., moved that the report be recommitted to the same committee, that the association be circularized during the year and that the results of the new investigation be presented at next year's convention. E. P. Walsh, United Railways of St. Louis, made an amendment for immediate adoption and the use of the report in any desired modified form by individual companies. The amendment was lost and the motion of recommitment was carried.

The report on claims-accounting provided for the distribution among accident accounts of the cost of all accidents. To make an exact distribution possible the accounting officers of the committee prepared a classified list of accident department expenses, which was read by H. J. Jumonville, American Cities Company, New Orleans, La. The list showed main accounts that could be subdivided to suit the wishes of individual companies. Mr. Bennett stated that the Claims Association felt this matter to be one entirely concerning the Accountants' Association. Upon the motion of W. J. Meade, Cleveland (Ohio) Railway, seconded by H. B. Cavanaugh, Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, the report was adopted. The joint meeting was then adjourned.

WEDNESDAY MORNING SESSION TRANSPORTATION & TRAFFIC ASSOCIATION

The first order of business was the report of the express and freight committee which was made by Mr. Norviel, chairman. An abstract appears elsewhere in this issue.

Charles L. Henry said that his road was furnishing practically an express service at freight rates and was limited to this charge by franchises. His company has what it calls a station delivery express service transported on the passenger cars. This is separate and distinct from the service of the old line express companies which are now operating on nearly all interurban lines. Mr. Henry believed that the freight business could properly be undertaken by electric roads. They ought to develop all sources of income now that the passenger business was being affected by the automobiles. He thought it might take some time to get rid of the franchise restrictions which hampered some roads, but it must be done.

At this point a written discussion from H. B. Potter, assistant to the second vice-president of the Boston Elevated Railway, was read. It took the form of a constructive criticism of the committee's report, based upon Mr. Potter's experience in the handling of freight on the Boston Elevated. Briefly he found from the standpoint of a terminal company, which is the form in which the Boston Elevated handles freight, that up to the present this class of traffic had earned only a small net profit, when the comparatively large amount invested in terminals and track facilities was taken into consideration.

R. B. Stearns, Milwaukee, said that he understood that the federal government, through the department of public markets, was making an investigation to determine the causes leading up to the lack of development of interurban lines for handling farm produce and package express.

J. R. Harrigan, Kansas City, briefly described the extent to which his road went into the freight and express handling business. He felt sure that the bulk weight business would prove profitable. He also stated that since making an interchange contract with the Great Western Railway this business was being done according to Interstate Commerce Commission requirements.

C. T. Chapman, general freight and passenger agent Inter-Urban Railway, Des Moines, said that his road was in a general freight business with interchange relations with steam roads. In reply to an inquiry he stated that about 60 per cent of the company's gross income was from freight revenue.

F. W. Coen, Cleveland, and H. A. Nicholl, Anderson, Ind., took part in the discussion, each describing briefly his experience in handling freight.

Upon motion the report of the express and freight traffic committee with its recommendations was received and approved.

Following this President Brush called for the report of the committee on passenger traffic which was presented by the chairman, E. Soules, manager publicity department Illinois Traction System. Mr. Norviel presented a written discussion of passenger traffic report in which he expressed the opinion that the best means of retaining the present monopoly of traffic is perfection in the matter of safety and convenience, and in providing every luxury possible in equipment, and a roadbed beyond criticism.

In the discussion which followed, Mr. Coen briefly described motor-bus operation in Cleveland. In connection with this subject Mr. Stearns stated that in most large cities there existed a demand for extension of lines when in most cases it was extremely difficult to justify the construction of either single or double track. It may be that motor buses or trackless trolleys will serve to solve this problem and develop the territory. In conclusion, he stated that the development of the trackless trolley was something that was probably more imminent than damage to the industry by the invasion of gasoline buses in congested districts. With the trackless trolley there would be no charge for maintenance of roadway, and the propulsion current would be taken from the trolley. Repairs to motors would be simplified by using motors substantially the same as those on the electric cars.

Upon request, A. P. Walker, Dubuque, Iowa, described a trackless trolley system in operation there. Upon motion it was decided to continue the subject of trackless trolleys next year.

FARES AND TRANSFERS

Fares and transfers was the subject of the committee report made by J. V. Sullivan, Chicago Surface Lines. A discussion of this report was led by Elmer E. Strong, New York. He objected to a registering fare box because it required two accounting machines on the car. Mr. Ching believed that a registering fare box was of very great advantage, since his experience indicated that they were accurate and gave very little difficulty. He also stated that he believed that to-day the fare box gives as good an opportunity to the dishonest conductor as the old system of fare collection. Yet with the honest conductor he believed the fare box formed an ideal system for fare collection. Mr. Ching also discussed the question of transfer issuing devices and bodily transfer of passengers in prepaid areas. The advantage of the latter form of transfer, namely, in prepaid areas, has aided in greatly reducing the number of paper transfers issued. This has become quite a problem since it entailed such tremendous detail in auditing. With the increase in number of paper transfers there is bound to be a proportionate increase in the abuse.

M. R. Boylan, Public Service Railway, stated that his Company had been using fare boxes for about six years. As he stated at the last convention the use of the locked box had been discontinued as it was cumbersome and expensive. The company has about 1500 registering fare boxes on the system. He stated that there is a decided advantage in the use of the fare box, which can get all of the fares. When locked boxes were put into use from one to three per cent more cash was in the box than appeared on the register. Conductors should have some kind of a voucher for every passenger. The company is equipping most of the two-fare lines with registering boxes, using extra registers for the extra fares. The conductors use identification checks where there are lap-overs.

Tickets comprise the principal fare collections on the city lines of Detroit, and these tickets are of different values. The company's problem, therefore, is to find a fare box that will satisfactorily receive and contain collections made up of cash and tickets. This, as Mr. Brooks understood it, was radically different from the situation in other cities. In his opinion the principle of the prepayment type of car has been demonstrated to be correct, but it has introduced problems of its own and one of these is that of fare collection by fare box. The Detroit United Railway has experimented with practically all of the devices offered. For Detroit conditions the lock box seems best suited, used in connection with an independent totalizing register. The company finds it impracticable to use more than one compartment box, and, so far, the use of such a box has been quite satisfactory. These boxes are removed at the carhouses at the end of the day's run and are replaced by an extra till so that the car is at all times ready for use. The boxes are opened by a representative of three departments, and the contents are placed in a portable vault and sent to the general cashier's office. The company has not found that the item of maintenance is excessive. It is experimenting with other devices but considers the use of the present device warranted from every viewpoint.

J. H. Wilson, Mobile, stated that the results with fare boxes have been satisfactory, but that there is trouble with the ticket receptacle. The expense on the boxes has been 22 cents per month for labor and 22 cents for repairs. The use of the boxes results in fewer accidents in collecting fares, for the conductor's hands are free to open and close doors. He hoped to see the ticket-counting mechanism perfected to prevent counterfeiting of metal tickets.

Mr. Boylan called attention to the desirability of devising some uniform method of collecting fares so that the manufacturers could produce a box which would meet all conditions. In the Public Service box there is one totalizer giving the commencing number and ending number. The conductor settles for the difference between these at the end of the day. This permits the simplification of the mechanism and construction of the box.

J. E. Duffy, New York State Railways, Syracuse, believes in fare boxes on prepayment cars but is trying out different types at present, hoping to determine which is best. An overhead register should be used in connection with locked or registering fare boxes. A fare should be registered for every passenger. While there have been some losses with the registering box these are overcome by the larger number of fares received. All conductors are not dishonest, and the honest conductor makes no objection to the fare box. The dishonest one is always trying to take advantage of any mechanical contrivance, but the fare box gets the fares that the honest conductor would otherwise have missed.

W. C. Callaghan, Helena Light & Railway Company, stated that he cannot see the necessity for fare boxes at present.

On motion of Mr. Collins, seconded by L. H. Palmer, the record prepared by Mr. Sullivan was accepted with thanks to him and his associates. President Brush then suggested the appointment of W. H. Collins as a member of the resolutions committee in place of C. B. Buchanan, who was not present. A motion to this effect was carried.

CHARACTER OF EMPLOYEES

The order of the program was then slightly changed and N. W. Bolen, Public Service Railway, read his paper on "Jobs for Real Men." This is abstracted elsewhere. W. H. Collins called attention to the importance of mental poise and ability to take responsibility.

J. E. Duffy, New York State Railways, stated that one of the most important qualifications is ability to handle employees entrusted to a man's charge. The superintendent of transportation must have the good-will of the men under him, but this does not mean that he should be lenient in discipline. When men know that he is honest and just they will feel that they have been dealt with properly no matter what difficulties arise in administering discipline. The specialization of the present age make conditions much more difficult for the transportation man than they were formerly.

J. J. Dempsey, Brooklyn Rapid Transit Company, stated that he is not sure whether the technically trained or college man is as well adapted to transportation work as one who is not so trained.

Mr. Dempsey said further that it is difficult to find technically-trained men who are willing to put in the long and irregular hours necessary. Experience in steam railroad work seems to be good training and country boys seem better for this work than those from large cities.

The report of the committee on uniform definitions was presented by Edward Dana, Boston Elevated Railway, in the absence of H. C. Donecker, chairman. This report is abstracted elsewhere in this issue. The report was accepted and referred back to the committee for further consideration during the coming year. The meeting then adjourned.

EAST BOSTON TUNNEL TOLL SITUATION

The proposed abolition of 1 cent tolls in the East Boston Tunnel appears to have narrowed itself down to a point where the bondholders have it in their power to determine whether or not the toll shall be abolished. If the owners of the tunnel bonds can be persuaded to waive part of their rights for a consideration, the toll will be discontinued. At present there are $5,293,000 tunnel bonds outstanding bearing interest at from 3 to 4 per cent. On the face of each bond is the stipulation that the whole amount of tolls collected from passengers in the tunnel shall be used to meet the principal and interest of the bonds. The city of Boston now proposes to ask the holders to waive this pledge, and in return the city will appropriate $125,000 a year to be added to the rental received from the Boston Elevated Railway for the use of the tunnel. This would provide the total interest requirements. It is anticipated that most of the bondholders will agree to the plan, which was approved by the voters at the January, 1914, election.

In the spring of 1848, one Joseph Curtis, of New York, asked the Common Council for permission to lay an experimental street car track in Broadway. The Council resolved "that the petition of Joseph Curtis for an endless rail track through Broadway be denied." Mr. Curtis sent a second application, in which he said: "When the owners of property in Broadway and the public at large shall become fully satisfied of its utility, they will become the petitioners, instead of your humble citizen." This time the Common Council granted the permission and made various remarks upon the venture.

Among others, it was stated: "The cars proposed by the projector are novel in many respects. They will seat but a single row of passengers and accommodate twenty-four persons at a time; the doors enter at the side. It is known that car bodies mounted upon two trucks and having a long space between them are more buoyant and ride more easily than those mounted upon a single truck. Mr. Curtis's car truck partakes of the quality of the former, and in addition is furnished with a series of India ruber springs to relieve concussion and increase its mellowness."

Thus was the ancestor of the straphanger given his first taste of "modern" street car transit.—*Wall Street Journal.*

YESTERDAY'S SESSION OF THE AMERICAN ASSOCIATION

Yesterday's session of the American Association was called to order at 2:20 p. m. by President Black.

The first order of business was the presentation of the report of the committee on relations with the Manufacturers' Association by C. L. Henry. Mr. Henry reported that there were several questions of importance but no definite action had been taken, so the committee simply reported progress.

The secretary then read a letter from Mr. Townley, chairman of the committee on electrolysis, reporting progress. This report appears elsewhere in this issue.

Arthur W. Brady then presented the report of the Anthony N. Brady medal committee. This report is published elsewhere.

The secretary then read the report of the committee on the company-section medal, recommending the award of the medal to Mr. Abendroth of the Milwaukee section. In Mr. Abendroth's absence the medal was given to Mr. Stearns for transmission to Mr. Abendroth.

Mr. Henry then presented the report of the committee on relations with company sections. This was followed by the report of the *Aera* advisory committee and by Mr. Bullock's paper on the "Aspects of Workmen's Compensation Laws." These reports and paper are published in abstract elsewhere.

A. D. B. Van Zandt, Detroit, said that the act in Michigan was different. The Supreme Court in that state had recently decided that the words "average," as used in the act and applied to wages, meant only the average number of days which the business warranted. Thus in mining, the year was only 200 days.

J. J. Burleigh, Public Service Railway, Newark, said that railway men could very well subscribe to the principle of compensation laws without committing themselves to any particular character of statute which might be forced on them, and he thought the duty of the railway managements was to protect their stockholders to the extent of resisting illegal demands. The New Jersey bill had been opposed by the manufacturers but not by any of the public utility companies. It provided an elective feature which automatically carried certain stipulated payments for specific periods, and more than 90 per cent of the company's employees had accepted this option. The law had not added materially to the company's financial burden, but this was because the company in the past had followed a very liberal welfare plan voluntarily. The New Jersey law fixed 50 per cent of the wages as a basis for weekly payments, and this he thought was wise. During the first year 2357 employee accident cases were reported. Of this number the company paid compensation or rendered medical service, or both, in 1302 cases. The remainder were trivial accidents which did not require attention. The total liability created by these cases during the year was $63,530. This was $9,804 more than the company might have been obliged to pay if it had literally followed the law, but it had construed the law liberally. He thought the existing New Jersey law was defective because it made no provision for a dependent parent of a son, who in death left no widow. This, he thought, should be corrected by an amendment. The law allows latitude to the company in carrying its own risk or insuring in a casualty company or protecting itself in any other way. He did not believe in the necessity of a state commission to administer this law.

C. L. S. Tingley, Philadelphia, then discussed the legal aspects of decisions that had recently been rendered in employers' liability cases in several States showing, among other things, that the words used in many statutes of this kind "arising out of and in the course of employment" had been construed broadly by the court so as even to include a case where an employee had been injured by an intoxicated fellow-worker. In conclusion Mr. Tingley urged the standardization of these state laws so far as was possible as it was inconvenient for interstate companies to operate under different laws.

Mr. Rosecrantz, Milwaukee, gave some particulars about the Wisconsin law. He spoke of one case where a conductor, having reached the end of the line and being anxious to finish his night's work and run the car back, took the controller and speeded the car up and ran into an open switch and swung off the car and was killed. The company contended that this death was not occasioned because of his employment. This contention was sustained in the Circuit Court and was not appealed.

THE REPORT OF THE COMMITTEE ON WAYS AND MEANS

Mr. Donecker then read the report of the committee on ways and means. This is published elsewhere in this issue. Following the report of committee on ways and means President Black called for an expression of opinion of Messrs. McCarter, Henry, Allen, McGraw, Beeler, Gaylord Thompson, Tod, Brush, Brady and General Harries, all of whom indorsed the committee's report most heartily. Before acting on the report however, President Black called for the report of the committee on changes in the constitution and by-laws which was presented by C. L. Henry, chairman. In its report this committee recommended only such revisions of the constitution and by-laws as were necessary to conform with the ways and means committees' recommendations for increased dues. The new schedule of dues was published on page 775 of the issue of this paper for Oct. 10. Upon motion both of these reports were unanimously approved.

REPORT OF COMMITTEE ON PUBLIC RELATIONS

Thomas N. McCarter, chairman of the committee on public relations, next read that committee's report. It is published on another page. Commenting on the report he stated that it was the intention of the committee to refrain from too much refinement of this subject but to present a code of principles upon which all members could stand and use as a creed of their business. Too long has the industry allowed the demagogue and his ilk to occupy the stage. The time has come when the association's work on the subject of public relations should not be confined to the sporadic stage, but all should go out and preach the gospel. In conclusion, Mr. McCarter tendered his personal services as one of the preachers of the gospel of public relations.

Mr. McGraw most heartily indorsed the suggestions of Mr. McCarter and stated that he felt sure that all member companies would indorse the report. If funds were not available at this time to pursue a comprehensive public relations policy, at least certain phases of the committee's report could be followed. He recommended that certain representative members be drafted and requested to prepare written addresses on the subject which could be presented to the public upon request. He also urged that if such a course was pursued, the addresses should be most carefully prepared and afterwards printed and judiciously distributed by all member companies as public information. This could be done at a very small cost. Moreover if the work of the public relations committee is to bear fruit, it is largely the duty of the individual railway companies to promulgate the work.

A. D. B. Van Zandt, Detroit, also heartily indorsed the work of the committee and suggested that since the subject was so big and so important it might be well to organize a public relations association, whose duty should include the assembling of data and information for the use of individual members in refuting false information printed in local newspapers.

President Black also emphasized the importance of this committee's report and urged that the code of principles be published and spread broadcast. Col. Harries concluded the discussion with his indorsement, and the report of the committee was unanimously adopted.

Other Business

On account of the unavoidable absence of Calvert Townley director Lackawanna & Wyoming Valley Railroad, his paper on "Electric Railway Securities from the Company's Standpoint" was read by Mr. Doolittle, director bureau of fare research of the association. This paper was received without discussion, following which Henry N. Staats presented the report of the committee on insurance in the absence of Mr. H. J. Davies, chairman and secretary of the Cleveland Railway Company. This report was received as information and the association was then adjourned until two o'clock Thursday afternoon.

WEDNESDAY MORNING SESSION ENGINEERING ASSOCIATION

The Wednesday morning session of the Engineering Association was called to order by President Hanna at 9:30 o'clock. Mr. Hanna opened the meeting with a reference to the standardization rules which had been adopted by the American Institute of Electrical Engineers after consultation with the Engineering Association. While the rules had been adopted by the institute too late to have the formal scrutiny and approval of the various standing committees of the Engineering Association they had been referred to those committees with the expectation that they would be formally approved in so far as they affected electric railways.

Report of Committee on Equipment

F. R. Phillips, chairman, then presented the report of the committee on equipment. The items in the report were considered separately, with action on each as follows:

The revision of specifications for heat-treated carbon steel axles, shafts, etc., was approved.

The recommendation of the committee that it be instructed to prepare a specification for gears and pinions was approved. The recommendation concerning proposed co-operation with a committee of the Master Car Builders' Association for the design of a new standard brass to meet the conditions of high-speed heavy electric traction was approved with the amendment that the committee be instructed also to co-operate with the heavy electric traction committee.

The recommendation of the standards committee that the general subject of car wiring with special reference to fire protection be referred to the next committee on equipment was approved.

The recommendation of the committee that the specification for solid wrought carbon steel wheels be adopted as a standard (as approved by the standards committee) was approved after the specification had been read section by section.

The next subject was that of specifications for air-brake hose. W. G. Gove, Brooklyn, as chairman of the committee on that subject, described the conditions such as short radii curves and carriage of oil from compressors which had developed the need for a special grade of electric railway hose.

For several years his company had tried to buy hose under the M. C. B. rules, but had never been entirely successful. It had for several years largely purchased one specific kind, and it was still doing so to a certain extent simply because the hose was satisfactory although very costly. The object of the specification was to secure a good article on a competitive basis. After some discussion the motion was made and adopted that the specifications be accepted as a recommended specification, with the further suggestion that the incoming committee consider the question of smaller sizes in hose.

The next subject was the "Lighting of Electric Street Cars," a paper on which had been prepared by L. M. Clark, Indianapolis, as Appendix C of the committee report. The discussion opened with an interchange of opinion on the influence of the ceiling color. H. H. Adams, Chicago, said that last winter he had changed the ceiling color from pea-green to light buff on certain new cars. He believed that the illumination had been improved 50 per cent by this change. Mr. Adams thought it desirable also to use say sixteen 23-watt lamps in preference to five 94-watt lamps, as a larger number of small units gave better distribution. Terrance Scullin, Cleveland, believed that the efficiency of the large lamps was so much greater that any distribution advantage to be gained from a smaller wattage lamp was lost in comparison. For this reason his company had come to the use of five 94-watt lamps in series with a spare lamp in case of failure of any one of the five.

W. G. Gove, comparing the Interborough Rapid Transit and New York Municipal car lighting, said that the 57-ft. N. Y. M. car with Soudan globes and three circuits of 56-watt lamps enjoyed as good lighting as the 50-ft. Interborough car with six circuits of 56-watt lamps. The difference was largely due to the fact that the Interborough car was finished in green up to the advertising space, while the N. Y. M. car was white to the top of the seat backs. The Interborough cars were now being changed to white enamel.

G. H. Stickney said the big factor was the protection of the eyes of the passengers from the glare of exposed bare filaments. It had come to his attention that an organization for civic betterment was planning a campaign against electric railways purely on account of this feature of car lighting. It would be more desirable for the railway interests to take the initiative for satisfactory lighting rather than be forced to it by public sentiment.

E. W. Holst, Bay State Street Railway, sent a communication emphasizing that large ultimate economies in car operation could be secured by replacing carbon lamps with Mazdas, especially when reflectors are used. His company had been experimenting with reflector equipments, and now had more than 100 cars lighted with 56-watt lamps so equipped. The general results coincided closely with those given in the report. His company's experiences had been reported in the technical press, notably the Electric Railway Journal of Sept. 28, 1912, and Dec. 20, 1913, and the *Street Railway Bulletin* May, 1914. The safety question introduced by the reflector had delayed his company more in the adoption of reflector lighting than any other factor. Among other objections, a fitter of 2¼ in., in suspending a glass reflector by means of a flange, was not considered safe practice. Finally, the manufacturers had been persuaded to make up reflectors and holders with 2¾-in. fitter, which size has a stronger reflector and the desired greater clearance for the use of heavier porcelain. To strengthen the reflector farther the company obtained holders having a metal collar extending down inside the reflector which was supported in such a way that it could not fall unless completely shattered. The holders now used have strong sockets, which are flexible, so that the lamps receive a less severe jar on railway crossings, etc., and are held so that they cannot work loose. The lamps are not so readily removed from the sockets, and, therefore, are less liable to be stolen. In conclusion, Mr. Holst recommended that the association standardize a 2¾-in. fitter for car lighting reflectors, and that it also prepare specifications for reflector and holder equipment to overcome some of the weaknesses which he believed existed in most of those now on the market.

Following Mr. Holst's letter, Mr. Scullin, with reference to Mr. Stickney's remarks about bare filaments, said that glare was overcome by the frosted lamp. As to falling shades, his company had had at least 8000 of them in use for the past two years without a single fall.

Upon motion the report on lighting was accepted.

Lightning protection was the subject next discussed, Mr. Palmer making the motion that the committees on equipment, power generation, distribution, electrolysis and block signals be instructed to consider the subject of lightning protection in its relation to car and line equipment.

C. H. Kelsay, Indianapolis, thought that so far as the traction circuits were concerned the main thing was the protection of the car. It would be a good plan to make a study of the different types of arresters as to relative efficiency.

William Roberts, Akron, believed that the question of protecting the car service or car equipment should be kept entirely distinct from that of protecting the stations and substations. The electrolytic arrester was taking satisfactory care of power houses and substations on both the high and low tension sides. He thought that where trouble had occurred the electrolytic arresters had not been properly charged. Such charging should be done preferably when the load was lightest. His company did the charging on its 22,000-volt system between 1 a. m. and 2 a. m.

Mr. Phillips, Pittsburgh, said that his company had tried some experiments on arresters with a static machine, but to no purpose. A charting of the Pittsburgh system as to places of greatest lightning trouble had disclosed some disquieting results and indicated the importance of such a study.

After the acceptance of Mr. Palmer's motion for a study of lightning protection by the five committees named, the report of the committee on equipment was accepted as a whole with thanks.

Buildings and Structures

The report of the committee on buildings and structures, which is abstracted elsewhere in this issue, was presented by the chairman, C. F. Bedwell. Referring to the form of contract, Mr. Bedwell said that its contents had been drawn from various sources and that it had been declared legal. C. R. Harte, New Haven, stated that the counsel of the Connecticut Company had also declared this form legal. On motion it was decided to suspend action on the standard form of contract until it has been considered by the committee on standards.

On motion the standard fire protection rules submitted by the committee were approved for submission to the standards committee as they had been approved during the past year by the National Fire Protection Association.

The next subject was that of powerhouse construction, Appendix C of the report. On motion this subject was ordered continued. In this connection, Mr. Roberts said that cognizance should be taken of the fact that substations are frequently a part of the modern power station.

On motion the report of the committee as a whole was accepted with thanks. The meeting was then adjourned.

ANNUAL MEETING OF MANUFACTURERS' ASSOCIATION

The annual meeting of the Manufacturers' Association was held yesterday afternoon in the Greek Temple. President Hawley introduced President Black, of the parent association, who extended the greetings of that association to the manufacturers. He also congratulated the Manufacturers' Association and thanked the committees for the important parts taken in convention endeavors.

President Black announced that the executive committee would call the mid-winter conference of the American Electric Railway Association and its allied associations in Washington. This city has been chosen instead of New York, because in New York practically no newspaper publicity wss obtained. In other cities, and particularly in Washington, the newspapers would feature the association deliberations and would distribute these by telegraph throughout the country. The next annual convention, he announced, would be at San Francisco. As a San Franciscan, President Black asked the hearty co-operation and support for the next convention. In closing he wished for a continuation of the harmonious working relations, happily now existing between the American and Manufacturers' Association.

President Hawley then announced the following nominating committee: W. L. Conwell, N. M. Hench, E. R. Mason, R. M. Campbell and E. F. Chaffee.

Before President Hawley instructed this committee, the association listened to Daniel M. Brady, who spoke of the desirability for having the executive committee include men from various sections of the country.

President Hawley announced that the location committee had seriously considered Boston for the 1914 convention, but that exhibit hall facilities were not available at the usual convention time. In connection with the present convention he reported a reduction of 5.5 per cent in exhibition space sold, as compared with last year. This year approximately 65,000 sq. ft. of space had been sold. The attendance of manufacturers was within 9 per cent of that at the same time last year, and the number of companies belonging to the association was practically the same.

When arrangements for this convention were made, no such serious financial conditions confronted the executives, or special means would have been taken to economize to even a greater extent than has been done this year. The cost of exhibition space this year was fixed at 35 cents per square foot, this being 12½ per cent less than that charged for the last two years. It was estimated that the surplus at the end of the present year would be practically the equal of that carried over last year. President Hawley spoke briefly of the 1915 convention and said that no special exhibit had been planned because a large number of the members would have permanent exhibits at the exposition.

In closing President Hawley said: "This convention is, I believe, considered a most satisfactory one, and the arrangements of the exhibits and the entertainment provided are fully equal to any of our previous conventions. Great credit is due to my associates on the executive committee, and particularly to the vice-presidents and chairman of the committees and their committeemen."

A unanimous vote of thanks was tendered to President Black for his co-operative efforts in connection with the present convention and exhibits. A unanimous vote of thanks was also extended to the officers and committees in charge of carrying out this year's exhibition. A motion thanking and complimenting Secretary-Treasurer McConnaughy for his large part of the convention work was passed unanimously.

The nominating committee then reported the following slate, for new members of the executive committee: E. F. Wickwire, Ohio Brass Company; John C. Jay, Pennsylvania Steel Company; Wiley Brown, Bridgeport Brass Company; C. R. Ellicott, Westinghouse Traction Brake Company; L. E. Gould, Electric Railway Journal. These nominations were received.

L. E. Parker then presented a separate ticket as follows: E. F. Wickwire, Ohio Brass Company; George Stanton, Cleveland Frog & Crossing Company; Thomas Aldcorn, Chicago Pneumatic Tool Company; W. F. Cutler, Southern Wheel Company; L. E. Gould, Electric Railway Journal.

The ballot resulted in the election of the following new members to the executive committee: Messrs. Wickwire, Stanton, Cutler, Ellicott and Gould.

According to the United States Geological Survey, the tungsten resources of this country are probably larger than has generally been realized. Many new deposits have been discovered in various parts of the Western States.

REPORT OF COMMITTEE ON OVERHEAD CHARGES

The purpose of the report of the committee on overhead charges, presented yesterday before the Accountants' Association, was to gather data as to the extent and nature of overhead charges as used by appraisers. Under the Interstate Commerce Commission system effective July 1, 1914, records of overhead charges as defined by appraisers cannot conveniently become a permanent part of the accounting procedure but must be provided as memoranda after the work is completed. Several member companies, however, have devised forms of unit cost analysis which not only permit compliance with the official classification but also provide authoritative data as to unit costs and overhead charges which will fortify their engineers in valuation proceedings before commissions.

The report mentions criticisms by appraising engineers of such items as stores expense, utility expense and equipment and tools embodied in last year's committee classification. If such items are definitely understood to be specific construction costs, the scope of the definition of overhead costs is correspondingly restricted, but such miscellaneous charges often continue to be presented to the accountant after the constructing engineer has completed his work. For this reason the committee did not think it advisable to change the details of its last year's classifications. Whether its defined overhead charges were included by appraisers in unit costs or as undistributed additions to the total of specific items was immaterial as long as such charges were not omitted or understated.

From the records of overhead costs submitted to the committee it was not possible at this time to make tabular comparisons covering all tangible and intangible overhead. The remainder of the report, however, was devoted to pointing out the magnitude of certain overhead items in the construction costs and the character of the charges included.

The main divisions discussed follow: Engineering, administration, stores expense, utility expense, labor expense, contractor's expense, equipment and tools, preliminary construction work, injuries and damages during construction, legal expense during construction, taxes during construction, insurance during construction, interest during construction, and unforeseen contingencies during construction. The specific data and percentages cited under each heading indicated the typical differences in amount which might be expected in any comparative analysis of overhead charges and led to the conclusion that no definite percentages could be designed which could be applied equitably to every case. Appraising engineers in making valuations must consider the differences that arise in particular cases. The committee stated that it was impressed with the necessity of accompanying appraisals with an analysis of actual available construction costs. The data collected by the committee was to be filed with the association and it was recommended that the work of preparing such additional memorandum records as might be submitted by member companies in accordance with the classification adopted be referred to the bureau of fare research during the ensuing year.

CONSTITUTIONAL RIGHTS

Some men think a nickel is a whole lot of money when they spend it on a street car company. It gives them the privilege of crossing their legs and letting people trip over them. It also gives them the right to sit sideways and look out of the window so they can occupy two seats. They regret the expenditure of the nickel so much that they economize by carrying the remains of a Flor de Glue Factory cigar into the car and take pleasure in holding it where others can inhale its fragrance.—*Cincinnati Enquirer.*

REPORT OF THE "AERA" ADVISORY COMMITTEE

The report of the *Aera* advisory committee, presented at the meeting of the American Association yesterday afternoon, explained that advertising was resumed with the January issue, and a gratifying increase has been shown in the number of manufacturing concerns which have used the pages of the magazine. With adverse business conditions and with the necessarily slow process of building up an advertising clientele, it has not yet been possible to place the magazine on a self-supporting basis, but the committee looks forward with confidence to a time in the very near future when the advertising receipts will more than pay the expenses of publication. Continuing, the report said, in part, as follows:

"The committee, at its first meeting, assigned to various members of the committee the work of securing contributions for *Aera's* pages. The result has been shown in the magazine from month to month. Vol. II of *Aera*, which ended with the July, 1914, issue, contained 1447 pages of reading matter as opposed to 1163 in Vol. I. Aside from the Question Box, 106 association members contributed articles. The Question Box has grown greatly in strength during the past year, 258 individuals contributing 1299 answers to 254 questions. These were divided by subjects as follows:

	Questions	Answers	Individual Contributors
Accounting	17	106	45
Way matters	40	325	72
Buildings and structures	1	5	5
Power generation	24	108	51
Power distribution	50	243	64
Equipment	31	195	57
Transportation	52	276	87
Miscellaneous	1	3	3
I. C. C. decisions	38	38	..
Total	254	1299	258

"*Aera* is intended to be a magazine for electric railway men by electric railway men, and the interest shown by association members is enabling it to fulfil the expectations of its founders.

"As a medium for putting the association members in touch with each other and with the work of the organization, your committee believes that the magazine has accomplished its purpose in a most satisfactory way. In the dissemination to electric railway men of information concerning the industry a great work has been and is being accomplished. Many able expositions of problems affecting the industry have been set forth in *Aera's* columns, and its influence has extended far beyond the limit set by the association membership. This influence has extended also through the use of a clipping service, sent to more than 1200 daily newspapers in the United States. The use of extracts from *Aera* has been quite general. Along the line of publicity may be cited work in connection with the convention. A full press service has been established to distribute information both before and during the convention, and the press associations have handled at gratifying length, considering the situation in respect to war news, the proceedings of the conventions.

"Your committee begs to extend its thanks to those who have contributed to *Aera's* pages and to bespeak for the magazine the continuance of the interest, which, in the committee's opinion, has established the success of the publication as a prominent feature of the American Electric Railway Association's work."

According to figures just made public by the Interstate Commerce Commission Eastern carriers operating 56,832 miles of road in August, 1914, as against 56,789 miles in August, 1913, made the following showing: Operating revenues, August, 1914, $117,009,576, against $124,764,032 in 1913; operating expenses, $79,018,045, against $87,756,902; net operating revenue, $37,991,551, against $37,007,130.

REPORT OF COMMITTEE ON EQUIPMENT

The committee on equipment of the Engineering Association reported yesterday on the several topics assigned to it as follows:

Revision of Specification for Heat-Treated Carbon Steel Axles, Shafts and Similar Parts—Owing to certain alleged unsatisfactory results by some users of axles under this standard specification and owing to the revised specification of the American Society for Testing Materials which was formerly nearly identical with that of the Engineering Association, the committee recommended that its successor be instructed to investigate the results obtained with axles made under the standard specification and to report on same with suggested revision, if any.

Specification for Gears and Pinions—The committee reported that it had gathered data on this subject and recommended continuation of the subject by the next committee.

M. C. B. Brass for High-Speed Heavy Electric Traction—The committee reported that Frank Kingsley, associate editor ELECTRIC RAILWAY JOURNAL, had drawn its attention to troubles experienced by heavy electric traction operators with the M. C. B. journal brass. The committee recommended that this subject be investigated by the Engineering Association in collaboration, if possible, with the Master Car Builders' Association.

Wires and Cables for Car Equipment—In this part of the report the suggestion is made that in many cases it would be found easier to draw the made-up cable into a straight run of soft steel conduit and afterward bend to form. This would be safer than bending the conduit and drawing the cable in afterward, and would enable a closer fit and less air space between cable and conduit to be attained. Lead-covered cable has many points in its favor, particularly easy installation, but care must be taken to avoid sharp bends and the driving of nails into it, and to support it against sagging. In general, the usefulness of lead-covered cable will be largely restricted to rewiring old cars since it costs more than steel conduit. The committee believed that a 30 per cent pure Para rubber was unnecessary for car wiring, but suggested that the manufacturers label each coil with an attested statement of the physical, chemical and electrical characteristics, the latter to include resistance in megohms per mile. A 20 per cent Para had been found satisfactory for 600-volt circuits, but an additional 1/32-in. diameter rubber insulation was recommended for 1200 to 1500-volt d.c. circuits. An extra flexible rubber-covered triple-braided flameproof cable was recommended for main motor leads to fulfil underwriters' requirements. As rubber compound is necessarily inflammable, the only way to make insulation flameproof is to inclose it in a flameproof casing or braiding. It would be well to demand that taping or braiding be treated chemically to make it non-inflammable, but at present a non-combustible cable or cable covering seems unattainable. Steel conduit was being used more widely but on no account should it be used for the length of cable from the trolley or conductor base to the lightning arrester and from the lightning arrester to ground owing to the impedance which it would offer to a discharge of lightning. This length should be protected by fireproofed and watertight hard-wood or fiber molding.

Specifications for Solid-Wrought Carbon-Steel Wheels—The committee reported that it had not been found expedient at this time to promulgate definite designs of tapes, gages and templets, since all makers and inspection engineers have such apparatus which can be easily adapted to the standard association wheel design. The changes in the wheel specification as reported last year, other than those in phraseology, were as follows:

1. Inclusion of chemical composition requirements for steel made by the acid process.
2. Increase in allowable variation in carbon content from six to ten points difference.
3. Division of tolerances into classes, based upon service which wheels are to enter instead of on method of finishing at the mill. These tolerances are arranged so that under the specification wheels will be furnished machined to minimum tolerances unless special arrangement is made to permit of the use of wider tolerances and of furnishing wheels with rim contours unmachined. It is expected that most of the wheels ordered under this specification will be manufactured under the wider tolerances, and with the option to the manufacturer of furnishing unmachined contours, the tolerances being so fixed that under all usual conditions of service wheels furnished under the larger tolerances will be sufficiently accurate for service conditions.

The committee believed that a specification had been produced which may be safely used and recommends the adoption of the same as standard.

Specification for Air-Brake Hose—The committee submitted a specification on this subject with the recommendation that it be adopted as a recommended specification. The matter of an oil-resisting inner tube where the hose is subject to oil from compressors was recommended for further study owing to the lack of data on this subject. The specification follows:

SPECIFICATION FOR AIR BRAKE HOSE

I—MANUFACTURE

Number of Ply—1 (*a*) The hose shall be not less than four ply, and shall be soft and pliable.

Grade of Material—1 (*b*) Only a high-grade quality of rubber and cotton fabric shall be used. Rubber substitutes or short fiber cotton will not be acceptable.

Sample for Test—1 (*c*) The manufacturer shall furnish, free of cost, one extra hose for test purposes, with each lot of 200 hose ordered.

II—PHYSICAL PROPERTIES AND TESTS

Porosity Test—2. For the purpose of determining the porosity of the inner tube, one hose will be selected at random from each lot of 200 ordered, and subjected to an air pressure of 140 lb. per sq. in. for a period of five minutes. At the end of this time the rubber cover will be split with a knife and the hose submerged in water.

Under this condition and with above air pressure still in the hose, the inner tube shall not show any porosity.

Any escape of air must be distinct enough so as to permit of readily distinguishing between that due to the air which may be confined within the structure of the hose and that due to the porosity of the inner tube.

Bursting Test—3 (*a*) One hose will be selected from each lot of 200 ordered and a section 5 in. long cut from one end. The remainder of hose will then be subjected to a hydraulic pressure of 200 lb. per sq. in., and under this pressure the hose shall not show any signs of leakage nor develop any defects and shall meet the following requirements:

3 (*b*) The maximum expansion on the circumference shall not exceed the following:

Nominal size of hose	⅞ in.	1¼ in.	1⅜ in.
Maximum expansion	½ in.	⅝ in.	¾ in.

3 (*c*) The hose must then withstand the following hydraulic pressures for a period of ten minutes:

Nominal size of hose................	⅞ in.	1¼ in.	1⅜ in.
Pressure, pounds per square inch....	750	600	500

Friction Test—4. A section 1 in. long will be taken from the 5-in. section previously cut off, and a 20-lb. weight suspended from a separated end of wrapper in such a manner that the force will be applied radially and uniformly, and the amount of unwinding under these conditions shall not exceed 8 in. in ten minutes.

Stretching Test—5 (*a*) Another section 1 in. long will be cut from the remainder of the 5-in. piece, and the rubber tube or lining will be separated from the ply and cut at the lap. Marks will be placed on this section 2 in. apart and then the section will be quickly stretched until the marks are

10 in. apart and immediately released. The section will then be remarked as at first and again stretched to 10 in. and held in this position for a period of ten minutes. It will then be released and when measured within thirty seconds of the time of releasing the distance between the marks last applied shall not exceed 2¼ in. At the end of ten minutes the distance between the marks will be again measured and the set at that time shall not exceed ⅛ in.

5 (*b*) Strips taken from the cover shall meet the same requirements as specified for the inner tube in Section 5 (*a*).

Tension Test—6 (*a*) The hose shall conform to the following requirements as to tensile strength:

	Pounds per Square Inch Minimum	Pounds per Square Inch Maximum
Inner tube	800	1200
Cover	700	1100

From the 3-in. section remaining after the friction, stretching and tensile tests are made, a strip of duck the entire length of this section will be taken. One piece will be cut 3 in. wide and parallel with the warp threads of the duck. Another piece will be cut 3 in. wide parallel with the filler threads. The tensile strength of each of these pieces shall be determined by the use of grips as shown in Fig. 1 placed 1 in. apart directly opposite one another on the center of the test section. The section thus tested must develop a tensile strength of at least 225 lb. per inch for both warp and filler threads. The rate of separation of the grips shall be approximately 20 in. per minute, and in no case shall the test be counted when the duck breaks in the grips.

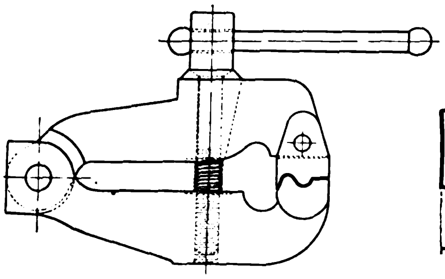


FIG. 1—GRIP FOR TESTING DUCK

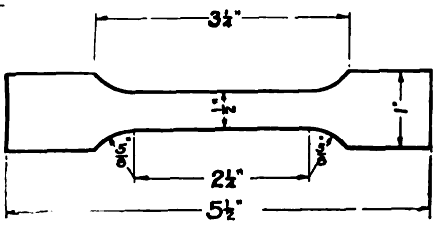


FIG. 2—TENSION TEST SPECIMEN FOR RUBBER

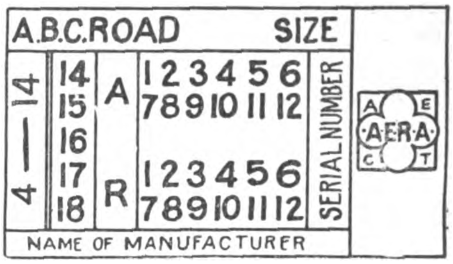


FIG. 3—HOSE LABEL

(*b*) Tension test specimens shall be taken from each lot of 200 ordered.

(*c*) Tension test specimens from tube and cover shall be cut with a specially designed die of the dimensions shown in Fig. 2.

III—SIZE AND DIMENSIONS

7. The hose shall be smooth and regular in size throughout its entire length, and shall conform to the following sizes:

Dimensions	Nominal size ⅞ in. Maximum	⅞ in. Minimum	1⅛ in. Maximum	1⅛ in. Minimum	1½ in. Maximum	1½ in. Minimum
Length	Specified length	½ in. under that specified	Specified length	½ in. under that specified	Specified length	½ in. under that specified
Outside diameter.	1-5/8	1-9/16	1-7/8	1-13/16	2-1/8	2-1/16
Inside diameter ..	15/16	7/8	1-3/16	1-1½	1-7/16	1-3/8
Thickness of cap vulcanized on ..	3/32	1/32	3/32	1/32	3/32	1/32
Thickness of inner tube	....	3/32	....	3/32	....	3/32
Thickness of cover	....	1/16	....	1/16	....	1/16

Note: All dimensions are in inches.

IV—WORKMANSHIP

Inner Tube—8. The inner tube may be made either by hand or machine. It shall be free from holes and other imperfections, and shall be so firmly joined to the cotton fabric that it cannot be separated without breaking or splitting the tube.

Wrapping— 9 (*a*) The canvas or woven fabric used as a wrapping for the hose shall be made of long fiber cotton, loosely woven, from 38 in. to 40 in. wide, and shall weigh not less than 20 oz. to 22 oz. per yard, respectively.

9 (*b*) The wrapping shall be frictioned on both sides and shall have, in additon, a distinct coating or layer of gum between each ply. It shall be applied on the bias with edges tapped at least ½ in.

V—MARKING

Serial Number—10. Each lot of hose of 200 or less shall bear the manufacturer's serial number commencing with "1" on the first of each year and continuing consecutively until the end of the year.

Label—11. Each hose shall have vulcanized on it a label of red or white rubber as shown in Fig. 3, located 6 in. from one end. Lettering and figures shall be not less than ¼ in. high, except name of the manufacturer, which shall be not less than ⅛ in. high. All letters and figures to stand in relief, not less than 1/32 in.

VI—INSPECTION

Inspection—12 (*a*) Inspection shall be made at destination, unless otherwise specified on order. The manufacturer, however, shall not rely upon the purchaser's inspection but shall provide sufficient inspection to insure against shipment of hose that do not conform to this specification.

12 (*b*) Where inspection is called for to be made at place of manufacture, the manufacturer shall afford the purchaser's inspector, free of cost, all reasonable facilities to satisfy him that hose are being furnished according to this specification.

Acceptance—13 (*a*) If the test hose conforms to Sections 2 to 6, inclusive, the entire lot from which it was taken will be examined and those complying with the specification will be accepted.

Rejection—13 (*b*) If the test hose fails to meet the requirements of Sections 2 to 6, inclusive, the entire lot from which it was taken will be rejected and the manufacturer notified.

Freight Charge on Rejected Hose—14. Rejected material will be returned to the manufacturer, who shall pay freight charges both ways.

Retests—15. Hose rejected in accordance with Sections 13 (*a*) and 13 (*b*) will be held for twelve working days from date of test report. In case of dissatisfaction with results of the tests, the manufacturer may make claims for retesting within that time.

Lighting of Electric Street Cars—The committee submitted as an appendix to the report an extended study of car lighting, showing the economy of modern metallic filament lamps, the use of various forms of reflectors, details of cost and typical layouts of lighting units. In general, the data are similar to those published in the ELECTRIC RAILWAY JOURNAL within the last year or two on the tests of the Bay State Street Railway, Cleveland Electric Railway and others.

Lightning Protection—In conclusion the committee reported on the replies received to its data sheet on lightning protection. The investigation revealed the fact that several of the larger companies have entered into exhaustive research work, notably the Denver Tramways and the Pittsburgh Railways. The committee recommended that in view of the importance of the subject it be continued.

Report of Committee on Standards Concerning Certain Recommendations of the Committee on Equipment, 1913-1914:

Recommendation of the committee on equipment: (*a*) As standard: Specification for solid wrought carbon steel wheels for electric railway service.

Action of the committee on standards: Adoption as a standard specification approved.

Recommendation of the committee on equipment: (*b*) As recommended specification: Specification for air brake hose.

Action of the committee on standards: Adoption as a recommended specification approved.

Recommendation of committee on equipment: (*c*) Wires and cables for car equipment: That further consideration of this subject be postponed.

Action of committee on standards: That the executive committee assign to the ensuing committee on equipment the general subject of "Car Wiring" with special reference to fire protection.

Recommendation of committee on equipment: (*d*) Revision of present standard specification for heat-treated carbon-steel axles, shafts and similar parts: That it be given more time to investigate.

Action of committee on standards: Recommendation approved.

Recommendation of committee on equipment: (*e*) Specification for gears and pinions: That it be given more time to investigate.

Action of committee on standards: Recommendation approved.

REPORT OF THE COMMITTEE ON FARES AND TRANSFERS

The committee on fares and transfers of the Transportation & Traffic Association presented yesterday conclusions on city conditions as follows: That the prepayment system of car operation is firmly established, and that fare boxes also have come to stay; that if the perfect fare box has not arrived the reason is probably that the users have not yet made up their minds as to what they want; that with a showing of 1 to 15 per cent in increased receipts there are several apparent advantages in the use of fare boxes; that few conductors have objected to the boxes on the ground of inaccuracy; that the practice of having tickets rung on a separate register does not appear to be a complete success and hence has led to the search for suitable metal tickets. On the last point the committee stated that there seemed to be no real danger of counterfeiting such tokens, but railway operators contemplating their use should remember that the federal government objects to the use of anything that resembles in color, design or inscription any United States or foreign coin. The committee did not express any opinion on transfer machines, but hoped that they would be discussed at the convention for further study because effective machines of this type would be very desirable.

The conclusions on interurban matters were as follows: That remittance by conductors should be on the closed system; that the verbal method of indicating to another conductor the right of a passenger to ride beyond a certain point is productive of abuses and should be replaced by an exchange or destination check, in form of a hat check printed with names or numbers of stations and numbered for record. The committee also stated that most of the companies which filled in the data sheets use some form of register for making a record of cash collections. It noted in conclusion that in several states the 2-cent-per-mile law is being applied to interurban passenger tariffs, and to avoid the troubles occasioned by the old method of computing fares by fare division points several of the larger interurban companies are now compiling new tariffs which split the nickel. This method, the committee said, will give the opportunity to place a redemption value on cash fare receipts without the loss of any percentage of the revenue by adding to the cash fares collected by conductors enough pennies to make the amount end in 0 or 5, and to make the receipt good for redemption of the extra penny or pennies at any agency.

REPORT OF THE COMMITTEE ON PASSENGER TRAFFIC

The report of the committee on passenger traffic of the Transportation & Traffic Association, read yesterday, was devoted largely to the trackless trolley and motorbus. Only the main points need be mentioned here, as the Electric Railway Journal has previously published so much on this subject, particularly the report made to the Board of Estimate and Apportionment, city of New York, by John A. McCollum (see issue of Nov. 22, 1913). After noting that the trackless trolley is used in but one or two places in this country, the committee considered the motorbus. Of the total bus companies reported but two out of fourteen are operated by electric railways as feeders for interurbans. Seven bus companies are reported as failures. The Indianapolis company failed despite a street railway reconstruction period and a 5-cent fare; in Pittsburgh, bus service through a fine residence section was given up with the advent of winter; in Detroit a municipal bus line at a 3-cent fare and a maximum ride of 6.5 miles was abandoned after a short trial, and a line at Hoboken, N. J., also found a 3-cent fare impossible despite heavy business. Interurban lines between Greenfield and Maxwell, Ind., and Morristown and Madison, N. J., also failed. The zone system is used except in New York and Washington, New York charging a straight fare of 10 cents and Washington 5 cents or six for a quarter. The latter company is operated at a loss. In all cases the buses are operated over paved streets. Bus companies have no paving charges, but in Massachusetts and New York their gross receipts are taxed and the former State also has a franchise tax. The situation in New York as to bus competition was discussed on the basis of Mr. McCollum's studies.

Eight private bus companies are contemplated, the largest being Los Angeles, Cal., with 105 vehicles, to go into service January, 1915. Five motorbus companies are trying to get franchises for a 10-cent service in Chicago. A similar rate of fare is contemplated by an applicant at Houston, Tex., while the Philadelphia Rapid Transit Company is seeking the right to operate motorbuses where it deems them desirable.

The committee concludes that while the possibilities of the motorbus are great, they will not be attained until the operating cost and rate of depreciation are decreased. At present it does not appear to be a serious competitor to the city railway except where roadway and traffic conditions are very favorable. To render them successful as feeders to interurbans, good roads, large population and reliable service are essential. The committee also discussed the development of new business; the distribution of traffic, especially peak loads; and improvement in public relations through the medium of the traffic manager and his department.

REPORT OF JOINT COMMITTEE ON CLAIMS ACCOUNTING

The joint committee on claims accounting of the Claims Association and the Accountants' Association submitted yesterday a classification of accidents with brief instructions for its use. The names of the fourteen accounts are as follows: Collisions with pedestrians; collisions at railroad crossings other than the company's; collisions between cars of the company; collisions with vehicles; derailments; defective equipment; boarding cars; injured or thrown while in cars (not in collision); alighting from cars; falling from cars (not purposely alighting); stealing rides; doors, gates and guardrails; ejectments, and miscellaneous. This primary classification is deemed to be sufficiently inclusive for all companies, and each company can insert subheads under the different accounts to suit its own convenience. Additional titles may seem necessary for subway or elevated railroads. These may be adopted as divisions of the miscellaneous group or even added separately. In the latter case they should be so defined that other members might readily understand that for comparison they should be included in the miscellaneous group.

REPORT OF THE COMMITTEE ON PUBLIC RELATIONS

The report of the committee on public relations, presented yesterday before the American Association, referred first to the appointment of a sub-committee to prepare a code of principles and to outline a comprehensive plan of educational publicity. This sub-committee consisted of James H. McGraw, chairman; C. Loomis Allen, Frank R. Ford, Guy E. Tripp and Col. T. S. Williams. Thomas N. McCarter, chairman of the general committee, was also an ex-officio member of the sub-committee. This sub-committee submitted for approval the following code of principles:

Code of Principles

1. The first obligation of public utilities engaged in transportation is service to the public.

The first essential of service is safety.

Quality of service must primarily depend upon the money received in fares. For this reason it is necessary that the rate of fare should be sufficient to permit the companies to meet the reasonable demands of patrons and to yield a fair return on a fair capitalization.

2. Regulated private ownership and operation of electric railways is more conducive to good service and the public welfare than government ownership and operation because the latter are incompatible with administrative initiative, economy and efficiency, and with the proper development of cities through the extension of transportation lines. The interests of the public are fully protected by the authority given to regulatory bodies.

3. In the interest of the public and good service local transportation should be a monopoly and should be subject to regulation and protection by the state rather than by local authorities.

4. Short-term franchises are detrimental to civic welfare and growth because they ultimately check the extension of facilities and discourage good service.

5. In order to render good service, electric railways must be allowed to earn a fair return on a fair capitalization, and the foundation for this result will be obtained, if the issuance and sale of securities representing such fair capitalization shall be legally authorized to such terms as will produce the requisite funds.

6. Securities which have been issued in accordance with the law as it has been interpreted in the past should be valid obligations on which an electric railway is entitled to a fair return.

7. The relation of adequate wages to efficient operation should always be recognized, but electric railways, being public servants regulated by public authorities, should be protected against excessive demands of labor and strikes.

8. The principle of ownership of securities of local companies by centralized holding companies is economically sound for the reason that the securities of the latter have protection against the varying business conditions of a single locality or company and because money for construction and improvements can thus be more readily obtained.

9. In the appraisal of an electric railway for the purpose of determining reasonable rates, all methods of valuation should have due consideration.

10. Full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public.

Publicity and Educational Plans

The sub-committee also recommended the establishment under the auspices of the American Electric Railway Association of a Bureau of Public Relations, this bureau to have a competent director with the necessary assisting employees. The work of the bureau to be under the general supervision and direction of the committee on public relations of the American Electric Railway Association, with the power in that committee to appoint, either from its own membership or outside, sub-advisory committees, who will co-operate in the work of the bureau.

The committee on public relations to appoint the director of the bureau and his employees and to fix their compensation; also, so far as practicable, to make up in advance the budget of the bureau's expenditures.

The work of the bureau to be along the lines suggested from time to time by the committee on public relations and to cover particularly the following:

I. The dissemination of information and literature on subjects of general importance to public service corporations, including particularly: (a) Relations with employees; (b) public relations; (c) regulatory laws and commissions; (d) publicity concerning facilities, service and accounts; (e) rate making; (f) depreciation and reserve accounts; (g) taxation; (h) franchises.

The above contemplates close association between the bureau and member companies of the association as to the furnishing and distribution of reports, information and statistics, and it is suggested that each member company be requested to designate a representative through whom correspondence with the bureau may be conducted.

II. Co-operation with similar committees of other public service associations.

III. Influencing the sources of public education, particularly by:

(a) Lectures on the Chautauqua circuits.

(b) Formation of a commitee of prominent technical educators to promote the formulation and teaching of correct principles and public service questions in technical and economic departments of American colleges through courses of lectures and otherwise.

(c) Formation of a similar committee in each of the great technical societies, such as the electrical engineers, mechanical engineers, civil engineers, chemists, hydraulic engineers, telephone engineers.

(d) Formation of a similar committee to work in connection with the various civic and economic societies.

(e) Discussions at institutions of learning and Y. M. C. A.'s on subjects pertinent to the relations between the public and service corporations.

IV. The publication in magazines and periodicals of signed popular articles on public service questions by prominent workers in the electric railway industry.

V. Newspaper advertising when desirable and financially possible.

In order to provide the necessary funds for carrying on this work it will be necessary to raise a sum of money, to be subscribed and paid in installments as called for by the committee. All monies to be expended under the direction and upon the authority of the committee.

In continuation the sub-committee said: "Obviously the ability to carry out the extensive program outlined above will depend upon the raising of sufficient money and the wise expenditure thereof. Your committee believes that much of the work outlined can be accomplished through the assistance of advisory committees and at comparatively little expense. Even if the funds available should not permit the carrying out of the full program, much good may be accomplished if only certain phases of the work are undertaken. Your committee has enumerated advertising as one field of work and believes in the effectiveness of this method of reaching the public but it is convinced after careful consideration that to carry on any comprehensive program of advertising would involve the employment of more money than can probably be raised and it, therefore, recommends the use of advertising only for specific purposes and on special occasions where conditions would seem to justify the expenditure."

In addenda to its report the committee published some abstracts from the address of President Black at the mid-year banquet of the association, held Jan. 29, 1914 (reported in the issue of this paper for Jan. 31, 1914), also an abstract from the report of the public policy committee of the National Electric Light Association, presented at Chicago, June, 1913.

THE ASPECTS OF WORKMEN'S COMPENSATION LAWS

Under this title H. A. Bullock, secretary New York Municipal Railway, took up the economic, social and political aspects of the subject in a paper delivered before the American Association yesterday. He showed that no attempt to deal with the problem without due regard to those three aspects will succeed. In approaching it, the underlying economic conditions must first be carefully studied, after which a spirit of co-operation with all interests involved must be fostered. In States already having compensation laws the railway companies should not "cry over spilt milk" but should have recourse to the courts in case any act is confiscatory. In the State of New York, where the railroads opposed a fair compensation law in 1910, a victory for the anti-compensation forces resulted in an amendment to the State constitution containing features placing it in the front rank of radical compensation acts. Mr. Bullock advocated an intelligent conduct of the battle for fair treatment for employers, if such be necessary, in the light of thorough understanding of the problem rather than passive submission to injurious legislation. He advised against political wire pulling, attacks upon the constitutionality of particular measures and the use of "inspired" newspaper articles. He emphasized these points, among others: 1. State insurance has many disadvantages to the railroads. 2. A wide choice of method of providing compensation should be allowed. 3. Employers should endeavor to guard themselves against laws which remove their common-law defenses, while employees are fully protected. 4. Employers should have concern over laws fixing unreasonable compensation periods. 5. An effort should be made to prevent compensation commissions and their deputies from becoming a source of disturbance between employer and employee.

COMMITTEE ON EXPRESS AND FREIGHT TRAFFIC

The report of the committee on express and freight traffic of the Transportation & Traffic Association, presented yesterday, included the replies received from fifty-one roads in answer to a data sheet sent out by the committee. Only one road out of the fifty-one reported that it was maintaining a pick-up and delivery service. All of the roads were using a per-diem charge for carload business, being about equally divided between the steam-road basis of 45 cents per day and the C. E. R. A. basis of 50 cents per day. Practically all of the roads were using territorial classifications with exception sheets, and a large majority used local association demurrage rules of some kind, only eleven roads reporting the non-use of any such rules. About the same result appeared in the case of storage rules. All of the lines reported the use of either the unit way-bill, the blanket way-bill or both.

In the matter of uniform class rates the committee was unable to recommend either a maximum or minimum, considering that the matter of rates would still have to be a matter for local consideration. A recommendation for continuances of this investigation was, however, made for the ensuing committee.

A general discussion of the matter of advertising for freight traffic was given in the report, as well as a digest of franchises for handling freight and express traffic by electric lines in several states. The appendices to the report included also a reproduction of the data sheet sent out by the committee and a statement regarding the best form of organization for a freight and express department.

ELECTRIC RAILWAY SECURITIES FROM THE COMPANIES' STANDPOINT

In introducing his address on electric railway securities from the companies' point of view, Calvert Townley, director of the Lackawanna & Wyoming Valley Railroad, Scranton, Pa., deplored the fact that electric railway officials are now assenting by silence to the perpetuation of a misleading impression when they in general admit the past failures of railway men without stating with proper emphasis that the public not only assented to railway acts without a serious protest but even joyously partook of the resulting benefits. Mr. Townley believes that no one needs to be ashamed of the electric railway industry, and that if railway officials agree with him that their partner and their predecessors' partner, the public, has profited by the development of the industry as much as or more than the investors and the industry itself, this fact should be widely proclaimed instead of being the subject of abject apologies.

In Mr. Townley's opinion, the points of view of a railway and its customers are so diametrically opposed that it could not maintain a successful business if they were regularly allowed to fix the rates. The ultimate analysis of regulation shows that it is only to prevent investors from making too much profit. The key of the future salvation of railways is the fact that they cannot be successfully controlled and developed by fiat and decree, but must be accorded the customary time-honored bargaining rights in order to be fundamentally and economically safe. Real publicity is needed, not a mere exhibition of daily doings to the public gaze, but the establishment in the public mind of fundamental railway economics.

In such a class Mr. Townley groups the following principles: Railways must grow with the communities they serve, and over a period of years new capital needed for growth will always greatly exceed the additional receipts obtained from increased service. In other words, additions and extensions of existing roads cannot be financed out of earnings. Yet security selling is competitive, and the needed funds will not come from private sources unless the chances of a satisfactory return appeal to private investors. Moreover, this return cannot be permanently fixed, for commercial and financial conditions change constantly. In short, Mr. Townley concludes, unless the exercise of public control be reasonable and such as to insure safety to capital and stability of earnings while allowing wide latitude for satisfactory future returns, the resulting possible diversion of capital from electric railway securities will disastrously retard progress in the communities served.

INVESTMENT BANKERS AND PUBLIC SERVICE ACCOUNTANTS

The address on investment bankers and public service accountants by H. S. Swift, treasurer West Penn Traction Company, Pittsburgh, Pa., before the American Association yesterday dealt mostly with the gradually increasing influence of bankers in the financial affairs of public corporations, from their first small interest to their present representation in directorates and even direct control of management and operation. Mr. Swift outlines the various conditions that are usually studied by investment bankers in considering the underwriting of public utility securities. He states that bankers in analyzing reports were formerly guided by general rules regarding gross earnings per mile of road, maintenance per mile of track, etc., but that experience taught them the inelasticity of such rules and led them to follow the electric railway accountants in considering the car-mile as a unit of comparison.

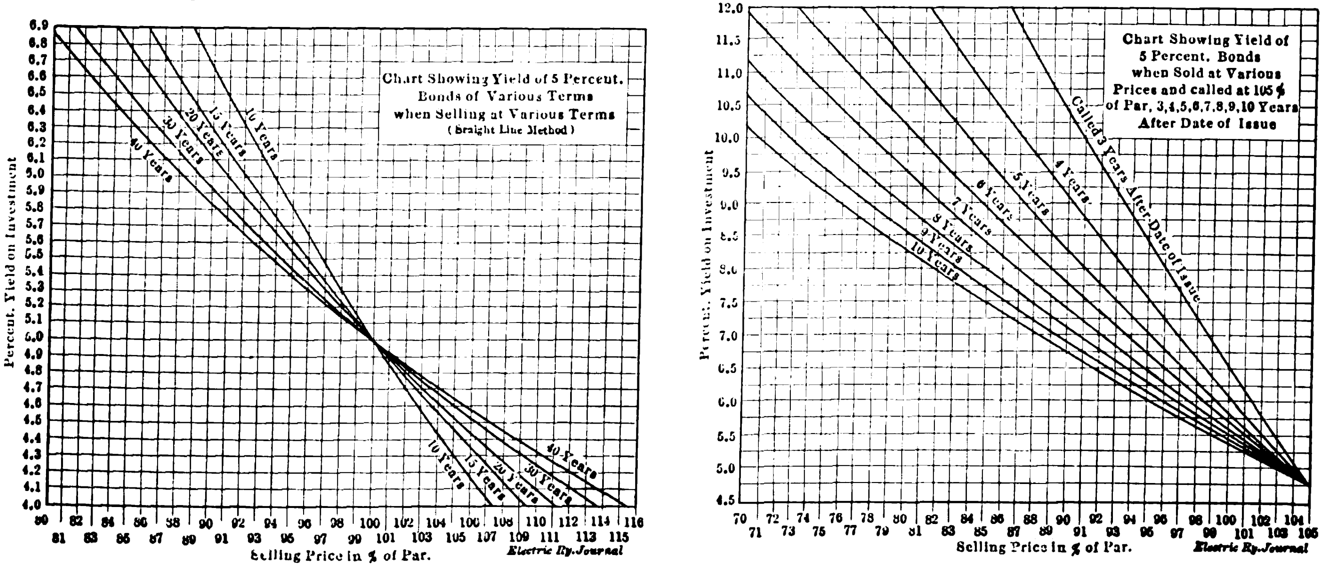
According to Mr. Swift, the growth of the statistical department of investment banking houses has been rapid, not only along the line of collecting public service commission as well as public utility reports, but also in connection with the analysis of operating reports for securing personal information and for answering inquiries of prospective purchasers. The information that bankers desire concerning public utilities serves two distinct purposes, first, to guide them in their decisions concerning the underwriting and purchasing of securities, for which purpose only pertinent facts are desired, and second, to provide a general story about the property that can be used as a sales talk to investors. No attempt seems to have been made by investment bankers to employ their statistical departments in making actual audits, such work being delegated to certified public accountants and consulting engineers.

Mr. Swift believes that investment bankers would like to see more uniformity in the distribution of expenditures between maintenance and construction and the ascertainment of some fairly accurate amount per car-mile or per mile of track and per car per annum that would represent a fair expenditure for maintenance, renewals and depreciation. They would also be interested in a completely detailed statement of construction expenditures. Mr. Swift notes, however, that although investment bankers can analyze public utility reports, they do not seem to have made efforts to unite with public utility accounting officers for making suggestions and discussing improved methods.

ACCOUNTING TREATMENT OF BOND DISCOUNT

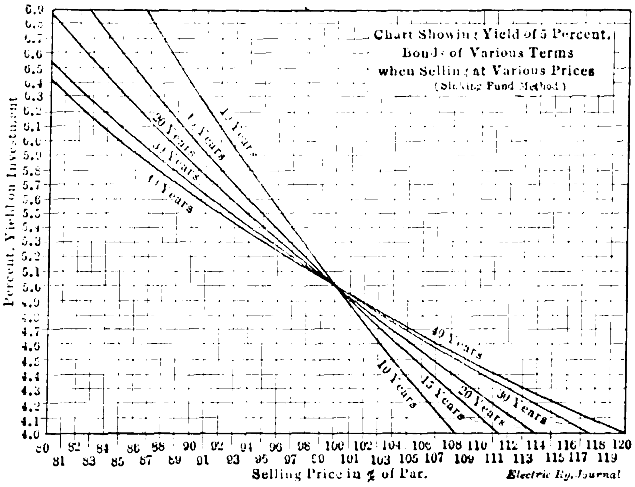
In the address delivered yesterday by James F. Fogarty, secretary The Milwaukee Electric Railway & Light Company, Milwaukee, Wis., on the subject of the accounting treatment of bond discount, the history of bond discount from 1897 to date was first briefly reviewed. Mr. Fogarty pointed out that discount was formerly regarded as the "initial cost" of borrowed money—i. e., the commission paid for its use over and above the annual cost represented by the nominal or coupon rate of interest. He also indicated the reasoning from which it has more recently been concluded that discount and nominal interest are closely related and together form the cost of borrowed money.

According to Mr. Fogarty, while current classifications of accounts do not prescribe uniform treatment of bond discount, the prevailing practice requires that it be regarded as a deferred cost which is properly chargeable to income and which should be amortized over the term of the security. To the extent that discount represents a part of interest during construction, it is recognized under current accounting practice as a proper charge against capital account. Bond discount is measured in part by the rate of return required for the investment of capital under the particular conditions surrounding the loan. It usually includes the cost of brokerage, or compensation of the investment banker incidental to marketing the security. From the corporation's point of view it is not possible to separate discount into its element of interest and brokerage; hence both costs are in practice treated as a part of the interest charge.



ACCOUNTING TREATMENT OF BOND DISCOUNT—CHART SHOWING YIELD OF 5 PER CENT BONDS

In cases involving reasonable rates and in the determination of income for purposes of taxation, bond discount has only an indirect effect, according to Mr. Fogarty. It is generally considered as a part of the rate of return rather than as an element of the cost of property. In conclusion Mr. Fogarty stated that the weight of authority prescribes that bond discount be amortized from income in order to extinguish it as a capital asset. It may be written off by annual accruals through either the sinking fund or the straight line method of amortization, but, while both methods lead to the same results, the straight line method seems to be generally preferred because of its greater simplicity.



ACCOUNTING TREATMENT OF BOND DISCOUNT—CHART SHOWING YIELD OF 5 PER CENT BONDS

In connection with his address Mr. Fogarty presented three interesting diagrams, reproduced herewith, to show the effect of bond discount in increasing nominal interest rates and the effect of the sale of bonds at a discount and their redemption at a premium. For instance, by reference to the diagrams it will be seen that the sale at 88 of a thirty-year 5 per cent bond results in an actual interest cost of 5.854 per cent calculated by the sinking fund method, and 6.136 per cent calculated by the straight-line method. Similar computations can be made for the various terms of life, rates of interest and sales prices of bond issues.

REPORT OF THE COMMITTEE ON INSURANCE AND FIRE PROTECTION

The report of this committee of the American Association, presented yesterday, stated that it had received reports from 274 companies for the year 1913; 122 companies made no report. These reports show:

Amount of insurance carried	$317,846,276	
Amount of premiums paid	1,779,671	
Amount of fire losses	599,498	
Amount recovered	533,453	
Ratio of recoveries to losses	88.9	per cent.
Premiums per $100 of insurance	56	cents
Losses per $100 of insurance	18.7	cents
Recoveries per $100 of insurance	16.7	cents
Ratio of losses to premiums	33.5	per cent.
Ratio of recoveries to premiums	29.8	per cent.
Number of fires	143	

More members reported this year than in any previous year. The losses of 1913 were higher than those reported in any previous year except one; but the rate of insurance was the lowest in the history of electric railway insurance as disclosed by the committee's reports.

Of the $1,779,671 paid for insurance, $533,453, or about 29 per cent, was returned to the insured for losses, leaving about $1,250,000 for commissions to agents and others, for other expenses of conducting the insurance business and for dividends. Some of the members included in their insurance and premiums boiler insurance, flywheel insurance, tornado insurance, burglary insurance, automobile insurance, and possibly other insurance, but these companies were only three in number, so far as the committee knows, and the elimination of the cost of these other forms of insurance would not materially alter the average cost as shown by the tables.

Fourteen companies reported that they carried no insurance, and three companies reported that they carried their own insurance. Four companies reported the amounts of insurance carried by them, but did not feel at liberty to report the premiums paid. One company reported the amount of premium paid, but failed to state the amount of insurance carried. In these cases the committee has assumed that the rate was 50 cents per $100.

Fifty-nine companies reported fires. Of the 143 fires of the year, thirty-six were reported by one company. The committee has assumed that companies that reported no fires had none.

Several fires from overheated resistance, diverters or grids were reported, and others from the same cause occurred early in the year 1914. Fires from this cause were so frequent that the committee endeavored to find a remedy, and with that purpose in view corresponded with electric railway engineers, car builders, insurance engineers and others. No better remedy was suggested than that contained in the rules and regulations of the National Electric Code, formulated and published by the National Board of Underwriters, and a rule requiring conductors to tie down their trolleys when leaving cars in yards and motormen to remove their controller handles.

Sixty-one members reported that they had equipped buildings to the number of 266 with automatic sprinklers. The amount invested in automatic sprinkler protection, as indicated by these reports, was $1,650,000, but several companies that reported sprinklered buildings failed to report the cost of their sprinkler equipment. This investment shows that railway companies are protecting their property, and this is probably the principal reason for the reduction in the average rate of insurance.

Attention is called to a report presented to the American Electric Railway Engineering Association in 1913 by its committee on buildings and structures, containing rules for the protection of buildings and for fire drills. These rules have since received the approval of the National Fire Protection Association.

Insurance companies have continued to give particular attention to the insurance of railway properties, and have reduced their rates to companies that have been able to show that they were entitled to lower rates.

In the opinion of the committee, a lower average rate for the entire industry than the 56 cents shown in this report ought not to be expected unless the hazard of fire is still further lessened. In the long run, it is to the interest of the electric railway business that rates on properties not efficiently protected and guarded be high, in order to induce their owners to put them in safer condition. Fire prevention is much more important than the collection of fire losses. Electric railway properties can be placed among the most desirable risks, from the viewpoint of fire insurance companies, by the installation of approved devices for the prevention or quick extinguishment of fires, and by the exercise of only ordinary care on the part of officers and employees in the upkeep and cleanliness of buildings, yards and rolling stock.

TABLE SHOWING CAUSES OF FIRES, COST AND LOSS DURING THE LAST YEAR

Causes of Fires	Number of Fires	Loss
Adjacent property	6	$426
Boiler blowout	1	
Broken span wires	3	
Car heater	1	2
Car wiring	1	1,801
Cigar stubs, cigarettes, matches	10	1,442
Clothing hanging near stove	1	
Collision	1	19,386
Collision, train and automobile	1	1,875
Defective car heater	1	70
Defective car wiring	2	201
Defective insulation	1	1,125
Defective stove in car	1	94,717
Dropping of trolley wire	1	1,750
Electrical	26	7,395
Electric heaters	2	2,367
Fireworks	1	2,000
Ground wire	1	25
Hot ashes	1	120
Incendiary	3	245
Lightning	8	266,081
Match thrown in window pocket	1	4,529
Overheated journal	1	
Overheated resistance	4	7,612
Overheated stove	6	5,831
Short-circuit	2	1,278
Short-circuit in transformer	1	17,000
Short-circuit in high-tension wire	1	
Smoking	1	
Spark from generator	1	730
Spontaneous combustion	2	94
Tramps	2	538
Trolley down on car on bridge	1	150
Trolley wire broke stove pipe in car	2	7,648
Unknown or not reported	45	153,060
Total	143	$599,498

TABLE SHOWING CLASSES OF BUILDINGS INJURED BY FIRE DURING THE LAST YEAR

Property Damaged	Number of Fires	Loss
Carhouses and cars	53	$451,567
Stations and depots	6	3,342
Power stations	3	859
Substations	3	17,407
Store houses	3	30,144
Shops	2	4,015
Oil houses	2	1,676
Park buildings	5	14,946
Other buildings	19	19,163
Electric victor machine	1	900
Unknown or not stated	46	55,479
Total	143	$599,498

The committee submitted several tables with its report. One showing the different causes of fires, and another showing the different classes of buildings injured by fire during the past year, are reproduced.

BUREAU OF INSURANCE

The report concluded with a report to the committee from Henry N. Staats, insurance expert. Mr. Staats said, first, that he thoroughly indorsed the rules laid down for the prevention of fire by the American Electric Railway Engineering Association in its Proceedings of 1911, under the head of "Fire Protection of Carhouses." He also reported that the rules drafted by the committee on buildings and structures of the American Electric Railway Engineering Association to cover the instruction to employees bearing upon fire protection and maintenance had been approved by the committee on railway, light and power properties of the

National Fire Protection Association. This committee consists of C. H. Patton, chairman, Cleveland; R. C. Bird, H. J. Davies, J. C. Forsyth, M. F. Jones, J. V. Parker, A. M. Schoen, Martin Schreiber, H. N. Staats, R. Swetland, L. Wiederhold, Jr., and A. G. Wilbor.

Mr. Staats also reported that the Central Traction & Lighting Bureau (composed of old-line insurance companies) had, after several years of controversy and delay, issued its schedule for rating electric railway properties. A strict application of this schedule would result in an increase in the present cost of insurance. In conclusion, he said that if electric railway managers would follow the rules adopted by the American Electric Railway Engineering Association for standard buildings and structures, for protection and inspection of their properties and for car heating and car wiring, they should obtain a rate of 10 per cent or less on each $100 of insurance carried; or they could safely carry their own insurance, and make money in so doing.

REPORT OF THE COMMITTEE ON BUILDINGS AND STRUCTURES

The report of the Engineering Association committee on buildings and structures, presented yesterday, stated that the executive committee had assigned the following subjects for consideration of this committee: "Fire Protection Rules" (to be given joint consideration with the National Fire Protection Association), "General Specifications and Form of Contract," and "Power House Construction." A sub-committee was appointed to obtain the approval of the fire protection rules, contained in Section 1 of Appendix B, page 406 of the 1913 Proceedings, by the committee on electric railway and power properties of the National Fire Protection Association. This approval was obtained, and the rules were set forth in the report. It was also recommended that these fire protection rules be again referred to the committee on standards for its recommendation.

The sub-committee on general specifications and form of contract submitted a form of contract and general conditions of specifications, that had been approved by the committee as a whole, and it was recommended that these forms be approved for adoption as standard.

The sub-committee on power house construction called particular attention to its report on this subject, which was found to be exceptionally broad, and one which should make an intensely interesting and valuable study for the association. To secure definite results on this subject the committee made certain assumptions which included the size of the station, the character of the load, the station site, the locations of the coal and ash-handling equipment, the arrangement of water conduits, main building and shop, and distribution of cost. With these assumptions a general synopsis of the whole plant was made and submitted for consideration.

REPORT OF COMMITTEE TO CONSIDER RELATIONS WITH SECTIONAL ASSOCIATIONS

The committee of the American Association on relations with sectional associations reported yesterday that it did not recommend any changes in the amendment to the constitution adopted last year providing that all members of such associations must be members of the American Association. The committee believed that closer relations should exist between the American Association and the smaller associations scattered throughout the country. There is a tendency toward co-operation, as was indicated by the action of the Central Electric Railway Association's arrangement with the Engineering Association for co-operation in the matter of standards. . The presidents of the section associations were invited to attend the midwinter convention of the American Association.

REPORT OF THE COMMITTEE TO DEVELOP UNIFORM DEFINITIONS

The Transportation & Traffic Association committee appointed to develop uniform definitions reported yesterday that at the 1913 convention the committee had presented thirty-nine definitions of terms. Due to lack of time, these definitions received no consideration, the report being accepted but no action being taken thereon. Under such circumstances, uniformity in terminology will not be assured. The committee, therefore, presented yesterday a report which includes the definitions presented in 1913, and, in addition, called attention to other definitions heretofore adopted by the association, principally in the reports of the committee on construction of schedules and time-tables. As some of the definitions presented last year were inconsistent with definitions previously approved, where such non-conformity appeared both definitions were shown and the convention was asked to take such action as will definitely give one of the definitions the approval of the association. The committee feels that the association should not, without due discussion, place upon its records recommendations of such importance as the standardization of terms.

REPORT OF COMMITTEE ON AWARD OF MEDALS FOR BEST PAPER READ BEFORE A COMPANY SECTION

The American Association committee on the award of a medal for the most meritorious paper delivered before a company section during the year reported yesterday that nine excellent papers had been examined. (For list see ELECTRIC RAILWAY JOURNAL, October 10, 1914, page 774). The committee unanimously concluded that the award should be made to H. G. Abendroth, of the Milwaukee Electric Railway & Light Company section. [Mr. Abendroth's paper was entitled "Overhead Charges in Valuations." An extended abstract of this paper was published in the issue of the ELECTRIC RAILWAY JOURNAL for June 27, 1914, page 1434.—EDS.]

REPORT OF THE COMMITTEE ON ELECTROLYSIS

The American Association committee on electrolysis reported yesterday to the effect that the association has appointed two of the members of this committee along with one representative of the American Electric Railway Engineering Association as delegates to the national committee to consider electrolysis. As the engineering and technical questions involved are being considered by the electrolysis committee of the American Electric Railway Engineering Association, the committee concludes that it can best serve the interests of the association and avoid duplication of work by keeping in close touch with the work of the above mentioned delegates and with the engineering association's committee, rather than by itself giving the subject independent and comprehensive study. The committee reported satisfactory progress along these lines and suggested the continuation of the committee for another year or until such time as the association decides that its duties shall terminate.

An Englishman recently returned from Brussels, tells the following story: "About 150 German officers are quartered at the house of the manager of the Brussels tramyards at Uccle. One night, after dinner, a major sent for him and said that he had not given them the best wine that he had in his cellars. The host protested that he had, but the major said, 'You have not. I know where there is some better champagne, and if you will hand over your keys I will fetch it myself.' The manager looked closely at the officer and said, 'I seem to know you.' 'Yes,' replied the major, 'I was your chauffeur once for six months.'"—*Electric Railway & Tramway Journal, London.*

THE ASPECTS OF WORKMEN'S COMPENSATION LAWS*

By Edwin Gruhl, Assistant to President North American Company

While in late years there have been many additions to the list of workmen's compensation acts, many of a comprehensive character, it is a mistake to assume that a complete and satisfactory program has been developed anywhere. There seem to be differences in the theory underlying the various laws as well as in their prescribed methods of application. Mr. Bullock has pointed out in a comprehensive way the economic, social and political aspects of the problem which must be considered before a satisfactory solution can be reached.

Perhaps the most important administrative question is how the company can best be insured against compensation losses. Both the employee and the company are interested in the greatest protection at least cost. Four methods are possible in providing such insurance: (1) state insurance, administered and controlled by public officials, such as occurs in Washington and Ohio; (2) insurance by stock companies; (3) insurance by a mutual company comprising employers engaged in a similar industry, and (4) self-insurance. It is still too early to say which is the most economical, but there are several reasons why the administration by a mutual association conversant with the problems of one industry or, if the company is of sufficient size, self-insurance, is the most satisfactory.

1. The problem of assessing the cost of insurance over different types of employment is more complicated than we are frequently led to believe. Many years will have to elapse before sufficient experience data are available to place equitably upon each industry its proportionate cost of the risk. Each machine carries with it its peculiar hazard, and each operation its own danger. The classes of employees in the traction industry are unusually diverse, ranging in hazard from bookkeeper to lineman and comprising every variety of indoor and outdoor employment. It is impossible at this time to devise a single premium rate or set of rates which will conform to the average risk of any particular company and where such uncertainty exists it is to be expected that any stock company or state department will exaggerate the risk and overstate the rate. During the necessarily slow period of developing standards and accurately measuring risks it is of interest at least to follow carefully individual loss ratios if not to provide and administer the actual insurance for workmen's compensation—to experiment rather than be experimented with. Any possible savings can well be invested in other forms of employees' welfare.

2. We may well question the inherent economy of compulsory state insurance. There are too many obviously unsolved problems of economy and efficiency in the usual state departments to expect that insurance funds will be safely invested at the maximum return or that overhead charges will be kept at an irreducible minimum. With varied industries claiming its attention a high degree of organization will be necessary if the state bureau is properly to fulfil its designed function.

3. Workmen's compensation is only one of the phases of what has frequently been termed social insurance. Judging from current discussions and the character of proposed legislative enactments in many states it will not be long before we will be asked to consider that the compensation for accidents while on duty be supplemented by schemes which provide insurance for accidents off duty, for sickness, for unemployment, for old age pensions, etc. Many traction companies, impressed with the necessity for a broad welfare policy, are already providing some of these benefits through mutual societies. The success of such plans has depended largely upon the realization by the employee of the mutual interest he has in the well-being of his company and of his co-employees and in seeing that such welfare plans are properly administered and the funds of the association not paid out in cases of malingering and fraud. Such a mutual interest is impossible under state insurance.

4. Only where the traction company carries its own insurance or carries its insurance in a sufficiently confined mutual company, so that its interests are not merged with a large number of diverse industries, can there be any automatic reduction in cost because of the activities of the "safety first" movement. Fire insurance companies through long experience endeavor to make equitable reductions in rates because of type of construction of buildings, installation of sprinkler systems and the elimination of fire hazards. It does not call for much play on the imagination to picture the difficulties which would be encountered by any insurance expert in trying to ascertain the proper reduction to be made in the rate because of the effect of the company's "safety first" movement.

CARRANZA SWOOPS DOWN ON MEXICO CITY TRAMWAYS

The New York *Evening Post* for Wednesday, Oct. 14, contains the following startling story from Mexico City of the seizure on Oct. 12 of the local public utilities by the present arbiters of still-harried Mexico:

"The seizure of the Mexico Tramways Company lines by the Carranza government to-day was made at the point of the bayonet.

"The Mexican Tramways Company, Ltd., is a Canadian corporation capitalized at $1,000,000. Its home office is in Toronto, Ont. Shortly before noon, soldiers surrounded the main building occupied by the office and plant, while a delegation of officials entered the premises and served notice upon General Graves that all the books, rolling stock and other property of the company, with the exception of the cash in the vaults, must be delivered to the chief of police. The order was given in the name of the supreme chief, and was signed by the governor of the federal district.

"The government explained that the measure was a provisional one taken in the interests of public welfare, and due to the stoppage of the street-car traffic of the city on noon of last Thursday, when the motormen, conductors, inspectors and shop men struck because their demands for a 100 per cent increase in wages, an eight-hour day, and recognition of the union were not granted by the company in the four hours' time limit specified by the strikers' committee.

"The principal owners of the property are English, French and Belgian, with some American stockholders. All foreign employees were kept in the building at the behest of the troops. The management has made a vigorous protest to the Brazilian, British, French and Belgian Legations. A formal protest was registered also with Carranza.

"Carranza later designated Tomas Ramos as acting general manager of the system. The lines of the company form a network over the entire federal district, extending for nearly 250 miles, and carrying millions of passengers monthly.

"Due to a depreciation in the Mexican peso, the management informed the government to-day of its inability to grant the demands of the men for shorter hours and double wages, saying that passengers now were being transported at less than 1½ cents gold. Immediately after this reply of the company was made, soldiers took possession of the property.

"The act has caused a sensation here, as the tramway company and the allied Mexican Light & Power Company, Ltd., supply all the light, power, heat and transportation within a radius of 30 miles of the capital. The joint investment of the allied companies represents nearly $100,000,000."

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*Abstract of written discussion of the paper by Mr. Bullock on this subject presented at the meeting of the American Electric Railway Association, Atlantic City, N. J., Oct. 14, 1914.

REPORT OF THE WAYS AND MEANS COMMITTEE

The report of the ways and means committee of the American Electric Railway Association was presented yesterday. This committee was appointed at the mid-year meeting of the association and was instructed to devise methods for the increase of the association's receipts and to effect, if possible, economies in the association's expenditures.

The committee said that under its instructions three matters of extraordinary importance connected with the finances of the association presented themselves during the past year for its consideration. The first of these was the question of the support of *Aera*, and acting with the *Aera* advisory committee and under the authority of the executive committee the printiing of advertisements in this magazine was resolved upon, to take effect with the January issue. An advertising solicitor was appointed and efforts were made in various ways to interest manufacturers in *Aera* as an advertising medium. Business conditions have been adverse and the difficulties that have presented themselves were many. In view of these circumstances, however, the committee believes that a fairly satisfactory showing has been made and is confident that a decided increase in the advertising carried will be evident during the coming year. In the meantime, it is the purpose of the committee to effect such economies as will, it is hoped, bring the expenditures for *Aera* into a closer ratio to its receipts.

The matter of financing the fare research bureau also received attention by the committee. According to its report, this important function of the association was put in operation on May 1 with the appointment of a director, at which time an appropriation of $2,500, made by the association, for the first year's work, was available. In addition to this sum of money, the committee proposed to enlist the aid of fifty member companies and to secure from these companies subscriptions to a fund which would provide for the maintenance of the bureau for a period of three years. In view of business conditions, however, it was later resolved to defer the call for these contributions. In the meantime the members of the committee on the cost of passenger transportation service have provided a sum of money which will care for the finances of the bureau until such time as it seems advisable to issue the call to the larger list of companies. The thanks of this association, the committee says, are due to the members of the committee on the cost of passenger transportation service for their great generosity which has enabled the bureau to inaugurate the very valuable work which it is designed to carry on.

The question of the dues of member companies was given to the ways and means committee for its consideration, and at the January meeting a report was presented to the executive committee covering a scale of dues which, if put into effect, would provide some $16,000 additional revenue each year. In this connection the committee called attention to a letter sent out with the proposed amendment to the constitution and which explains in detail the reason and necessity for this action of the association. Continuing the report says:

"The work which the association is doing is constantly increasing. No organization in the country of similar magnitude, doing so large a work, is operated so economically as is this association. Nor is the scale of dues in any similar organization so low. The additional revenue is a necessity, and the increases proposed are, in no case, excessive. Work for electric railways of a value scarcely to be estimated is being carried on by the association, and in no other way can the results which we are achieving be secured for member companies as cheaply and as efficiently. Your committee, therefore, urges upon you the duty of supporting the proposed constitutional amendment, believing that the benefits to be derived warrant in full measure such additional expense as the individual companies may be called upon for. The inauguration of the new scale will increase the receipts from company and individual membership from $52,000 a year to $68,000 a year. This increase is a necessity unless the activities of the association, which are of so much value to the electric railways of this country, shall be materially curtailed, and your committee believes that the proposed constitutional amendment is worthy of and should receive unanimous approval at your hands."

REPORT OF ANTHONY N. BRADY MEDAL COMMITTEE

The report of the American Association committee appointed to formulate conditions of competition for the Anthony N. Brady gold medal was presented yesterday afternoon. It referred to the fact that in February the American Electric Railway Association was notified by the American Museum of Safety that it had been authorized to make an award annually of a gold medal, with a silver and a bronze replica, in memory of Anthony N. Brady, to that American electric railway company which for the year of award should have done most to conserve the safety and health of the public and of its employees. The Museum of Safety requested the American Electric Railway Association to appoint a committee to formulate the conditions of competition for this medal. The president of the association appointed as the members of such committee Arthur W. Brady, chairman; Frank Hedley and C. S. Sargeant. This committee formulated the conditions for the competition, which were submitted to the president of the association and approved by him. [A copy of these conditions was printed in the ELECTRIC RAILWAY JOURNAL for May 9, 1914.] They follow closely the conditions formulated for the award of the E. H. Harriman gold medal to the American steam railways making the best safety record. The report then goes on to say that, in the form adopted, these conditions were sent to the electric railways of the country in June last. Much interest has been manifested, and several companies have entered the competition for the year ending June 30, 1914. The committee appointed by the president to make the award consists of the following: Bion J. Arnold, chairman; James H. McGraw, Will J. French, Prof. George F. Swain and Frank J. Sprague. The committee suggests that the association recognize, by proper resolutions, the generosity and far-sighted public spirit manifested by the family of the late Anthony N. Brady in offering this medal.

ILLUMINATING BY SEARCHLIGHTS AT THE PANAMA-PACIFIC EXPOSITION

Four hundred giant searchlights will be used next year to flood the palaces and gardens of the Panama-Pacific International Exposition with vari-colored light. Two hundred of these have already been received. Half of the shipment consists of 18-in. instruments and half of 13-in. reflectors. These are the smallest searchlights which will be used and are to be installed on the roofs of all the main exhibit palaces, above the arches over the entrance gates, and on the six main towers of the courts, including the Tower of Jewels. The great reflector on this tower will be 432 ft. above the ground.

The other searchlights, to arrive within a few weeks, will include 100 30-in. lights, 100 18-in. and many colored scintillators, consisting of a battery of monster lights and projectors 3 ft. and 4 ft. in diameter, to be set up on the breakwater, just east of the California Building. At night this enormous searchlight will play symphonies of color on the clouds, and will be met by the powerful beams from another enormous searchlight which will be set up on the crown of Mount Tamalipas, 15 miles away across the bay.

Traditional custom and desire makes plain commercial rivalry and friendliness our means of conquest in South America.—*Electrical World*.

THE TRANSPORTATION DEPARTMENT AND THE CHANCE IT OFFERS*

By N. W. Bolen, General Superintendent Public Service Railway

A transportation head of an electric railway system is comparatively modern, so far as the title is concerned, being practically coincident with the introduction of electrically propelled cars. The carhouse foreman was the czar of the early horse car railway, and his duties were many. He selected the horses and mated them, saw to their shoeing, purchased the corn and oats and hay for their feed; employed the drivers and conductors and enforced discipline among the employees with a heavy hand. By rule-of-thumb methods, he developed schedules and determined headways and performed many functions that now are considered of sufficient importance to justify the maintenance of special departments.

With the advent of the electric car came changed conditions, the personnel of the men changed, and with the mustering out of the faithful mule and horse went many of the faithful men who had manned the cars in former days and in their places there arose a different type of employee. These changed conditions have been responsible for the evolution of the transportation man, and in any discussion of the opportunities offered him, his task is a primary consideration. In general he is charged with the responsibility of safely, speedily and comfortably transporting a major portion of the population adjacent to his lines, to and from their work. He must see that sufficient and proper equipment is provided; that trained and disciplined crews man the cars; that schedules are constructed to meet the wants of the passengers; provide workable hours for the trainmen and still be economical in operation. Many of his duties interlock with the work of other departments, and each department is as mutually dependent on the other.

The "Triple Entente"

The transportation man is subject to the "triple entente," namely: the public, the company and the employee. Heads of other departments have to work out the problems that involve the last two factors, but the transportation man has not only to meet the just and unjust criticism of the public concerning the operation of his department, but also act as mediator for other departments. The irate passenger who has missed his train due to a blockade resulting from a car splitting a defective switch or from a trolley wire down, is not prone to calmly withhold his wrath until he can, figuratively if not literally, lay hands on the head of the offending department. The transportation man, at this juncture, must prove himself a diplomat, if he is to smooth out the trouble and send the patron on his way with the proper feeling towards the company.

Amicable relations with the public are necessary, but of equal importance is the maintenance of proper relations with heads of other departments and the employees under his direction. In most cases it will be found that the man possessed of the qualities which make of him a successful leader among men, has but little trouble maintaining pleasant relations with his superiors and fellow officials. To obtain results and preserve discipline is a task that calls not only for energy and efficiency, but also for sympathy, and a spirit of personal interest in the employees under him.

Dean Schneider of the University of Cincinnati treats happily of what qualifications are necessary for success in his paper on "Selecting Young Men for Particular Jobs" under "Major Characteristics." Out of this paper quite an imposing list of qualifications might be developed for the ideal transportation man, but as really essential, the following ones stand out strongly: Good health, directive ability, personal magnetism, mental poise and willingness to assume responsibility.

To the young man possessing in a fair degree the qualifications named, the transportation department offers a field which will give him full opportunity. A majority of the transportation heads to-day are men who, like Topsy, "just growed up" in the business. These men have had but few sign posts to guide them, and the degree of success attained has resulted principally from the applications of such methods of operation found practical in the days previous to the advent of the electric railway. The more complex operating conditions to-day require greater development in operating practice than formerly, but the basic principles remain unchanged. This is an age of specializing, and the eyes of the executive and the manager are scanning the work of the young men in the service, looking for material from which heads of departments may be developed.

The unsettled question of the college-bred man versus the practical man with its pros and cons is left for others to debate. It is sufficient to say that the directing head of an army of transportation employees must, above all things, be a man in the full sense of the word for, after all, the dominant factor of his success will be his ability to handle men. Technical training is a great help to the transportation man in dealing with the mechanical department, the power and distribution department and the maintenance of way department, and the man who has such training is doubly blest. This, however, will in no way take the place of such qualities as being a good disciplinarian or a successful promoter of team work.

The technical courses of our universities provide much that the graduate may directly apply when he enters the engineering branch of electric railway work, but there yet remains the opportunity to provide a broad and comprehensive course in transportation training. Such a course would greatly aid the student of transportation when taking up his duties as a subordinate in actual service, but no amount of study will offset the necessity of obtaining first-hand knowledge of operating details. Through their actual performance and only by contact with various phases of the work can he obtain the training that will fit him for the responsibilities of the job higher up.

With the constantly increasing demand for economies in railway operation, the transportation end of the game has become a complex proposition. The public demands more for a single fare than it did formerly, the ride is longer, the cars are bigger, wages are higher and hours shorter, but the nickel is no larger. All of these call for higher efficiency in the transportation department as well as in other branches of the service. To the man who likes a varied existence, who is willing to work irregular hours and bear the responsibility of a public duty, the job will prove an attractive one, not from its financial rewards, but from love of the work, which is inherent to the born railroad man. The constant expansion of electric railway lines will require more men to fill these positions of responsibility, and to-day is the time for the young man to prepare himself. His course is well defined, and time will tell to what extent he has profited by his superior advantage over the pioneers of the craft who blazed the trail and derived their entire training in the hard school of experience.

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*Abstract of paper presented at meeting of the Transportation & Traffic Association, Atlantic City, N. J., Oct. 14, 1914.

NEW YORK SUBWAY TRACK EQUIPMENT

The distinctive features of track equipment of the New York Subway are to be made the subject of a paper to be presented at the next meeting of the New York Railroad Club to be held on Friday of this week at 29 West Thirty-ninth Street, New York, the speaker to be O. O. Dixon, assistant engineer Interborough Rapid Transit Company, and an interesting evening is expected.

ELECTRIC RAILWAYS IN CHINA

At the present time only four cities in China have electric street railways; and of the four, three cities are only nominally in China. The Hongkong street railway is a British enterprise operating in a British colony; likewise, the Shanghai street railways are the property of British and French companies, and operate only in their respective national concessions, which are practically foreign territory. Similarly, the electric railway in Dairen (Dalny), South Manchuria, is a Japanese enterprise, built and conducted in a leased territory which, during the period of the lease, is to all intents and purposes a Japanese colony. In none of these three cities was it necessary for the British, French or Japanese companies to secure permission from the Chinese authorities to build and operate their respective street railways and lighting plants.

Of Chinese cities proper, Nanking has a light steam railway, 7½ miles in length, which provides facilities for only a small part of the city. The service is very infrequent, as there are only two locomotives on the line. The city of Mukden, Manchuria, has about 5 miles of track, on which very small horse cars are operated at irregular intervals; but the rails were copper bonded when laid, and it is proposed to electrify the line when the necessary funds can be secured. Both the Nanking and Mukden lines were built by the viceroys of the provinces in which these cities are situated, and are therefore the property of the province or city.

Taken in the order of their importance, the street railways of Shanghai consist of the lines of the Shanghai Electric Construction Company, Ltd., which serve the International Settlement; the lines of the Compagnie Française de Tramways et d'Eclairage Electriques, which serve the French concession; and a line built by a Chinese company in the Chinese territory which adjoins the native city and the French concession.

The lines of the International Settlement Railway were built under the terms of a franchise, granted Oct. 10, 1905, to Bruce, Peebles & Company, Ltd., of Edinburgh, Scotland, by the municipal council of the International Settlement. This franchise was subsequently transferred to the Shanghai Electric Construction Company. A royalty of 5 per cent on the gross receipts of the company is payable to the Council. The company pays municipal taxes on all its buildings, but not on the tracks, poles, overhead lines, or cars. The franchise also stipulated that the street railway company should take its electric current from the Council's electric station. The rates fixed, per kilowatt hour, with a minimum annual consumption of 1,250,000 kw-hr., were as follows: First 600,000 units, 3.22 cents; second 600,000 units, 3.08 cents; third 600,000 units, 2.95 cents. These initial rates were based upon an estimated production cost of 2.2 cents per unit, but it was found, during the second year that the line was in operation that the initial rates were too high, and the Council, upon application by the company, made a new arrangement with the company. This arrangement provides for a fixed charge of 64 taels per kilowatt year plus a flat rate of 1.5 tael cents per unit for each unit consumed. The result for a consumption of 2,750,000 units in 1912 was an over-all charge equal to 2.34 cents United States currency per unit.

Immediately after the signing of the franchise and contract for power, the Shanghai Electric Construction Company entered into a contract with Bruce, Peebles & Company, Edinburgh, for the construction of rail lines equivalent to 23.3 miles of single track with equipment, including cars, carhouse and repair shops with tools. In the way of rolling stock the contractors were required to supply sixty-five double-end cars, each to seat thirty-two persons, twelve first-class and twenty third-class, and each equipped with two 25-hp motors. It was specified that each car should develop a speed corresponding to 18 m.p.h. The contract price for the complete equipment was $1,348,020.

Service was inaugurated in March, 1908, and on March 1, 1913, the company was operating its cars over 9.16 miles of double track and 7.15 miles of single track, or an equivalent of 25.47 miles of single track. On that date sixty-five cars equipped with motors and thirty trailers were in service, with fifteen additional motor cars and ten trailers contracted for and to be delivered during the present year.

Passenger traffic has shown a steady and remarkable increase. In 1909, 11,772,715 persons were carried; in 1910, 18,751,215; in 1911, 27,257,250; and in 1912, 40,734,233.

The French concession system was built and is operated by the Compagnie Française de Tramways et d'Eclairage Electriques de Shanghai, quite independent of the lines in the International Settlement, though joint running rights have recently been arranged and several joint circular routes instituted. The gage and rails are the same as on the International Settlement lines; and the cars on both lines are of about the same size and design. The running of cars began in May, 1908, and there are now in service, on the 10½ miles of track owned by the company, twenty-eight motor cars and four trailers, with an additional ten motor cars and eight trailers ordered in Europe. Direct current at 550/600 volts is used for traction, and the cars are equipped with Bruce-Peebles motors and controllers. The overhead trolley is used throughout the system.

In 1912 the car mileage was 980,342, and the number of passengers carried was 12,299,708, or 12½ passengers per car-mile. As on the International Settlement lines, both first and third-class passengers are carried, and here also the fares are charged by sections, third-class paying from 1 to 4 cents United States currency and first-class from 1½ to 7½ cents, according to the distance traveled.

The increase in traffic is shown by a comparison of the average number of passengers carried per day in the past four years. In 1909 it was 12,300; in 1910, 19,760; in 1911, 23,200; and in 1912, 33,700. The company's gross receipts from the street railway were $58,563 in 1909; $78,711 in 1910; $92,376 in 1911; and $121,032 in 1912, loss by exchange not deducted. Working expenses in 1912 were $74,590, leaving a profit for the year of $46,442, as against $26,689 in 1911, and $18,535 in 1910; while in 1909, a loss of $1,673 was sustained.

The Inland Electric Company, which is owned and controlled entirely by Chinese, for some years has been operating an electric lighting station and waterworks to supply the native city of Shanghai. The company's street railway line is being built under a franchise granted by the municipal authorities of the native city, the main features of which are an annual payment by the company of 3 per cent of its gross earnings in lieu of taxes, and the retention by the municipality of the right to purchase the entire plant at the end of thirty years, at an assessed valuation. The company is capitalized at about $98,000 United States currency.

Construction was begun only in January, 1913, but the laying of the first line of rails was completed in April, and the management hoped to have some cars running in June. The line extends from a point on the Chinese Bund, near the east gate of the native city, southward along the bank of the Whangpoo River for about 2 miles, and then turns west to the station of the Hangchow Railway, a total distance of about 3 miles. The railway station is the present southern terminus; but it is proposed soon to extend the line in a southwesterly direction to the large Kiangnan arsenal and eventually to the hamlet of Siang Fah. The east gate, or northern terminus, connects with the French street railway. The line is laid with grooved girder rails of German manufacture, weighing 90 lb. per yard, and the gage is 1 m.—the same as the lines in the

International Settlement and the French concession. The rails are laid upon beds of broken stone, 1 ft. wide and 8 in. thick, with concrete blocks under the rail joints, and tie rods spaced about 25 ft. The overhead feeder is carried on three-section iron tubular poles 18 ft. above ground.

Twelve cars, with 25-hp motors of 450/500 volts, and six trailers were being built for the company in the shops of Nicholas Tsu. These are of the same general design as the cars in use on the International Settlement and French street railways, and the trucks, motors, controllers, and other electrical fittings have been imported from England. The Chinese management expects to arrange joint running rights with the French company, and also, possibly, with the International Settlement company; or the Chinese line may eventually be leased to the French company for operation. The latter arrangement would avert a threatened paralleling of lines in one district. The French concession extends, on the south, up to the wall of the native city, and the French company has built a line which follows the wall almost from the west to the east gate. This wall is now being leveled, and the franchise of the Chinese company authorizes the building of a line just within the site of the wall all around the native city. Such a line would, of course, parallel the French line from the west to the east gate.

The Tientsin tramways, with the auxiliary lighting plant, are the outcome of an agreement, made in 1904, between a Belgian syndicate (represented by E. Meyer & Company, of Tientsin) and the then viceroy of Chili Province, H. E. Yuan Shih Kai. By the terms of this agreement the syndicate was authorized to construct a meter-gage electric street railway in and about the native city of Tientsin and to install a lighting system within the native city.

In addition to the line around the native city and in other Chinese territory, the company's lines extend through the Japanese, Russian, Italian, Austrian, and French concessions, with the Settlement railway station and bund as termini. The double-track line which runs about the native city is laid upon a boulevard which was built at the close of the Boxer outbreak upon the site of the old city wall, which was razed at that time.

Construction work was begun in 1904, and regular service of street cars and lighting commenced in 1906. At present the company has a total of 7¾ miles of double track line laid with rails of grooved girder pattern weighing 92 lb. per yard. The rails, which are 19.7 yd. in length, are laid upon broken limestone beds, with tie-rods spaced 5 ft., and are double bonded. The wires are carried upon 19 ft. tubular iron poles, which on wide streets are set between the two tracks and on narrow streets on one side. The roadway between the rails and for 19 in. on each side is stone flagged, and maintained at the company's expense.

Service is maintained by sixty-six motor cars and fifty trailers. All of the motor cars and some of the trailers were imported complete from Belgium and Germany; but the wooden bodies of newer trailers have been built in the company's shops, upon designs which have been found more suitable to local conditions. For the sake of cleanliness, the cloth window curtains and seat upholstery have been entirely eliminated and wooden seats substituted. Moreover, as the costume of both Chinese men and women makes a high step very difficult, the floor of the new trailers is only as high as the axles, with a single step at the entrance. The new trailers have no platforms or doors at the ends of the car, entrance and exit being by double side doors which are kept locked while the car is in motion. Each car seats sixty persons, and each platform of the motor cars carries eight to ten more, a small railed-off inclosure being reserved for the motorman. With minor exceptions, the entire route is double-tracked, and the service fairly frequent.

On an average, 2,000,000 passengers are carried per month. In former years an attempt was made to reserve a small section of each car for first-class passengers at an extra fare, but this has been abandoned, owing to lack of patronage, and only one class is now maintained. On the line around the native city the fare for a journey from the east to the west gate (one-half of the circumference of the city, or about 1½ miles) is 8 mills United States currency; while on the longer line, which passes through the foreign concessions, the fare is 1 cent for a maximum distance of 3½ miles. As copper coins are considerably depreciated in relation to the silver currency, the company posts in its cars rates of exchange between the two; and a passenger who, for example, tenders a silver Mexican or Peiyang dollar in payment of his fare is entitled to receive, say, sixteen silver 10-cent pieces and some odd coppers in change, dedepending upon the exchange rate for the day. The company estimates its loss on copper coin at 30 per cent, and as Chinese silver also fluctuates in value in relation to European currency, a further loss may be suffered. For instance, the company must exchange 130 to 135 copper cents for one Mexican dollar, and then the value of the Mexican dollar may sink from, say, 2s. 2d. to 2s., or even lower.

Direct current at 550/600 volts is employed for the street railway service. The older motors and controllers are from Siemens & Schuckert, Berlin; but the more recently imported motors and controllers have been purchased from the Ateliers des Constructions Electriques de Charleroi, Belgium. For the locally built trailers, wheels and axles only are imported.

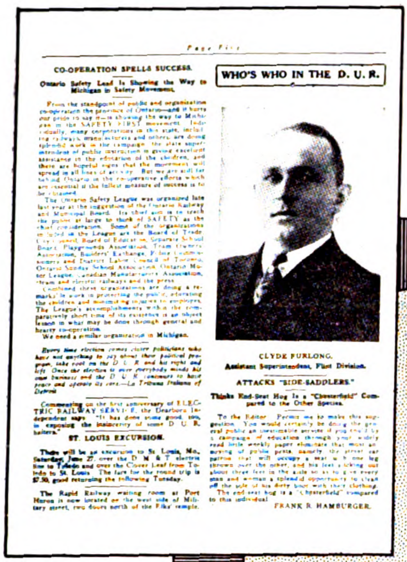
The company provides small Chinese-style houses for the workmen, rent free; and a free bathhouse is maintained, daily baths for motormen and conductors being compulsory. Wages are paid as follows, per month: carpenters, $6.70 to $7.70 United States currency; fitters, $6.70 to $9.25; machine hands, $6.15 to $7.70; smiths and plate workers, $6.70 to $8.25; electricians, $7.70 to $10.25. These wages are of course only for Chinese workmen, the European foreman and instructors being very liberally paid.

The paid-up capital of the company is $1,206,250, and the first dividend of 4 per cent per annum was paid to stockholders in 1912, after five years of operation without any return to the shareholders. The dividend for 1913 was 6 per cent and a steady progress is anticipated for the future.

COMPANY PUBLICATIONS

The number of companies which issue publications in the interest of their employees or in the combined interest of the public and their employees has increased steadily in recent years. Naturally some of these are much more pretentious than others. Their contents vary with the purpose for which the particular publication is issued. Many of the publications intended for distribution among the public have gained quite a following. On the opposite page there are reproduced in one engraving nine typical pages from such publications, showing the varied ways in which the matter of public relations and the best interests of the employees are sought to be conserved through the medium of some of these publications.

President Marks, of the Borough of Manhattan, New York City, returned recently from a trip which he made to the cities of the East to study public market conditions. He inquired particularly into the matter of handling foodstuffs in cities by electric railways. He was impressed by the market terminal in Philadelphia, to which farm produce is brought by trolley. Mr. Marks was quoted as saying that he had suggested to officers of the Brooklyn Rapid Transit System the establishment of a similar system of delivery in Brooklyn. He expressed himself as convinced that the city must make every effort to have the railroads and the electric railways develop the market terminals in Greater New York.



Page Five

CO-OPERATION SPELLS SUCCESS.

Ontario Safety Lead Is Showing the Way to Michigan in Safety Movement.

From the standpoint of public and organization co-operation the province of Ontario—and it hurts our pride to say it—is showing the way to Michigan in the SAFETY FIRST movement. Individually, many corporations in this state, including railways, manufacturers and others, are doing splendid work in the campaign, the state superintendent of public instruction is giving excellent assistance in the education of the children, and there are hopeful signs that the movement will spread in all lines of activity. But we are still far behind Ontario in the co-operative efforts which are essential if the fullest measure of success is to be obtained.

The Ontario Safety League was organized late last year at the suggestion of the Ontario Railway and Municipal Board. Its chief aim is to teach the public at large to think of SAFETY as the chief consideration. Some of the organizations included in the League are the Board of Trade, City Council, Board of Education, Separate School Board, Playgrounds Association, Team Owners' Association, Builders' Exchange, Police Commissioners and District Labor Council of Toronto, Ontario Sunday School Association, Ontario Motor League, Canadian Manufacturers' Association, steam and electric railways and the press.

Combined these organizations are doing a remarkable work in protecting the public, educating the children and minimizing injuries to employes. The League's accomplishments within the comparatively short time of its existence is an object lesson in what may be done through general and hearty co-operation.

We need a similar organization in Michigan.

Every time election comes closer politicians who have not anything to say about their political program, take root on the D. U. R. and hit right and left. Once the election is over everybody minds his own business and the D. U. R. continues to have peace and operate its cars.—La Tribuna Italiana of Detroit.

Commenting on the first anniversary of ELECTRIC RAILWAY SERVICE, the Dearborn Independent says: "It has done some good, too, in exposing the insincerity of some D. U. R. baiters."

ST. LOUIS EXCURSION.

There will be an excursion to St. Louis, Mo., Saturday, June 27, over the D. M. & T. electric line to Toledo and over the Clover Leaf from Toledo to St. Louis. The fare for the round trip is $7.50, good returning the following Tuesday.

The Rapid Railway waiting room at Port Huron is now located on the west side of Military street, two doors north of the Elks' temple.

WHO'S WHO IN THE D. U. R.

CLYDE FURLONG,
Assistant Superintendent, Flint Division.

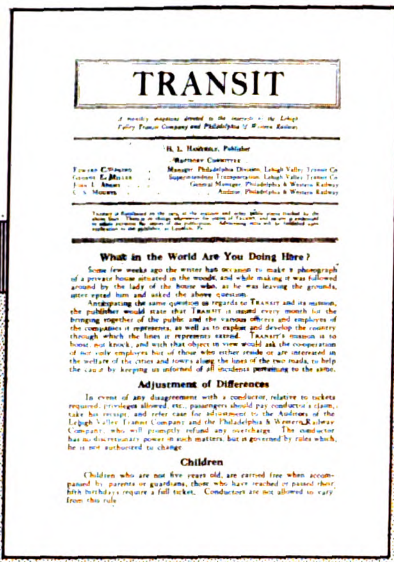
ATTACKS "SIDE-SADDLERS."

Thinks End-Seat Hog Is a "Chesterfield" Compared to the Other Species.

To the Editor: Permit me to make this suggestion. You would certainly be doing the general public an inestimable service if you could by a campaign of education through your widely read little weekly paper eliminate that most annoying of public pests, namely, the street car patron that will occupy a seat with one leg thrown over the other, and his feet sticking out about three feet in the aisle so as to give every man and woman a splendid opportunity to clean off the sole of his dirty boot with their clothing.

The end-seat hog is a "Chesterfield" compared to this individual.

FRANK R. HAMBURGER.



TRANSIT

A monthly magazine devoted to the interests of the Lehigh Valley Transit Company and Philadelphia & Western Railway

H. L. [illegible], Publisher

Advisory Committee

[illegible] . . . Manager, Philadelphia Division, Lehigh Valley Transit Co.
[illegible] E. Miller . . . Superintendent Transportation, Lehigh Valley Transit Co.
John L. [illegible] . . . General Manager, Philadelphia & Western Railway
C. S. [illegible] . . . Auditor, Philadelphia & Western Railway

[illegible]

What in the World Are You Doing Here?

Some few weeks ago the writer had occasion to make a photograph of a private house situated in the woods, and while making it was followed around by the lady of the house who, as he was leaving the grounds, intercepted him and asked the above question.

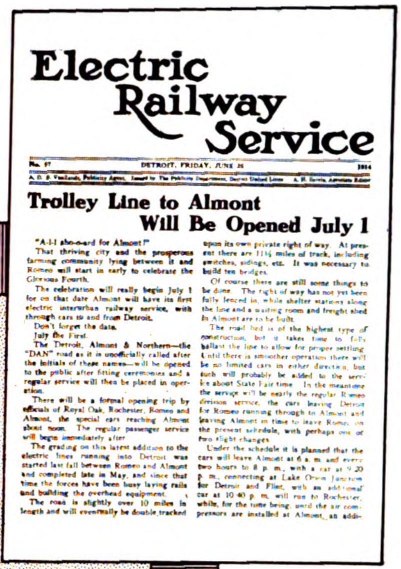
Anticipating the same question as regards to TRANSIT and its mission, the publisher would state that TRANSIT is issued every month for the bringing together of the public and the various officers and employes of the companies it represents, as well as to exploit and develop the country through which the lines it represents extend. TRANSIT'S mission is to boost, not knock, and with that object in view would ask the co-operation of not only employes but of those who either reside or are interested in the welfare of the cities and towns along the lines of the two roads, to help the cause by keeping us informed of all incidents pertaining to the same.

Adjustment of Differences

In event of any disagreement with a conductor, relative to tickets required, privileges allowed, etc., passengers should pay conductor's claim, take his receipt, and refer case for adjustment to the Auditors of the Lehigh Valley Transit Company and the Philadelphia & Western Railway Company, who will promptly refund any overcharge. The conductor has no discretionary power in such matters, but is governed by rules which he is not authorized to change.

Children

Children who are not five years old, are carried free when accompanied by parents or guardians; those who have reached or passed their fifth birthdays require a full ticket. Conductors are not allowed to vary from this rule.



Electric Railway Service

No. 57 DETROIT, FRIDAY, JUNE 26 1914

A. D. B. VanZandt, Publicity Agent. Issued by The Publicity Department, Detroit United Lines. A. H. [illegible], Associate Editor

Trolley Line to Almont Will Be Opened July 1

"A-l-l abo-o-ard for Almont!"

That thriving city and the prosperous farming community lying between it and Romeo will start in early to celebrate the Glorious Fourth.

The celebration will really begin July 1 for on that date Almont will have its first electric interurban railway service, with through cars to and from Detroit.

Don't forget the date.

July the First.

The Detroit, Almont & Northern—the "DAN" road as it is unofficially called after the initials of these names—will be opened to the public after fitting ceremonies and a regular service will then be placed in operation.

There will be a formal opening trip by officials of Royal Oak, Rochester, Romeo and Almont, the special cars reaching Almont about noon. The regular passenger service will begin immediately after.

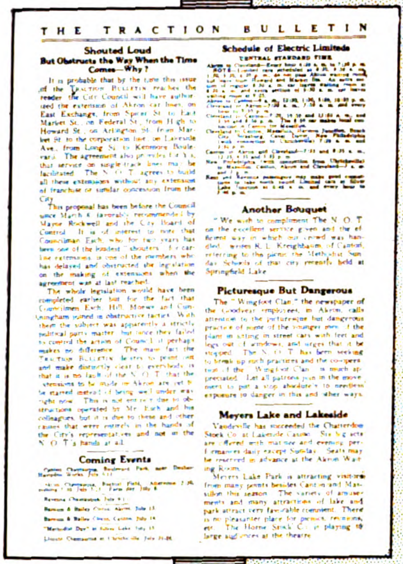
The grading on this latest addition to the electric lines running into Detroit was started last fall between Romeo and Almont and completed late in May, and since that time the forces have been busy laying rails and building the overhead equipment.

The road is slightly over 10 miles in length and will eventually be double tracked upon its own private right of way. At present there are 11¼ miles of track, including switches, sidings, etc. It was necessary to build ten bridges.

Of course there are still some things to be done. The right of way has not yet been fully fenced in, while shelter stations along the line and a waiting room and freight shed in Almont are to be built.

The road bed is of the highest type of construction, but it takes time to fully ballast the line to allow for proper settling. Until there is smoother operation there will be no limited cars in either direction, but such will probably be added to the service about State Fair time. In the meantime the service will be nearly the regular Romeo division service, the cars leaving Detroit for Romeo running through to Almont and leaving Almont in time to leave Romeo on the present schedule, with perhaps one or two slight changes.

Under the schedule it is planned that the cars will leave Almont at 6 a. m. and every two hours to 8 p. m., with a car at 9.20 p. m., connecting at Lake Orion Junction for Detroit and Flint, with an additional car at 10.40 p. m. will run to Rochester, while, for the time being, until the air compressors are installed at Almont, an addi-



THE TRACTION BULLETIN

Shouted Loud
But Obstructs the Way When the Time Comes—Why?

It is probable that by the time this issue of the TRACTION BULLETIN reaches the reader the City Council will have authorized the extension of Akron car lines, on East Exchange, from Spicer St. to East Market St., on Federal St., from High to Howard St., on Arlington St., from Market St. to the corporation line, on Lakeside Ave., from Long St. to Kenmore Boulevard. The agreement also provides for Ys, that service on single-track lines may be facilitated. The N. O. T. agrees to build all these extensions without any extension of franchise or similar concession from the City.

This proposal has been before the Council since March 6, favorably recommended by Mayor Rockwell and the City Board of Control. It is of interest to note that Councilman Esch, who for two years has been one of the loudest "shouters" for car line extensions, is one of the members who has delayed and obstructed the legislation on the making of extensions when the agreement was at last reached.

The whole legislation would have been completed earlier but for the fact that Councilmen Esch, Hill, Moewe and Cunningham joined in obstructive tactics. With them the subject was apparently a strictly political party matter, but since they failed to control the action of Council it perhaps makes no difference. The main fact the TRACTION BULLETIN desires to point out and make distinctly clear to everybody is that it is no fault of the N. O. T. that the extensions to be made in Akron are yet to be started instead of being well under way right now. This is not entirely due to obstructions operated by Mr. Esch and his colleagues, but it is due to these and other causes that were entirely in the hands of the City's representatives and not in the N. O. T.'s hands at all.

Coming Events

Canton Chautauqua, Boulevard Park, near Dueber Hampden Works, July 5-12.
Akron Chautauqua, Buchtel Field, Afternoons 2:30, evening 7:30, July 5-11. Farm day July 8.
Ravenna Chautauqua, July 9-1[illegible].
Barnum & Bailey Circus, Akron, July 13.
Barnum & Bailey Circus, Canton, July 14.
"Methodist Day" at Silver Lake, July 15.
Lincoln Chautauqua at Uhrichsville, July 21-26.

Schedule of Electric Limiteds

CENTRAL STANDARD TIME

[illegible]

Another Bouquet

"We wish to compliment The N. O. T. on the excellent service given and the efficient way in which our crowd was handled," writes R. L. Kreighbaum, of Canton, referring to the picnic the Methodist Sunday Schools of that city recently held at Springfield Lake.

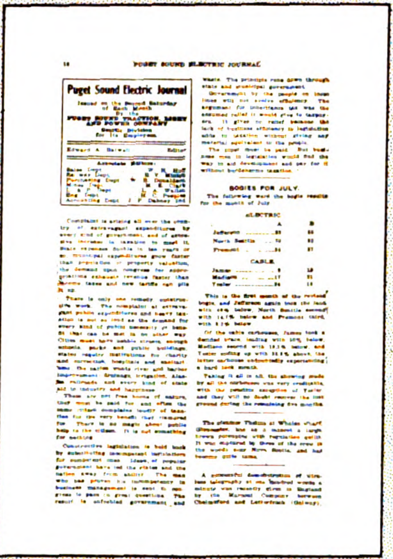
Picturesque But Dangerous

The "Wingfoot Clan," the newspaper of the Goodyear employees, in Akron, calls attention to the picturesque but dangerous practice of some of the younger men of the plant in sitting in street cars with feet and legs out of windows, and urges that it be stopped. The N. O. T. has been seeking to break up such practices and the cooperation of the "Wingfoot Clan" is much appreciated. Let all patrons join in the movement to put a stop absolutely to needless exposure to danger in this and other ways.

Meyers Lake and Lakeside

Vaudeville has succeeded the Chatterton Stock Co. at Lakeside Casino. Six big acts are offered with matinee and evening performances daily except Sunday. Seats may be reserved in advance at the Akron Waiting Room.

Meyers Lake Park is attracting visitors from many points besides Canton and Massillon this season. The variety of amusements and many attractions of lake and park attract very favorable comment. There is no pleasanter place for picnics, reunions, etc. The Horne Stock Co. is playing to large audiences at the theatre.



18 PUGET SOUND ELECTRIC JOURNAL

Puget Sound Electric Journal

Issued on the Second Saturday of Each Month
By the
PUGET SOUND TRACTION, LIGHT AND POWER COMPANY
Seattle Division
for Its Employees

Edward A. [illegible], Editor

Associate Editors

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[illegible]

BOGIES FOR JULY.

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ELECTRIC

CABLE

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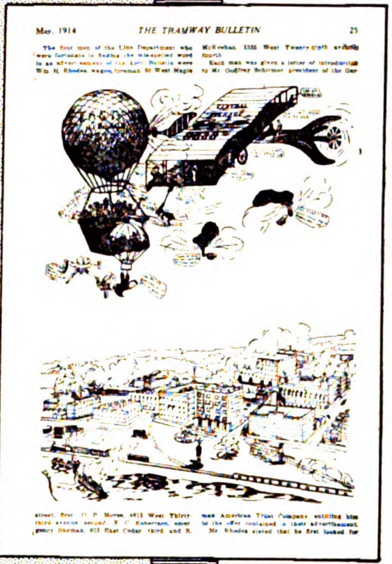
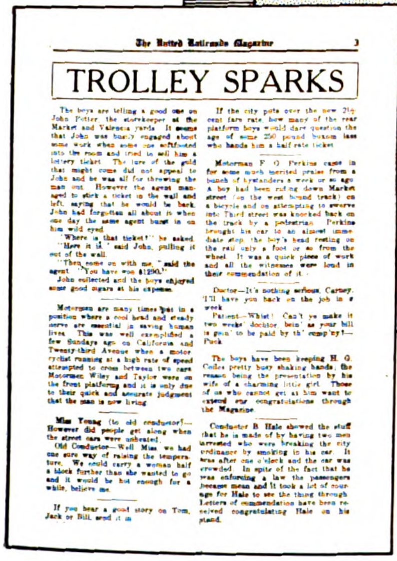


May, 1914 THE TRAMWAY BULLETIN 25

The four men of the Line Department who were fortunate in finding the mis-spelled word in an advertisement of the April Bulletin were Wm. H. Rhodes, wagon foreman, 60 West Maple street, first; O. P. Moran, 4613 West Thirty-third avenue, second; F. C. Robertson, emergency lineman, 923 East Cedar, third, and R. McKeehan, 3335 West Twenty-ninth avenue, fourth.

Each man was given a letter of introduction to Mr. Godfrey Schirmer, president of the German American Trust Company, entitling him to the offer contained in their advertisement.

Mr. Rhodes stated that he first looked for



The United Railroads Magazine 3

TROLLEY SPARKS

The boys are telling a good one on John Potter, the storekeeper at the Market and Valencia yards. It seems that John was busily engaged about some work when some one pussyfooted into the room and tried to sell him a lottery ticket. The lure of the gold that might come did not appeal to John and he was all for throwing the man out. However the agent managed to stick a ticket in the wall and left, saying that he would be back. John had forgotten all about it when one day the same agent burst in on him wild eyed.

"Where is that ticket?" he asked.

"Here it is," said John, pulling it out of the wall.

"Then come on with me," said the agent. "You have won $1250."

John collected and the boys enjoyed some good cigars at his expense.

Motormen are many times put in a position where a cool head and steady nerve are essential in saving human lives. This was well exemplified a few Sundays ago on California and Twenty-third Avenue when a motorcyclist running at a high rate of speed attempted to cross between two cars. Motormen Wiley and Taylor were on the front platforms and it is only due to their quick and accurate judgment that the man is now living.

Miss Young (to old conductor)—However did people get along when the street cars were unheated.

Old Conductor—Well Miss, we had one sure way of raising the temperature. We could carry a woman half a block further than she wanted to go and it would be hot enough for a while, believe me.

If you hear a good story on Tom, Jack or Bill, send it in.

If the city puts over the new 2½-cent fare rate, how many of the rear platform boys would dare question the age of some 250 pound buxom lass who hands him a half rate ticket.

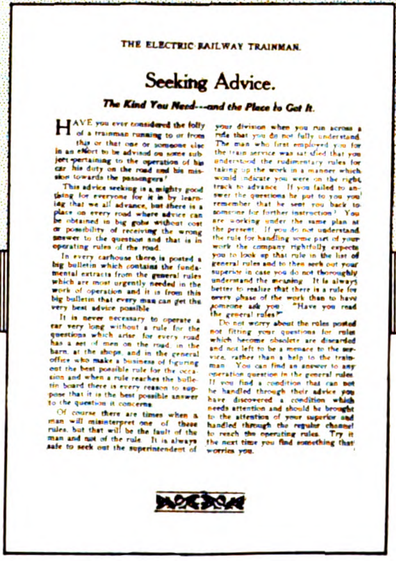
Motorman F. O. Perkins came in for some much merited praise from a bunch of bystanders a week or so ago. A boy had been riding down Market street (on the west bound track) on a bicycle and on attempting to swerve into Third street was knocked back on the track by a pedestrian. Perkins brought his car to an almost immediate stop, the boy's head resting on the rail only a foot or so from the wheel. It was a quick piece of work and all the witnesses were loud in their commendation of it.

Doctor—It's nothing serious, Carney. I'll have you back on the job in a week.

Patient—Whist! Can't ye make it two weeks' dochtor, bein' as your bill is goin' to be paid by th' comp'ny!—Puck.

The boys have been keeping H. G. Coiles pretty busy shaking hands, the reason being the presentation by his wife of a charming little girl. Those of us who cannot get at him want to extend our congratulations through the Magazine.

Conductor B. Hale showed the stuff that he is made of by having two men arrested who were breaking the city ordinance by smoking in his car. It was after one o'clock and the car was crowded. In spite of the fact that he was enforcing a law the passengers became mean and it took a lot of courage for Hale to see the thing through. Letters of commendation have been received congratulating Hale on his stand.



THE ELECTRIC RAILWAY TRAINMAN.

Seeking Advice.

The Kind You Need—and the Place to Get It.

HAVE you ever considered the folly of a trainman running to or from this or that one or someone else in an effort to be advised on some subject pertaining to the operation of his car, his duty on the road and his mission towards the passengers?

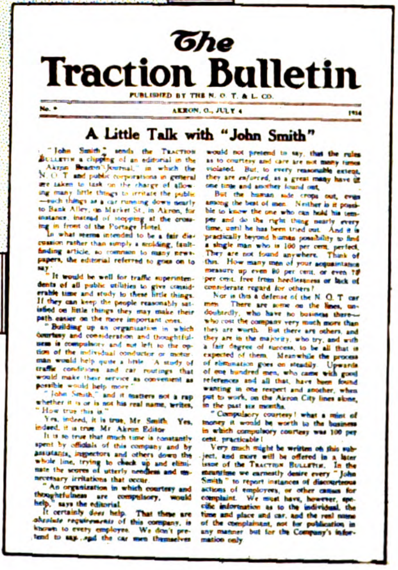
This advice seeking is a mighty good thing for everyone for it is by learning that we all advance, but there is a place on every road where advice can be obtained in big gobs without cost or possibility of receiving the wrong answer to the question and that is in operating rules of the road.

In every carhouse there is posted a big bulletin which contains the fundamental extracts from the general rules which are most urgently needed in the work of operation and it is from this big bulletin that every man can get the very best advice possible.

It is never necessary to operate a car very long without a rule for the questions which arise for every road has a set of men on the road, in the barn, at the shops, and in the general office who make a business of figuring out the best possible rule for the occasion and when a rule reaches the bulletin board there is every reason to suppose that it is the best possible answer to the question it concerns.

Of course there are times when a man will misinterpret one of these rules, but that will be the fault of the man and not of the rule. It is always safe to seek out the superintendent of your division when you run across a rule that you do not fully understand. The man who first employed you for the train service was satisfied that you understood the rudimentary rules for taking up the work in a manner which would indicate you were on the right track to advance. If you failed to answer the questions he put to you you remember that he sent you back to someone for further instruction? You are working under the same plan at the present. If you do not understand the rule for handling some part of your work the company rightfully expects you to look up that rule in the list of general rules and to then seek out your superior in case you do not thoroughly understand the meaning. It is always better to realize that there is a rule for every phase of the work than to have someone ask you: "Have you read the general rules?"

Do not worry about the rules posted not fitting your questions for rules which become obsolete are discarded and not left to be a menace to the service, rather than a help to the trainman. You can find an answer to any operation question in the general rules. If you find a condition that can not be handled through their advice you have discovered a condition which needs attention and should be brought to the attention of your superior and handled through the regular channel to reach the operating rules. Try it the next time you find something that worries you.



The Traction Bulletin

PUBLISHED BY THE N. O. T. & L. CO.

No. 9 AKRON, O., JULY 4 1914

A Little Talk with "John Smith"

"John Smith," sends the TRACTION BULLETIN a clipping of an editorial in the Akron Beacon Journal, in which the N. O. T. and public corporations in general are taken to task on the charge of allowing many little things to irritate the public—such things as a car running down nearly to Bank Alley, on Market St., in Akron, for instance, instead of stopping at the crossing in front of the Portage Hotel.

In what seems intended to be a fair discussion rather than simply a scolding, fault-finding article, so common to many newspapers, the editorial referred to goes on to say:

"It would be well for traffic superintendents of all public utilities to give considerable time and study to these little things. If they can keep the people reasonably satisfied on little things they may make their path easier on the more important ones.

"Building up an organization in which courtesy and consideration and thoughtfulness is compulsory and not left to the option of the individual conductor or motorman would help quite a little. A study of traffic conditions and car routings that would make their service as convenient as possible would help more."

"John Smith," and it matters not a rap whether it is or is not his real name, writes, "How true this is."

Yes, indeed, it is true, Mr. Smith. Yes, indeed, it is true, Mr. Akron Editor.

It is so true that much time is constantly spent by officials of this company and by assistants, inspectors and others down the whole line, trying to check up and eliminate the scores of utterly needless and unnecessary irritations that occur.

"An organization in which courtesy and thoughtfulness are compulsory, would help," says the editorial.

It certainly *does* help. That these are *absolute requirements* of this company, is known to every employee. We don't pretend to say, and the car men themselves would not pretend to say, that the rules as to courtesy and care are not many times violated. But, to every reasonable extent, they are *enforced*, as a great many have at one time and another found out.

But the human side crops out, even among the best of men. Neither is it possible to know the one who can hold his temper and do the right thing nearly every time, until he has been tried out. And it is practically beyond human possibility to find a single man who is 100 per cent. perfect. They are not found anywhere. Think of this. How many men of your acquaintance measure up even 80 per cent. or even 75 per cent. free from heedlessness or lack of considerate regard for others?

Nor is this a defense of the N. O. T. car men. There are some on the lines, undoubtedly, who have no business there—who cost the company very much more than they are worth. But there are others, and they are in the majority, who try, and with a fair degree of success, to be all that is expected of them. Meanwhile the process of elimination goes on steadily. Upwards of one hundred men, who came with good references and all that, have been found wanting in one respect and another, when put to work, on the Akron City lines alone, in the past six months.

"Compulsory courtesy! what a mint of money it would be worth to the business in which compulsory courtesy was 100 per cent. practicable!

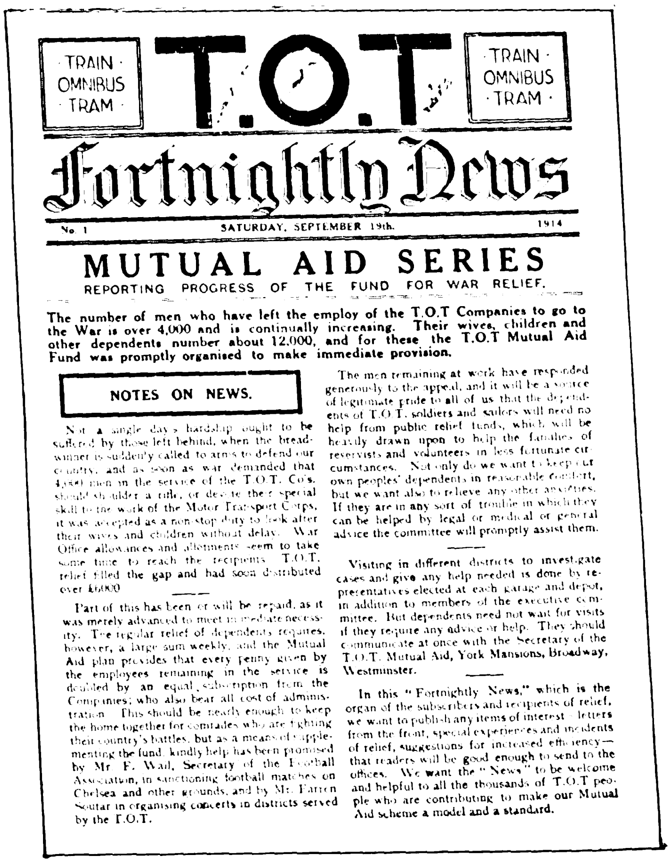
Very much might be written on this subject, and more will be offered in a later issue of the TRACTION BULLETIN. In the meantime we earnestly desire every "John Smith" to report instances of discourteous actions of employees, or other causes for complaint. We must have, however, specific information as to the individual, the time and place and car, and the real name of the complainant, not for publication in any manner but for the Company's information only.

ILLUSTRATIONS OF NINE TYPICAL PAGES OF RAILWAY COMPANY PUBLICATIONS

LONDON T. O. T. MUTUAL AID WAR FUND

The publicity committee of the T. O. T. (tramway, omnibus and tube) mutual aid fund in London has begun the publication of the "*Fortnightly News*," which is to be the organ of the subscribers to the fund and the recipients of the relief. The committee expects to publish any items of interest, letters from the front, special experiences, incidents of relief, and suggestions for increased efficiency that readers furnish to the officers. It is now preparing a full list of reservists and volunteers who are in the army, and it plans to give not only the names but as far as possible the corps and the regiment to which each man belongs. The first and third pages of the first issue are reproduced herewith.

The number of men who left the employ of the T. O. T. companies to go to the front is more than 4000 and is constantly increasing. Wives, children and other dependents number about 12,000. War allowances seemed to require some time to reach the recipients, so the T. O. T. mutual aid fund was organized to make immediate provision. Already the fund has distributed more than £6,000. The plan provides that for every penny given by the employees remaining in service an equal allowance is made by the companies, who will also bear the cost of distribution. Furthermore, concerts and football matches are being planned as means of supplementing the fund. Visiting in different districts to investigate cases and give the help needed is done by representatives elected at each garage and depot, in addition to members of the executive committee. Dependents can also secure aid by communicating directly with the secretary.



TRAIN · OMNIBUS · TRAM

T.O.T

TRAIN · OMNIBUS · TRAM

Fortnightly News

No. 1 SATURDAY, SEPTEMBER 19th. 1914

MUTUAL AID SERIES

REPORTING PROGRESS OF THE FUND FOR WAR RELIEF.

The number of men who have left the employ of the T.O.T Companies to go to the War is over 4,000 and is continually increasing. Their wives, children and other dependents number about 12,000, and for these the T.O.T Mutual Aid Fund was promptly organised to make immediate provision.

NOTES ON NEWS.

Not a single day's hardship ought to be suffered by those left behind, when the bread-winner is suddenly called to arms to defend our country, and as soon as war demanded that 4,000 men in the service of the T.O.T. Co's. should shoulder a rifle, or devote their special skill to the work of the Motor Transport Corps, it was accepted as a non-stop duty to look after their wives and children without delay. War Office allowances and allotments seem to take some time to reach the recipients. T.O.T. relief filled the gap and had soon distributed over £6000.

Part of this has been or will be repaid, as it was merely advanced to meet immediate necessity. The regular relief of dependents requires, however, a large sum weekly, and the Mutual Aid plan provides that every penny given by the employees remaining in the service is doubled by an equal subscription from the Companies; who also bear all cost of administration. This should be nearly enough to keep the home together for comrades who are fighting their country's battles, but as a means of supplementing the fund, kindly help has been promised by Mr. F. Wall, Secretary of the Football Association, in sanctioning football matches on Chelsea and other grounds, and by Mr. Farren Soutar in organising concerts in districts served by the T.O.T.

The men remaining at work have responded generously to the appeal, and it will be a source of legitimate pride to all of us that the dependents of T.O.T. soldiers and sailors will need no help from public relief funds, which will be heavily drawn upon to help the families of reservists and volunteers in less fortunate circumstances. Not only do we want to keep our own peoples' dependents in reasonable comfort, but we want also to relieve any other anxieties. If they are in any sort of trouble in which they can be helped by legal or medical or general advice the committee will promptly assist them.

Visiting in different districts to investigate cases and give any help needed is done by representatives elected at each garage and depot, in addition to members of the executive committee. But dependents need not wait for visits if they require any advice or help. They should communicate at once with the Secretary of the T.O.T. Mutual Aid, York Mansions, Broadway, Westminster.

In this "Fortnightly News," which is the organ of the subscribers and recipients of relief, we want to publish any items of interest—letters from the front, special experiences and incidents of relief, suggestions for increased efficiency—that readers will be good enough to send to the offices. We want the "News" to be welcome and helpful to all the thousands of T.O.T people who are contributing to make our Mutual Aid scheme a model and a standard.

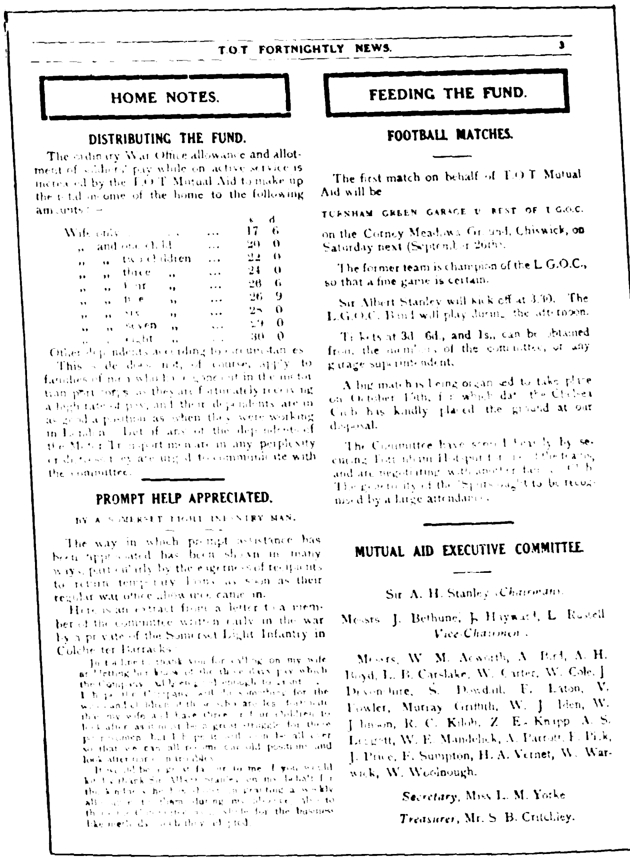
FIRST PAGE OF LONDON RAPID TRANSIT WAR ORGAN

The first issue contains interesting letters from three men in the thick of the fighting, relating their personal experiences on the battle line and expressing appreciation for the way in which dependents have been cared for by the transportation lines. Tables are also presented showing the total weekly income from war office allowances and T. O. T. mutual aid benefits, which ranges from 17s. 6d. for a wife only to 30s. for a wife and eight children. The subscription of employees for the week ended Sept. 12 amounted to £453 19s. 10d., which total is doubled by the subscription of the company. The average amount subscribed per head amounted to 5s. 1d. The South Metropolitan Company headed the list with 98 subscribers out of every 100 employees, but was closely followed by the Metropolitan Electric Tramways with 96 per cent, the Associated Equipment Company with 94 per cent and the Central London Railway with 93 per cent. The chairman of the mutual aid executive committee is Sir Albert H. Stanley, managing director of the London Underground Electric Railway, London United Tramways, Ltd., the Metropolitan District Railway and the London General Omnibus Company, Ltd.

BELL OR BUZZER CIRCUITS USED FOR TELEPHONING

Wouldn't it be more convenient to buzz and speak your instructions to the office boy or other subordinate and get the answer immediately without waiting for him to come to your desk?

The Western Electric Company is demonstrating a simple little outfit consisting of two hand telephone instruments called Interphones, which can be connected to any existing bell or buzzer circuit without any change in the bell, batteries or wiring and which transforms them into a practical working telephone system. With the old push button and bell system two trips were necessary, one to find out what was wanted, the other to carry out the instructions. With one of these Interphone outfits installed only one trip, if any, is necessary. The cost of one outfit is $8.75.



T.O.T FORTNIGHTLY NEWS. 3

HOME NOTES.

DISTRIBUTING THE FUND.

The ordinary War Office allowance and allotment of soldiers' pay while on active service is increased by the T.O.T Mutual Aid to make up the total income of the home to the following amounts:—

	s.	d.
Wife only ...	17	6
,, and one child ...	20	0
,, ,, two children ...	22	0
,, ,, three ,, ...	24	0
,, ,, four ,, ...	26	6
,, ,, five ,, ...	26	9
,, ,, six ,, ...	28	0
,, ,, seven ,, ...	29	0
,, ,, eight ,, ...	30	0

Other dependents according to circumstances.

This scale does not, of course, apply to families of men who have gone out in the motor transport corps, as they are fortunately receiving a high rate of pay, and their dependents are in as good a position as when they were working in London. But if any of the dependents of the Motor Transport men are in any perplexity or distress they are urged to communicate with the committee.

PROMPT HELP APPRECIATED.

BY A SOMERSET LIGHT INFANTRY MAN.

The way in which prompt assistance has been appreciated has been shown in many ways, particularly by the eagerness of recipients to return temporary loans as soon as their regular war office allowances came in.

Here is an extract from a letter to a member of the committee written early in the war by a private of the Somerset Light Infantry in Colchester Barracks:

Just a line to thank you for calling on my wife [illegible]

[illegible]

FEEDING THE FUND.

FOOTBALL MATCHES.

The first match on behalf of T.O.T Mutual Aid will be

TURNHAM GREEN GARAGE v. REST OF L.G.O.C.

on the Corney Meadows Ground, Chiswick, on Saturday next (September 26th).

The former team is champion of the L.G.O.C., so that a fine game is certain.

Sir Albert Stanley will kick off at 3.30. The L.G.O.C. Band will play during the afternoon.

Tickets at 3d., 6d., and 1s., can be obtained from the members of the committee, or any garage superintendent.

A big match is being organised to take place on October 10th, for which day the Chelsea Club has kindly placed the ground at our disposal.

The Committee have scored heavily by securing Tottenham Hotspur for one of the teams, and are negotiating with another famous club. The generosity of the 'Spurs ought to be recognised by a large attendance.

MUTUAL AID EXECUTIVE COMMITTEE.

Sir A. H. Stanley (*Chairman*).

Messrs. J. Bethune, J. Hayward, L. Russell (*Vice-Chairmen*).

Messrs. W. M. Acworth, A. Bird, A. H. Boyd, L. B. Carslake, W. Carter, W. Cole, J. Devonshire, S. Dowdall, F. Eaton, V. Fowler, Murray Griffith, W. J. Iden, W. Johnson, R. C. Kilby, Z. E. Knapp, A. S. Leggett, W. E. Mandelick, A. Parratt, F. Pick, J. Price, F. Sumpton, H. A. Vernet, W. Warwick, W. Woolnough.

Secretary, Miss L. M. Yorke.

Treasurer, Mr. S. B. Critchley.

AN INSIDE PAGE OF LONDON PAPER

GEAR TESTING

To see how the hardness of the gear teeth is measured and how the manufacturer is able to offer gearing that will meet difficult and special requirements is worth the acquaintance of every operator. At spaces 140 to 144, the R. D. Nuttall Company is giving such information. Each Nuttall gear and pinion before leaving the Nuttall gear plant at Pittsburgh, the largest in the world, it tested for hardness after heat treatment by means of a Shore sclerescope such as is exhibited. Again, special impact and abrasive machines are used by this company for testing the resistance of gearing to shock and wear.

GAS-ELECTRIC MOTOR CAR WITH LONG BAGGAGE COMPARTMENT AND 600-1200 VOLT MOTORS

The Spokane, Portland & Seattle Railway has contracted with the General Electric Company for a gas-electric motor car, which will be the first car of this type to be employed on this railway. It is the intention to place the car in operation between Portland and Rainier, Ore., on the Astoria-Columbia division of the road.

Steam trains are now making two round trips each way per day between these two cities, 45.8 miles apart: leaving Rainier at 7:40 a. m. arriving at Portland at 9:45 a. m., and leaving Portland at 12:50 p. m. arriving at Rainier at 2:40 p. m.; leaving Rainier at 3 p. m., arriving at Portland at 5 p. m. and leaving Portland at 5:35 p. m., arriving at Rainier at 7:25 p. m. The total distance for the four single trips per day is 183.2 miles. The gas-electric motor car will be required to haul regularly one 25-ton trailer seating 60 passengers. At times when traffic is heavy it may be necessary to haul two trailers of this capacity on both round trips.

The schedules of trains composed of the motor car and two trailers will be increased ten minutes each run, with stops of not more than thirty seconds. The maximum grade on this section of the railway is ½ per cent., extending over a distance of about 3 miles; but, in general, the road follows the Columbia river grade and is nearly level.

The Spokane, Portland & Seattle Railway runs from Spokane, Wash., through Portland, Ore., to Warrenton, Fort Stevens and Holladay on the coast. It connects with Seattle, Wash., over the Great Northern Railway and the Northern Pacific Railway. Other connecting lines are the Oregon Trunk Railway, Oregon Electric Railway and the United Railways. The road embraces a total of 556 miles, standard track gage. The rolling stock equipment comprises sixty-nine locomotives, ninety-eight passenger cars and 740 freight and miscellaneous cars.

The gas-electric motor car for this railway is what is known as type RE-70-B-21. The details of construction conform in general to those of the standard cars manufactured by the General Electric Company. The baggage room, however, is about twice the usual length in order to transport the large quantities of express handled, particularly the heavy shipments during the fruit season. The specific dimensions are 70 ft. 11-⅜ in. over bumpers by 10 ft. 6-⅜ in. wide over all. The car weighs approximately 51 tons and has a seating capacity for sixty-eight passengers. The interior is partitioned into four compartments. The cab in front containing the power plant apparatus measures 11 ft. 11 in. long; next is the baggage room, 20 ft. 10-⅞ in. long; then the smoking section, 12 ft. 6 in. long; and the passenger compartment, 20 ft. 5-⅞ in. long.

The car is equipped with two GE-205, 600-1200 volt, box-frame, oil-lubricated, series, commutating pole railway motors having a total of 200-hp capacity. The motors are mounted with nose suspension directly on the axles of the forward truck. They are insulated for 1200 volts so that they may be interchanged, if desired, with the motor equipments on the cars of the Oregon Electric Railway, which operates on the 1200-volt system. The generating unit consists of an eight-cylinder, four-cycle gas engine of the "V" type, direct-connected to a 600 volt, commutating pole electric generator, designed to meet the special conditions the service demands.

The body of the car is of the all-steel type of construction, except the seats and interior finish, which is of mahogany. A rear open platform entrance with body and platform railings is provided. The bearings and treads and flanges of the wheels conform to M.C.B. standards. The trucks are of the heavy spring bolster type with elliptic bolster and coil equalizer springs.

ELECTRIC RAILWAY DEVELOPMENT IN THE UNITED KINGDOM

Since 1878 the route length of tramways and light railways on public roads open for traffic in the United Kingdom has increased from 269 miles to 2662 miles. Capital expenditure increased from $20,475,068 to $386,203,761, and the number of passengers carried from 146,000,000 to 3,220,000,000, while the net receipts had grown from $1,123,947 to $27,194,590. The number of passengers carried in the year 1912-1913 was equal to about seventy-one times the estimated population of the United Kingdom. This figure, of course, is much lower than the annual per capita riding of the inhabitants of larger cities which may range from 200 to 300.

Of the total of 1818 miles of line owned by local authorities, 1617 miles are worked by the authorities themselves, or in a few cases by other local authorities leasing from them and the remaining 201 miles by leasing companies. The return also includes 15 miles of trackless trolley route worked by the owning local authorities. In 1913 the route mileage worked by electric traction was 2546 miles out of a total of 2662, as against 2518 out of 2637 in the preceding year, the remaining portion in 1912-1913 being 4.4 per cent of the total length of line. Of the 286 undertakings, 171 belonged to local authorities and 115 to companies or other parties. The net receipts of local authorities who worked tramway undertakings belonging to them, or leased from other local authorities, amounted to $19,932,794 on the year's traffic, and they applied $6,323,330 toward the reduction of tramway debt and $2,649,702 toward the public-tax fund, while carrying $3,634,054 to reserve and renewal funds. In the cases of four local authorities and seven companies, the returns for tramways showed an excess of working expenditure over gross receipts, while two trackless trolley systems also exhibited a deficiency. The return shows that in twenty-five cases it was necessary to seek aid from rates to meet some part of the charges for the year including interest and redemption of tramway debt. The total amount thus obtained was $316,264, as compared with $302,365 in the previous year.

The total number of passengers carried in 1912-1913 was 3,219,857,293 as against 3,127,318,732 in the preceding year, and the number of miles run by the cars 334,777,515 and 323,354,389, respectively. The capital expenditure per mile of single track open worked out at $66,797 last year for lines and works, and for all items at $88,711, as compared with $66,295 and $87,621, respectively, in 1911-1912. The percentage of net receipts to total capital outlay in 1912-1913 was 7.04, and to net capital outlay (eliminating amounts expended on construction or purchase of old lines and works superseded) 7.64, as against 7.5 and 8.15, respectively, in the previous year. The percentage of working expenditure to gross receipts last year was 62.68, against 60.6 in 1911-1912, and the number of passengers carried per mile of route open was 1,204,011, against 1,183,620 in the preceding year. The percentages of passengers carried per car mile were 9.62 and 9.67, and the average receipts per passenger $0.0213 and $0.0215. There was $2,649,702 paid in 1912-1913 in relief of taxes out of the profits of undertakings worked by local authorities, as compared with $2,377,329 in 1911-1912.

The miles of route open last year of tramways numbered 2,661.69, and of trackless trolley systems, 12.59, as against 2,637.95 and 5 miles of trackless trolley in 1911, 1912. Comparisons are also given of the steam period in 1898, when with 1,064.19 miles of route open 858,485,542 passengers were carried, and the number of miles run by cars was 90,593,716. In the horse period (1879) there were 321.27 miles of route open, and the total passengers carried numbered 150,881,515, while the miles run by cars aggregated 19,418,373. The average receipts per passenger in 1898 worked out at $0.0246 and in 1879 at $0.0368.

Among the Exhibits

The gear and pinion department of the E. W. Bliss Company, Brooklyn, N. Y., is represented at the convention by E. W. Stone.

* * *

The Mica Insulator Company, New York, has no exhibit this year. It is represented at the convention by Charles E. Coleman and Charles H. Bell.

* * *

W. H. Sauvage, president Sauvage Appliance Company and inventor of Sauvage shim slack adjuster and other car appliances, is present at the convention representing his own interests.

* * *

George E. Pratt, who for many years was a regular attendant at electric railway conventions, is back this year as a representative of the Railway Utility Company, of Chicago. It has an interesting exhibit of thermostats and ventilators.

* * *

George Sanford, railroad sales agent for the Parrott Varnish Company, Bridgeport, Conn., added one more to the large number of New York supply men attending the convention. He arrived Tuesday night and is stopping at the Marlborough-Blenheim.

* * *

The result of seven years' experimenting of Prof. Irving Fisher, connected with Yale University, to perfect a visible card index is shown in space 523. Manufacturers and railroad men from all parts of the United States have visited the booth and all are enthusiastic over the simplicity and easy access of this remarkable system.

* * *

G. T. Abel, Brooklyn, N. Y., painting specialist, is making his headquarters at the convention with the Columbia Machine & Malleable Iron Company, space 620. For twelve years Mr. Abel, with an experienced crew of painters has been engaged in contract car painting, doing work for electric railways in all parts of the country.

* * *

Frank Sheeran, representing J. J. McCabe's do-most-anything 2-in-1 lathe, is down here to tell everybody that while he has no lathe on exhibit there are plenty of them in railway shops hereabout. One of the nearest is in the shops of the New Jersey & Pennsylvania Traction Company at Trenton.

* * *

Full of years (160 of them) and honors, the F. W. Devoe & C. T. Reynolds Company is still in the business of making and selling paints and varnishes. C. G. Chamberlin, though not in at the founding of the company, is representing it among the electric railway trade to-day.

* * *

Harry M. Shaw and Frank H. Shaw, Newark Engineering Company, Newark, N. J., are attending the convention in the interest of their insulating specialties, overhead material, third-rail insulators and Shaw lightning arresters. The lightning arresters are shown at space 557 with the Lord Manufacturing Company exhibit. The American General Engineering Company, New York, is the general sales agent for this material.

* * *

George E. Austin, president American General Engineering Company, arrived Tuesday night to attend the convention. He is stopping at the Brighton. During the year his company has brought out a new motor-driven self-contained armature banding machine with automatic weighing tension feed. On this single machine one can band armatures, slot commutators, wind coils and grind commutators. The machine is four machines in one, designed to save space and secure economy in labor and accuracy of work done.

John C. Dolph, insulation specialist, Newark, N. J., arrived to attend the convention Wednesday morning. During the past year Mr. Dolph has developed a water-repellant acid and alkali-proof anti-corrosive preservative paint called "Universalak," especially adapted to preserve iron and steel surfaces exposed to the elements. He has also brought out "Synthite," a new type of synthetic insulating compound, moisture and acid-proof, especially adapted to withstand high temperatures. This can be used and applied by any shop mechanic by the brush-dipping or impregnating method.

THE "RADIAX" TRUCK BETTER THAN EVER

The J. G. Brill Company is exhibiting one of its "Radiax" type of trucks with a wheelbase of 11 ft. 6 in. This truck has a much simpler brake rigging than the one shown last year; it is designed on the same general principle as the body brake rigging of a double-truck car but is pivoted over the king pin at each end from which the motors radiate. The motor, axle and wheels, together with the brake beam, hangers and shoes, radiate as a unit from the same pivotal point. The truck is placed with one axle radiated to show the slight inclination of the links which form the connection between the journal box and the frame when on a curve; these links have hemispherical tops which move freely in socket castings placed on top of coil springs. At the bottom of each link are two pins or trunnions which engage in grooves under a yoke brace; when the truck enters a curve one of these pins immediately leaves its groove transferring the load to the other pin and thus setting up a powerful tendency to return to the normal position as soon as straight track is reached. The double pin arrangement has another important function in that it holds the car body steady on straight track. Attention is being called to the solid forged side frames of this truck which, in addition to their strength, have the advantage of permitting the body and frame springs to be placed where they will do the most good. The Third Avenue Company's low-level car on the Boardwalk opposite the Pier is mounted on a "Radiax" truck with 24 in. wheels; forty-nine of these trucks were furnished. It is learned that the Brill Company has received thirty-nine orders for "Radiax" trucks.

THE SAFETY OF THE PUBLIC

The Prepayment Car Sales Company, in space 414, has on exhibit several different types of door-operating mechanisms and safety features, and perhaps the working model of the door mechanisms as used on the stepless cars of the New York Railways Company best illustrates the safeguards available for insuring the safety of the public.

The operation of the door in opening and closing is controlled by an electric foot button switch operated at the prepayment position by the conductor. When the car motor is running (which is illustrated in the exhibit by a car motor controlled by a starting switch) the door cannot be opened by the foot-switch, although it can be opened at any time by an emergency switch. When the door is open, an interlocking switch prevents the car motor from being started. If the door touches a passenger in closing, the safety shoe on the edge of the door automatically reverses and opens the door until the door is clear of the passenger, when it instantly again recommences its closing movement. In these ways the safety of the public is safeguarded at every point.

In addition to this, every moment of time is saved to expedite the operating schedule of the car. The conductor can depress the door foot-switch before the car has stopped, and the moment it has stopped, but not before, the door will automatically open. The motorman can set his car-controller to running position while the door is open and the moment the door is closed, but not before, the car will start. In this way valuable time is saved to the railway.

Electric Railway Journal

DAILY EDITION

Published at the Annual Conventions of the American Electric Railway Association and Its Affiliated Associations

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PROGRAM FOR TO-DAY

CONVENTION MEETINGS

9:30 a.m. Meeting of Engineering Association, Engineers' Hall, Convention Pier.

ENTERTAINMENT

11:00 a.m. Morning Concert by Engel's Orchestra, Lobby, Convention Pier.

Responsibility of Investment Bankers

Valuable as has been the work of investment bankers in floating security issues and analyzing company and commission reports, as stated Wednesday by H. S. Swift, they have not yet rendered all of the service of which they are capable to the electric railway field. Their assistance and influence are still greatly needed in the matter of improving accounting procedure and in helping to establish a fair basis of regulation. Investment bankers presumably would like more uniformity in the distribution of maintenance and construction expenses and more detailed statements of construction expenditures, but if no action follows this desire the wish itself is of little help. On such points as these there is an urgent need for a closer union between the statistical departments of the investment banker and the accountants of the public utility company. For instance, a definitely expressed consensus of opinion of the investment houses as to what the ideal annual report should contain would be invaluable as indicating the investor's idea of corporate publicity. Bankers should also take greater interest than they have hitherto manifested in the subject of rate regulation. It is at the foundation of railway development and if unfair precedents are established the entire industry will suffer. Hence, whenever a rate or valuation case comes up affecting a public utility in a city in whose development a particular group of bankers are interested, even if they have no direct financial interest in the utility itself, they should make an effort to see that the regulatory body has all proper information. As a rule the banker is prominent in the civic life of the community in which he lives, and he is considered, and properly so, as a conservative and constructive factor in its financial affairs. He should make his influence felt in the encouragement of right financial thinking in connection with utilities which serve the town in which he lives. The field of investment bankers is wide, and their sources of statistics almost unlimited, but they could do much more while maintaining their sales activities, by applying the means at their disposal directly toward the solving of public utility problems.

The Parable of the Talents

The modern version of the Parable of the Talents, as told by L. R. Nash, of Stone & Webster, in the convention issue of this paper, has attracted considerable interest and comment at the convention. According to it the servant who buried the talent which had been entrusted to him and who consequently was able to return it without diminution to his master was better off than those who invested theirs in commercial undertakings. Their attempts to develop the public utilities of the day seemed at first successful. But this very success aroused the hostility and cupidity of the public, which, by drastic laws on rates, valuations, taxes and service requirements, so reduced the value of the investments that when labor troubles arose and higher wages had to be paid there was little or no equity left for the owners. The revised tale teaches an important lesson in regard to the rights of owners, and the result which will follow the elimination of all incentive to capital to enter the public utility field unless it is assured of adequate returns. There is no doubt that in many instances during the last few years the investor who followed the example of the third servant in the retold parable would have done better financially if he had followed the example of the other two servants. Nevertheless, if the reader should draw this conclusion as a general truth from Mr. Nash's parable he would be incorrect, and we are sure that there is no one who will admit the truth of this contention more willingly than Mr. Nash himself. Present laws may be defective, absurd theories in regard to capital may be current, injustice to capital may be prevalent, but the fundamental economic truth remains that those who invest their money in commercial undertakings to improve the condition of their fellows and render them a legitimate service deserve and will get greater compensation than those who refuse to do so. No community can progress, even if it can exist, on any other rule of conduct, and laws which attempt to enforce any other principle are bound to fail.

Compensation for Carrying United States Mail

The effort of the electric railways to secure adequate compensation for carrying mail matter seems likely at present to meet with success. It has been a long struggle because, strange as it may seem, it has been impossible to induce the Post-office Department to meet the electric roads on a business basis. The situation on the electric roads, certainly on the city roads, is entirely different from that on the steam roads. The latter furnish the only means of transportation for the mail. If the mails were not carried by them there would be no mail facilities along the line. In the cities, however, the Post-office Department can deliver the mail by wagon, automobile, hand or electric car. It is purely a matter of expediency as to which will be used. We have never been able to see any reason why a city electric railway should do this business below cost or for less than the price which it considers adequate. Several railway companies, as shown by the committee report, have taken the same view and have declined to carry any more mail. We are glad to see, however, that the Post-Office Department and also the congressional committees in charge of these matters are adopting a more rational view. The injustice of compelling the steam railroads to carry the mail below cost has been impressed upon the public, and a bill has now been introduced in Congress to make the pay to the steam railroads for mail carried more adequate. This reform is an excellent example of what can be done by an appeal to the sense of justice of the people. As a result of this step, it seems probable that a fair treatment will also be accorded to the electric roads. The active propaganda of the association committee during the year seems to be bearing fruit. The Senate committee has expressed itself as willing to consider reformatory measures, if their justice is proved by definite data. The industry is to be congratulated upon this result.

Conventionalities

Getaway Day! Makes you feel blue, doesn't it?

John P. Fox, the original bagman, is in our agitated midst.

All through the convention F. M. Loud of the Public Service Railway has been singularly quiet.

That Treat-Speed combination of the C. C. Smith properties is a dangerous one when turned loose in the Shelburne grill.

An esteemed contemporary reports that the Goldschmidt Thermit crowd has moved to the Hotel Ostend. Ostend invested by the Germans, as you might say.

J. A. Emery of Ford, Bacon & Davis, has left for a few days the engineering work on the new Philadelphia subway and elevated lines. He arrived yesterday with Mrs. Emery.

On Thursday William H. Wheaton, chief engineer of power stations and master mechanic of the Wilkes-Barre Railway, added to his numerous duties the pleasanter one of showing the exhibits to Mrs. Wheaton.

Boss Chubbuck of the I. T. S. has dropped his roll betting on E. A. MacNutt's skee-ball game. The latter could have beaten the record at one time on Wednesday if he had only rolled eight more balls into the fifty hole.

W. V. Dee of the entertainment committee has been in charge of its publicity work, and his humorous articles have been a feature of the work of getting out the Dailies. We have laughed heartily over Mr. Dee's compositions.

"Truly, sir, one of the things that ought to yield the greatest satisfaction to a person of eminent virtue is to live to see himself in good reputation with the world, and his actions published in print."—*Don Quixote.*

WANTED—Synonyms for the words: Showing, exhibiting, displaying, offering, presenting, bringing forth, providing, demonstrating, submitting, furnishing, producing, unfolding, supplying and proffering. Apply to editor of "Among the Exhibits."

J. L. Peacock, inventor of the famous Peacock brake, arrived in town on Wednesday morning to attend the convention. Besides his extensive interest in the brake business, he is also running a large ranch where he is raising little peacocks.

The neatly manicured brochures which are so frequently prepared by J. P. Ripley of J. G. White & Company remind one of the exhibits of axles. Some of the sentences in them are polished so that they make a looking-glass appear like a piece of emery cloth.

The Connecticut Company certifies to the presence of one more delegate, Thomas McGreevy of the auditing department. This increases the Connecticut delegation to thirty, and it claims, therefore, the largest number of delegates sent by any road within the well-known universe.

We were afraid that Tom AH Hay wouldn't get into the colyum this year until WO Hay, his brother, said he was suffering from his annual attack of litigiousness. Just like last year some cruel man dragged Tom into the courts at convention time—but we still hope he'll breeze in on Friday.

All of the officers and executive committee of the American Electric Railway Association are at the convention this year. For the last two or three years business has detained one or another from attendance. L. S. Storrs has been called back to New Haven, but he was here during the early part of the week.

The official list is doing stunts with the name of our old friend J. M. Bosenbury, superintendent of motive power and equipment of the Illinois Traction System. In the first list he appeared under the R's and in the second list he appeared nowhere. We are wondering how his name will appear in the list this morning.

L. R. McDonough, who has recently been appointed secretary to P. J. Kearny, electrical engineer of the electric division, New York, New Haven & Hartford Railroad, arrived Wednesday. He was formerly construction engineer under Charles Rufus Harte, who is well known by his activities in the work of the various associations and needs no introduction here.

Thomas E. Wood, master mechanic, Omaha, Council Bluffs Street Railway Company, Omaha, Neb., better known as "Old Tom" and noted as the leading orator of the Iowa Street & Interurban Association, claims that he is no longer interested in the exhibits, as he had made a complete examination of every detail in every booth on the pier by 7 a. m. on Monday morning.

W. T. Dougan, who was engineer of construction on the underground electric system of the old Metropolitan Railway in New York for nine years and engineer of maintenance of way on the same system (later the New York Railways) for eight years, is the latest railroad man to join the ranks of the peddlers, as he has just become president of the T. H. Reynolds Contracting Company.

Martin Schreiber risked his life recently (and that of one of the Public Service automobiles) in trying to get a company section organized in Allentown in time for the convention. One of his office staff who accompanied him returned by train a nervous wreck. We mention this merely to indicate how aggressive the association committeemen are.

As the convention draws to its inevitable close it seems fitting to speak of the efforts of the entertainment committee that have helped to make the convention such a success. Certainly these have been appreciated by the delegates and their guests, and we take the liberty of extending their thanks as well as our own to W. G. Kaylor, chairman of the committee and to his efficient assistants.

J. E. Duffy, general superintendent of the New York State Railways' Utica-Syracuse lines, and Elmer E. Strong, superintendent of transportation of the Rochester lines of the same property, have been seen so much together that five contributors have coupled their names in a wheeze to the effect that one invariably associates strength with Duffy, the latter being a well-known (to some) brand of Irish malt whiskey. We think its a bum wheeze, too.

A contributor (state of mind unknown) reports as follows: Manager Grayson is looking for a job. President Frank O. Grayson of the same company is very much in evidence at the convention looking after the various accounts which he handles in the Southwest. The story of Manager Grayson's dismissal follows: About ten days ago several "Friend Peddlers" of St. Louis, under the guise of directors of the company, which is wholly owned by Mr. Grayson, sent out notices to the trade that at an indignation meeting recently held Mr. Grayson had been dismissed for conduct unbecoming a general manager. The character of the charges as noted were such that the railway men receiving the notices, with a few exceptions, understood that a huge joke was being perpetrated on their old friend "Foggy." They heartily entered into the spirit of the thing and since then collect telegrams have been pouring into St. Louis depicting alleged hitherto unknown irregularities and misconduct. To bring about a climax to the fiasco a banquet of some proportions was arranged for and held under the auspices of the jokers a few nights ago. Grayson was forcibly carried to the banquet and after making him listen to verbal chastisement by a dozen or more of his closest friends he was presented with a loving cup and several other tokens of esteem. Frank says although he was worried at first over the action brought against him he has since been gratified to find several large orders from railway friends in the mill as a result of the excitement. Incidentally, he has an album full of censored poems which he is keeping in memory of the second anniversary of his firm's business.

THE NEW PRESIDENT

C. Loomis Allen, elected president of the American Electric Railway Association yesterday at the age of forty-four years, is remarkably well qualified for the position by temperament and experience. He has been actively interested in railway association work for so long that the duties of his new office will have no elements of novelty. The honor which comes to him has been well earned, for as third, second and first vice-president successively he has shouldered a lot of responsibility. Mr. Allen in his railroad career has shown that rare combination of executive ability and tact which should make his incumbency of the office of the greatest value to the association.

In a case like this the members of the railway public are desirous of knowing, or reviewing if they know already, the steps which have led to a man's elevation. Mr. Allen is a native of Syracuse, N. Y., where most of his life has been spent. He attended Alfred and Syracuse Universities and there laid the theoretical foundation for his practical work. His first work was practical enough, for he became axeman for the engineering department of the Norfolk & Western Railway. Thus introduced to the profession of civil engineering he served in more and more responsible positions until he felt equipped for independent work. He then joined T. H. Mather, and under the firm name of Mather and Allen, the two had charge of the civil engineering end of the electrification of the railways in Syracuse between 1892 and 1895.

C. LOOMIS ALLEN

For three years following Mr. Allen was civil engineer of the Syracuse Street Railway and the Syracuse Consolidated Street Railway, which later became the Syracuse Rapid Transit Company. His next step was a promotion to the assistant general managership of this company, of which he became general manager in 1899. For a short time he was general manager of the Lorain (Ohio) Street Railway but returned in 1901 to become engineer of the Utica & Mohawk Valley Railway. His sphere of usefulness in this and other New York Central properties rapidly extended until finally he became vice-president and general manager of all the lines centering in Syracuse and Utica.

Again in 1912 Mr. Allen determined to get into business and organized the firm of Allen & Peck, Inc., which purchases and manages public utility properties.

Mr. Allen was the first president of the American Electric Railway Transportation & Traffic Association, and he was also in 1904 president of the Street Railway Association of the State of New York. Presidencies are, therefore, not new to him. He comes to his enlarged responsibilities with the members of the Association behind him as a unit. He will put "ginger" and snap into the work without arousing antagonism in the large and diversified membership of the association.

ENTERTAINMENT COMMITTEE

Under the direction of Charles R. Ellicott, who very gracefully acknowledged the efforts of W. G. Kaylor, chairman of the entertainment committee, and the other members, the week's events were put through without a hitch. Many of the features introduced were new and tastes of all kinds were catered to. The thorough enjoyment of everyone was shown by the attendance at the various affairs, and the enthusiasm with which the dancing teams, music and other attractions were received. All the members of the committee worked hard to insure this success under the various sub-chairmen, and in conventions to come it will be a hard task to improve or better the arrangements that went through with such snap and enjoyment.

WINNERS AT AUCTION BRIDGE

The ladies' auction bridge tournament which began on Tuesday was completed with the play-off on Wednesday afternoon, the semi-final rounds eliminating all but the following four contestants: Mrs. S. M. Gallaher, Mrs. W. P. Goff, Mrs. Harry B. Logan and Mrs. Edward P. Wisch. In the final round between these four ladies Mrs. Gallaher and Mrs. Goff were paired and succeeded in winning the prizes that had been provided for first place. Mrs. Logan and Mrs. Wisch, as runners up in the tournament, received the prizes accorded for that place.

THE ANNUAL BALL

The annual ball, held last night, was equal in attractiveness and attendance to any ever conducted under the auspices of the association. It formed a fitting climax for the splendid week of entertainment with which the delegates have been regaled during their stay in Atlantic City. The music commenced shortly after nine o'clock, and from then until after midnight the floor was crowded with dancers while many looked on from the sides of the hall. A feature of the evening was the entrance to the floor of Miss Collins and Mr. Little, who delighted the audience with several specialty dances. Mr. and Mrs. S. S. Crane, of Altoona, Pa., also gave a performance of modern dancing which brought forth a lot of applause.

WINNERS AT SKEE-BALL

One of the most interesting of the events scheduled by the committee was the skee-ball tournament, and the large number of players together with the high scores show the popularity of this game. The winner of the grand prize for the ladies is Mrs. T. W. Connette, 240; the second prize being awarded to Mrs. R. R. Paradies, 230. The first gentlemen's grand prize was won by C. G. Chamberlain, 310. The second went to S. C. Morrell, 430, this score being for three games necessary to settle the tie for second place. Altogether 7623 games were rolled in the 325 hours during which the alleys were open. Thursday's daily prize for the ladies went to Mrs. R. R. Paradies, and for the gentlemen to C. G. Chamberlain.

T. F. McKenna, chairman of the committee on skee-ball, together with William J. Fleming, Jr., and H. H. Helms, were constantly at the alleys and had their hands full in taking care of the crowd.

LOST AND FOUND COLUMN

Lost—Manufacturers' Association Badge No. 4419 has been lost. Finder will please return to H. G. McConnaughy at the office, Convention pier.

Lost—Badge No. 5346.

Found—Badge No. 3801.

Found—Gold Seal Fob.

Lost—Mrs. H. G. McConnaughy, while attending the carnival festivities Wednesday evening, lost a small crescent of pearls. A suitable reward is offered for the return of this crescent to the office of the secretary of the Manufacturers' Association.

Lost—A. W. Hulme, general foreman New York Railways, Fiftieth Street and Sixth Avenue, New York, announces the loss of his badge, No. 1027. Mr. Hulme will be very grateful if the finder will kindly mail his badge to the address given.

OBSTACLE GOLF

A large number took advantage of the most interesting course laid out by Gimbel Brothers on the Marlborough-Blenheim lawn and, while the final day's play was held on a damp and difficult green, the following scores attest to the cleverness and ability displayed by the contestants. By those who have gone over the nine holes and have encountered the many obstacles put in their way to make the play difficult, the scores turned in can be appreciated.

The ladies winning the first and second prizes are as follows: Mrs. F. E. Donohoe, with a score of 78 for eighteen holes, and Mrs. L. H. Wilson with a score of 88.

The gentlemen's first and second prizes were won by E. A. MacNutt, with a score of 73 for eighteen holes, and W. F. Ham with a score of 74. Thanks are due to N. M. Garland, chairman of the golf committee, and his associate, H. A. Hegeman, for the manner in which they handled this game, as a great deal of interest was aroused in many who had never had any golfing experience.

TRAP SHOOTING

The trap shooting, which was introduced for the first time this year, proved a popular diversion, and many took advantage of the opportunity to try their skill in handling a gun. The winner of the contest among railway delegates was William H. Hitchcock, who broke 87 birds in 100 shots. The Manufacturers' Association contest was won by Harry Lee, who broke 96 birds in 100 shots. The winning novice was H. MacNutt, with a score in 50 shots of 36. The total number of clay pigeons was 5500 and the number of contestants was 76. The committee having the trap shoot in charge consisted of C. C. Castle, chairman; C. W. Laskay, W. H. Turbee, P. M. Kling, Waldo E. Berry and John M. High.

MANUFACTURERS ELECT OFFICERS

Yesterday at noon the executive committee of the American Electric Railway Manufacturers' Association elected the following officers for the 1915 term:

President: Edwin H. Baker, second vice-president Galena Signal Oil Company, New York.

Vice-President in Charge of Relations with the Parent Association: Charles C. Pierce, manager Railway department General Electric Company, Boston.

Vice-President in Charge of Entertainment: Thomas Finigan, vice-president Pierson, Roeding & Company, San Francisco.

Vice-President in Charge of Finance: F. A. Elmquist, railway representative Sherwin-Williams Company, New York.

Vice-president in charge of Exhibits: D. W. Smith, president The Peter Smith Heater Company, Detroit.

Secretary-Treasurer: H. G. McConnaughy, manager Dearborn Chemical Company, New York.

OTHER CONVENTIONALITIES

Gentlemen! The Chinese-American delegation: Messrs. Ong, Ching and Chur.

Simple declaratives from the delegates' list: Edward Leeds, Henry Baetz, Henry Burns and so does J. M., James Drew, Henry Dates, Byron Fowles (baseball term), Exum Haas, I. May, F. T. Wood.

Farley G. Clark, chief engineer, Toronto Railway Company, arrived with George E. Austin yesterday morning. They are stopping at the Brighton. George says that the Brighton is on Clark's treat, simply to remind the bunch where to find them.

The Chicago Surface Lines party includes J. F. Henning, superintendent of materials and supplies, and E. W. Anger, in charge of carhouses. These two gentlemen have the welfare of 3500 street cars and more than 2,000,000 people at heart. Note the order of preference.

Dean Treat has a new title. Not everybody on the Chicago Special knew it, but just a bit ago he was told to sign assistant general manager Wisconsin Public Service Company, instead of assistant general superintendent., C. R. Phoenecie, formerly general superintendent, being the general manager of that property. Now that the good news is out, are you going to treat, Dean?

ELBERT HUBBARD ON 3-CENT FARES

In summing up his article in the *Fra* on 3-cent fares, Elbert Hubbard said in part:

"We cannot fool calves by giving them whitewash instead of milk. Any business that is depressed, suppressed and submerged until it is hanging on by its eyebrows spreads a depressing effect on the entire community. Run-down equipment, unpainted cars, shabby interiors, flat wheels, what the railroad men call 'Harry Thaws'—that is, loose nuts—these things all react to the disadvantage of every business man in town. Cheap men, cheap equipment and cheap service all tend to put a town to the bad. A street railway system has got to be kept right up to date. The whole thing should be smart, and have a look of prosperity and well-being if the town is going to prosper and go ahead. Visitors judge a town, first by its lights, or absence of them, next by its transportation facilities.

"A 3-cent fare has only one genuine, positive use—and that is to nurse along a political boomlet. Greece started on her downfall when she began to give the voters something for nothing. A pension was devised for every citizen, under the specious argument that a man must be paid for jury duty and was liable to be called upon at any time. This of course was very pleasing, but it pauperized the citizens, evolving a race of Weary Willies. Rome did the same thing over again with free shows, spectacles, pageants, and finally with free bread.

"The voter who is caught by the cheap slogan of free bread, free trade, free rides, free entertainment, or 3-cent fares, is not wise in his day and generation, and the best of it all is the fact that voters everywhere are now becoming alive to the truth of this dictum—something for nothing leaves nothing."

FINAL SESSION OF THE TRANSPORTATION & TRAFFIC ASSOCIATION

Acting President Brush called the Thursday morning session of the Transportation & Traffic Association to order at 9:30 o'clock. The first order of business was the subject of continuing the joint committee of accounts with the Accountants' Association. On motion it was determined to make this joint committee a standing committee.

The report of the committee on standards for car loading was then taken up but not acted upon inasmuch as this report is to be handed to the executive committee of the American Association to be studied by that committee between now and the midyear meeting. The chair stated, however, that any member who was vitally interested could see the records now by getting into touch with the secretary of the American Association.

Training of Employees

The next order of business was the report of the committee on training of transportation employees. In the absence of the chairman, J. T. Crabbs, Brooklyn, the report was read by E. E. Strong, Rochester. The opening discussion related principally to how far it was advisable for the motorman to acquire practical mechanical knowledge of the apparatus in his care. Mr. Strong said some of his men had gone so far as to buy special text-books, and he presumed that they did this with the idea of ultimate promotion. W. J. Harvie said it was all right to answer any questions that a man might ask, but he did not believe in the tendency to make a practical man out of a platform employee.

C. H. Coe, Public Service Railway, stated that his company had obtained wonderful results from a follow-up system which it had inaugurated about fifteen months ago. After a man leaves the instruction classes for platform duty he is followed up for three continuous weeks. During the day the chief motorman makes one or two trips with this man and points out his weaknesses. This practice had reduced the accidents of first-year men to an appreciable extent.

H. C. Moser, Fifth Avenue Coach Company, New York, said that many inspectors and starters had little or no knowledge about time-table principles; also that they tended to spend an undue part of their time with the motorman and not enough with the conductor.

G. W. Manning, Salt Lake City, spoke of the "safety first" movement which had been started among his company's employees before being brought before the public. This company had received about 350 suggestions from the men and most of these had considerable merit.

W. F. Dement, Washington Railway & Electric Company, contributed written discussion on the "safety first" movement and other matters relating to transportation. His company had been giving talks to trainmen assisted by means of lantern slides, moving pictures and bulletin notices. Between March 3 and March 24 fifteen meetings were held at the several carhouses and these were attended by 812 out of 835 trainmen. The main effort was directed toward preventing all kinds of collisions between cars. The result is shown by the fact that from Jan. 1 to Sept. 30, 1914, only seventy-five such accidents occurred compared with 107 for the same period of the preceding year. He heartily approved the committee's recommendation to keep separate the temporary from the permanent bulletins so that the former could be readily destroyed when obsolete. The plan to print bulletins to conform in size with the pages of the rule book, for individual issue, did not seem practicable. He recommended, however, that one or more rule books be kept up to date by some loose-leaf binding and manifolding process. These might be termed "Master Rule Books," and when the time arrived for reissuing the rule book it would only be necessary to send the master book to the printer.

As to wages his company had paid the men daily since 1901. Payment is made by the depot clerk (receiver) except in a few cases where crews finish their day's work some distance from the carhouse, in which case the conductor is permitted to pay his motorman. The conductor enters on his day card the conductor's pay and the motorman's pay. These figures are checked by the depot clerk by means of his "on and off" sheet. The amount of pay and the name of each conductor and motorman is entered by the depot clerk, on a train register or payroll, which is forwarded to the treasurer's office for final checking.

Referring to instructions of employees Mr. Dement wrote that his company had started with an 18-ft. skeleton car carrying hand brakes, G.E.-800 motors and connections for both overhead and conduit operation. This car was located in the instruction room and was jacked up so that the motors could be operated. The company now uses a larger skeleton car with four motors and air brakes. This car is stored at the station where the school is located, and one day of each week all student motormen are taken on it to a piece of idle track about ½ mile long, over which instructions in the operation of cars and location of car trouble are given.

J. E. Duffy, Syracuse, said it was not expected on his property that the younger men could absorb all the bulletins that had been issued during the past five years. The company had established a rule that the new men shall be under the direction of the chief instructor instead of the general superintendent for six months so far as minor discipline was concerned. Good men were scarce and every opportunity should be taken by the railway to give a chance to the man who shows his willingness to do the right thing. It was his experience that bulletin boards were not read as they should be. It has been the practice of his company for the past five years to collect all permanent bulletins every year or two for printing in a book, which is of the size of the rule book, for distribution among the men.

C. E. Learned, Boston, discussed the safety movement in its relation to the employee. There was often a feeling among the men that the accident work was simply a selfish movement on the part of the company. Nevertheless his company had undertaken to interest the employee and believed it was succeeding. The question of intoxication had been taken up with the union officials and discussed so sensibly and amicably that the men on the road now considered the use of liquor a sufficient cause for discharge. He did not think that the men were as interested in short hours as in a good pay envelope. As to bulletin boards all important rules were not only posted on the board but were put on gum stickers so that the men could place them in their rule books. Consequently the men carry the rules all the time, and if they do not understand them can talk them over with their superintendent.

J. R. Ong, Wisconsin Railroad Commission, pointed out the importance of practical "safety first" by eliminating dangerous car conditions, such as non-tripping fenders. It was often found that the fender was deliberately placed so high that it could not be tripped if it passed over a prone body on the track. The topographical conditions were, of course, sometimes beyond the company's control, but in other instances the fenders were carried high simply on account of poor track. If the companies were sincere in the "safety first" movement they should also place the proper fending devices on interurban cars.

J. V. Sullivan, Chicago, said that the street car accidents in Chicago for 1913 have shown a decrease as compared with 1912, in spite of an increase in the number of cars operated and passengers carried. One of the best features of the Chicago work was the series of motion picture talks in the public schools and parks.

W. F. Ham, Washington, stated that the bulletin board demanded from the men more than could be reasonably expected from the higher officials of the company. He has suggested to his transportation department that a rule book be issued twice a year. Even the division superintendents, all intelligent men, do not always know what the rules are. When bulletins are posted frequently it is very essential that the men have some way of getting them in compact form. Furthermore when men are transferred they should have before them data of the special conditions on the new division. Referring to Mr. Dement's remarks he said that the reason for paying the men daily was almost entirely because of the fact that his company believed it would have a better effect on the men. A conductor who was getting his daily wage was less inclined to get hard up and be tempted to take that which was not his. There had been no difficulty or very little extra accounting in changing from the flat daily wage to the graduated daily wage. This system has been in use for three years.

Mr. Ham also described the profit-sharing plan whereby 26 per cent of the passenger earnings are set aside as a special fund. From this are deducted first the wages paid to the trainmen, and second the amount actually disbursed for the settlement of accidents. The remainder was distributed among the men at the end of the year. In this way the men benefited directly by reducing accidents. His company is now working on a plan whereby the men on each division will be informed of the cost of each accident and its nature. He was hopeful that when the men knew the number and cost of the accidents on each division they will become still more interested in reducing them. Upon motion the report of the committee was approved.

RESOLUTIONS OFFERED

Vice-Chairman Nicholl then took the chair following which W. H. Collins presented the report of the committee on resolutions.

Three sets of resolutions had been prepared by Charles Hewitt, chairman; W. H. Collins and C. Loomis Allen, members of the committee. The first set of resolutions expressed regret at the resignation of D. A. Hegarty as president of the association due to his entering other business, and presented the hearty thanks of the association to Mr. Hegarty for his splendid work as a committeeman and officer; the second was a resolution of thanks to Acting President M. C. Brush and the other officers and members of the various committees for their work of the year; the third was a resolution of thanks to the Manufacturers' Association for the splendid exhibit.

CLOSING BUSINESS

The report of the committee on nominations, consisting of Messrs. Shannahan, Donecker and Sullivan was then presented as follow: President, M. C. Brush, second vice-president Boston Elevated Railway; first vice-president, H. A. Nicholl, general manager Union Traction Company of Indiana; second vice-president, L. C. Bradley, assistant district manager Stone & Webster, Texas district; third vice-president, R. E. Danforth, general manager Public Service Railway. For executive committee: J. K. Choate, vice-president, J. G. White Management Corporation; T. C. Cherry, general manager Maryland Electric Railways; George H. Harris, general superintendent San Francisco-Oakland Terminal Railways; C. D. Emmons, general manager Chicago, South Bend & Northern Indiana Traction.

The secretary was duly instructed by the chair to cast one vote for the entire ticket, and all the officers and members of the executive committee were then declared elected.

After Mr. Brush had been inducted he called attention to the necessity of doing extra good work during the coming year, as doubtless a great many delegates who had come regularly to Atlantic City would be unable to go to San Francisco. He then thanked the association for his election as president. The meeting was then adjourned.

FINAL SESSION OF ACCOUNTANTS' ASSOCIATION

The first order of business for the Accountants' Association yesterday was the consideration of the report of the special committee on changes in committee organization, appointed last Tuesday. The committee recommended standing committees and their respective memberships as follows: Classification of accounts, 5; passenger accounting, 5; express and freight accounting, 5; education, 5; accounting definitions, 5; representing association at convention of National Association of Railway Commissioners, 3; joint committee on engineering accounting, 5; joint committee on transportation accounting, 5; and joint committee on claims accounting, 3.

It was also recommended, that, with the exception of the classification committee, the majority of each of the above committees should hold over from one year to the next in order to secure continuity of work. The classification committee should remain as at present constituted. In case of the resignation of any member of a standing committee, his successor should be appointed by the president. Special committees should be appointed from time to time when necessary, to be discharged upon the completion and acceptance of their reports. It was moved by H. B. Cavanaugh, Cleveland, Southwestern & Columbus Railway, Columbus, Ohio, seconded by W. F. Ham, Washington Railway & Electric Company, Washington, D. C., and duly carried, that the report be adopted.

President Glover announced that owing to the unsettled state of the accounting features of valuation, A. T. Smith, division of valuation, Interstate Commerce Commission, was unable to attend as scheduled, but that Director C. A. Prouty promised to arrange for an address by some member of the valuation staff next year.

Robert Seeley, The North American Company, New York, then gave his address on "The Accounting Treatment of Depreciation," which President Glover declared to be the most valuable contribution to the association in recent years. Secretary M. W. Boylan read communications from H. J. Davies, Cleveland (Ohio) Railway, and W. H. Forse, Jr., Union Traction Company of Indiana, Anderson, Ind. Mr. Davies mentioned the provisions of the Cleveland franchise regarding the treatment of maintenance, renewals and depreciation. He felt that the reserve for these purposes would better be based on car-miles or probable life. In connection with the latter basis he explained the inventory being made in Cleveland, which would probably give the average mortality of the various property items. Mr. Davies agreed with Mr. Seeley, that original cost accounts should not be disturbed until the retirement of property.

While in accord with the general principles of Mr. Seeley's article, Mr. Forse noted that the company's surplus might be sufficient to care for so-called depreciation even if the balance sheet contained no specific reserve, and also that the new Interstate Commerce Commission classification makes the accruing of depreciation mandatory upon interstate carriers. Mr. Forse was opposed to any sweeping assertion that no charge should be made against the depreciation reserve for expenditures in the way of renewals.

M. S. Moyer, Barclay, Parsons & Klapp Company, asked Mr. Seeley if the New York Public Service Commission classification had not sufficiently distinguished between maintenance and depreciation. Mr. Seeley replied that the New York practice, if carried out, was ideal, but that the commissions had started in the middle of things and had difficulty in dealing with property in service for some time. In reply to an interrogation from P. L. King, San Antonio (Tex.) Traction Company, Mr. Seeley said that a gradual replacement of a car part by part was a good illustration of the reason why the maintenance and depreciation charges should be combined. The difference between the maintenance expenses and the estimated amount for both charges should be carried to the depreciation reserve.

Mr. Ham believed that the use of the term "insurance replacement" suggested by Mr. Seeley would clear up much of the confusion surrounding the subject of depreciation. Mr. Ham mentioned the various component parts of so-called depreciation to show the indefiniteness of the items concerned and to prove that a depreciation fund could be only an approximation of the actual physical loss. He expressed himself as thoroughly disgusted with those who endeavored to secure minute details on this subject. Mr. Seeley leaned toward providing for depreciation by means of a reserve account accrued periodically over a period of years, but Mr. Ham, citing the supposititious case of the possible abandonment of the New York elevated system on account of public demand, said that the public to-day should not be required to bear the burden of such ultimate retirement of property and no charges therefor should be included in the present rate. In such a case the value of the property should be continued in a suspense account to be amortized in future years. A motion of thanks to Mr. Seeley for his paper was then duly carried.

President Glover expressed his appreciation for the large size of the meetings this year and also for the presence of several new members. He then called upon the committee on resolutions, which presented resolutions of thanks to the several speakers and committees at the convention as well as to the Manufacturers' Association. R. N. Wallis, Fitchburg & Leominster Street Railway, Fitchburg, Mass., then presented the recommendations of the committee on nominations, as follows: President, C. S. Mitchell, Pittsburgh (Pa.) Railways; first vice-president, T. P. Kilfoyle, Cleveland (Ohio) Railway; second vice-president, F. J. Pryor, American Railways, Philadelphia, Pa.; third vice-president, H. A. Culloden, Pacific Electric Railway, Los Angeles, Cal., and secretary and treasurer, M. R. Boylan, Public Service Railway, Newark, N. J.

The following members were nominated for the executive committee: L. T. Hixon, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.; J. C. Collins, New York State Railways, Rochester, N. Y.; W. C. Nicholson, Omaha & Council Bluffs Street Railway, Omaha, Neb. and F. E. Webster, Massachusetts Northeastern Street Railway, Haverhill, Mass. H. L. Wilson, Boston (Mass.) Elevated Railway, moved the casting of a unanimous ballot by the secretary for the above nominees under a suspension of rules, which motion was duly seconded and carried. Mr. Mitchell thereupon took the chair and called upon the newly elected officers and committeemen for a few words, after which the session was adjourned.

THURSDAY SESSION OF ENGINEERING ASSOCIATION

The Thursday morning session of the Engineering Association was called to order by President Hanna at 11:45 following the joint session with the Accountants' Association.

The order of business was the report of the committee on power generation, which was presented by B. F. Woods and J. W. Welsh. An abstract of this report is printed elsewhere. Preceding the discussion L. P. Crecelius also presented the report of the committee on smoke abatements.

Smoke Abatement

The report stated that public sentiment was crystallizing against dense black smoke emissions from the chimneys of power plants in cities of more than say 20,000 inhabitants. Due partly to the general belief that smoke indicated excessive fuel loss and that its elimination would result in enormous economy, the committee was led to include a digest of the studies made by the Bureau of Mines. Thus, in March of this year Samuel B. Flagg, engineer Bureau of Mines, had presented a paper on the "Combustion of Coal and Smoke Abatement" before the Cleveland Engineering Society, in which he pointed out that the presence or absence of smoke at the top of any stack was not of itself a proof that the plant was inefficiently or efficiently run or even improperly or properly operated. Continuing, he had said that the difficulty of obtaining the intimate mixture of air and combustible gases before they come in contact with the surfaces which the lower temperature below the efficient points was the greatest to overcome, and that there is great need for the proper furnace construction to bring about this mixture. A great many ways had been tried to overcome the trouble. In numerous cases the use of better mixing devices made it possible to obtain complete combustion and prevent smoke without the admission of any more air. Other methods were the decrease of the rate of heating of the fuel so as to make it gradual and more nearly uniform.

Continuing, the committee said that it was important to examine the best practice in regard to furnace construction and operation in connection with the possible smokeless combustion. It was as yet practically impossible to define clearly and definitely the quantity or degree of smoke for the various grades of coal under conditions which are economically sound when viewed from every standpoint. The problem depended also on the character of the community. In a non-industrial community it might be possible to go to the expense of lowering the rate of the furnaces below the point of maximum usefulness or of substituting a fuel containing little or no smoke producing volatiles; but in the case of an industrial center such measures would do great economic injury. Furthermore, as the present methods of measuring smoke density were very indefinite and unsatisfactory and the work of the committee could well be continued toward studying improvements in this line. The report also contained a number of illustrations and explanations showing several designs of furnace and boiler settings recently installed to lessen the degree of smoke emission as governed by the following requirements.

Case 1. Low investment of prime importance to the exclusion of all other considerations.

Case 2. The use of low-grade coals, viz., high smoke producing volatile content and high ash content.

Case 3. High capacity and economy where the cost and character of the fuel supply justifies it.

Power Generation

In opening the discussion William Roberts, Akron, said that he did not believe it was possible to operate any system of overfeed stokers as efficiently as underfeed stokers, although there were occasions when certain types of stokers had to be used on account of the fuel. He had one station where nine overfeed stokers of three different types caused more repair expense than the sixteen underfed stokers of one type in another station. As to smoke he did not think it was possible under any circumstances with conditions of varying load to eliminate the appearance of an excessive amount of smoke.

J. W. Welsh, Pittsburgh, reported that he had gone into many boiler rooms where the men said they were operating under high efficiency yet large holes would be discovered in the fires despite their denials. This was the condition that led to the inefficiency of the overfeed stoker. He believed that if it was operated with skill it would develop almost the same efficiency as the others.

Charles H. Bigelow, Millville Traction Company, found that one bad point of the overfeed stoker was the sifting of coal under certain conditions. This condition did not occur with the underfeed stoker which had also eliminated smoke from the chimney.

In reply to a question Mr. Woods said that CO_2 recorders were applicable to both types but especially the overfeed. Most of the trouble with recorders was that most of them lagged ten to thirty minutes behind the procession. Information as old as that was of small value to the fireman. However, these instruments were being steadily improved.

Mr. Alpern, American Engineering Company, stated that one important condition in the operation of stokers was the poor boiler setting. His company had often taken gas notes at the top of the first or second pass and usually found there was quite a dilution of gas between that pass and the flue. The tendency to go to steel setting was a splendid thing as it would cut down radiation losses and dilution materially. The condition of the boiler baffler also had a material bearing on capacity.

B. F. Wood said the idea of overload capacity should be dissipated in some way. There really was no overload on the boiler. It was operated simply at some increase over what had been the manufacturer's customary rating. He knew of a case where the boilers were operated for several hours at several hundred per cent above the manufacturer's rating. This was with oil-fired furnaces, but indicated that the boiler would have been able to take care of the same duty if coal-fired furnaces had been developed to the higher rate. We had not reached a boiler rating limit, but rather a furnace limit.

In reply to a question by Mr. Roberts about putting reactance on the grounded neutral of a 22,000-volt transmission line (in view of the fact that a possibility of disruption might throw 22,000 volts on to a 13,200-volt lead), Mr. Welsh said there was no doubt that the use of resistance or reactance in the grounded neutral of a transmission line would greatly reduce the short-circuit current.

Appendix C, relating to sixty cycle and twenty-five cycle rotary converters was then considered. Mr. Crecelius pointed out that the data, especially as to cost and efficiency, were about two years old, so there might be some variation in securing figures to-day on individual cases.

Mr. Roberts said that in his experience the sixty-cycle rotary required at least twice as much attention as a twenty-five-cycle machine. He has only one man to look after eleven twenty-five-cycle machines whereas three men are required for fifteen sixty-cycle rotaries. His company had purchased sixty-cycle rotaries because the lighting and power load had increased so much faster than the railway load, the ratio being 123 to 25.

Upon motion the meeting was then adjourned.

FINAL SESSION OF THE AMERICAN ASSOCIATION

President Black called the final session of the American Association to order at 2 o'clock yesterday afternoon. The first business was the presentation of the report of the committee on compensation for carrying United States mail. This was read by Mr. Brush and is published elsewhere in this issue.

The report of the committee on federal relations then followed. This was read by Chairman Brady and is also published in another column.

In the discussion on this report General Harries described the hearing in connection with the Crosser bill in Washington last spring. It is said that it was almost an accident that the association became actively concerned. He spoke of the gentleman who assisted, including Mr. McCarter, Mr. Clark, Mr. Rosecrants, Mr. Nicholas, Mr. Kerr, Mr. Henderschott and others. The arguments presented were potent, and anyone who will read the testimony presented before the committee will have difficulty in understanding how the majority of the committee could have voted in favor of the bill. General Harries also referred to the good work done by the mail committee and said that the contest was now largely up to the members of the association to work individually. They should discuss the matter with the congressmen in their districts and show them the correctness of the position of the railway companies. It was impossible to do all of the work by frontal attacks at Washington. The campaign should include a rear attack, directed at the individual congressmen in their home districts.

The reports of the commitee on costs of passenger transportation was then read. It is published in another column. After the reading of this report President Black urged upon all member companies the importance of sending to the Bureau of Fare Research their operating statistics. This bureau can be made very valuable to the companies, he said, if it receives their co-operation in the way of furnishing data.

Mr. Stearns then presented his paper on "A Zone System of Fares in Practice." It described the system of fares in use in Milwaukee, gave the history of the plan and presented data on the results of the operation of the zone system in European cities. It was illustrated by a number of charts and a map. Owing to the time required to make the engravings from this illustrative material the publication of this paper in this journal will have to be postponed until after convention week.

In the discussion which followed the reading of this paper W. J. Clark complimented the author upon the results of his investigations. Upon motion of Mr. Henry it was voted to print the article in pamphlet form for distribution among the members.

The report of the committee on taxation was then read. It will appear in the issue of Oct. 17. Upon motion of Mr. Brady a vote of thanks was extended to Mr. Tingley for this report. The association also voted to print and distribute among the members the report of the committee on transportation of United States mail.

The secretary then read a letter from A. B. Guigon, chairman of the committee on a legal association. The letter simply reported progress.

The report of the committee on the 1915 convention was then read. It is published elsewhere in this issue. In further explanation President Black urged on all member companies the importance of replying to the bulletins sent out by the secretary as soon as possible. He said that the people in San Francisco expected fully as large attendance under the existing conditions as they had hoped for before the European war was declared. They believe that the travelers who usually go abroad, numbering several hundred thousand annually, will in large measure visit California during the coming year. He felt sure that the journey to the Pacific Coast would repay everyone who took it. In conclusion he said that the exposition was one of the most beautiful and interesting the world had ever seen. The fair would be opened on time, namely Feb. 20.

The committee on nominations then reported as follows:

For president: C. Loomis Allen, president Newport News & Hampton Railway, Gas & Electric Company, Syracuse, N. Y.

For first vice-president: Charles L. Henry, president, Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.

For second vice-president: John A. Beeler, vice-president and general manager Denver Tramway Company, Denver, Col.

For third vice-president: L. S. Storrs, president Connecticut Company, New Haven, Conn.

For fourth vice-president: Timothy S. Williams, president Brooklyn Rapid Transit Company, Brooklyn, N. Y.

These nominations were received with applause. Upon motion the secretary cast one ballot for these officers. President Black then appointed Mr. Brady and General Harries a committee to escort the newly elected president to the chair, and added that he bespoke the same hearty cooperation for Mr. Allen, the new president, as had been accorded him during the past year.

President Allen thanked the association for his election and promised to carry forward the work of the association to the best of his ability. He then called for the report of the committee on resolutions. This was presented by Mr. Henry.

Mr. Henry gave a list of the members of the association who had died during the year and expressed its appreciation of their services and sorrow at their departure. The thanks of the association were also expressed to the retiring officers, to the Manufacturers' Association, to the technical press and to the family of the late Anthony N. Brady for gifts or services rendered.

The meeting then adjourned.

CLOSING SESSIONS OF THE CLAIMS ASSOCIATION

After the joint session of the Claims Association and the Accountants' Association on Wednesday, the former association received the report of the committee on claims accounting, which was read by Mr. Bennett in the absence of Chairman Davies. Following this report Mr. Drown led the discussion and also made suggestions regarding a proper classification. The report was recommitted to the committee with instructions to circulate it among the member companies, asking for an expression of opinion from the accountants and claim agents relative to the classification of accounts desired. These will be used in formulating an account classification which may be reported at the next convention.

The Thursday morning session of the Claims Association followed the regular program. Under the subject of general business Mr. Walsh called the association's attention to the death of his company's president, Captain McCulloch. Following this the report of the nominating committee was received, and the following officers were elected for the ensuing year: President, William Tichenor, claim agent Terre Haute, Indianapolis & Eastern Traction Company; first vice-president, George Carson, claim agent Puget Sound Traction, Light & Power Company, Seattle, Wash.; second vice-president, R. E. MacDougal, claim agent New York State Railways, Rochester, N. Y.; third vice-president, S. B. Hare, claim agent Altoona & Logan Valley Traction Company; secretary and treasurer, B. B. Davis, claim adjuster Columbus Railway & Light Company. This will be Mr. Davis' tenth consecutive term in office.

The executive committee includes P. C. Nickel, claim agent New York Railways; F. J. Whitehead, manager claims department Washington Railway & Electric Company, Washington, D. C.; C. B. Proctor, claim agent Memphis Street Railway, Memphis, Tenn. The subjects committee is composed of F. D. Edmonds, assistant general attorney New York Railways; H. D. Briggs, assistant general claim agent Public Service Railway; C. B. Brunner, claim agent Easton Transit Company, Easton, Pa., and J. E. Burr, claim agent Eastern Pennsylvania Railways, Pottsville, Pa. The members of the ways and means committee include J. S. Harrison, Jacksonville, (Fla.) Traction; J. S. Kubu, claim agent New York State Railways, Utica, and A. Dixon, El Paso, (Tex.) Electric Railway. The members of the employment committee are B. B. Davis, Columbus Railway & Light Company; E. E. Slick, Union Traction Company of Indiana, Anderson, Ind., and C. J. McAleer, Schenectady Railway.

Before adjourning its final session a vote of thanks was extended to all those who had contributed papers, and H. K. Bennett presented Mr. Weh with a gold badge of the association as a token of respect. Upon motion, Mr. Weh by reason of his being a past president, was made a member of the executive committee.

The following statement is attributed to a car driver of Burnley, England, who has been serving at the front in the King's Own Lancaster Regiment, and who has been invalided home: "The French treated the English Tommies like gods. If we had been King of England they could not have done more for us. I was never in a grander country."

JOINT MEETING OF THE ENGINEERING AND ACCOUNTANTS' ASSOCIATIONS

President Hanna of the Engineering Association called the joint Engineering and Accounting meeting to order yesterday morning at 10 o'clock, with President Glover on the platform for the Accountants' Association. The report of the committee on engineering accounting was presented by its chairman, J. P. Barnes, Syracuse & Suburban Railroad, Syracuse, N. Y. This report, abstracted elsewhere in this issue, covered the three subjects of overhead charges, inter-departmental charges and cost accounting, each of which the delegates discussed in turn.

OVERHEAD CHARGES

This section of the report was not extended, owing to the report of the committee on overhead charges of the Accountants' Association presented Wednesday. President Glover summed up the joint committee's report on this subject by stating that it called attention to the fact that some proper items of overhead charges were often left out of construction cost. In a number of cases construction work was shown on the books at a certain amount and on subsequent analysis it was found impossible to construct that piece of work for this amount. In President Glover's opinion, this was largely caused by a misunderstanding of the rulings of commissions. In this connection he cited the new ruling of the Interstate Commerce Commission specifically providing for charging to construction work the proper amounts of salaries of officers when engaged thereon, and he emphasized the desirability of following this ruling closely.

INTER-DEPARTMENTAL CHARGES

In supplementing the committee report on inter-departmental charges, Mr. Barnes said that when a job was done for construction or operation, there was accrued an unavoidable overhead cost composed of two increments, one including operating items such as cost of supervision, administration, office expenses, etc., and the other including fixed items like interest, taxes, etc. In the case of construction work the overhead cost was as large a part of the cost as the actual cost of materials and labor and should be represented in the property accounts. As regards inter-departmental operating charges, however, the same elements of overhead cost arose, but operating accounts did not make any provision for, and actually did not contain the second increment of fixed charges. Mr. Barnes said that if inter-departmental operating charges were to be handled at all they must be handled under the present system differently from the construction inter-departmental charges, and the question was whether such treatment was good accounting and good engineering.

In reply to a question by Terrance Scullin, Cleveland (Ohio) Railway, President Hanna said that most public service commissions were liable to depend for information on outside sources, and that one of the principal problems now before the parent association was to gather information so that the member companies might be in a position to guide the commissions and to put before them information on this subject, properly prepared. In addition, President Glover stated that the proposed system of inter-departmental charges was a system of accounts entirely separate and distinct from the regular operating charges. The cost statement was a statement entirely separate from the operating or income statement prescribed by law and one that would show the true state of affairs of the company better than would the latter statement, although balancing with it as to the total.

C. H. Lahr, Northern Ohio Traction & Light Company, Akron, Ohio, believed in the theory of the report, but doubted its good practical effects. H. G. Salisbury, Toronto (Ont.) Railway, thought that the only solution was to use a percentage basis to cover the overhead charges, according to the amount of work produced, for both labor and material. William Roberts, Northern Ohio Traction & Light Company, Akron, Ohio, asked why there should be any difficulty in distributing overhead charges, when manufacturers could apportion such charges with sufficient correctness to be able to make estimates of the cost of repairs or manufacture plus such charges.

G. W. Palmer, Jr., Bay State Street Railway, Boston, Mass., criticised the loading of estimates with an increment for overhead expenses so as to show a total in excess of outside prices, when the work did not result in any increase in the total overhead. In reply J. P. Ripley, J. G. White & Company, New York, emphasized the desirability of securing accurate costs, and C. R. Harte, Connecticut Company, New Haven, Conn., said that if the overhead was properly pro-rated it would take care of itself just as it did in a manufacturing plant. When such a plant had too high an overhead for competitive purposes, it got more work and cut down the overhead. The overhead charges had a fluctuating value depending on the output.

Mr. Ripley asked for a discussion from engineers regarding a return on construction equipment engaged in construction work. In reply L. P. Crecelius, Cleveland (Ohio) Railway, outlined the plan followed by his company. In the case of new construction work, estimates were prepared subject to approval by the street railway commission. In these all costs were carefully detailed and analyzed and an arbitrary overhead charge of 15 per cent of the total cost was added, this percentage covering contingencies, interest on money and miscellaneous items.

W. J. Mead, Cleveland (Ohio) Railway, brought out the interesting point that no fast rule could be devised for giving the right percentage of burden or overhead charges. What would be right in one place would be wrong in another. There was no way to get at the facts, except after long years of operation. Martin Schreiber, Public Service Railway, Newark, N. J., said the fact that the inclusion of overhead charges would run the cost up should not work against the proper principle. If it really cost more when all the overhead charges were added the work should certainly be done outside. Often operators seemed put out by the fact that they were not able to make small articles on their own property as cheaply as they could buy them outside, but in this day of specialties this was not a disgrace.

It appeared to H. F. Merker, East St. Louis & Suburban Railway, East St. Louis, Ill., that it was not proper to purchase an article outside if its manufacture inside would reduce the overhead for the department making it, for the company might save something through the department doing its other work with less overhead expense. If the department was crowded, however, and the making of the article would increase the total overhead, it would be better to have the work done outside.

Mr. Schreiber said the committee had tried to agree on a certain percentage for inter-departmental charges, but it was found that every particular case had to be analyzed separately. As regards very small articles, it would not make much difference whether the overhead was charged, if overhead were charged on larger jobs. Theoretically the small piece should have an overhead charge just as much as should fifty cars, but practically it made little difference.

Charles H. Bigelow, Millville (N. J.) Traction Company, was of the opinion that in repair shops where a number of men were carried on account of break-down jobs, the minor articles should not stand the overhead charges, for these should be placed against the break-down accounts. Mr. Harte touched upon the need of consistency in treating overhead charges on small and large articles, so as to be prepared to substantiate appraisal figures before commissions. Mr. Barnes then read two paragraphs in the report of the committee which to his mind summed up the entire discussion.

COST ACCOUNTING

Mr. Barnes next outlined the cost accounting section of the report. G. G. Whitney, Washington Railway & Electric Company, Washington, D. C., said that many of the companies during the past year had realized the value of cost accounting, especially those engaged in valuation work. He recommended the use of a system of work order or job numbers. P. L. King, San Antonio (Tex.) Traction Company, emphasized the importance of co-operation between the engineering and accounting departments in cost accounting work, and in reply to Mr. Merker said that in his company after the work was completed a report of final cost was made up in detail and a copy given to the engineering department for use in forming future estimates. Mr. Bigelow stated that such statements were eminently necessary. President Hanna noted that the provision of the report calling for "a final statement from the accounting department showing the actual cost of the work" covered this point. Mr. Harte said that no charges should be added to the authorization except as they passed through the hands of the engineer or the person responsible for the authorization. In large companies the engineer in charge should have a monthly comparison of the auditor's book statement and the estimate in order to head off charges improperly made.

H. H. George described the practice of the Public Service Railway engineers in furnishing an estimate of the replacement value or original construction value of the work done at the same time the estimate of proposed work was made, and after the work was done in furnishing the auditing department with a revised estimate of the cost of materials actually replaced. At this point Charles H. Clark, Cleveland (Ohio) Railway, and Mr. Roberts raised some questions regarding the accounting treatment of replacements, which were ably answered by Mr. Barnes. Then followed a discussion between Messrs. Barnes, Merker, Glover and Palmer, regarding the non-replacement of as much value as originally estimated. The concensus of opinion finally seemed to be that the first estimate of replacements should be revised to show the value of the articles actually replaced, which should then be written off on the books.

Mr. Barnes then called attention to the fact that it was upon the suggestion of the joint association that the Interstate Commerce Commission system of accounts was revised, which should be a source of great gratification to the members. Mr. Roberts moved that the report of the engineering-accounting committee be adopted and that the committee be continued, which motion, together with a vote of thanks, was carried.

LIFE OF RAILWAY PHYSICAL PROPERTY

Mr. Schreiber then reported for the committee on life of railway physical property, to the effect that this joint committee had during the last year given further study to the subjects outlined and discussed in its 1912 and 1913 reports, that it had followed closely the work of member companies and studies of depreciation and life of physical property by other technical associations and bodies, and that it had in preparation its final report, although recent developments had made the submission of such a report inadvisable at this time. Mr. Ripley moved that the report of progress be accepted and the committee be continued. The motion was carried and the joint meeting then adjourned.

According to the Department of Commerce, the United States leads the nations in the value of manufactures, although the products of its factories are chiefly consumed at home. In 1909 the United States produced more than $2,000,000,000 in manufactures, of which only about 5 per cent was sold to foreign countries.

REPORT OF COMMITTEE ON FEDERAL RELATIONS

The report of the committee on federal relations, presented before the American Association yesterday, mentioned the appointment of Horace F. Clark, of the law firm of Clark, Prentiss & Clark, as Washington representative of the association. Mr. Clark's appointment was made after the annual meeting last year, and followed the appointment of E. B. Burritt, the former Washington representative, to the office of secretary of the association.

The report then gave a review of some of the bills which had been presented before Congress during the past year and the action of the committee thereon. In the early part of 1914, the report says, there were five bills in the House of Representatives compelling the speedy substitution of steel for wooden cars in interstate passenger service. Some were more drastic than others, and it was apparent that electric railways engaged in interstate commerce would be seriously affected by the enactment of any of these bills. Therefore a hearing was arranged in January before a sub-committee of the House committee on interstate and foreign commerce in Washington and was attended by members of the committee on federal relations and other representatives of the electric railway industry. An account of this hearing appears on page 533 of the Electric Railway Journal for March 7, 1914. The House committee on interstate and foreign commerce has not yet reported any of the bills on steel cars pending before it, but an omnibus bill has been prepared to take the place of a number of these bills and was introduced in May by Mr. Stevens, of New Hampshire. Its number is H. R. 16,875. Electric railways are exempted from the operation of this bill by Section 17, which reads that "the provisions of this act shall not apply to electric street railways or electric interurban railways." It is believed that the arguments presented at the hearing favorably impressed the sub-committee and that any bill which it reported relating to steel cars will exclude electric railways from its operation.

The federal relations committee report then described the hearings conducted before the House committee on the District of Columbia in regard to the proposed municipal ownership of the street railways in Washington. The committee adds that it believes that the force of the arguments made in the report of the minority members of the House committee against municipalization will ultimately prevail, but every member company should make a point of seeing that these arguments are brought to the attention of the representative in Congress from its district.

The report then refers to House bill 16,586, amending the interstate commerce act so as to require approval by the commission of stocks, bonds, notes, etc., payable at periods of more than twelve months after date and issued by common carriers subject to the act. The bill was passed by the House, and as passed, it applies to electric railways engaged in interstate commerce. The federal relations committee arranged for a hearing before the Senate committee, and this committee reported the bill to the Senate with a number of important amendments, including one reading as follows:

"The term common carrier railroad corporation, as used in this section, shall not be construed to include street railway lines or electric interurban lines unless they form a part of a railroad system operated in part with steam."

The bill in this form is pending before the Senate, but it is generally understood that no legislation on this subject will at present be urged for passage.

Other Bills and Conclusion

The report referred to other bills of considerable importance to electric railways which have been before Congress this last year. One is to subject urban street railways to the jurisdiction of the Interstate Commerce Commission, and its immediate object appears to give to the commission jurisdiction over the Omaha-Council Bluffs controversy, which, in June, 1913, the Supreme Court of the United States held was beyond the jurisdiction of that body. The subject of compensation to employees of common carriers engaged in interstate commerce is covered by several of the other bills introduced. The Federal Trade Commission act, which became a law in September, probably has little relation to electric railway companies, but the Clayton antitrust act contains several provisions of interest to them. One is the provision against the acquisition by one interstate corporation of the capital of another when the effect is to lessen competition. Another relates to interlocking directorates.

In 1913 the committee on federal relations called attention to the "gradually increasing scope of the relations between the electric railway industry and the United States government." In its present report it says that the record of the past year lends confirmation to this statement. The report concludes as follows:

"It is too early to say that Congress has recognized the impropriety of making all of its legislation in relation to common carriers by railroad applicable to electric railways equally with the trunk line steam railroads. At the same time, it is believed that progress has been made in securing that recognition. The absurdity of requiring, for instance, the comparatively small and weak electric carriers of the country to submit to distant authorities at Washington the issues of notes, stocks, bonds and other obligations already abundantly supervised by state authorities, is apparent as soon as really considered. The fact that important committees of the House and Senate have manifested their realization of the differences between steam and electric railways by making exceptions to bills as above indicated encourages the hope that in future legislation the two classes of railroads will be kept separate. The probability that future federal legislation affecting the electric railway industry will be fair, reasonable and workable would be much enhanced if steam and electric railroads were regarded and treated by United States congressmen and senators as belonging to different classes. Our membership can do much by personal interviews and communications with representatives and senators to have the differences between the two classes of carriers recognized. The subject is so important that no member should fail to do what he can to secure the result aimed at."

WHAT IS "PUNCH"?

What is that force in an advertisement that makes you buy the thing advertised?

What is it that enables one man to sell two or three cars while the other fellow isn't selling any?

We call it "punch" in a general way, but what is "punch"?

Punch is vim vitalized. It is vigor with a voltage behind it. It is "pepper" coupled to "push." It is power, personality, persistency and pugnacity done up in the same package.

It is knowing enough—not too much.

It is talking enough—not too much.

It is the correct sizing up of a situation.

It is knowing what to do with a situation when once sized up.

It is knowing how to say and do forceful things in a forceful way.

It is knowing when to pull the order blank.

It is the ability to get out of a tight place with the order.

It is dominating the interview and coming away with the check.

"Punch" is the child of ambition and the father of success.

"Punch" is just plain, every-day "horse-sense" with a "kick" in it.—*Ford Times.*

REPORT OF COMMITTEE ON TRAINING OF TRANSPORTATION EMPLOYEES

The report of the committee on training of transportation employees of the Transportation & Traffic Association, presented yesterday, stated that data sheets were sent out to the member companies covering the following subjects assigned for investigation: 1. A comprehensive investigation of the "safety first" movement. 2. Bring up to date the digest of state and municipal regulations affecting employment. 3. Recommend practices for handling bulletin boards. 4. Study of the various methods of paying wages. 5. Recommendation regarding the standardizing and use of training schools, instruction cars and apparatus for various sized properties.

The committee decided, on the subject of "safety first," that its general adoption by a large number of companies was too recent to justify definite conclusions. Also, that the results obtained were believed to be too involved with attending influences to justify a definite statement. The committee stated, however, that if interest and enthusiasm could be maintained, further trial of the movement was warranted, but that the results should be measured with extreme care. The interest which inspires the safety movement is susceptible of misconstruction and, when once started, patience and persistence are necessary to overcome recognized prejudice.

In its report of legislative and municipal enactments the new laws in Massachusetts, New York and West Virginia are mentioned. In commenting on these, the committee states that the invasion of constitutional restrictions is becoming more manifest, and the laws affecting street railway organizations continue to savor of class legislation. If this principle is to be accepted by railroads, their influence in the framing of such laws should be exerted aggressively to prevent enactment.

Recommended practice for handling bulletin boards, which was one of the subjects assigned to this committee, indicates clearly a tendency to dissatisfaction with the results secured by existing methods. Recommendations governing notices as distinguished from bulletins, provide for the display of notices on the bulletin boards and their removal when obsolete. Bulletin recommendations provide that they shall be printed to conform in size with the rule book page, revised annually to include live bulletins in pamphlet form of the same size, and followed with a periodic revision of rule book every five years. On small properties where printing is not justified, individual issues should be supplied by using some established manifolding process. It was also recommended that bulletin discussions should be featured at periodic meetings and followed by inspection and examination. All notices should also receive like attention when their importance requires.

Regarding the methods of paying wages, the committee concludes that where various allowances are not involved and rates are fairly uniform, considerable merit attaches to daily payment by conductor or depot official from current receipts, using individual pay receipts as sub-vouchers to payroll which they accompany. This method was found desirable on properties of fairly good size, and it is also applicable to the largest properties if receivers are stationed at terminals to clear the conductors' daily receipts. While local conditions may make this method objectionable, weekly payment in cash by the paymaster should meet all requirements. Objections to unreceipted vouchers may be eliminated by requiring individuals to sign and deliver to the paymaster receipts for the payments made.

In the report on standardization and use of training schools, instruction cars and apparatus, it is stated that the data indicate that standardization is desirable. The best argument which could be advanced in support of uniform practice lies in the fact that extreme variations exist. Until each superintendent studies wherein his own practices are fundamentally wrong in principle but little may be accomplished in the way of securing uniform practice throughout the country.

Training schools are a necessary adjunct to all properties, irrespective of size. Employees should be taught their duties thoroughly, be made to realize the importance of work carefully performed and without ridicule or rebuff, be afforded opportunity to reach a thorough understanding of what is required of them. In order to accomplish this result personal attention of a painstaking order is necessary. A specific time should be devoted to this and a specialized effort made, uninterrupted by other administrative duties.

Regarding the use of instruction cars, the committee concludes that where operation is in congested territory, an instruction car is regarded as an essential part of the instruction methods. Its use, however, should be confined to rudimentary practice in the early stages of instruction. The necessity for instruction apparatus is believed to exist, the quantity and manner of display, however, being dependent upon the extent of use to which it is put.

For small properties the committee believes that a superintendent, depot master or inspector should be assigned to the work of instruction and that one man should do this work rather than several. A surface car upon a siding may serve as a school and by its use accurate operation may be required followed by platform instruction and supplemented by explanation and questioning to insure thorough understanding.

On medium-sized properties a permanent instructor with assistants, whose number depends upon the number of employees to be trained, should be provided. Owing to the number of students and the inability to give personal supervision, methods involving the use of forms and instruction blanks will be necessary. The number of cars used for instruction should be increased to meet required needs. Instruction apparatus should be displayed in greater detail and various parts indicated in such a manner as to make up for the reduced personal attention. Instruction plants for the large systems differ only from the former in the size, the essential features being the same, but with a larger supervisory staff.

ACCOUNTING TREATMENT OF DEPRECIATION

The address on the subject of the accounting treatment of depreciation delivered yesterday by Robert Sealy, assistant treasurer the North American Company, New York, before the Accountants' Association, treated the subject primarily from the point of view of "insurance replacement" rather than from that of the wasting of assets. The tenor of the address was to the effect that the extent of accounting provisions for depreciation and their importance is largely dependent upon the financial policy of the electric railway in question. There has been a rather general attempt on the part of regulating commissions to enforce accounting practices insuring the financing of future replacements, and it seems generally recognized that replacements are properly to be charged against income and not to be capitalized. Of all the methods for making such charges against income, the accrual method or charge against income during the preceding years appears preferable. Where regular charges to income are not separately accrued the surplus may provide the necessary reserves to insure replacement.

Mr. Sealy deplored the serious confusion of terms which has arisen in connection with the subject of depreciation and said that there is no part of accounting procedure so in need of standard definitions. In regard to the line of demarcation between charges to maintenance and charges to the reserve accrued for replacements, it seemed essential that charges to the reserve when based upon the anticipated life in service should be made only when the replacement effected actually adds to the life of the unit. Mr. Sealy condemned the practice of deducting the depreciation reserve from the asset account on the balance sheet as being a departure from the underlying theory of original cost and the substitution therefor of the theory of present value with its accompanying confusion. It would be better practice to treat the reserve as a liability. When reserves to insure replacements were accrued from income, Mr. Sealy felt that there was no necessity for separately funding the assets offsetting the reserve liability. Various methods had been suggested as a proper means of equalizing the charges against revenue, but pending the accumulations of mortality data it served no particularly useful purpose to draw fine distinctions between them, for all were presumably destined toward the same end. Mr. Sealy suggested that eventually the application of the principles of insurance to the calculation of the annual premiums or reserve credits would give figures more nearly representing the actual cost than would the assumptions involved in the application of the ordinary sinking fund or straight line methods.

One of the most interesting sections of the address dealt with the distinction drawn between the engineer's problem of appraising the present value of physical assets and the accountant's problem of accounting for the financing of replacements, and also with the description of the indeterminate nature of the engineer's task and the lines along which the accountant can proceed when the engineer supplies the essential underlying data. The accountant's problem is similar to and almost identical with that of the life insurance actuary who determines the premium to be paid by the insured under any one of a number of policy plans, but estimates on the annual reserve at present are far from accurate owing to the absolute lack of experience data with respect to the useful lives of various classes of property.

REPORT OF JOINT COMMITTEE ON ENGINEERING ACCOUNTING

The report of the joint committee on engineering accounting presented yesterday covered the three topics of overhead charges, inter-departmental charges and cost accounting. The committee did not take up in detail the subject of overhead charges, inasmuch as it is in the hands of a committee of the Accountants' Association. Such charges were defined, however, to cover costs over and above those of labor and material and directly and properly chargeable to a particular undertaking or piece of work. They comprise two distinct classes—first, those of an operating nature, including cost of supervision, administrative expenses, insurance, wear and tear on machinery, non-productive labor, etc.; and second, those of a more general nature, including interest, taxes, etc. Overhead costs are not susceptible of exact distribution and in general are estimates based upon and controlled by the conditions surrounding a particular case. They seldom, if ever, bear any fixed percentage relation to their respective costs of labor and material.

Inter-departmental charges were discussed from the standpoints of construction and operation. Inter-departmental charges for construction should properly include allowances for all overhead costs incidental to the work, and the Interstate Commerce Commission rule prescribed in the uniform system of accounts effective July 1, 1914, should apply in all cases. In the practical application of such a system, however, it is necessary to distinguish between the two classes of overhead costs previously mentioned, the proportionate amounts of only the first class being credited to the operating accounts of the departments doing the work, and the charges of the second class, representing return upon investment in plant and equipment used for the work, being credited to the accounts originally bearing the charges.

Such a system, if applied similarly to inter-departmental operating charges, would result in the inflation of the operating expenses by the overhead charges of the second class. On the other hand, inter-departmental operating charges under a system of including costs of only labor and materials would be inaccurate and misleading. A system of inter-departmental accounting in which the overhead costs of both classes were added to the job order cost (the department benefited by the work being billed with the total and the accounts of the department doing the work credited) would leave the total of operating expenses unaffected by the addition of overhead costs of both classes, since they would cancel in summation. Yet under this plan the department doing the work would be unjustifiably credited with an amount to cover fixed charges upon a portion of its plant and equipment, for it is not directly charged with an amount to cover the fixed charges on all equipment used by it. The inclusion of only charges of the first class would solve this difficulty, but no reason exists why the department benefited should be charged with the first class and not the second. The only solution of the problem lies in a system of cost accounting, summarized in a statement which is separate from the operating statement and in which the accounts of each department include its due portion of general expenses, taxes, interest, etc., and are then credited with the total cost (including labor, material and overhead of both classes) for work done for another department.

Cost accounting is defined by the committee as a separate and supplemental detailed analysis of accounts, designed to reflect the expenditures for different undertakings and various classes of work, as well as unit costs, with greater accuracy than is possible under systems of accounts prescribed by law. The essential features of the system outlined by the committee for both large and small companies follow: (1) preliminary estimate of cost; (2) actual or estimated original cost of work to be replaced, if any; (3) authorization through the proper official for the expenditure of the amount of the estimate; (4) formal notice of completion from the engineering department to the accounting department; (5) final statement of actual cost authorized by the accounting department; (6) supplemental authorization covering over-expenditures, if any; (7) certificate of completion, canceling unexpended balances, from the accounting department to the authorizing officials. This system insures the retention of all original records in the accounting department, and it can be used as a basis for increased economies of operation and valuable data for future estimates. In conclusion, the committee recommended that consideration of the subdivision of the maintenance expense accounts under the new Interstate Commerce Commission system be referred to next year's joint committee.

THE WAR AND PUBLIC UTILITIES

The September number of *Bonds and Mortgages*, Chicago, contained an article on "The War and Public Utilities—The Outlook for Investor and Public under New Conditions," by William H. Hodge, publicity manager H. M. Byllesby & Company. Mr. Hodge believes that well-managed public utilities will withstand the present strain on capital to far better advantage than most industries, pointing out, however, that "if a situation arises where a corporation will be saved from serious embarrassment by the application of surplus earnings to construction needs, rather than to the payment of dividends, the stockholders should have no grounds for criticism. Cases such as this will be comparatively rare in the American publicity field, and there is nothing in them warranting lessening of confidence on the part of investors in the securities of public utility companies under responsible and capable management." Mr. Hodge observes that public utilities deal with the law of averages. They can go through calamities affecting society just as cities and states persist in the face of blows which wipe out individuals and individual enterprises.

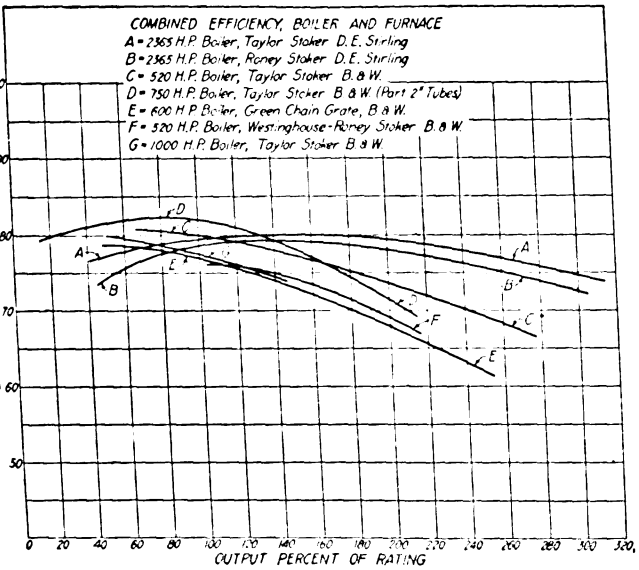
REPORT OF COMMITTEE ON POWER GENERATION

The report of the committee on power generation of the Engineering Association was presented yesterday. It consisted of three monographs prepared as sub-committee reports as follows: "Status of Automatic Stokers," by R. J. S. Piggott, mechanical construction engineer Interborough Rapid Transit Company; "Control and Safety Devices for Power Stations and Feeder Circuits with Special Reference to Reactance," by J. W. Welsh, electrical engineer Pittsburgh Railways, and Fay Woodmansee, Woodmansee & Davidson, Chicago, and "Advantages and Disadvantages of Sixty-Cycle Apparatus with Particular Reference to Rotary Converters for Railway Service," by L. P. Crecelius, superintendent of motive power Cleveland Railway, and W. H. Sawyer, Ford, Bacon & Davis, New York.

Mr. Piggott reported that the principal considerations in the design of a stoker are: (1) Coking of green coal; (2) adequate mixture and heating of volatile matter with air; (3) burning of fixed carbon; (4) disposal and dumping of ash and clinker. Other points, only less important than the first four are: (5) prevention of sifting, and (6) prevention of clinker adherence to brickwork and stoker parts. He considered the qualities of the three types of stokers; overfeed, chain grate and underfeed.

In the matter of costs his conclusion is that the comparative prices of the various stokers per rated horse-power of boiler are of little value unless the forcing capacity, maintenance and labor attendance are taken into account. The accompanying table gives average data for representative types. The costs per horse-power are averaged for each case; the forcing capacity is that obtainable with first-class operation and adequate draft in glowing apparatus. The maintenance figures cover stoker only. The maintenance of brickwork on overfeeds is usually higher than underfeeds on account of the expensive and troublesome coking arches. The same clinker adherence occurs in each, but is more pronounced in the underfeeds. The field narrows down to chain grates for high volatile high ash coals, and the gravity underfeed for practically all other classes. It is not certain but that the underfeed will eventually take the whole field.

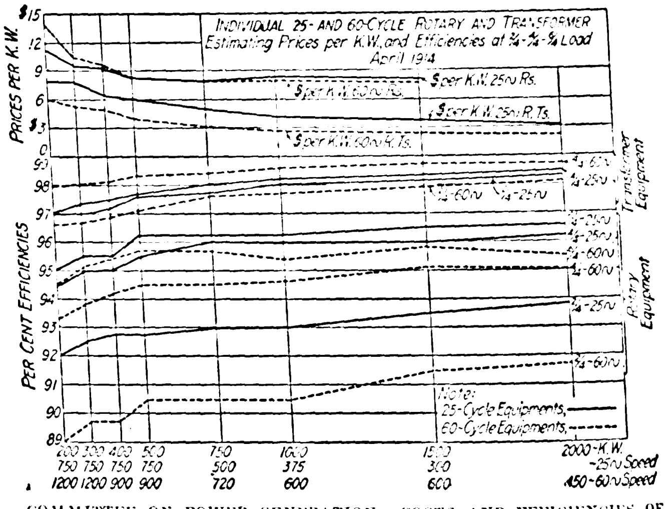
Stoker	Type	Average Price Per Rated Boiler Horse-power	Normal Forcing Capacity, Per Cent Rating	Draft	Price Per Maximum Horse-power	Maintenance Per Ton Coal (Dollars)	Man—Hours Attendance Per Active Hour	Pounds Coal Per Square Foot Grate Surface (Maximum)
Step and slope grates............	Overfeed	$3.60	190	Natural	$1.90	$0.10- $0.12	0.45	35-38
V grates...........................	Overfeed	3.60	175	Natural	2.06	0.11- 0.14	0.45-0.50	35-42
Chain Grates.....................	Overfeed	3.50-6.55	260	Natural and forced	2.52	0.06- 0.10	0.20-0.30	45-48
Gravity underfeed	Underfeed	5.65	300-350	Forced	1.88-1.62	0.025- 0.04	0.08-0.10	60-75
Horizontal retort underfeed......	Underfeed	4.44	300	Forced	1.48	0.04- 0.06	0.30-0.40	50-65



COMMITTEE ON POWER GENERATION—CHART SHOWING STOKER EFFICIENCY CURVES

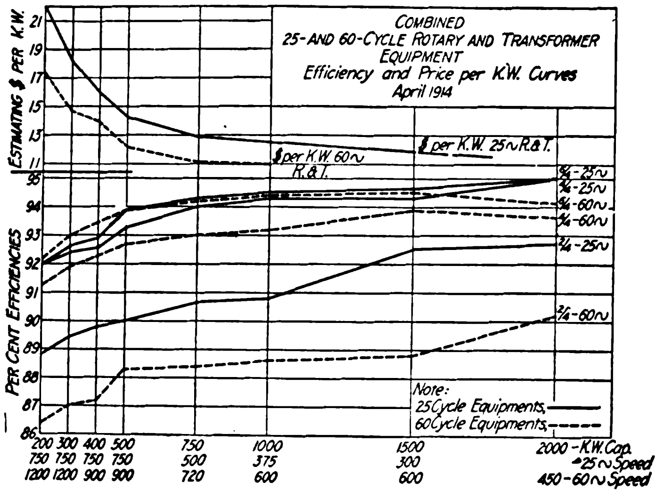
Mr. Piggot summarizes the data of efficiency of various modern stoker installations in the accompanying figure. These curves are for boiler efficiency only, not allowing steam for blowing or driving stokers, or for boiler feed pumps. All except the double-fire Roney stoker show best efficiency at less than 100 per cent boiler rating. Referring to the input-output line, it will be seen that the net output of steam is lower at any given coal input by the amount of steam used for auxiliaries necessary to operate the boilers. This in turn lowers the net boiler-plant efficiency by an amount which varies for every case. It will be found that the highest point of the new efficiency curve has been raised 20 to 25 per cent more in output than the highest point of the boiler efficiency curve. This indicates that the boilers should be run averaging about 25 per cent higher than the most efficient test point, viewed from this consideration only. But the principal factor influencing the load to be carried on the boiler is the relation of fixed charges to operating cost.

Messrs. Welsh and Woodmansee devoted their article to a discussion of the fundamental principles of the part played by natural and artificial reactance in power plants and transmission lines, particularly as affecting short-circuit currents, load distribution and synchronizing power of synchronous apparatus. They took up reactance location in generator mains, busbars and feeders and gave curves of the short-circuit currents produced under various conditions, and of the mechanical strains in reactance coils resulting therefrom. Some useful data given are as follows: Approximate space for a twenty-five-cycle, 50-kva coil 0.6 cu. ft. per kva, and for a 500-kva coil 0.3 cu. ft. Corresponding costs are $12 and $4 per kilovolt-ampere. The following figures were given for sixty-cycle coils: 50-kva, specific volume 0.3 cu. ft. per kilovolt-ampere, unit cost $6 per kilovolt-ampere. The volume is given as low as 0.0175 cu. ft. per kilovolt-ampere



COMMITTEE ON POWER GENERATION—COSTS AND EFFICIENCIES OF TWENTY-FIVE-CYCLE AND SIXTY-CYCLE APPARATUS for a 475-kva coil, and the unit cost $1.46 per kilovolt-ampere for a 1200-kva coil. A number of photographs of modern reactance-coil installations were reproduced in the report.

The paper by Messrs. Crecelius and Sawyer reviews the present status of sixty-cycle apparatus, particularly as contrasted with twenty-five-cycle apparatus. They stated that under normal operating conditions there is little choice between the two frequencies as far as turbo-generators are concerned, except that with high-speed generators the regulation may not be quite as reliable in the sixty-cycle machines when the load is variable. The damage from short-circuits also may be intensified. These machines are slightly more efficient and they are much cheaper, as are also synchronous motors built for the higher frequency. The same considerations hold with transformers.



COMMITTEE ON POWER GENERATION—COSTS AND EFFICIENCIES OF TWENTY-FIVE-CYCLE AND SIXTY-CYCLE APPARATUS

The writers state that, while the sixty-cycle rotary is probably not quite as reliable as the modern twenty-five-cycle machine, it is more so than the older ones and is reliable for ordinary conditions. The general tendency to hunting and flashing has been reduced by improved design. The present high speed permits the use of 8½ in. to 9 in. between commutating points and this, combined with commutating poles, improved mechanical design and copper dampers or cage winding, has resulted in the production of a sixty-cycle converter which approaches the twenty-five-cycle one in commutating ability. Hunting tendencies have also been reduced through the elimination of the reciprocating engine.

Under abnormal power supply conditions the sixty-cycle rotary is more sensitive to flashing than the twenty-five-cycle one, as it is also in case of d.c. short-circuits. Commutator speeds must be higher to give the necessary distances between commutating points, but as the current per brush arm is smaller, on account of the larger number of poles, the commutators can be made shorter. Sixty-cycle machines also run cooler, temperature limitations being not one of the controlling considerations as in twenty-five-cycle machines. From the standpoint of efficiency the twenty-five-cycle rotary converter is slightly better, but the advantage is neutralized or even reversed when transformer efficiency is included. In the matter of price the two types are nearly on equality in large sizes, with the sixty-cycle rotaries ahead in moderate and small sizes. The report includes numerical data bearing out the statements. Much of this information is shown in the accompanying diagrams. (The reader is referred for further information to articles based on data furnished by Mr. Crecelius and published in the issues of the ELECTRIC RAILWAY JOURNAL for April 5, 1913, page 618, and March 28, 1914, page 713.)

REPORT OF COMMITTEE ON COST OF PASSENGER TRANSPORTATION SERVICE

The committee on cost of transportation service, American Electric Railway Association, submitted its report yesterday. Much of the report discussed the organization and activities of the association's bureau of fare research organized May 1, 1914 (see ELECTRIC RAILWAY JOURNAL of May 9 and May 16, 1914). At present the bureau receives monthly reports from about 100 companies outside of New York and Chicago, the operating revenue of which amounts to more than $205,000,000 a year, which is about 40 per cent of the operating revenue of the entire industry. The results disclosed did not make possible generalized comparative summaries but they did reflect the present tendencies of business depression and indicated decreases in revenue at a greater rate than decreases in the cost of operation. The committee urged that more companies file statistics promptly with the bureau in order that the association could point out to the public the changing relations between revenues and the expenses more frequently and forcibly than is possible when reliance must be placed on yearly manuals and census bulletins.

The bureau had co-operated with the committee on standards for car loading in collecting information and had also made a somewhat extended study of the cost of rush-hour service, and results from the studies to date appeared in the report of the committee named. The bureau had also prepared a syllabus of the New England situation where some companies had increased the fare from 5 cents to 6 cents. At the instance of a member company it is also gathering information about rates of fares charged by neighboring interurban companies for use in an action looking toward an increase in rates of fare. Furthermore, at the request of the committee on compensation for carrying United States mail, the bureau is compiling data on handling all material of electric lines.

The committee then mentioned the investigation of maximum length of profitable ride conducted jointly by the Boston Transit Commission and the Public Service Commission of Massachusetts (see ELECTRIC RAILWAY JOURNAL of Aug. 1, 1914). In commenting on its figures the committee said it was very much to be doubted whether a passenger riding 2.86 (two-thirds of the round trip of 4.28 miles) would cost the company only two-thirds as much as the one riding to the end of the line, for the cost of handling a passenger does not depend entirely upon the length of the ride. Under the assumptions and figures of the joint commission, it appeared that a charge of 5.25 cents instead of 5 cents would raise the earnings from 5.4 per cent to 7 per cent and that the earnings might be further raised to 8 per cent by an increase to 5.38 cents per ride. The committee added that the work of the joint commission was an instance of the growing interest in the field of work assigned to the bureau of fare research. The fact that in the year 1912 passengers were using electric railways ten times as frequently as steam railroads, double the ratio of 1900, indicated the increasing importance in the relations of the public to the electric traction industry and the need for a clearer understanding of the economic problems of that industry.

The expenses of the bureau had been somewhat less than the amount authorized by the association, but this did not indicate that the authorized amount was greater than the later needs of the bureau. The original plan provided for the annual appropriation by the association of $2,500 for three years, and that $5,000 a year for each of the three years should be obtained from the member companies interested. As the bureau did not begin its operations until May, and since the initial expenditures of the bureau had been low, it had been decided to date the pledges to the support of the bureau from June 1, instead of from Jan. 1, 1914, as originally made. For the five months, May to September inclusive, the expenses of the bureau had been about $2,500. The association had expended in behalf of the bureau from its own funds $2,000 and had received contributions from member companies of $1,000.

REPORT OF 1915 CONVENTION COMMITTEE

The 1915 convention committee of the American Electric Railway Association presented a progress report yesterday. It reported that at a meeting held at the association offices on Feb. 25, 1914, the then existing status of arrangements for hotel and convention headquarters accommodations had been presented. By reason of the expressed attitude of the San Francisco Hotelmen's Association, it was determined necessary to ascertain so far as was then practicable, the probable number of delegates who would attend the 1915 convention. The secretary had been instructed to prepare and send out a letter requesting information as follows: Number of delegates definitely guaranteed; probable number of additional delegates; date of arrival in and departure from San Francisco; kind of room desired, indicating, if possible, double or single room, and with or without private bath; if ladies will accompany members of the party, they should be included in the number to be guaranteed or in the number probably in attendance from each company.

As of July 3, data blanks had been sent to members and replies requested. The number of replies received to date had not been sufficient to develop a satisfactory basis for the making of hotel reservations.

At its meeting referred to the committee had recommended to the president of the association that he appoint a chairman of a committee on transportation, the chairman in turn to appoint the other members of the committee. It had also recommended that the Manufacturers' Assosiation appoint a similar committee to co-operate with the committee of the American Association.

THE INTRAMURAL RAILWAY AT THE SAN FRANCISCO FAIR

Of the several means to be taken to eliminate the bugaboo of leg-weariness from the grounds of the Panama-Pacific International Exposition during 1915, the most elaborate and effective will be the little intramural steam railway, with its 5 miles of steel track, work on which was begun on Oct. 1. The steam locomotives to be used will be 17 ft. in length, similar except in size to the standard modern Pacific type of engines and will be equipped with air brakes, standard automatic couplers, electric headlight and six drive wheels. Each engine will haul a train of ten miniature passenger cars of a gage of 19 in. The cars themselves will have a width of 42 in. and a length of 20 ft. and will contain ten transverse seats to seat twenty passengers each. With ten such cars to each train and eight trains in operation, 1600 people can be put in motion at once. Conforming to city speed regulations, the trains will make only about 10 m.p.h. between stations, of which there will be seven including three terminals, elaborately fitted up with train sheds, elevated platform and turntables. The entire line will be 2½ miles in length, double track and built with rails weighing 40 lb. per yard.

In consequence of such a large number of men in the employment of Belfast (Ireland) Corporation Tramways having joined the colors and of the traffic receipts having fallen by about £500 per week, Mr. Nance, the general manager, has found it necessary to reduce the number of cars in service during the quiet hours of the day. The number of cars during the busier hours has, however, been increased.

REPORT OF COMMITTEE ON COMPENSATION FOR CARRYING UNITED STATES MAIL

This report, submitted in manuscript, was most voluminous. It refers first to a statement sent by the committee under date of Dec. 11, 1913, to Judge Moon, chairman of the House committee on post-offices and post roads. An abstract of this letter was published on page 1337 of the Electric Railway Journal for Dec. 27, 1913. It was accompanied by estimates prepared by the Boston Elevated Railway and the Brooklyn Rapid Transit Company as to the cost of the operation of mail cars on those systems. The letter complained of the lack of the compensation paid by the government to the electric roads for carrying mail and asked for relief.

The committee then states that while it was making efforts to convince the two committees in Washington of the justice of the claims of the railways, individual companies were also carrying on negotiations. Among these were the Lehigh Valley Transit Company and the Cincinnati Traction Company, which, however, were not able to secure relief. On the other hand the Pittsburgh Railways were more successful in their negotiations with the Post office Department and succeeded in securing added compensation by computing the length of their cars on the basis of the entire inside length rather than the length between bulkheads by removing the bulkheads, and while their rate remains the same, that is 1 cent per foot of length of car body, the length of car body in computation was so increased as to materially add to their compensation per car-mile, so that the rate received by this company was approximately 25 cents per car-mile for a standard 16-ft. car body with two 5-ft. platforms. The Boston Elevated Railway, in endeavoring to secure added compensation, was advised by the department that "relative to the question of increasing the length of the mail cars used by your company in the performance of service on route 304,001 at Boston, you are informed that the conditions of the road have been carefully investigated and it is found that the present authorized facilities appear ample for the proper performance of the service."

An account was also given of the extended negotiations of the Connecticut Company with the government. These finally resulted in the decision of the Connecticut Company not to carry the mails any longer. An account of the situation, with the copy of the letter addressed by the Connecticut Company to the government, was published on page 1470 of the Electric Railway Journal for June 27, 1914, and also appeared in the report of the committee.

The Brooklyn Rapid Transit Company, in its negotiations with the Post-office Department, advised the second assistant postmaster general, on May 7, 1914, that the compensation to the company for carrying United States mail was unremunerative "and the continuance of this service under present conditions cannot be justified, and unless conditions can be complied with and authorized by the Post-office Department which will warrant our continuing the service it will be necessary, after reasonable notice, for this company to discontinue our service of carrying United States mail in independent cars." After investigation on the part of the Post-office Department and negotiations between the two parties, the railway company discontinued all mail service. The committee adds that there may be and undoubtedly are cases where other electric railways have had negotiations with the Post-office Department during the past year of which the committee is not informed.

In the meantime, Senator Bourne's committee was investigating the whole question of compensation for carrying United States mail and on Aug. 31, 1914, published "Report of the Joint Committee on Postage on Second Class Mail Matter and Compensation for the Transportation of Mail." The recommendation of the committee included a bill to increase the railroad mail pay about $5,000,000 a year and expressed the opinion that mail transportation should yield a car-mile revenue approximately the same as passenger service because conditions and expenses are similar. In the report Chairman Bourne complains of the vacillating policy of the Post-office Department which, he states, has changed its proposed method of payment four times in four years. He ascribes much of the delay in preparing the report to this fact. The report quotes variations in the department's estimates of alleged overpay of the railroads from $10,531,792 down to $221,832. One paragraph reads: "Before closing this report we deem it our duty to inform Congress that our work has been greatly handicapped by the deplorable lack of definite information in the Post-office Department regarding its own operations and by the attitude of the representatives of both the Post-office Department and the railroads. On both sides there has been a persistent tendency towards special pleading. From the beginning the railroads have been opposed to the adoption of space as a substitute for weight as a basis for mail compensation. On the other hand the Post-office Department has evinced a determination to secure a reduction in the total amount of railway mail pay, with little, if any, regard as to whether or not such a reduction is justified under prevailing conditions."

The report further states: "Representatives of the railroads are open to similar criticism. A reading of the evidence will show that they were either not in possession of very definite data or they were reckless in their computations showing the amount of under-payment they believed existed. Their estimates of under-payment vary from $15,000,000 to $38,000,000."

On Aug. 25, 1914, Senator Bankhead introduced Senate Bill 6405 "authorizing and directing the Postmaster General to readjust compensation of steam railroad companies for the transportation of mail."

Aside from the increased compensation provided in this bill, it should be of interest to the delegates to note the following extract, Section 7: "After the rate specified in this act shall have been in effect for a period of two years, the Interstate Commerce Commission shall, whenever requested by the Postmaster General or the representatives of the railroads with an aggregate mileage of at least 25 per cent on the railroads carrying mail, make an investigation of the justice and reasonableness of rates as in effect, grant hearings to parties in interest, and report to Congress at the earliest practicable date thereafter the results of such investigation, making specific findings as to whether the rates fixed herein shall be increased or decreased and, if either, how."

"Section 9.—That it shall be unlawful for any railroad company to refuse to perform mail service at the rates of compensation specified in this act when required by the Postmaster General so to do, and for every such offence it shall be fined not exceeding $5,000. Each day of refusal shall constitute a separate offence."

On Sept. 11, 1914, the committee forwarded to Senator Bourne a communication requesting information as to what his committee had in mind relative to the cases of the electric railways. On Sept. 12 Senator Bourne replied to the committee in part as follows:

"Referring to your letter of Sept. 11 as to why a committee of that association was unsuccessful in securing consideration for the electric roads similar to that of the steam roads; when this committee began its hearings it had before it two plans submitted by the Post-office Department for compensating both steam and electric lines for carrying the mails, the first having been submitted to Congress on Aug. 12, 1912, and the second, a modification of the first, to our committee on Jan. 20, 1913, both being what has been frequently denominated a space-cost plan.

"When representatives of your association appeared before our committee on Feb. 7, 1913, we expected them to discuss the modified plan of the Post-office Department, with which we supposed they were familiar. It developed that they were not familiar with its provisions and their testimony was directed more to a demonstration that they were underpaid rather than the submission of a plan which would do substantial justice to both the government and the electric lines.

"Later, namely on Feb. 19, 1913, in response to my request, your Mr. Lyons prepared and submitted a bill, approved by your association, recommending among other things an increase of 0.5 cent per linear foot over the present pay. This bill was promptly submitted to the Post-office Department for an expression of opinion as to its merits, and on July 25, 1913, the Postmaster General submitted a memorandum prepared by Second Assistant Postmaster General Stewart in opposition to its provisions. In the concluding paragraph of the memorandum Mr. Stewart makes the following statement: 'The tentative draft of the proposed law for regulation of compensation allowed electric and steam railroads for the transportation of the mails, contained in House Document No. 105, as modified by letter of the Postmaster General dated Jan. 20, 1913, is believed to provide a scientific and equitable plan for the fixing of compensation for the carriage of the mails by railroads, both steam and electric.'

"Later the department abandoned this and submitted a new plan, same not being applicable to electric lines. The committee rejected both and prepared a bill embodying its own views as fully set forth in its report made to Congress on Aug. 31. As we progressed in our study we found that the conditions applicable to steam and electric railways were so different that they would have to be considered as independent propositions. It was and is not our purpose to neglect the electric lines, but action has merely been postponed on account of the consideration just stated, and this is indicated on page 122 of our report where we say: 'We have on hand a balance therefore, of $18,439.50 still available out of which to defray such additional expense as may be incurred in working out a plan for mail pay to electric roads, etc.'

"The committee has your association's suggested bill before it and it will receive due consideration before any action is taken. If it is your desire or that of other members of your association to present anything new before the committee we shall be pleased to receive it."

To this the chairman of the committee forwarded a reply assuring Senator Bourne that the committee would be glad to submit further information to him.

It would appear therefore that this convention should direct and authorize a duly appointed committee to assemble, prepare and submit further detailed information to Senator Bourne's committee.

The electric railways are peculiarly fortunate in now being in a position to benefit by the experience of the steam railroads as well as by the report and bill submitted by the Senate committee, and in presenting their case the committee should be particularly careful to be so informed and to have such statistics as will prevent any possible criticism by the commission similar to that to which the steam railroads were subjected. The committee in submitting this report is of the opinion that the electric railway companies' case was never in better condition than at the present moment and that prospects are bright for it to receive fair and patient consideration by a judicial body peculiarly well qualified to render a report and recommendation consistent with facts and conditions.

Prof. John R. Wildman, head of the accounting department of the New York University School of Commerce Accounts and Finance, who on Tuesday delivered the address on accounting education, is the author of two valuable books on accounting, one a short treatise, called "Cost Accounting," and the other an exhaustive work, entitled "The Theory of Accounting."

THE RECONSTRUCTED FORT WAYNE PLANT

Discussing editorially the problems involved in the reconstruction of the double-decked generating station of the Fort Wayne & Northern Indiana Traction Company in Fort Wayne the *Electrical World* said in its issue of Oct. 10, 1914:

"Rebuilding an electric station without interruption of service is always a feat involving much ingenuity and sometimes a very high degree of engineering skill. The station reorganized had been built only seven years and when constructed gave promise of exceptionally good results. It was of the double-decked type with the turbines on the second floor directly over the boilers, an arrangement which in principle is a good one, leading to short steam connections and an economical design of station. In this instance, however, an amount of vibration developed which made reconstruction and abandonment of the double-deck scheme imperative, and when the conditions of load demanded an increase in equipment advantage was taken of the opportunity to make a complete change in the arrangement of the units and thereby remedy the existing trouble.

"The plant contained both twenty-five-cycle and sixty-cycle generators, and the increasing load demanded an increase of sixty-cycle equipment which was met by the installation of a pair of 6250-kva turbo-generators. To accommodate these a building was erected alongside the original station with its turbine floor on the level of the old. boiler floor, and a basement was provided for the auxiliaries. The result was a new and efficient plant for the sixty-cycle service, the new turbines being more efficient than the older ones. The main twenty-five-cycle machines had to be moved without interrupting the service on the railway lines to which they fed energy. At least one of these had to be in operation all but continuously except during periods of the very lightest load. The railway turbines were dismantled one at a time, and the pieces were carefully lowered by the traveling crane through a hole in the turbine-room floor, loaded on a flat car and shunted around to the new portion of the station. The ground-floor equipment of auxiliaries was then transferred to the new turbine room, and the whole equipment was put to work without interruption of service, leaving all of the active generating equipment alongside the boiler room in the new building. The old turbine floor was then put to good use by placing in it substantially all the control and switching apparatus for the station, and also installing there three large motor-generator sets, two used for the direct feeding of the railway lines and the third as a frequency changer to enable the night load to be carried from the sixty-cycle generators.

"One specially interesting feature of the new portion of the plant is a corridor in the basement for the entrance of cooling air for the generators. After passing through the generators the warm air is turned into the boiler room through suitable ducts. Two of the large condensers and some of the auxiliary appliances as well are installed in this air corridor, and the large entrances into it under the turbo-generators serve to limit to the basement a considerable amount of the noise from the machines which otherwise would be perceptible in the turbine room itself."

COMMERCIAL ATTACHÉ TO STUDY CHILIAN TRADE

Verne L. Havens, consulting engineer and for a number of years chief engineer of the Mexican Tramways, has been recently appointed commercial attaché of the Department of Commerce. Mr. Havens will proceed to his station at Santiago, Chili, some time next month. He will study out means for improving and developing American trade with the country to which he is assigned.

"Chili offers a first-rate market for the goods which we produce in the greatest quantity," says Mr. Havens in the New York *Evening Post*. "She has to import all her coal and timber, cotton and refined oil. And those are four articles in the production of which this country is a leader. Last year Chili took 113,000 tons of coal from us, but previous to this she had dealt mostly with England and Germany; and of course the long sea voyage has made coal extremely expensive. It has been $10 a ton in normal times; to-day, it is much higher.

"There seems to be no reason why this country should not supply a great portion of Chili's coal at a much lower rate, now that the Panama Canal is completed and communication between our Eastern and Gulf Coast ports and the West Coast of South America is simplified. This applies not only to anthracite, but to soft coal, of which latter grade enormous quantities can be used. It seems to me that this offers an opportunity for the Alabama, Tennessee, and other Southern soft-coal fields.

"Then, take timber. There is practically no timber in Chili. It must be imported. They have been taking a great deal of Douglas fir from our Northwestern States, but now they will be able to get yellow pine from our Southern States shipped through the canal. Douglas fir is a very good wood, adaptable for house-trimming, and so forth; but it is rather soft. A tough woodlike yellow pine will be extremely valuable to the Chilians for heavier construction, for bridge building, car sills, and similar things. All of the cotton goods that the Chilians wear they must import, and as I have said, they have no refined oil. Besides this, although they have great resources in crude iron ore, they produce no steel. I understand the Bethlehem Steel Company is planning to operate down there.

"It is a very delicate matter to develop trade with a foreign country. At best, trade is an elusive quantity. Much depends upon the spirit in which the campaign is launched. It does not pay to create an impression in a country that you expect to win its trade simply because it has no other resource, and must buy from you or from nobody. All peoples are proud, and they require, and have a right to require, consideration and the manifestation of a spirit of conciliation and cordial desire for co-operation."

BALANCE OF TRADE FAST TURNING IN FAVOR OF THE UNITED STATES

"From the figures which I have received on the import and export trade between the United States and foreign countries," stated Andrew J. Peters, Assistant Secretary of the Treasury, in charge of customs, in the New York *World*. "I am confident that the balance of trade in favor of this country will exceed even the most sanguine predictions made prior to and after the beginning of the European war."

"On Oct. 10 of this year our imports from foreign countries amounted to $3,303,700, while our exports were $4,121,812. On Oct. 12 our imports were $272,996, while our exports were $487,357. This was an unusually small percentage of day's receipts compared with the month. But on Oct. 13 the imports were $5,582,830, while the exports amounted to $6,707,243.

"The total amount of imports from Oct. 5, according to the figures in my possession up to the present date, are $33,271,857, while our exports during the same period amount to $39 840,816.

"The ports of New York, Boston, Philadelphia, Baltimore, Newport News, New Orleans, Galveston, San Francisco and Chicago represent 87 per cent of our import trade and 72 per cent of our export trade. My calculations are based upon reports which I have received from the collectors of customs at these ports, which indicate conclusively that the United States is beginning to feel the effect of the depression in the markets of Europe and is selling all kinds of products to those nations now engaged in war, resulting in a balance of trade in favor of this country which is bound to have its effect upon the present strained financial situation.

WHY THEY ARE CALLED "WINNER" SEATS

Foremost among the car seats exhibited by The J. G. Brill Company this year is the improved "Winner" type. The improvement in the construction of this seat consists chiefly in using double levers at both ends, making it more substantial than ever and capable of standing rough handling by conductors hurrying to change over at the end of the route, or by passengers of large dimensions forcing themselves back by pushing against the foot rails or seat backs. This type of seat is shown with woven cane upholstered cushions and backs, and slat backs; also with high, three-part back and arm rest for interurban car service. For interurban service the double lever at each end gives the strong support necessary for the high and heavier back. The "Winner" seat is constructed with pressed-steel one-piece pedestal, pressed-steel one-piece aisle and wall plates, angle-steel cross frames, and the backs have springs as well as the cushions. The Brill standard stationary back seat has the pedestal and aisle end arm made of pressed steel in one piece; there are no cross frames and therefore when the cushion is lifted out only the pedestal and back remain, leaving a free space for sweeping the car. Rolls of lined and unlined twill-woven cane manufactured at the Brill plant by improved processes are exhibited. Three types of motormen's seats of both adjustable and non-adjustable types are also shown.

MULTIPLE-UNIT FREIGHT TRAIN OPERATION

The Empire United Railways, Inc., will shortly place in service five new freight cars to take care of a large increase in its freight business. In this connection Ernest Gonzenbach, general manager, contemplates a new idea in freight traffic arrangements. The equipment for these cars was specified to be Westinghouse No. 333-E railway motors with automatic battery unit switch control to operate in trains. Instead of operating single freight cars, affording too frequent service, the plan will be to operate in two and three-car trains, thus approaching more nearly steam traffic conditions. Thus, while the service rendered will still be superior to that afforded by steam railroads, the cost of operation will be such as to allow of profit at steam railroad rates.

STEEL POURED LIKE WATER WELDS PIPES WHILE YOU WAIT

Strollers in Machinery Hall yesterday were attracted by a lurid glare emanating from the Goldschmidt Thermit Company's space. On investigation they found that practical demonstrations of pipe welding were going on on a regular commercial scale, short lengths of 1¼-in. extra heavy pipe being joined together by the Thermit butt-welding method. This is the first time that the reaction has been demonstrated on the pier and it is certainly well worth seeing.

In using this process for pipe welding, the pipe ends are first accurately squared up by means of a pipe-facing machine designed for the purpose, and are then held tightly together by means of clamps. A cast-iron mold is placed around them at the joint, and into this is poured the superheated mass of slag and steel produced in half a minute by the Thermit reaction. The slag goes in first and covers the outside of the pipe and the inside of the mold with a protective coating which prevents the steel, going in afterward, from coming in contact with either the pipe or the mold. The entire mass, however, brings the pipe ends to a welding heat, at which time they are squeezed together by means of the clamps and a butt-weld affected. The entire operation is completed in from five to ten minutes.

After seeing one of these demonstrations it is easy to understand how, in rail welding with Thermit, the insert placed between the rails is butt-welded on each side to form a continuous rail head. It is also a liberal education to see Mr. Mann of the Goldschmidt Company handling this white hot steel and pouring it from crucible to mold as though it were as easy as drawing beer from a keg.

NEW ENGLAND COMPANY DISCARDS OPEN-BENCH CARS

The New England Investment & Securities Company is building twenty new cars for its properties—the Springfield Street Railway and the Worcester Consolidated Street Railway—and is using the electrical equipment from some of the open-bench cars which are being dismantled. This procedure permits the use of the latest type of cars without the large outlay of capital necessary for the purchase of an entirely new car. Following in the steps of the New York companies, the Security Company has equipped the cars with electro-pneumatic contactor devices of the Westinghouse HL type. The wiring is so arranged that the main line switch cannot be closed until the doors of the cars are closed, and if the latter are accidentally opened while the car is in motion the control circuit is broken and the power is shut off of the motors. These contactor devices have a further advantage in that the main power arc is broken beneath the car.

JOHNS-MANVILLE PROGRESS

The "safety first" 2500-volt fuses at the H. W. Johns-Manville Company's space 336 have excited much interest during the week. It is claimed that these fuses will absolutely operate on circuits of all capacities. In connection with these fuses, the company has recently developed a line of fuse boxes embracing types both for aerial and underground work. These boxes have been designed with the "safety first" movement in mind. The operator is entirely protected from live metal parts and contacts by porcelain carrier handles, which are left in the box permanently so as to make the operation of the fuse boxes at 2500 volts absolutely safe.

Ebony asbestos wood for switchboards and panel boards is also attracting much attention. This new material has been approved by the National Board of Fire Underwriters, for all places where slate, marble and soapstone have previously been used. Its dielectric strength is so great that it permits considerable reduction in thickness. Where 1-in insulation would ordinarily be specified, ¾-in. ebony asbestos wood is sufficient. Moreover, its mechanical strength is much greater, and it can be worked up with the tools ordinarily used by carpenters. It is made in various thickness from 1-in. and up, and in sheets of various sizes from 36 in. x 48 in. to 48 in. x 96 in. and takes a high polish.

J-M air-brake expander rings, which are a decided improvement over the old style air-brake cylinder packing expander rings, are also being exhibited. The trouble with the old type rings has been largely due to the leakage of air in the brake cylinder and unnecessary wear of the packing leather, resulting in reduced braking efficiency. With the new J-M expander ring these difficulties have been entirely overcome. The claims for this new ring are that it increases the life of packing leather, eliminates brake failure due to leakage, increases braking efficiency by utilizing the full pressure applied, prevents distortion and is very easy to apply. Other features of this company's exhibit include a full line of fuses, primary cut-out boxes, several kinds of "Vulcabestos" insulation and its well-known underground fiber conduit.

During the three and one-half years ended on June 30, the New York Central & Hudson River Railroad had not had a single train accident by which a passenger lost his life. During this period the company carried 136,000,000 passengers.

HIGH-VOLTAGE OUTDOOR SUBSTATION

By the happy combination of electrical and structural engineering the Railway & Industrial Engineering Company, in space 609, has developed and is exhibiting a unique line of out-door substation equipment. Besides showing this equipment mounted on one of this company's several standard T. E. substation steel structures, it is also exhibiting its lightning arrester and disconnecting switch equipment. The lightning arresters are particularly adapted to outdoor substations. The series horn-gap choke coil allows a 50 per cent wider gap to ground and provides the same protection as other types. A very important feature in this lightning arrester is the magnetic blow-out which accelerates the travel of the arc up the horns. Recent improvements in this lightning arrester equipment include the insertion of resistance in the ground circuit to limit the flow of dynamic current which might otherwise be experienced if two phases discharged simultaneously.

The disconnecting switch, known as the Burke horn-gap and designed to open under load and at same time protect the main contacts from burning, is also attracting much attention. Recently tests were conducted where this switch opened very satisfactorily under loads of 4000 and 5000 k.w. at 50,000 volts. Oscillograph records taken during these tests showed conclusively that no surges or line disturbances were created. In general the main blade of the switch is carried on two insulators so as to avoid any torsional strains which might loosen them between sections or on the pin. The new type of main contact developed for this switch is entirely weatherproof. It consists of a flexible leaf brush and contact block so arranged that in closing the switch a wiping motion is obtained which keeps the contact clean, and a sleet hood covers the entire contact. The drop-forged operating mechanism provides for easy adjustment. The low-voltage side of this out-door substation is operated with a weatherproof oil-switch and the new suspension type lightning arrester. A steel cabinet box houses the metering equipment.

THE CLEAN WAY TO CLEAN CARS

The application of vacuum cleaners for cleaning cars and for all sorts of cleaning around carhouses and stations is being demonstrated by the Western Electric Company. The cost of cleaning cars is a very large item in operating expense. With some companies it actually exceeds the costs of mechanical and electrical maintenance and repairs. The heavy and diverse character of the dirt and litter which packs into the car slats, and is sometimes wet down by dripping umbrellas and wet feet, makes a very exacting job for a suction cleaner, and this company has spent a great deal of time and effort in solving the problem.

The high power Western Electric cleaner, with a special large hose and brush tool especially designed for slatted car floors, is believed to do this work better, more quickly and at a less cost per car than the broom and brush method. It picks up transfers, cigar butts, peanut shells, street dirt and all sorts of litter left in the car excepting full-sized newspapers. It is in use by some of the largest and most progressive roads in the country.

F. J. S. Hosken, general manager Darwen (England) Corporation tramways, has instituted a miniature rifle club, the object being to teach men how to handle a rifle and to shoot straight. The range, which is situated in a large room under a billard hall, was formally opened by the Mayor. Mr. Hosken is acting as honorary secretary, and he has the support of a strong committee. There is no charge for membership, and ammunition is supplied at ten shots for 2d. Rifles are provided and instructors have offered their services.

Among the Exhibits

W. R. Gorton, who among other things is now talking highway crossing protection, was busily engaged yesterday in driving home the good points of the apparatus of the Protective Signal Manufacturing Company of Denver, of which Will is general sales manager and associate engineer.

* * *

Charles B. McLeer and Joseph F. McLeer are attending the convention in the interest of the McLeer Electric & Manufacturing Company. This company has recently added a number of new devices to its old line of manufacture and is now operating in the electric railway and lighting field.

* * *

The flexible gear at the Nuttall exhibit, spaces 140-144, is the latest development in gears for railway service. These gears cushion all shocks on the gear teeth, due to rough track, emergency brake application or any inequality in motor torque. The result is an increased life of gear teeth, armature and axle bearings, commutator, brushes, brushholders, etc.

* * *

One of the most important features to be taken into consideration in working out car designs to meet local requirements is the air compressor. The most recent development in this line by the Westinghouse Traction Brake Company is a 16 cu. ft. compressor of minimum height and weight, known as D-1-H, which has been built expressly for low underframe cars, or wherever else space is valuable.

* * *

We understand that Tom K. Bell, chief engineer Atlantic Welding Company, New York, is inviting the railway managers and the engineers in particular to stop off at Ardmore on their way home, to see a demonstration of the Atlantic Welding Company's new electrically-welded joint at its laboratory at that place. Those wishing to avail themselves of the opportunity should get in touch with Mr. Bell, who is stopping at the Strand Hotel, room 611.

* * *

Pyrene again came to the front Wednesday night when a small fire was discovered at the outer end of the pier. The first thought of the man who discovered the fire was to obtain a Pyrene extinguisher. After making a run to the booth he found it closed but broke in and opened a box to obtain one. The same thing occurred Thursday except that the fire was in the main building.

* * *

An exhibit of special interest in the way of illustrating the advancement made in air-brake mechanism to meet present requirements, especially for subway and elevated service, is being demonstrated by the Westinghouse Traction Brake Company in the Main Building. This exhibit consists in a rack containing a complete air-brake equipment for motor car and is arranged to show the performance of the apparatus in every detail, whether controlled electrically or pneumatically.

* * *

Hubbard & Company, in space 618, feels that its mission in the electric railway and central station field is to teach the use of pressed steel brackets and cross-arms of commercial steel sections. Consequently the visitors to this exhibit have carried away a new idea for use in handling their overhead line problems. The Hubbard slogan is "Make brains do the work of surplus metals." A full line of Presteel specialities and standard pole line hardware which includes Presteel brackets and Bo-arrow arms are on exhibition. It was hoped that this company's new complete catalog would be ready for distribution at the convention. Unfortunately it was disappointed, but promises the delivery of the catalog in about two weeks. This company's plant does not confine itself to its own products but solicits the manufacture of small steel pressings of any description.

Electric Railway Journal

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THE SUCCESS OF THE 1914 CONVENTION

In a time of general financial stringency, such as we are having at present, brought on by the catastrophe of the war in Europe, many fears were expressed as to the effect on the success of the convention. But they were not realized. It is true that the attendance was not quite so large as last year, especially as regards the roads at a distance, but most of the Eastern roads sent larger delegations than usual, and there was a marked earnestness on the part of the delegates in Atlantic City to obtain the most benefit from the trip. One general manager expressed the situation in our hearing as follows: "These are the times when the railroads must use every method and device which will produce a saving. Our gross receipts have fallen off 5 per cent, and it will be hard for us to maintain our usual 60-per cent operating ratio, but we are going to make every effort to do so. I felt able to send only one-half of the usual number of my men to the convention this year, but every man whom we have sent will make the most of his time, both among the exhibits and on the floor and will take back to those who did not come as much information to help them in their work as he can." The effect of this spirit, which seemed to be general, was evident throughout the convention in the earnestness with which the delegates participated in the discussions at the meetings and in the attendance at all of the sessions, which was noticeably larger than usual, and with the care with which they inspected the exhibits. The latter, as a whole, were equal, if not superior, in interest, to those shown in previous years, although they occupied about 5 per cent less space. In view of the attendant circumstances, the slightness of this falling-off is notable.

THE AMERICAN ASSOCIATION

The work during this past year of the American Electric Railway Association, as represented by the papers and reports at Atlantic City, was largely upon the subject to which our convention issue this year is devoted, that is to say, of public relations. The report itself on this subject was presented on Wednesday afternoon, and the sympathetic spirit with which it was received and the enthusiasm which its recommendation inspired showed that the necessity for prompt and vigorous action along these lines was generally realized. We have already discussed in our daily issue for Thursday the recommendations made by this committee as well as its proposed code of principles, and its suggestions should be carried out soon. Other notable papers and reports at the American convention were the address on valuation by Mr. Stevens, presented at the meeting on Tuesday, and the excellent reports on carrying United States mail, federal relations, cost of passenger transportation service, taxation and the most instructive paper by Mr. Stearns. This latter paper will be published in our issue of next week. Everyone who reads even cursorily the papers and reports presented at the meeting of the American Association will be impressed with the serious character of the problems with which the industry is face to face—problems which concern not only the industry but the public as well, because the interests of each community are necessarily closely associated with those of the utility which provides its transportation service. It cannot prosper if that is crippled and is unable to meet legitimate demands for transportation. With the larger fund which the association will have through the increase in dues decided upon at Atlantic City, its possibilities for doing more effective work are increased, and we look forward to an even more successful association record as a result of the coming year's work.

THREE CARDINAL INVESTMENT PRINCIPLES

In his address Wednesday on the company's point of view regarding electric railway securities, Calvert Townley brought out three principles which are at the foundation of the electric railway financial problem of to-day. They are as follows: (1) Railways must grow with the communities they serve, and the resulting additions and betterments required cannot possibly be financed out of the earnings; (2) security selling is competitive, and if electric railway securities are to be sold they must be comparatively attractive, in price and yield, and (3), financial and commercial conditions are constantly changing so that fixed rates of return cannot be expected to attract for a long term of years. The importance of these principles needs no demonstration among electric railway officials, but the problem is how to impress them properly upon the public mind. When citizens, legislators, congressmen and public service commissioners realize these facts, they will know that the imposition of one-sided bargains on electric railways will cause only a reduction of profits, a dearth of capital for needed extensions and a throttling of community growth. Naturally, electric railway securities should be among the most popular offered, and this has been largely the case in the past, but it cannot continue if capital is to be legislated into ever less remunerative or permanently blocked channels.

It is impossible to have too much publicity on these points. As one writer in our convention issue said, the company figuratively must live in a glass house for the exhibition to the public of its daily activities. Such a broad policy of publicity, bringing to public view the company's side of daily operating problems, is certainly most desirable. Yet the term, as Mr. Townley used it, and as we used it above, refers also to that more intangible but eminently desirable process of education whereby the public mind is gradually attuned to a proper appreciation of fundamental railway economics. In connection with such basic principles of electric railway investments as outlined above, educative efforts cannot be made too carefully or too seriously.

THE UNIVERSITIES AND THE INDUSTRY

An interesting feature of the convention this year was the large number of educators present. This is as it should be. The date at which the convention is held—at the beginning of the college year—makes it very difficult for the active college teacher to be present. Nevertheless, the effort on the part of the association to bring about a closer relation between institutions of learning and the industry was successfully inaugurated this year, and as the advantages of such a connection to both become better understood, we believe there will be a growing co-operation between the two, a co-operation which will not be confined to attendance by the teachers at the annual convention.

The universities and the industry have much to gain from such closer relations. The industry needs the ability for analytical study and research for which years of training have fitted the universities and it needs a sympathetic interest and thorough understanding of its problems on the part of the men who direct the departments of research and mold the minds of our future citizens. The industry also needs the influx into its ranks of the educated men whom the universities are graduating. But the benefits will not be on one side only. Those which the universities can secure from a close touch with the industry are no less great. They comprise opportunities of study and improvement in the laboratory of human industry and reality rather than in the miniature laboratory within the college walls.

The departments in the university with which the closer relations of which we are speaking should be developed are not those purely of engineering. There are many engineering problems to be solved in the electric railway business, but there are other departments of university work with which electric railway companies are rapidly coming into as close, if not closer, touch than with those of engineering. We hope that at the next convention an invitation from the association will be extended not only to the professors in engineering courses as was done this year, but also to those concerned with the science of government and economics. The electric railway problems in this field which must be solved if this country is to progress are acute and of the greatest magnitude, and if the interest of the universities can be enlisted to study these questions thoroughly at first hand a great benefit should be achieved. We hope that the general campaign decided upon at Atlantic City to inculcate right thinking into the body politic will be sufficiently broad to cover this point.

FEATURES OF THE T. & T. CONVENTION

That the Transportation & Traffic Association has behind it a remarkable record of accomplishment is shown in the reports of the various committees. The association has now succeeded in developing, in pracically complete form, standard codes of rules for city and interurban service, the former code having reached its final stage last year, as the only revision submitted at the convention was an amendment to the long-discussed Rule 55. The interurban code, during the past year, has been made consistent in diction throughout as well as made to harmonize with the city code and with that of the American Railway Association in so far as this is possible. This achievement is something of which the association may well be proud, for the difficulties in the way of bringing together the conflicting opinions and varying conditions of hundreds of different railways might easily appear to be an impossible task. Indeed, it was so looked upon by many when the work of preparing the standard codes was undertaken several years ago.

The work of the committee on express and freight traffic has also been exceptionally valuable to the association, not only in pointing out the possibilities of this comparatively new means for increased revenue for electric railways but also by providing, in detail, information as to the means whereby such a business might best be undertaken.

It would seem that the nature of the work of many of the Transportation & Traffic Association's committees is tending more and more toward the custom of having each committee originate, to a large extent, the subjects which are to be considered and discussed before the association in convention. This has applied especially to the work of the committee on transportation employees owing to the fact that the scope of its efforts has been largely extended owing to the safety first movement. It applies also to the committee on fares and transfers and on passenger traffic, both of which have placed before the association discussions on new methods of fare collection and of passenger transportation.

This year the Transportation & Traffic Association has extended its activities to a large extent by a greater development of the joint-committee idea, considering matters in conjunction with the other associations through committees on block signals, on transportation engineering, on block-signal rules and on transportation accounting. The association has even gone one step further this year by holding a session with both the engineering and claims associations to consider the general subject of accident prevention, and it cannot be denied that this marked extension of co-operative action between the various organizations affiliated with the American Electric Railway Association will add materially to the breadth of the information secured.

WHAT THE ACCOUNTANTS ACCOMPLISHED

The sessions of the Accountants' Association at Atlantic City during last week were marked not only by good attendance and the presence of new members but also by the really constructive work accomplished. The committee reports submitted this year were as a whole most valuable contributions to electric railway accounting theory and practice. With the formal adoption of the new Interstate Commerce Commission uniform system of accounts by the association, the classification committee saw the attainment of its longed-for goal. Work still remains to be done, both in rectifying slight errors or omissions that only time can disclose and in striving, with the assistance of the committee representing the association at the National Association of Railway Commissioners convention, to bring about the adoption of the uniform system by all state commissions, but we are confident that the classification committee will continue to display the same combination of assiduous effort, sound judgment, earnest co-operation with regulatory commissions and steadfast devotion to association interests that has characterized it in the past.

The newer committees on freight and express accounting, accounting definitions and education all produced desirable results. While the endeavors of the committee on education have probably had the most tangible outcome, the other two committees laid firm bases for advancement toward the standardization of freight and express accounting and accounting definitions. The securing of uniform accounting definitions was and will be particularly difficult in view of the divergent attitudes of accounting authorities and especially the controlling public service commissions on various accounting practices, but the collating of all commission rulings on both disputed and undisputed points will be valuable as showing the weight of opinion and the amount of work yet to be done to secure absolute uniformity. The most obvious way, of course, to bring about such uniformity is to secure if possible the universal adoption of the Interstate Commerce Commission classification. State commissions now have an opportunity to sacrifice minor differences for the good of accounting practice.

Not by any means in the background, on account of its scope and content, was the report of the committee on engineering-accounting, covering overhead charges, inter-departmental charges and cost accounting. It is the attention given to such subjects that marks the perfection of accounting procedure and scientific management to-day, and the report of the committee is fully deserving of the more extended study that we shall give it later. The recommitment of the report on claims-accounting was largely brought about by minor differences of opinion among the claim agents as to the relative importance of certain accounts, as well as by an alleged lack of mutual exclusiveness among the accounts, but these points can readily be cleared up this year by the proper circularization of the two associations concerned.

Space permits us to comment only briefly on the excellent addresses delivered by Messrs. Wildman, Swift, Fogarty and Sealy, all of whom presented timely, instructive and authoritative discussions on important issues in the electric railway field. It would be improper to leave this résumé, however, without referring to that improvement of association organization contributed by the outgoing officials, through the standardization of committee organization and membership. The definite choice of nine standing committees, with the provision that the majority of their members shall continue over from year to year in order to insure continuity of committee efforts, will be an almost indescribable aid to the new officers. The establishment of a three joint standing-committees will result in greater co-operation and sympathy between the four associations, while the institution of the new standing committee on passenger accounting, with the retention of the committee on freight and express accounting, takes care of a subject of vital importance in all questions relating to an increase of rates, namely, the segregation of expenses between freight, passenger and express business.

POWER MATTERS AT THE CONVENTION

Two eminently serviceable reports on the subjects of power generation and power distribution respectively were presented at Atlantic City. The power end of electric railways is liable to be overshadowed by the more conspicuous and less technical, although no less difficult, transportation, accounting and other parts of the business. The railways must have power to propel their cars, and it is fitting that power problems particularly affecting railways should be carefully considered by the Engineering Association.

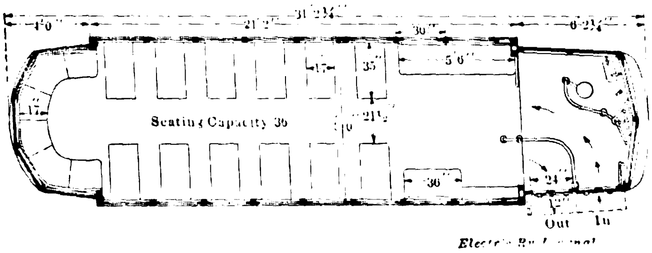
The report on distribution was taken up largely with specifications and revisions thereof. This kind of work is extremely tedious, both in collecting the original data and in phrasing the specifications to insure the getting of the best possible materials without imposing unnecessary hardships upon the manufacturers and thus inflating the cost of the product. There is no way in which an association can exert an influence and achieve prestige more surely than through the maintenance of satisfactory standard specifications. The association's thorough method of handling specification preparation insures good work. Every word in this particular report has been carefully weighed. The retiring chairman of the committee deserves more than verbal thanks for the work which he has done or inspired.

The other report was made up of monographs, and this fact was briefly commented upon in our issue of Oct. 3. We also recently called attention to the diminishing number of convention papers not including in this statement, of course, those individual or joint contributions to committee reports. Now it requires no argument to prove that, for the benefit of its members, the association wants all real contributions to knowledge in its field, but space cannot be found on the programs for them in the form of papers. They can, however, be presented efficiently through committee reports, thus insuring proper correlation of subjects and unity and coherence in their presentation.

Making a Small Company Pay

How the Charlottesville & Albemarle Railway Was Brought from Bankruptcy to Prosperity by the Introduction of Modern Generating and Distributing Equipment, One-Man Prepayment Cars, Park Traffic, Good Headways and Proper Accounting Methods

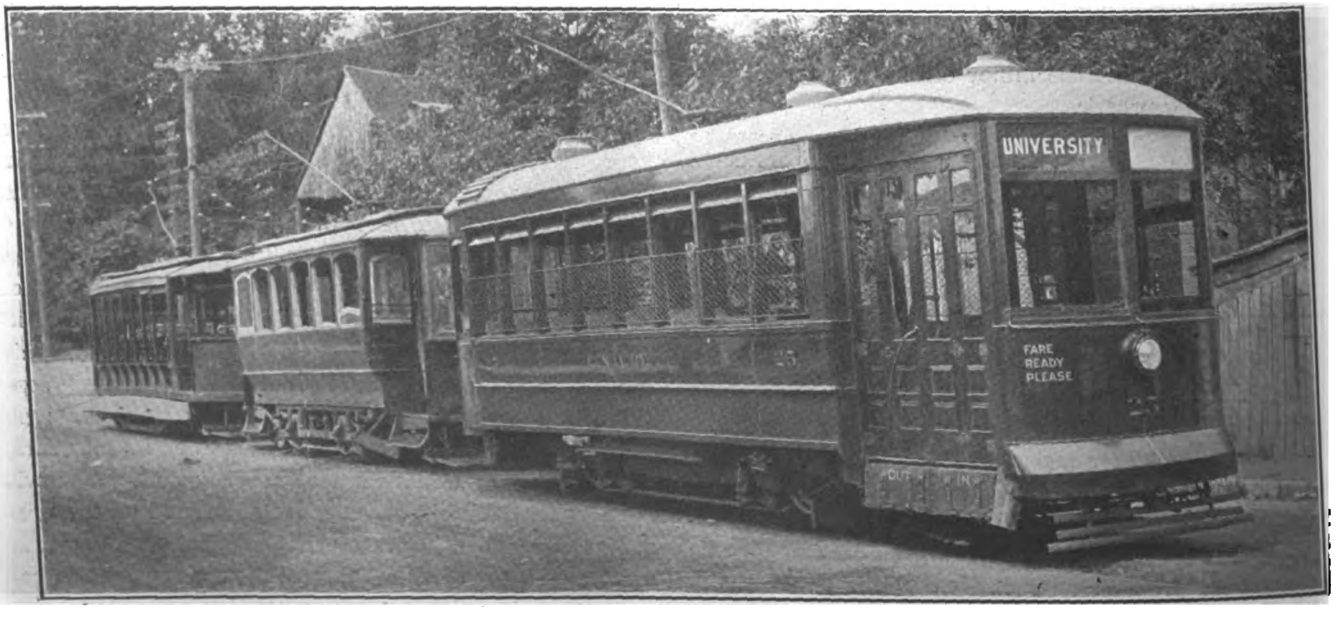
Charlottesville, Va., is a town of about 12,000 people, situated in the foothills of the Blue Ridge Mountains about 97 miles northwest of Richmond and 114 miles southwest of Washington. It is the county seat of Albemarle County, one of the rich agricultural counties of Virginia noted especially for its apple orchards and for the celebrated Albemarle pippin, of which the greater part of the crop is exported to Europe. The fine climate and beautiful foothill and mountain scenery have attracted many wealthy people from the North and West, who have added largely to the handsome residences in the country surrounding Charlottesville, which district, it is predicted, will some day become the Touraine of America. The city promises to figure in the future as a radiating point for interurban railways extending to prosperous sections of Albemarle and adjoining counties. Steam railroad service is afforded by the Chesapeake & Ohio and the Southern Railways, which here intersect and make the city a railroad center of some importance. Charlottesville has a few silk, woolen, lumber and agricultural manufactories, but it is better known as the home of the University of Virginia, to which some 960 students reported during the college year of 1913-1914. This state university was planned and its older buildings designed by Thomas Jefferson, including the Rotunda, here illustrated, which is a reproduction on a reduced scale of the Pantheon at Rome and which towers the large college library. The university buildings in general recall "Monticello," the home which the great statesman-architect built on one of the near-by mountains.



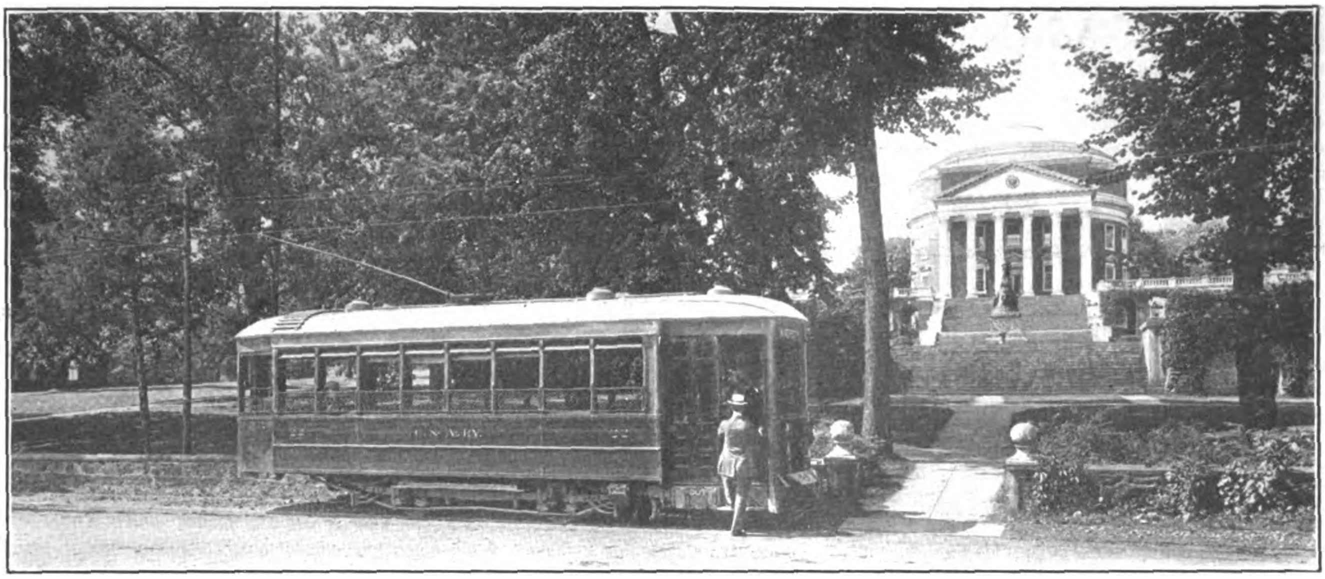
C. & A. RAILWAY—PLAN OF ONE-MAN NEAR-SIDE CAR

SOURCES OF BUSINESS

In a town of the size and few industries of Charlottesville there would seem to be little chance for the development of a profitable electric lighting, power and railway utility. Further, the lighting department of the Charlottesville & Albemarle Railway has to meet municipal gas competition, while the railway runs over but one route, Main Street, from the Chesapeake & Ohio Railway station, at one end, past the Union station to the university and railway park gounds at the other end. As the original length of route was but 3 miles it is evident that profitable business in this field was out of the question if people were to ride only because they had to do so. In any event, the deficits grew larger and larger from the time that the company was formed in 1903 to its purchase by the present owners in July, 1912. At that time the rehabilitation of the property was entrusted to John L. Livers, now vice-president and general manager. Under his direction the company built an entirely new power plant, changing over from d.c. to a.c. distribution, installed modern prepayment cars with one-man near-side operation to give a frequent and attractive service on an economical basis, converted a money-losing hotel into a set of six cottages and park furnishings, and developed the lighting and power business along popular and more business-like lines. The fruits of the new order began to appear in June, 1914, when the company was earning about twice its fixed charges and when it declared a semi-annual dividend of 3½ per cent on its preferred stock. This was the first dividend in its history. Furthermore, the business, while increasing rapidly, is still well within the saturation possibilities of Charlottesville, so that the owners feel that the outlay of new capital was well worth while. However, it will be clear from the fol-



C. & A. RAILWAY—THE NEW NEAR-SIDE AND THE OLD CLOSED AND OPEN CARS IN LINE



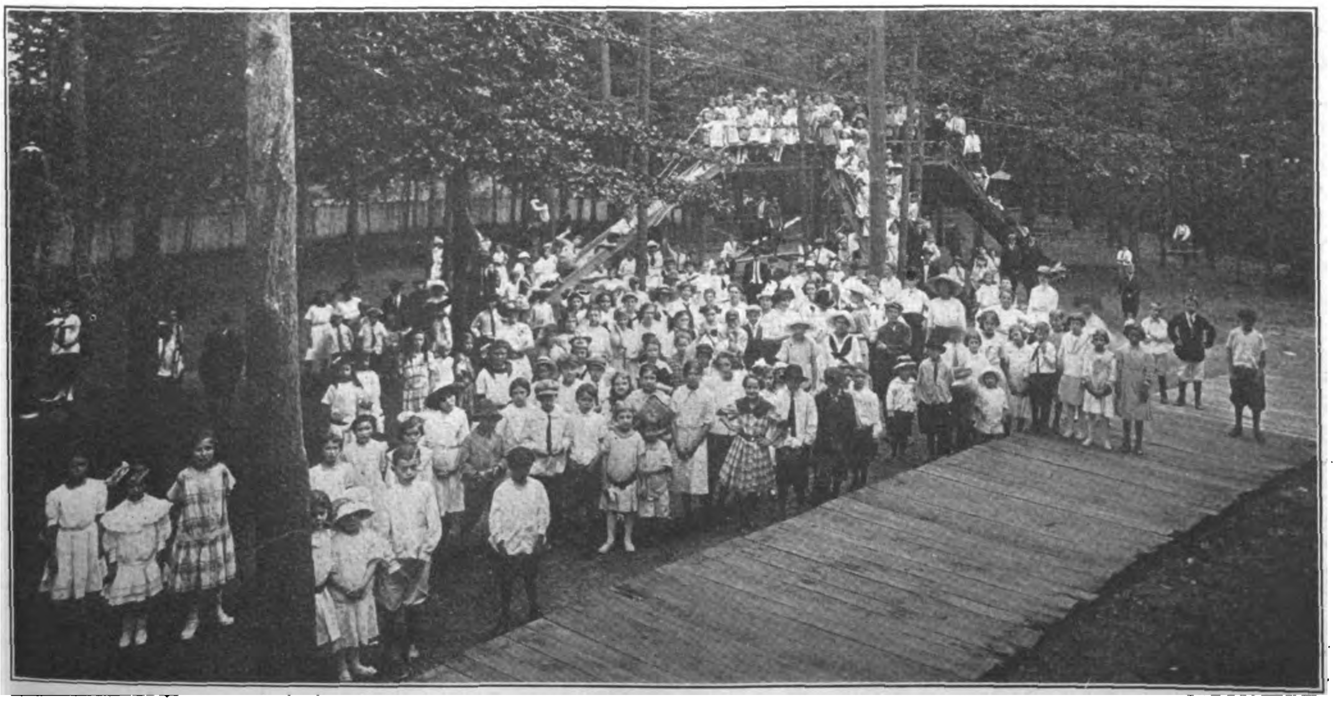
C. & A. RAILWAY—ONE-MAN NEAR-SIDE CAR IN FRONT OF THE ROTUNDA, UNIVERSITY OF VIRGINIA

lowing detailed account of the changes made in each department that the financial success of the company has been due to something more than the influx of new money. In the earlier days, especially, the exercise of mother wit, ingenuity and civic spirit accomplished more than cash alone.

TRACK AND CARS

When the property was taken over in July, 1912, the entire trackage, including sidings, was but 3 miles. As the new management had decided to use one-man single-end cars, changes in the track were necessary at each end of the line. The company was anxious to build a loop at its downtown terminal at the Chesapeake & Ohio station, but it has never been able to get permission from the railway which owns the ground necessary for the loop. The electric railway met the situation by building a cheap turntable by means of which the motorman-conductor readily turns the light cars in use. An extension of ½ mile has been built and a branch extended 1100 ft. directly to the new stadium of the university. The number of sidings on Main Street has also been increased from three to five to enable the railway to give the remarkably short headway of five minutes in a town of 12,000 people. An excellent class of houses is now being erected in the vicinity of the university, the growth in this section being greatly encouraged by the assurance of frequent service to the downtown shopping section.

Two interesting incidents arose in 1912 during the period of track reconstruction and extension. Part of the track at the uptown end was on a badly decayed trestle. This trestle was 200 ft. long and would have cost about $850 to replace. Mr. Livers, however, foresaw that the growth of Charlottesville in this direction would make it far more desirable to fill this section up to grade and to macadamize the roadway alongside. A suggestion to this effect was made to the county commissioner, accompanied by the company's offer to share the expense. Residents along the line were also solicited to favor the improvement and bear a part of the cost. As the result of this missionary work, the road



C. & A. RAILWAY—CHILDREN'S DAY AT FRY'S SPRING, WITH SLIDE IN THE BACKGROUND was macadamized at a cost to the railway of only $100, thus saving $750 compared with rebuilding the trestle, beside securing a safer and permanent construction.

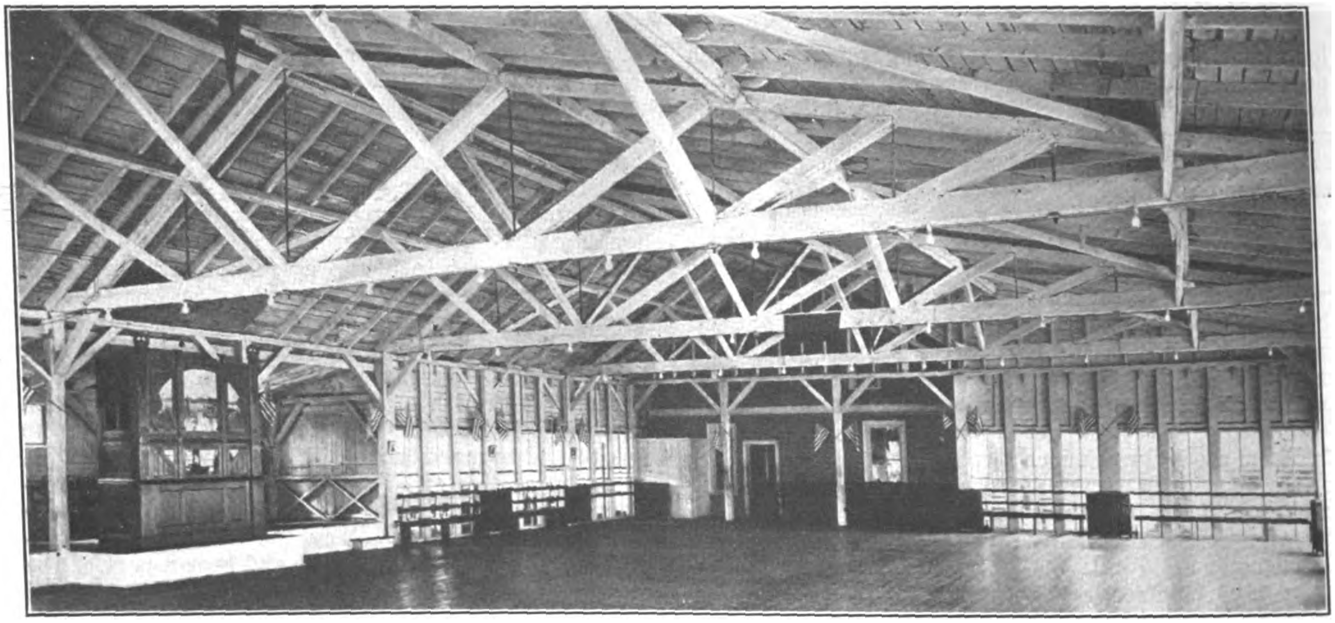
The other incident was the solution of a clearance difficulty. In making the extension at the university end of the line it was found that the old monitor-roof cars would be unable to clear a viaduct of the Chesapeake & Ohio Railway. The electric railway could not afford to raise the viaduct, even if that had been practicable, but avoided the opposite dilemma of lowering the grade of the roadway by the happy expedient of converting from monitor to arch-roof type its original nine open and five closed cars. This change was made by a local carpenter at the rate of $6.75 per car for labor and material, the latter item including sheet-iron ventilators similar in form to those seen on a chimney.

Previous to its purchase of new one-man cars, the company worked wonders with some of the old closed cars by painting the interiors with ordinary bathroom enamel, while the exteriors were painted orange and blue, the colors of the University of Virginia, thus making them more attractive to the students. The cars were also equipped with tungsten lamps. These changes were very inexpensive, but they gave to the cars an air of cleanliness and cheer which met with a hearty approval from the public. However, the cars were of such old-fashioned and heavy build that it would have paid to take them out of regular service almost on the basis of the saving in energy alone. This point is indicated by the fact that the old cars weighed between 24,000 lb. and 30,000 lb., whereas the 31-ft. 2¼-in., one-man near-side car, which averages, say, 5 ft. 2¼ in. more in length, weighs but 18,000 lb. As a single-platform car, with five rows of cross-seats per side and the usual end circular seat and longitudinal seats, the near-side design seats thirty-six passengers compared with an average seating of twenty-four in the longitudinal seat cars. It is true that the usual ride in Charlottesville is short, but for that very reason it was felt that the seating must be attractive and ample to get the business. The safety features of the near-side car constitute another great improvement over the old cars, while the savings of one-man operation are a potent factor in making possible more cars and, consequently, a frequent headway.

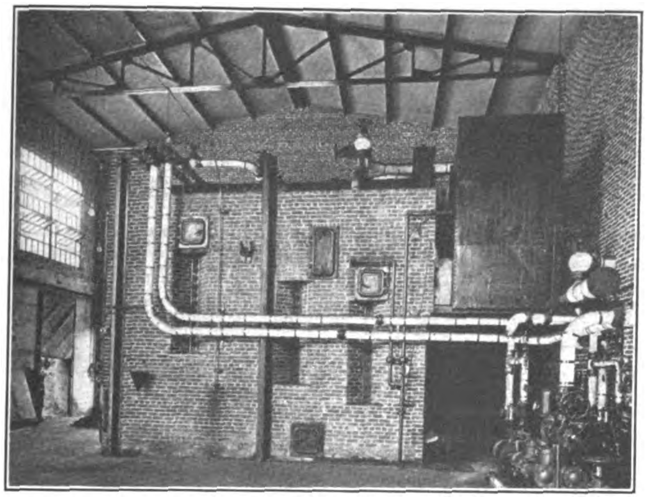
The first order placed with The J. G. Brill Company for near-side cars comprised five. One of these cars was exhibited by the Near-Side Car Company at the October, 1913, convention of the American Electric Railway Association, where its vivid orange, in honor of the University of Virginia attracted many visitors to examine its more substantial qualities. This car proved so popular that the company placed two more in service in June, 1914, making seven in all. All of the cars are of the single-truck type, 31 ft. 2¼ in. over all and 21 ft. 2 in. between the corner posts. An accompanying plan shows the arrangement of seating and of the railings on the 6-ft. 2¼-in. front platform. Owing to a moderate ramp the step heights from the rails to the car floor are but 13 in., 13 in. and 8⅝ in. The only doors used are on one side of the platform, and these are operated by the motorman-conductor in connection with the step. The car body weighs 9500 lb. without equipment. The underframe is made up of steel plates and structural shapes and the body of wood. The interior is in cherry with oxidized trimmings. The trucks are of the Brill 21-E type, with 8-ft. wheelbase. That the operating equipment and minor-furnishings are modern in every particular appears from the use of two GE-200 motors with No. 36-J controller, General Electric air brakes, Consolidated heaters with thermostat control, Consolidated buzzers for the passengers' push-button system, Rico sanitary strap sleeving and tungsten lighting. Air brakes for a single-truck car are uncommon, but they are naturally of great convenience in one-man operation. Tickets are sold six for 25 cents, and these as well as straight 5-cent fares are deposited in New Haven fare boxes.

While the merits of the new cars were quickly appreciated by the public, the railway management made it a point to announce to its patrons that "these cars were built for you." The attitude of a local paper was summarized in its editorial statement concerning the two latest cars, namely, that "They mean one step farther for a larger and better Charlottesville."

All of the cars are equipped with an original station and trip indicator invented by Curtis L. Carter, superintendent of the company. It was devised because some difficulty had been found in keeping the cars on Main Street to such close time that they would pass each



C. & A. RAILWAY—DANCE HALL WITH SELF-PLAYING ORCHESTRAL ORGAN. NOTE ALSO SASH, RADIATORS AND OTHER FIXTURES FROM A DISMANTLED HOTEL

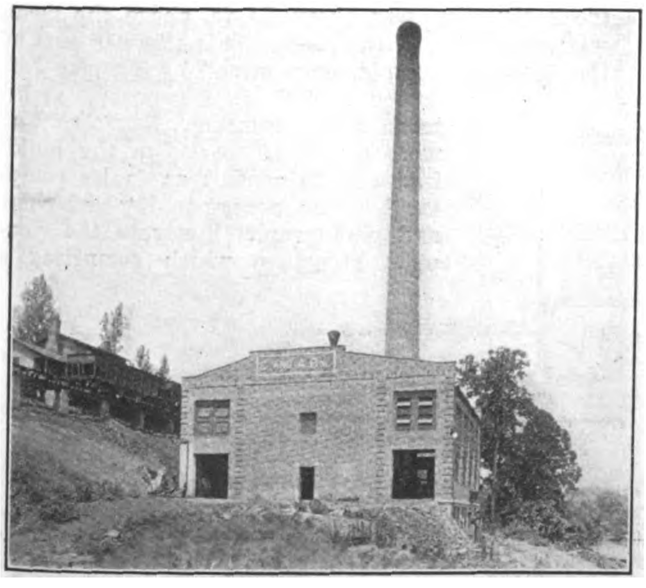


C. & A. RAILWAY—BOILER ROOM SHOWING VERTICAL SLIDING DOOR IN COAL STORAGE AT LEFT

other at any of the five sidings without delay to either car.

Essentially the device consists of an ordinary clock movement, about the size of an alarm clock, arranged for suspension from a hook on the vestibule framing in front of the motorman. The dial consists of a time-table upon which the switches and streets are marked. This dial revolves with the regular clockwise motion so that each switch or station in turn is brought under a pointer fixed on the left side of the clock. The object of the pointer is to designate the point at which the car should be at any given time. Consequently, if the car is at, say, East Fourth Street when the pointer indicates East Fifth Street, the motorman knows that he is one block behind, or if he is at East Sixth Street he knows that he is one block ahead. In this way he can keep on schedule at all times without consulting his watch or a time-table. Arrangements are now being made to place this combination clock and time-table on the market.

The company has, of course, scrapped most of the old closed cars, but one of them has been converted to a work car. No funds were available for an elaborate carhouse, nor was one needed in this climate. Nevertheless, a satisfactory shelter was erected by using old rails for the framing and clothing it with corrugated iron. A reduction from $2.40 to $1.01 per $100 in the insurance rate was also allowed by the underwriters because of a few changes and improvements such as bonding rails, removing wooden floors, installing a line cut-out switch, filling in bad spots, etc. All electrical work is done at home in connection with the lighting and power department.

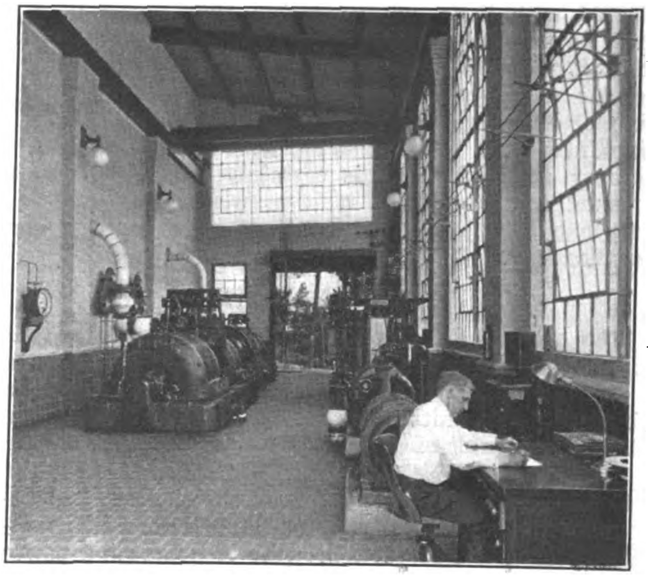


C. & A. RAILWAY—POWER STATION AND CONCRETE TRESTLE AS SEEN FROM THE REAR OF THE STATION

PROFITABLE PARK BUSINESS

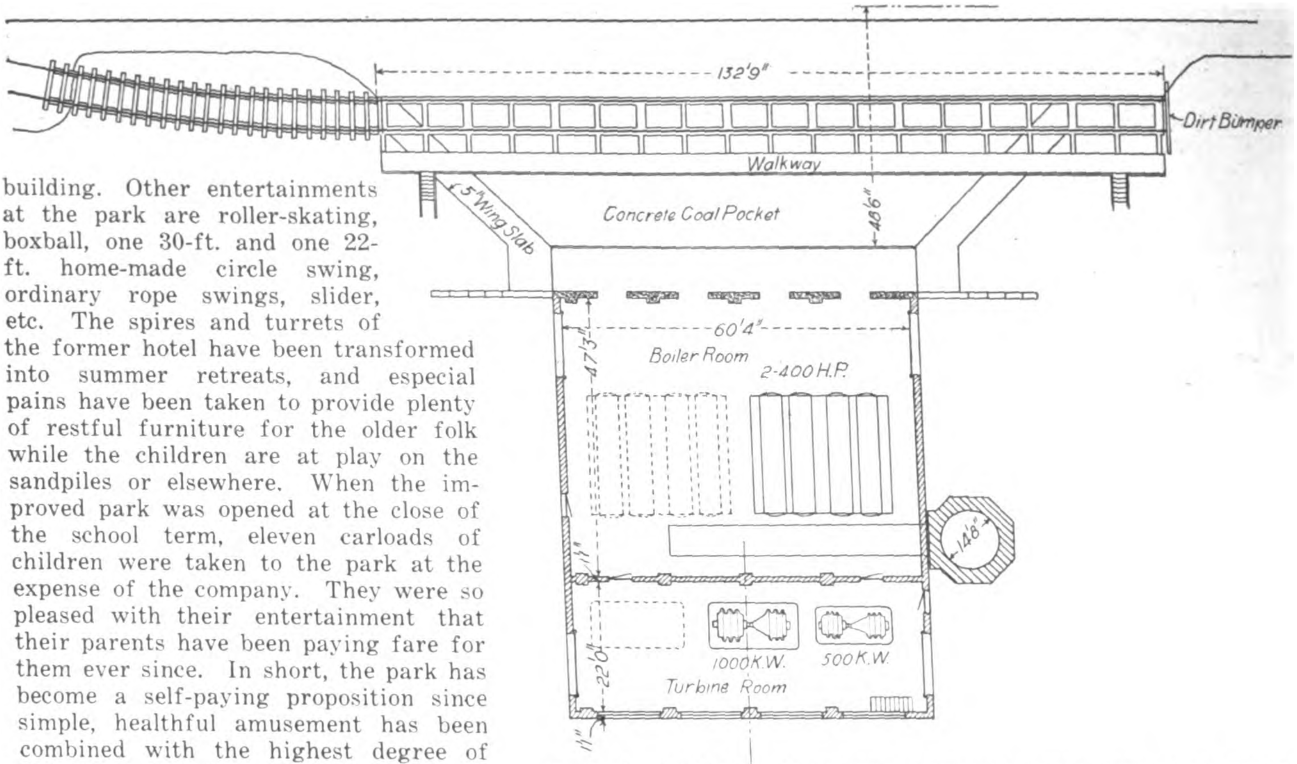
Near the university end of Charlottesville the company owns Jefferson Park, a 13-acre natural playground. This park, of course, depends for patronage only upon the white population of Charlottesville, which does not exceed 8000. Originally the park had little more than a dancing pavilion, its trees and bushes and Fry's spring, a local health source of some note. The water contains sulphur and iron, but it is not suitable for bottling because it discolors rapidly.

In planning to make the park more attractive the company was fortunate in being able to dismantle a large hotel near by. This hotel had proved a financial failure, but as it was comparatively new its salvage value was high. After six cottages had been built from its materials, plenty of timber, glass and other items were left to furnish the park. In the first place the dancing pavilion was glazed completely with windows, which can be raised to make the pavilion as airy as desired or lowered to make it comfortable on chilly nights. A number of the hotel radiators are available for really cold weather, and the toilets, chairs and kitchen equipment are also from the hotel. The pavilion is attractively decorated with national flags and college banners or streamers, in addition to which handsomely framed photographs supplied by the General Electric Company remind visitors of the many domestic applications of electricity.



C. & A. RAILWAY—INTERIOR OF TURBINE ROOM WITH SWING SASH ON THE RIVER SIDE

One of the most important changes in the operation of the dancing pavilion was the substitution of a Welte electrically-played organ for human musicians. Under the old method the cost of the musicians actually exceeded the entire park receipts. Contrariwise, the organ has paid for itself in little more than a season, it has proved entirely satisfactory for dance music, it is ready with a large repertoire at any time, and it never tries to dictate to the taste of the public. In addition to dancing at the pavilion, moving pictures are flashed upon a screen from an operator's booth outside the



C. & A. RAILWAY—PLAN OF POWER STATION AND COAL TRESTLE

building. Other entertainments at the park are roller-skating, boxball, one 30-ft. and one 22-ft. home-made circle swing, ordinary rope swings, slider, etc. The spires and turrets of the former hotel have been transformed into summer retreats, and especial pains have been taken to provide plenty of restful furniture for the older folk while the children are at play on the sandpiles or elsewhere. When the improved park was opened at the close of the school term, eleven carloads of children were taken to the park at the expense of the company. They were so pleased with their entertainment that their parents have been paying fare for them ever since. In short, the park has become a self-paying proposition since simple, healthful amusement has been combined with the highest degree of decency and order. It is certainly an unusual achievement in a town where everyone is within easy reach of open country and woodland.

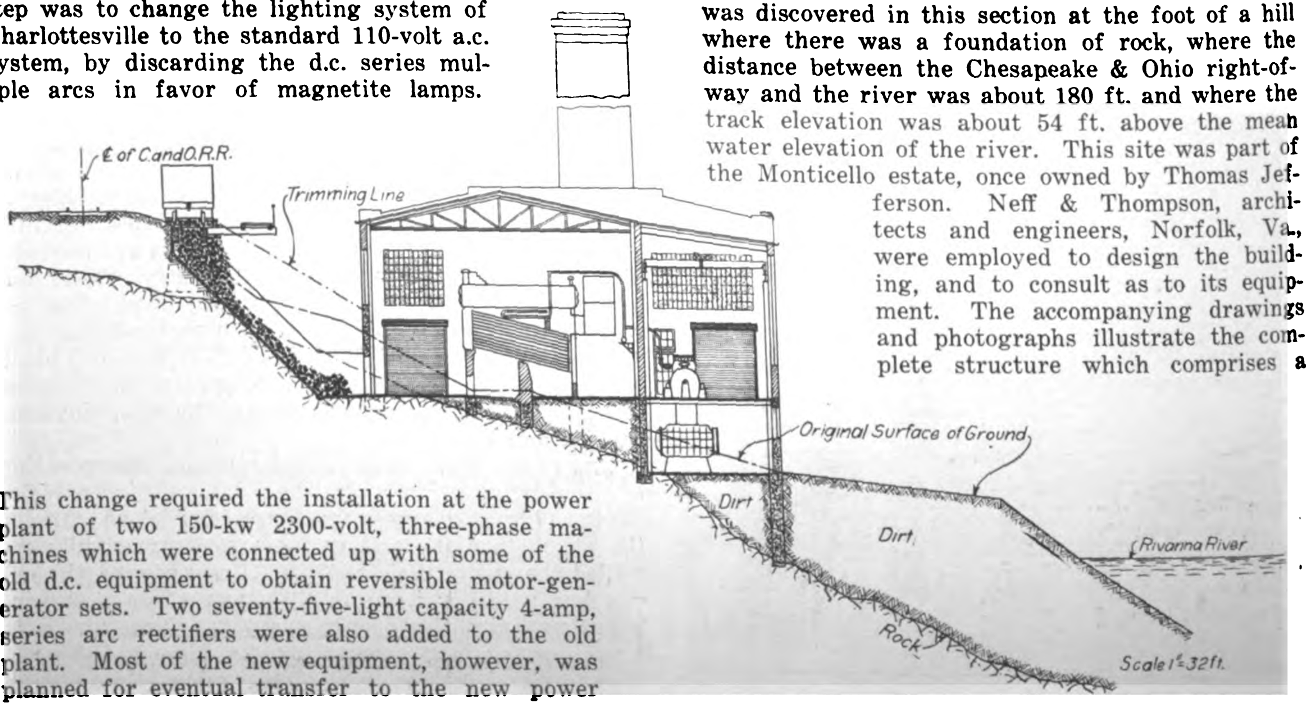
POWER REHABILITATION

The original d.c. power plant of the Charlottesville & Albemarle Railway was in the heart of the city in a location where a cheap water supply could not be obtained. The units consisted of one 100-kw and three 150-kw generators belted to one 300-hp and one 500-hp Corliss engine. With the growth of Charlottesville the 440-volt three-wire d.c. system of distribution had become uneconomical while the machinery itself was practically obsolete. In fact, the cost of generating power was sometimes as high as 8 cents per kw-hr. The first step was to change the lighting system of Charlottesville to the standard 110-volt a.c. system, by discarding the d.c. series multiple arcs in favor of magnetite lamps. This change required the installation at the power plant of two 150-kw 2300-volt, three-phase machines which were connected up with some of the old d.c. equipment to obtain reversible motor-generator sets. Two seventy-five-light capacity 4-amp, series arc rectifiers were also added to the old plant. Most of the new equipment, however, was planned for eventual transfer to the new power plant hereinafter described.

In February, 1913, the company was obliged to order a 500-kw Curtis turbine, owing to a flywheel explosion on the 500-hp Corliss engine. As no condensing equipment was on hand, the company made a surface condenser out of an old boiler. This accident was only one of many power difficulties before the new plant was ready.

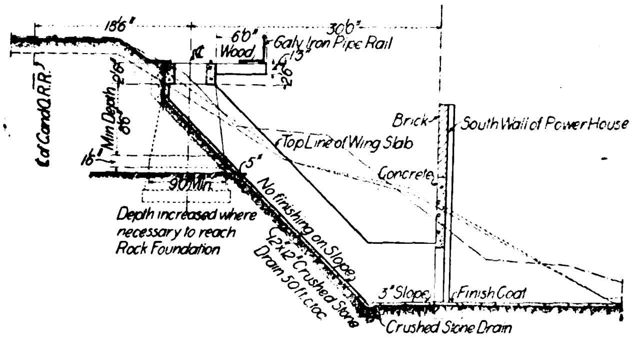
POWER STATION

Before the site for the new plant was selected, a careful study was made of all the surrounding country, and a location was discovered which was admirably suited for the needs of the company. About 2 miles east from the city the tracks of the Chesapeake & Ohio Railway nearly parallel the banks of the Rivanna River. A point was discovered in this section at the foot of a hill where there was a foundation of rock, where the distance between the Chesapeake & Ohio right-of-way and the river was about 180 ft. and where the track elevation was about 54 ft. above the mean water elevation of the river. This site was part of the Monticello estate, once owned by Thomas Jefferson. Neff & Thompson, architects and engineers, Norfolk, Va., were employed to design the building, and to consult as to its equipment. The accompanying drawings and photographs illustrate the complete structure which comprises a

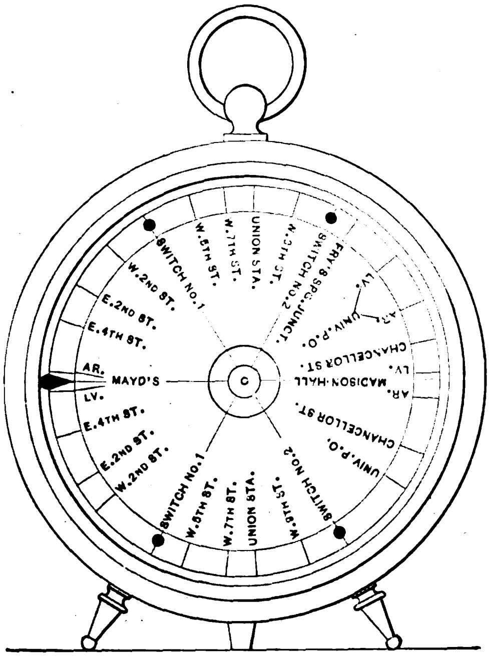


C. & A. RAILWAY—CROSS-SECTION OF POWER STATION, COAL DUMP AND GENERAL LAYOUT turbine room 60 ft. 4 in. x 22 ft. and a boiler room 60 ft. 4 in. x 47 ft.

The entire arrangement is a model of convenience and simplicity. A siding was installed upon a specially designed concrete trestle, the sloping railway embankment was covered with a concrete slab, and at the foot of the embankment the boiler-room floor was located so that coal dumped from the hopper-bottomed cars would by gravity slide down this 1000-ton coal pocket at an angle of 45 deg. into the boiler room directly in front of the hand-fired boilers. The rate of flow into the boiler room is controlled by manually-operated vertical sliding coal doors in the wall between the coal pocket and boiler room. The turbine-room floor was located at the same level as the boiler-room floor, and ehe turbine-room basement in which the surface condensers were installed was obtained with the minimum amount of excavation, the condenser piping being connected directly with the river. All of the foundations of the building were of reinforced and plain concrete, reinforced where subjected to water pressure from the outside during such times as the river is in flood and also in the coal pocket where the south wall of the boiler room acts as a retaining wall for the coal pocket. In other locations plain concrete was used. On these concrete foundations the exterior walls and division walls of hard burned common red brick were constructed, the brickwork being laid up with mortar containing a liberal amount of Portland cement. These walls are bearing walls, that is to say, they contain no built-in columns of any kind. All of the sash are of the Lupton roll-steel type arranged with a liberal number of pivoted sections for ventilation, the various pivoted sections being operated by means of gang operating devices so that all openings on one side of the building are controlled simultaneously from one position. This sash is wire-glazed except that the lowest row is of French clear plate to give the turbine-room attendant a good view of the river conditions. The larger door openings are protected by means of interlocking-slat rolling steel doors, the smaller openings are fitted with metal covered doors and frames. The roof construction consists of structural steel trusses with channel-iron purlins and thin "Ferroinclave" reinforced concrete slab formed by the use of dovetail sheet metal with a 1½-in. layer of concrete on the top and a ⅜-in. coating of plaster on the underside. On top of this concrete slab was placed about 5000 sq. ft. of the H. W. Johns-Manville Company's J-M asbestos three-ply built-up roofing. The brick stack, which is located at the front end of the building, is of the Custodis type, 175 ft. high and with an inside diameter of 7 ft. 6 in. at the top.



C. & A. RAILWAY—DETAIL OF CONCRETE COAL STORAGE



C. & A. RAILWAY—SCHEDULE CLOCK

The inside facing of the turbine-room walls is an impervious pressed brick of buff color. There is also a wainscoting of cherry-red quarry tile with a tile floor, and this finish with the neat tungsten fixtures gives the interior a most agreeable appearance. The concrete floor is reinforced with Kahn bars. Any parts of the machinery can be moved with a hand-power 10-ton Reading crane. The turbine room also contains a high-grade toilet, washroom and shower bath equipment.

The underwriters have given this completed building a rate of 8 cents per $100 of insurance carried. This represents probably the lowest rate which has ever been given a power house in the South, and as a matter of fact is within 1 cent of being the lowest possible rate obtainable upon a power house in the Southern cities under the existing insurance schedule. This result was made possible by the architects and engineers, who, before the building was started, had a thorough and definite understanding with the underwriters concerning their requirements, penalties, etc. The only place in which they departed from the requirements of the underwriters was in connection with structural steel which the insurance companies wanted to have protected throughout with fireproofing. It was found upon investigation, however, that to protect the structural steel members supporting the roof slab in this way would cost more than was justified by the 1 cent in insurance rate which could have been saved in this manner. The company in its old plant paid 24.1 cents per $100 instead of the 8 cents per $100 which it now pays.

While the exact cost of this completed station is not available, the owners assert that the slight increase in the cost of a fireproof building of this character over a building of ordinary construction was amply justified by the saving in insurance alone, although if the saving in insurance was entirely neglected the saving in the cost of repairs would justify this expenditure. Of course, it is also worth much from an operating standpoint to have a power house that will be subjected to a minimum degree to interruptions from fire.

POWER-HOUSE EQUIPMENT

The boiler room contains two 400-hp B. & W. boilers which are operated at a pressure of 175 lb. and 100 deg. Fahr. superheat. Room is provided, however, for a duplicate equipment. The superheated-steam lines are extra heavy pipe with Shawco bell-turned joints and high hub steel flanges, cast-steel fittings and cast-steel body valves. A separate saturated steam connection from each boiler supplies steam to a header for steam to the boiler feed and air pumps, and other auxiliaries. The piping was designed and installed by the Benjamin F. Shaw Company, Wilmington, Del. It comprises a total length of about 700 ft., all covered with 85 per cent J-M magnesia covering.

The condensers for the turbines are of the surface type, manufactured by the Wheeler Condenser & Engineering Company. They maintain a vacuum of approximately 28½ in. to 29 in. of mercury. The condensate is used for boiler feed, supplemented by water from a spring on the property, while circulating water is taken from the river and returned at a point below the plant. One GE water-flow meter and two steam meters are installed to keep an accurate check on the steam-raising equipment. The boiler feed pumps are of Epping-Carpenter make, and the feed-water heaters are of the Stilwell-Bierce open type.

The turbine room now contains the 500-kw 3600-r.p.m. unit which was taken from the old plant. This machine is connected to a 2300-volt, three-phase, sixty-cycle generator. The second Curtis turbo-generator set is of 1000-kw capacity. It is also operated at 3600 r.p.m. and supplies the same kind of current. Foundations have already been provided for a duplicate 1000-kw set. The exciters consist of one 25-kw, 125-volt, d.c. generator, direct-connected to a 3600-r.p.m. non-condensing Curtis turbine. There is also one 17½-kw, 1800-r.p.m. motor-generator set with 125-volt generator, compound-wound and 2200-volt, three-phase, sixty-cycle motor.

The switchboard is of standard General Electric design, the material being of natural black slate panels 1½ in. thick in three sections, 90 in. high, mounted upon pipe framework. The instruments have dull black finish. The panels reading from left to right are as follows:

1—Swinging bracket containing power factor and synchronizing instrument.
1—17½-kw exciter panel
1—25-kw exciter panel
1—500-kw generator panel
1—1000-kw generator panel
2—a.c. feeder panels, capacity each 1250 kva.
1—Tirrill regulator

The current as generated at 2300 volts is carried into Charlottesville over two circuits. The only other wires from the power plant are for a private Bell telephone system which ties in the power station, substation, office and carhouse.

The day load at the present time averages approximately 300 kw and is rapidly increasing. The night load line, which averages about 600 to 700 kw for a short period, is also building up quite rapidly. The efficiency of the new plant as compared with the old one is indicated by the fact that for 175,000 kw-hr. a month it is actually using only four cars of coal compared with fourteen to fifteen cars when a load of only 125,000 kw-hr. a month was carried.

The old plant is still being used for the mercury arc rectifiers and a.c.-d.c. sets, but it is planned to transfer this equipment to a new brick substation and office building on Main Street near the car shelter, so that both cars and machinery may be cared for by only one man.

PROMOTION OF LIGHT, POWER AND RAILWAY BUSINESS

When the property was taken over by the present management, the office of the company was located at the power plant instead of being on the business street of the town. No solicitors were employed, rates were high and inconsistent, and it is reported that considerable money had been lost through improper accounting and unpaid service. One of the first steps was to rent a store located on Main Street, where the public could conveniently do business with the company and see frequently its display of electrical specialties and wiring supplies. The old rates of 18 cents per kw-hr. maximum to 5 cents minimum were reduced to 12 and 4 cents respectively, with a second minimum of 3 cents per kw-hr. for large-motor service. Solicitors who were sent out met with such success that the number of customers was increased from 300 in 1912 to 1006 in June, 1914.

The retail sales of electrical supplies also rose rapidly, as is indicated by the fact that for the year ending June 30, 1913, the company sold $5,000 of tungsten lamps in addition to 300 flatirons, twenty-three vacuum cleaners besides many vibrators, percolators, etc.

The change to 110-volt a.c. distribution also made it possible for residents of Charlottesville to bring such items from other cities without finding them useless on the local circuits. The number of arc lamps, including the city contract, was increased from 106 to 140. In short, in one year, the power and lighting business grew from $18,541 to $36,176.

A detailed study showed 1863 electrical possibilities in all, and of this number the company now has 1006. Only one solicitor is now needed, and six wiremen, with helpers, are constantly employed to wire houses. One of the advertisements which the company uses to call attention to the advantages of electric lighting is a bill file, the front of which is made in the form of an incandescent lamp and bears the words "Is your house wired?"

Among the latest customers of the company is a lumber mill with 135 hp, a woolen mill with 140 hp and a silk mill with 40 hp in motors.

The business-like methods adopted for handling lighting and power accounts have also been applied to the railway service. It is a fact that at least 20,000 deadhead rides were given in the year before the present management took hold. Free service has been eliminated with absolutely no grumbling because the improvement in the service is so evident that no fault-finders can get a hearing from the public. For the year ending July 31, 1913, the railway carried 892,055 passengers. The gross earnings from the railway service are now more than $15,000 per mile of track installed.

The company co-operates wherever possible in all measures brought forward to advance the interests of the community, and has taken a leading part in the Charlottesville Chamber of Commerce. Through personal solicitation the membership of this body was increased from ninety to 308 in one year, and funds were collected to pay for a secretary who would devote all his time to progressive publicity for Charlottesville. As a last word, it may be said that the relations of the company with the public are very pleasant indeed, for the people appreciate the enterprising spirit that has furthered the promotion of Charlottesville's general welfare by giving the town a high-class public utility service.

The present ownership and management of this property comprises the following: President, F. C. Todd, Baltimore, Md., manager Baltimore office, General Electric Company; vice-president and manager, John L. Livers, Charlottesville, Va.; secretary, E. E. Starke, Charlottesville, Va.; treasurer, Norman James, of the N. W. James Lumber Company, Baltimore, Md.; general superintendent, Custis L. Carter, Charlottesville, Va.; R. H. Fife, superintendent of construction, and Geo. H. Smith, in charge of wiring and supply department.

Mooted Principles in Valuation

Abstract of Address Delivered by Hon. Frank W. Stevens, Chairman of Valuation Committees, New York Central Lines, Before A. E. R. A. at Atlantic City—Discussion of Distinctions Between Valuations of Public Utilities for Different Purposes

At the Tuesday afternoon session of the American Electric Railway Association convention at Atlantic City one of the leading addresses was that delivered by Hon. Frank W. Stevens, chairman of valuation committees, New York Central Lines, on the subject of "Mooted Principles in Valuation." An abstract of this address, which on account of its importance was held over until this issue for more extended treatment, is published below:

It is exceedingly extraordinary that valuation should be called a mooted question, yet the fact remains that it is. The valuation of public utilities has been carried on for a considerable number of years in this country, but with very little reference to the foundation principles upon which valuations should be conducted.

OPINIONS ON RETURN ON BONA FIDE INVESTMENT

At a hearing before the interstate commerce committee of the House on Feb. 15, 1912, Commissioner Clements of the Interstate Commerce Commission testified that it was "sound justice and law that, as a basis for constitutional earnings, a fair return on the value of the property means, generally speaking, a fair return on the investment actually made, originally and subsequently." Investment means simply the money that the stockholders have taken out of their pockets or borrowed and put into the business.

The same question was raised before the Senate committee, when Commissioner Meyer said: "But there is an element, and one upon which, if the Interstate Commerce Commission is to make this investigation, you will have to give us some instructions—namely, how to keep property that was originally donated, and what to do with the advance in the value of railway property caused by the development of the community. These questions are directly involved in the question of physical examination." The proposition to which Commissioner Meyer alludes is that the property which was originally donated to the public service corporation was not entitled to any return in the rate whatsoever, and also that appreciation of railway property should not be recognized. This goes back directly to the investment proposition.

The principal witness before the Senate committee on interstate commerce, who was chiefly instrumental in framing the present valuation act, was Prof. John R. Commons, of Wisconsin. At Professor Commons' suggestion, the form of the act was expressly made to allow the Interstate Commerce Commission to pass upon the very questions now being discussed. Professor Commons said:

"The amount of value on which this company is entitled to earn a profit is the amount of its real or reasonable investment, the amount which the owners have taken out of their pockets, and which they might have invested elsewhere under fair competitive conditions and secured themselves a fair competitive return. But if the public has paid a higher rate and that higher rate has gone into the new construction of physical property, that excess in the inventory value of the physical property does not represent a grant on the side of the company against the public but represents a contribution which the public has made to the physical property."

As long ago as 1910 in the advance rate cases before the Interstate Commerce Commission, both in the Western case and in the Eastern case, the commission itself spoke on these subjects. In the Western case Commissioner Lane said:

"Perhaps the closest approximation to a fair standard for the basis upon which to compute the return allowed to public service corporations is that of *bona fide* investment, the sacrifice made by the owners of the property, considering as part of the investment any shortage of returns there may have been in the early years of the enterprise. By thus taking the life history of a road through a number of years, its promoters are entitled to a reasonable return."

This return, however, is expressly limited, for it is provided that no return shall be given on wastefulness, mismanagement or poor judgment, there always being the restriction that no more than the reasonable rate shall be charged. Thus in the same case the commissioner said: "It would appear that one of the problems of the future in railroad regulation is to discover the machinery by which the railroad may justly take to itself an adequate return for the investment made by its stockholders and also share with the community the advantage of the surplus which it creates."

In the Eastern case, Commissioner Prouty made the following remarks:

"The president of the Pennsylvania Railroad testified that since 1887 his company had put into the Pennsylvania lines east of Pittsburgh $262,000,000 from earnings. During all that time this company also paid its stockholders munificent dividends. Now, to whom belongs this $262,000,000, a sum which, according to the statistical report of the Pennsylvania Railroad to this commission for the year ended June 30, 1910, equals nearly two-thirds of the cost of construction of the 2123 miles of railroad owned by the company?

"Should there not be some distinction made between this sum which has accrued from the operation of the property and the amount which has been paid in from other sources? We are not required at this time to express an opinion on this point."

QUESTIONS AT ISSUE

The above statements and extracts from opinions call serious attention to a matter which has many advocates —namely, the opinion, first, that a public service corporation should not be allowed to earn any return upon property originally donated to it; second, that it should not be allowed to earn any return upon property paid for out of earnings, assuming, of course, that during the time when these earnings were accumulated the company was earning a reasonable dividend upon its actual investments; and, third, that the public service corporation should not be allowed to earn any return upon appreciated values, or, as sometimes stated, though unfairly on account of the implied assumption, upon the "unearned increment."

LEGALITY OF RETURN

These questions, of course, may be approached from two points of view: First, is the proposition here indicated correct and proper economically? Second, do such questions constitute the law of the land? On account of the limited time at my disposal, however, I shall confine myself to the legal proposition as to whether or not these elements of value, donated property, property paid for out of earnings, and appreciation of property, are such that under the law of the land we are entitled to have earnings upon them.

COURTS FINAL JUDGE OF REASONABLE RATES

The fixing of rates by legislative authority for corporations which had theretofore been entitled under the law to fix their own rates began in this country in the seventies. Among the first cases upon the question as to whether any such legislative power existed was the Munn case arising in Illinois. The United States Supreme Court in that case, after long argument, held what is now universally recognized, that legislatures (and now their delegated agents, public utility commissions) had that power, subject to the condition that the rate fixed must be a reasonable rate.

This, of course, left the matter very largely up in the air, because the test would be required at once—what is a reasonable rate? And a more important question at the outset was: Who has the final power to determine what is a reasonable rate? The Supreme Court in the first instance declared, practically, that the final power of passing on the reasonableness of the rate was a legislative and not a judicial power. This proposition was repeated in subsequent cases and was always held, with some dissent, which kept growing with changes in the court personnel, until 1889. In this year, in the case of the Chicago, Milwaukee & St. Paul Railway versus the State of Minnesota, the court changed its first view and decided that it did not lie in the power of the legislature of any state, or the Interstate Commerce Commission, or Congress to pass the last word upon the question whether a rate was reasonable or unreasonable, but that it did lie with the courts.

Now, upon what theory? It was held in the above and subsequent cases, that the power of the court in that final question was to be exercised and could be exercised for one purpose only, and that was to prevent a confiscation of property. Until legislative action resulted in a rate so low as to mean confiscation, the courts could not interfere. The case of Reagan versus the Farmers' Loan & Trust Company is a very celebrated case on this point. In this case the court said that "While it is not the province of the courts to enter upon the merely administrative duty of framing a tariff of rates for carriage, it is within the scope of judicial power and a part of judicial duty to restrain anything which, in the form of regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property."

Further citations are unnecessary to show the functions of the courts with reference to rate-making. The courts have no power to make any rate. They have no power within certain limits to interfere with any rate that is made by a public service commission or by a legislature. They have the power, however, when the rate reaches such a point as to be confiscatory in its practical working, to interfere, because property is protected against such assaults. The great and important question in every rate case that comes before the courts, therefore, is this: What is the property of the corporation? Whatever this property may be, as it is recognized by law, it must be protected by the courts.

The case, then, practically comes down to this: Are items which are in the nature of property—that is, property which has been donated, or which has been paid for out of earnings, no matter whether the returns were excessive or not, or property which has increased in value or appreciated—are those elements of property in the hands of the corporation? If they are, they must be protected against confiscation, the same as any other property. If they are not, then another question arises.

FAIR VALUE OF PROPERTY

The first case in which the question came before the Supreme Court as to the standard to be adopted in determining the reasonableness of a rate, was Smythe versus Ames. At that time all sorts of theories were propounded as to the basis upon which a rate was to be judged. It was argued on behalf of the state that if the property was allowed to earn anything above operating expenses and taxes, the courts could not interfere, and that the measure or the amount of the return was wholly a matter of local state policy. It was also argued by the state that, if this previous contention were not allowed, the company should only be granted a reasonable return not exceeding the rate of interest, upon the reproductive cost of the property. The railroads contended, however, that they were entitled to earn not only the operating expenses and taxes, but also interest upon their bonded indebtedness and a dividend upon the amount of stock outstanding. There were the two poles. The court said that neither of the contending parties were right, and that the basis for the calculation of rates was the fair value of the property.

IGNORANCE AS TO "VALUE"

But now we come to the question which in one sense is amusing and in another sense deplorable. During the seven years when I have been personally engaged in the investigation and consideration of this question, I have scarcely ever been able to find out what anybody thought of the term "value." Since my connection with practical operations under the recent valuation act, hundreds of men have professed to me to be entirely ignorant of what was meant by "value." Such a condition, after the organization of business for thousands of years upon a property basis, is a source of astonishment.

If the value of the property is to be protected, the question must arise how theories such as those laid down by Professor Commons and Commissioner Clements can work. They seem to regard it to be a self-evident proposition that the Supreme Court can change the definitions of value to include or exclude classes of property. This may seem to be an extraordinary statement, but it is not made without proof.

PROFESSOR COMMONS' OPINION

Professor Commons, who is an able man and a profound student, but all of whose statements I do not indorse, says:

"The Supreme Court has really been working out a theory of value in the last forty years, since the Munn case, and has very materially recast its old conception of what constitutes value. The fundamental basis of the court's contention is not market, competitive or actual value, but rather a fair, reasonable or just value. The court recast its theory of value in rate-making cases because it perceived that in setting up a value for the property it created substantially a creditor and debtor relationship, the owners of the property being in the nature of creditors and the public in the nature of debtors for something devoted to their service.

"From 1889, the time of the Chicago & Milwaukee case, down to the present time, the latest cases being the Consolidated Gas case in New York, the Knoxville Water case and possibly one or two more recent cases, the court has been making a transition. It has been shifting its ground as to what is value or valuation, or the amount of value for rate-making purposes. The valuation bill should provide for the original cost to date, in order that the court may have before it the facts, and the amount of differences involved in the different methods of valuation. The securing of original cost and present value would make it possible for the court to consider whether a railroad is entitled to appreciation in its land values, equivalent to the appreciation which private owners adjoining them have enjoyed. My own idea is that if the case were properly presented to the court, the court would adhere to the idea of reasonableness throughout, and would recognize that for rate-fixing purposes this property, being devoted to a public use, was entitled to a return on the actual reasonable investment cost of the property only."

PRESENT PROBLEM OF VALUATION

A very serious question confronts all owners of public service property at the present time. It is being gradually worked out through the valuation act whether or not there can be two kinds of value attached to the same article of property; a value for taxation or a value for sale and another value for rate-making purposes, the last value being one which would exclude the three classes of property previously mentioned as well as others. The only protection which carriers have for their property lies in the definition of the word "value." If theorists, if commissions, if legislatures, if courts can make a definition of "value" to fit the case, then it is just as possible for the Supreme Court or any other court to confiscate utility property as it is possible for a commission or a legislature to do so, and if by changing the definition of the word "value" they can exclude donated property, as Professor Commons seems to think they can, or property paid for by earnings, or appreciation of property, they can confiscate that part of the property by denying any return upon it, for such a procedure is nothing more nor less than confiscation.

MEANING OF VALUE

The first mooted question in valuation, therefore, is: "What is value?" A definition for this cannot be manufactured by the individual any more than by the courts. It is embodied in the language. "Value, in exchange, expresses nothing but a ratio, and the term should not be used in any other sense." Value, in the sense that we are using it, is always expressed in terms of money. What determines this ratio? Nothing more or less than the mental condition. Scores of definitions all run to the same proposition, but in the discussion of this question, inasmuch as the Supreme Court of the United States has the final word upon all these subjects, its opinion is most valuable as to what constitutes value.

From a collection of eight cases before the Supreme Court on the subject of rate making, there has been prepared the following summary:

1. There is not an intimation in any one of the cases that the court is using the term "value" in a sense different to that given to it in condemnation and taxation cases.
2. It has declined to hold that the cost is the value of the property, although consistently holding that it is an element which must be considered in fixing value.
3. It has decided that when property or rights are owned in fact, it is immaterial whether the owner paid anything for them or not. Their value must be respected in fixing the rate.
4. It has decided that in ascertaining the present value it is not limited to the amount of the actual investment; that the making of a just return for the use of property involves the recognition of appreciation in value.
5. It has declined to hold that cost of reproduction is necessarily the value of property.
6. It has held that cost of reproduction is one way or method of ascertaining value. It does not follow, however, that any article may be worth the cost of reproduction or that obsolete property which must be thrown out of use is not worth the cost of reproduction.
7. It has held that a variety of matters are to be considered in fixing value.
8. It has decided that the ascertaining of the matter of value is the exercise of a reasonable judgment having as its basis the proper consideration of all relevent facts, which, of course, is the very element of value in exchange.

RECENT DECISIONS

In the Minnesoa rate cases decided last year, it was pressed upon the court in argument that where a right-of-way has been donated free of cost it should not be included in the aggregate amount upon which to base a return; that lands secured under the right of eminent domain should never be valued at more than the original cost, and that lands procured or purchased from earnings should not be included in the value of the property. The court, however, used this language in reply:

"It is clear that in ascertaining the present value we are not limited to the consideration of the amount of the actual investment, as the company may not be protected in its actual investment if the value of its property be plainly less; so the making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost."

Hence, if the court adheres to principle and its own declarations, the appreciation of property must be recognized as a part of the value. In the most recent case which has come before the Supreme Court, San Joaquin County versus Stanislaus County, 233 U. S. 454, the court held expressly that whether the water rights in question cost the company anything or not they owned them. They were property, and the company was entitled to a fair return upon them. This, then, disposes entirely of the question about donated property.

CONCLUSION

The answer to the question stated at the beginning is this: There cannot be, in principle, two kinds of value, for value is simply a relation between the article valued and money, and there cannot be two relations of the same thing to money. The courts have, in taxation and chiefly in condemnation cases, laid down certain rules regarding property, and property which is donated, acquired from earnings or appreciated, must be recognized as part of the total value. If they are not recognized in rate-making cases, those elements of value are certainly confiscated. Certain well-meaning gentlemen who entertain a view of the economic side of the question far different from what I do maintain that the courts have tried to do this. I have tried to show that the courts have done nothing of the kind. They maintain that the courts can do it. I maintain that the courts cannot do it, because as soon as they do, in a case where they have jurisdiction solely for the purpose of protecting property against confiscation, they thus put a definition to value other than that which they set in condemnation cases, and actually confiscate that part of the property which is not recognized by the new definition.

The Hagerstown & Frederick Railway recently adopted the plan of distributing as souvenirs to the patrons of Braddock Heights Park, Md., a large number of hatpins, the heads of which are buttons, similar to those worn by the trainmen of this line. The design, which was originated by S. H. Bennett, auditor of the company, is very attractive, bearing the words "Heart of Maryland Route." These souvenirs, while inexpensive, proved good drawing-cards at the park, and the demand for them exceeded the supply.

Proceedings of Friday's Session of the Engineering Association Meeting

The Concluding Session of the American Electric Railway Engineering Association was Mainly Occupied with Discussion of Way Matters—L. P. Crecelius was Elected President of the Association

The final session of the Engineering Association opened Friday morning with President Hanna presiding and a representative number of engineers in attendance. The first order of business was the report of the committee on way matters which was presented by Mr. Kimball.

FOUNDATIONS IN PAVED STREETS

R. C. Cram, Brooklyn, N. Y., in opening the discussion of the question of the proper foundations for track in paved streets, emphasized the fact that there were practically only five types of track construction in general use in this country, the sixth type shown in the illustrations accompanying the report being comparatively new. While the committee did not take into consideration all the minor variations in the different designs obtained in response to requests for data, the four types recommended are representative of those followed with more or less success. The crux of the track situation is how much money can railways afford to spend. There are advocates of all types, but the problem resolves itself into one of the most economical designs to fit the service given.

C. R. Harte, New Haven, discussed loads on soil particularly. He brought out the fact that there was little or no information upon which accurate calculations could be made since different soils act differently under varying conditions. In a good many instances the calculated bearing power of the soil is exceeded without serious results. Unquestionably confined soils have a greater bearing power than the same soils unconfined. When the problem is one of improving the bearing qualities of soil, undoubtedly drainage offers the best method while it is possible to obtain fairly good results with a filler or dryer.

Geo. L. Fowler, New York, referred to the information in the reports regarding the results of deflectometer tests conducted by the Chicago Board of Supervising Engineers, particularly referring to the fact that this test did not indicate that the rail raised the load. He also stated that the actual stresses in track were an unknown quantity and practically no records were available. The distribution of the loads over the subgrades largely depends on the quality of material used for ballast. He also made several references to some steam railroad experiments conducted to determine track stresses.

In explanation of the results of the deflectometer tests it was stated that this track was on 9-in. 129-lb. girder rail laid on concrete foundations. Consequently, it was more or less rigid and wave motion was eliminated. C. H. Clark, Cleveland, next replied to Mr. Fowler's theoretical conclusions regarding track stresses by stating that steam railroad traffic conditions did not apply to street railways in paved streets. Street railway traffic is slow-moving, consequently the resulting stresses were not comparable. Pavement maintenance is the most important factor entering into track construction in paved streets. Consequently the most rigid construction produced the best results. President Hanna qualified Mr. Clark's statement, however, by stating that it was impossible to make track absolutely rigid.

E. M. T. Ryder, Third Avenue Railway, New York, suggested that the use of a 7-ft. tie instead of the 8-ft. tie shown in the standard designs aided in reducing the track allowance and this turn resulted in lower construction and maintenance costs. In reply to this suggestion, Mr. Cram stated that the committee's idea in recommending a 6-in. x 8-in. x 8-ft. tie was to furnish a fixed bearing area. So long as the bearing area was maintained the tie lengths and widths could be varied to suit any engineer's ideas.

T. K. Bell, Ardmore, Pa., stated that street railway traffic conditions were not similar to steam railroads, consequently street railway track studies must be made along independent lines. In the past the concrete-beam track construction was popular, but the experience of those using it indicated that it was not good practice—in fact, in many instances it accounted for new difficulties such as rail corrugation. Mr. Bell also referred to foreign practice in making track construction more flexible, calling particular attention to the use of a bitumen layer beneath the rail to reduce noise and provide a more elastic track foundation.

C. H. Hile, Boston, stated that in his experience the present tendency was toward more flexible types of track construction. The element of noise is becoming of considerable importance in a large number of large cities and flexibility seems to offer the solution. In fact, he stated that the question was now up in Boston and a committee had been appointed to make a thorough study of the subject.

Mr. Dodge said that his company was using the concrete-trench type of track foundation with considerable success. It had adopted wood block for pavement because of its improved wearing qualities and noise reducing characteristics.

At this point in the discussion President Hanna suggested that a motion would be in order to approve the recommendation of the way committee or those of the standards committee. After the motion had been put and seconded, Mr. Schreiber stated that it was the standard committee's belief that it would be unwise for the association to adopt these designs as recommended practice, because of the reasons set down in the standards committee report, since some of the designs did not represent the best modern practice. In order that there would be no misunderstanding of the standards committee's action, it was stated that its purpose was to accept the designs as a whole or recommend that they be turned back for further consideration if it disagreed with some of the details. President Hanna stated that he believed that these designs represented the best types in general use to-day and should be so considered.

In explanation of some points raised in the discussion, Mr. Cram stated that the committee was undecided as to the correct assumptions for the soil bearing qualities. Improper drainage unquestionably reduces bearing power of soils, consequently elimination of moisture is of prime importance. Another phase of the subject which should receive consideration was the character of traffic and the fact that it could not be diverted entirely during the construction period. In practically every city it is necessary to build track under service. Consequently the type of construction adopted must permit this practice. Regarding the use of solid concrete construction, Mr. Cram stated that some of the largest companies in the country had adopted it as standard. It had to be included as a recommended design. The European practice in constructing tracks in paved streets offered a number of features well worthy of careful consideration. In closing he stated that the track chapter in the 1913 convention issue of the ELECTRIC RAILWAY JOURNAL had served as the basis for the early stages of the committee's work.

The report of the committee as to track foundations in paved streets was referred back in accordance with the recommendations of the standards committee.

T-RAIL IN PAVED STREETS

T-rail in paved streets, the second subject considered by the way committee, was presented by Mr. Graves and discussed by Messrs. Clark, Wilson, Cram and Bell. It brought out the fact that those using T-rail did not believe that it was limited to any traffic conditions excepting special work where it was undesirable from a pavement maintenance standpoint. It was also stated that in many cities its use or its nonuse was attributed to the action of city authorities who specified the rail section to use. A recommendation of considerable importance in favor of the use of T-rail was its tendency to clear the track for vehicular traffic. The report of this sub-committee was received as information.

W. F. Graves, Montreal, suggested that it might be well to recommend to way engineers that comparative records be kept to show the cost of maintaining paving with girder and T-rail construction respectively.

Mr. Hurd, Universal Portland Cement Company, said that an investigation had recently been made in several Western states covering 20 miles of track with concrete paving. He highly favored such construction. As evidence of the complete bond thereby maintained between the rail and pavement, he mentioned the simultaneous breakage of a 7-in. welded girder rail and the cracking of the adjacent paving at Fond du Lac, Wis.

In conclusion Mr. Cram stated that the specifications for concrete pavement distributed at the meeting by Mr. Hurd might give the impression that they had been issued or approved by the committee on way matters. This was not so. The committee had not mentioned any pavement whatsoever. Therefore, this was simply a suggested unofficial specification for paving to go with the committee's proposed type D construction.

OTHER MATTERS

The next order of business was the report on heavy electric traction, which was presented by the chairman, E. R. Hill. The report was duly accepted.

C. R. Harte then presented the report of the committee on resolutions in which thanks were extended to the president, the other officers and the committees for the excellent work they had done during the year. Thanks were also extended to the Manufacturers' Association for its splendid exhibits and assistance to the committees. Mr. Harte then presented a resolution that the executive committee be requested to consider the appointment of a necrology committee to prepare memoirs of members upon their death. The report and motion were duly accepted.

The report of the committee on nominations was then presented by Martin Schreiber as follows: President, L. P. Crecelius, electrical engineer, Cleveland Railway; first vice-president, John Lindall, superintendent of rolling stock and shops, Boston Elevated Railway; second vice-president, B. F. Wood, chief engineer, United Gas & Engineering Company; third vice-president, F. R. Phillips, superintendent of equipment, Pittsburgh Railways; secretary and treasurer, E. B. Burritt. Executive committee: J. P. Barnes, general manager, Syracuse & Suburban Railroad; G. W. Palmer, Jr., electrical engineer, Bay State Street Railway; H. F. Merker, engineer maintenance of way, East St. Louis & Suburban Railway; W. G. Gove, superintendent of equipment, Brooklyn Rapid Transit System. The secretary was instructed to cast one ballot, and the gentlemen named were duly elected.

Retiring President Hanna expressed his thanks to the members for their cordial co-operation that he had enjoyed during his administration, and also expressed his thanks for the assistance given by Messrs. Burritt and Stocks at Association headquarters. President-elect Crecelius was then inducted to the chair. Mr. Crecelius thanked the members for his election saying that the honor was one that he greatly cherished. On motion the session was then adjourned.

ATTENDANCE AT THE CONVENTION

Up to Thursday night 2450 persons had registered at the associations' headquarters. This is a reduction of 20 per cent from last year's registration of 3085. There were 1400 railway men, 464 or 25 per cent fewer than last year; and 1050 supply men, 171 or 14 per cent fewer.

CORNELL ELECTRIC RAILWAY REUNION LUNCHEON

Following the precedent established last year the Cornell men in attendance at the Atlantic City convention held a get-together luncheon. At 12:30 on Thursday thirty or more railway and supply men lunched together informally at the Marlborough-Blenheim. Before lunch was served each man rose in turn and stated his name, class and present occupation. Ernest Gonzenbach, general manager Empire United Railways, and E. J. Dickson, vice-president International Railway, attended as guests. A permanent reunion committee was appointed as follows: Fred. L. Wright, vice-president Wm. Wharton, Jr., Inc., Philadelphia, Pa., chairman; W. K. Archbold, president Archbold-Brady Company, Syracuse, N. Y.; C. H. Clark, engineer maintenance of way Cleveland Railways, Cleveland, Ohio; T. M. Farmer, Jr., vice-president Consolidated Car Heating Company, New York; H. H. Norris, associate editor ELECTRIC RAILWAY JOURNAL, New York, and Lee H. Parker, Stone & Webster Engineering Corporation, Boston, Mass. Mr. Wright desires the names of all Cornellians engaged in electric railway work.

A meeting of secretaries of technical societies has been called for October 31 at the United Engineering Societies Building in New York to consider the formation of a Society of Technical Associations' Secretaries. This is the outgrowth of a movement which has been under development for some time as a result of the increasing necessity for co-operation in society management. The number of technical societies is now so great that some simple method of preventing conflict of dates of meetings, scope and plan of work, etc., seems to be imperatively needed. The objects of the proposed association will not be definitely defined but they are comprehended in a suggested phrase as "the development and solution of problems of mutual interest to the service of its members." The call for the meeting is signed by the secretaries of the following societies: American Institute of Electrical Engineers, American Society for Testing Materials, American Society of Mechanical Engineers and American Institute of Mining Engineers, and American Institute of Chemical Engineers.

Reports Presented at Concluding Session of the Engineering Association

The Committee on Way Matters Reported Extensive Data Based on a Comprehensive Canvass of the Association Membership—The Committee on Heavy Electric Traction Presented a Brief Report—Abstracts of the Reports are Given Below

The report of the committee on way matters of the Engineering Association, presented yesterday, covered: Proper foundation for tracks in paved streets; use of T-rails in paved streets; pavement for use in connection with girder and high T-rails, and alloyed steel rails. The report showed that the basic principles followed in the study of track foundations in paved streets were permanency and the features which influenced it. Permanency is of prime importance to electric railway tracks in paved streets, where, as a rule, the types of pavements found are costly, and both the railway and street traffic are heavy, making repairs difficult and expensive. After a careful study of all the factors influencing the design, the committee concluded that the question of proper foundations for track in paved streets required a most careful study of the soil in the street with respect to its bearing value.

Dependable data regarding the bearing values of various surface soils were somewhat meager, but sufficient information was found to allow the committee to recommend designs of foundation construction for adoption. The bearing powers of the soils, shown in the following table, were taken into consideration:

Material	Safe Load in Tons Per Square Foot
Quicksands and wet soils	0.1 to 1.0
Dry earth according to depth below surface	1.0 to 3.0
Moderately dry clay, confined	2.0 to 4.0
Dry, stiff clay	4.0 to 6.0
Sand, confined	2.0 to 6.0
Sand, compact and cemented	4.0 to 8.0
Gravel, cemented	8.0 to 12.0
Rock	25.0 to 200.0

As a result of a study of the track-drainage problem, the committee found that much soil which was considered unfit for roadbed without some form of concrete foundation may be rendered serviceable by the installation of a suitable subsoil drainage system. In this connection it was also concluded that heavy clay soil which retains moisture for long periods required subsoil drains regardless of the type of foundation used. To give an idea of the percentage of moisture retained by certain soils which would prove of value in determining what drainage arrangements were necessary, the following figures were given: Pure clay, 70 per cent; clay loam, 50 per cent; loamy soil, 40 per cent; sand, 25 per cent.

It was also found that the character of the foundation was closely related to the question of electrolysis, being to a certain extent a determining factor of the leakage of stray currents. A well-drained rock or concrete roadbed may, in general, be expected to offer much higher resistance to leakage current than one in which a large amount of moisture is retained. Another factor in obtaining good foundation drainage is the installation of surface drains and a pavement which will prevent the infiltration of surface water.

Information gathered from the data sheet tended to show that the practice of rolling the subgrade and ballast was increasing, and the committee recommended that rolling should be done wherever practicable under working conditions, if warranted by the kind and condition of the subsoil. Rolling is especially recommended where the street is known to be on made ground, or where there has been much disturbance of subgrade due to foreign subsurface constructions and cross trenches. Where it is impracticable to roll, the subgrade should at least be thoroughly rammed so as to eliminate soft spots, and the ballast thoroughly tamped by hand or by operating loaded cars over the track, the tamping being continued until there is no movement observed under load. In some instances, a subballast of cinders, placed under the crushed stone or gravel ballast, may be used to advantage. This is particularly true where it is desired to increase the depth of the ballast without greatly increasing the cost of ballasting materials.

In order to eliminate the misunderstanding as to the meaning of the term "permanent track construction," the committee made the following explanation: A track may be called permanent when it is built to the established line and grade in a street, wherein all customary foreign sub-surface structures are in place and the permanent pavement of the street has been installed, or will be constructed, immediately following the track construction. A permanent track also is one designed with the object of securing the minimum maintenance cost and the maximum life from the several materials involved when subjected to mechanical wear, action of the elements and harmful disturbances not under control.

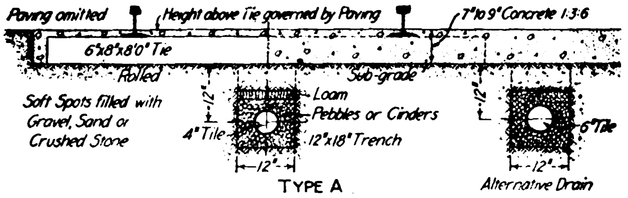
The principal items to be considered in the design of track structures in paved streets were stated to be as follows: Character, bearing power and drainage of sub-soil; loads to be carried; form of sub-structure necessary to distribute the loads over the sub-soils; form of superstructure to be carried by the sub-structure; the character of the street improvements with respect to line, grade, sub-surface structures and paving, and the traffic conditions under which the work is to be executed.

Information gained from the data sheets indicates that only 20 per cent of the eighty roads reporting on the subject of ballast use concrete ballast construction. While this may be somewhat misleading since it is not on a mileage basis, it is an indication of the preference. When it is also considered that some of the largest properties are abandoning concrete construction in favor of either stone ballast or the more resilient concrete sub-ballast construction, it appears that current practice is not generally in favor of solid concrete.

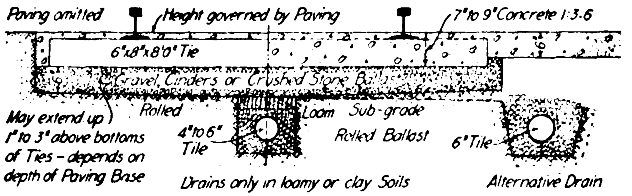
Two general conditions usually are confronted in constructing track in streets, the one where most of the improvements are yet to be made, such as in new extensions through recently developed territory, and the other where all the expected improvements have been made or will be completed within a very short time. Under the first condition it is not generally advisable to install a standard permanent type of construction, but a temporary type which can be removed before a full life is reached should be used. Where the improvements are in, it is desirable to install a standard construction suited to the conditions obtaining, and such construction should preferably be entirely new in order to obtain a maximum life from all its component parts.

In order to obtain uniformity in designing methods, the committee adopted a standard track loading to be used. It is believed that the load produced by a 50-ton car supported on eight wheels with 25-ft. truck centers, and 5-ft. wheelbase should be adopted. In considering soils a load of 1.5 to 1.75 tons per square foot should be used, and the soil should be assisted in performing its whole duty by adequate drains.

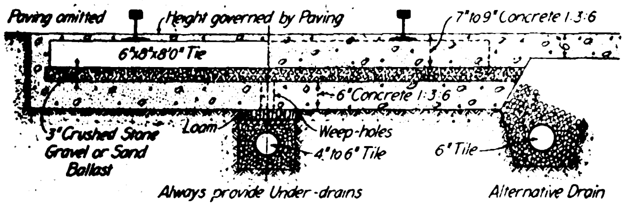
As a result of its study of all the factors which might influence the various designs of track foundations in paved streets, the committee submitted four types of foundation construction for adoption as recommended designs. These are shown in the accompanying illustrations. Sub-soil conditions largely govern the selection of any of these four types. It was inferred, however, from the information at hand that the soil generally found in city streets was in the original state, or if it has been in place for many years, afforded sufficient strength in the sub-grade to sustain the average loading, provided the loads are distributed through a moderate amount of crushed stone, gravel, or even cinder ballast.


Paving omitted
Height above Tie governed by Paving
7" to 9" Concrete 1:3:6
6"x8"x8'0" Tie
Rolled
Sub-grade
Soft Spots filled with Gravel, Sand or Crushed Stone
12"
Loam
Pebbles or Cinders
4" Tile
12"x18" Trench
12"
12"
6" Tile
12"
Alternative Drain

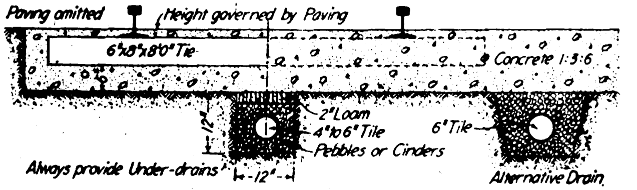
TYPE A
For Gravel, Sand and sandy loam Soils - Moderate Traffic and Cars up to 25 Tons
Provide Surface Drains


Paving omitted
Height governed by Paving
7" to 9" Concrete 1:3:6
6"x8"x8'0" Tie
Gravel, Cinders or Crushed Stone Ballast
May extend up 1" to 3" above bottoms of Ties - depends on depth of Paving Base
Rolled
4" to 6" Tile
Loam
Sub-grade
Rolled Ballast
6" Tile
Drains only in loamy or clay Soils
Alternative Drain

TYPE B
For most Soils except very heavy Clays - Heavy Traffic and heaviest Cars up to 35 Tons
Provide Surface Drains


Paving omitted
Height governed by Paving
7" to 9" Concrete 1:3:6
6"x8"x8'0" Tie
6" Concrete 1:3:6
3" Crushed Stone Gravel or Sand Ballast
Loam
Weep-holes
4" to 6" Tile
6" Tile
Always provide Under-drains
Alternative Drain

TYPE C
For heavy water-retaining Soils and other uncertain made Ground - Heaviest Traffic and Cars
Provide Surface Drains


Paving omitted
Height governed by Paving
6"x8"x8'0" Tie
Concrete 1:3:6
2" Loam
4" to 6" Tile
6" Tile
Pebbles or Cinders
Always provide Under-drains
12"
Alternative Drain

TYPE D
For heavy water-retaining Soils and other uncertain made Ground - Heaviest Traffic and Cars
Provide Surface Drains

COMMITTEE ON WAY MATTERS—RECOMMENDED FOUNDATION CONSTRUCTION DESIGNS

This report on track foundation also contains a tabulation of the characteristics of track construction in North America as reported by seventy-eight cities; a bibliography of proper foundations for track in paved streets; an article describing foreign street railway construction, and an appendix containing definitions of the various terms used in describing roadbed, track, ballast and ballast materials.

USE OF T-RAILS IN PAVED STREETS

T-rails in paved streets received the thorough consideration of the committee having this subject in hand. After analyzing what had been done since the first committee on this subject was appointed in 1907, it was deemed advisable to consider the points for and against the use of T-rails in paved streets. The chief points in favor of its use are as follows: First, the T-rail is generally considered to be designed on better mechanical lines. Second, more satisfactory mechanical joints can be manufactured, partly because of the symmetry of the rail outline. Third, the flangeway is more suitable for different wheel flanges. Fourth, the rails have a longer life as a rule, under equal traffic, with a lessening of street openings for renewals. In theory the life of the ordinary joints is probably longer, with a lesser amount of disturbance of pavement at the joint. Fifth, many installations of T-rail in paved streets in recent years have satisfactorily met the local conditions. Several cities have required the adoption of high T-rails in replacement of tram and girder-grooved rails. Sixth, much objection has been improperly directed against T-rails when it should have been brought against the pavement. This has been proved by the installation of modern pavements with old high T-rails.

The points against high T-rails are as follows: First, it is more expensive per foot of finished track and pavement. Second, the lack of a self-cleaning flangeway. Third, increased wear of pavement adjacent to rails, under extreme traffic conditions, resulting in high paving maintenance. Fourth, it is apt to offer a greater resistance to vehicular traffic. Fifth, difficulty in preventing seepage of water in flangeway.

Replies to data sheets sent out by this committee show that at least nineteen different types and arrangements of paving between the gage lines of T-rail tracks are in general use. The total trackage of the companies included 2241 miles of T-rails of all sections, of which 1086 were represented by rails of 6 in. or more in height. From these data sheets a tabulation of the paving used between the rails is as follows:

	Miles
Concrete	19.48
Asphalt	404.19
Slag brick (scoria)	49.67
Macadam	86.05
Granite blocks	635.85
Wood block	84.41
Brick	724.93
Bituminous	37.27
Asphalt block	2.88
Other pavements	196.24
Total	2240.97

On the question of cost of maintaining pavements in T-rail track construction, very little accurate information was obtainable. The tendency throughout the replies, however, indicated that the cost of maintaining paving along T-rail was somewhat greater than girder rail, but that this was offset by the T-rail's improved wearing qualities.

As a result of its study of the data sheets the committee reached the following conclusions: First, there is a diversity of opinion among member companies regarding the use of T-rail in paved streets. Second, that granite or brick headers along the gage lines and under the head rails are most generally used. Third, that Portland cement grout or asphaltic cement grout is the most desirable means of filling the space next to the rails. Fourth, that the tendency of vehicular travel to follow the tracks is about as heavy with T-rails as with other kinds of rails. As a general proposition, the committee could not recommend the use of T-rails for all conditions, and it believed that the limiting conditions were usually reached in the congested portions of city streets. It also recommended that when T-rails are to be laid in permanently paved streets, they should be 7 in. in height, in order to permit satisfactory pavement construction.

PAVEMENT FOR USE IN CONJUNCTION WITH GIRDER AND HIGH T-RAILS

Although the committee was not able to give this subject the consideration it demanded and recommended that its work be continued during the ensuing year, some valuable data were collected and presented regarding the need for traffic records. The report stated that records of this kind were of utmost importance and utility to engineers connected with construction, maintenance and use of streets, and particularly in arriving at a recommended practice for the pavements to use with girder and high T-rails. Since there was no standard method of recording and comparing traffic on streets of the same city or in different cities, the committee endeavored to suggest a uniform method of recording, analyzing and standardizing quantity and weight of traffic on a unit basis.

As a result of their study, the committee decided that the records should be based on simple, accurate methods of counting, recording and reducing the traffic to standard units of quantity and tonnage. In addition this method should be such as to make it easily understood and applied. The period to be covered by any traffic count should be fourteen consecutive hours from 5 a. m. to 7 p. m. and during six consecutive or different week days. However, if average weather and traffic conditions are known and selected, the record may cover only three consecutive week days. Traffic counts should not be taken in abnormal weather, such as seasons of snow and ice, nor during continuous rainy, very hot or excessively cold days, and holidays. The count should be taken at or near the center of the block and not at street intersections and should include traffic both ways. Preferably the observer should be stationed in an elevated position, a second-story window facing the street being most satisfactory.

The committee also presented a general classification of vehicles for practical results as follows: Horse vehicles, subdivided into one-horse, two-horse, three- or more horse and motor vehicles. In computing weights, the horses as well as the vehicles must be considered, because both are factors in pavement wear. For record purposes the average weight of one-horse vehicles, empty and loaded, can be taken at one ton; two-horse vehicles, at two tons; three-horse or more at four tons. Similarly the average of all motor vehicles, empty and loaded, for transportation of persons and goods may be taken at one and three-quarter tons. Bicycles, motorcycles and saddle horses should be excluded A form of traffic counting slip was also designed and recommended by this committee.

ALLOYED STEEL RAILS

This subject was merely a continuation of the review of the subject of alloyed steel rails begun by the committee on way matters in 1912. One of the most striking things observed in this study was that the tonnage of alloyed steel being rolled into rails of all sections has been declining for the last three years. The production of Bessemer steel rails also has been steadily declining, while the production of open-hearth rails has been increasing at approximately a corresponding rate. In other words, the indisputable tendency is toward the more general use of open-hearth rails, which tests have shown to have greater wearing qualities than Bessemer rails. On the other hand, while open-hearth rails cost 7 per cent more than Bessemer rails, purchasers are loath to pay any more to obtain the additional wearing qualities which would be furnished by an alloyed steel.

As a matter of general interest, however, the following table of special steels possessing the general characteristics mentioned, is shown:

Kind	Steel Containing	General Properties Anticipated
Titanium	0.1 per cent metallic titanium	Less segregation, cleaner metal, hence, longer life.
Nickel	3.5 per cent nickel.....	Increased life.
Nickel chrome	Containing varying percentages—nickel and chromium	Increased life by being tough and hard.
Manganese ...	About 12 per cent manganese	Very tough and hard, cannot be easily cut or drilled, wears slowly.
Electric	Made in electric furnace.	Very clean steel, free from impurities, thus adding life.
High silicon..	About 0.35 per cent silicon	Increased life. Much used in England.

The four types of foundation construction submitted for adoption as recommended designs by the way committee were in turn submitted to the committee on standards. This committee recommended that the types be referred back to the committee on way matters for further consideration, since some of the designs do not, in the committee's opinion, represent the best modern practice.

COMMITTEE ON HEAVY ELECTRIC TRACTION

The report of the committee on heavy electric traction of the Engineering Association included a revision of the recommended designs covering clearances for overhead conductors, the revision consisting in a diagram giving a 15-ft. 3-in. clearance for overhead d.c. conductor rails. A continuance of the subjects of clearance lines for third-rails and of the study of modern electric locomotives was recommended for the ensuing committee. In connection with this report the committee on standards approved the proposed clearance for overhead conductors as a recommended design.

Appalachian Power Business

Much new business has been obtained recently by the Appalachian Power Company, Bluefield, W. Va. In talking with a representative of the ELECTRIC RAILWAY JOURNAL M. A. Viele, of Viele, Blackwell & Buck, consulting engineers of New York, who is vice-president of the company, spoke of the contracts for energy which have been closed recently.

The Appalachian Power Company began to deliver energy on Aug. 1, 1912. It has a large potential market in the southwestern part of Virginia and the adjoining section of West Virginia. In the last few weeks fifteen contracts have been closed with coal-mining companies. They had been pending for some time, and their final execution was made possible by the increased output of coal resulting from the new markets opened by the European war. The power company was not delivering energy to any of the coal-mining companies in this list on Sept. 1, but it will be delivering to all but one of them on Jan. 1, 1915. It is estimated by Mr. Viele that the gross revenue from these companies for the first year will be from $55,000 to $60,000, and that in 1916 it will be between $85,000 and $90,000. The total gross revenues of the company thus far in 1914 are about 15 per cent greater than in the corresponding period of the previous year.

The company is prepared to finance its construction requirements. Its securities were underwritten on a basis providing for the completion of the construction necessary for the use of the entire estimated output. A construction program was arranged which covers the period to June 30, 1916. The capital provided for construction purposes has been divided into regular amounts, and these have been expended in accordance with the program. The company, however, is ready to hasten its work and open more developments if the market for energy warrants this change in plan.

The Improvement Club—An American Institution

The Author Outlines the Evolution and Methods of Local Organizations Formed for the Purpose of Bettering Conditions, Including Street Car Service, in Various Sections of a City

BY W. T. BUCHANAN, PUBLICITY MANAGER, PORTLAND RAILWAY, LIGHT & POWER COMPANY

Ofttimes when sitting back of a mahogany desk, in a ten-story skyscraper, figuring out street car service in the hope of satisfying both the stockholder and the patron, a knock comes at the door and the secretary announces the presence of the president of the Skookum Street Improvement Club. As he enters the room you note that the lines of the visitor's face are rigid. He carries himself with an air of knowing just what he is after. Evidently he proposes to hit from the shoulder. You put on your best smile, grasp his hand and tell him that you are delighted to meet him. He begins with a complaint, maybe of the service—which is for more cars on Skookum Street, 10 miles from the business center—more often it is a demand, and once in a while it is a favor that he asks.

How familiar this mental picture must be to every president and general manager of a public utility when reviewing his own experiences with this wondrous individual—the "president of the improvement club." He is an American institution—the outgrowth of our boasted democracy, and his like is not to be found in any other country. His counterpart does not exist in Europe. He is indigenous to American soil. What consideration shall we give him in the general scheme of publicity to educate the masses to a better understanding of the aims and purposes of a public utility? The man who presides over a street railway company of any size will agree that this individual has a very important relation to its gross earnings.

Withal the president of the Skookum Street Improvement Club is a peculiar individual. Sometimes he carries a chip on his shoulder. He smilingly informs you that he has read Mellen's testimony as to the New Haven operations before the Congressional committee. He, if you take the trouble to inquire, will tell you that he recently perused an interesting article in *Hearst's Magazine* on "Municipal Ownership." He is familiar with *Everybody's*, the *Cosmopolitan*, and in a daily paper he is a constant reader of all items telling of the relation of the company with the politicians. He says he knows all about "the jokers" in the franchise—as told to him by some politician or by having read of them in the newspaper having a "punch." Not infrequently he is a believer in socialism. Ordinarily he is saturated with the dope of the muckraker. Sometimes he is amenable to reason, and occasionally he is fair and desirous of getting at the truth. Even then he often dreams that the presidency of the Skookum Street Improvement Club will land him into a fat and healthy political job. There are none to deny that this man is an important element in the public utility field. Every manager has met him time and time again, and each one has a different method of handling him.

How came this man into the commercial make-up of our country? He is a brand-new factor—his existence was not known thirty years ago, when the horse car was the only means of city transportation. In those days, if the car got off the track he was ready to put his shoulder to the back shield and help put it on the track. Now he makes a bee line for the president's office to make known his complaint.

The improvement club or association is really a by-product of the electric railway. It was the electric railway that brought within reach of the business section the suburban territory. Before that time the horse car would not permit of long street car lines as they exist to-day. In moving out along the electric railway the citizen found he needed paving, sewering and all the various conveniences of city life. Being somewhat isolated he found that his requests were not heeded at the city hall, and this led him to forming improvement associations. These associations linked their efforts with neighboring associations, and now nearly all large cities have even a central civic association composed of delegates from each of the neighborhood clubs.

The growth of the improvement clubs in all the cities of the country has been one of the marked characteristics of urban development. Some idea may be gathered from the following statistics as to the number of improvement clubs in Western cities.

Kansas City	112	Omaha	68
St. Louis	242	Minneapolis	181
Denver	64	Portland, Ore.	62
San Francisco	262	Seattle	73
Los Angeles	182	Dallas, Tex.	54
Milwaukee	150		

Think of 100 small organizations, in one city, acting as regulating bodies for whatever portion of the street car service that might take the fancy of the members of the clubs.

Have you ever attended one of their meetings? Usually only ten or twelve members are present. It appeals to the visitor as a sort of neighborhood affair. Hundreds of citizens living near the meeting place never attend and only know of the existence of the club through reading of it in the newspapers. If it is desired to secure additional cars, a new fender, a lower step, or a reduction of the fare, the modus operandi of starting the movement begins after this form. A meeting of the club is called. Ten members attend. A resolution is passed—perhaps it was prepared by the leader downtown in a lawyer's office—and with this resolution in the hands of a committee on which the president usually acts ex-officio he starts for the newspaper office and has it printed. "It's news," says the city editor, and that is sufficient dictum to send the stuff broadcast without regard to the truth of the claims set forth. Then comes another meeting of the club, fiery speeches are made, the newspapers print reports of them, and the campaign is on. What sort of action is needed to secure the co-operation of these clubs toward a sound and sane treatment of the community's most important business enterprise?

THE RECORD IN ONE CITY

It is a well-established fact that in cities like Milwaukee, Kansas City, Omaha and those on the Pacific Coast, practically all matters of a disturbing character start from the improvement club. Here is a list of new projects involving either capital expenditure or loss of revenue which were under discussion by the improvement clubs during one winter season in a Middle Western city: Crosstown lines; lower steps; six tickets for a quarter; new fenders; double tracking; no-seat-no-fare; express service; bridge tolls; no-stop cars; paving; heating of cars.

The above, if put into effect, would involve an expense of a million dollars or more. If any deduction is to be derived from the experience of this Middle Western city, it is the wondrous ability of an improvement club in starting an agitation which became more or less effective. In the case of the Middle Western city the crosstown line was finally agreed to by the local public utility. The lower steps agitation was mothered by the Women's Club and won in a jump. The six-tickets-for-a-quarter scheme was defeated in the courts, new fenders were ordered, the no-seat-no-fare lost out, bridge tolls were adjusted and the paving bill runs higher and higher.

It is evident that the improvement club has within it all the elements which go to make trouble for the manager of a public utility unless he can secure its co-operation. Many are the plans devised to bring about co-operation between the improvement club and the public utility. The first element to be considered is the character of service rendered the public by the utility. Cheap goods at high prices have no place in the game of publicity. Co-operation cannot be secured if the bargain is left handed with the jughandle in the grasp of the utility. Street car men are merely merchants. They have a given commodity to sell, and it is no different than the sugar of the grocer. To secure co-operation there must be good service rendered. With this fundamental to begin with the opportunity for publicity of an appreciable character is an inviting one.

There should be a close contact on the part of the utility with each club, particularly its officers. There should be a complete list of all the members, their house addresses, their occupation. A neighborhood club too often takes into account only its immediate section without relation to the hundred or more neighborhoods throughout the system, and it is this broader relation that should be impressed upon the members. To any one who has much to do with the improvement club it is apparent that there are difficulties in the way of convincing those who have the political bee in their bonnets and have a sinister purpose to accomplish at the expense of the utility. With these persons the contest takes on the character of a battle of wits, and not unfrequently the man with "a sinister purpose" is defeated.

THE PSYCHOLOGICAL TIME TO CUT SERVICE

In explaining the present dull business of the country President Wilson, in talking to the representatives of the National Vehicle and Implement Dealers' Association, remarked that the "trust" legislation proposed no doubt was having a depressing effect, but he regarded the present era as "psychological" for the correction of evils which later on, if permitted to run, would even create more suffering. The President's term "psychological" as applying to the present situation finds a counterpart in the utility field. What the President no doubt means is that an early day cure involves a milder dose of medicine to take than permitting the fever to run its course. While the President's viewpoint as to trust legislation does not meet with the writer's approval, his method of reasoning—taking the trouble by the nape of the neck—has much in it that can be commended. There is an incident now in process of incubation with an Eastern utility which is being watched to find the "psychological moment" for action. The situation is something like this: The company found its gross earnings falling off as a result of lessened travel upon the street cars. The apparent need of reducing the service was manifested, and the order went out to "cut." There is no feature of the relation between the public utility and the community which is so delicately attuned and so responsive to public displeasure as the street car service. Take out any cars on a given line, and within a very short time there will be a delegation in the railway president's office entering serious objections. In the case in question the lines were tightened by making faster time, and here and there was an actual reduction of the service. The first manifestation of displeasure came from the men who were let out. They told their neighbors. A week or more rolled round, then came a brief notice in the newspaper. Another week there was a letter written to the newspapers by a patron complaining of the service. The next step will be the call of a reporter. Later on the improvement club will take up the issue. Then perhaps there will be a complaint filed before the public utility commission, and an investigation will follow.

If the situation is not handled with care the ire of the public will be taken out in some form of drastic legislation. The point to be attained is to discover the precise moment for action to avoid the usual holocaust. In other words, when will the "psychological" moment appear? Shall the old service be put on for a week or more only to return later on to the cutting process and thus jockey along until the public has forgotten the incident? The interesting feature of the experiment now being undertaken is to note each step made by the public. Apparently only a very small portion is aware of the cutting down. This is due to the skill with which the schedule man is handling the car line, and it may be that the skill of the schedule man will save the day. It must be conceded that the least said about the changes the better. To announce a reduction in the service in the public press and thus to commit the proposition to the "direct" method of publicity would only produce the storm to be avoided. The situation of this Eastern utility is not an unusual one, although it has features out of the ordinary: a heavy fixed charge, a large track mileage and long lines. The public views with complacency the fixed charge and feels that the service should be adequate. Its conception of an adequate service is not in accord with the heavy fixed charges, and the outcome is being watched. What will be the next move? And when will be the "pyschological" moment to bring a peaceful solution of the difficulty?

If advice is to be given it would be to go slow with the changes and the cutting down process. If it is to be admitted that the "indirect" method is a better one, then the process should be very slow. There should be co-operation between the club and the management. Ordinarily the citizen will realize the full force and effect of dull times and for that reason may admit of a slight cut. However, each move will prove an interesting chapter in the book of "Cutting Down the Service."

SUGGESTIONS AS TO WHAT TO DO

An experience of years with the improvement clubs has brought these conclusions to the writer:

Keep in close touch with all of them. Upon the very first appearance of trouble meet the members more than half way. Let them be free to come to the office. Treat them as a very vital element in the business of the day. Make apparent the difficulties of operation, and let no stone go unturned which will bring about the co-operation so heartily desired. The improvement club is one of the most vital factors in the utility field to-day.

Changes in Taxation Laws

Abstract of Report of Committee on Taxation at A. E. R. A. Convention, Showing Modifications in State Tax Laws—Franchise Tax Burden on User—Gross Earnings Tax Truest Measure of Property Value

The committee on taxation confined its efforts this year to an endeavor to keep abreast of the changes in the taxation laws of the various states. Thirty-five states reported no change. From four states no report was received, namely, Arizona, South Dakota, Tennessee and Wisconsin. Iowa reported the passage of a joint resolution calling for an amendment to the constitution to be submitted to vote not before 1916. It provides for the classification of property and the exclusive taxation of property so classified for state purposes. Maryland created a tax commission. Massachusetts changed its method of taxation of foreign corporations and provided for the levying of an income tax. Minnesota passed a bill classifying property for purposes of taxation. The Oregon tax commission changed its method of valuation, which resulted in an increase in taxation.

From the tables prepared by the bureau of the census, the percentage of gross earnings paid in taxes by electric railways in the various states has been computed for the years 1902, 1907 and 1912 as shown in the table on page 926.

SPECIAL TAXATION

At a meeting of the National Tax Association, the committee on taxation of public service corporations submitted a report in which is discussed the question of "the equalization of taxation upon public service corporations subject to ad valorem taxation." Attention should be called particularly to this expression of the committee:

"A generation ago, before states and the nation had undertaken to regulate effectively, through commissions or otherwise, the service and charges of public service corporations, this theory [i.e., special taxation much heavier than that imposed on other classes of business or property because they hold special franchises of great value] offered a natural and logical remedy for some of the evils of unregulated monopoly.

"But the situation changes when public service corporations are brought under effective regulation. Under the latter condition, regulation of rates and service must proceed upon the theory that the corporations should be allowed to earn a reasonable return upon a fair valuation of their property. Special taxes upon regulated monopolies, therefore, merely increase the expense of providing the service and increase the rates necessary to allow a reasonable return, or else diminish the resources available for extending and improving this service.

"It is through public regulation and not through taxation that a correct policy toward public service corporations must be worked out, and theories of taxation should be based on the assumption that public service corporations are to be subjected to public control."

In the special report on taxation, of the bureau of corporations of the federal government, issued December, 1913, the federal government notes the change in the method of taxation of public utilities in Rhode Island by the creation of a permanent tax commission and the imposition of a tax of 1 per cent on the gross earnings from operation of street railways within the state in addition to the tax of the same amount heretofore levied by the state as well as to the general property tax on the tangible property of the companies. The new tax is in lieu of other taxes on intangible personal property and exempts holders of stocks, bonds and other evidences of indebtedness of such companies from taxation.

The conference of New England state tax officers held in January and December, 1912, adopted a series of resolutions recommending to their several states the classification of personal property for purposes of taxation, an extension of franchise taxes at rates which shall compensate for advantages enjoyed, and, in connection therewith, the exemption from local taxation of those securities whose value is included in the value of the franchise.

The state of Connecticut appointed a commission of three disinterested persons "to examine into the system of the taxation of railroads and street railroads located partly or wholly within the state . . . and to make such recommendations in connection therewith as shall seem to them advisable." The commission appointed by the state of New Jersey recommended, among other things, that public utility properties now locally assessed should be assessed by a state board of equalization with the aid of data from the public utilities board and valuations certified to local taxing districts. A special commission in Colorado recommends that all public utilities be taxed by a central taxing body.

TAX ON FRANCHISES

In a paper on the taxation of public service corporations, Milo R. Maltbie, Public Service Commissioner for the First District of New York, before the second international conference on state and local taxation, said:

"The method of taxing public service corporations which has attracted the most attention within the last few years is the special franchise tax. It is virtually a tax upon the right to use the streets, highways and public places for special purposes. The primary object of the movement for the taxation of franchises has been not so much to increase governmental income as to secure to the public a larger share of the profits of the corporations. Whether investors in public utilities have obtained a larger profit than they have deserved may be an open question, but that the public generally believes that they have is indisputable.

". . . But wherever there is a complete and effective system of public regulation or wherever it may be obtained as easily as the franchise tax, the advisability of attempting to control corporations thereby is open to question. The amounts taken from the public service corporations through a franchise tax may be collected in the long run from the users of the service and not from the stockholders. Under an effective system of public regulation the corporation must, of course, be allowed to earn a sufficient amount to pay all costs of operation and also a fair profit on the capital used. If, in addition, a sum must be earned to pay a franchise tax, the authority exercising public control must allow the corporation to place its rates sufficiently high or to supply service so inferior that it may earn the tax.

"The franchise tax imposes a burden on the user in order that property owners in general may be relieved. If every citizen used the services of the public utilities in direct proportion to his ability to pay, or the property he owns, or any other just standard, the injury would be merely theoretical. But the use of public utilities, especially in cities, usually bears little relation to individual income or property owned. Consequently, every dollar that is taken from public service corporations for the support of the government is likely to be taken from those who are least able to pay."

GROSS EARNINGS TAX

The report of the commission on revenue and taxation of the state of California in 1906 contains the following:

"The true present value of a street car property depends solely upon what can be taken out in gross yield less operating expenses and depreciation. The only item ascertainable with any degree of certainty is the gross receipts. The gross earnings tax is, therefore, suggested by the very fact that any other sort of taxation is uncertain and indeterminate in application and operation and must directly or indirectly refer back to the earnings. It has, moreover, all its usual advantages of certainty and ease of administration, of steady yield and steady growth, of satisfaction to the public and to the companies. It is notable that whenever cities lease or rent franchises for a term of years, they almost universally prefer a percentage of the gross earnings as the annual rental charge to a fixed annual payment. The reasons which incline both parties to regard this as the fairest and most satisfactory form of bargain apply with full force to the question of taxation."

At the sixth national conference, Alfred H. Holcomb, assistant secretary American Telephone & Telegraph Company, said:

"The increasing exemption from taxation of certain forms of personal property, such as moneys and credits, relieves private owners of such property from a burden in a way which is never thought of for public service corporations and which is even impossible of application to them under the special methods which have been devised for the assessment of their property. The 'stock and bond' method, for instance, or the 'net earnings' method reach a value for the entire property, real, personal and mixed."

It seems to be the general consensus of opinion of the closest students of the question of the taxation of corporations, and more particularly of public service corporations, that the gross receipts method is the fairest and truest measure of the value of the property which can be obtained, far superior to the ad-valorem method.

DIFFICULTY OF VALUATION

The difficulty of adequately or fairly valuing the property of a public utility is illustrated by the opinion of Chairman Stevens, Public Service Commission for the Second District of New York, in the Westchester Street Railway case decided April 24, 1912. This opinion is in part as follows:

"An inquiry into the value of a railway property as a whole is an investigation of the question, how much money or other things will men be willing to part with for the sake of possessing such property? The difficulty attending the investigation is: (1) the property has never been, we will assume, bought or sold, so that there is no direct test or evidence of its ratio of exchange; (2) it is not one of a class of things which is bought or sold with such frequency or under such circumstances as to afford a fair test of what it would be likely to bring upon exchange or sale.

"In short, no direct evidence is obtainable concerning its probable ratio of exchange. The only course open to the investigator is to select those qualities or attributes which in his judgment would create a desire for the property and then estimate how much that desire would induce a prospective purchaser to surrender for its satisfaction. The value of a property depends upon its earning power, direct or indirect. To the ordinary investor it is its direct earning power as shown by the excess of its revenues over its expenses. To another road it may be indirect, by furnishing business upon which a profit can be made, or by the suppression of destructive competition. The net earnings rule of valuation, when properly and carefully applied with due regard to all the features of the individual case, is probably the one having the surest support of basic principle."

It has long been apparent to public utilities that their property was not being assessed by the same method as was the property of individuals or mercantile and manufacturing corporations, whether these assessments were made by local assessors or by commissions created for the purpose. This impression is confirmed and some of the reasons therefor well set forth in the second annual report of the Tax Commission of Ohio, which reads to this effect:

"To properly perform his duties under these circumstances requires a degree of moral courage in the assessing officer which is not possessed by the average human, and his returns are more usually works of fiction than of truth. Proper returns have never been and never will be secured until property is assessed by officers whose tenure of office and compensation are made to depend on efficiency and faithful observance of the law."

Commenting on the provisions of the Ohio law which require all property to be assessed at its true value in money, the commission remarks:

"It will be necessary to make some radical changes in the statute before proper results can be secured. Property should be valued as the commercial world values the same. . . . That property of public utilities has not been assessed at the commercial value the slightest investigation will demonstrate. The capital stock and bonded indebtedness of the public service corporations in Ohio, as reported by the commissioner of internal revenue for the year ending June 30, 1911, amounted to $1,690,000,000, with net earnings of $53,118,252, or a little more than 3 per cent on the total capitalization. This commission assessed the property of the corporations in Ohio for the year 1911 at $912,000,000, or a sum nearly equal to the net earnings as stated in that report, capitalized at 6 per cent.

"The capital stock and bonded indebtedness of the industrial, mercantile, manufacturing and miscellaneous corporations in this state, as reported by the commission of internal revenue for the year ending June 30, 1911, exceeds $1,750,000,000, with net earnings of $151,504,400. The property of all the incorporated companies in Cincinnati, not only manufacturing, but mercantile and all other kinds, exclusive of public service corporations and banks, was assessed in 1910 at $17,697,260, or at a little more than 10 per cent of the amount of capital invested by manufacturing corporations alone, as reported by the Bureau of the Census. As the conditions were relatively the same throughout the state, it is certain that the total assessment of all the private corporations in Ohio for the year 1910 would not exceed $150,000,000. These figures were very largely increased during the last year, but it is believed property of this kind is not yet assessed at near its true value."

In support of its contention, the commission later on quotes from the Minnesota Tax Commission:

"The uniform universal custom throughout the entire state has been to assess property at from 25 to 50 per cent of its actual value, and this custom has had the long-continued approval of the people, the silent support of the law-making and the law-enforcing departments of the state government. It is a stillborn statute, unenforced and unenforcible. Any attempt to comply with its provisions would be revolutionary."

CONCLUSION

It is, therefore, perfectly apparent that under present-day conditions, with a full knowledge of the value and capitalization of properties in the hands of the taxing authorities and with none of this information with respect to other properties in the hands of the authorities, and with the voting power of the individual property holder held as a club over the taxing bodies, particularly the local assessor, the electric railway industry, together with other public utilities, is bearing an undue and unfair proportion of the burdens of taxation.

TABLE SHOWING BY STATES PER CENT RATIO OF TAXES TO GROSS INCOME FOR OPERATING AND LESSOR COMPANIES COMBINED

	1912	1907	1902
United States	5.6	4.6	4.8
New England:			
Maine	3.3	1.9	1.9
New Hampshire	3.2	1.5	1.3
Vermont	3.1	2.1	1.8
Massachusetts	7.8	5.8	6.3
Rhode Island and Connecticut	6.6	5.5	5.3
Middle Atlantic:			
New York	5.8	3.9	5.2
New Jersey	5.9	4.1	4.4
Pennsylvania	3.4	2.1	3.9
East North Central:			
Ohio	5.7	4.0	3.4
Indiana	3.0	3.7	4.9
Illinois	8.7	4.6	5.2
Michigan	4.3	3.5	3.5
Wisconsin	5.8	4.9	3.8
West North Central:			
Minnesota	6.3	5.9	3.5
Iowa	2.8	2.3	2.3
Missouri	5.9	6.1	6.0
North and South Dakotas	3.1	1.8	...
Nebraska	7.3	5.1	2.5
Kansas	5.0	2.3	2.3
South Atlantic:			
Delaware, Maryland and District of Columbia	6.7	6.2	6.9
Virginia	5.3	4.4	2.8
West Virginia	4.4	3.6	2.5
North Carolina	2.5	3.0	2.5
South Carolina	2.7	3.2	3.2
Georgia	6.0	6.2	4.6
Florida	5.0	3.6	2.3
East South Central:			
Kentucky	6.1	6.5	6.1
Tennessee	6.8	6.9	6.1
Alabama	6.4	5.1	2.5
Mississippi	3.7	3.5	1.7
West South Central:			
Arkansas	4.8	2.4	1.9
Louisiana	5.8	6.0	6.9
Oklahoma	4.3	1.3	...
Texas	3.8	3.0	2.3
Mountain:			
Montana	4.2	2.5	2.8
Colorado	5.7	3.3	3.5
All other mountain	3.9	...	...
Pacific:			
Washington	6.3	4.6	3.1
Oregon	7.1	3.2	1.7
California	4.2	4.2	5.0

Discussion on Reactance by A. I. E. E.

At the meeting of the American Institute of Electrical Engineers held in New York on Oct. 9 the topic for discussion was reactance in power station and transmission work. This topic is of particular interest to electric railway men at this time on account of the attention devoted to it in the Atlantic City report of the committee on power generation of the American Electric Railway Engineering Association. Two papers were delivered in New York, "Protective Reactances for Feeder Circuits of Large City Power Systems," by James Lyman, L. L. Perry and A. M. Rossman, all of Sargent & Lundy, Chicago; and "Use of Reactance with Synchronous Converters," by J. L. McK. Yardley, Westinghouse Electric & Manufacturing Company.

The first paper continues the discussion of the effects of reactance in power stations covered by the same authors in a paper printed at the 1913 midwinter convention of the institute. The present paper discusses in greater detail the uses and limitations of reactance coils in the feeder circuit of large city power stations. They conclude that in a large city power system, the miles of underground cable and consequently the cable faults increase at a faster rate than the generating capacity. The severity of short-circuits also increases with increased generating capacity. Feeder reactances are particularly effective in reducing and localizing the effect of such short-circuits. When properly proportioned feeder reactances are used, an increase or decrease of generator reactance has only a limited effect on the amount of kilovolt-amperes flowing into a fault. Bus-section reactances in the generating station in connection with feeder reactances still further reduce and localize these effects, even when it might be more desirable to distribute their effect if other conditions permitted.

It would be desirable for many reasons to operate feeders in parallel at their substation ends, but such operation tends to increase greatly the kilovolt-amperes flowing into a feeder short-circuit and to cause other feeders besides the one affected to trip out when overload relays with the usual settings are used.

In his paper Mr. Yardley presented a large amount of original data on the effects of protective reactance on the a.c. side and d.c. side of the rotary converter. Many oscillograms of currents and emfs were reproduced in connection with the paper. He divided synchronous converter installations into several classes for purposes of analysis, namely: those in which it is of prime importance to keep voltage on the lines, those in which heavy overloads are frequent but where the voltage may be allowed to drop off during overload, and those in which brief although frequent interruptions are not objectionable if necessary to protect apparatus. On account of space limitations it is impossible here to even summarize the results of the tests described by Mr. Yardley which have been very recently carried out. Among other conclusions he states that if a properly-designed quick-acting circuit breaker be used, and the proper amount of reactance be placed in the d.c. circuit, it is impossible to flash a converter over, as the circuit-breaker will trip out the circuit before the current approaches the tripping-out flash-over value.

In the discussion D. B. Rushmore, Schenectady, N. Y., called attention to the present-day recognition of the necessity for considering an electrical system as a whole rather than treating each part separately. Formerly the demand was for transformers of low reactance, while now special effort is made to make it as high as possible. Phillip Torchio, New York, claimed that insulated rather than bare wire should be used in reactance. H. W. Buck, New York, stated that long-distance transmission lines possess inherently so much reactance and resistance that protective reactors are not needed so far as the delivery of the line is concerned. J. J. Frank, Pittsfield, Mass., expressed the opinion that, since it has no moving parts, the reactor is the most satisfactory and reliable protective device thus far developed. N. W. Storer, Pittsburgh, said that the protective reactor should be equipped with a quick-opening short-circuiting device to connect the reactor in circuit when the reactance is needed and to keep it short-circuited at all other times.

In line with the country-wide movement to grasp opportunities offered by the Panama Canal and the war in Europe for the expansion of United States trade in South America, J. G. White, of J. G. White & Company, Inc., New York, has established three scholarships in the Spanish language at the Pennsylvania State College. He offered the prizes "as a stimulus to the students to fit themselves for handling Latin-American trade." Mr. White's offer has been accepted.

New Presidents of the Associations

Those Elected Were: Accountants' Association—C. S. Mitchell, Pittsburg Railways; Claims Association, William Tichenor, Terre Haute, Indianapolis & Eastern Traction Company; Engineering Association—L. P. Crecelius, Cleveland Railway; Manufacturers' Association—E. H. Baker, Galena Signal Oil Company; Transportation & Traffic Association—M. C. Brush, Boston Elevated Railway

At the concluding sessions of the four affiliated organizations of the American Electric Railway Association the elections of the new presidents for the ensuing year resulted in the selection of men who have all been active in association work, and who may be expected to maintain the high standard of past activities in cooperating with C. Loomis Allen, the new president of the American Association, of whom a biography was published in yesterday's issue. Brief biographical sketches of these new officers as well as of the newly elected president of the Manufacturers' Association are given in the following paragraphs.

Matthew C. Brush, who was elected president of the Transportation & Traffic Association on Thursday, is second vice-president of the Boston Elevated Railway. He graduated from Armour Institute in 1897 and from the Massachusetts Institute of Technology in 1901, and soon after graduation took up work in the mechanical and transportation departments of the Union Pacific, and Chicago, Burlington & Quincy Railroad. While in steam railroad work he acted as machinist, foreman, and roundhouse foreman of the Union Pacific Railroad with headquarters at Omaha, Neb., and he was general foreman in charge of shops and roundhouses of the Chicago, Rock Island & Pacific Railroad. He also secured some experience in steamship traffic in the Great Lakes district.

In 1904 he entered electric railway work as general manager of the Boston Suburban Electric Companies, which operate an extensive system of suburban electric railway lines west of Boston with headquarters at Newton. Soon after he was also elected vice-president of the system. Here he carried forward a constructive policy of strengthening public relations, systematizing operation and placing the entire system upon a firm financial foundation.

In the spring of 1910 Mr. Brush accepted the position of general manager of the properties controlled by the Buffalo & Lake Erie Traction Company, with headquarters in Buffalo, but returned to New England in November of the same year to become assistant to the vice-president of the Boston Elevated Railway. He was elected to his position as vice-president of the Boston Elevated Railway Company early in 1912.

In all of the positions which he has occupied Mr. Brush has made constant efforts to promote friendly relations with employees and with the public. He is credited with the first successful attempt to secure sixcent fares on a large scale on a New England system. In his present position he has had charge of the efficiency work of the company and has waged a warfare against preventable losses, and on behalf of service improvements. He has taken an active interest in railway association work, notably the New England Street Railway Club and the American Electric Railway Association. Since Mr. Hegarty's resignation he has been acting president of the Transportation & Traffic Association, and showed by his conduct of the sessions of this association at Atlantic City that he has those qualities which will enable him to administer the duties of his new office in a most efficient manner.

L. P. Crecelius, who was elected president of the Engineering Association on Friday, was born in St. Louis, Mo., in 1879, and received his educational training in the public schools of that city and in the St. Louis Manual Training School of Washington University. After completing this course he began an apprenticeship in power plant work with the Southern Electric Railway Company as plant electrician in 1899. When this company was later consolidated with other electric railway properties into the United Railways he continued in the power department of the new company in various capacities. In 1896 he left St. Louis to go to Newark, N. J., to accept the position of assistant superintendent of overhead construction of the Public Service Railway under Albert Stanley. He gave up this position in 1907 to go to Cleveland, Ohio, where, after the readjustment of traction affairs in that city, he was engaged to assist in appraisal work. In 1910 he was appointed by John J. Stanley to be superintendent of motive power and electrical engineer of the Cleveland Railway. He continues in this work at the present time and has had a great deal of interesting work in connection with the rehabilitation of the power distribution and substation equipment of the company.

M. C. BRUSH
President Transportation & Traffic Association

L. P. CRECELIUS
President Engineering Association

Mr. Crecelius is an active member of the American Electric Railway Engineering Association and of the American Institute of Electrical Engineers. In the former he has naturally specialized in the direction of power generation, having been chairman of the power generation committee in 1912 after membership in the committee for two years. He began his active work in the association on the car wiring committee about 1907. During the past few years he has been especially interested in the development of the 60-cycle converter and presented a paper on this subject recently before the Cleveland Section of the American Institute of Electrical Engineers. He contributed an article on the same general subject to the 1914 report of the committee on power generation of the Engineering Association. Mr. Crecelius has an inventive turn of mind and an inspiring enthusiasm for his work. As vice-president of the association he has become familiar with its administrative problems.

C. S. Mitchell, who was elected president of the American Electric Railway Accountants' Association at Atlantic City on Oct. 15, has been third vice-president of the association during the past year. He has long been active in the association, has been a member of different committees for a number of years and has been a member of the association since 1900. Mr. Mitchell's railway experience has been entirely in Pittsburgh. He was born near that city and entered the auditing department of the United Traction Company of Pittsburgh in August, 1897. In 1899 control of the road was purchased by the Philadelphia Company which in 1902 acquired all of the surface railways in Pittsburgh. At that time Mr. Mitchell was appointed auditor of the combined property and continued in that position until 1912, when he became controller of the company.

C. S. MITCHELL,
President Accountants' Association

WILLIAM TICHENOR,
President Claims Association

William Tichenor, the new president of the American Electric Railway Claims Association was born in Lewis, Ind., in 1859. After completing his education in a country school, he taught school for ten years. During this period he married, and in 1891 moved with his family to Ann Arbor, Mich., where he studied law in the University of Michigan. He graduated in 1893 and soon after completing his law studies, moved to Terre Haute, Ind., where he began the practice of law. In 1896 he was elected prosecuting attorney of Vigo County, served two years in this capacity, and then returned to the practice of law in Terre Haute.

In January, 1905, Mr. Tichenor was made assistant attorney of the Indianapolis Traction & Terminal Company. Later when Hugh J. McGowan, then president of that company, purchased and merged the lines which now form the Terre Haute, Indianapolis & Eastern Traction Company, he was made claim agent of the company and he holds this position at at the present time. He became a member of the Claims Association at the Columbus convention in 1906 and has attended every convention since that time. During the past two years he has served as second vice-president and first vice-president, respectively, of the association.

E. H. BAKER,
President Manufacturers' Association

Edwin H. Baker, the newly elected president of the American Electric Railway Manufacturers' Association, has a widespread acquaintance and rich experience in association and railway affairs which eminently fit him for the position to which he has been elected. Mr. Baker was born in Brooklyn, N. Y., March 4, 1853. He attended school in his home city and graduated from the Brooklyn Polytechnic Institute. His first business position was with S. T. Baker & Company, with whom he remained from 1873 to 1894. Then he entered the service of the Galena Oil Company, now the Galena Signal Oil Company, of which he is second vice-president.

Mr. Baker was elected a member of the executive committee of the Manufacturers' Association in July, 1905. He served as chairman of the finance committee in 1904-1905, as treasurer in 1906, and for three years has been vice-president in charge of exhibits. He is a member of the following clubs: Brooklyn, New York Railroad, New York Yacht, New England Street Railway, Empire, Boston Railroad and Pittsburgh Railroad.

First Lecture in Correspondence Course

The first lecture in the correspondence course for electric railway accountants conducted by John R. Wildman, professor of accounting New York University, School of Commerce, Accounts and Finance, is to be mailed on Oct. 19. The lecture discusses first the purpose and scope of accounting, this subject after the general introductory remarks being taken up from the standpoint of the purpose of the systems of accounts established by public service commissions. Professor Wildman then mentions the factors that produce income, namely, land, labor, capital and business organization. In connection with the latter point, valuable information is offered concerning the economic phases of organization. Later an extended discussion of the legal phases of business organization is given, showing the proprietary or capital accounts that are used under each form and the legal method of organization, rights and liabilities that characterize each form. Trusts, including consolidations, mergers and holding companies, will be discussed more in detail when the preparation of financial statements is studied. The lecture contains at the end references for collateral reading and the first quiz for the members of the course. The latter consists of an essay regarding various features of the corporate and financial organization of the correspondent's company.

It is stated that the names and marks of the ten men submitting the best quiz papers will be published in the lecture next month.

A recent issue of the *Electrical Review*, London, gives the total value of British export trade in electrical goods in August as £238,621, compared with £564,291 in July. The principal markets for the August electrical exports were: Canada and Newfoundland, £14,960; Argentina, £37,269; India, £40,215; Victoria, £13,778; New South Wales, £14,155, and New Zealand and Fiji Islands, £11,309. The United States, Philippines and Cuba received £1,476 from Great Britain during August, and Germany received £5,768. The principal item of export was machinery which had a value of £86,789 or, roughly, 37 per cent of the total. The registered electrical imports into Great Britain amounted to £86,734, having fallen from £291,244 in July. The principal countries supplying this trade were the United States, £39,426, and Germany, £24,953. The corresponding German figure in July was £168,000. The principal item of import was machinery. It was valued at £29,152 or, roughly, 34 per cent of the total. During the month the British re-exports amounted to £10,001.

South American Trade Opportunities

Several speakers discussed South American trade opportunities at a lunch of the Merchants' Association of New York, held at the Hotel Astor on Oct. 14. Those who spoke were W. S. Kies, manager foreign trade department National City Bank of New York; John F. Fowler, vice-president W. R. Grace & Company, New York, and Charles M. Pepper, former foreign trade adviser of the Department of State. Nearly 1000 people attended the lunch.

Mr. Kies explained in detail the plans of the National City Bank for the opening of two branch banks in South America. The decision to open these branches, which was reached in June, before the commencement of the European war, was made possible by the new federal reserve law. It was mainly through the assistance of German and British banks in South America that the trade of Germany and Great Britain with South American consumers had been built up to large proportions. It was well understood that a regular provision in the loan arrangements between those banks and South American borrowers required that the proceeds be spent with manufacturers in the countries which advanced the funds. When the new banking act was passed many inquiries as to the possibilities of foreign business were received. As a result of these, 6000 letters were sent by the bank to exporters and importers, and the responses showed that American manufacturing interests had suffered from lack of banking facilities in South America. Within a few years the development of trade with South America would lead to surprising and satisfactory results.

Mr. Fowler said that there was no mystery about South American commerce, but that it required care and meant large and long responsibilities. Long before the European war was started there was a general business distress in South American countries. Each South American country would have to learn, one by one and each in its own way, how to face the present problem and how to get on its feet again. The buying power of South America, Mr. Fowler added, was much crippled and would remain so for some time. It must not be imagined that all exports from Europe to South America were cut off. Up to the time of the present economic distress in South America trade between this country and South American countries had been increasing. Mr. Fowler expressed the belief that hereafter this country would enjoy a larger share of the commerce of South America. As a market South America had not been neglected by this country. There was not a small town in South America that was not ransacked for orders on behalf of merchants and manufacturers in the United States.

It could not be expected that this country, under the conditions that had prevailed in the past, would take as large a share of South American trade as would Europe with its population of 450,000,000 comprising both producers and consumers. That population was to be compared with the 100,000,000 of this country, most of whom were pretty well contented with what they got at home. The new tariff law, however, was a sign that this country was prepared to buy more from the rest of the world than it had done before. Hereafter this country would increase steadily the volume of its purchases from South American countries.

The present was an opportune time, Mr. Fowler said, but the prospects must be considered earnestly and sensibly, not hysterically. A great deal of what had been preached lacked common sense. It always had been European capital that stimulated South American countries. If capital from this country could be sent to the assistance of South American countries, it would help greatly to develop future trade. Referring to the frequent reproaches against exporters here on the score of niggardly credits, Mr. Grace said that our exporters had been very liberal and much more so than they would be in home trade. Whether he bought in Europe or here, the worthy South American trader had about the same credit facilities. Wherever situated, it was the unworthy customer who howled the loudest when merchants would not give him dangerous terms. Shipping facilities, Mr. Fowler declared, were relatively as good to South America as to Europe, and there was no complaint to be made about freight rates.

In conclusion, Mr. Fowler mentioned some "don'ts," which briefly were as follows: Don't use second-hand packages. Don't use boxes carrying old ship marks. Don't advertise contents on the outside of packages. Don't forget that freight is frequently discharged on rough seas. Don't forget that the customer wants to receive goods on time. Don't forget to give good service with reasonable charges.

Mr. Pepper declared that South America was one of the great and growing markets of the world and should be studied in that attitude. He advised manufacturers to establish permanent exhibits of products in large South American centers. This country was reaching the period when a great many more manufacturers must have foreign markets.

Lessons from the South American Experience

Col. Herrera de Hora, in giving to a representative of the ELECTRIC RAILWAY JOURNAL the story of his thirty-odd years' experience in South America, stated that in 1880 he began electrical pioneer work there with the Bell telephone and the Brush electric light. This succeeded well, and if the industry had been judiciously fostered by extending a fair amount of credit, so as to enable the people to digest the new industry, America would have been pre-eminent in the electrical enterprise. Our manufacturers, however, says M. de Hora, saw fit to insist in almost all instances on practically cash transactions with the result that the Englishman entered the market. Having banks, such as the London River Plate, the London & Brazilian, the British Bank of South America and several others, through which they had been in the habit of extending credit for Manchester goods from six months to periods of eighteen months and two years, they attacked the electrical market on the same credit lines, so that the American orders rapidly fell off and by 1890 most of the trade was in English hands. The Germans then came along, and by means of hard-working and courteous representatives who spoke the language, by means of metric catalogs in Spanish and Portuguese, and by means of manufacturing to order, they succeeded in ousting the British. At the outbreak of the present European war Germany practically controlled the electrical supplies of the whole South American continent, although their goods are inferior in most cases to the British and more so to the articles supplied by American manufacturers.

If our manufacturers wish to succeed in South America they can only do so by taking a leaf out of the Germans' book. They must endeavor to satisfy in every sense their customers, by sending an experienced and tactful representative speaking fluently the languages of the countries he visits, to study conditions, ascertain the status of the business people, make friends and social acquaintances and, most important, find out the exact requirements of the various purchasers. Then they must fill those requirements without one hint of substitution and with especial care in packing. American manufacturers must not forget that South America is full of shrewd business men, honest and reliable. They are naturally proud of the progress made by their various countries and they can be reached only by gaining and holding their entire confidence.

COMMUNICATIONS

Using the Technical Journal

STONE & WEBSTER

BOSTON, MASS., Oct. 6, 1914.

To the Editors:

I note with interest in the issue of Oct. 3 an abstract of Mr. Alvord's paper on "How to Use a Technical Journal," and I could wish he might follow it with a second paper, pointing to the solution of several problems, questions that must almost of necessity confront every engineer, whether he be classed as "young," "middle-aged" or "mature." Mr. Alvord says that he, himself, maintains a file of clippings and abstracts, a practice which, I believe, has proved very satisfactory to most engineers who have adopted it. I would be surprised, however, to learn that he does not let any questions go unanswered —or answered by mere guess—because he has not a clipping on the subject and does not know where he may readily find the needed reference. Therefore, I would plead for a better way of rendering available a great deal that is valuable, but effectually lost, because apparently too insignificant to index, or because it appears as part of an article under a different title.

I have long urged that the library world should so organize as to provide a custodian for every idea and every article needed by men in business or professions. It is easy enough to lay out such an organization on paper, but not easy to get people to believe in it, much less to finance it. The mere system of indexing is not a matter of greatest difficulty, but it is difficult to decide how far to go, i. e., to decide what is merely waste and what needs to be particularly cared for. A librarian not having use for an article himself, may trust too much to the titles and names of writers, while often the technical man scorns what is not of use to-day.

I believe, however, that we are evolving toward a system in which the specialists are to be held morally responsible for information and sources of information kindred to their specialties. For instance, in the needed system, if two engineers are particularly interested in good roads, one would hold himself responsible for the literature of tar macadam roads, and the other for that of wood pavements, assuming that the whole literature of roads and pavements is too much for one man. This would be a step toward contributing to the support of a special library on roads, which would naturally know who are the specialists. This same idea carried to its ultimate development is what we need the country over, professional men of every description standing sponsors for, or subscribing to the work of, those who will collect the information and have it available when wanted.

I would hold publishers of journals responsible to maintain card indexes of substantially everything that goes into their journals, so that they can hold up their right hands and say, "Nothing has appeared in this journal in the last ten years of more than six lines in length that we cannot lay our hands upon."

Such refinement is, I believe, a matter of the near future, because men in their earning capacity are realizing more and more that they need to know what other men have said that pertains to their immediate problems. Believe that the well-trained librarian can generally advise about the ways and means of getting information on almost everything, and insist that he thus make himself useful to you. He may tell you that John Smith has a still better clipping file than yours, and you may need to thank the librarian for putting you in touch with your superior. G. W. LEE, Librarian.

Insert Special Work Failures

THE MEMPHIS STREET RAILWAY COMPANY

MEMPHIS, TENN., Oct. 7, 1914.

To the Editors:

I have read with interest the very exhaustive articles on "Insert Special Work Failures," in Nos. 12 and 13, Vol. 44, of the ELECTRIC RAILWAY JOURNAL. I thoroughly concur in all you have to say and wish especially to emphasize what you have said in regard to the proper installation of special work. It is difficult to instill into a foreman the exact care necessary to get the best results. I believe that the life of a complicated layout of special work can be increased fully 50 per cent by proper installation and maintenance.

I also wish to call attention to one feature of insert failures not mentioned in your articles; namely, the carelessness on the part of the manufacturer in forming the groove through the insert plate. Failure to have the groove of the insert uniform with the groove of the adjoining rail, especially in curves, is the cause of the gouging of the opposite rail. This is a defect difficult for the railway company to remedy and one to which the manufacturers should give careful attention.

J. H. HAYLOW, Engineer.

UNITED RAILWAYS COMPANY OF ST. LOUIS

ST. LOUIS, MO., Oct. 9, 1914.

To the Editors:

In my opinion the article entitled "A Study of Insert Special Work Failures," appearing in the ELECTRIC RAILWAY JOURNAL of Sept. 19, and the article entitled "Examples of Insert Special Work Failures" appearing in the issue of Sept. 26, cover the subjects very thoroughly. Such articles as these are sure to result in a more thorough study of special work failures by maintenance of way departments. In addition to the study of special work pieces in service, a thorough study of the scrap pile and of the worn-out special work pieces at the time they are removed from the track is worth while.

There is no doubt that the life of insert special work could be materially increased if inserts were tightened, readjusted or removed at the proper time, or if proper work was done with the rail grinder or welder to reduce the pounding of car wheels at cupped places. It has been the practice of this company and, I believe, of almost all of the large companies, to keep one or more gangs constantly engaged in making repairs to insert special work. There is a large variation in the amount of work to be done, however, and it is not always possible to obtain at the proper time a sufficient number of men who are competent to make such repairs. If the work is not handled by well-trained men a large number of inserts are almost sure to become loose in a short time, and even with the best men it is difficult to obtain satisfactory results with some of the types of so-called renewable inserts.

C. L. HAWKINS, Chief Engineer.

The Public Service Commission for the First District of New York has issued Vol. 8 of its proceedings for the period from Jan. 1, 1913, to Dec. 31, 1913. A very complete index at the back of the volume permits a quick reference to any of the cases before the commission during the period.

Equipment and Its Maintenance

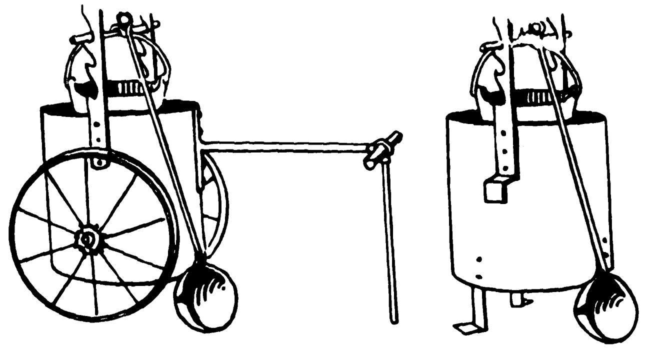
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Centers—Renewal and Repair

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

"Get acquainted with your fastenings" is the first word in the care of centers. The maker is always ready to explain their construction. There are many styles of fastenings, and a clear understanding of them will be a big first help. Watchfulness is the next. Examine your centers after a rainstorm, or after the sprinkler has been around; wet lines remaining around the edges of the center show the fastening to be imperfect. If the style of the fastening will permit, tighten it as soon as possible; this will often prevent the loosening of the crossing arms.



FURNACE POT AND LADLE OF PORTABLE AND STATIONARY TYPES

TOOLS

Owing to the variety of fastenings, a full list of tools cannot be given. However, the use and make of the levers and special tools required will be explained and often furnished by the makers of the special work. The chipping tools shown are indispensable. Two styles of lead furnaces are also illustrated; the one on wheels is the better. Before lighting your fire, take the weight off the wheels. To do this we use three short pieces of rail which are 1 in. longer than the distance from the bottom of the furnace to the bottom of the wheels. If the weight is not taken off, the tops of the wheels will soon begin to bind against the side of the furnace. A good grinder is a necessity; flexible shaft types are the most practicable. A good blow torch, also, is needed.

SAFETY FIRST

When chipping, always use goggles with a good heavy glass. "The eye you buy is never as good as the one nature gave you." Always set a block about 6 in. high and 1 ft. wide, with a generous quantity of waste between the block and your chisel; this will protect the pedestrian and incidentally the near-by store windows.

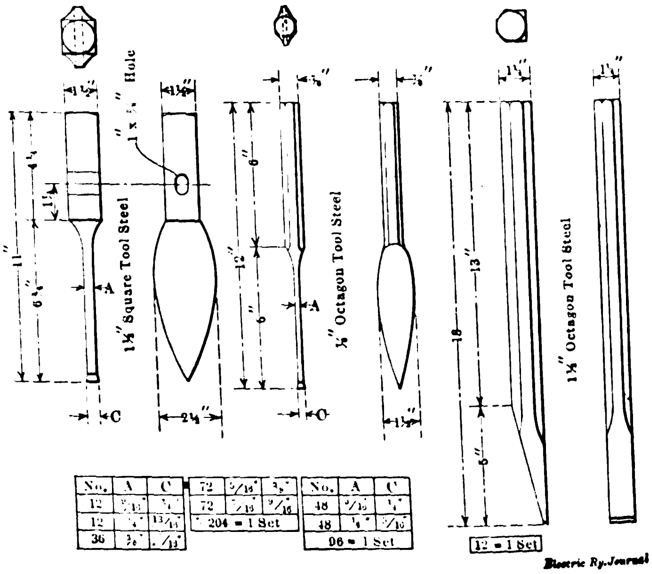
REMOVING THE CENTER

The method of removing the center depends upon the style of fastening. If there is babbitt to remove, you may be able to confine your chipping to one side. Thus clear, you may be able to force your center over to one side, which will give more room to work on the other and allow the use of the heavier cutter. "Stickers" are often met, and the best means we have found to remove them is by expansion. The torch is applied until the entire casting is heated; next a ring of clay or putty about 1 in. high is placed around the center; cold water is then poured on the center, a spillway having been formed to carry the water outside the casting. As soon as the center shows cool, a vigorous attack with light sledges will loosen up the worst "sticker." The operator will quickly become expert at this work, and much time and labor will be saved. The center removed, a thorough cleaning out of all dirt is necessary. To reset for babbitting, all moisture must be removed. The torch is seldom used for this, as kerosene and waste are better and cheaper.

RESETTING

The resetting of the center is the important point and requires quite a little skill. Four points are selected close to the ends of the abutting rails. Then the distance from the top of the rail to the bottom of the bed is found. From this distance deduct the thickness of the center, and the remainder will be the height of the bearing point. Finally, the center is lowered to the tops of the bearing and adjusted until there is a perfect bearing at all four points. It is essential that there shall be no rocking when the fastening is applied.

Opinions differ as to the material for use in the bearing points. We have obtained the best results, under traffic, with soft iron. Some use lead while others use copper. We have found babbitt very good, especially with bolted centers, because the strain can be gradually increased, while lightly tapping the bearing points, until the center is brought to the proper level. The next thing of importance is a good tight end fit. No dependence should be placed on the babbitt for keeping the center tight. A good hard babbitt should be used in order to prevent sagging or giving way in the center.



Electric Ry. Journal

STANDARD CHIPPING TOOLS FOR HARD CENTERS

Babbitt should not be subjected to excessive heat. The practical test of the required heat is made with a piece of dry paper or a sliver of white pine; when the paper or pine flames, your metal is right and should be used quickly for best results.

Pouring babbitt is dangerous work if the proper precautions are not used. A little kerosene in the bottom of the bed will often save a bad burn and can never do any harm. Always use goggles and cover up the top of the hands.

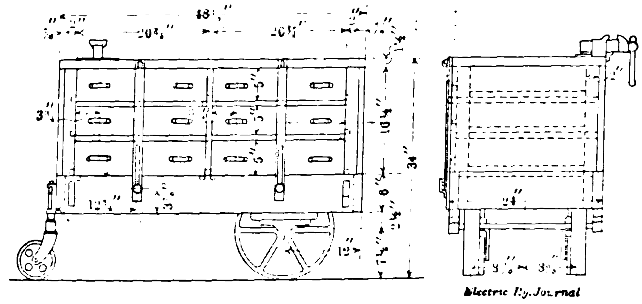
A good emergency repair on an all-babbitt center is made by placing some screen wires or 1/8-in. or 3/16-in. rods in the bottom of the opening, raising them above the floor on small bits of iron, say, 3/4 in. high; place a hammer handle in the groove and pour the opening full of babbitt. The wire prevents the metal from being pounded up to one end, and you will be astonished at the service secured from a center like this. We have had them under fairly hard service for three months and they remained in good shape. They will at least save your crossing while waiting for the new center.

The question of comparative merit between the all-babbitted center, the center with a partly machined bearing surface and the center with a completely machined bearing surface has been raised. No center made will last as long as the crossing (and by this the 90-deg. or nearly 90-deg. crossing is meant) without unduly dishing or becoming so noisy as to make its renewal or repair necessary, but the all-babbitted center, properly installed, will hold just as well as either of the other types. The manner of fastening will not prevent cold rolling or peening; this must be overcome either by direct downward pressure or greater depth of center. This can be done just as easily with the all-babbitt center, with the advantage in its favor of quick renewal and easy fitting.

Detroit United Portable Work Bench

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

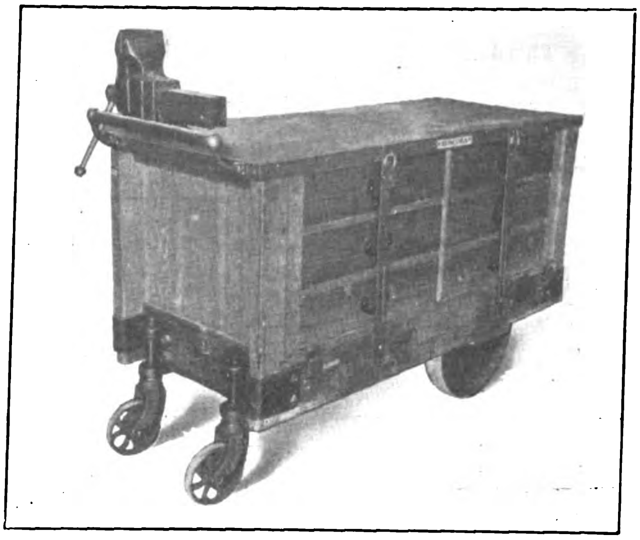
The removal from cars and storage and replacement of the many small brass castings and other parts, prior to painting and finishing, is a process that generally entails numerous petty but annoying losses. Even the loss of time occasioned by the overturn of a box of wood screws or the misplacement of a casting or the running back and forth to a work box may amount to an appreciable period. Therefore, any device that permits work of this character to be accomplished with the least loss of time is always of interest.



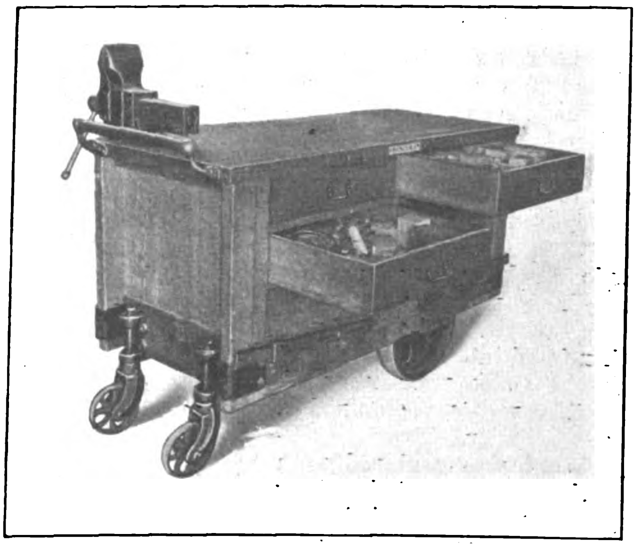
DETAILS OF DETROIT UNITED PORTABLE WORK BENCH

At the Highland Park paint shops of the Detroit United Railway, a portable work bench that deserves comment is in use. This bench is mounted on the familiar type of shop truck and consists of a cabinet 24 in. x 48 in. in plan, containing six drawers. The top of the cabinet is made of 1½-in. oak, and is fitted with a cast-iron woodworkers' vice and a suitable handle for pushing the bench from car to car. The drawers may be locked by means of slotted bars and padlocks, as will be best understood by reference to the accompanying illustrations.

When a workman receives orders to strip a car, he places all the necessary tools in one of the drawers of the bench, and pushes the bench to a convenient location alongside of the car. The several fittings, upon removal, are placed in a drawer reserved for that purpose. When the work is completed, the bench is returned to the stripper's storeroom, where the parts are made into bundles or placed in boxes and tagged with the number of the car. It has been found in practice that two men can work with ease at one bench, and that a number of cars may be stripped before the drawers are filled. Hence only a few trips to the stripper's storeroom are necessary.



PORTABLE WORK BENCH WITH DRAWERS LOCKED



PORTABLE WORK BENCH WITH DRAWERS OPEN

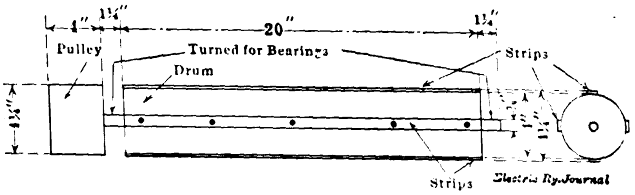
The method of bundling and boxing the fittings eliminates the confusion and chance of loss in the stripper's storeroom, and greatly expedites the cleaning and polishing of these parts. Even the wood screws removed when taking down the trimmings are kept in small boxes provided for that purpose and are used again. When a car is ready for trimming, the drawers of the bench are filled with all the parts belonging to that car, in addition to a supply of extra nails, brads and screws for emergency use. Thus the bench has made it possible to complete the trimming of a car without requiring the frequent trips between car and storeroom formerly necessary. The approximate cost of one portable bench complete is about $40, which is more than made up by the saving of time.

Device for Testing Controller Finger Springs

BY R. H. PARSONS, ELECTRICAL FOREMAN

The Third Avenue Railway, New York, has recently put into use a simple device for testing the springs of controller fingers. This addition was brought about by trouble with broken springs and the fact that certain manufacturers submitted samples of fingers, the springs of which are claimed to be practically unbreakable. To get to the bottom of the situation and to see if there was anything in the claims for unbreakability a device has been fitted up as follows:

A K-11 controller frame then in the shop for overhauling was stripped with the exception of the main cylinder bearings and the fingerboard. An old car axle was mustered into service by turning it to 4 in. in diameter for its full length and also turning it down to 7/8 in. at two points, as shown on the sketch. These points correspond with the bearings of the controller frame, as the turned-up car axle was to fit into the place of the main controller cylinder. The end shown at the left of the sketch was to act as a pulley.



DRUM USED IN CONNECTION WITH A K-11 CONTROLLER FOR TESTING FINGER STRIPS

Four strips 1/3 in. thick x 1 in. wide were screwed onto the drum over its entire length and were equally spaced on its surface. The drum was then fitted into the frame, and the bearings were replaced. In this way we obtained a false cylinder. Next the fingerboard was equipped with the fingers to be tested. These fingers were applied in the usual manner with the regular holding screws, and all were set with the same spring tension. The completed frame was then fastened to a bench, and a belt regulated to run at a speed of 320 r.p.m. was attached to the pulley from the shop line shafting.

The fingers under test are set with 8-lb. spring tension, adjusted so that normally they rest lightly on the drum. As the drum turns, the strips raise the fingers 1/8 in. allowing them to drop to the drum after passing the strip and again lifting when the next strip is reached, thus getting four lifts per revolution of the drum, the action being exactly the same as that received in regular service in a controller.

The diameter of the drum over the strips is the same as that of a main controller cylinder measured over the plates. Therefore the fingers are raised at the same angle as in a real controller, and the lift due to the strips is practically the same as that recommended by the manufacturers of the fingers.

Although not necessary, the standard controller cover is put onto the frame to help keep out the dust and to drown the noise. The drum is well greased with vaseline and is allowed to run continuously. As stated before, the drum makes 320 r.p.m. and as the fingers get four lifts per revolution the fingers will move up 768,000 times during a ten-hour day. It seems to me that this test will decide a number of points about controller fingers.

Proper Connections of Transformer Secondaries to a Self-Starting Rotary

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

The following incident may be of educational value to the substation construction man:

A substation was erected to house three 500-kw rotary converters with three 185-kw, 25,000-volt, sixty-cycle, single-phase transformers for each rotary. The transformer primaries were connected in delta and the secondaries in six-phase, 428 volts with 61 and 91 per cent starting taps. The rotaries were six-phase, self-starting on the a.c. side, diametrically connected and wound for 600-volt, d.c. railway service.

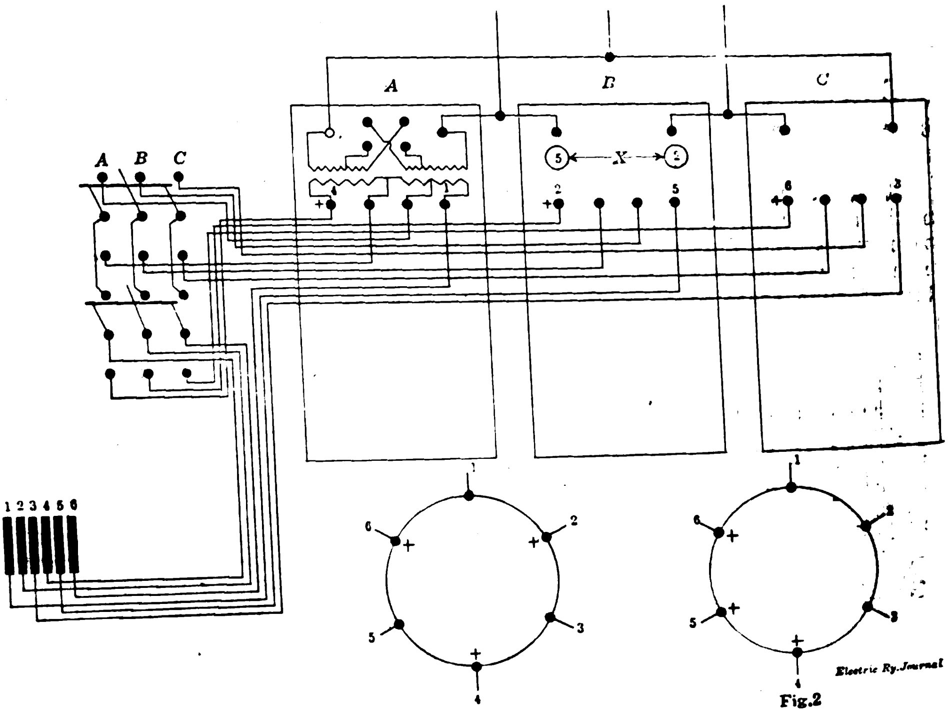


Fig.1 Fig.2

DIAGRAM OF CONNECTIONS BETWEEN TRANSFORMER SECONDARIES AND CONVERTER RINGS WITH ANALYSES SHOWING CORRECT (FIG. 1) AND INCORRECT (FIG. 2) ORDER OF CONNECTIONS

When the rotaries were lined up and the transformer primaries connected I asked the engineer in charge if he had any blueprints of the secondary connections. He answered "No," but gave me half a day to work out the connections from the manufacturer's instruction book. (It should be stated here that the a.c. starting panels and the d.c. panels were supplied by another manufacturer so that we had no assembly print of the connections.) Within the time stated I presented to the engineer the accompanying diagram, which he in turn submitted to the rotary manufacturer's representative for verification before ordering the connection of the secondary cables. But the representative condemned the diagram and ordered us to change the two leads on transformer *B*, indicated by *X* in the accompanying drawing, so that the lead going to ring No. 2 would be transposed to ring No. 5, while the No. 5 lead would go to ring No. 2. The rest of the diagram was pronounced all right.

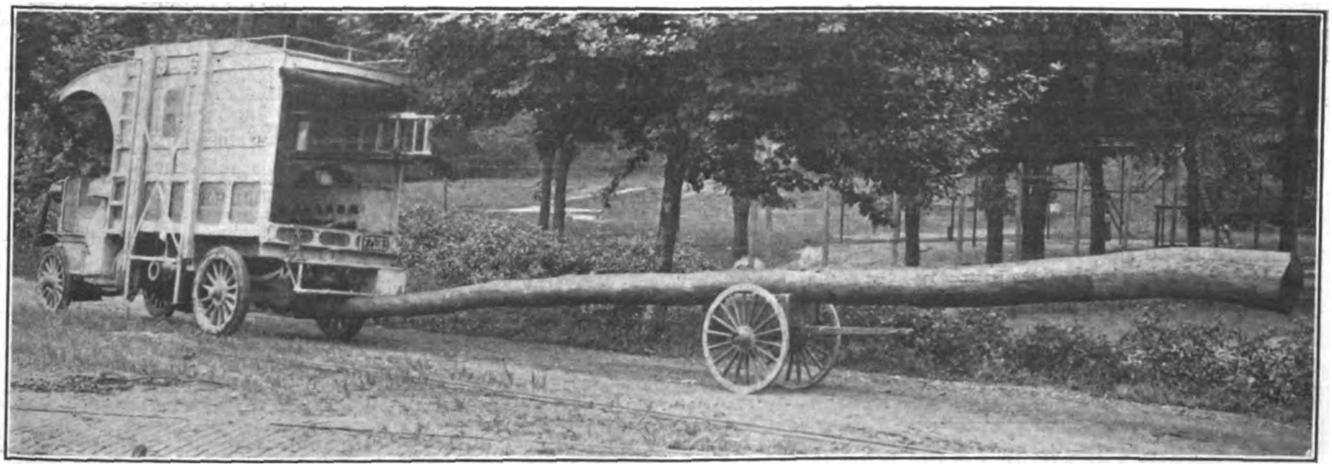
The cables were connected and on the Sunday afternoon set for starting the machinery we tried the rotaries, but they would not run at all although 60 amp at 25,000 volts were being taken from the line. On examination we found that two armature coils of each group of coils were cold but that the third coil was red hot.

We had a long debate as to the cause of the trouble. Some suggested an auxiliary induction motor for starting and others proposed to change the armature. After three days we determined to "cut and try" until the right way was found. Strange to say, when the two leads on transformer *B* were reversed to comply with the original diagram the rotary converter ran correctly. On analyzing the connections we found that the order of positive and negative connections was in alternation as per Fig. 1, whereas the connections suggested by the manufacturer's representatives came out as per the impracticable negative and positive grouping shown in Fig. 2.

When the substation was placed in service the manufacturer's representative was promoted by his company to the position of district engineer. I was dismissed.

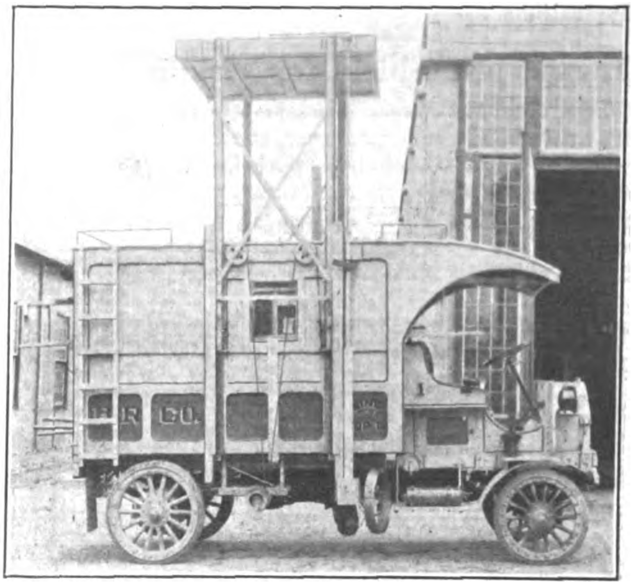
Motor Truck for Line Maintenance

A motor truck for overhead line maintenance embodying a number of unusual features has recently been purchased by the line department of the Harrisburg (Pa.) Railways. Essentially this truck consists of the standard chassis sold by the Motor Truck & Tractor Company, Harrisburg, Pa., equipped with 40-hp, four-cylinder Continental engine and fitted with a body designed especially for overhead line maintenance. This body, exclusive of the driver's seat, is 10 ft. long x 5½ ft. wide over all. The interior of the body, which is reached from the ground by two steps at the rear, is fitted with a work bench, tool box, combination ladder, racks for rope and wire and shelves for miscellaneous tools and buckets. An extension of the upper rear step permits the installation of the pipe vice. A small cabinet on the opposite side of the steps provides space for the soldering kit. This cabinet is substantially built and lined with sheet asbestos so that there will be no liability of fire in case the solder kit is set in it while hot.



HARRISBURG RAILWAY'S LINE TRUCK WITH POLE TRUCK ATTACHED

Perhaps the most novel feature is that the tower platform, which is 6 ft. x 5¼ ft. in size, is raised and lowered by the engine which drives the truck. By means of a worm drive in combination with a friction drive connected to the engine shaft, the tower elevating mechanism is driven by the truck motor. The friction drive is engaged with the engine shaft by a hand lever accessible on the platform floor. This lever is connected to the friction drive by an extension shaft, hence it is operative at any position of the platform. The upper section of this shaft is a rectangular bar which fits into a pipe with a nut bushing at its upper end.



MOTOR TRUCK OF HARRISBURG RAILWAYS WITH MOTOR-DRIVEN TOWER PLATFORM RAISED

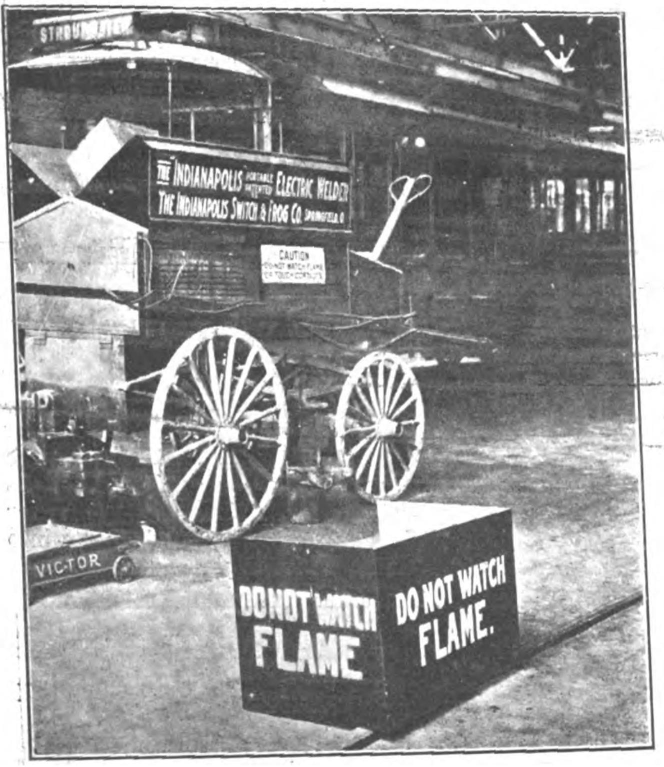
The tower elevating shaft projects each side of the car body, where it is fitted with a cable drum. Over these drums two cables pass to a pair of sheaves mounted near the top of the body, and each cable connects to a leg of the tower. The platform legs and guides are of wood and steel construction, being of sufficient length to raise the platform 17 ft. above the ground, thus permitting a lineman to work on a trolley with 22 ft. clearance above the top rail. The platform has folding hand rails on all four sides. A short ladder at one end of the body permits access to the roof, and a small rail around the edges of the roof makes it possible to use this space to store pike poles and other long linemen's tools.

In addition to providing an engine which will propel this truck at approximately 15 m.p.h., the engine was made large enough to draw a pole truck, a coupling being provided for this purpose at the rear end of the body. Views of this truck with the tower in the elevated position, and with the tower down and the pole truck coupled for transportation, are shown in the illustrations.

Inexpensive Shield for Welding Service

To protect the eyes of passers-by when electric welding operations are in progress, the Cumberland County Power & Light Company, operating the electric railway system of Portland, Maine, places around the point the shield illustrated in the accompanying halftone.

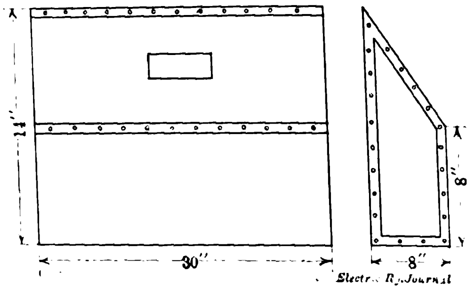
The shield is made of car dasher steel 1/16 in. thick and is 30 in. long and 18 in. square at each end. A 3/8-in. round rod brace connects the ends near their outside edges. The force working on the welding job is provided with special goggles, but as a cheap but effective "safety first" device in the interests of the public the shield deserves mention.


THE INDIANAPOLIS ELECTRIC WELDER
THE INDIANAPOLIS SWITCH & FROG CO.
CAUTION
VICTOR
DO NOT WATCH FLAME
DO NOT WATCH FLAME.

WELDING SHIELD USED AT PORTLAND, MAINE

Car Cleaners' Refuse Pan

In order to reduce the cost of car cleaning to a minimum, and at the same time eliminate floor trash which may represent a fire hazard, the master mechanic of the Little Rock (Ark.) Railway & Electric Company has devised and is using a refuse pan of the type shown in the accompanying illustration. This box is made of No. 16 or No. 18-gage galvanized iron, the opening near the top of the apron serving as a handle. The pan was made in the company's shop and its width is governed by the width of the standard step, since it is usually set beside the lower step where the refuse may be swept into it. When the pan is filled it is dumped into a larger trash container located at some convenient point on the carhouse floor.



SHEET METAL BOX

Emergency Kits at Junction Points

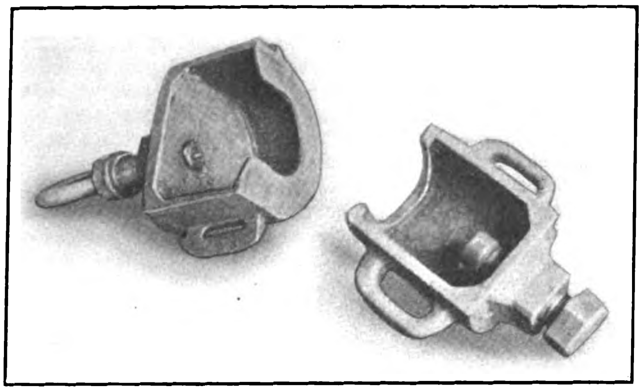
At a great number of junction points on the Minneapolis and St. Paul street railway systems of the Twin City Rapid Transit Company emergency outfits similar to that shown in the accompanying halftone are maintained. These outfits are housed in a wooden box located under the railway's telephone call box. The emergency supplies include trolley pickups, extra switchrods, shovel, broom and such personal belongings like raincoats, rubber gloves, etc., as may be stored there by the local inspectors. A 1-in. steel cable with swivel hooks at each end is stored around the pole holding the box. This cable is available for use in case of derailment or in handling broken wagons.

EMERGENCY TOOL BOX AT JUNCTION POINT

The buses of the Coventry, England, tramways department have been requisitioned by the government for military purposes, and are to be sent to Aldershot.

East St. Louis Pinion Pullers

Generally speaking there are almost as many different kinds of motor pinion pullers as there are shops in this country. Those employed by the East St. Louis & Suburban Railway, while in some respects like others already described, include several features. The pinion pullers shown in the accompanying illustration are used to remove GE-73 twenty-four tooth pinions and GE-70 seventeen-tooth pinions. The castings were made by a local foundry from patterns furnished by the railway. The work of finishing and applying the pulling screws was done in the railway's shops.



PINION PULLERS OF THE EAST ST. LOUIS & SUBURBAN RAILWAY

The smaller puller, or that for the GE-70 seventeen-tooth pinions, is made with a large nut on one end of the puller screw, and the other end is enlarged and cupped so that it will fit over the end of the armature shaft. The other puller also has the cupped puller-screw bearing, but the projection of the screw beyond the nut is formed into an eye. This eye serves as a place to attach the hook from the overhead traveling hoist, which is used to elevate armatures from the pit to the shop floor. A pinion puller of one of these types is provided for each of the different types of motors used by this company. The finished GE-73 puller cost approximately $9, and the GE-70 puller cost about $7 complete.

Testing Dielectric Strength of Oil

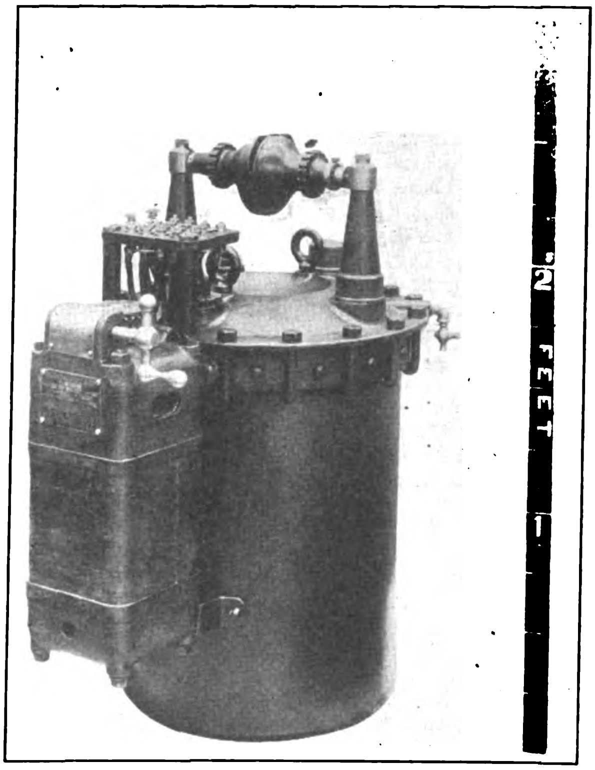
To insure successful operation of high-voltage oil-insulated apparatus, it is necessary to maintain the dielectric strength of the oil at maximum value. A testing set has recently been developed and placed on the market by the General Electric Company for determining this quality.

This set consists of a testing transformer with an induction regulator for voltage control and an oil spark-gap. All of the parts are assembled and mounted to form a compact unit which may be conveniently and quickly operated. The set is built for both twenty-five and sixty cycles.

The transformer has a rating of 3 kva at 30,000 volts, but may be operated at 10 per cent above this figure. The high voltage winding has a voltmeter coil for indicating directly the test voltage. The transformer tank is of drawn seamless steel and the cover is fitted so as to be oil-tight, permitting shipment filled with oil. The induction regulator allows a variation of the test voltage from zero to maximum. The regulator, as well as the transformer, is arranged for series-parallel connection, making the set suitable for use on 100-volt or 200-volt circuits. A dial is attached to the top of the rotor shaft of the regulator and is accurately graduated to give readings of the test voltage directly in kilovolts. The set may also be equipped with a small portable voltmeter for reading the test voltage, provision being made on all outfits for mounting an instrument specially designed for the set. This instrument is of the dynamometer type, is very accurate and the scale is graduated to read the test voltage in kilovolts.

The oil is tested between flat metal disks, which are located inside the receptacle. One electrode is stationary, and the other has a micrometer adjustment with an adjustable zero index. This permits taking up readily any wear in the gap. The receptacle is designed so that it may be very conveniently cleaned. It is estimated that ¾ qt. of oil is sufficient for one sample, allowing five tests on clean oil.

The oil receptacle and spark-gap are supported by the high-voltage terminals of the transformer. Merely by turning the receptacle about its horizontal axis, the oil which has been tested may be emptied, being caught by a depression in the transformer cover and flowing away through a pipe. The receptacle and gap may also be easily removed from the supports, leaving the transformer free for high potential testing of any kind up to 33,000 volts. This apparatus is also equipped with a small sensitive circuit-breaker of novel design, which is attached to the side of the regulator. The set may also be mounted on a truck, making it portable.



TYPE K 30,000-VOLT OIL-TESTING SET

The use of the induction regulator for voltage control produces no noticeable distortion of the emf wave shape and therefore contributes greatly to the accuracy of the test results. The weight of the sixty-cycle set complete is 465 lb., height 30 in., length 24 in., width 17½ in.; the weight of the twenty-five-cycle set complete is 670 lb., height 32 in., length 26½ in., width 20½ in.

An agreement has been reached between the St. Louis, Springfield & Peoria Railway, included in the Illinois Traction System, and the Southern Illinois Light & Power Company whereby the railway agrees to carry freight for the light company in smaller quantities than carload lots. The agreement has been approved by the State Public Utilities Commission of Illinois.

News of Electric Railways

TRANSPORTATION CONDITIONS IN PITTSBURGH

President Callery of Pittsburgh Railways Reviews Transportation Problems in Letter to Mayor

J. D. Callery, president of the Pittsburgh (Pa.) Railways, recently sent to Mayor Joseph G. Armstrong a reply to the Mayor's communication in regard to conditions in Pittsburgh. In his letter Mr. Callery refers to the Mayor's expression of a hope that the company and the city will be able to come to some amicable agreement. He says he reciprocates that feeling, as the company prefers to give good service and to "establish relations of peace and comfort between the city, the company and the latter's patrons." Mr. Callery first replies to the Mayor's apparent implication that the company has not done all it could possibly do to provide good service, then analyzes the Mayor's suggestions, saying some are practicable and others are not, and declares that the service is as good as could be expected "in view of the little aid the company received from the two preceding administrations." Not much can be accomplished, Mr. Callery says, "unless the whole people will give us their intelligent co-operation." The Mayor's recommendations will be carried out, Mr. Callery promises, or else he will show the Mayor that it is not wise that they should be adopted. Concerning the company's treatment of recommendations made by the State Railroad Commission several years ago, the letter makes these assertions:

That on the thirteen routes for which additional service during the rush hours was recommended the service is 44 per cent better; that there are 38 per cent more street inspectors to regulate the headway of cars that the schedule may be followed; that there are no more switches in the downtown district that have to be operated by the crew of a car; that the heating and ventilation of cars are better regulated and are in charge of the crews; that the company has shown itself ready to co-operate in the abolition of grade crossings; that 308 double-truck cars have been put into service instead of only the fifty additional fixty-six-seat cars recommended by the commission in June, 1910; that in trying to improve the service and to change the number of cars to suit the requirements of travel the company is at a disadvantage in that there are some lines which do not have places at the termini where cars can be turned, and therefore a few lines do not furnish as good a service as they otherwise could; that many of the twenty-eight-seat cars have been abandoned, as recommended, and replaced by larger cars.

Several reasons against through routing of cars are given. Regarding the suggestions by the Mayor for a more liberal transfer system, Mr. Callery says:

"A universal transfer system in such a city as Pittsburgh would not be just to the company. You do not suggest such a system in your letter, nor do I believe that you would think of demanding it. There must be some proportion established between the distance the passenger travels and the 5-cent fare. Every patron will recognize that there is some mileage which he is entitled to for 5 cents, and he ought not to ask for more, nor would he if he thought he was justly treated. We are limited to a fixed fare of 5 cents within the city, and every passenger coming into town in the morning or going home at night gets an equivalent for what he pays. Short riders do not proportionately get as much as the passenger who is carried 4, 5 or 6 miles, but we do not like this any better than the short rider does. It is impossible in street-car traffic to make each passenger pay exactly the mileage he travels, as in railroad traffic. It would take too much time to adjust it on the cars. The London bus system could not be applied to street cars.

"Every district of the county has its own through service into the city. This is due largely to the topography. Street cars have to follow the easiest route. There are sixty-six distinct lines that touch the downtown district. We cannot construct and operate crosstown routes with any advantage. It has been our aim and purpose to bring every passenger into the heart of the city for one fare. We have tried to select transfer points so that men and women may get to and from working centers for one fare.

"It is not to the particular advantage of the people of the city to give universal transfers, but rather to the suburban patrons who get a long ride anyway. To give to a patron of one distinct route a transfer which would let him ride to the end of the other sixty-five routes would be folly. There is no way by which we can get money to run the cars except through the 5 cents from our patrons. A general transfer system would give to those persons who may now get a long ride a still longer one, and the person who really pays his own fare and a little more for the suburbanite would have poorer service.

"I have felt it my duty to state my objections to some of your suggestions, but I wish you to understand from this letter that I am ready to do anything that is practicable in the way of adopting any of the changes and recommendations of yourself and of the City Council. There is no one who is more anxious than I to have the Pittsburgh Railways give the best possible service to the public."

A list of suggestions for new franchises is appended to Mr. Callery's letter, the proposed grants including curves, turnouts, sidings and new tracks on streets already occupied by rails and on streets not yet occupied.

DEVELOPMENTS IN CLEVELAND

New Stock Issue, Schedules and Safety Zone Matters Reviewed

The Cleveland (Ohio) Railway has applied to the Ohio Public Utilites Commission for permission to issue $2,382,600 of new stock. Councilman William Stolte and others objected at once on the ground that the low fare would be endangered by the additional stock issues. Mayor Baker, however, notified the company that the city would make no opposition. He said that the place to oppose expenditures is in the City Council and not before the commission. E. W. Doty, a member of the commission, said that a hearing on the application would be held shortly. Joseph Alexander, engineer, of the street railway commissioner's office, said that all the expenditures shown in the application were favored by Commissoner Witt.

Councilman Koch introduced a resolution at the regular meeting of Council on the evening of Oct. 5 which provides for a 4-cent fare with a rebate of 1 cent for transfers. Mayor Baker, however, disapproved of the plan. Mr. Koch insists that it is unfair to force those who are compelled to use transfers to make up the deficits in operation. W. F. Thompson, president of the City Council, revived the idea of the zone system. He says that it is practically impossible to extend the 3-cent fare system to outlying territory and that a readjustment of the plan must be made at no distant date.

J. J. Stanley, president of the Cleveland Railway, stated that the company would insist upon the schedules in the Tayler franchise, and that it would be unwise to try to undo what has been done and introduce another period of trials and uncertainty.

Cleveland is experimenting with a safety zone system similar to that in use in Detroit. At two Superior Avenue crossings and at the car stop on the east side of the Public Square zones have been marked off with paint on the pavements, and police officers have been stationed to instruct both pedestrians and drivers of vehicles how to use them. Safety lanes 25 ft. wide have been marked from curb to curb at the crossings and a strip 60 ft. long and 6 ft. wide has also been marked off at each car stop. This space is known as the safety strip. No vehicle is allowed to drive inside of this strip.

W. R. Hopkins, president of the Cleveland Rapid Transit Company, announced on Oct. 5 that all arrangements had been completed to finance the underground railway which the company proposes to build in Cleveland. The time for commencing the work will depend upon the breaking of the financial deadlock caused by the European war.

Members of the Cleveland local of the Amalgamated Association of Street & Electric Railway Employees are endeavoring to have a legislative committee established by the appointment of one member from each local organization in the State. They feel that the Legislature should collect the laws pertaining to the electric railway men and include them all in one bill, so that they would have no trouble in understanding just what is required.

NEW YORK SUBWAY CONSTRUCTION CONTRACTS

Recent Work Under Way and Contracts Let

Work has begun on the construction of the two new rapid transit tunnels under the East River from downtown Manhattan to Brooklyn. The two tunnels will be built by the Flinn-O'Rourke Company, Inc., and will cost more than $12,000,000. One will be operated by the Interborough Rapid Transit Company, and will connect the Seventh Avenue subway in Manhattan with the existing subway and its extensions in Brooklyn, the tunnel leaving Manhattan at Old Slip and reaching Brooklyn at Clark Street. The other will be operated by the New York Municipal Railway Corporation as a connection between the Broadway subway in Manhattand and the Fourth Avenue subway system in Brooklyn, the tunnel leaving Manhattan at Whitehall Street and reaching Brooklyn at Montague Street. The contract time for the completion of the tunnels has been set at forty-two months.

The Public Service Commission has awarded the contract for the construction of the diagonal station and connection in Forty-second Street between the existing subway and the new Lexington Avenue subway. It went to the lowest bidder, the Rapid Transit Subway Construction Company, for $3,097,312. This is the construction company of the Interborough Rapid Transit Company, the lessee of the existing subway. This connection will pass under the old Grand Union Hotel property and diagonally across and under Forty-second Street and a portion of the New York Central property on the northwest corner of Lexington Avenue and Forty-second Street. The diagonal station will be built in front of the Grand Central Terminal in Forty-second Street. It will be one of the largest underground stations in the world, and will have connections with the Grand Central Station, the proposed extension of the Hudson & Manhattan tunnels, the existing subway, the new Lexington Avenue subway and the reconstructed Steinway tunnel. Considering its location and the number of lines which will reach it, this station will probably develop into the greatest traffic center in New York City. As the construction must be done without endangering or seriously interfering with traffic in the existing subway, the contractor is required to give a bond of $250,000 to the Interborough Company, the lessee of the subway, as well as a bond of $500,000 to the city, for the faithful performance of the work.

Bids have been opened for that part of the Park Place, William and Clark Street subway, which runs from the Seventh Avenue subway in West Broadway through Park Place. under the Post Office Building and Beekman Street to William Street. This is part of the route which will connect the new Seventh Avenue subway with the new tunnel to Brooklyn, and will be operated by the Interborough Rapid Transit Company. It will be a two-track line, with a local staion at Park Place and Church Street, having an entrance from Broadway. It will pass under the new Broadway subway as well as the existing subway in Park Row. The official figures on the bids submitted were as follows: Frederick L. Cranford, Inc., $1,571,363; Degnon Contracting Company, $1,714,200; Smith, Hauser & MacIsaac, $1,886,467; Holbrook, Cabot & Rollins Corporation, $1,967,471; Oscar Daniels Company, $1,975,732; Underpinning & Foundation Company, $2,049,098; Rapid Transit Subway Construction Company, $2,250,175.

At its meeting on Oct. 6 the Public Service Commission refused, by a vote of four to one, to adopt a resolution, offered by Commissioner J. Sergeant Cram, declaring forfeited a contract between the city and the Dock Contractor Company for the construction of that section of the Broadway subway, Manhattan, lying between Bleecker Street and Union Square.

The Public Service Commission has approved the award by the New York Municipal Railway Corporation to the Thomas Crimmins Contracting Company for $197,442 of the contract for the installation of the third-rail, etc., in the Fourth Avenue subway, Brooklyn, between the Manhattan Bridge and Eighty-sixth Street. The proposed installation involves approximately 141,300 ft. of third-rail and 126,800 ft. of track rail bonding. The company will furnish the third-rail and most of the other materials. The contractor will give a bond of $25,000, and will agree to complete the work within thirty days from the completion of the track-laying work by the city, which is being done by the Thomas Crimmins Contracting Company.

The Public Service Commisson has approved the award by the New York Municipal Railway Corporation to the Terry & Tench Company, Inc., the lowest bidders, for $321,305 of the contract for the construction of additional tracks on the Broadway elevated line in Brooklyn between Havemeyer Street and Myrtle Avenue. The company will supply the structural steel, ties and other materials to be used in the installation of the additional tracks, and the contractor will perform the work. The plans have been submitted to the commission and approved by its chief engineer.

NEW SOUTH WALES GOVERNMENT RAILWAYS AND TRAMWAYS

According to the report of the Chief Commissioner, the number of tramway lines of the New South Wales Government Railways & Tramways open on June 30 was 212. The total capital expenditure on these lines was £7,628,653. The expenditure charged to capital account during the year amounted to £929,348. The total earnings were £1,934,164, as compared to £1,754,566 during the preceding year, an increase of £179,598, or 10.23 per cent. The working expenses amounted to £1,669,033, as compared to £1,572,190 for the preceding year, an increase of £96,843, or 6.16 per cent. The percentage of expenditures to receipts decreased from 89.61 per cent to 86.29 per cent. The net surplus, after providing for working expenses and interest on capital, was £1,680, as compared to a deficit of £32,456 last year. During the year the tramway fares were increased and it is estimated that the extra revenue secured during the last three months amounted to £45,000, thus enabling the company to wipe out the deficit that had accrued to the company during the preceding year.

During the year 310,592,698 passengers were carried, as compared to 294,455,452 during the preceding year, an increase of 16,137,246. The tramway miles run increased 1,460,709 to a total of 28,415,476. During the year 138 eighty-passenger bogie motor cars and thirty-two fifty-passenger four-wheel motor cars, besides other equipment, were purchased and 516 electric cars were overhauled. The earnings per tram mile increased from 1s. 3½d. in 1913 to 1s. 4¼d. in 1914. The working expenses showed no change in percentage, so that the return per tram mile after paying working expenses increased from 1½d. to 2¼d. The total staff during the year was 42,721, of which the tramways employed 9,394.

LAST OF TRUST LEGISLATION

The House of Representatives has now adopted the conference report on the Clayton anti-trust bill, following similar action by the Senate. The enactment of the Clayton bill into law ends the adminstrative program in respect to trust legislation, at least as far as the present moment is concerned.

Representative Mann, minority leader of the House, spoke in opposition to the adoption of the report, although he was not supported by all the other Republicans on the vote. Twenty-two Republicans stood with the solid Democratic majority as in favor of the legislation, and six Progressives also voted with the Democrats. The vote was 244 for and fifty-four against.

In attacking the Clayton bill report, Representative Mann pleaded for a cessation of legislation affecting business, saying: "We have the opportunity now by wise legislation to encourage our people to build manufacturing institutions, to make America independent practically of foreign aid in commerce, and to give us an inlet into every foreign commerce with our manufactured articles. We ought to be encouraging the production in our own country of many articles for which we are now wholly dependent upon foreign lands."

Joplin Arbitrators Chosen.—James A. Cable has been selected by the employees of the Joplin & Pittsburgh Railway and John M. Kinkel by the company as members of the board of arbitration to consider the wage schedule, which will automatically become a part of the agreement signed recently. These two will select the third arbitrator. Both Mr. Cable and Mr. Kinkel are members of the Kansas Public Utilities Commission.

Transportation Hearings for Western Massachusetts.—The commisson appointed by Governor Walsh to investigate the transportation needs of the five western counties of Massachusetts will shortly begin public hearings at the Hampden County Court House, Springfield. Among the subjects to be considered is the future electric railway development of the district. A strong sentiment on behalf of additional lines exists in many of the Berkshire towns, but no satisfactory plan of financing these has come to the front since the plans of the New York, New Haven & Hartford Railroad for the development of the district had to be abandoned for the time being.

Obstructionist Measures Laid on Table in City of Toledo.—At a meeting of the committee on public offices of the City Council of Toledo, Ohio, on Oct. 7, Councilman Mulholland's resolution to have the franchise committee break off all negotiations with the Toledo Railways & Light Company and with the various civic organizations was laid on the table. The committee took the ground that such a step would be antagonistic to every one interested in the speedy settlement of the franchise question. Council met in regular session on Oct. 5, and after adjournment the franchise committee discussed the Kryzaniak resolution to employ Cornell Schreiber, former city solicitor, to aid the law department in its contest with the railway company. This matter was finally tabled indefinitely. The majority of the members felt that City Solicitor Thurstin and his assistants are able to handle the matter and that data or information secured by Mr. Schreiber during his term in office belongs to the city and should be turned over to the law department.

New York Commission Disposing of Accumulated Business.—All cases pending since before the present personnel of the Public Service Commission of the Second District of New York assumed office have now been assigned for determination, and current cases are disposed of, in addition, as rapidly as may be. During the last month fifty-nine new formal cases were filed with the commission, but as final orders were issued in sixty-six cases the pending total has been reduced from 287 to 280. This makes a total of 363 new cases filed since March 16 of this year, and a total of 473 finally disposed of, reducing the number of cases pending from 390 on March 16 to 280 on Oct. 1. The disposition of informal complaints has kept pace with those of formal character. More than 125 informal complaints have been disposed of during the last month and eighty-four new ones filed. This reduces the total of such cases pending on Sept. 1 from 375 on that date to 331 on Oct. 1. Since March 16 more than 850 informal complaints have been filed with the commission and 1087 have been disposed of, reducing the total pending before the commission from 558 on March 16 to 331 on Oct. 1.

PROGRAM OF ASSOCIATION MEETING

Kansas Gas, Water, Electric Light & Street Railway Association

The seventeenth annual convention of the Kansas Gas, Water, Electric Light & Street Railway Association will be held at the Fifth Avenue Hotel, Arkansas City, Kan., Oct. 22, 23 and 24. The program includes the following papers: "Co-operation," by H. W. McGruder, president of the Liberal Light, Ice & Power Company; "Cost of Distribution and Overhead Charges," by E. A. Wright, manager of the Manhattan Light, Ice & Power Company; "Regulation and Control of Public Utilities," by T. J. Strickler, engineer of the State Utilites Commission, Topeka; "Safety First," by A. M. Patton, assistant general manager of the Western Railways & Light Company, Topeka; "Rate Making," by Prof. George Shadd, Kansas University, Lawrence; "When Bonds Come Due," by H. P. Wright, president of the H. P. Wright Investment Company, Kansas City.

Financial and Corporate

Havana Electric Railway, Light & Power Company

The condensed profit and loss statement of the Havana Electric Railway, Light & Power Company, Havana, Cuba, for the year ended Dec. 31, 1913, follows:

Gross earnings	$5,417,054
Operating expenses	2,489,832
Net earnings from operation	$2,927,222
Interest on deposits, rents, etc	140,087
	$3,067,309
Fixed charges, taxes, etc	1,219,206
Surplus income for the year	$1,848,103
Acquired surplus*	856,810
Surplus Jan. 1, 1913	294,749
Total	$2,999,662
Deduct:	
Dividends paid during the year	$1,686,205
Profits transferred to sinking fund reserve	92,412
Total	$1.778,617
Profit and loss balance carried forward to 1914	$1,221,045

*Acquired surplus represents excess in dividends received on stock of the Havana Electric Railway during the year from its accrued surplus over its actual earnings for 1913.

The above statement includes the operations of the railway division of the company only from June 18, on which date the operation by the Havana Electric Railway ceased upon its legal dissolution by merger into the Havana Electric Railway, Light & Power Company. The statement of operation of the railway division for the year, including the operation by the Havana Electric Railway to June 18, 1913, is shown by the following statement:

Car earnings	$2,860,947
Miscellaneous earnings	48,286
Stage earnings	356,894
Gross earnings	$3,266,127
Operating expenses:	
Maintenance	$322,041
Transportation	931,325
General	173,606
Stage lines	284,685
Total	$1,711,657
Net earnings from operation	$1,554,470
Deduct:	
Interest	$462,744
Taxes	61,601
Total	$524,345
Net income*	$1,030,125

*Miscellaneous income, such as interest on deposits, etc., not strictly departmental not included.

At the end of 1913 the railway department was operating twenty-four lines with a maximum of 285 cars on week days and 289 on Sundays. The total number of fare passengers was 56,782,362, an increase over 1912 of 4,913,509, or 9.47 per cent. The increase in 1912 over the preceding year was 7.1 per cent. The passenger earnings of the entire system during 1913 were 9.47 per cent in excess of the earnings for 1912. The passenger car miles increased from 9,192,296 in 1912 to 10,543,739 in 1913, or 14.7 per cent. Passenger earnings per car mile decreased from 0.2822 cent to 0.2693 cent, or 4.57 per cent. The total operating expenses increased 8.84 per cent, while the total operating expenses per car mile decreased from 0.1426 cent to 0.1353 cent, or 5.12 per cent.

The total new construction for single track, exclusive of yards, for 1913 was 5.53 miles, giving a total mileage of 71.78 miles. There were 4.68 miles of trackage reconstructed in 1913. Fifty new closed motor passenger cars were constructed and equipped and nineteen passenger cars were reconstructed. All new passenger cars were equipped for single-end operation and the older cars are being gradually changed from double to single end. The stages owned by the company decreased from 168 in 1912 to 165 in 1913, and the gross receipts decreased from $390,002 to $356,894. It is stated that preparations are being made for the use of electric motor omnibuses to replace a portion of the present stage service.

The work of maintaining discipline among the employees through the decision of a jury of two men, selected from conductors and motormen who serve for a period of four months, has been in use, it is stated, continuously since the latter part of 1907 with increasing success. During 1913 this jury examined and passed upon 10,038 cases, out of which 6094 were warned, 2159 fined, 1541 suspended, 125 discharged and 12 ordered back to practice. During the year 170 men resigned.

Accidents involving personal injury have shown a steady relative decrease during the last six years, owing to the effect of the jury system, the improved organization and the distribution of cash prizes to car men with best accident records. The car miles per accident have increased 50 per cent as compared with 1908 and the total passengers per accident 70 per cent. During the year a total of 19,134 trips were lost owing to wagon blockades. Freight traffic required 44 per cent more locomotive hours and 85 per cent more car hours. The total freight car mileage amounted to about 4.5 per cent of the passenger car miles.

Winnipeg Electric Railway

The income statement of the Winnipeg Electric Railway, Winnipeg, Man., for the year ended Dec. 31, 1913, follows:

Gross earnings	$4,078,694
Gross expenses	2,252,606
Net earnings	$1,826,088
Fixed charges	$570,583
Dividends	1,070,043
	$1,640,626
Surplus for year	$185,462
Balance Dec. 31, 1912	2,091,236
	$2,276,698
Less transfer to reserve account	$1,000,000
Less transfer to suspense account	375,000
	$1,375,000
Balance Dec. 31, 1913	$901,698

The gross receipts of the company for 1913 were $4,078,695, as compared to $3,765,384 in 1912, an increase of $313,311, or 8.32 per cent. The operating expenses for the two years were $2,252,607 and $2,004,142, an increase for 1913 of $248,459, or 12.4 per cent. The net earnings of $1,826,088 for 1913 compared with $1,761,236 for 1912, an increase of $68,852. or 6.8 per cent. The operating ratio increased from 53.23 in 1912 to 55.23 in 1913. Passengers carried in 1913 were 59,563,757 and in 1912 51,106,017, an increase of 8,457,740. Transfers increased from 11,858,213 in 1912 to 15,039,016 in 1913.

After providing for the percentage on earnings accrued to the city and the interest of bonds, the directors declared four quarterly dividends amounting to $1,070,043. This left a surplus of $185,462 to be transferred to profit and loss, making a total credit as of Dec. 31 of $2,276,698. From this $1,000,000 was transferred to the reserve account and $375,000 to the expense account, leaving $901,698 to be carried forward to profit and loss.

During the year 18.147 miles of track were laid and forty double-truck closed motor cars were constructed in the company's shops. During the period the company was granted a franchise and made contracts for new railways in the municipalities of St. Vital and Fort Garry.

GLASGOW CORPORATION TRAMWAYS

The result of the operations of the Glasgow Corporation Tramways for the year ended May 31, 1914, shows that the ordinary income amounted to £1,083,846 and the working expenses to £676,277, leaving a net revenue of £407,569. The ordinary income of the previous year was £1,011,543 and the working expenses £619,346, leaving a net revenue of £392,196. After adding interest on investments and rental of lines, and after deducting interest, sinking fund, taxes and depreciation and expenses amounting to £418,666, the net balance of £53,892 was paid over to the Common Good. The average traffic revenue per car mile increased from 10.364d. to 10.609d., or 0.245d. The working expenses, however, increased 0.281d. per car mile, mainly on account of increased wages, extra expenditures for permanent way and maintenance, fuel costs and local taxation.

The total amount of expenditure on capital account as of May 31 was £3,675,317. The amount to the credit of the depreciation and permanent way renewals fund at the beginning of the year was £2,040,282. There was added during the year £212,642 and deducted for renewals £94,186 of the account, leaving a credit balance of £2,158,738. To the original credit in the general reserve of £39,362 there was added £113 and deducted £1,405, giving a credit balance of £38,069. During the year £77,797 was expended for ordinary tramway repairs. In addition to this £85,438 was set aside to meet the cost of track renewals, calculated at the rate of £440 per mile of single track. The total cost of ordinary repairs for the power plant and sundry machinery was £7,895, and the charges against revenue to meet depreciation amounted to £32,048. The total cost of maintenance on miscellaneous equipment was £1,426 and revenue charges for depreciation £3,714. The total length of tramways now owned by the corporation, measured as single track, amounts to more than 196 miles.

Camden & Suburban Railway, Camden, N. J.—The Camden County Board of Equalization of Taxes, acting upon suggestions of the New Jersey Board of Equalization of Taxes, recently made increases aggregating $500,000 for public utility corporations in Camden. The equipment of the Camden & Suburban Railway, operated by the Public Service Corporation of New Jersey, was raised in valuation from $231,000 to $346,000, and the value of the poles and wires of the company was increased from $150,000 to $225,000. The gas equipment of the South Jersey Gas, Electric & Traction Company, also operated by the Public Service Corporation of New Jersey, was increased in valuation from $231,000 to $347,625.

Cleveland (Ohio) Railway.—The Cleveland Railway has applied to the Public Utility Commission of Ohio for authority to issue $2,382,600 of additional capital stock.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—The Interurban Railway & Terminal Company, the property of which was placed in the hands of receivers recently, suffered severely from the floods last year and from fire which destroyed its Sycamore Street depot in Cincinnati and a fire which destroyed another depot. The suit by the city to force the company to carry passengers to the city limits for a 5-cent fare complicated matters still further.

Lisbon (Portugal) Electric Tramways, Ltd.—The result of operations of the Lisbon Electric Tramways, Ltd., for the year ended Dec. 31, 1913, after deducting interest and amortization due on the debentures of the Compania Carris de Ferro de Lisboa and after the payment of £25,650 for interest on and redemption of the debentures of this company and also paying office expenses and directors' fees, showed a net profit of £103,686. Added to the £1,637 brought forward from the preceding year this gives a balance of £105,323. Of this amount £35,000 was credited to the depreciation reserve and £5,000 to the exchange reserve account, there remaining an available balance of £65,323 from which the usual preference dividend amounting to £25,533 was paid. On the ordinary share capital an interim dividend of 3 per cent, amounting to £19,020, was paid in November, 1913, and a final dividend at the same rate has been recommended. The balance of £1,749 was carried forward to next year's account.

New England Investment & Security Company, Springfield, Mass.—According to a statement filed with the Massachusetts Public Service Commission by the New England Investment & Security Company for the year ended June 30, the dividends and interest received during the year amounted to $712,215; deductions, $24,173; interest on coupon notes, $445,543, and dividends $170,000, leaving a surplus for the year of $72,499. This, combined with the accumulated deficit on June 30, 1913, of $525,717 and the discount on the sale of bonds of $23,920, gives a total deficit as of June 30, 1914, of $477,138.

Northern Electric Railway, Chico, Cal.—Meetings of the bondholders and other creditors of the Northern Electric Railway were called for Oct. 13 and 14 by the trustees of the Sloss Security Company to consider a reorganization plan.

Philadelphia & Western Railway, Upper Darby, Pa.—The gross earnings of the Philadelphia & Western Railway for the year ended June 30, 1914, were $371,857, as compared to $297,061 for the year previous. The operating expenses increased from $174,697 in 1912-1913 to $208,377 for the present fiscal year. The net earnings increased from $122,364 to $163,480; taxes from $10,459 to $11,100; other deductions from $1,023 to $1,065, and interest from $112,617 to $136,940. The surplus account increased from a deficit in 1912-1913 of $1,735 to a surplus of $14,375 for the last year. The company now operates 38.05 miles of track and owns twenty-seven cars. The capital stock authorized and outstanding is $2,000,000 of preferred and $4,000,000 of common. The authorized bonded debt is $4,000,000, of which $3,000,000 is outstanding. Of this amount, $970,000 is in the treasury of the company. A summary of the history of this company was published in the ELECTRIC RAILWAY JOURNAL of July 18, page 145.

Public Service Railway, Newark, N. J.—The $300,000 of Paterson Railway second general mortgage 5 per cent bonds due on Oct. 1, 1914, are being taken up on presentation at the office of J. S. Rippel, Newark, N. J. Holders on paying $10 per bond may have the security extended for thirty days at 5 per cent.

United Railways, St. Louis, Mo.—James D. Mortimer, president of the North-American Company, has been elected a director of the United Railways to succeed the late James Campbell. Richard McCulloch, who has been vice-president and assistant general manager of the United Railways, has been appointed general manager to succeed his father, the late Capt. Robert McCulloch. No successor has been elected to Capt. McCulloch as president.

DIVIDENDS DECLARED

Brooklyn (N. Y.) City Railroad, quarterly, 2 per cent.

Havana Electric Railway, Light & Power Company, Havana, Cuba, 3 per cent, preferred; 2½ per cent, common.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis., quarterly, 1½ per cent.

Public Service Investment Company, Boston, Mass., quarterly, $1.50, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period			Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO							
1m.,	Aug.,	'14	$123,078	*$64,764	$58,294	$32,837	$25,457
1 "	"	'13	129,052	*70,909	58,143	32,613	25,530
8 "	"	'14	837,571	*502,896	334,675	258,766	75,909
8 "	"	'13	824,768	*495,521	329,247	252,135	77,112
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.							
1m.,	Aug.,	'14	$91,032	*$58,960	$32,072	$28,544	$3,528
1 "	"	'13	99,752	*57,787	41,965	25,381	16,584
12 "	"	'14	1,150,490	*712,375	438,115	327,206	110,909
12 "	"	'13	1,167,414	*695,613	471,801	286,549	185,252
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO							
1m.,	Aug.,	'14	$243,564	*$156,117	$87,447	$43,607	$43,840
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH							
1m.,	Aug.,	'14	$1,225,277	*$720,756	$504,521	$353,468	$151,053
1 "	"	'13	1,157,231	*697,055	460,176	316,217	143,959
12 "	"	'14	14,684,923	*8,369,284	6,315,639	4,093,067	2,222,572
12 "	"	'13	13,811,857	*7,951,634	5,860,223	3,726,319	2,133,904
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE							
1m.,	Aug.,	'14	$272,799	*$128,777	$144,022	$63,464	$80,558
1 "	"	'13	251,278	*122,063	129,215	58,654	70,561
12 "	"	'14	2,491,684	*1,433,513	1,058,171	762,736	295,435
12 "	"	'13	2,251,109	*1,243,144	1,007,965	686,218	321,747
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.							
1m.,	Aug.,	'14	$219,250	*$124,388	$94,862	$59,519	$35,343
1 "	"	'13	228,532	*139,279	89,253	48,860	40,393
12 "	"	'14	2,740,793	*1,710,759	1,030,034	641,522	388,512
12 "	"	'13	2,626,252	*1,486,783	1,139,469	586,595	552,874
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE							
1m.,	Aug.,	'14	$76,293	*$41,221	$35,072	$15,503	$19,569
1 "	"	'13	81,046	*40,396	40,650	15,529	25,121
12 "	"	'14	670,432	*460,149	210,283	184,754	25,529
12 "	"	'13	666,708	*410,694	256,014	176,318	79,696
PORTLAND (MAINE) RAILROAD							
1m.,	Aug.,	'14	$121,027	*$59,455	$61,572	$19,880	$41,692
1 "	"	'13	130,854	*62,282	68,572	16,380	52,192
12 "	"	'14	1,033,387	*643,829	389,558	253,497	136,061
12 "	"	'13	1,028,607	*706,711	321,896	138,486	183,410

*Includes taxes.

Traffic and Transportation

TRAINMEN'S MEETING AT LAWRENCE

So-Called War Meeting Held Recently to Discuss the Item of Expense, the Enemy Against Gross Receipts.

It is the practice of the managers of the various properties controlled by the Albert Emanuel Company, Dayton, Ohio, to hold meetings of the trainmen every week. At Lawrence, Kan., a so-called war meeting was held recently. The men were addressed by J. T. Skinner, manager of the Lawrence Railway & Light Company. This meeting was particularly fruitful in results and provoked considerable discussion. An abstract of Mr. Skinner's remarks follows:

"We will call this our 'war meeting,' simply making use of the latest issue as a synonym. Our work is to give efficient service at the lowest possible expense. A war council has for its object consideration of the best methods of attacking the enemy. We are together to consider plans for attacking the items of expense, our enemy against our net receipts. This does not mean that we have not appreciated your efforts in carrying on this war against expenses, but it does mean an attack with renewed energy against unnecessary expense. As we have no desire to cut down the service or throw men out of employment, it is up to us to see if we cannot, by our 'safety first' movement and courteous treatment of the public, increase receipts and decrease operating expenses so that our net receipts shall be greater and the capital invested in the property feel less like going on strike. We hope each will enter into the spirit of the movement and do cheerfully whatever extra work may be involved. You men can easily note the attitude of the people. We are giving the equivalent or better service than four years ago. On three recent Sunday evenings we had fully as many at the park as when the resort was new, but the receipts were from $60 to $100 less than formerly. People walk out, get all they can free and walk back.

"The main thing in connection with our expenses is the question of accidents. 'Safety first' comes ahead of good service and courteous treatment. You have more to contend with than you did four years ago. While four years ago we had about 100 automobiles, two weeks ago the number registered with the county was 469 and there were fully thirty more that had not been registered. Good paving and long blocks tend to encourage the speeding of automobiles and motor cycles. In this 'safety first' campaign we want the co-operation of the automobile owners and drivers. If you men are not careful, it will do very little good to put 'safety first' slogans in the cars and publish articles in the papers. The men in our organization must be the leaders in the 'safety first' campaign against accidents. The cards in the cars, the articles in the newspapers and the blotters given to the school children all tend to help this movement.

"Accidents are always costly. Even if no damage is done, service is delayed and time and expense are involved in making investigations. It is up to you to get as accurate and thorough a report on the spot as possible. In connection with accident cases the tendency has grown on the part of the public to file claims for an amount which they think does not justify the expense on the part of the company of making a thorough investigation and contesting the case. The best way to deal with the matter is to prevent accidents from occurring, or at least cut the number down to a minimum. We cannot pay you men a 1 per cent dividend if our receipts continue to decrease and our expenses to increase. We must earn that dividend by saving it in our operating expenses. Watch the little things.

"The 'safety first' movement depends more on the spirit with which it is entered into than on the actual equipment, devices or methods employed. Another feature of the 'safety first' movement is concentration. Concentration presupposes that you can keep your mind on what you are doing and not worry about other conditions. In running your car have your mind on your work. There are many things that cause a man to worry, but by keeping them out of your mind while you are on duty you make your own work easier, with better results for the company and for yourself.

"In this 'safety first' movement we have placed fourteen safety slogans in the cars. We want more. We want your assistance in helping to work up safety slogans that will add interest to the campaign and be of benefit to you and to the company. We are going to make small rewards for safety slogans handed in. Mr. Rice will act as judge. We figured on offering prizes of 50 cents each for the ten best 'safety first' slogans and 25 cents each for all other 'safety first' slogans that we accept. We will not know nor will Mr. Rice whether the whole prize will go to one man or be divided among ten."

In the general discussion which followed the men told their experiences. The feeling was that the automobilist of to-day is more careless and causes more trouble than did the operators of cars four years ago. The new traffic ordinance was also considered, and it was agreed that respect for the measure could be secured best by the trainmen themselves paying strict and constant obedience to every provision of the ordinance.

Gasoline-Electric Bus Service for Springfield, Mass.—Regular electric motor bus service will shortly begin at Springfield, Mass., under the auspices of the Springfield Transit Company, between the downtown district and the Forest Park section of the city. The equipment consists of a bus seating twenty-eight passengers and driven by a 15-kw gasoline-electric-generator unit supplying energy to a 25-hp motor. The company contends that with a 10-cent fare the service will be more flexible than can be afforded by the local trolley system.

Service Problems in Cincinnati.—At a meeting of the committee on transportation of the Federated Improvement Association of Cincinnati, Ohio, on Oct. 8, a report of its investigation into the street-railway service was made. While a communication was sent to the City Council asking that steps be taken to furnish the kind of service people want, it was explained that Walter A. Draper, vice-president of the Cincinnati Traction Company, had informed the committee that the transfer and rerouting plans were now in process of adjustment between the Council and representatives of the company.

Authority of Pennsylvania Commission Over Boroughs.—S. H. Mountney, general manager of the Slate Belt Electric Street Railway, Pen Argyl, Pa., recently complained that the action of the borough of Pen Argyl in refusing to permit cars to stand on tracks at terminal points frequently resulted in patrons missing desired connections. The commission in dismissing the complaint wrote in part as follows: "Speaking generally, this commission would have no authority under the act of Assembly to issue any orders against boroughs, since they are not public service companies within the meaning of the Public Service Company Law. Such boroughs are vested with certain authority over the use and occupation of the streets and highways within their territorial limits and for an abuse of such authority, unwarrantably interfering with the performance of the railway's duty as a public service company, the company would have an appropriate remedy in the courts."

Extension of Safety Zone Idea in Louisville.—In addition to the safety zones which the traffic authorities have created at the downtown street intersections in Louisville, marked with the standards in some cases and indicated by the traffic policemen in others, broad white lines are being painted at intervals across the roadways so as to indicate to the pedestrians inside of which limits they can be assured of safety and to indicate to the motormen where the front ends of their cars are to stop. The experiment was tried first at Fourth and Green Streets, where several hundred persons gathered and watched the painting operation, the paint being applied directly on the wood-block paving. These lines cross the streets at right angles and are in line with the building fronts or inner line of the sidewalks. They do not last more than a day or so and have to be frequently renewed, but it is the impression that they will generally expedite pedestrian traffic and avoid congestion on the sidewalks at the intersections. That the regulation in the traffic ordinance providing for the stopping of automobiles outside the safety zone at downtown street corners when a street car has stopped to take on or let off passengers will be enforced is shown in the record of recent cases arising in the police court.

Personal Mention

Mr. W. T. Waters has been appointed advertising and publicity representative of the Georgia Railway & Power Company, Atlanta, Ga. Mr. Waters was born and educated in Atlanta, and for many years was on the staff of the Atlanta *Journal*.

Mr. Carroll H. Shaw has been appointed electrical engineer of the Sheboygan Railway & Electric Company, Sheboygan, Wis., to succeed Mr. W. B. Voth, superintendent of light and power. Mr. Shaw was born in Abington, Mass. In 1906 he entered the Massachusetts Institute of Technology, and was graduated from the electrical engineering course in 1910. Since that time he has been with the engineering department of the National Lamp Works of the General Electric Company at Cleveland, Ohio.

Major H. C. Evans, of the Lorain Steel Company, was a guest of honor at a dinner on Friday night at the Bellevue-Stratford, Philadelphia, to celebrate the thirtieth year of continuous affiliation with the company. The hosts were members of the sales department of the company and consisted of the following: Messrs. A. L. Verner, S. J. Cotworth, H. L. Gleeson, E. P. Thomas, W. B. Gresham, Daniel Coolidge, P. M. Boyd, Carroll Burton, E. B. Entwistle, A. S. Littlefield, S. P. McGough, William W. Kingston, J. A. Stacey and E. M. Noonan.

Mr. James C. Ernst has retired as the active head of the South Covington & Cincinnati Street Railway, Covington, Ky., as well as from the management of the Columbia Gas & Electric Company, the Union Gas & Electric Company and the Union Light, Heat & Power Company. In the future Mr. Ernst will be associated with these companies in an advisory capacity. Mr. Ernst has been connected with the South Covington & Cincinnati Street Railway and the Union Light, Heat & Power Company since 1896. He has been the active head of the Columbia Gas & Electric Company since its organization in 1907 and he has been associated with the Union Gas & Electric Company since 1911.

Mr. James Harmon, New Albany, Ind., for the last four years claim agent and safety agent for the United Gas & Electric Company and later of all the Insull properties in the New Albany-Jeffersonville-Louisville section, has been made general claim and safety agent for all of Indiana for the Insull properties. Mr. Harmon has risen from the ranks where as conductor he acquired a wide and practical familiarity with actual operating conditions. As claim and safety agent he had great influence in reducing the casualties on the Southern Indiana Insull lines. He was one of the first to use street-car cards to advertise correct methods of boarding and leaving cars and perfected for his company the periodical examinations of trainmen and other employees to keep them alert as to safety precautions. In his new post Mr. Harmon will have his headquarters in Indianapolis. He will be succeeded in New Albany by Henry Hutchins.

Mr. George B. Wheeler, secretary and general manager of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., and a past president of the Wisconsin Electrical Association, has resigned to devote his time to private interests. Mr. Wheeler's resignation followed twenty-three years of active management of the railway and light property at Eau Claire. Mr. Wheeler and his partners sold their interests in the Chippewa Valley Railway, Light & Power Company and the Chippewa River Water Power Company to the Kelsey-Brewer Syndicate, Grand Rapids, Mich., at which time all the old officers and directors retired. After engaging in journalistic work for a number of years, Mr. Wheeler entered the electric railway field in 1891 as general manager of the Eau Claire Street Railway, Light & Power Company. Subsequently he was appointed receiver of the property. When the company was reorganized Mr. Wheeler was elected secretary and general manager and the name was changed to Chippewa Valley Railway, Light & Power Company. Later the Chippewa River Water Power Company was organized for development work, and at the time of Mr. Wheeler's retirement this company owned all the water powers on the Menominee River and a valuable water power on the Chippewa River.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Niagara River & Eastern Railroad, Niagara Falls, N. Y.**—Application for a charter has been made in New York by this company to build an interurban railway from the terminal of the Buffalo, Lockport & Rochester Railway in Buffalo along the right-of-way of the Niagara, Lockport & Ontario Power Company to Niagara Falls. Capital stock $1,500,000. Headquarters: Niagara Falls. Incorporators: E. G. Connette, president of the International Railway; Frank A. Dudley, vice-president of the Buffalo, Lockport & Rochester Railway; A. J. Porter and A. W. Gray, Niagara Falls.

Oil Belt Terminal Railway, Jennings, Okla.—Chartered in Oklahoma to build an electric railway from Coffeyville, Kan., through the oil fields of Oklahoma. Capital stock, $100,000. Incorporators: Joseph Hall, Cincinnati; W. A. Ledbetter, Oklahoma City, and W. N. Patterson, Muskogee. [E. R. J., June 13, '14.]

***West Virginia Electrical Company, Parkersburg, W. Va.**—Chartered in West Virginia to build an electric railway from Weston to Owensport, 50 miles. Connection will be made at Owensport with the lines of the Little Kanawha Railway.

FRANCHISES

Fresno, Cal.—The Fresno Traction Company has received a franchise from the Council on South J Street and Fresno Avenue in Fresno.

Long Beach, Cal.—The Pacific Electric Railway has asked the Council for a thirty-five-year franchise over certain streets in Long Beach.

Parker, Cal.—The Parker & Colorado River Electric Railway has received a franchise from the Department of the Interior to build an electric line through the Colorado River Indian Reservation. The proposed line will extend from Parker to a point near Ehrenberg, where a ferry will be constructed to receive freight for the Palo Verde Valley. Grading for this railway will be begun at once. W. H. Tharpe, is interested.

Sacramento, Cal.—The Pacific Gas & Electric Company has received from the Council an extension of time on its franchise in which to complete the extension of the Riverside line in Sacramento.

Marion, Ill.—The Southern Illinois Railway & Power Company has received a franchise from the Board of Supervisors of Williamson County to build an electric line from Marion to Carrier Mills.

Lafayette, Ind—The Lafayette & Northwestern Railway has received a franchise from the County Commissioners of Benton County to build an electric line from Lafayette to Kankakee where connection will be made with a line to Chicago. A branch line will be built to include Fowler, the county seat of Benton County. The terms of the franchise state that the line must be in operation from Lafayette to Rensselaer by Jan. 1, 1916. [E. R. J., Sept. 19, '14.]

***Alexandria, La.**—Messrs. S. A. Guy and W. A. Sullivan, Shreveport, have asked the Council for a franchise to build an electric line in Alexandria.

New Bedford, Mass.—The Union Street Railway has asked the Council for a franchise to extend and double-track several of its lines in New Bedford.

Westfield, Mass.—The Springfield Street Railway has received a franchise from the Council to build a double track on the south side of State highway, so that it will be possible to use the new underpass beneath the Boston & Albany Railroad tracks leading to the Westfield State Sanitarium and the East Mountain section in Westfield.

Worcester, Mass.—The Worcester Consolidated Street Railway has asked the Council for a franchise to relocate its tracks on West Street in Worcester.

Sharon, Ohio.—The Farrell Railway has asked the Council for a franchise to build an electric railway in Sharon.

Cornwall, Ont.—The ratepayers of Cornwall were to vote Oct. 14 on a by-law granting the Cornwall Street Railway, Light & Power Company a twenty-year extension of its franchise in Cornwall. Provision is also made for the rebuilding of the loop lines on Cumberland Street and Water Street in Cornwall.

Sarnia, Ont.—The Sarnia Street Railway has been authorized by the City Council to take up its tracks leading to the Pere Marquette Railroad station, and to relay them on Christina Street to Clifford Street and westerly on Clifford Street in Sarnia.

Richmond, Va.—The Virginia Railway & Power Company will ask the Council for a thirty-year franchise in Richmond.

Martinsburg, W. Va.—The Youngstown-Sharon Railway & Light Company has asked the Council for an extension of time on its franchise in Martinsburg.

TRACK AND ROADWAY

Hot Springs (Ark.) Street Railway.—Plans are being made by this company to begin work soon on the extension of the Malvern Avenue line in Hot Springs to the Hot Springs Country Club.

Pine Bluff (Ark.) Company.—Material has been ordered and work will soon be begun by this company on the extension of the East Sixth Avenue line in Pine Bluff.

Pacific Electric Railway, Los Angeles, Cal.—This company has taken initial steps toward connecting the Riverside line with the Los Angeles main line. The work of laying the track from the main line to the Riverside line will be begun at once.

California Terminal Railway, Sacramento, Cal.—This company, which plans to build an electric line from San Rafael to Sacramento, is obtaining right-of-way through Jamison Canyon in Solano County. C. W. Conlisk, San Francisco, is interested. [E. R. J., Oct. 12, '14.]

Sacramento (Cal.) Interurban Railway.—The project to build a 30-mile electric railway between Sacramento and Roseville, via Fair Oaks, Orangevale and small towns in Placer County, has been abandoned and the directors of the company have filed notice of dissolution with the Secretary of State. [E. R. J., April 6, '12.]

Pacific Gas & Electric Company, San Francisco, Cal.—The Chamber of Commerce is negotiating with this company for the possible raising of a bonus to extend the company's line to the Libby, McNeil & Libby plant in Sacramento.

San Francisco (Cal.) Municipal Railway.—Plans are under way for an extension on Columbus Avenue in San Francisco for a connection with the Union Street line to North Point Street, thence to Van Ness Avenue and thence to Chestnut Street to connect with the Van Ness Avenue line. Plans are also under way for an extension through the Fort Mason Military Reservation to Laguna Street at an entrance to the Panama-Pacific Exposition grounds; for the construction of the California Street line from Thirty-third Avenue to Second Avenue, thence along Geary Street to the Geary Street line; also for a line on Church Street.

Sausalito (Cal.) Incline Railway.—The Railroad Commission has granted this company a certificate of public convenience and necessity to operate an incline railway in Sausalito, Marin County. The company is also authorized to issue $15,000 of preferred stock or common stock for the acquisition of right-of-way and other property. Allen H. Vance, Sausalito, is interested. [E. R. J., June 6, '14.]

Waterbury & Milldale Tramway, Waterbury, Conn.—The Public Utilities Commission has granted this company authority to construct 2.88 miles of new track in Southington.

Washington Railway & Electric Company, Washington, D. C—This company is asked to consider plans to extend its line from Fourteenth Street and B Street southwest to the entrance of the new bureau of printing and engraving in Washington.

Jacksonville (Fla.) Traction Company.—Plans are being considered by this company to extend some of its lines in Jacksonville. An extension on Hogan Street from Bay Street to Eagle Street, Cedar Street and Pearl Street will soon be built.

Peoria (Ill.) Railway.—This company has placed in operation its new double track line on Main Street as far as Western Avenue in Peoria.

Terre Haute, Indianapolis & Eastern Company, Indianapolis, Ind.—Work will be begun at once by this company on the extension of the South Eighth Street line from H Street to M Street in Richmond.

***Keokuk, Ia.**—Plans are being made to build an electric railway from Keokuk, Ia., west to Wayland, Mo., thence south via Williamstown, La Belle, Newark, Bethel, Shelbyville, Shelbina, Paris, Mexico and Fulton to Jefferson City, about 140 miles. H. W. Knight, Chicago, represents a number of capitalists who are back of the project.

Orleans-Kenner Electric Railway, New Orleans, La.—Surveys have been completed by this company between New Orleans and Baton Rouge, 100 miles; grading has been completed from New Orleans to Kenner, 9 miles; grading is in progress from Kenner to St. Charles Parish, 2½ miles; 9.6 miles of track has been laid from both ends of this line and all contracts have been awarded to build this line to connect New Orleans, Hanson City, Harrihan, Harlem, Shrewsburg, Arnaults, Providence and Hanson City. The principal contractor is the Johnson & Company, Inc., 409 Tulare Newcomb Building, New Orleans. Officers: E. A. Stanford, New Orleans, president, and John Lorenz, secretary and treasurer. [E. R. J., July 18, '14.]

Bay State Street Railway, Boston, Mass.—Plans are being made by this company to relay the track on the south side of River Street in Haverhill this fall.

Holyoke (Mass.) Street Railway.—Work has been begun by this company installing a double track throughout Aldenville.

Transcona, Man.—By arrangement with the Transcona, Man., Council, J. H. Kern, who holds the franchise to build an electric railway in Transcona, to the boundary of the City of Winnipeg, is required to begin active construction on the line in the spring of 1915. It is said that certain preliminary work is being done, however, and that ties have been delivered along the route.

United Railways, St. Louis, Mo.—Plans are being considered by this company to have its Union Avenue line extended to the city limits of St. Louis.

Trenton & Mercer County Traction Corporation, Trenton, N. J.—This company is asked to consider plans to extend its lines from Crosswick to Allentown and Hightstown.

Piedmont & Northern Railway, Charlotte, N. C.—An extension between Spartanburg and Gastonia, 32 miles is being planned by this company. An extension northward from Charlotte to Concord, N. C., about 25 miles is being considered and another extension from Concord to Salisbury, Greensboro and Durham is also being contemplated. The work on the Concord branch will be begun first.

Columbus Railway, Power & Light Company, Columbus, Ohio.—An extension of the Arlington line in Columbus into the new addition as far as the intersection of Arlington Avenue and Cambridge Boulevard is being planned by this company.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as financial backing can be obtained work will be begun by this company on its line between Ardmore and Oil City. [E. R. J., May 30, '14.]

Cushing (Okla.) Traction Company.—Preliminary arrangements are being made by this company to build its 13-mile line from Cushing to the oil fields. R. D. Long, McAlester, is interested. [E. R. J., Jan. 6, '14.]

Oil Belt Traction Company, Oklahoma City, Okla.—Since the announcement that this company plans to build an electric line from Coffeyville, Kan., through the northern oil fields numerous towns and cities are trying to be included in the system. The present plans are to extend the line south via Bartlesville, Miami, Afton, Tulsa and Chandler to Oklahoma City, together with intermediate points. Centralia, an inland town near Afton, has offered the company 10 miles of right-of-way, 5 acres of land for depot purposes and $5,000 as a bonus. [E. R. J., June 13, '14.]

London & Port Stanley Railway, London, Ont.—The electrification of this railway, the city's road to Lake Erie, will not be delayed on account of the war, and rehabilitation work is being rushed ahead.

London & Port Stanley Railway, London, Ont.—The rehabilitation electrification of this railway, the city's road to Lake Erie, will not be delayed on account of the war.

***Mexia, Tex.**—Plans are being considered by the Mexia Commercial Club to obtain a franchise to build an electric railway in Mexia.

Kelso & Eastern Railroad, Kelso, Wash.—No definite plans have yet been decided upon by this company in connection with the construction of the proposed line between Kelso and Mayfield. J. L. Harris, Kelso, president. [E. R. J., Oct. 4, '14.]

Mercer Electric Railway, Athens, W. Va.—Grading has been completed and as soon as financial backing can be obtained work will be begun by this company on the construction of its 7-mile line between Athens and Princeton. R. G. Meador, Athens, president. [E. R. J., July 29, '14.]

Weston & Glenville Electric Railroad, Weston, W. Va.—The proposed plan to build a 25-mile electric railway between Weston and Glenville is still in the preliminary stage. Lloyd Rinehart, Weston, is interested. [E. R. J., Dec. 27, '14.]

Janesville & Madison Traction Company, Madison, Wis.—Surveys have been completed by this company for its 43-mile line between Janesville and Madison, via Edgerton, Albion, Stoughton, Skirting Lakes and Lake Morona. C. A. Van Ness, Madison, secretary. [E. R. J., July 25, '14.]

SHOPS AND BUILDINGS

Northern Electric Railway, Chico, Cal.—Work will be begun at once by this company on the new depot at the corner of Myers Street and Robinson Street in Oroville.

Iowa Railway & Light Company, Cedar Rapids, Ia.—Plans are being made by this company to enlarge its passenger station at Cedar Rapids.

Mesaba Electric Railway, Virginia, Minn.—This company has completed its new carhouses between Virginia and Mountain Iron. They are equipped with machinery for repairing cars and motors.

Southern Traction Company, Dallas, Tex.—New passenger stations will be erected at once by this company in Abbott, Corsicana, Forreston and Milford. The structures will all be one story and of brick construction. Each depot is estimated to cost $3,000.

POWER HOUSES AND SUBSTATIONS

Shore Line Electric Railway, Saybrooke, Conn.—This company is installing the following new equipment at its power house at Thamesville: one 1875-kva Westinghouse-Parsons turbo-alternator, 25 cycles, 2300 volts, 3625-kva step-up transformers 2300 to 2200 volts; a 25-kw, 125-volt, motor-driven exciter, a new high-tension switchboard, a 500-hp Edgemoor boiler equipped with a Westinghouse underfeed forced draft stoker and a 6 x 12 x 10 outside packed Worthington boiler feed pump.

Columbus Railway, Power & Light Company, Columbus, Ohio.—It has been announced that this company will at once install in its Gay Street power house a new 1000-kw motor generator set, an order for which was placed some time ago.

Bryan & Central Texas Interurban Railway, Bryan, Tex.—Work has been begun by this company on the concrete foundations for its new power plant in Bryan. The generators, engine and all necessary equipment has been ordered.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Plans are being contemplated by this company to build a new power plant between Glen Rose and Walnut Springs.

Monongahela Valley Traction Company, Fairmont, W. Va.—Plans are being made by this company to build a new power plant in Hutchinson.

Manufactures and Supplies

ROLLING STOCK

Kansas City (Mo.) Railway is reported to have sent out specifications for forty new cars.

Ogdensburg (N. Y.) Street Railway has ordered one carbody from the Wason Manufacturing Company.

Dallas (Tex.) Consolidated Street Railway has received twenty cars built by the American Car Company.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo., has ordered one line car from the McGuire-Cummings Manufacturing Company.

Geary Street Municipal Railway, San Francisco, Cal., has ordered fifty more cars from the Jewett Car Company, now making a total of 175 cars ordered.

Danville (Va.) Traction & Power Company, Danville, Va., has ordered two cars from the Southern Car Company. The Westinghouse Electric & Manufacturing Company will furnish the electrical equipment, consisting of quadruple 40-hp motors and control.

Boston (Mass.) Elevated Railway has ordered six center-section car bodies for articulated car bodies from the Laconia Car Company, in addition to the previous order for thirty-seven center-sections noted in the ELECTRIC RAILWAY JOURNAL of Sept. 12, 1914. The company is also planning to send out next week specifications for a large number of trail cars, for use in its new Boylston Street subway.

Cleveland (Ohio) Railway, noted in the ELECTRIC RAILWAY JOURNAL of Aug. 8, 1914, as having ordered 100 prepayment center-entrance motor cars from the G. C. Kuhlman Car Company, has specified the following details for this equipment:

Seating capacity	62
Weight, exclusive of trucks and motors	21,052 lb.
Bolster centers, length	26 ft.
Length over vestibule	50 ft.
Width over sills	8 ft. 2 in.
Width over all	8 ft. 4½ in.
Height, rail to sills	25½ in.
Height, sill to trolley base,	9 ft. 6 1/16 in.
Body	semi-steel
Interior trim	cherry
Headlining	Agasote
Roof	plain arched
Underframe	metal
Air brakes	West.
Axles	Pollock
Bumpers	ry. std. 6 in. chan.
Cables	ry. std.
Car trimmings	ry. & Kuhlm.
Control	West.
Couplers	O-B.
Curt'n fixtures	Cur. Sup. Co.
Curtain material	Pantasote
Destination signs,	Hunter Illuminated
Door signal device,	Elec. Serv. Sup. Co.
Fare boxes	Cleveland
Fenders	Eclipse
Gears and pinions	West.
Gongs	Brill
Hand brakes	ry. co.'s vert.
Heaters	Peter Smith
Headlights	Dayton
Journal boxes	Symington
Motors,	4 West. 340, outside hung
Paint	Sherwin-Williams
Sanders	Nichols-Lintern
Sash fixtures	Kuhlman
Seats,	Brill trans. and long. rattan
Trolley base	ry. std.
Trucks	Brill 51-E-1
Varnish,	Outside, Chicago Varnish Co.; inside, Wright Bros.
Ventilators	Scullin's design
Wheels,	Pittsburgh Forged Steel Co.

TRADE NOTES

W. T. Kyle has joined the sales force of the Okonite Company at its general office, 253 Broadway, New York. Mr. Kyle for the past six years has been connected with the Duplex Metals Company as district sales manager.

Union Switch & Signal Company, Swissvale, Pa., has received an order from the Chicago, South Bend & Northern Indiana Railway to install a.c. automatic block signals between its car barns and Weller Avenue, La Port, Elkhart and Miller, Lake Erie crossing, La Port and Winklers, South Bend, and on the Southern Michigan, South Bend and State Line. There will be sixty-four one-arm, Style "B," upper quadrant, left-hand semaphore signals operating in two positions between 0 deg. and 45 deg. They will be installed on the TDB system, which permits two trains to be between turnouts going in the same direction, but prevents opposing movements. The signals will be controlled by continuous a.c. track circuits and the materials and construction will be similar to the installation already in service which was recently installed by this signal manufacturer.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received an order from the Waterloo, Cedar Falls & Northern Railway, Waterloo, Ia., for 600/1200 volt railway apparatus for operation over its new 60-mile extension between Waterloo and Cedar Rapids, consisting of the following equipment: Five 60-ton locomotive equipments, seven high-speed equipments for two-car train operation in limited parlor-buffet and observation service, five equipments for local passenger and baggage service, four trailer equipments for local train service, one express car equipment, and one line car equipment. This company has also received the following orders for equipment: Cleveland (Ohio) Railway, 408 type No. 340 motors and control for quadruple equipments for low-floor center-entrance cars; Washington-Virginia Railway, five quadruple motor and pneumatically operated control equipments; Kansas City, Clay County & St. Joseph Railway, one combination freight and work car equipment, consisting of quadruple No. 327-C motors and double end electro-pneumatically operated unit switch control, for 600/1200 trolley operation; Ogdensburg (N. Y.) Street Railway, one double equipment of No. 323-A motors and control; Seattle (Wash.) Municipal Street Railway, one quadruple equipment of No. 310-C motors and double end unit switch control of the electro-pneumatic type, with an additional feature of an emergency brake operated by means of dynamic braking.

ADVERTISING LITERATURE

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, has issued a folder which contains comparative data on the wearing qualities of case-hardened and tool steel gears and pinions.

Union Switch & Signal Company, Swissville, Pa., has issued Bulletin No. 79 which describes its electric crossing gate, and Bulletin No. 80 describing its model No. 13 low voltage, d.c. switch movement.

Goldschmidt Thermit Company, New York, N. Y., prints in its quarterly publication, *Reactions*, an illustrated article on welding rails with thermit and grinding joints on the San Antonio (Tex.) Street Railway.

American Rolling Mill Company, Middletown, Ohio, has issued a catalog which contains a large number of testimonial letters in regard to its products, among which are included condensers, boiler tubes, culverts and sheet-metal work for buildings.

Root Spring Scraper Company, Kalamazoo, Mich., has issued a thirty-two-page illustrated pamphlet entitled "The Passing of the Sweeper." In this the Root spring scraper is described and mention is made of its efficiency in handling snow. This company's railway spring scraper, special Root scraper, manually or air operated, the Kalamazoo scraper and the Root spring life guard are illustrated and described in detail.

W. N. Matthews & Brother, Inc., St. Louis, Mo, have issued a sheet which illustrates in detail their holdfast lamp guards. A clamping collar locks the guard to its socket. The guard does not touch the lamp anywhere and holds the lamp so that it is always at least 1 in. from any combustible material. A special spring cushion absorbs shock and vibration.

Bayonet Trolley Harp Company, Springfield, Ohio, has issued a folder which discusses the defects and remedies for trolley equipment. In this little treatise quotations are liberally taken from the articles of C. W. Squier, assistant engineer New York Municipal Railway Corporation, which have appeared from time to time in the ELECTRIC RAILWAY JOURNAL. The valuable suggestions of Mr. Squier on trolley maintenance, expressing as they do the results of practical experience and careful observation, are supplemented in the folder by comments showing how the trolley equipment manufactured by this company meets the requirements outlined in his articles.

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THE BASIS OF OPTIMISM

In an interesting interview, published elsewhere in this issue, H. Hobart Porter points out the relation between the industrial situation and the gross earnings of electric railway companies. These have not shown as great decreases in business caused by the war as the steam railroads, and this comparative stability of earning power, as Mr. Hoyt, of N. W. Halsey & Company, pointed out in our issue of Oct. 10, constitutes one great merit of electric railway securities in the eyes of bankers. The general economic situation, however, is improving. Already the West is beginning to feel the benefit of the export sales of grain, negotiations are reported from Washington looking toward the marketing of a large part of the cotton crop, and large foreign government orders are stimulating individual industries throughout the country, particularly among the textiles and some branches of the machinery trade. The electric railway companies should soon begin to feel this revival of business. Their normal annual growth of traffic, excluding that from any extensions, is about 5 per cent, and if there has been a setback in this increase during the last few months it ought to be added to the normal growth with the general revival of business. This country is not in a critical financial condition. It is producing in abundance the primary necessities of life, and general business should rapidly approach its normal footing with the clearing up of the banking situation, which should not long be delayed.

THE SOPHISM OF LOCAL CONDITIONS

In discussions at gatherings of street railway operators, where practices are compared either informally or on the floor of the convention, one constantly hears the phrase "local conditions." This expression is used to justify or explain some practice in vogue that is divergent from generally accepted standards. It applies particularly to transportation questions although unusual designs of car bodies apparently are often explained by the same phrase. Frequently it will be found on investigation of the factors involved that there is no fundamental condition or compelling reason for divergence from generally accepted practice, and it is difficult to avoid the conclusion that a lack of discriminating analysis and a near approach to provincialism is indicated when an operating man allows himself to drift into the state of mind where such a vague generality is submitted as logic. When the phrase "local conditions" is advanced as a reason or an explanation, the person to whom it is addressed should not accept it as adequate without himself weighing all the influencing factors and drawing his own conclusions as to its adequacy. As an excuse for moribund practices or for the magnification of petty detail it has been done to death.

TROLLEY FREIGHT TO PUBLIC MARKETS

At this time a strong effort is being made by the New York City administration to establish a large number of public markets in order to lower the cost of living. One suggestion which is being considered with favor is that the electric railway be utilized to bring farm produce to the city. Electric freight would be a novelty to New York, although the Brooklyn Rapid Transit System once had a fleet of refuse cars under municipal contract and also a number of express cars for one of the old-line companies. The Brooklyn company now conducts a large electric freight business, but this is chiefly in connection with dock shipments and not with outlying truck farms. Public sentiment in New York hitherto has not favored the extended operation of trolley freight on the grounds of unsightliness and noise. It is difficult to see, however, the propriety of this criticism. If the freight was not taken through the streets by car it would have to be carted over the same streets in a larger number of much noisier trucks, and the cars make no use of the street pavement which the trucks wear out rapidly at the expense of the taxpayers. Finally, such a car service need not interfere with the busiest city schedule since produce cars going inward would naturally be operated only during the very early morning hours, while they could be returned during any of the slack hours of the day. The present is therefore a favorable moment for the electric railways in and about New York to follow the example set for years by the Western interurbans in inaugurating and building up a service that will earn good profits and the gratitude of the ultimate consumer.

DISCIPLINE OF RAILWAY RECRUITS

An easy-chair reading of the recent convention discussions at Atlantic City will bring to light many valuable ideas for the electric railway operator, but none of greater worth than that of recruit discipline as practiced on the Syracuse properties of the New York State Railways. It has been so long the custom to place all platform men on the same basis of discipline regardless of their experience that any move toward a preferential system may seem revolutionary. It is revolutionary openly to acknowledge and practice such segregation, yet he would be a poor superintendent indeed who did not discipline a new man with less rigor than a hardened offender. However, the policy described by Mr. Duffy is commendable in treating the matter of discipline according to sound pedagogical principles. In Syracuse it is not the superintendent who is the disciplinarian for the hundred and one minor infractions which the novice commits during his first six months, but the instructor, the same man who had lately released the student as fit to operate a car. This plan is one that "blesses him that gives and him that takes." The superintendent gives up a part of his prerogatives, but in exchange therefor he is relieved of the disagreeable task of teaching a man what he ought to know when he leaves the care of the instructor. The instructor, on the other hand, can do better work because he knows where his teaching has failed in practice. Another advantage is that the instructor remembers the degree of aptitude and willingness shown at school by the novice, whereas every green motorman or conductor is practically a stranger to the superintendent. Thus the Syracuse system is a frank acknowledgment that the instruction of a platform man matures in the responsible handling of his car and not in the classroom.

DRAINAGE AND TRACK FOUNDATIONS

The report on proper foundations for track in paved streets, as submitted by this year's way committee, is one of the most valuable contributions with which the industry has been favored in recent years. Anyone who has had occasion to compare the different types of track foundation used in this country will readily realize the great variation in foundation design installed to perform practically the same service under the same conditions. All of these cannot be the best, and the committee's study should help greatly to bring about standardization, or at least greater uniformity, in this important branch of electric railway engineering. While it appears unfortunate that the rules of the standards committee did not permit the Engineering Association to accept the four recommended track designs other than as "information," the present enormous diversity in foundation conditions probably made any other course impracticable.

We have no doubt that some track engineers, conscious of their own peculiarities of soils, grades, rainfall and other conditions, may take exception to certain individual features in the proposed sections. Perhaps the greatest degree of dissent will arise in connection with the underdrains suggested for types *C* and *D* concrete foundations. Undoubtedly in these types the bearing power of the subsoil is not so likely to be affected by water because the ties are completely surrounded with concrete and the subgrade would also be filled with practically waterproof material. But in type *C* construction, certainly, we believe that seepage from the pavement surface should definitely be cared for. This can be done by providing weepholes with outlets to a sewer system so that they will not drain into the subgrade. Otherwise water from higher ground near by might back up to the subgrade and cause the tracks to heave in freezing weather. Doubtless one reason why the committee showed underdrains for concrete constructions was to provide for those cases where the heavy absorption of water by the soil would leave the subgrade resting on a precarious foundation.

As to the types *A* and *B*, or the ballasted constructions, we believe that it would be practically impossible to eliminate water from them unless underdrains such as the committee suggests are provided. If this was not done, the entrance of seepage water would carry silt into the voids of the ballast from the sides and bottom of the subgrade, and this silt, in time, would reduce the bearing power of the ballast.

These, however, are matters of detail upon which there may be a legitimate difference of opinion. The committee may rest content in the knowledge that it has given the fraternity a set of designs which represent a big step toward the ideal track.

MODERN CAR LIGHTING

The discussion on car lighting which was held at the Oct. 14 session of the Engineering Association, revealed clearly that the days of the bare filament lamp are numbered. So long as only the comparatively inefficient carbon lamp was available for car lighting the number and candle-power of the units necessarily was limited for economic reasons. The initial effect of the introduction of the more economical tungsten lamp was simply the substitution of tungsten for carbon bulbs in the same sockets except that the new units were of greater capacity. It soon became evident, however, that more light was by no means synonymous with better light, because the bare filament tungsten lamp proved too dazzling to the human eye. In fact, where the car finish was a pure white, the very reflection of the lamps proved fatiguing. After the general use of the tungsten filament had made the question of energy consumption of relatively less importance a number of companies began to experiment with the use of reflectors to see whether car lighting could not be made as agreeable as the illumination of rooms in a stationary structure.

These pioneer attempts, begun little more than two years ago, soon brought out the fact that the manufacturers would have to develop lighting fixtures suitable for at least two conditions incident to car operation, namely, breakage from vibration and security against robbery. Apparently these conditions have now been met to a degree which is great enough to justify serious consideration of reflector lighting by electric railways generally. There is still a division of opinion with regard to the number and capacity of units, some favoring say sixteen 23-watt lamps and others preferring one circuit of 94-watt units. Both parties are agreed, however, that reflector lighting makes a light interior car finish more instead of less agreeable to the eye and that it produces appreciable economies in the initial lamp capacity. As one of the speakers intimated at the discussion, it is now incumbent upon the electric railway to abolish the bare filament lamp before any serious agitation on the subject is stirred up by civic betterment organizations.

ZONE FARES IN MILWAUKEE

City systems which are face to face with the problem of the increasing cost of transportation and the diminution of the 5-cent fare will find a possible solution in the paper by Mr. Stearns elsewhere in this issue. This paper was presented at Atlantic City last week, but on account of the time necessary to reproduce the illustrations its publication was postponed until to-day. The problem initially in Milwaukee did not differ from that in most American municipalities. It is one which is bound to arise as the result of the growth of every city, the consolidation of its surface railways and the extension of the 5-cent fare to all points within the city limits. This is a common condition, and in cases of this kind there are certain to be apparent discriminations in fare within the single-fare district. These discriminations can easily be found, as Mr. Stearns says, by the use of a ruler and a map, and they necessarily result in complaints and demands for lower fares from those outside the 5-cent limit who think they ought not to be obliged to pay two fares when other sections are receiving as long or a longer ride for a single fare. Such demands sound plausible when considered by those who do not realize that the system of fares in use is a somewhat chaotic development and inheritance from previous days. At the same time, when these demands are backed by real estate promoters who care nothing about the financial welfare of the railway company but only want the lower fares to help them sell lots, they constitute a serious menace not only to the railway company but to the character of service which that company can give to other sections of the city.

This, in brief, was the problem presented to The Milwaukee Electric Railway & Light Company and the Wisconsin Railroad Commission, and the answer in that case was the zone system described by Mr. Stearns. This system retains for the metropolitan district the basic 5-cent fare but provides for additional fares of 2 cents for zones or belts outside of the central district. The latter does not correspond with the corporate limits of Milwaukee but is an area of 8 to 9 miles in length and 6 miles in width. The introduction of this system necessarily increased some fares, even within the city limits, but not, of course, to the extent of another nickel, and on the whole it has given entire satisfaction to the public. This fact is evidence of the contention sometimes made that long distance riders on a city system will not seriously object to a fare corresponding to the length of their ride, provided other parts of the city are not on a very different basis. In its practical application the zone system necessarily involves complications in fare collection, but these seem to have been carefully worked out in Milwaukee and to be simple of application by both the public and employees of the railway.

The financial statements presented by Mr. Stearns show that even with this increase in fare the suburban lines at Milwaukee as a whole are not profitable. This also is undoubtedly a general condition. But if a city system is fairly profitable and the community is growing, a railway company can carry a number of slightly unremunerative suburban extensions in the hope that they will develop later into profitable feeders.

We are glad to see such an interesting departure from standard American practice in fare collection set forth with so much detail as in Mr. Stearns' paper. It holds forth a great deal of promise for many American localities. A large number of states now have commissions with powers over rates as great as those possessed by the Wisconsin commission, and there would seem to be no legal objection in most instances for an application of this remedial measure elsewhere.

BIG WHEELS NEEDLESS ON TRAILERS

The prominent display of dwarf-type railway motors at the last convention of the American Electric Railway Association was a strong demonstration of the faith which the manufacturers now have in the permanence of a design that but lately was classed as a freak. It is evident also that the progressive electric railway operator is prepared to encourage the efforts of the manufacturers, if we are to judge by the adoption of this new motor by such roads as the Mahoning & Shenango Valley Railway, the Third Avenue Railway, New York, and the United Railroads of San Francisco. The last-named company went to the trouble of making extended tests, as detailed in our issue of Aug. 8, and secured very favorable results in the saving of energy by substituting dwarf motors with 24-in. wheels for old motors with 30-in. diameter wheels. At the same time, of course, a substantial reduction in step height was attained.

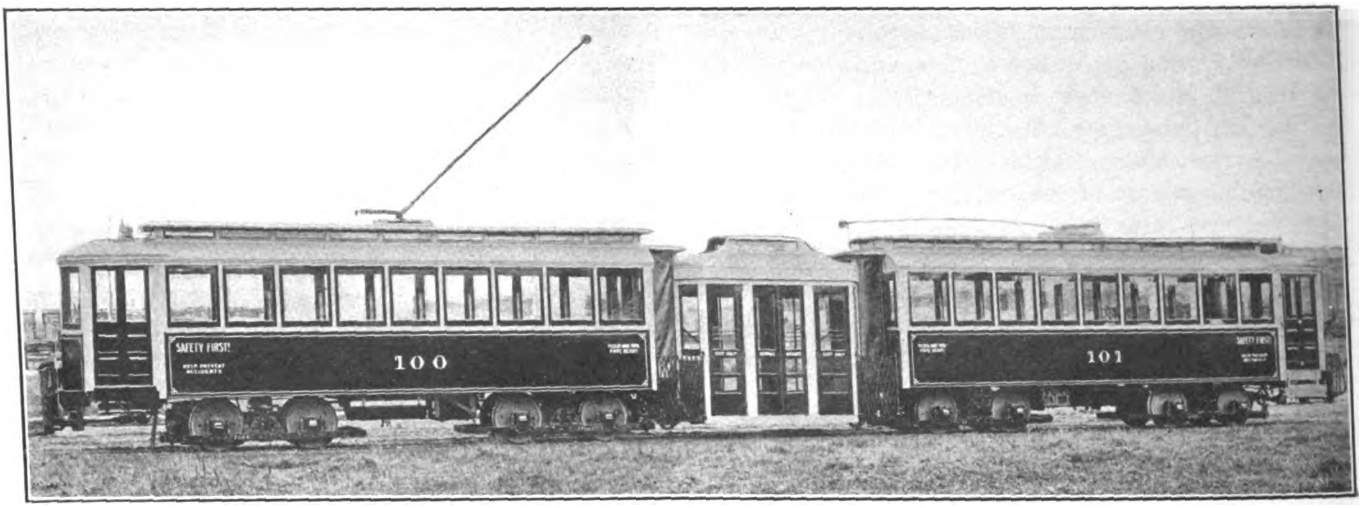
These cases are mentioned to show that other companies are finding the Pittsburgh low-wheel idea perfectly feasible for their motor cars, yet some very recent orders for cars otherwise modern show that the adaptability of the small-wheel principle even for trailer service is not widely appreciated. So far as motor cars are concerned, it is to some extent understandable why the ultra-conservative operator should stick to the big wheel and big motor. Perhaps he does not think it worth while to depart from present standards for the sake of a small fraction of new cars; or he may feel that the maintenance reliability of the dwarf motor over, say, five years is still an uncertainty. But such reasoning does not apply to the operator who is beginning the use of trailers. His very success in trailer operation will depend upon using a light and inexpensive car that permits rapid and easy exit and entrance. Therefore, he must not consider his trailer primarily as a car which could go into motor service but rather as a special design for a special purpose. To use big wheels, and consequently a high step, in a car which has no motors is to misunderstand the trailer situation completely. The location of draft rigging on the cars of the train offers practically the only mechanical problem and this is a small one indeed, compared with the juggling that has been required to lower motor car steps 3 in. or 4 in. Where so much ingenuity has been applied to the steps of the motor car, it is not unreasonable to expect the trailer to be a low-floor car as a matter of course.

Twin Cars in Portland, Ore.

Several Cars of the Articulated Type Have Been Placed in Service in This City—They Are Built from Old Double-Truck Cars of Small Size and Provide Units Seating Sixty-Four Passengers

The Portland Railway, Light & Power Company, Portland, Ore., which is managed and operated by E. W. Clark & Company, Philadelphia, is having much success in the operation of its new "twin cars." These cars, rebuilt from the old high-step trolleys, follow, in a general way, the articulated type of car used in Boston, with this principal exception: the Portland cars utilize two double-truck car bodies, whereas those in Boston use only single-truck cars. Complete separation of incoming and outgoing passengers is effected and a double interlocking system of signals between conductor and motorman has been introduced.

The objects sought in the reconstruction of the smaller units into "twin cars" may be summarized as follows: to utilize effectively and profitably the heavy investment in small cars of low carrying capacity; to obtain a unit which will hold a large number of passengers, thus reducing the number of cars operated during the rush periods; to reduce platform cost where two-car trains are now operated; to extend the prepayment feature to cars not so designated, and to reduce accident risk.



TWIN CARS IN PORTLAND—GENERAL VIEW OF CAR READY FOR SERVICE

STRUCTURAL DETAILS

The "twin car" consists of three compartments, of which the two end sections are 34-ft. 6½-in. cars with one vestibule and platform removed from each, and the middle section is the suspended platform for the two cars. This middle section acts as a flexible connection between these two cars and is used only for entrance, exit and fare collection. The conductor is stationed in this middle compartment, hence the advantages of the center entrance prepayment type of cars are obtained. No trucks are under the center compartment, and therefore but one step from the street into the car is required.

The length over bumpers is 73 ft. 4 in., the middle section being 12 ft. center to center. The equipment consists of four GE-58 motors, with K-6 controllers and GE emergency air-brake equipment. The floors of the two end cars are 36 in. above the rail, and this distance is divided into three steps, the first, of 14 in., being from the street to the main floor of the center compartment, the second, of 12 in., to a platform on either end of this middle section, and the third, of 10 in., comprising a portion of the pivotal connection between the compartment and the car body. The last step is circular and built on the center sills of the original platform. When the car takes a curve this step rotates over a circular toe-board rising from the 12-in. platform of the middle section. Sufficient clearance is provided between this toe-board and the circular step, and free rotation is afforded, thus forming a perfectly safe and comfortable passage even on the sharpest curves.

The center compartment is carried on a steel underframe pivoted on center bearings, supported both by the lateral sills extending from the car body and by a center pin pendant from a bearing rigidly fastened to the original platform sills. Roller bearings on the steel underframe are set on radial side bearings under the circular step.

Double curtains on spring rollers inclose the passageway between the middle and end sections. The inner curtain, of pantasote with cloth lining exposed, clears the floor by several inches and reaches only shoulder high. This curtain can easily be removed for cleaning. The outer curtain of 12-oz. waterproof canvas extends from below the circular step level to the ceiling.

The roof section of the pivotal connection is hinged to the transom of the center compartment and bears on the transom roof of the end section. This permits carrying the roof line of the car bodies through the middle section and thus suggests the appearance of a center entrance car. This effect is increased by life guards pendant from the ends of the car bodies and dropping from the side sill level to the level of the bottom sill of the center portion. Pantograph gates are supported in brackets between the compartments.

The steel underframe consists of a set of four 5-in. channel irons extending the full length of the center section. The ends of these beams are supported by the upper center bearings, and their middle portion is shaped by reverse curves at either end so as to drop below the floor level. The side sills are 4-in. x 4-in. angle-irons, spaced the width of the center section apart. Their ends are bent inward and upward to connections on the channel irons and form the end sills of the middle section. The side sills are 1 in. below the level of the center sills and form a convex ramp laterally through the center compartment. Diagonal braces, from corner to corner, and lateral end braces with side end truss members complete the underframe.

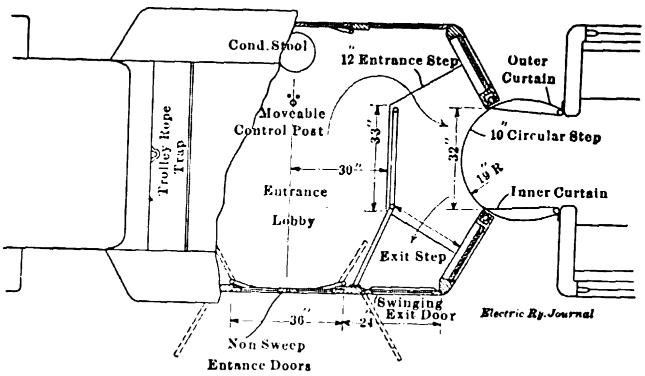
ENTRANCE AND EXIT FACILITIES

A pair of center entrance doors are adjoined by exit doors on either side. The entrance doors are of the "non-sweep" type and are hinged in the center on a pivot, the movement being controlled by a roller on the outer edge which runs in a slotted guide-way above the doors. The exit doors are of the simple swing type with check. The conductor's station is opposite the entrance doors behind a movable post. A permanent barrier at the end of each the platform steps and movable barriers between the entrance and exit doors separate the streams of entering and leaving passengers. The entering passengers cross the center section and pass the conductor on either side before reaching the platform step.

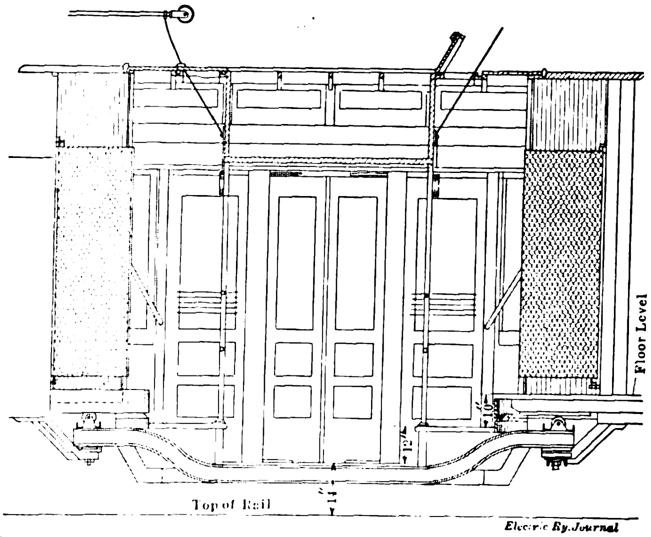
The fare-registering and door-operating devices are mounted on the above mentioned movable post, as are also the conductor's stool and bell cord signal to the motorman. This post is shifted to the opposite side of the compartment when the direction of the train is reversed. All connections are automatically made when the post is placed in position. This is accomplished by a set of plugs entering sockets in the floor and overhead rods. Three hand levers and a pedal mounted on this post control the entrance doors, the exit door, the register shift and the register respectively. Overhead rods connect the doors and register with the post. The entrance doors are opened and closed by the conductor. The exit door is unlocked and locked by the conductor, but must be pushed open by the leaving passengers. A small electric light in each motorman's cab is connected in a circuit which is only completed when the entrance and exit doors are closed and locked. As a double precaution against boarding and alighting accidents, the bell cord signals, by a ball and tube mechanism attached to the door operating devices, are locked to prevent possible signaling unless the doors are closed and locked.

The trolley poles are carried through a slot in the ventilators on either end of the center section. Trolley catchers are used. An emergency valve, which can easily be operated by the conductor, enables the latter to apply the air brakes independent of the motorman in case of emergency.

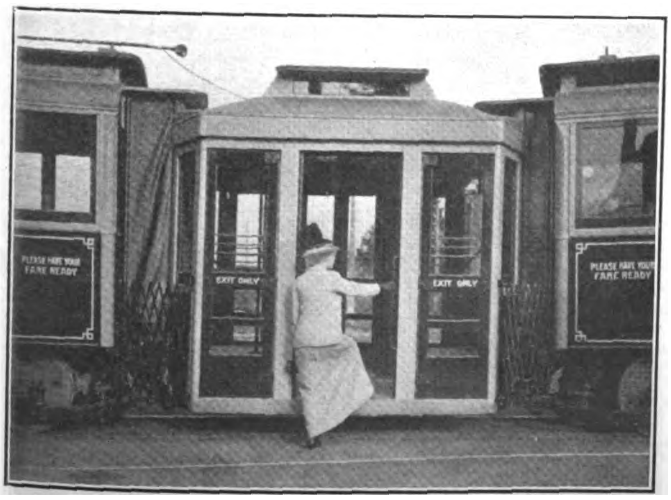
The motorman has exclusive use of the end platform and door. A movable seat on the rear end locks the door and, with its opposite stationary seat, increases the original seating capacity of the train by four passengers; thus making the total seating capacity of the "twin car" sixty-four. There are at present four of these cars in operation.



TWIN CARS IN PORTLAND—PLAN OF VESTIBULE SHOWING ARRANGEMENT OF EQUIPMENT



TWIN CARS IN PORTLAND—ELEVATION OF ENTRANCE AND EXIT VESTIBULE



TWIN CARS IN PORTLAND—VIEW SHOWING EASY ENTRANCE FACILITIES

The cost of constructing the first of the "twin cars" to be built was approximately $1900, but it is expected that the cost in the future will be but $1000, the difference in figures being caused by high cost of preliminary design, patterns and changes due to experimental work.

For subsequent cars which are now under construction in the company's shops a number of changes are to be made in order to improve the external appearance, but the general construction of the new cars will be identical with those first built. The principal change will be the carrying of the roof line of the two car bodies through the middle section, this being planned for the sake of appearance.

The engineering experiment station of the University of Illinois has issued a bulletin entitled "The Thermal Properties of Steam," No. 75 in the series. It was prepared by C. A. Goodenough and presents a critical discussion of the experimental investigation of the various thermal properties of steam, an outline of the thermodynamic relations that must be satisfied, and the development of a general theory of superheated and saturated steam. It is believed that this formulation of the properties of steam give absolute thermodynamic consistence, extreme accuracy, simplicity, flexibility and great range of validity. Copies of the bulletin may be obtained without charge from C. R. Richards, acting director of the experiment station, Urbana, Ill.

A Zone System of Fares in Practice[*]

This Is a Comprehensive Description of the First Extended Application in This County of the Zone System of Fares for City Lines—Full Detail of Earnings and Expenses Are Given—Data from European Cities Are Appended

BY R. B. STEARNS, VICE-PRESIDENT AND ASSISTANT GENERAL MANAGER THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY

A zone system of street railway fares and collections applicable to suburban and interurban territory in place of the nickel system almost universally used in American cities and suburbs has been placed in operation during the last year on the urban, suburban and interurban lines of the Milwaukee company. The system to be described is a practical attempt at the fixing of street railway fares so that they will vary more or less closely with the distance traveled and in some respects is not unlike the zone system on the electric railways of England and the Continent. The treatment in the central district, however, is substantially different and is necessarily so in order to accord with American conditions. While fares so fixed are not exactly in line or parallel with the cost of service, they are quite likely to prove more so than flat fares for longer zones. It is believed that this is the first attempt on a relatively large scale to introduce small increments of distance traveled for small increments in the way of added fare.

While the system may at first appear complicated in operation, in point of fact it is relatively simple, and predicted difficulties of fare collection have not developed. The general scheme was referred to in President Harries' address at the 1913 convention.

THE MILWAUKEE RAILWAY SYSTEM

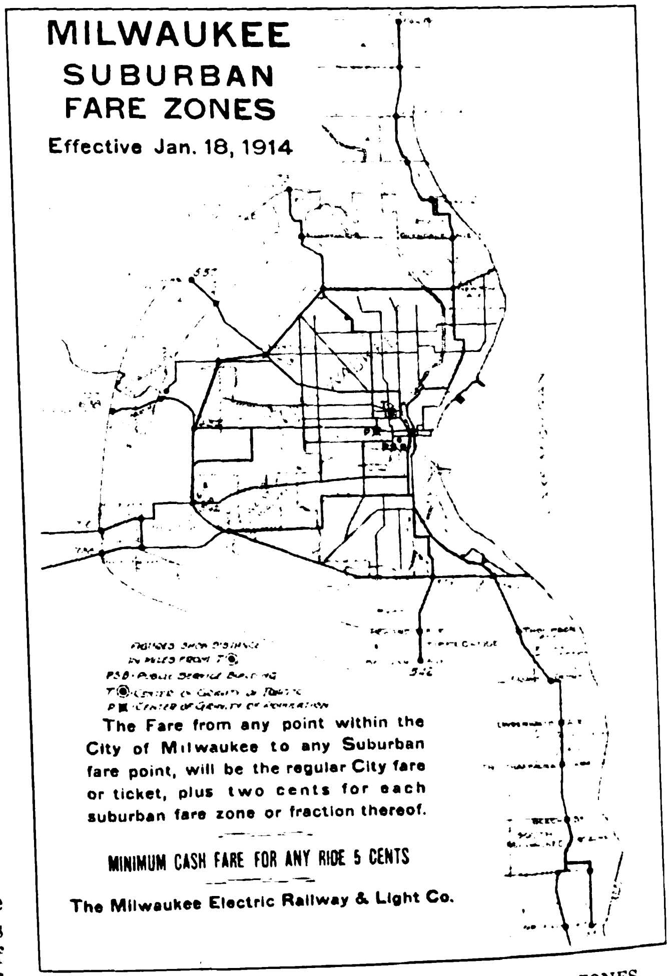
The Milwaukee railway system comprises 417 miles of surface tracks, of which 175 miles are located in the city of Milwaukee, 60 miles serve the suburbs of Milwaukee, 20.5 miles comprise the local system in the city of Racine, and the remaining 161.5 miles are essentially interurban. The interurban tracks extend southward 37 miles to Kenosha, passing through several municipalities, including Racine, which has a population of 40,000. They also extend 51 miles to the west, passing through the cities of Waukesha, Oconomowoc and Watertown, and 37 miles to the southwest, passing through Hales Corners, St. Martins and East Troy, with a branch line from St. Martins through Waterford and Rochester to Burlington. On the entire system there are operated 686 passenger cars, carrying about 150,000,000 passengers per annum.

FORMER RATES OF FARE AND DISTANCES

The fare charged within one fare limit of Milwaukee is 5 cents cash, six tickets for 25 cents, twelve tickets for 50 cents, and twenty-five tickets for $1. Each of the latter two classes of tickets have coupons attached which will be accepted in payment of one fare within the city of Milwaukee fare limits, if the order of the Railroad Commission, providing for the sale of thirteen tickets for 50 cents is set aside or vacated in the action now pending. About 81 per cent of revenue from urban traffic is paid in tickets.

Prior to Jan. 18, 1914, the rate of fare beyond the single-fare limits of Milwaukee was 5 cents cash into and through each 5-cent zone, these 5-cent zones having been fixed in previous years by franchise negotiation, trade or voluntary concession and extended through each suburban city or village adjacent to Milwaukee and on the interurban lines beyond. The distances for a 5-cent fare varied from 0.99 to 7.17 miles and were the sources of many complaints. Overlapping fare zones had grown into the system from time to time, due to extension of the city fare limits, annexation of territory, compromise, franchise provisions, etc.

On certain suburban lines reduced rate commutation bearer tickets were sold in blocks at 7½ cents each. These were good for a ride in either direction in the city of Milwaukee, including one 5-cent suburban zone adjacent thereto.


MILWAUKEE
SUBURBAN
FARE ZONES
Effective Jan. 18, 1914
FIGURES SHOW DISTANCE IN MILES FROM T
PSB-PUBLIC SERVICE BUILDING
T-CENTER OF GRAVITY OF TRAFFIC
P-CENTER OF GRAVITY OF POPULATION
The Fare from any point within the City of Milwaukee to any Suburban fare point, will be the regular City fare or ticket, plus two cents for each suburban fare zone or fraction thereof.
MINIMUM CASH FARE FOR ANY RIDE 5 CENTS
The Milwaukee Electric Railway & Light Co.

MILWAUKEE ZONE SYSTEM—MAP SHOWING ZONES

The fares charged on the interurban lines were made up by the sum of the various 5-cent zone fares, plus the Milwaukee single fare, transfers and reduced rate city tickets being exchanged for that portion of the ride in Milwaukee from the first fare point to the Public Service Building, located within the business district. Reduced rate round-trip tickets were sold to certain interurban points. The relation between the round-trip rate and the one-way rate was not uniform but varied according to the circumstances which the fare was designed to meet.

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[*] Paper presented at convention of the American Electric Railway Association, Atlantic City, N. J., Oct. 15, 1914.

COMPLAINTS REGARDING DISCRIMINATIONS IN FORMER RATES AND DISTANCES

With the advent of commission regulation, many complaints were made by patrons and municipalities, alleging discriminations, citing the various instances of disproportionate distances for the same fare, urging extension of single-fare limits and round-trip reduced rates comparable with those in existence on other parts of the lines, etc. Cases had been brought before the commission involving the extension of the Milwaukee single-fare limits to two of the principal suburbs, and a number of other cases were pending, all of which gave evidence of continued controversy and involved much time and expense on the part of both the company and the commission.

Abundant opportunity existed for complainants to present a plausible case. All that was necessary was a diligent search with ruler and map to discover instances where the company was giving longer rides for the same money and then to argue that the complainants were either paying too much or received less favorable treatment and hence were discriminated against. The single-fare zone does not in several instances correspond with the corporate limits of the city. In one case many years ago, real estate owners desiring to subdivide land for sale at a profit undertook to raise $30,000, and actually paid over $20,000, as a subsidy to procure the construction at that time of an extension of one city line some 3 miles into the country, with the apparent understanding that city service at the single fare be extended to the outer terminus. These hopes of rapid development were not realized, and operating deficits still continue to exist due to sparsity of traffic. This condition gave rise to recurrent demands for lower fares from other suburbs. In other cases, franchise conditions inherited in many cases from predecessor companies prescribed fare zones, which gave equal possibilities of unfavorable comparison.

These existing conditions were in their nature beyond the control of the company. Its only defense, aside from considerations of density of traffic, was the very evident fact that the instances cited were not paying expenses. Public policy and the best policy of management required that inequalities be eliminated and that a new uniform system of fares based as far as possible upon scientific principles be substituted for the prevalent system of fares.

Accordingly, in conformity with the suggestion of the Railroad Commission of Wisconsin, the company made formal application, under date of Aug. 15, 1913, requesting that the commission "investigate the rates for suburban and interurban service and by order prescribe such uniform tariffs and schedules of rates as shall be just and proper under the circumstances." All the various cases and petitions before the commission involving reasonableness of the alleged discriminations for suburban and interurban service were consolidated and disposed of in the decision of Jan. 2, 1914. A few citations from the opinion upon the points involved will be of interest.

CITATIONS FROM DECISION

Discriminatory Features of the 5-Cent Zone. "In selling transportation to persons the adopted standard unit of measurement is the passenger-mile—one passenger carried one mile. Although steam lines in general have adhered to this standard, the electric interurban system in many cases have used the so-called 5-cent zone system of rates. This system is merely an extension of the flat 5-cent city fare and has no scientific basis for suburban or interurban operation. The resultant inequalities which exist under this system of rates may well be illustrated by measuring the different fares charged by the unit of measurement—the passenger-mile. No better examples can be cited than can be found upon the suburban and interurban systems involved in the present proceeding."

Discriminatory Features of Overlapping Zones. "Directly due to the inequitable nature of the 5-cent zone system, as outlined in the * * * discriminations of one-way fares, is the practice of granting overlapping zones, special and round-trip rates to favored points. When overlapping zones are injected into the 5-cent zone system we have a rate scheme which places every locality in competition with its neighbors. For instance, it is usually contended that if a company extends the limits of an interurban zone for ½ mile so as to reach a certain locality, and thereby grants a lower fare to this locality to all points through the overlap, it logically follows that the next locality ¼ mile or ½ mile distant should be granted a similar concession. The result is that this necessity of granting overlaps caused the rate schedules to become even more discriminatory, and, carried to its logical conclusion, the entire schedule ultimately must fall to the ground.

"In any equitable system of fares for suburban and interurban service the overlapping zone cannot be justified except under very extreme conditions."

Necessity of Uniform Distance Basis for Fares. "In establishing a revised system of interurban and suburban fares it is fully realized that the present fares will be considerably disturbed in some sections of the territory, but this is not due to the application of any radical or untried theory of rates. It is due principally to the fact that the existing fares * * * do not rest upon any scientific basis but are based upon unequal zone distances and concessions to favored localities. The results of such a schedule are obvious. Invariably one or more localities are built up at the expense of others. Patrons favorably situated are granted extremely low fares, part of the cost of which has to be borne by those less favorably situated and paying excessive rates. With these facts in mind, a revision is here undertaken with the sole aim of removing as much of the discriminations as possible and placing a schedule of fares in force, upon a uniform rate per passenger-mile, which will equalize opportunity for local growth and expansion, insure equitable treatment of individuals and reasonably reserve the amount of traffic upon the various lines."

Basis of Zone System of Fares. "In bringing about uniformity in the suburban fares by applying the distance basis * * * the fares as authorized are placed as near as possible upon an equitable basis by the establishment of consecutive 2-cent zones. * * * This scheme of fares is far less discriminatory than the existing 5-cent zones with the accompanying overlaps. The present system is discriminatory partly because the suburban zones vary all the way from 1.44 miles to 7.17 miles. * * * When cognizance is taken of the fact that 5 cents is charged for these varying distances the inequalities as between suburbs becomes apparent. * * * To remedy these differences it will be necessary to employ shorter zones upon a proper basis. A charge of 2 cents as applied will necessarily raise the low rates and decrease the higher ones."

These changes were immediately made effective upon the entire system with the exception of the longest suburban line, where a reduced trip ticket with an increase of 2½ cents over the present cash fare and 3½ cents over the suburban cash and city ticket fare has been installed for a period of one year in order that the transition to an increased fare operate gradually.

PRESENT SYSTEM OF ZONE FARES—UNIFORM FARES AND DISTANCES

The system of fares established in compliance with the opinion and decision of the commission comprises a "Central" or "Metropolitan District," extending 8½ miles to 9 miles in length and 6 miles in width, bounded on one side by Lake Michigan; the area aggregates approximately 35.5 square miles and contains a population of 400,000. The Metropolitan District conforms substantially to the area within the then city limits, the corporate limits, however, being disregarded as controlling. Within the boundary of the Metropolitan District a single fare is charged irrespective of distance carried. The length of the various lines radiating from the center of gravity of the street railway traffic in the downtown district to the outlying territory and beyond the Metropolitan District into the suburbs, is as shown in Table I.

TABLE I—DISTANCE IN MILES FROM CENTER OF GRAVITY OF TRAFFIC

	City Portion	SUBURBAN PORTION					Total Suburban	Total
		First Zone	Second Zone	Third Zone	Fourth Zone	Fifth Zone		
1. Farwell	4.64	....	....	....	....	....	....	4.64
2. Oakland, W.F.B., Fox Point	4.26	1.01	1.07	0.91	0.88	0.78	5.90	10.16
3. Holton Street	3.04	....	....	....	....	....	....	3.04
4. Third Street	3.28	....	....	....	....	....	....	3.28
5. Eighth Street	4.27	....	....	....	....	....	....	4.27
6. Twelfth Street, North Milwaukee	4.66	1.50	1.15	....	....	....	2.65	7.31
7. Fond du Lac	3.78	....	....	....	....	....	....	3.78
8. Wanderer's Rest	4.13	1.07	0.37	....	....	....	1.44	5.57
9. Pabst-Wauwatosa	4.80	1.44	....	....	....	....	1.44	6.24
10. Vliet Street	4.46	....	....	....	....	....	....	4.46
11. State Street	2.70	....	....	....	....	....	....	2.70
12. Wells Street, Wauwatosa	4.52	1.02	0.83	....	....	....	1.86	6.38
13. Clybourn Street	2.57	....	....	....	....	....	....	2.57
14. National-West Allis	5.42	1.08	0.60	....	....	....	1.68	7.10
15. Burnham-West Allis	5.78	1.58	0.52	....	....	....	2.10	7.88
16. Muskegon	3.78	....	....	....	....	....	....	3.78
17. Mitchell Street	4.41	....	....	....	....	....	....	4.41
18. Eighth Avenue	4.67	....	....	....	....	....	....	4.67
19. First Avenue	4.34	....	....	....	....	....	....	4.34
20. Howell-Tippecanoe	3.89	1.05	0.48	....	....	....	1.53	5.42
21. South Milwaukee	4.19	1.23	0.87	0.91	0.83	1.17	7.17	11.36
22. Delaware Avenue	4.52	....	....	....	....	....	....	4.52
23. Wisconsin Street	1.30	....	....	....	....	....	....	1.30
24. Michigan Street	1.38	....	....	....	....	....	....	1.38

NOTE.—Line No. 2 has a sixth zone 1.25 miles in length; Line No. 21 has a sixth zone 1.15 miles in length and a seventh zone 1.01 miles in length.

A comparison of the length of these lines and an examination of the map on page 950 will disclose the variation of the boundaries of the Metropolitan District from a true circle. Some of these city lines are through or radial lines extending from the outer limits of the Metropolitan District in one division of the city through the downtown district and continuing on to the outer boundary of the Metropolitan District in another division of the city, and some extend beyond into the suburban territory. Some of the city lines are entirely of the crosstown character and do not approach the center of traffic. The map is similar to that displayed in card form in the cars of the company.

Beyond the limits of the Metropolitan District upon each of the suburban or interurban lines radiating from the city nine lines comprising this system have been divided into geographical zones approximating 1 mile in length, the zone points being placed at principal traffic points where such was possible within reasonable variation in distance from the 1-mile point.

The charge for a ride from any point within the Metropolitan District into or through each such geographical zone is 2 cents in addition to the city fare. For any local suburban haul originating and terminating beyond the Metropolitan District, the fare is computed in like manner as the suburban components of the above rates of fare, the minimum cash fare for any ride being 5 cents.

On the interurban lines extending beyond the limits of the suburban territory the fare charged is 2 cents for each additional mile, the interurban fares being computed to the nearest 1 cent. Where interurban lines pass through the principal outlying cities or subterminals for distances ranging from 2 miles to 3 miles a 5-cent cash fare is substituted for the 2-cent-per-mile rate, thus providing a single 5-cent fare within the city limits of each of the sub-terminals. For "through interurban passenger service" upon all interurban lines, the mileage included within the Metropolitan District of the city of Milwaukee is in every case computed at 4 cents. For passengers riding locally on interurban cars between the Metropolitan District and the outer limits of the suburban service zones, the charge in every case is the same as the rate of fare for suburban service. The rates of fare per passenger for all interurban service between points outside the Metropolitan District of the city of Milwaukee is the difference between the through rates to these points. The through fare between sub-terminals is equal to the sum of the local fares. Non-transferable individual 300-mile mileage books at 1.8 cents per mile, good for the payment of any interurban or suburban fare, with a minimum tear of 5 miles, are sold through conductors on interurban cars. When the cash fare is odd, the next highest fare is torn.

Upon both suburban and interurban lines, children under three years of age are carried free. Children between the ages of three and ten, inclusive, are carried for one-half the full fare. All passengers are entitled to the usual transfer privilege within the single-fare limits of the city of Milwaukee and to transfers upon the several suburban lines, provided, however, that no such transfer shall operate to compel the company to carry a passenger on the suburban lines for less than the regular fare of each 2-cent distance or fraction thereof on each line within which the passenger rides.

When the new fares were placed into effect all abandoned reduced-rate and round-trip tickets outstanding were honored for a period of thirty days, after which they became void upon the cars but were redeemed on demand at a pro rata portion of the original cost.

COMPARISON OF ZONE SYSTEM WITH FORMER RATES

The distances, comparative over all cash rates and resulting rates per adult passenger-mile, on all suburban lines, as measured from the center of gravity of traffic in the Metropolitan District, are contained in Table II.

Reference to the map on page 950 will disclose that the center of gravity of the street railway traffic, marked *T*, coincides closely with the center of population, marked *P*, the former point extending about 3000 ft. in the direction of the business district. The terminus of all interurban lines and of the longest suburban or South Milwaukee line, or the Public Service Building, whose location is marked *P. S. B.*, is also close at hand. In fact, the three focal points—center of traffic, center of population and the terminal building—are within 2900 ft. to 3500 ft. distant from one another.

During various discussions before the commission upon the reasonableness of uniform rates and distances in the suburban territory, an attempt was made to show discriminations in the application of such uniform rates by associating the distance to various suburban points from the Public Service Building rather than from the limits of the Metropolitan District within which the city fare applies for any distance. It will be noted

TABLE II—DISTANCES AND RATES, ETC., FOR FORMER AND PRESENT CONDITIONS

Suburban Line	DISTANCE		Over-all Distance (Miles)	OVER-ALL RATES CITY PLUS SUBURBAN		Number of Suburban Zones, Present Basis (Number)	OVER-ALL RATE CITY PLUS SUBURBAN ADULTS' RATE PER PASSENGER-MILE		Distribution Suburban Revenue, per cent
	City (Miles)	Suburban (Miles)		Former (Cents)	Present (Cents)		Former (Cents)	Present (Cents)	
1. Oakland W.F.B.F.P.	4.25	5.90	10.16	15	17	6	1.48	1.67	9.4
2. North Milwaukee....	4.66	2.65	7.31	10	9	2	1.37	1.23	7.3
3. Wanderer's Rest......	4.13	1.44	5.57	10	9	2	1.79	1.61	2.3
4. Walnut-Wauwatosa	4.80	2.27	7.07	10	9	2	1.41	1.27	3.7
5. Wells-Wauwatosa....	4.52	1.86	6.38	10	9	2	1.57	1.41	10.0
6. National-West Allis.	5.42	1.68	7.10	10	9	2	1.41	1.27	12.7
7. Burnham-West Allis.	5.78	2.10	7.88	10	9	2	1.27	1.14	8.0
8. Tippecanoe	3.89	1.53	5.42	5	9	2	0.92	1.66	3.1
9. South Milwaukee....	4.22	7.17	11.39	10	19	7	0.88	1.67	43.5
Weighted average rate per passenger-mile....................							1.18	1.50	100.

NOTE.—These comparisons are based upon a 5-cent cash city fare. The actual average city fare from city tickets and cash was 4.18 cents per revenue passenger for the year 1913.

that the zone distance as determined by the commission is based upon the outer limits of the Metropolitan District rather than with reference to the central points described, although such central points were undoubtedly considered in determining the limits of the Metropolitan District.

With the application of the zone system to the suburban lines, changes in rates became necessary on all interurban lines. The commission found from its computations as to the cost of the interurban service that actual costs justified the establishment of basic rates to yield about 2.75 cents per passenger-mile. "When the conditions prevailing on the interurban system are considered, * * *" it stated, however, "it seems best to place the rate at a lower figure than the cost of service would demand so as to encourage the passenger density with this lower rate to increase sufficiently to bring the revenue to the point where it will bring an adequate return above all expenses."

A comparison of the old and new rates on the interurban lines is shown on the accompanying diagrams. These show clearly the rates on a distance basis, measured from the outer limits of the Metropolitan District, as compared with similar rates as measured from the Public Service Building and rates upon the old 5-cent basis, together with a statement of the number of rates not changed and those increased and decreased by the application of the zone system.

METHODS OF COLLECTION

All city and suburban cars of the company are of the prepayment type, either with semi- or fully-inclosed platforms with folding doors, the latter cars having no bulkheads. Small portable fare boxes are used, except on interurban cars carrying through service. These fare boxes are of light aluminum construction, with wireglass sides exposing the fares to view, and are provided with convenient handle for portable use.

Under the present system of 2-cent suburban zone fare collections, passengers originating at or destined to points within the Metropolitan District pay 5 cents cash or a city ticket, and in addition thereto 2 cents cash or one 2-cent zone ticket for each 1 mile suburban zone into or through which the passenger rides, in the manner hereafter described, the passengers being entitled to one transfer within the Metropolitan District, if requested, at the time fare is paid.

One objection to such a system is that it involves the collection of small increments for added fares with the probable use of a large number of pennies and necessitates care in accurately ascertaining the zone into which outbound suburban passengers had paid their fares.

To meet this problem the company provided for the sale of suburban zone tickets by conductors on the cars. These tickets have a value of 2 cents each, are printed with a broad red band across each face, and are of the same size as the city ticket but are readily distinguished from these. Zone tickets are sold in small quantities at no discount and are good only for one ride into or through any one suburban fare zone. During the last four months the sales of such zone tickets have aggregated 21.8 per cent of the suburban revenues, and their use has practically eliminated the anticipated troubles arising from the collection of fares in pennies. Conductors on city and suburban runs are provided daily with $25 in value of city tickets, $5 in value of 2-cent zone tickets, and provide themselves with $5 in change, an amount which is no different from the change carried prior to the establishment of the zone system.

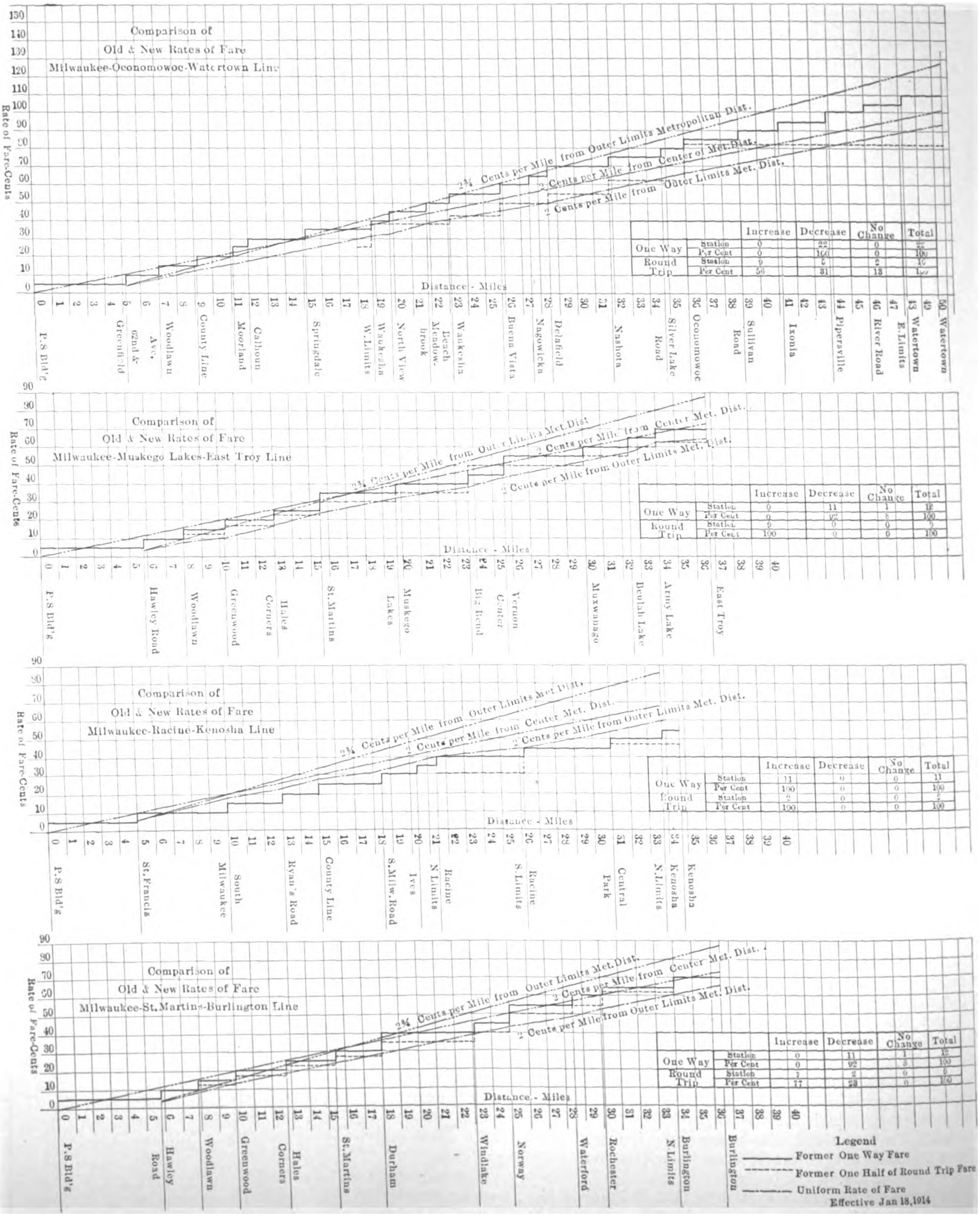
The problem of checking destination necessitated a change in the regular transfers used upon lines reaching into the suburban territory so as to provide space for the conductor to punch time and zone destination by name to which the passenger has paid fare. In the case of the longest suburban line, comprising seven 2-cent zones, a special zone receipt was necessary because of lack of space on the regular transfer. This form of receipt is issued to all outbound passengers originating within the Metropolitan District except those destined to points within the first 2-cent suburban fare zone adjacent to the Metropolitan District, on all lines except in the case of the longest line. As passengers leave the cars beyond the first zone the receipts are lifted by the conductor and remitted in the usual way.

Outbound passengers may pay regular city fare to the city fare limits and continue their journey into suburban territory upon payment of the necessary additional 2-cent zone fares in cash or zone tickets or may pay through fare to suburban destination when boarding the car. When suburban cars pass from the Metropolitan District to suburban territory, the conductor enters with the portable fare box and collects the suburban fare from the passengers who have not paid through fare to destination, issuing the transfer receipts accordingly. When passengers leave the car beyond the first suburban zone, the receipt is surrendered to conductor who checks destination and collects any deficiency.

Inbound suburban passengers when boarding cars are requested by conductor to make prepayment of through fare to the Metropolitan District and place the amount in the fare box in cash or tickets. No receipts for fare paid are given to inbound passengers, except upon the longest line of seven zones. On this line, when cars pass into the Metropolitan District, the receipts are lifted to check passengers who have paid city fare.

The minimum cash fare for any ride in suburban territory is 5 cents. Two-cent suburban zone tickets are not honored within the Metropolitan District and are not good for the initial ride in suburban territory unless three or more are paid at the same time for each passenger for a continuous ride. Conductors report on trip sheets the actual number of passengers on car entering and leaving the Metropolitan District and, in addition, the number of passengers on and off in each 2-cent zone. This information serves as a basis for the division of earnings.

The collection of fares under this system has worked out satisfactorily and, since the elimination of various experimental schemes, does not now involve delay or congestion. It is also believed to provide means for collection of all fares in a practical manner. On special occasions, such as large crowds at suburban resorts, State Fair and during rush hours when large numbers of workingmen are concentrated at certain points, the collection of fares is facilitated by the use of extra fare collectors for short periods of time, who assist by collecting fares and by loading the large interurban cars usually employed for this service at both ends. In some special cases small portable ticket booths have been employed where through tickets from suburban resorts to the Metropolitan District are sold, thus greatly facilitating the rapid loading of cars. This plan has eliminated the difficulties anticipated at congested points, as a large percentage of passengers purchase tickets at the ticket booths.



Milwaukee-Oconomowoc-Watertown Line

		Increase	Decrease	No Change	Total
One Way	Station	0	22	0	22
	Per Cent	0	100	0	100
Round Trip	Station	9	5	2	16
	Per Cent	56	31	13	100

Milwaukee-Muskego Lakes-East Troy Line

		Increase	Decrease	No Change	Total
One Way	Station	0	11	1	12
	Per Cent	0	92	8	100
Round Trip	Station	9	0	0	9
	Per Cent	100	0	0	100

Milwaukee-Racine-Kenosha Line

		Increase	Decrease	No Change	Total
One Way	Station	11	0	0	11
	Per Cent	100	0	0	100
Round Trip	Station	2	0	0	2
	Per Cent	100	0	0	100

Milwaukee-St. Martins-Burlington Line

		Increase	Decrease	No Change	Total
One Way	Station	0	11	1	12
	Per Cent	0	92	8	100
Round Trip	Station	7	2	0	9
	Per Cent	77	23	0	100

MILWAUKEE ZONE SYSTEM—COMPARISON OF OLD AND NEW RATES OF FARE ON VARIOUS LINES

Interurban cars do not carry local city passengers. Such cars stop, however, at frequent points outbound in the city to pick up passengers destined to suburban points and beyond. Inbound cars within the Metropolitan District discharge passengers only. The collection of fares on all interurban cars in through service consists merely in lifting tickets sold at agencies or collecting cash fares and issuing proper receipt therefor.

COST OF SUBURBAN SERVICE

The cost of service for suburban and interurban traffic has not been of controlling importance in the establishment of the rates of fare, as provided in the order of the commission, since, like many suburban and interurban properties, it was evident that any rates of fare which purported to pay a reasonable return upon the investment would be prohibitive and result in decreased traffic. It is of interest to compare, however, the revenues resulting from the operation of the zone system with the costs of furnishing the service rendered.

In the development of the cost of service, the method employed is that used heretofore on the company's properties and consists of separately localizing revenues, operating costs and the value of the tangible property as determined by the commission used and useful for railway purposes. Each of the several lines has been separately treated, and a summary showing the cost of service on the combined lines determined.

Operating expenses are grouped according to the unit with which the expense item varies, and miles of track, car-miles, car-hours and revenue passengers have been used as the unit of apportionment. Depreciation and return upon the investment in tangible property have been computed upon the investment applicable to each suburban line. When assembled these figures constitute an income account for any line and enable the determination of its unprofitableness. The operating expenses were determined from the actual expenses for the first eight months of the year 1914 and the remainder of the year estimated.

These expenses have been grouped as follows:

(a) Under expenses, varying with the car-hour, there are included: wages of conductors and motormen; incandescent lamps for lighting cars; water and supplies for cleaning cars; fuel, kindling and other supplies for heating cars; miscellaneous transportation expenses.

(b) Under expenses varying with the car-mile, there are included: 43.88 per cent of the way and structures group of charges; equipment; lubricating supplies for cars and motors; miscellaneous car service, supplies and expenses.

(c) Under expenses, varying with the miles of single track there are included: the remaining portion of the way and structures group of charges (56.12 per cent).

(d) Under expenses varying with the revenue passengers carried, there are included: superintendence of transportation; wages of miscellaneous car service employees; tickets, transfers, etc.; secret inspection; ticket punches, motormen's tools, badges, etc.; wages of station employees; wages of carhouse employees; miscellaneous carhouse expenses; operation of telephone system; patrol and wreck service expenses; injuries and damages (actual expenditures).

(e) Under power plant expenses, varying with the car-mile, there are included: power apportioned (proportionate cost of power).

(f) As overhead expense there are included: general expense; insurance; stationery; operation of stores department; maintenance of stores department equipment; maintenance of stores department buildings, fixtures and grounds; rent of land, buildings and other property; taxes.

Such expenses have been apportioned as a definite percentage of classes (a) to (e).

(g) Under depreciation there has been included an amount calculated at 4.38 per cent of the reproduction cost new on the suburban lines, being the basis of the amount estimated by the Railroad Commission of Wisconsin in the previous fare case and chosen for purposes of illustration.

(h) Return upon the tangible property has been calculated at 8 per cent. This likewise follows the percentage in the commission's 1914 calculations.

The reproduction cost new of the various lines is based upon the Railroad Commission valuation as of Jan. 1, 1910, to which has been added the property additions made subsequent to that date to bring the valuation in this case to June 30, 1914, for the purpose of determining the cost of service for the year ending Dec. 31, 1914. The physical property has been assigned to the zone or line of which it is a part wherever possible, but such items as land, power plants, rolling stock, etc., have been apportioned on a car-mile or car-hour basis as appeared proper, using operating units for these zones for the year 1914 for determining such apportionment, land being apportioned on the car-hour basis; roadway and paving, transmission and distribution system being directly applied in accordance with the geographical location of this property; power plants, with their buildings and grounds being apportioned on the car-hour basis, and railway stock, with its buildings and grounds being apportioned on the car-mile basis.

The valuations as obtained are approximate. It is believed that the method used is as accurate as can be followed without an extended appraisal. The company is engaged in an extensive valuation of its property, and it is believed when this work is completed the reproduction cost new of the various lines will be materially increased, as the results obtained up to the present time indicate that the old inventories were not complete and that old unit prices used were in many cases too low. Owing to the present lack of returns upon any basis, the correction of these appraisals is a matter of principle rather than of necessity, to substantiate the reasonableness of present earnings.

The combined suburban lines heretofore referred to, and comprising the suburban zone system, show roughly total operating revenues for the year 1914 of $252,672, with an approximate reproduction cost new of $1,191,864. For each $1 of revenue the valuation amounts to $4.71. The actual return upon the reproduction cost new for the year amounts to 1.71 per cent, showing a deficit on the basis of an 8 per cent return of $74,961. There are appended hereto typical detailed tabulations showing the cost of service so determined for several of the suburban lines comprising the zone system, together with a combined statement.

A summary of the cost of service of the suburban lines is shown in Table III.

TABLE III—SHOWING RETURNS OF INDIVIDUAL LINES

	Per Cent of Total Revenue	Operating Revenues	Operating Expenses (Cost)	Deficit	Per Cent of Return
Whitefish Bay Fox Point	9.4	$23,781	$44,163	$20,381	−3.54
North Milwaukee	7.3	18,561	25,806	7,244	−0.51
Wanderer's Rest	2.3	5,732	11,585	5,853	−8.96
Walnut-Wauwatosa	3.7	9,364	14,230	4,866	−3.23
Wells-Wauwatosa	10.0	25,172	26,837	1,665	+6.08
National-West Allis	12.7	32,072	38,690	6,618	+3.03
Burnham-West Allis	8.0	20,157	30,364	10,206	−0.57
Tippecanoe	3.1	7,828	17,894	10,065	−10.72
South Milwaukee	43.5	109,999	118,059	8,059	+6.25
Combined	100.0	$252,671	$327,632	$74,960	+1.71

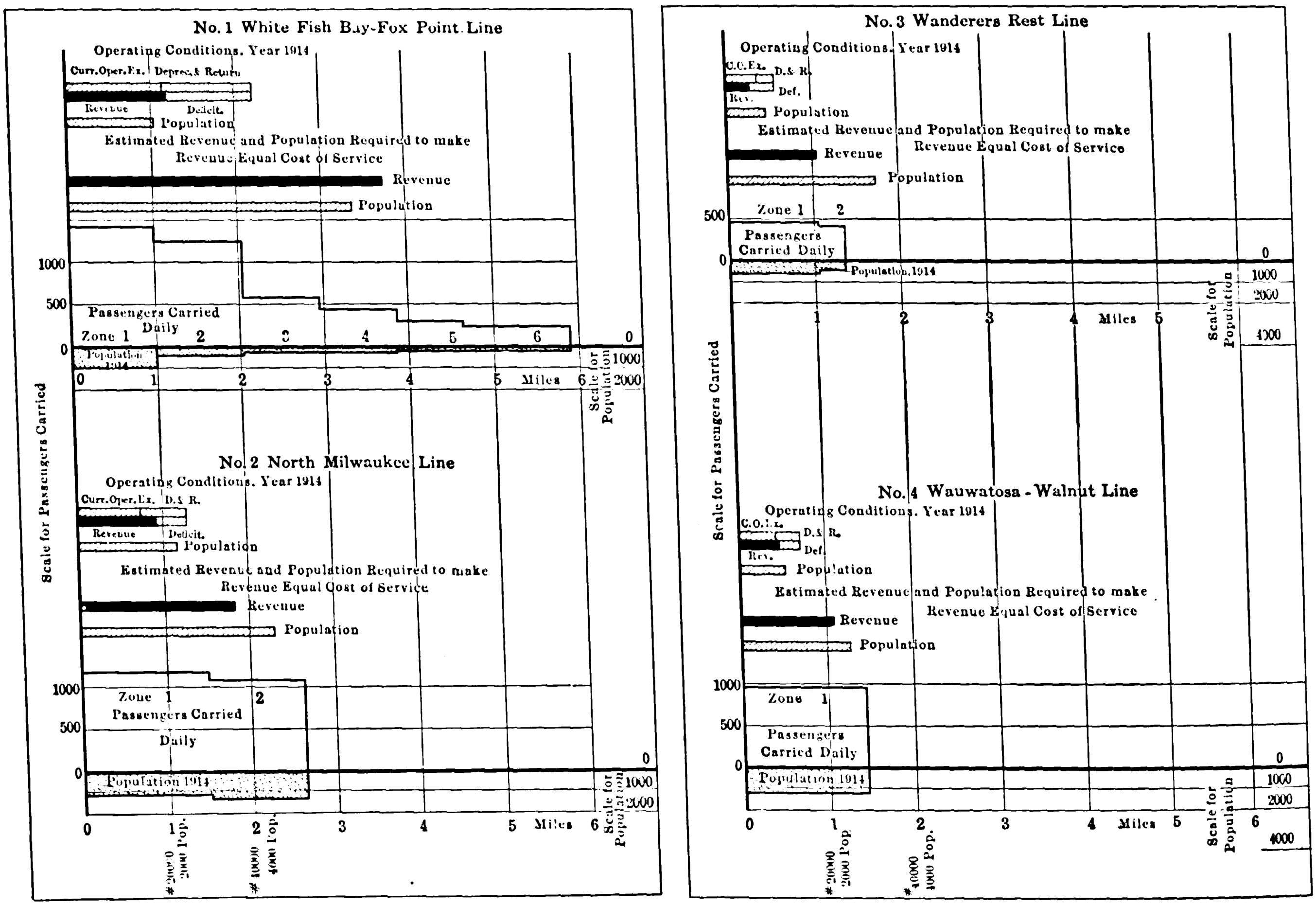
Distance Distribution of Passenger Traffic—Cost and Earnings and Estimate of Additional Revenue Required to Equal Cost of Service

The normal distance distribution of traffic by days from the metropolitan district to the end of each suburban line by zones, determined by the use of conductor's trip sheet records, the tributary population by zones, the revenues, current operating expenses, depreciation and return and deficit by lines are graphically shown on charts, which illustrate the results of the computations of the cost of service.

The unit costs per car-mile, per car-hour, miles of single track, together with revenue passenger and passengers per mile, population and average rides per capita for the year 1914, are shown in Table IV for each of the suburban lines computed from the data heretofore referred to.

Table IV—Comparison of Revenue and Other Data for the Various Lines

Line	Revenue per Car-Hour	Revenue per Car-Mile (Cents)	Revenue per Revenue Passenger (Cents)	Revenue per Mile Single Track	Miles of Single Track	Passengers per Car-Mile	Tributary Population	Annual Rides per Capita
1	$2.39	19.83	4.85	$2,591	9.18	4.1	2,140	229
2	2.43	22.09	4.04	5,396	3.44	5.5	2,334	197
3	1.10	17.83	4.02	3,899	1.47	4.4	960	148
4	1.55	30.42	3.02	6,503	1.44	10.1	1,097	282
5	3.13	31.88	3.79	9,719	2.59	8.4	2,330	286
6	2.82	30.55	3.50	8,909	3.60	8.7	3,777	243
7	2.95	24.48	3.79	4,500	4.48	6 5	1,760	302
8	1.17	12.25	2.84	4,774	1.64	4.3	1,050	262
9	4.05	28.88	6.43	7,402	14.86	4.5	10,642	161
Combined	$2.83	25.83	4.59	$5,917	42.70	5.6	26,090	211



MILWAUKEE ZONE SYSTEM—RESULTS ON LINES 1, 2, 3 AND 4

Assuming that the valuation, rate of return and depreciation, together with the per cent of overhead expense burden to current operating expenses, remain the same as in the 1914 statement and that no reduction in the service heretofore operated be made on any suburban line, the additional revenue and passengers required on each line to justify the present investment and make revenues just equal the cost of service, are estimated as shown in Table V.

The additional revenue and passengers required as shown in Table V have been determined on an assumption that the current operating expenses by lines with growth in business necessary to earn a reasonable return will approximate 60 per cent of the total cost of service. The number of passengers has been determined from the additional revenue thus required on the basis of the average fare per passenger for the year 1914, for each line separately.

Table V—Data for 1914 and Additional Revenue and Passengers Required in 1915 to Make Revenues Equal Cost of Service

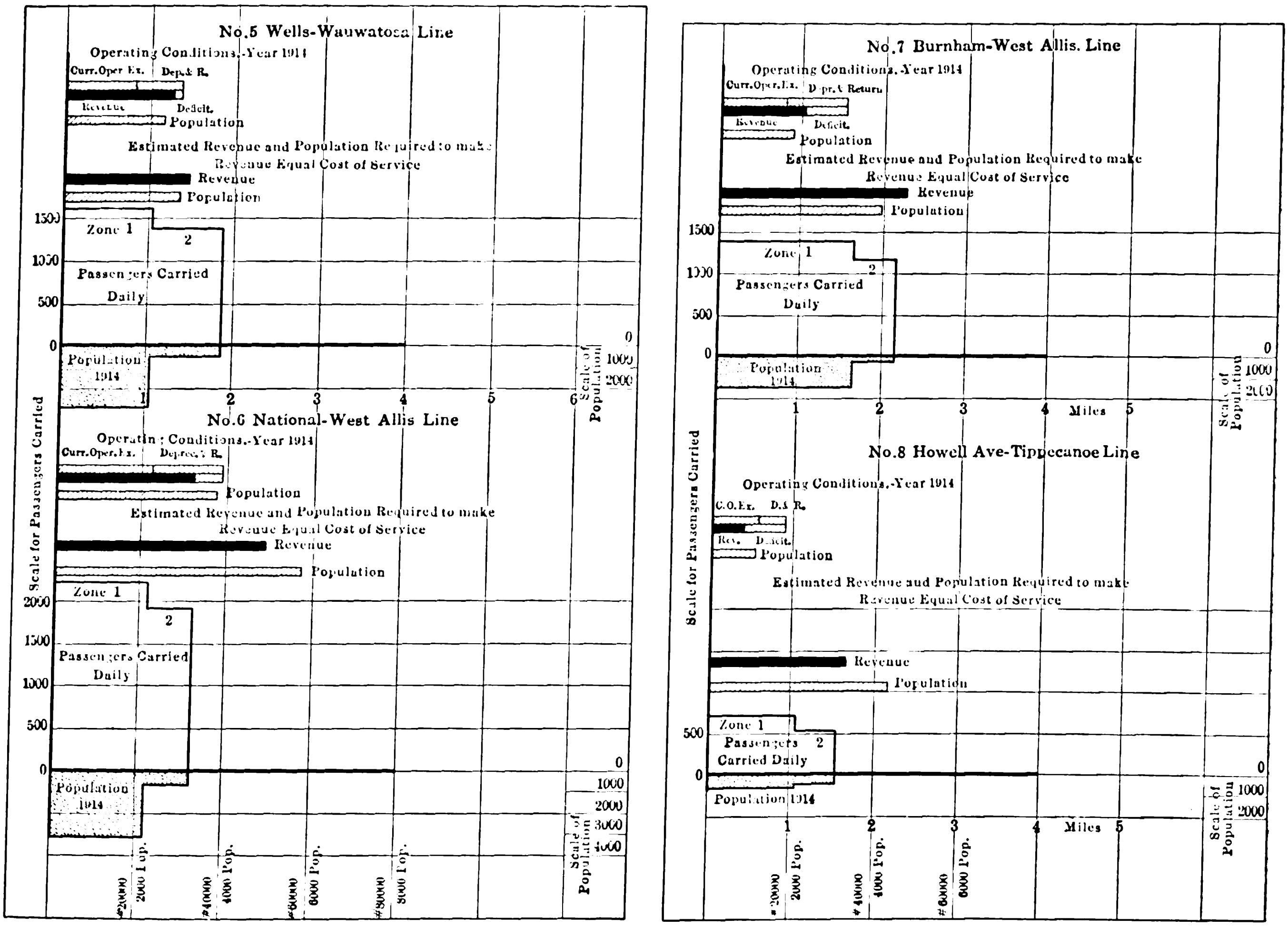
Line	Year 1914: Depreciation and Return, per Cent to Total	Year 1914: Current Operating Expenses, per Cent to Total	Year 1914: Amount of Deficit	Additional Revenue Required, 60 per Cent Basis	Additional Passengers Required	Revenue Passengers, 1914	Per Cen Additional Passengers Required
1	49.8	50.2	$20,381	$50,952	1,050,557	490,475	214.
2	41.0	59.0	7,245	18,113	448,341	459,072	98.
3	37.0	63.0	5,854	14,635	364,055	142,536	255.
4	38.0	62.0	4,866	12,165	402,814	309,787	130.
5	37.2	62.8	1,666	4,165	109,894	663,343	17.
6	41.0	59.0	6,618	16,545	472,714	917,307	52.
7	49.5	50.5	10,206	25,515	673,087	531,776	127.
8	38.0	62.0	10,065	25,163	886,211	275,234	322.
9	48.0	52.0	8,059	20,147	313,328	1,710,086	18.
Combined lines..	45.0	55.0	$74,960	$187,400	4,721,001	5,499,166	85.8

The causes for any differences in the distribution of the traffic, population and rate of return by lines may be traced to the characteristics of the several lines:

(1) The Whitefish Bay-Fox Point line passes through a residential district after leaving the metropolitan district, through the first four zones or to the north lim-

its of Whitefish Bay. The first zone is entirely within the limits of the village of East Milwaukee, which had a population of 707 in the 1910 census. The second, third and fourth zones lie entirely within the limits of Whitefish Bay, which had a population of 542 in the 1910 census. The resort at this location also contributes a considerable amount of summer business. Both of these villages have increased considerably in population since the last census. From that point north the territory is sparsely settled and is mainly farming land, except that there is a country club at Fox Point and this line has much summer picnic traffic.

(2) On the North Milwaukee line, the first zone after leaving the metropolitan district first passes through vacant property and into a fairly well settled residential district. The north end of this zone and the second zone lies entirely within the village of North Milwaukee, a manufacturing suburb, having a population of 1860, according to the 1910 census.



MILWAUKEE ZONE SYSTEM—RESULTS ON LINES 5, 6, 7 AND 8

(3) Both zones of the Wanderer's Rest line pass through a very sparsely settled farming district. Wanderer's Rest Cemetery at the end of the line creates some Sunday traffic. This is a portion of a line it was originally proposed to extend into interurban territory.

(4) On the Walnut Street-Wauwatosa line the single zone lies entirely within the residential suburb of Wauwatosa and is used in connection with Zones 1 and 2 of Line 5. This suburb had 3346 people in 1910.

(5) On the Wells Street-Wauwatosa line the first zone lies entirely within the city of Wauwatosa. Part of the second zone of this line extends beyond the city limits of Wauwatosa to the county farm.

(6) Both zones, National-West Allis line, of this line lie entirely within the manufacturing and suburban city of West Allis. This suburb had a population of 6645 in the 1910 census. The second zone is entirely in the residential portion of the city.

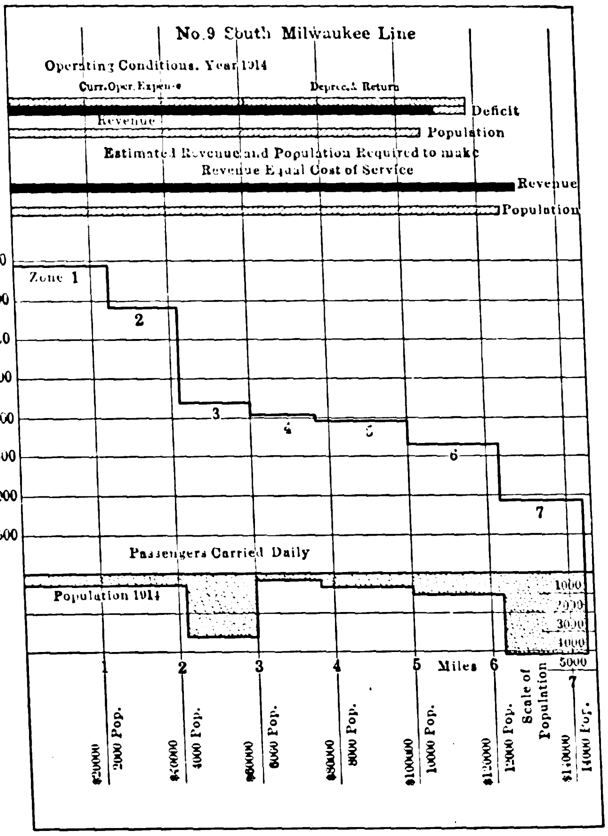
(7) Both zones of the Burnham-West Allis line lie entirely within the city of West Allis, but the line passes entirely south of the thickly settled portion of that city and, therefore, does only a small local business.

(8) Both zones of the Howell Avenue-Tippecanoe line are outside of the limits of any municipality, but the district is only fairly well built up with residences.

(9) On the South Milwaukee line the first zone passes through a residence district which gradually thins out. There is one small college located within this zone. A portion of the second zone has the same characteristics of the first zone, but passes through ½ mile of vacant property and enters partly into the manufacturing section of the city of Cudahy. The third zone lies entirely within the city of Cudahy. The fourth zone lies partly within the outskirts of Cudahy and partly in a sparsely settled district adjacent. The city of Cudahy had a population of 3691 in the 1910 census. The fifth zone lies partly within the above district and partly within the manufacturing city of South Milwaukee. This city had a population of 6092 in the 1910 census. The sixth zone lies entirely within the central portion of the city of South Milwaukee. Both branches of the seventh zone also lie entirely within the city of South Milwaukee but reach into the thinly populated sections on the outskirts of that city.

EUROPEAN ZONE SYSTEM

An opportunity was presented to analyze and tabulate certain data relating to the application of the street railway zone system and methods of collecting fares in a number of foreign cities. The information from which this tabulation was prepared was obtained from the files of the secretary of the American Electric Railway Association, consisting of voluminous letters and exhibits received from various foreign companies in response to a circular letter which was sent out by the secretary under date of Sept. 11, 1912, at the request of the committee to study the best methods of collecting and accounting for variable rates of fare. The material was arranged, translated and abstracted by a special committee appointed from members of the Milwaukee Company Section No. 1, A. E. R. A. An abstract of the report for each city and a tabulation showing the summary of the results obtained is appended hereto. Since the general practice of all the cities is very similar as to methods of collecting and accounting for fares, the abstract for the city of Leeds, England, which is appended separately, is typical of all. The principal differences in details of practice are clearly shown in the tabulation.



MILWAUKEE ZONE SYSTEM—RESULTS ON LINE 9

A study of the report indicates that:

(1) The zone system is used in all of the sixteen European cities from which reports were received.

(2) The length of ride and rates of fare are varied, but considering the purchasing value of money, the rates are generally higher than the fares in this country and higher than those obtaining in Milwaukee.

(3) Small increments in the fares for additional distance traveled are provided throughout the congested or central districts as well as the outlying districts.

(4) The rates provide much higher fares for the distance equivalent to the boundary of the central zone than exist in Milwaukee and probably other American cities. The same is noted for total fare to other zones.

(5) A marked similarity in the methods for collecting and recording fares in all of the cities is noted. In every instance receipts are given for the fares when collected and these receipts are subject to check by inspectors who board cars at unexpected intervals.

TABLE VI—COST OF SERVICE ON THE MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY COMBINED SUBURBAN LINES (1-9 INCLUSIVE), YEAR ENDING DEC. 31, 1914
(From Limits of Metropolitan District to Terminus of Suburban Service)

	Amount	Number of Units	Cost per Unit
Operating revenues (total)	$252,671	....	....
Operating expenses (total)	327,632	....	....
(a) Costs varying with the car-hour	49,776	88,982	$0.5594
(b) Costs varying with the car-mile	25,426	977,955	.0260
(c) Costs varying with the miles of single track operated	18,103	42.70	423.9658
(d) Costs varying with the number of revenue passengers carried	28,598	5,499,616	.0052
(e) Costs of electrical energy-car-mile	22,297	977,955	.0228
(f) Administrative and overhead expense burden	35,877	Per cent (a) to (e)	24.88 per cent
(g) Depreciation reserve[1]	52,203	....	....
(h) Return upon tangible property[2]	95,349	....	....
Deficit	74,960	....	....

[1] 4.38 per cent on $1,191,864.
[2] 8 per cent on $1,191,864.
Actual return upon reproduction cost new ....1.71 per cent
Reproduction cost new, $1,191,864, is based upon Railroad Commission valuation as of Jan. 1, 1910, corrected to June 30, 1914. Earnings and expenses including all service operated are actual for the first eight months of the year 1914; remainder of year estimated.

(6) The issue of transfers generally carries extra charge and free transfers are exceptional.

(7) Special fares for workmen and special ticket rates are common, but limited to restricted hours, usually issued before 7:30 a. m. and good for return before 8 p. m.

The close similarity in certain features of operation of the zone system in all of the cities is quite marked. The information does not disclose whether this similarity has arisen through precedent or whether the experience of all the companies has gradually led to the adoption of the same methods through the process of cut and try. The limited means of working classes and the consequent necessity for strict economy have undoubtedly been the main factors in developing short zones and small units of fare at the expense of congestion and higher rates of fare to others in the outlying districts. As the information procured was limited to rates of fare and methods of collection and did not contain financial statements or other traffic statistics, no conclusion can be drawn with respect to the cost of the service.

It is certain, however, that valuable lessons can be learned through studying the methods of our careful, painstaking neighbors, and the adoption of certain details of the European methods in this country would undoubtedly prove advantageous.

ADVANTAGES TO BE DEVELOPED BY THE ZONE SYSTEM

At the risk of repeating statements heretofore made on this subject, the zone idea is based upon the assumption that it is more desirable to maintain the single-

TABLE VII—COST OF SERVICE ON OAKLAND-DELAWARE AVENUES, WHITEFISH BAY AND FOX POINT SUBURBAN LINE (1), YEAR ENDING DEC. 31, 1914
(From Limits of Metropolitan District to Terminus of Suburban Service)

	Amount	Number of Units	Cost per Unit
Operating revenues (total)	$23,781.97	....	....
Operating expenses (total)	44,163.42	....	....
(a) Costs varying with the car-hour	5,557.08	9,934	$0.5594
(b) Costs varying with the car-mile	3,117.66	119,910	.0260
(c) Costs varying with the miles of single track operated	3,892.01	9.18	423.9658
(d) Costs varying with the number of revenue passengers carried	2,550.47	490,475	.0052
(e) Costs of electrical energy-car-mile	2,733.95	119,910	.0228
(f) Administrative and overhead expense burden	4,441.37	Per cent (a) to (e)	24.88 per cent
(g) Depreciation reserve[1]	7,737.84	....	....
(h) Return upon tangible property[2]	14,133.04	....	....
Deficit	20,381.45	....	....

[1] 4.38 per cent on $176,663.
[2] 8 per cent on $176,663.
Actual return upon reproduction cost new ....3.54 per cent deficit
Reproduction cost new, $176,663, is based upon Railroad Commission valuation as of Jan. 1, 1910, corrected to June 30, 1914. Earnings and expenses including all service operated are actual for the first eight months of the year 1914; remainder of year estimated.

TABLE VIII—COST OF SERVICE ON WELLS STREET-FARWELL AVENUE, WAUWATOSA SUBURBAN LINE, (5) YEAR ENDING DEC. 31, 1914
(From Limits of Metropolitan District to Terminus of Suburban Service)

	Amount	Number of Units	Cost per Unit
Operating revenues (total)	$25,172.10	....	....
Operating expenses (total)	26,837.83	....	....
(a) Costs varying with the car-hour	4,495.34	8,036	$0.5594
(b) Costs varying with the car-mile	2,053.09	78,965	.0260
(c) Costs varying with the miles of single track operated	1,098.07	2.59	423.9658
(d) Costs varying with the number of revenue passengers carried	3,449.38	663,343	.0052
(e) Costs of electrical energy-car-mile	1,800.40	78,965	.0228
(f) Administrative and overhead expense burden	3,208.59	Per cent (a) to (e)	24.88 per cent
(g) Depreciation reserve[1]	3,797.28	....	....
(h) Return upon tangible property[2]	6,935.68	....	....
Deficit	1,665.73	....	....

[1] 4.38 per cent on $86,696.
[2] 8 per cent on $86,696.
Actual return upon reproduction cost new .... 6.08 per cent

Reproduction cost new, $86,696, is based upon Railroad Commission valuation as of Jan. 1, 1910, corrected to June 30, 1914. Earnings and expenses including all service operated are actual for the first eight months of the year 1914; remainder of year estimated.

fare point at a constant or symmetrical distance from the center of traffic than to extend single lines upon the basis of the cost of separate services to points which are not symmetrical, to the other single-fare zones. The writer has stated in a previous memorandum: "The cost of street railway service is a function of and more or less directly proportional to the distance passengers are carried. With the extension of the city fare zone into outlying territory the average length of ride increases and, correspondingly, the cost of carrying a passenger. In any system a limit must sooner or later be reached where the added haul is supplied at less than cost."

If the Metropolitan District, constituting the city fare limits, shall be determined at points that are equitable for the city as a whole and is approximately symmetrical with respect to the center of traffic, in order to avoid opportunities for claims and discriminations as between different sections of the suburban territory, a distinct advantage is developed by the application of the zone system hereinbefore described.

Such a system eliminates differential fares which are extremely difficult to avoid, as well as discriminatory distances for the same fare, and permits of the substitution of fares on a distance basis substantially the same for all communities. It permits of small increments in the way of added fares for small increments in distances. It equalizes opportunity for local growth and extensions equitably between communities and will avoid the complaint of one locality being built up at the expense of another. It will relieve congestion and ultimately establish a more uniform distribution of population than seems possible under the old flat rate system of longer fares for varying distances wherein development clusters above the city fare limits.

The system is flexible inasmuch as it lends itself to further extensions from time to time along what are now interurban lines, as density of business increases.

Opposition to the zone system developed from those whose fares were increased. Some had difficulty in understanding that the State Supreme Court had held that the Railroad Commission had power to modify rates prescribed in franchise grants. The situation developed an interesting aspect of the differences from a popular viewpoint between downward and upward "regulation."

TABLE IX—COST OF SERVICE ON OKLAHOMA-CUDAHY-SOUTH MILWAUKEE SUBURBAN LINE (9), YEAR ENDING DEC. 31, 1914
(From Limits of Metropolitan District to Terminus of Suburban Service)

	Amount	Number of Units	Cost per Unit
Operating revenues (total)	$109,999.88	....	....
Operating expenses (total)	118,059.17	....	....
(a) Costs varying with the car-hour	15,208.96	27,188	$0.5594
(b) Costs varying with the car-mile	9,902.18	380,853	.0260
(c) Costs varying with the miles of single track operated	6,300.13	14.86	423.9658
(d) Costs varying with the number of revenue passengers carried	8,892.45	1,710,086	.0052
(e) Costs of electrical energy-car-mile	8,683.45	380,853	.0228
(f) Administrative and overhead expense burden	12,188.01	Per cent (a) to (e)	24.88 per cent
(g) Depreciation reserve[1]	20,125.35	....	....
(h) Return upon tangible property[2]	36,758.64	....	....
Deficit	8,059.29	....	....

[1] 4.38 per cent on $459,483.
[2] 8 per cent on $459,483.
Actual return upon reproduction cost new .... 6.25 per cent

Reproduction cost new, $459,483, is based upon Railroad Commission valuation as of Jan. 1, 1910, corrected to June 30, 1914. Earnings and expenses including all service operated are actual for the first eight months of the year 1914; remainder of year estimated.

MERGING OF URBAN, SUBURBAN AND INTERURBAN TERRITORY

From a territorial viewpoint, ordinarily the city merges into its next adjacent suburb without sufficient changes in the character of community improvements to enable one to determine that he is passing beyond the bounds of one municipal jurisdiction into those of another. The outer limits of suburban communities usually possess little that distinguishes them from the rural community into which they merge. Interurban lines are actually built or operated as extensions of suburban lines, which in turn are extensions of city lines. It is difficult, if not impossible, accurately to define urban, suburban and interurban territory because they merge into one another as day into twilight and night. In fact, it is questionable whether such definition is either desirable or necessary for electric railway purposes.

We have previously indicated that the selection of the suburban and interurban fare problem seems, from a practical viewpoint, to require that street railway fares be fixed so that they will vary more or less closely with the distance traveled, that a central district is necessary to promote more semblance to conditions under which American cities have been built up, and that short zones beyond merge into each other without confusion.

The problem of regulation of rates presents similar

TABLE X—ABSTRACT FROM REPORT ON ZONE SYSTEM OF STREET RAILWAY FARES AND METHOD OF COLLECTION OF LEEDS CORPORATION TRAMWAYS, LEEDS, ENGLAND

(This abstract is substantially typical of the practice prevailing for the sixteen European cities referred to in the tabulation.)

Fares:
  Rate:
    ½ mile for ½d.
    2 miles for 1 d.
    3 miles for 1½d.
    4 miles for 2 d., etc.

Workmen's Fares:

Before 7:45 A.M., the rate is half of the ordinary fare. By purchasing a return ticket at the same time a passenger can return over the same section of route as that traveled over in the morning any time after 12 o'clock noon on the day of issue.

Overlapping Fares:

These are in operation and are on the same basis as the ordinary fares.

Collection and Operation:

Conductors upon leaving the depots are supplied with tickets, a punch and way-bills. There are way-bills for each route or line and a total way-bill. The total way-bill shows the number of tickets at the different values (½d, 1d, 1½d, etc.) supplied to the conductor as well as the punch number. This is signed by him as a receipt of punch and tickets. The conductor accepts only cash or tokens (the latter are issued to large employers of labor, etc., at face value only) in exchange for tickets. Each passenger receives a ticket with the value marked thereon and punched opposite to the stage to which he is entitled to travel.

A number of inspectors are engaged for the purpose of checking cars at different points and seeing that all passengers have properly numbered and punched tickets.

No transfers are issued.

Children under twelve years travel at half fare. Children under fifteen going to and from school also travel at half fare.

Accounting:

After completing a day's work the conductor must hand in cash and tickets equivalent to the amount of tickets he received when starting out. He locks his punch and places it in his box, which is sent to head office. The ticket-room staff examines the ticket boxes returned and enters the amount of tickets sold on the total way-bills, which are then forwarded to the punch room where the punch register is compared and added to the way-bill. The conductor's journey way-bills and receipts are then compared with the total way-bills. The number of tickets sold must correspond with the number registered on the punch. The punch has a bell attachment which rings each time it is operated.

General:

Route mileage	70 miles
Number of cars	292
Passengers carried year ending March 31, 1912	86,021,943
Population served (approximately)	550,000

Fare Boxes and P. A. Y. E. Method:

No fare boxes are used and the P. A. Y. E. system is not made use of.

TABLE XI—FARE STATISTICS FOR SIXTEEN EUROPEAN CITIES, COMPILED FROM CIRCULAR LETTER SENT OUT BY AMERICAN ELECTRIC RAILWAY ASSOCIATION IN 1912

County and City	Company	Statistics	Length of Zones (Miles)	Fare per Zone (Cents)	Special Rates	Remarks
Various cities in Great Britain.	British Electric Traction Company.	400 miles of route..........	0.23 to 0.5	0.5 to 1 minimum	Workmen's tickets.	No transfers mentioned.
Birmingham, England.	Birmingham Corporation Tramways.	Single track mileage, 101.46; route mileage, 60.3; 461 cars; passengers per annum, 132,000,000 (25 per cent workmen's rates); revenue, $2,721,600; population served, 850,000.	2.34 3.08 4.11	2 3 4	Workmen's return fraes: 2.71 miles—2 cents 4.68 miles—3 cents 6.15 miles—4 cents 8.22 miles—5 cents	Workmen's return fare gives reduced rate for return from any trip started before 7 A.M. on same day. No transfers mentioned. Cash only tender except workmen's tickets.
Bradford, England.	Bradford City Tramways.	Miles of route, 56; miles of single track, 100.67; number of cars, 242; population served, 337,000.	1.6	2	Workmen's tickets.	No transfers.
Croydon (Suburb of London), England	South Metropolitan Electric Tramways & Lighting Company, Ltd.	Three routes totaling approximately 13 miles.	1 1.5 2.5 3 4 4.5 5.5	2 3 4 5 6 7 8	No reduced rate tickets.	Zones are fixed and overlap every ½ mile. No transfers.
Leicester, England..	Leicester Corporation Tramways.	Miles of single track, 19.3; number of cars, 140; passengers carried per annum, 31,314,360; revenue, $633,666; population served, 227,242.	2.18	2	None mentioned.	Universal 2-cent fare except on two lines where 4 cents are charged. Transfer stages, where fare is 2 cents, are used.
Leeds, England....	Leeds Corporation Tramways.	Miles of route, 70; cars, 292; passengers carried per annum, 86,021,343; population served, 550,000 (approximate).	½ 2 3 4	1 2 3 4	Workmen's tickets, one-half of ordinary rate.	No transfers. Before 7:45 A.M. rate is one-half of ordinary fare. Return ticket purchased at same time permits return over same section of route any time after 12 M. on day of issue. Overlapping fares in force.
London, England...	London United Tramways.	Number of cars, 340; track mileage, 55.2; passengers carried, 62,547,128.	2¼ 3 4½ 5¼ 6	2 3 4 5 6	None mentioned	No transfers except in case of two short feeder lines.
Aberdeen, Scotland.	Aberdeen Corporation Tramways.	None given	2-5 Center of city to any terminus. Across city.	1 2 4	Season tickets.	Three months' season ticket costs $3 for 700 yd. 12 cents extra for each additional 100 yd. No transfers.
Cardiff, Wales.....	Cardiff City Corporation.	Miles of single track, 33; number of cars, 130; passengers carried, 1911, 2,586,421; population served, 183,000; revenue, 1911, $610,500.	1.44 1.99 2.72 3.33 4.00 4.78	2 3 4 5 6 7	Workmen's tickets.	Transfers as understood in America not used. Transfers used which permit people to ride one-half mile and take another car in another direction, tendering transfer ticket in payment.
Glasgow, Scotland..	Glasgow Corporation Tramways.	None given.	2.28	1	None.	No transfers.
Halifax, Nova Scotia	Halifax Corporation Tramways.	None given.	.35 1.35 2.49 3.73 5.05 6.30 7.64	1 2 4 6 8 10 12	Workmen's tickets: 2.70 miles, 2 cents 4.99 miles, 4 cents 7.47 miles, 6 cents 10.11 miles, 8 cents 12.61 miles, 10 cents 15.29 miles, 12 cents	Transfers good for 1.7 miles cost 2 cents.
Paris, France.......	Paris Tramways.	Miles single track, 52.7; passengers carried, 1911 in city, 61,183,000; out of city, 20,474,000; city receipts, $1,407,088; out of city, $347,203.	Suburb Section 1.6 1.94 City Section 0.62 to 2.36 One section Two or more sections	 2 or 1[a] 3 or 2 3 or 2[a] 4 or 3	Reduced fare in morning hours.	Double fare is charged late at night. No transfers are used.
Brussels, Belgium..	Brussels Tramways.	City double track mileage, 64.48; suburban double track mileage, 14.88; passengers carried in 1911, 119,240,102; cars, 610.	0.93 minimum 1.80 maximum on line. Suburban 0.93 minimum each extra 0.47 mile	2 3 2 1	....	Transfers cost 1 cent per 0.93 mile or less on section line; or 2 cents for greater distance.
Berlin, Germany...	Greater Berlin Street Railway.	Comprises Berlin, Charlottenburg and north, south and west Berlin suburban lines.	None given	2½–5	Monthly passes are sold. Cost varies with number of lines on which used.	Loads are limited except in the event of more than normal travel.
Hamburg, Germany.	Street Railway Company.	....	2.2 4.4 Over 4.4	2½ 3¾ 5	Workmen's cards; weekly or monthly season tickets.	Free transfers must be used on first available car.
Vienna, Austria....	Municipal Street Railway.	Miles of single track, 155.65; motor cars, 1,230; trailers, 1,419; population, 2,064,600.	Two zones Four zones More than 4 zones	3 4 6	Monthly and semi-annual passes 4.80 to 24 respectively.	Transfers are in use.
Amsterdam, Holland	Amsterdam Municipal Railways.	Greatest length for one line is about 5.6 miles; there are 14 lines of which four are over 3½ miles in length.	3.53 or less 3.53 to 5.58	3¾	Tickets, books at 6 cents per ticket. Before 7:30 A.M. fare is 3 cents; by paying 6 cents before 7:30 A.M. a passenger can make a second trip (same day before 8 P.M.) equal in length to a 7½-cent ride. Double tickets are issued for 10 cents, for which two 7½-cent rides can be had.	No transfers.

NOTE.—[a], Fares given in first column for Paris are first-class fares; in second column are second-class fares.

aspects. It seems improper that an arbitrary line should be drawn attempting to mark the end of urban territory and the beginning of suburban territory, or the end of suburban and the beginning of interurban territory. Were such a line drawn, its location cannot be permanent on account of the changing character of the development of the community. If no such arbitrary line can be properly drawn, it follows that there is little logic in drawing a line beyond which the profits, if any, arising from city operation shall not be extended.

The extension of the city fare into suburban communities for the purpose of distributing population and lessening congestion presupposes the existence of suburban lines already built or whose construction is contemplated. The only inducement that can ordinarily be offered for the construction of a suburban extension is that such construction will insure the permanence of the city fare.

Interurban lines open up additions to suburban territory and make interurban territory more directly and conveniently tributary to the suburban and central city. They thus share in the same responsibilities and partake of the same relations as exist between suburban lines and the city lines of which they are extensions.

If these statements are true, it logically follows that the profits of the city lines should be extended not only over their suburban extensions but also over the latter's interurban extensions. Such a policy would seem to do injustice to no one or group of individuals, and when properly applied should result in the gradual extension of electric railway facilities so much desired by rural communities. In fact, the application of such methods through the medium of regulation by commissions would do far more for the development of communities than many other schemes now apparently regarded as of great importance by legislators.

The results of the present computations as to the cost of service of the suburban lines on the Milwaukee company's property corroborate similar figures for prior years and lead to the conclusion that such deficits must be made up of surplus from urban traffic. A study of the cost of service on the suburban lines indicates that such lines, taken by themselves, are not self-sustaining.

It is believed certain that the most desirable plan is a consistent application of the zone system to the suburban lines, based approximately upon the principle of uniform fares for uniform distances, coupled with a central metropolitan district within which a unit fare is charged sufficient to absorb any suburban deficits and still give a reasonable return upon the entire investment. Such a plan will eliminate discrimination, equalize opportunity for local growth and expansion, relieve congestion and ultimately produce a more uniform distribution of population.

The zone system herein described has been demonstrated to be capable of operation in practice equally, if not more, free from the usual complications of fare collections.

SUMMARY AND CONCLUSIONS

The following brief conclusions may be drawn from the study which has been made of the zone system of fares as practically applied in Milwaukee:

(1) An analysis of the data herein set forth indicates that suburban street railway traffic is not in itself profitable when viewed from the standpoint of the investor, the public service corporation and the regulating commission.

(2) The present community development of most American municipalities is such as to prevent in a practical way the installation of a system of fares which will result in reasonable returns upon suburban lines.

(3) The future profitableness of suburban lines must lie in the restriction of the allowable ride for a single fare and the gradual application to the extended metropolitan area of a zone system somewhat along lines described herein. No difficulties are encountered in the practical operation of such system and the American public will eventually recognize the equity of such a plan.

The Daily Issues

A letter from a subscriber to this paper received on Monday of this week says: "I have just returned from the Atlantic City convention, and after what I saw there, it is impossible to do anything but send my subscription for the coming year. Your part of the exhibit was great, and I feel that I must read every issue of your journal during the coming year." This letter and inquiries at the convention in regard to the method in which the daily issues were published last week suggest that a brief account of the plan followed would be of interest.

The issues for Tuesday, Wednesday, Thursday and Friday of the daily issue of the ELECTRIC RAILWAY JOURNAL were printed in Philadelphia, that of Saturday was printed in New York. Philadelphia was chosen because New York was too far away and the printing facilities in Atlantic City were not adequate for the work. The manuscript was sent to Philadelphia by special messengers during each day up to about seven o'clock, and the news thereafter was transmitted by telephone directly to the printing office. Twenty-one persons were brought on from the New York or branch offices of this paper to assist in this work. Part of this force remained continuously in Philadelphia. The others worked in Atlantic City, and one or more of the editors went to Philadelphia each night to read the final pages.

The force required to carry the manuscript to Philadelphia and that in the printing office working exclusively on the daily issues consisted of about forty men and boys, making altogether about sixty-one persons engaged directly on the work. The forms were usually ready for the press about midnight, and enough copies were printed quickly to supply the needs in Atlantic City. More time was taken to print the rest of the edition, but all of the sheets were sent to New York in time to be bound and mailed to the regular subscribers on the day of issue.

The expenses of publishing a paper under these conditions and in a rented printing office amounted to considerably more than if the daily issues had been published in New York, and only a portion of this expense was covered by the advertising printed in the daily issues. The remainder represents the contribution of the ELECTRIC RAILWAY JOURNAL to the success of the convention in supplying a prompt and reliable report of it to the railway men at Atlantic City and at home.

Industrial Welfare and Efficieny Conference

In accord with the unanimous vote of the first Pennsylvania Industrial Welfare and Efficiency Conference held in Harrisburg last year, John Price Jackson, Commissioner of Labor and Industry, has issued a call for a second conference to be held in the state capitol at Harrisburg on Nov. 17, 18 and 19, 1914. This conference is held under the auspices of the Pennsylvania Department of Labor and Industry and the Engineers' Society of Pennsylvania. The purpose of the conference is to enable the employers and employees together to work out the great problems before them with reference to increasing the welfare of the employees and the prosperity of the industries.

Appraisals of Ohio Public Utilities

The Joint Committee on Valuation for Ohio Public Utilities Formulates General Principles for Guidance of Companies in Making Inventories and Appraisals as Required by Commission Regulation in that State

On March 19, 1914, the Ohio Public Utilities Commission issued Order 176 and on April 25, 1914, a supplemental order, both calling for inventories and appraisals of the property (owned, operated or leased) of all public utilities in the State. At a meeting on Aug. 14, 1914, of representatives of the various utilities in the State, a committee was appointed to formulate principles applicable to all utilities under the commission's rulings. The members were as follows: Robert Lindsay, chairman, vice-president and general manager Cleveland Electric Illuminating Company; Frank C. Dunbar, district attorney American Telephone & Telegraph Company; Allard Smith, general manager Cleveland Telephone Company; Rollo R. Stevens, Ohio State Telephone Company; J. C. Martin, president Ohio Water Works Association; F. W. Coen, vice-president and general manager Lake Shore Electric Railway, and M. B. Daly, president East Ohio Gas Company. This committee, proceeding upon the assumption that the "reproductive cost new, less depreciation" method was the one called for by the commission, recently published its report, which is abstracted below.

INTERPRETATION OF SCOPE OF ORDER

Although the terms "inventory," "appraisal" and "valuation" were used interchangeably in Order 176, the committee felt that the evident purpose was to secure not only a complete inventory of the items of property of each utility, but also a valuation or appraisal of the property. By property was meant not only the plant, in the largest sense of the word, but also the business. To the cost of physical property and overhead charges must be added the cost of establishing the business and any other elements which enter into the total value of the property. The term "net value" used by the commission refers simply to the depreciated value of the physical property without regard to overhead charges or to the business of the utility.

USE TO BE MADE OF DATA

No announcement has been made of the use which will be made of the inventories and appraisals filed with the commission. It has a right in the case of any particular company to proceed at once to make a final valuation or simply to retain the data for future use. In the case of an immediate final valuation, the data already secured would constitute *prima facie* evidence relative to the value of the property as of the date named. The report states, however, that even in the absence of a valuation by the commission, it is possible that an effort might be made to use the inventory and appraisal as evidence against the utility in any proceeding relating to the fixing of rates, capitalization, sale, condemnation, taxation, or any other proceeding that might take place in the future.

PROPERTY USED AND USEFUL

All property, whether or not used and useful, is to be included in the inventory and appraised upon the basis of its reproductive costs as of a certain date. "Used and useful" property embraces the following:

(1) Property regularly in service in the course of operation.

(2) Property not regularly in service, but which, owing to the wide range in demand, is actually needed and used at some time.

(3) Property which of necessity may seldom if ever be used, but which prudence and good management deem essential as a part of the reserve capacity of the plant and as a safety measure to guarantee constant service.

(4) Property which good management and business judgment consider it necessary to acquire in advance of immediate need for the sake of economy, etc.

(5) All other property and property rights devoted to the public use.

The report states that overhead costs should be applied to all classes of property according to their nature, without regard to whether or not such property is used and useful.

REPRODUCTIVE COST NEW

According to the committee report, the cost of reproducing the property of a utility is made up of: (1) the cost of reproducing the plant, and (2) the cost of reproducing the business which was attached at the time of investigation. The reproductive cost new of such property should take into account all physical, municipal, industrial and other conditions existing at the time which affect the cost of labor, materials, engineering, administration, financing and securing of business, together with all other items which enter into the reproductive cost new of the plant and business as an entirety.

The types of units actually in use should be taken and no theoretical substitution should be made of units of a different type which might be capable of rendering equal service. The material prices and labor costs should be fair and reasonable, due allowance being made for market fluctuations and any abnormal conditions. In the case of the latter, fair prices may be determined by means of a trend curve going back far enough so that the trend price would not be materially affected by going still further back. The period for which the trend curve is plotted has no relation to the length of time it would require to reproduce the property.

PERIOD OF THEORETICAL REPRODUCTION

The owner of public utility properties must bear the cost of interest on money expended for reproduction of both plant and business from the time it is raised until such reproduction is complete and also the cost of insurance and taxes over the same period. In order to arrive at the proper amount of interest, insurance and taxes to be added to the reproductive cost, it is necessary to estimate the reasonable period that such reproduction will require. The reasonable period varies for different utilities and properties of different size, and the committee expressed its inability to estimate it at all.

It is stated, however, that there is a general tendency to assume a much shorter period than is actually required. The period should begin when the proposition is first conceived and follow through all the successive steps to completion. The date certain to be taken for the completion of the plant and business should be July 1, 1914, as of which the inventory and appraisal are made, and the period of theoretical reproduction should be such period prior thereto as it would require to complete the plant and business by that date. Although during the earlier part of this period the principal expenditures will be on account of construction, expenditures incurred for establishing business will begin at some time during the period and proceed simultaneously with construction expenditures until the end.

OUTLINE OF INVENTORY

In order to comply with Order 176, the committee believes that the inventory should include:

I. Reproduction cost new of: A. Preliminary work; 1, preliminary investigation; 2, organization of company; 3, cost of financing; 4, franchise. B. Physical plant, consisting of: 1, land; 2, rights-of-way and water rights; 3, buildings; 4, generating or pumping plant, exchange equipment, etc.; 5, distribution and transmission systems, track, etc.; 6, tools, teams, vehicles, etc.; 7, furniture and fixtures; 8, working capital; (a) cash and other quick assets; (b) stores and supplies; 9, other items of physical property. C. Established business: 1, cost of organizing and training operating, selling and clerical forces; 2, cost of selling service; 3, any other costs of attaching business.

II. Any other elements of going value or good-will.

III. All other elements of value.

The foregoing items are more specifically defined in succeeding paragraphs. Preliminary investigation, the report states, should date back to inception, but should exclude promoters' compensation, which should come under organization. Organization should cover promotion, incorporation and other legal expenses, and preparation of stock and bond issues and other documents. Discount on bonds, however, and expenses incident to floating loans should come under cost of financing. Only the amounts actually paid for franchises should be listed.

PHYSICAL PLANT

Under the heading "land" should be given the original cost, including purchase price, condemnation costs, brokers' and attorneys' fees, surveying costs, recording fees, liens on the property, payments for damages to abutting property and cost of grading land when not done in connection with buildings. The date and conditions of acquisition should also be given. The value as of July 1, 1914, should be given for each parcel, with comparative figures for contiguous property, and the authority for such figures. Additional value by reason of present use should be recorded, consideration being given to (1) location with reference to center of distribution, (2) location with reference to transportation facilities, (3) suitability of property for future growth, and (4) any other natural advantage, such as availability of supply of condensing water, etc.

The heading "rights-of-way" should include the cost of reproducing all rights-of-way acquired for the location of poles, wires, cables, conduits, pipe and track, whether such rights-of-way consist of land owned in fee or of easements acquired by permanent grants or through revocable licenses, oral or written. The cost items concerned are the purchase price or award and expenses of condemnation proceedings, the cost of obtaining consents, the salaries and expenses of right-of-way agents and others employed in securing such grants, recorder's fees and all other expenses.

The cost of reproduction of each building owned by the utility should include the preliminary costs and the contractor's charge for reproducing the building. The latter should be based on one or more competent contractors' estimates, which should show quantities and unit prices and take into account proper allowances for delays due to strikes or other causes, contractor's profit and his costs to meet payments prior to final settlement according to the usual plan. In making his estimate the contractor should not omit those elements of cost which, while not apparent in the finished building, are necessarily incurred in connection with its construction. Among such items are demolition of old buildings, excavation, pumping, bracing, protection of streets and adjoining buildings, cost of estimate, traveling, insurance, bond, fees and permits, stair guards and lights, tests, protection of masonry and other work, temporary office, telephone, photographs, sheds, temporary toilets, temporary heat, temporary inclosures, watchmen, omissions and contingencies. Architects' and owners' supervision, unforeseen expenses not included in the contractor's estimate, and the cost of grading, sidewalks, fences, etc., in connection with the building are also elements of the reproductive cost.

The allowance for working capital should be sufficient to care for emergencies and contingencies as well as for the ordinary expenses of operation. It is impossible to lay down any definite rule for estimating the proper amount to be allowed for this item. It must be determined by each utility with regard to its ordinary outstanding indebtedness, its ordinary accounts receivable and accounts payable, its methods of collection, the natural risk of the business and the condition of its credit.

UNIT COSTS

In estimating unit costs it should be remembered that plants are always constructed piecemeal, with consequent greater cost. The following elements, says the committee, enter into the cost of any unit: 1, Cost of unit f.o.b. point of supply; 2, cost of purchasing; 3, cost of inspection; 4, freight switching, expressage and cartage; 5, cost of unloading; 6, cost of preparing unit for use; 7, cost of hauling to point of use, whenever different from point of delivery; 8, shop, storeroom or yard charges; 9, labor; 10, tools and appliances; 11, incidental material; 12, breakage, loss and waste; 13, construction superintendence; 14, employers' liability insurance; 15, public liability insurance.

OVERHEAD CHARGES

The costs which should be allocated to the units have been outlined above under unit costs. Overhead expenses, which should be allotted as a gross sum or apportioned to large groups of units, include legal expenses, administration and supervision, engineering, insurance, taxes and interest during reproduction, contingencies, and omissions and oversights. No fast line of distinction, however, can be drawn between these two classes. Each utility must take care to avoid duplicating in the gross overhead any items which have been allocated to the units. Apportionments among the groups of units may be advisable where one or more of the overhead charges apply in varying percentages to the different groups of units, but caution must be used that apportionments are made correctly.

APPORTIONMENTS

When two or more utilities are operated by a single company or portions of property are used in common, the value of the jointly used property should be apportioned among the various utilities according to the service requirements of each property. Where the utilities are operating in more than one political subdivision, apportionment should be made according to the service requirements of each subdivision or rate area.

In the case of joint ownership of poles, the reproductive cost should be apportioned on the basis of the respective rights. In the event of joint occupancy of poles, the reproductive cost should be apportioned as though the pole were jointly owned, if the occupying company has been granted a permanent right. If the occupying company has a right terminable at the will of the owner, whether on a rental basis or otherwise, and has certain attachments fastened to the pole, the reproductive cost of the owner's property should include the entire reproductive cost of the pole and its own atachments, while the similar cost of the occupying company's property should include the reproductive cost of its attachments and also the reproductive cost to it of securing the permits, contracts, rights-of-way and all other costs involved in reproducing its rights and physical property.

COST OF REPRODUCING THE BUSINESS

The cost of reproducing the business should include all the necessary cost of attaching the business and reproducing the income of the utility as of July 1, 1914. Some of the elements of expense which enter into such cost are as follows: 1, Organizing and training the operating force; 2, organizing the clerical force; 3, organizing and training the selling force; 4, securing customers, including expenses of solicitors, advertising, printing and free inducements; 5, commercial engineering; 6, printing forms, records, books, schedules and directories, and 7, rent of offices.

DEPRECIATION

Inasmuch as Order 176 requires that depreciation be shown, the report briefly explains the straight-line and the sinking-fund methods, but finds both inferior to actual inspection. Attention is called to the distinction between depreciation and depreciation reserve, the latter representing an amount accrued out of earnings or set aside out of surplus in anticipation of the occurrence of depreciation. In the words of the report, "It is important to note that neither the amount in the depreciation reserve nor the amount which ought to be in such reserve is in any way a measure of the depreciation or loss of value which has already taken place. nor does it afford a measure of the rate at which depreciation or loss of serviceability will occur in the future."

There is no direct connection or relation between the depreciation of any physical units of property and the preliminary and overhead costs which pertain to the property as a going concern. For instance, if some poles or sections of rails, cables or conduit depreciated so that they must be replaced, it does not follow that the values resulting from general engineering, legal, financing, organization and other such costs, have deteriorated to the same extent. The opinion of the committee is that depreciation in preliminary and overhead costs, if it exists at all, is so small that it is impracticable to compute it, and that the utilities are justified in ignoring it in making up their inventories.

OTHER METHODS OF VALUATION

In conclusion the committee points out that reproductive cost new less depreciation is not the only evidence of the value of a utility, and recommends that the following clause be inserted on the last sheet of the inventory above the signature:

"This inventory and appraisal has been made in an effort to comply in all respects with the commission's Order 176, by listing the items of property owned by this company and stating their reproductive cost new less depreciation. The company reserves the right, in any appropriate proceedings involving the value of said property or any part thereof, to offer any other or additional evidence of value."

The consulting engineer of the Brunswick-Coburg (Australia) Tramways Trust has submitted his report on the construction of the line, the cost of which will be $673,052. It is anticipated that tenders for most of the work will be called for this year. A committee, consisting of members of the Melbourne City Council, the Trust, and the Brunswick and Coburg Councils, is considering the report.

H. H. Porter on Utility Earnings

According to H. Hobart Porter, of Sanderson & Porter, New York, the average earnings of public utility companies are holding up well under present disturbed financial conditions. In talking with a representative of the ELECTRIC RAILWAY JOURNAL, he spoke particularly of the affairs of the American Water Works & Electric Company, of which he is president, and also of other utilities in which he is interested.

Mr. Porter said that while the rate of increase in the gross revenues of the operating properties controlled by the American Water Works & Electric Company is smaller than in previous years, it is still good. Since May 1 the rate of increase over the corresponding period of 1913 has been nearly 50 per cent better than the similar increase of 1913 over 1912. The company includes many properties furnishing different classes of utility service. Some of these, on account of special influences arising from the disturbance of industry as a result of the war, show actual decreases in business. General observations seem to indicate that the slackening of industry affects transportation companies very early. Steam properties, which are so largely dependent upon freight for their great volume of revenue, are affected first. Electric transportation, furnishing the local service in cities and short-haul service between communities, is affected to a lesser degree. Electric central stations are affected to a still smaller degree except where a large amount of the consumption is required in manufacturing industries that are closed down. The receipts of water companies have a tendency in times like the present to show only a decreased rate of growth rather than an actual falling off in business.

One development of the situation which Mr. Porter mentioned with pleasure was the fact that in most cases municipal and other public authorities have co-operated in every way in helping the properties to make the best of the conditions imposed upon them by the war, such as the postponement of construction outlays which the present financial conditions make imperative. Public utilities, Mr. Porter said, are not affected so much directly by the war, as they are indirectly through the prevention of the sale of securities to provide funds for capital requirements. There is also an indirect effect arising from the demoralization of the market for cotton and the reduced consumption of iron and steel products. In some sections of the Northwest and the great Central Western States, however, the agricultural communities generally are exceedingly prosperous, wheat selling for more than twice its cost of production.

Mr. Porter added that the present crisis seems to have demonstrated some of the principal advantages of holding company ownership of public utilities as compared to independent ownership. An investor in the securities of a holding company has the added protection arising from diversity in the ownership of operating plants. The frequent result of this condition is that the decline in earnings of a plant in one locality is overcome by increased earnings in other plants. With properties situated in different localities and carrying on different classes of business, a large reduction in the total operating revenue seems to be less likely to take place. Moreover, companies have found it possible to secure capital for urgently needed improvements for controlled properties at times when independently owned utilities have not been able to do so.

One of the most important pieces of new construction work which Sanderson & Porter are carrying on at present is the hydroelectric development at Cohoes, N. Y., for the Cohoes Company. None of the public utilities in which they are interested is undertaking any construction work, except such as is absolutely necessary or was under way and almost completed.

When Mr. Porter was asked his opinion as to the duration of present conditions, he said that if the expectation of the best European observers for a long war was borne out by events, present conditions would have to continue or possibly grow worse. If, however, their prediction of a comparatively long war should not be accurate, this would have an immediate and overwhelming influence over all other considerations. In any event, the increased cost of capital must be marked for some time, and this must have a very radical effect on the future course of public utility financing. All over this country rate-regulating public bodies have made decisions on the assumption that capital could be had at rates substantially less than those experienced in the initial promotion of utilities. If utilities are to continue to grow under prevailing conditions, however, a much more liberal attitude must be taken by public authorities in reference to rates of return on capital.

Report of Latin-American Trade Committee

That industries of the United States will be seriously injured by loss of Latin-American trade if the restriction of commercial credits is not remedied, is one of the conclusions of the Latin-American Trade Committee recently appointed by Secretary of Commerce W. C. Redfield. The committee is headed by James A. Farrell, chairman of the National Foreign Trade Council, and consists of representatives of manufacturing, commercial, transportation and financial elements engaged in, or affected by, foreign trade.

The committee finds that the sister republics are turning to the United States for funds to carry on industrial development and that the greatest opportunity lies in systematic preparation for extension of trade when peace restores normal conditions rather than in hasty invasion of southern markets. Dependence upon London banking is sapping American foreign selling power. While the committee admits that trade with South America must partly depend upon London exchange as long as the republics owe heavily to Europe, it urges that in the mutual interests of all the American republics new credit machinery be created to escape this dependence as much as possible. The committee considered the proposed establishment of a "co-operative exchange" or merchant's clearing house for Latin-American trade. On account of the difficulty of obtaining co-operation, the necessity and difficulty of standardizing credits, the seasonal variations of shipments of South American produce and the expense, the plan was pronounced impracticable.

The committee believes that the present disorganization of the trade of the United States with Latin America may best be remedied and placed on a permanently satisfactory basis under the following plan:

(1) By the establishment of a dollar exchange, by the ultimate creation of a discount market, and, pending the establishment of a discount market, by the extension of adequate accommodation by banking institutions and the establishment of reciprocal balances in the United States and in Latin America for financing Latin-American trade; and (2) by the perfection of American selling machinery through furnishing additional support to commission houses familiar with Latin-American business; by forming associations of merchants and manufacturers to be jointly represented in Latin America, and by obtaining information as to the possibilities of developing retail stores in large Latin-American cities.

The committee believes that this country is hardly in a position to undertake considerable investments in South America at the present time, but industries with an already considerable trade at stake may well consider the necessity of protecting that trade by obtaining for their customers some relief from the present stringency. Such investments, if judiciously made, would yield an ultimate fair return and meanwhile provide a market for American materials which cannot now be sold.

Panic Economies Discussed

At the monthly meeting of the New York section of the American Society of Mechanical Engineers held on Tuesday, Oct. 20, the topic of the evening was "Panic Economies." A paper dealing with that subject was presented by Frederick A. Waldron, who stated that the causes of panics were, in general, suspension of credit, the calling of loans on high-grade collateral thus affecting commercial paper, and curtailing employment in many industries. Lack of work, in consequence, involved many non-producers who drew upon the banks to tide themselves over the depression, and this made the banks increase their cash holdings, producing further limitations in the ability to obtain credit.

Mr. Waldron pointed out the necessity for manufacturing firms to place themselves in a sound condition financially at the beginning of a panic by increasing their cash resources. He outlined the need for care in reducing running expenses, especially with regard to reductions in working forces, and advised the elimination of all non-productive work, experimental operations and the like. All doubtful stock should be turned into cash and unfinished material completed and sold. Necessary construction and engineering work might be carried on to advantage by co-operation with the engineering forces of other companies. In conclusion, the lessons to be learned from the present industrial depression were that the nations of the world were becoming interdependent, that our factories were not prepared to meet the demands of new markets and that the attitude of unwillingness to change standards must be abandoned if the trade of countries such as South America was to be obtained.

In the discussion which followed, William Kent referred to the panic of 1872 which came after the period of extraordinary expansion after the civil war and which was brought about by a single failure, the day rate for labor dropping from $1.75 to 87 cents in a few months. This panic lasted for several years, but in 1879 people suddenly awoke to the fact that the panic was over, and expansion began again. The reaction was almost as sudden as the advent of the panic, and the speaker felt that the recovery from the present depression was going to be just as rapid and just as unexpected. Every panic had been followed by a boom because things wore out and had to be replaced. Mr. Kent advocated a freer issue of emergency currency, citing the carrying on of the country's business throughout the civil war through the large issues of greenbacks. He objected to the maintenance of cash reserves in emergency times, stating that the reserves were intended to be used during panics. He advocated loaning money at high interest rates on commodities such as copper or cotton, so that the people could spend money and get things going again. He suggested that if everyone would pay his debts instead of hoarding money, panics would be reduced in severity.

During the discussion the point was raised that one great difficulty opposed to our obtaining the South American markets was that our efforts have always been along lines of labor-saving devices while in South America labor is very cheap. The United States, therefore, would have to revolutionize South America's methods before being able to sell machinery there.

COMMUNICATIONS

Broken Bolts in Built-Up Crossings

UNION TRACTION COMPANY OF INDIANA

ANDERSON, IND., Oct. 17, 1914.

To the Editors:

Your editorial of Sept. 12 concerning "Broken Bolts in Built-Up Crossings" calls attention to a problem of especial interest to electric interurban railways. Bolts and joints come loose when any locking device is used, probably from two causes. The first and by far the greater cause is the fact that the joint bars when placed are not driven in position as firmly as is possible, or the bearing at all points is not uniform. In this condition the vibration and natural deflection of the track, due to the operation of trains, will cause sufficient working to allow the joint bar to assume a different position. This will allow the bolt to become loose or, in other words, will require a shorter bolt length, and as a result the nut will be loose and require a second tightening. The second cause is that if a nut is of sufficient strength it can be tightened so as to make the bolt stretch. If the bolt does actually stretch a permanent set is obtained in the steel of the bolt. This means that the elastic limit of the steel has been exceeded and a new bolt should be installed.

If a bolt becomes loose from either of the above causes, a locking device which will continue to hold the nut tight on the bolt, even though the bolt is loose in the joint, is most desirable. With this type of lock the nut cannot work off under the vibration of trains and it may be retightened, and, in the meantime, will hold the joint bar in place. Of course all nuts have to be tightened occasionally on account of the wear in the joint. On the other hand, many locking devices, when the bolts loosen from the causes already mentioned, free the nut, and it gradually works off the bolt. Soon after the bolt will come out of the joint, on account of the vibration, and other bolts soon follow, with a possible dangerous condition resulting.

LOUIS A. MITCHELL,
Superintendent of Roadway.

Indexing Technical Information

NEW YORK, Oct. 15, 1914.

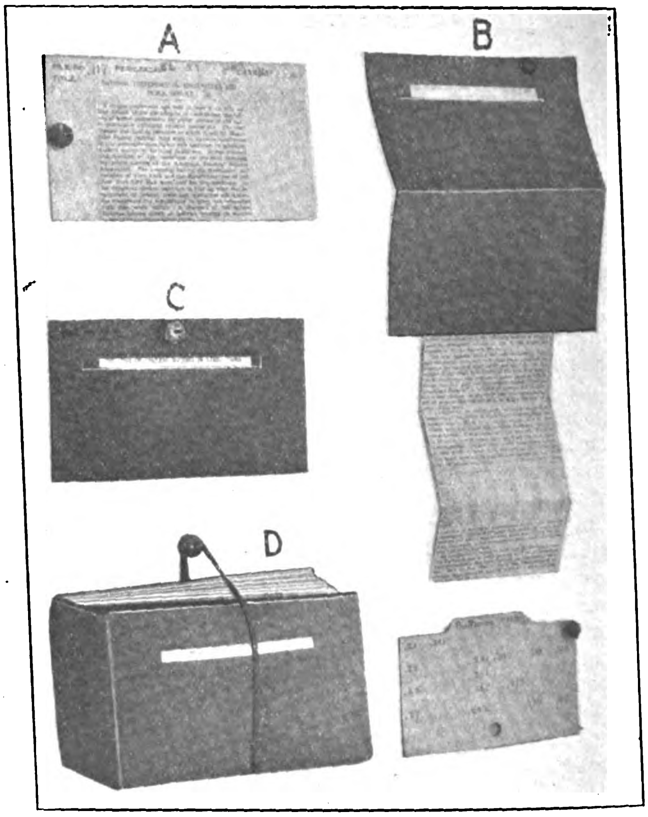
To the Editors:

The abstract of Mr. Alvord's article on "How to Use the Technical Journal" in your issue of Oct. 3 gives points of vital interest to every engineer, for the progress of any technical art is heralded in the technical press long before the facts are consolidated in stable form in text and reference books. I started some twenty years ago to index current literature pertaining to the electric transportation and lighting arts and tried faithfully every method which I knew—card indexing, scrap books, files, etc. When it came to getting working results from this material confusion arose. In carefully analyzing the causes of the difficulty it developed that an alphabetical index was a delusion and a snare. In the context of an article lies its value, and this context gives it a fixed place in any general scheme of technical knowledge as conceived in the mind of the indexr.

The most suitable index must be the creation of the user, but there are several underlying principles which, if understood, will smooth the way. In the first place, the whole subject to be indexed must be divided into suitable groups. For example, let us divide material on electric transportation under ten headings, taking them in the order of their natural occurrence in the growth of an electric railway property as follows, using the Dewey decimal system of numbering: .0, historical; .1, general description; .2, finance; .3, engineering; .4, operation; .5, power station; .6, transmission system; .7, equipment; .8, track, and .9, maintenance.

Under this rough classification we can commence to crudely sort out our information. Each individual compiling an index associates certain groups of facts together, and, if he will expand his index according to this preconceived correlation of facts it will not tax his memory to recall the proper location of desired data. The method of expansion by the Dewey decimal system permits subheadings to be interpolated *ad libitum* between consecutive decimal numbers and the growth of the index does not disturb the original decimal classification.

Another general principle which I have found useful in gathering data under groups, is that the physical location of the general data should be considered and the information should be filed in the class of physical material with which it is naturally associated. For instance, signal systems would go under track; copper wire tables under transmission, etc. This cuts down the number of cross-references required.



INDEXING TECHNICAL INFORMATION—EXHIBIT OF SAMPLE FILING DEVICES

Under the head of general descriptions of systems of electric transportation falls a large portion of general technical information, and the matter contained may fall also under any or all other general divisions of our index. In order to systematize this disorder I discovered that nine out of ten men will remember the geographical location of the event, structure or system to be inquired into and from this psychological peculiarity I found it desirable to arrange general descriptive matter geographically, giving consecutive numbers to all towns in order of an alphabetical state list of population of five thousand and over. As a short cut to this where electric railway topics are to be classified one can use the "Electric Railway Directory," in which every railway system in this country and Canada has been assigned a number. In my index each town has a card of its own and if any information appears regarding a railway system centering in a town, the index number of the data is entered on the card and under headings such as "transportation system," "power station," "equipment," etc. The clippings are filed in geographical order under the index number for the class, which gives the most useful arrangement.

So much for general system of indexing. Next comes the getting of this matter collated and indexed. Without going into all the features of the different methods I shall explain one that I have been using for the past sixteen years. I have more than 40,000 clippings sorted so that they are useful, and the railway index has expanded into more than 980 divisions. To save the regret of having destroyed what may be wanted later I clip everything, although many topics which afterward become important at the time of filing seem valueless. Two copies of every periodical clipped are required. The accompanying illustration shows the methods used in filing: *A* is a standard library card 3½ in. x 6 in. All cuttings not longer than 6 in. are pasted on cards of this size, and by turning the clippings over the lower edges and pasting them on the backs, both sides of the cards can be used. The title is pasted high enough to be used for the title of the clipping. Where an article is longer than 6 in. the folder is used, as shown at *B* and *C*. A slit is cut across the folder long enough to allow the clipping to protrude through and show the title. The clipping is pasted to the folder and folded up so as to be contained within it. Rubber stamps for the different journals clipped and the dates are used to reduce clerical work, which can be done by an office boy in his spare time. All that is required of the maker of the index is that he fill in the index numbers. With a little instruction any intelligent assistant can sort clippings into general classes, when they can be indexed rapidly.

The folder *D* contains all of the cuttings from the ELECTRIC RAILWAY JOURNAL for May 23, 1914. The small card used for geographical locations is shown in the lower right-hand corner. I use different colors of folders and cards for different years so as to give a chronological idea of the date of the information.

ALBERT B. HERRICK, Consulting Engineer.

A Good Word for the Card Index

PUBLIC SERVICE CORPORATION OF NEW JERSEY
NEWARK, N. J., Oct. 15, 1914.

To the Editors:

From the special librarian's point of view, the preservation of technical information in an accessible form is of the highest importance. But even with every facility at hand, it is a difficult problem to get the most out of a collection. For the average person, the cost of binding volumes of a journal, and the space required for keeping a file of any length prohibit this method of handling magazines; while the fact that few journals publish cumulative indexes covering a longer period than six months or a year would seem a very real barrier to the use of the index brought out with each volume. In addition, material published while the volume is still running, is unrecorded unless noted in some manner at the time of reading. A personal index, therefore, is necessary, both to keep a cumulative record of information, and to cover very recent publications.

To do away with indexing each article as read, and with cumbersome bound volumes, the vertical file may be resorted to, and separate articles arranged according to some definite plan. To do this without a card index, however simple, as Mr. Alvord advocates in his recent paper, is almost an impossibility. In the first place, if alphabetical arrangement under subjects is employed, we find that few articles have an unmistakable heading. Many might as readily be filed under several different heads, and unless a close watch is kept, there is always the possibility of filing similar material under slightly different topics. Thus in referring to an article, one can never be sure just what phase of the subject presented itself most prominently at the time of filing, nor that all the material on a given subject has been withdrawn for reference. In this connection, it would seem that a card index is an indispensable adjunct to the office file, for cross-reference purposes, at least, and to secure a uniform, easily consulted record of subject headings used. For instance, it is desirable to know at a glance whether abstracts or articles are filed under street railways, electric railways, transportation, interurbans, or any one of numerous titles more or less synonymous for this class of information. A simple cross-reference card, referring from each of these headings to the one preferred will settle at once where in the file all of the material on that topic will be found.

A question on which Mr. Alvord has not touched, but which must be met, is that of arrangement alphabetically by subject or according to a decimal or other classification. The former is simpler but usually separates allied, but slightly different, subjects. A decimal classification, such as "An Extension of the Dewey Classification Applied to the Engineering Industries," by L. P. Breckenridge,* while requiring some little care in application, brings all related information together, and permits indefinite expansion. Here again, a card index is needed to indicate the class number of article or abstract.

Whatever method of filing is used, however, one is lead to the same conclusion—that the readiest means of recording the location of data with the minimum of effort and the greatest accuracy is by some form of card index.

H. I. BREWER, Librarian.

A Standardization Committee Suggested for Car Design

BROOKLYN, N. Y., Oct. 20, 1914.

To the Editors:

With the advent of steel in passenger car construction, the question of standardization in design has become a pertinent one, and the railways as well as carbuilders' engineers keenly feel the need for adopting standards that will simplify construction and reduce to a minimum the labor attached to the preparation of plans, templates, dies, patterns, specifications, etc., in connection with placing of orders for new equipment.

You have suggested recently that the contour of roof, curvature of buffer, spacing of posts, construction of underframe and other similar details are subject to standardization to an extent that the expense of engineering in connection with purchases of new cars would be reduced. While some of the items mentioned could undoubtedly be standardized it will be quite evident to the designer that the mere adoption of certain standard dimensions in the general design would not result in lessening the cost of engineering nor reduce the preliminary shop work in connection with the construction to any marked degree. The variation in general dimensions and contour of the car structure, would hardly be considered a factor in the preliminary cost to the carbuilder, and to the railway engineer standards of the nature referred to might prove a hindrance rather than a help, in designing the best car for a given service.

I am firmly of the opinion that the opportunity for real standardization work in connection with car construction lies, not in the attempt to provide a standard car, but in adopting standard practices in connection with the details of design. The adoption of standard sections for framing members, pressings and drawn steel, riveting, moldings and framing connections together with uniform practice in connection with calculation of stresses, specifications and forms of contract should be of mutual benefit to the railways and carbuilders.

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*Bulletin 9 of the University of Illinois Engineering Experiment Station.

A great deal could be accomplished along these lines by the organization of a standing committee of experienced designing engineers representing both the car builders and railways. This arrangement would afford a means for full and thorough investigation and consideration of the various items entering into car construction applicable to standardization and should result in reducing to a minimum the inconsistent variations in designs due largely to the individual ideas of the designers. W. E. JOHNSON.

Development of Carload Freight on Electric Lines

DETROIT UNITED LINES

DETROIT, MICH., Oct. 20, 1914.

To the Editors:

During the last few years a great deal of attention has been given to the development of the freight business on electric lines. Not the least interesting feature of this development is the method employed, which appears to vary greatly in different localities and which to some extent may be said to reflect the local conditions. Unfortunately, the freight business, on many of the electric lines, is confined almost entirely to that of moving less than carload quantities. This is so not because the carload business is undesirable but largely because the franchise restrictions and the terminal facilities available in the cities do not permit of the development of so-called carload business on even a moderate scale. However, even under such circumstances it may be possible to secure a small portion of the more desirable carload traffic.

Considerable discussion has been had as to the necessity for meeting steam road rates in competition for this freight business. Some electric lines have adopted the steam road basis of rates throughout, even to the low commodity rates, applying on carload business. The wisdom of such a course is questionable, as the cases where it is necessary to meet the steam road rate in order to secure a fair proportion of the business are exceptions. On the other hand, the steam road rates are so low, in many instances, that it is doubtful if an electric line operating freight cars in single units or with from one to four car trains could live under such rates.

Between growing communities there is always an exchange of commodities in carload quantities on which prompt service is required, and it is this class of business which should appeal to electric lines since it affords an opportunity of securing business at rates which may be made remunerative. There may be several things to incline the shippers to consider the electric lines, such as a shortage of cars and the indifference of steam roads, but service is the strongest argument, and once the business is secured, satisfaction in this respect will invariably overcome any objection to the higher rate.

The electric lines are here to stay. They are a force for much good in the development of the territory through which they pass, and the freight department is contributing its quota. The service afforded over these electric lines should be an important factor in determining a basis of freight rates. As a matter of fact, isn't freight service on electric lines really express service, minus the pickup and delivery features, just as dependable in every respect and in many cases more so? This is something which it is believed the public is rapidly coming to understand and appreciate, and in the end it is bound to redound to the good of the electric lines. N. RUMNEY,

Traveling Freight and Express Agent.

New Committees of the American Association

Several committees were authorized at the last meeting of the executive committee of the American Electric Railway Association held in Atlantic City, and in the case of two of these committees the members have been appointed by President Allen.

One of these committees is that appointed to take charge of the midyear meeting of the association, which is to be held this year during the last week in January in Washington, D. C. The committee in charge of this meeting is Charles L. Henry, chairman, M. C. Brush and J. H. Hanna.

Another committee has been appointed to consider the present rules of the association in regard to individual members, and this committee will report to the executive committee whether in its opinion any changes in these rules are advisable. The members of this committee are L. S. Storrs, chairman, Charles L. Henry, C. S. Mitchell, L. P. Crecelius and James H. McGraw.

The association will also have a committee on valuations. The personnel of this committee has not yet been selected by President Allen, but it has been decided that the committee will be made up of six members consisting of three executive officers of member companies, two consulting engineers and one accountant.

Engineers Disapprove of Registration

The Pennsylvania Legislature last winter authorized the appointment of a commission, which was duly appointed, to look into the advisability of the registration of engineers. Hearings were held in Pittsburgh on Oct. 15 and 16, and in Philadelphia on Oct. 19. A final hearing is to be held in Harrisburg Oct. 28. The commission prepared a bill, based on that drawn up by members of five national engineering societies, for the purpose of stimulating discussion and obtaining the views of engineers of the State.

At the hearings in Pittsburgh and in Philadelphia the general sentiment was strongly opposed not only to the bill offered but to any licensing bill. Previous to the Philadelphia hearing the Philadelphia Association of Members of the American Society of Civil Engineers discussed the matter and was represented before the commission by a committee, which presented a report giving arguments against any form of registration or licensing. The association, however, suggested some measures which would help to accomplish the primary object sought, that is, the safeguarding of life, health and property. In the committee's opinion this could more certainly be accomplished by requiring State approval of plans for engineering structures than by attempting to weed out by examination incompetent engineers. The commission expects to present a preliminary report to the Governor about Nov. 1, and a final report at the end of this year.

A consular report from Japan states that there are now within a radius of 50 miles of Osaka close on 250 miles of double track in operation and 80 miles more under construction or proposed in the near future. The growth of light railways has been slower, there being at present less than 50 miles, but another 50 miles are under construction. Numerous plans are projected, but hitherto these have been held up by the difficulty of finding capital.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

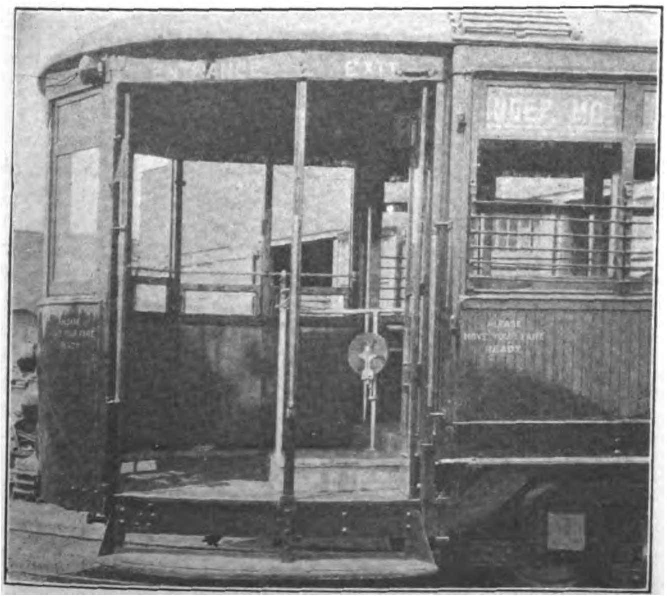
(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Standard-Wheel Low-Step Car with Opera Seats

BY G. T. SMITH, MASTER MECHANIC METROPOLITAN STREET RAILWAY, KANSAS CITY, KANSAS CITY, MO.

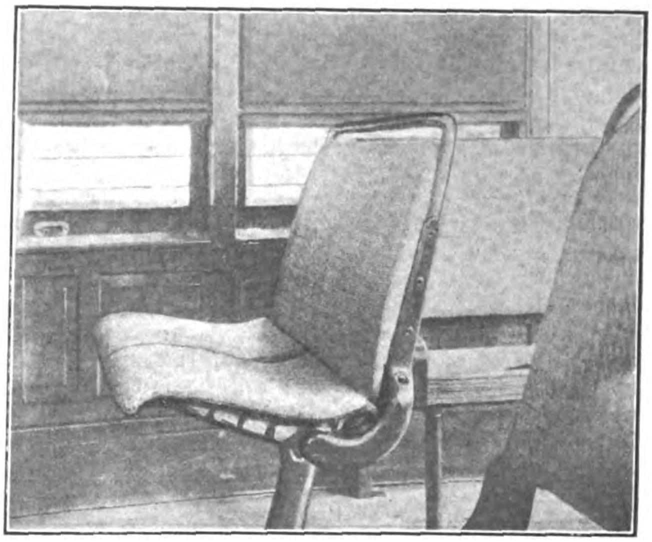
A single-end car containing such refinements as a 13½-in. step with 34-in. wheels and opera-chair seats has been put in service recently by the Metropolitan Street Railway, Kansas City, Mo. This equipment was developed in the company's shops from an old car remodeled for experimental purposes. The method of obtaining a low step without reducing the wheel diameter should be of particular interest. The step height from the rail is 13½ in., from the step to platform floor 12½ in. and from the platform floor to the car floor 9 in., making a total height of 35 in. The difference between this 35 in. and the necessary wheel clearances was made up by the combined ramps or incline on the rear platform and car floor. The car floor proper was ramped or inclined 2½ in. from the end sill to the body bolster. The platform floor was ramped 3 in. in the form of a spiral, starting from a point 14 in. inside the entrance door and extending to the end sill of the car.

In order to avoid placing the conductor on the inclined floor, a small platform or dais 4½ in. high was built in the center of the vestibule beside the step at the bulkhead. This dais is also used as an auxiliary step at the rear exit door. In service, the dais is found to be advantageous, since it elevates the conductor above the passengers' heads and gives him the desired commanding view, as from 75 to 80 per cent of passenger leave the car by the front exit. One of the accompanying illustrations of the rear platform indicates that the spiral ramp is inconspicuous. It will also be noted that the conductor's stand is fitted with an adjustable seat which folds automatically when not in use.

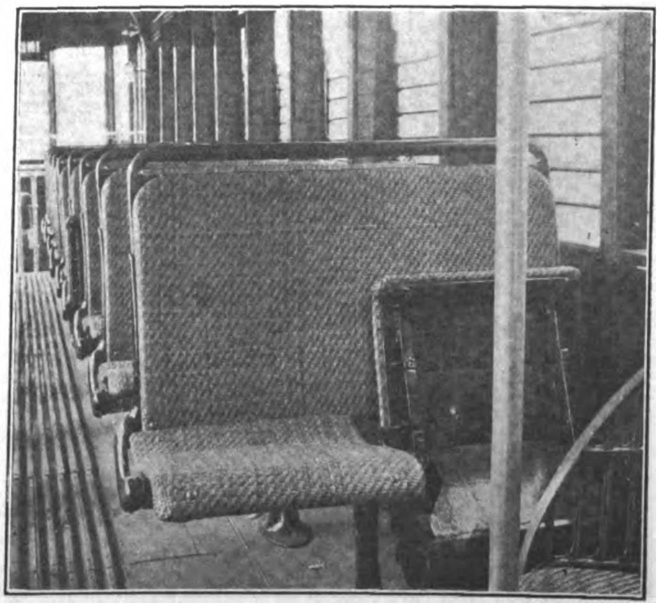


KANSAS CITY CAR—REAR PLATFORM WITH CONDUCTOR'S DAIS AND INCONSPICUOUS SPIRAL RAMP

Both the rear exit and entrance doors were hinged and all operating mechanism was placed underneath the platform. The doors are controlled through two operating handles, one above the other, installed at the dividing rail between entrance and exit aisles. The front exit door is of the sliding type and is operated in conjunction with the folding step, the mechanism being arranged so that the step is completely lowered when the door is one-third of the way open. This detail was arranged to prevent a passenger in a hurry from passing out of the door before the step was in position for regular service.



KANSAS CITY CAR—SIDE VIEW OF OPERA SEAT IN LOWERED POSITION



KANSAS CITY CAR—OPERA SEAT SHOWN IN FOLDED POSITION

Undoubtedly the seats constitute the most novel feature in the design of this car. These are built like opera chairs, there being two hinged seats to one back. The seats are covered with rattan and no springs are used in the upholstering. They are very comfortable and much superior to the upholstered type from a sanitary standpoint. Another feature is that when the car is crowded and the person nearest the wall of car desires to leave, it is unnecessary for the other seated passenger to step out in the aisle because the outside passenger simply rises and folds his seat behind him, thus making sufficient space for the passenger nearest the wall to pass by him.

Still another feature of these seats is that they facilitate car cleaning. During the cleaning the seats may be folded against the back, thus giving the sweepers and cleaners free access to the floor. As shown in one of the accompanying illustrations, the seats are supported with one pedestal placed at the center, the overhang on the aisle being free from the floor to the bottom of seat. The inside end of the seat is attached to the car side by a bracket, which makes a very rigid construction. The electric heaters are of the short cross-seat type, and are placed beneath the seat adjacent to the wall, the seat castings having suitable lugs cast thereon for the attachment of the heaters.

Car illumination is supplied by five 54-watt tungsten lamps with Holophane shades installed along the center line of the body. In view of the difficulties encountered in the drilling of the steel carlines in the roof of an old car, the six-lamp circuit with selector switch was not used. In order to provide some light, should the main lighting circuit fail by the burning out of a lamp, an extra or sixth lamp was installed in the circuit used for the signs and headlights which are supplied with 23-watt tungsten lamps. By the use of a three-way switch a light from the front sign can be diverted to the inside circuit. This, with two 23-watt lamps of the same circuit which light the rear platform, gives sufficient light until the car reaches a terminal.

Ground Connections for Clusters

BY G. H. MCKELWAY, DISTRIBUTION ENGINEER BROOKLYN RAPID TRANSIT SYSTEM

On roads using wooden trolley poles, whenever it is desired to hang a light cluster to light a station platform or road intersection, it is the custom to run the ground wire down the pole, stapling it to the pole to make a neat looking job and also to prevent or at least discourage the theft of the wire. Then the wire is run underground from the foot of the pole to the nearest track rail, to which it is attached by means of a bond terminal.

But on lines where the overhead work is supported from metal poles it is common to use the pole itself as part of the negative return. Instead of carrying the ground wire down the pole it is customary to connect it to the pole at the height of the cluster bracket or span wire and let the pole carry the current to the ground. Then the pole itself is either considered to be well enough grounded to make unnecessary any connection to the rail, or, if that is not thought to be desirable, a wire is run underground from the base of the pole to the track and grounded there. This latter precaution may seem unnecessary, but the practice of connecting to the rail as well as to the pole is standard with many companies and is rightly considered to be safer and sometimes more economical. The only advantage that the first plan has over the second is the matter of first cost, and generally of maintenance as well.

The greater cost of the second method is not so much the cost of the extra piece of wire as of the labor to open the street and install it. The cost of this opening is generally high because metal poles are seldom used except in cities where the streets are usually paved, and the cost of opening up an asphalt or stone or wood-block pavement laid on a concrete foundation is appreciable and is often increased by the necessity of having to pay an excessive sum to the city inspector who is assigned to see that the opening and repairs are properly made. However, there are three objections to considering sufficient the grounding of the pole alone. Iron poles are nearly always set in concrete, and good concrete is a pretty fair insulator although the concrete placed around the butts of poles is often of a rather poor quality. The three objections are as follows:

Lamps—Full voltage does not get across the lamps owing to the poor ground and, therefore, they do not burn brightly.

Poles—The continual passage of current from the lamps to the pole and from it to the ground causes electrolysis, which gradually destroys the pole at the ground line. This objection may seem to be rather far-fetched, but the writer knows of several instances where such marked deterioration of the pole has occurred just at the ground line that it has been necessary to renew the poles because they were dangerous in their weakened condition. In one case where a common ground wire from several clusters was grounded to a pole, that pole soon failed and was replaced with another with the same ground connection. The result was that the second pole failed within two or three years. Then a ground connection was made to the track and the trouble ceased.

Persons and Animals—It is quite easy, in dry weather, even for the poor concrete in which a pole may be set to become a fair insulator, and sometimes a very good one, with the result that as soon as the cluster is lighted the pole becomes charged and is then a source of danger to any person or animal that might touch it.

A good connection to the nearest track rail does away entirely with the first and third objections and makes the second practically negligible, although with a soil of low resistance a very small proportion of the current may leak to the rail through the ground instead of being carried away by the wire. Please note, however, that the writer says "a good connection." As soon as the wire becomes broken or the terminals loosen from either the pole or the rail the connection drops into the first class and acquires all the objections of that class.

A still better plan, although more costly, is to run the ground wire directly from the cluster to the track, in the same general manner as when wood poles are used, instead of making any connection to the pole. It is of course impossible to staple the wire to an iron pole and, in a city, the necessity for neatness of construction and protection against the theft of the wire is even greater than where wood poles are permitted.

Therefore, the obvious way to install the wire is to run it down the pole in an iron or fiber pipe, the latter being attached to the pole by means of bands around both. The iron pipe is the stronger and is almost always used, although fiber has been substituted on some lines because of the belief that with iron pipe the ground wire would not help as a lightning arrester due to the choking effect of the iron pipe which surrounds it. This precaution seems to be unnecessary, but whatever construction is used the result is the best possible ground because there is a strong permanent connection direct from the cluster to the track.

The Engineer of London states that the percentage of unemployment in Great Britain during August, the first month of the war, was 6.3. At the end of September the percentage of unemployed had fallen to 5.1. These figures apply to the insured trades.

Catenary Experiences on the Empire United Railways, Inc.

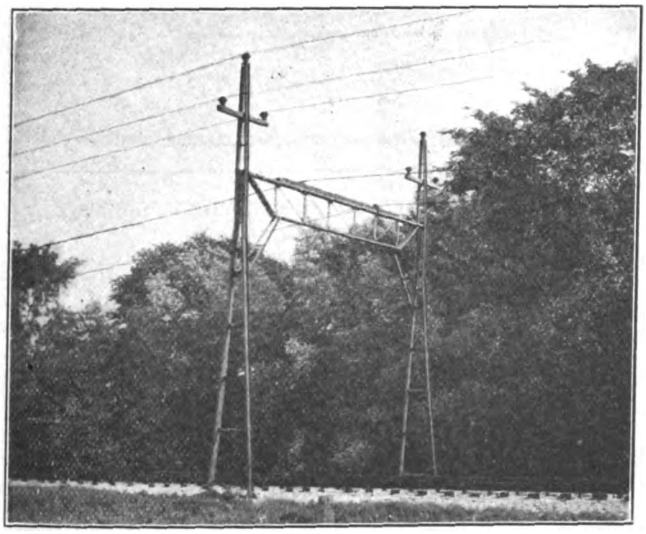
BY THOMAS H. MATHER, CHIEF ENGINEER

Catenary construction on the original Syracuse, Lake Shore & Northern Railroad and on the Rochester, Syracuse & Eastern Railroad (these roads being now merged under the name of the Empire United Railways, Inc.) has proved to be a decided improvement over the pole-span construction. On the initial installation from Long Branch to Baldwinsville, some mistakes were made owing to erroneous ideas regarding what the catenary would and would not do.

The construction consisted of Archbold-Brady steel bridges on four concrete pedestals, spaced 300 ft. apart. The messenger was 9/16-in. steel cable. Hangers were 10 ft. apart, excepting on six spans, where the spacing was 20 ft. apart. This difference in spacing was owing to the fact that the second track was extended some 900 ft. farther than originally intended, and as the overhead material was already purchased, a makeshift erection of half the number of rods on these last spans was employed. The only provision made against side sway was a steady strand from the hanger to the side of the bridge; that is, on tangents only once in 300 ft. Anchor bridges were erected at each end of this 7-mile section.

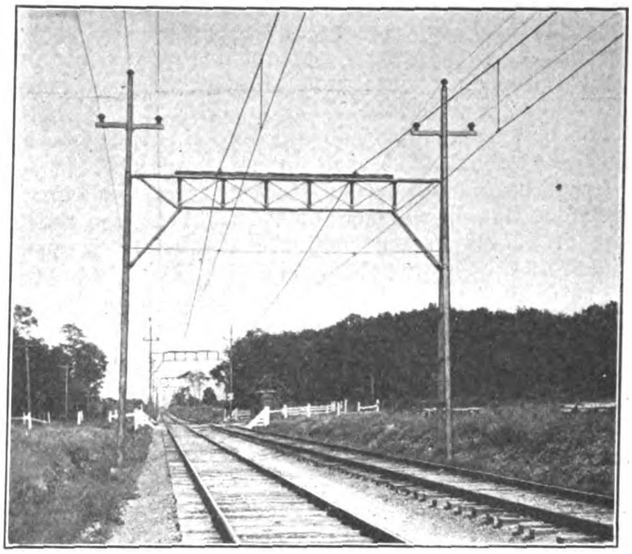
The doubts entertained were: first, that 10-ft. spacing of hanger rods was too infrequent; second, that the bridges were of too light construction; third, that during heavy storms, with wind blowing at or about right angles to the line, the sway of the trolley wire would be so excessive as to interfere with successful operation.

Operation was started before the construction of the overhead was completed, about 2 miles of the line being entirely loose, and not steadied at the towers. The first car went over the line on a day in February, with a gale of wind from the west (the line is approximately north and south). No sway that interfered with operation was observed. On the 10-ft. spacing there was excessive "chattering," which materially decreased on the 20-ft. spacing and every bridge stood and is standing yet.



CATENARY CONSTRUCTION EMPIRE UNITED RAILWAYS, SHOWING CONSTRUCTION OF TOWERS

Acting on the practical lessons received, every alternate hanger was removed. Later 30-ft. spacing was used, then 50-ft., and later still 60-ft. spacing. This last spacing has proved entirely satisfactory. On this first section, an attempt was made to provide for expansion by leaving a camber of about 12 in. in the trolley wire in the center of the span, so that in warm weather the expansion of the messenger would make the trolley wire straight from tower to tower. The results were not as expected and attempts at such adjustments were not repeated on later construction. It has been found that during the first year after construction both messenger and trolley wire require adjustment, owing to changes of temperature, and thereafter give little trouble.



STANDARD CATENARY BRIDGE CONSTRUCTION ON THE EMPIRE UNITED RAILWAYS

The cost of this initial section was about $4,580 per mile of double track, including all material, bridges, concrete foundations and all erection, but exclusive of the cost of copper wire. This exceeded the cost of pole-span construction by about $1,200 per mile. This pole-span construction was with poles 35 ft. long, tops 8 in. diameter and butts not less than 14-in. diameter, set about 85 ft. apart, and the cost was $3,279 per mile of double track.

On later construction from Baldwinsville to Fulton some changes were made, such as building a more economical bridge and removal of hanger rods, which effected a slight economy; but on the latest construction, a still further and more decided economy was obtained by using as messengers the two 500,000 circ.-mil feeder cables, which had been carried on cross-arms on the towers. This saved the cost of the steel cable messengers and the cost of erection of the feeders, and reduced the cost of material (excepting copper) and erection complete to $3,517 per mile, or $238 more per mile of double track than pole construction.

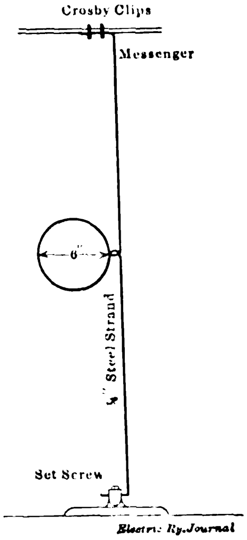
The appearance of a railroad with this catenary is greatly improved over that with poles, and insures greater safety in operation of high-speed roads at grade highway crossings, as the open nature of catenary does not obstruct the motorman's view on each side, as do poles.

Maintenance costs are somewhat lower than on pole lines, but as the principal cost is the renewal of rods and sister hooks, a hanger device with screw connections eliminated would materially reduce the cost of maintenance. The corrosion of the threads in the rod and sister-hook connection makes renewals necessary in from two to four years. A flexible hanger is recommended, rather than a rigid type, especially on single track, where the impact of the trolley wheel is on both sides of the ear. The tendency in these cases is to bend the trolley wire upward, leaving the ear slightly under the wire and offering an obstruction to smooth travel of the trolley wheel.

An experimental home-made hanger of ¼-in. steel strand has been in use on the Rochester-Syracuse division for about four months and so far has given satisfaction. In its first form a loop was put in the strand about half way between the trolley wire and the messenger, and twisted to a horizontal position. While this gives flexibility under compression yet it has slight resistance to tension. In the later form an additional twist is given leaving the loop vertical and giving greater resistance to any tensile stress without impairing its flexibility. The strand is attached to the messenger by two Crosby clips and to the ear by bending about 2 in. of the strand at right angles and introducing it into a horizontal hole through the boss. It is fastened by a set screw at the top.

The bridges require painting once in five years and the cost is about $2.35 each for paint and labor.

It will be found more satisfactory to build a separate telephone line on the edge of the right-of-way, and the cost of catenary construction hereinbefore given includes this. The telephone line is of 25-ft. poles 6-in. diameter at tops, set forty per mile, with two circuits of No. 10 hard-drawn copper wire.



HOME-MADE HANGER

Hard spots have not developed on any part of the trolley wire, but on single track, portions contiguous to the ears have become slightly annealed.

There is an assertion by linemen and car men that operation on catenary is not so much impeded by sleet as on pole lines. There is no good proof that the catenary line will stand up under more sleet than poles will, and it is possible that sleet may more readily shake loose on the longer spans of catenary. Trolley sleeves of the Ohio Brass Company's Type A or Type C are recommended, as trouble has been experienced with any type surrounding the wire, especially if they are located near the hanger rods.

Pull-off poles on curves are spaced 100 ft. apart and a ¼-in. steel cable messenger is run the entire length of the curve attached to the towers and these poles. Pull-offs are attached to messengers and trolley wire and secured to this cable.

The catenary on this railway has shown a decided superiority over any pole-span construction in appearance, in its permanency and in its maintenance cost. As a large proportion of that cost is due to the type of hanger rod used, the installation of a flexible type secured to the messenger, in some other satisfactory method than by a device involving the use of a screw, will result in a further reduction. Since the difference in initial cost of construction is so insignificant, in a choice, a consideration of that feature would be negligible. While this particular type of catenary was erected as a pioneer effort, those responsible for its adoption feel that their decision has been justified by the results. On the road employing this type of catenary, no pantograph operation is used, all cars being equipped with trolley pole and wheel, and attaining a speed of 60 to 65 m.p.h.

The Georgia Railway & Power Company, Atlanta, Ga., has distributed twenty-three pulmotors intended for free use of the public in emergencies along its 600 miles of line in Georgia.

Wheel Gages Used at Decatur Shops

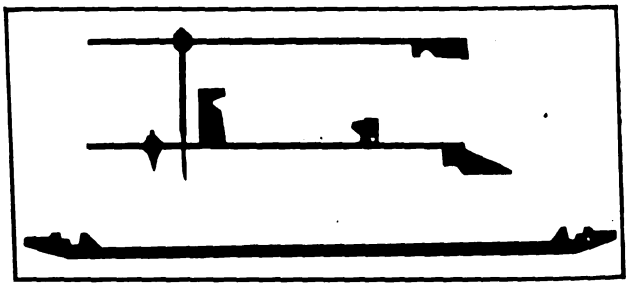
BY J. C. HOUGHTON, MECHANICAL DEPARTMENT ILLINOIS TRACTION SYSTEM

At the main shops of the Illinois Traction System at Decatur, Ill., we have built and used for some time with accurate results the wheel gages shown in the accompanying halftone. These gages are lettered *A*, *B* and *C*. They are designed for use with M.C.B. standard wheels. The material of which they are made consists of ⅝-in. cold-rolled steel and 3/16-in sheet steel. The scribers are ⅜-in. Stubbs steel.

In mounting a new wheel and axle, gage *A* is first used for finding the center of the axle. The heel of the gage is set up against the fillet of the journal and a mark is made at the approximate center, using the scriber. The same operation is then performed from the other end of the axle and another mark is made with the same setting, and then the proper adjustment is made to determine the center. The scriber is adjustable and can be used on various sizes and lengths of axles, and yet it is so securely mounted that very accurate work can be accomplished with it.

After the center of the axle has been determined as just described, gage *B* is used while the first wheel is being mounted. The heel of this gage is a contour of the M.C.B. steel wheel tread. The use of the gage is a very important step in mounting wheels. After the first wheel is in place, it is a very easy matter to determine the position of the second wheel by the use of the width gage *C*.

Our method of using gage *B* is as follows: Press the first wheel on a few inches. Then put the contour over the wheel and level up the bar with a level using the adjustable scriber which moves up and down in the hollow stem, according to the different sizes of wheels. After the bar is level and the scriber rests on the axle, it is locked in this position and the wheel is then pressed on until the scriber comes to the center line made by gage *A*. The scriber does not slide back and forth on the bar as it does on gage *A*. It must be secured after once set for the gage of track for which it is used. Gages *A* and *B* can be used for narrow-gage work.



ILLINOIS TRACTION SHOPS WHEEL GAGES

By the use of gage *C*, which is made of flat steel and cut out at the end in accordance with the M.C.B. requirements, it is easily possible to get an accurate setting for the second wheel.

It is reported in Australia that the war will not appreciably retard the carrying out of the Melbourne suburban railway electrification scheme; only some $30,000 of material is of German origin, and it can be obtained elsewhere. In connection with the Sydney railway station lighting and signaling projects, a portion of the work has already been carried out, but owing to the difficulties in obtaining supplies of apparatus from Europe, the completion of this work is uncertain.

Building a Way Station for $263

The following data cover the constructional features, bill of material and costs of a standard 8 ft. x 10 ft. way station as built by the Northern Ohio Traction & Light Company:

The platform consists of a cinder foundation upon which rest 6 in. of concrete, the upper 1 in. being a wearing surface. The body of the slab is 1:2:4 mixture, and the wearing surface one part cement and two parts sand. The platform is cut into sections, as shown on the plans, this cutting extending through to the foundation. The surface is finished rough.

As anchor bolts 5/8 in. x 12 in. machine bolts with washers are used. These are carefully placed, using a wooden template made to accord with the drawing.

The framing is entirely of dressed lumber. The wall framing, with the exception of the doorway and window openings, is completely covered with No. 27 gage "Trussit," fastened on with staples. The "Trussit" is then plastered, first on the outside, with a mixture of one part Portland cement and three parts sand, tempered with lime mortar, if necessary. This plastering is 3/8 in. thick outside of the metal and floated to an even surface. When the outside is set the inside is plastered in the same manner.

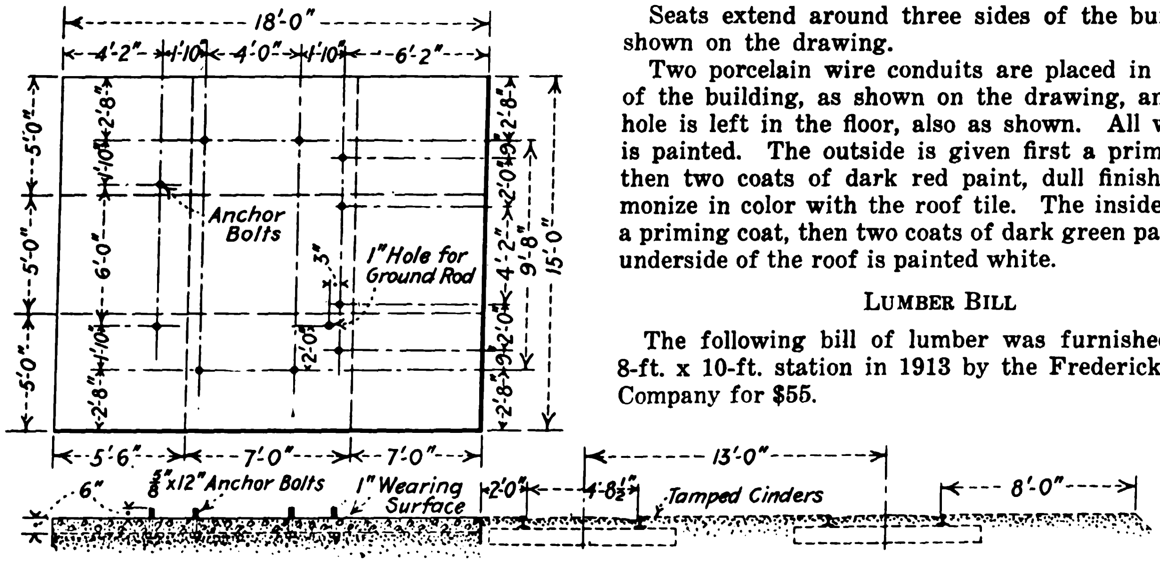
The rafters are curved, as shown on the drawing. On these is laid 1-in. x 6-in. match flooring, which in turn is covered with four-ply roofing felt to form a bedding for the tile. The tile is 7-in. x 10-in. vitrified red Spanish roofing tile, carefully laid. The door casing, window frames and outside corners are put on after the plastering is done and set.

Seats extend around three sides of the building, as shown on the drawing.

Two porcelain wire conduits are placed in each end of the building, as shown on the drawing, and a 1-in. hole is left in the floor, also as shown. All woodwork is painted. The outside is given first a priming coat, then two coats of dark red paint, dull finish, to harmonize in color with the roof tile. The inside is given a priming coat, then two coats of dark green paint. The underside of the roof is painted white.

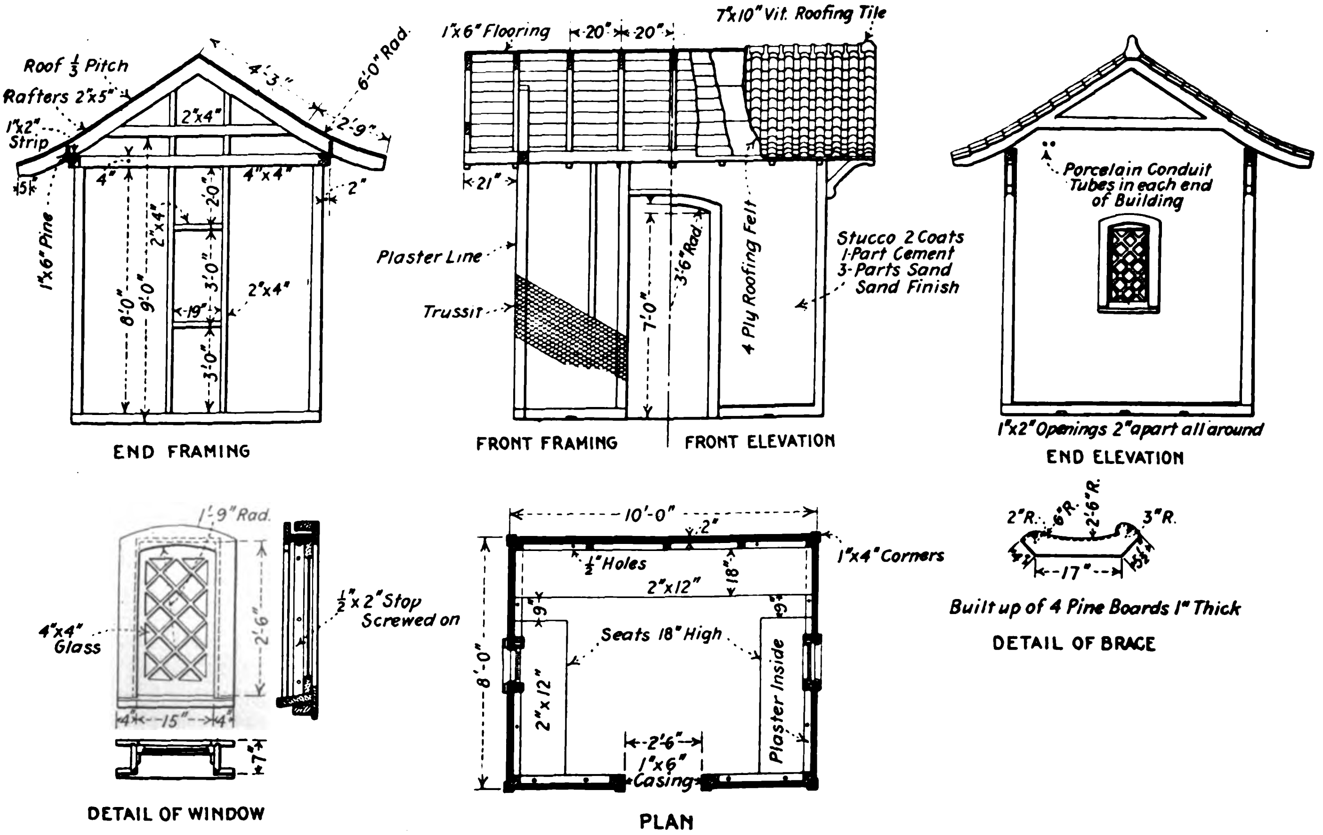
LUMBER BILL

The following bill of lumber was furnished for an 8-ft. x 10-ft. station in 1913 by the Frederick Lumber Company for $55.



18'-0"
4'-2"
1'-10"
4'-0"
1'-10"
6'-2"
5'-0"
2'-8"
1'-10"
6'-0"
Anchor Bolts
3"
1" Hole for Ground Rod
2'-0"
4'-2"
9'-8"
15'-0"
5'-6"
7'-0"
7'-0"
13'-0"
6"
5/8"x12" Anchor Bolts
1" Wearing Surface
2'-0"
4'-8½"
Tamped Cinders
8'-0"

PLATFORM FOR STANDARD 8-FT. X 10-FT. WAY STATION OF NORTHERN OHIO TRACTION & LIGHT COMPANY



Roof ⅓ Pitch
Rafters 2"x5"
1"x2" Strip
1"x6" Pine
4'-3"
6'-0" Rad.
2'-9"
2"x4"
4"x4"
2"
20"
3'-0"
19"
8'-0"
9'-0"
END FRAMING
1"x6" Flooring
20"
20"
7"x10" Vit. Roofing Tile
21"
Plaster Line
Trussit
7'-0"
3'-6" Rad.
4 Ply Roofing Felt
Stucco 2 Coats 1-Part Cement 3-Parts Sand Sand Finish
FRONT FRAMING
FRONT ELEVATION
Porcelain Conduit Tubes in each end of Building
1"x2" Openings 2" apart all around
END ELEVATION
1'-9" Rad.
4"x4" Glass
2'-6"
½"x2" Stop Screwed on
4"
15"
DETAIL OF WINDOW
10'-0"
2"
1"x4" Corners
½" Holes
2"x12"
18"
Seats 18" High
Plaster Inside
8'-0"
2'-6"
1"x6" Casing
PLAN
2"R.
6"R.
2'-6"R.
3"R.
17"
Built up of 4 Pine Boards 1" Thick
DETAIL OF BRACE

PLAN AND ELEVATION OF 8-FT. X 10-FT. WAY STATION FOR NORTHERN OHIO TRACTION & LIGHT COMPANY

2 pieces, 4 in. x 4 in., 14 ft	Pine S 4S	Frame
2 pieces, 4 in. x 4 in., 12 ft	Pine S 4S	
10 pieces, 4 in. x 4 in., 10 ft	Pine S 4S	
3 pieces, 2 in. x 4 in., 10 ft	Pine S 4S	
3 pieces, 2 in. x 4 in., 10 ft	Pine S 4S	
18 pieces, 2 in. x 8 in., 7 ft	Pine S 4S	Rafters (sawed at mill)
250 ft., b. m., 1 in. x 6 in	Match flooring, pine	

3 pieces, 2 in. x 12 in., 10 ft	Pine S 4S	Seats
8 pieces, 1 in. x 6 in., 12 ft	Pine S 4S	Casings, etc.
2 pieces, 1 in. x 8 in., 12 ft	Pine S 4S	End finish
2 pieces, 1 in. x 8 in., 12 ft	Pine S 4S	Corners
2 pieces, 1 in. x 2 in., 12 ft	Pine S 4S	Strips

2 window frames, 2 sashes, 4 fancy braces—Mill work.
250 sq. ft. 2-ply felt roofing.

OTHER MATERIAL

Platform

4.17 cu. yd. 1:2:4 concrete
6 2/3 bbl. cement
1.9 cu. yd. sand
3¾ cu. yd. stone
0.83 cu. yd. 1:2 mortar
2.66 bbl. cement
0.75 cu. yd. sand
10, ⅝-in. x 12-in. machine bolts

Roof

2½ squares red Spanish roofing tile 7 in. x 10 in.
14 ft. cresting, Spanish roofing tile.
28 ft. eave tile, Spanish roofing tile.
2 pinials, Spanish roofing tile.

Walls

40 sheets, 15½ in. x 96 in., No. 27 gage "Trussit."
281.39 sq. ft. plastering, 1in. thick, 0.89 cu. yd.
2.1 bbl. cement.
0.89 cu. yd. sand.
1.5 sacks lime for tempering.

Wiring

2 porcelain conduits.

Painting

Done by contract.

COST OF ONE STATION

The cost of all items for the standard 8-ft. x 10-ft. way station totals as follows:

Lumber, complete with door, window frame and sashes	$ 55.00
"Trussit," 428 lb., at 4 cents (less discount)	16.84
Roofing tile (cost includes freight)	41.25
11.43 bbl. cement, at $1.28	14.65
3 54 cu. yd. sand, at $0.60 ton	2.58
3.75 cu. yd. stone, at $0.95 ton	4.75
1.5 sacks lime, at $0.50 sack	.75
Labor of erecting	115.07
Painting	12.00
Total cost of building	$262.89

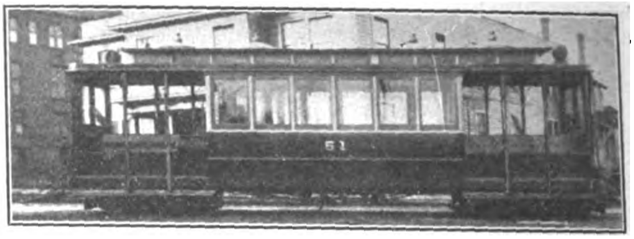
Oil as a Cause of Commutator Pitting

In a paper read before the Association of Iron & Steel Electrical Engineers B. G. Lamme stated that the phenomenon of pitting or the eating away of the mica between commutator bars had often been falsely credited to commutating conditions, to high voltage between bars, too thin mica, quality of carbon brush, use of lubricants, etc.

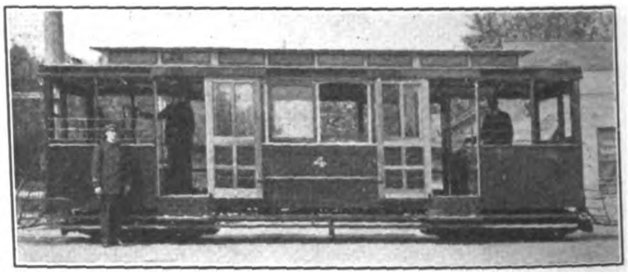
Some years ago an extended study of this matter had been made. This was based upon a large number of cases of actual trouble. The results from machines in actual service were so conflicting that no positive conclusions could be drawn. However, eventually the evidence pointed to oil as one of the fundamental conditions in this trouble. Extended tests were then made to determine the effects of oil on the mica, and the results indicated clearly that those insulations which absorb oil were liable to pit or eat away in time. Apparently where the oil could dissolve out the binding material in the mica, minute particles of carbon or copper would be disseminated through the mica, thus decreasing its resistance locally. Combustion of these particles would usually be noticed as "ring-fire" around the commutator. Ring-fire is almost always due to incandescent carbon particles scraped off the brushes, but is not usually harmful if the mica adjacent to the spark does not burn or deteriorate. Experience shows that the ordinary good grades of mica plate are not affected by such ring-fire, and it is only when foreign conducting particles penetrate into the plate that this burning may gradually eat away the mica. It was found that some binding materials used in building mica plate were more soluble in oil than others, and it was noted that in those plates with soluble binders the pitting was most pronounced. This led then to one solution of the pitting trouble, namely, the use of what might be designated as insoluble binders in the mica plate, with very tight construction of the commutator, so that oil could not penetrate along the sides of the plate, and with care in preventing oil from getting on the commutator.

Seattle Open Cars Changed to Closed Prepayment Type

For many years past the standard cable car used on the Seattle division of the Puget Sound Traction, Light & Power Company has been of the California type, similar to car No. 61, as shown in the accompanying cut. This car, with its open ends and running board, has been the cause of an abnormal number of boarding and alighting accidents. This trouble is aggravated by the fact that the cable lines operate at an approximate speed of 10 m.p.h., which is a further invitation for persons to board or leave the car while in motion.


SEATTLE CABLE CAR BEFORE REBUILDING

In March, 1913, a trial car, redesigned so that the entrance and egress of passengers would be controlled by the gripman or conductor, was put in service and was operated with marked success. During the past year eleven additional cars have been converted into the inclosed type, as shown in the cut of car No. 4. It was originally estimated that, if 50 per cent of the step accidents on the cable lines could be eliminated, the interest on changing these cars from the old type to the inclosed type would be about 20 per cent. It has worked out in practice that approximately 75 per cent of the step accidents have been eliminated with the inclosed type of car. The interest on the investment made in converting these cars is therefore about 30 per cent.


SEATTLE CABLE CAR AFTER REBUILDING

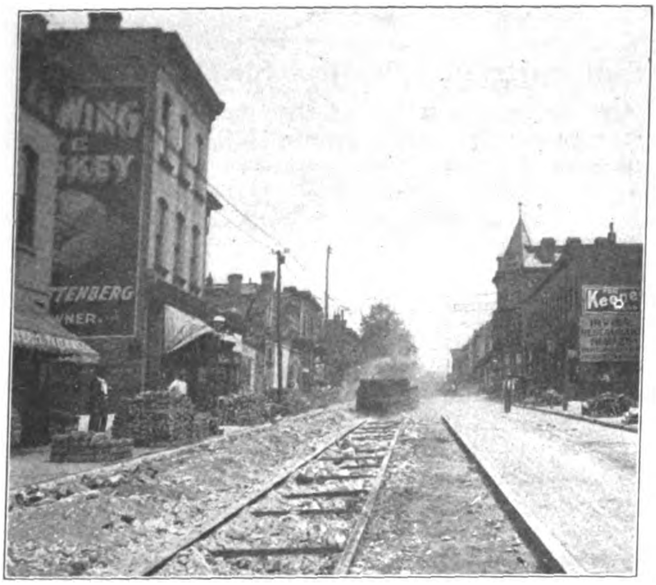
A further saving from the operation of these cars is due to the fact that at the present time all passengers enter at one point, depositing their money in fare boxes.

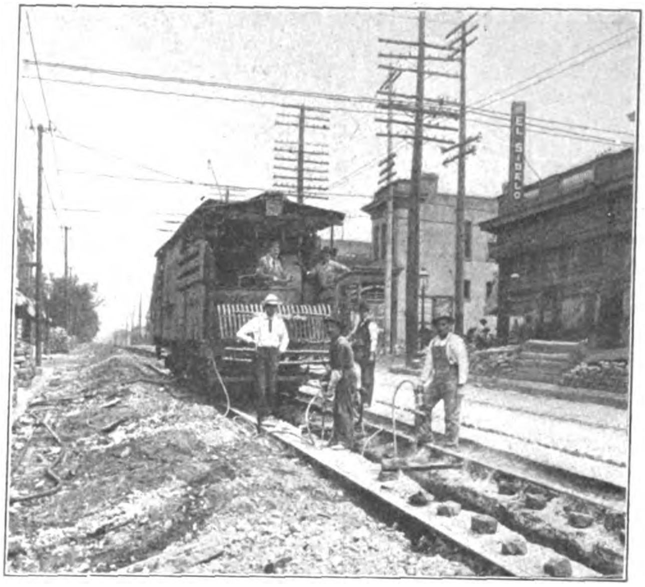
The inclosed type of car weighs, without passengers, approximately 14,700 lb. This is practically the weight of the car before it was redesigned. The width is 8 ft. 8 in. over all. The car seats thirty passengers. These cars are equipped with Exide batteries, 5-watt 8-volt lamps, and have nine lights. The center portion is entirely inclosed, both ends being open with two sliding doors on each side. The step folds with the sliding door.

Dynamiting Concrete Track Foundation

For several years the United Railways Company of St. Louis, Mo., has resorted to dynamite as the most economical means of loosening the concrete foundations under its track when rehabilitation is necessary. The method adopted has been to blast with small charges of dynamite which were sufficient to shatter the concrete so that it could be taken out in large pieces, and at the same time not damage the surrounding property. Essentially the equipment used in this work consisted of a car equipped with motor-driven air compressor for use in driving the drills and a cover car to confine the blasts.

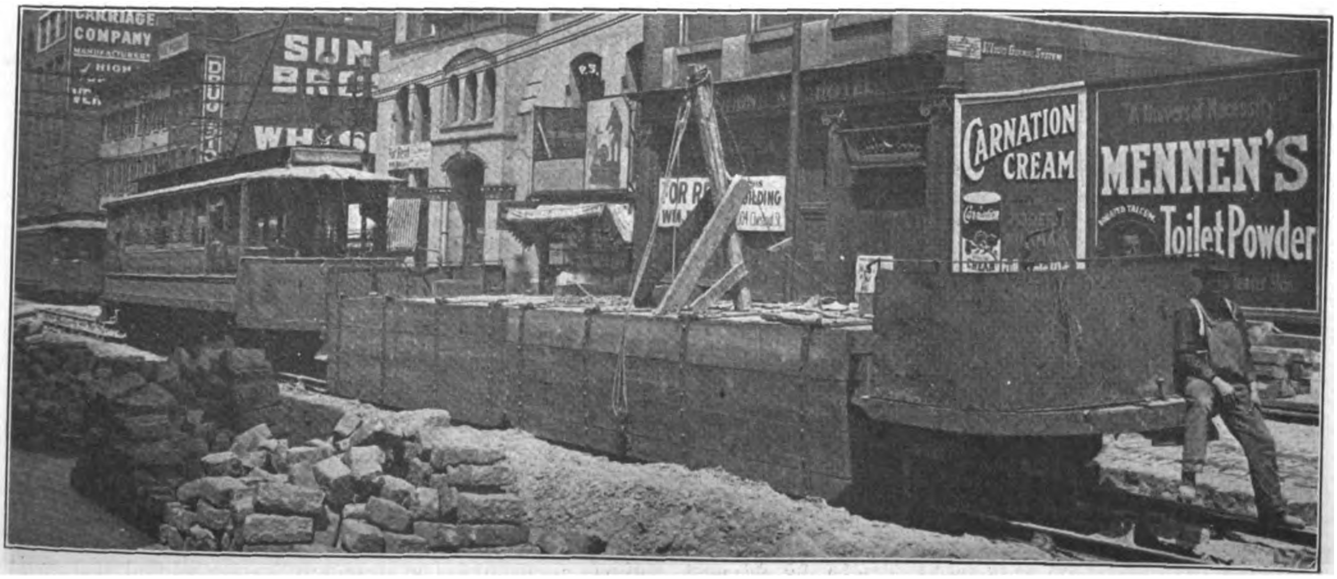
After holes have been drilled in the concrete, slightly below the center of gravity of the section to be removed, a 0.1-lb. charge of 40 per cent dynamite has been rammed into it. A fulminating cap has been used to explode this charge, twelve holes being shot at one time by an electric firing machine. In order to prevent damage by flying rocks or broken concrete at the time of the explosion, each blasting gang has been supplied with a cover car, which is merely a flat car with a heavy bottom and side boards extending below the car floor. This equipment has proved very effective in service and has not been superseded since it was adopted in 1906. Views of the cover car, the air compressor car and 1¼-in. drills, as well as the cover car during an explosion, are shown in the accompanying illustrations.


ST. LOUIS DYNAMITING CARS—VIEW OF COVER CAR DURING BLAST


ST. LOUIS DYNAMITING CARS—DRILL GANG AND AIR COMPRESSOR CAR

Ingenious Fusible Plug

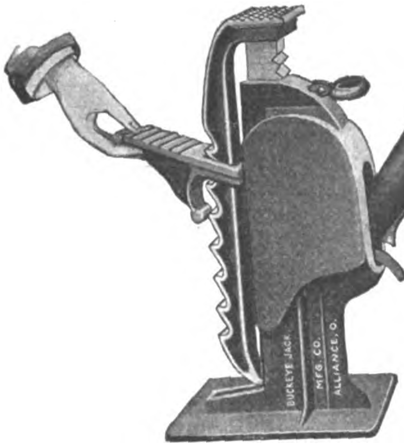
A correspondent of *Power* describes an ingenious fusible plug which is reported to have overcome the difficulties experienced with the usual type set directly in the boiler shell. The new form is set at the top of a piece of ½-in. pipe several feet long screwed through the shell and extending below the lowest normal water level of the boiler. The fusible plug is composed of an alloy that melts at the temperature of the steam, or, say, 350 deg., but, since the lower end of the pipe is below water level, no steam can reach the plug unless the water is low. Normally the radiation from the pipe cools the water that is in it considerably below steam temperature and keeps the plug from melting.



ST. LOUIS DYNAMITE CARS—VIEW OF COVER CAR USED TO CONFINE EFFECTS OF BLAST

Jack with Adjustable Auxiliary Foot

The Buckeye Jack Manufacturing Company, Alliance, Ohio, has recently added to its extensive series of jacks a design of 5-ton capacity designated the No. 14 Special. A feature of this jack, and one said to be original with its manufacturer, is the adjustable auxiliary foot. This adjustability is secured without the use of tools so that changes for operation at almost any height can be made very quickly. The height when the bar is down is 14¼ in., the raise is 7½ in., and the height when the bar is up is 20½ in. The jack is made of malleable iron. It weighs about 40 lb., and is made both single and double acting.



JACK WITH ADJUSTABLE FOOT

Safe Deposit Fare Box

For the past several years the Ohmer Fare Register Company, Dayton, Ohio, has been exploiting an unusual type of fare box known as Ohmer's "Safe Deposit." This box contains a steel tube, which, when removed, automatically seals the deposits placed therein.

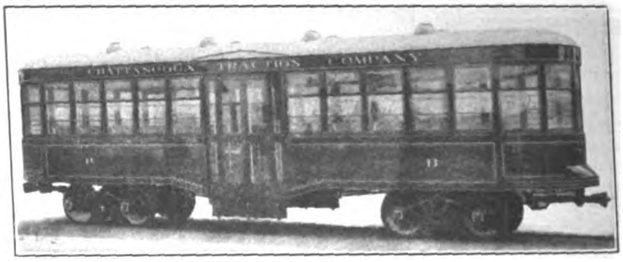
FARE BOX APPLIED TO PAY-WITHIN PREPAYMENT CAR

The merits of this box may be summarized as follows: Its size economizes platform space; it permits tickets in strips to be deposited; it has no exposed screws or bolts; the cylindrical insert is easily handled and practically indestructible and the insert locks automatically when withdrawn from the box; the lower half of the box is made of steel and the upper part is cylindrical plate glass; ingeniously placed baffle plates make it difficult to extract coins from the box; the box can be placed anywhere on a platform without interfering with traffic and it can be maintained at slight expense.

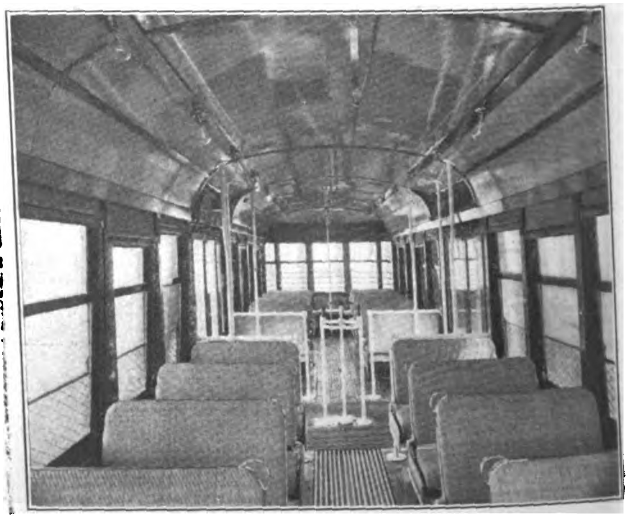
The dimensions of the fare box are as follows: length of outside tube, 15⅞ in.; length of insert tube, 12¾ in.; length of glass, 10⅞ in.; outside diameter of tube, 5 in.; outside diameter of insert tube, 4¾ in., and length of fare box with hopper, 30¼ in. The weight with insert tube is approximately 20 lb.

Side-Entrance Trailers for Chattanooga

Growing appreciation of the merits of the side-entrance car for trailer service is shown again by the purchase of two such cars by the Chattanooga (Tenn.) Traction Company from The J. G. Brill Company. These cars, which seat fifty passengers on end and transverse rattan seats, are 38 ft. 3¾ in. over the vestibules, 30 ft. 2¾ in. over the car posts, 8 ft. 4 in. over the sills and 8 ft. 6⅞ in. over the base of the arch roof. The height from the top of the rail to the sills is 2 ft. 9½ in. The underframe of the car is composed of metal and the body of wood with interior finish of cherry and bronze trimmings. The body weighs 15,315 lb. and is mounted upon 53-D trucks with Carnegie steel wheels and high-test heat-treated steel. Miscellaneous fittings include eight Brill exhaust ventilators per car, Tomlinson couplers and Hedley anti-climbers. A 12-in. horizontal wheel brake is provided at the conductor's stand. The cars have swinging glass doors, folding steps, push-button system and International R-5 registers for fare recording.



CHATTANOOGA SIDE-ENTRANCE CAR—EXTERIOR, WITH DOORS CLOSED AND STEP FOLDED UP



CHATTANOOGA SIDE-ENTRANCE CAR—INTERIOR VIEW

News of Electric Railways

NEW HAVEN DISSOLUTION DECREE

A Summary Is Presented of the Terms Under Which the New Haven Railroad Will Divest Itself of Its Principal Subsidiaries

The decree embodying the agreement reached by the New York, New Haven & Hartford Railroad and the government for the settlement of the Sherman law dissolution suit begun by the United States against the company was signed on Oct. 17 by Judge Mayer in the Federal District Court at New York and was immediately filed. As a result of this settlement the New Haven Railroad is left in possession of all its railroad lines except the Boston & Maine and its traffic agreement with the Boston & Albany, but it has been compelled to divest itself of all its electric railways except the New York, Westchester & Boston Railway. As regards its steamship lines it loses all except the Sound liners and must abide by the decision of the Interstate Commerce Commission concerning these. Until that decision is handed down it cannot dispose of any of the vessels or real property of the companies concerned, and cannot discontinue operation of the steamship lines or change any existing routing or traffic arrangements. On the other hand, the government is prevented by the decree from again bringing action against the New Haven Railroad upon any of the issues presented in the suit.

In order to accomplish the separation of the New York, New Haven & Hartford Railroad and the Boston & Maine Railroad and of the New York, New Haven & Hartford Railroad and the electric railway and steamship companies, the appointment of three sets of trustees is made, one for the New Haven interest in the Boston & Maine, one for the Connecticut trolleys, and one for the Rhode Island trolleys. These trustees are instructed to sell the stock held by the New Haven system before certain dates set by the court, and to assist any bona fide effort to reorganize the properties. They are forbidden to countenance any attempt on the part of the New York, New Haven & Hartford Railroad or its interests to re-establish by indirect methods its old monopoly. Moreover, to make this more difficult, every purchaser of the stock to be placed on the market is required to execute an affidavit attesting that he is a bona fide purchaser and is not acting in the interest of the New Haven Railroad.

In the first place, the decree declares that the New York, New Haven & Hartford Railroad, the New England Navigation Company, the Boston Holding Company and the Providence & Danielson Railway have been parties to combinations in restraint of trade and are now monopolizing a part of such trade, consisting of transportation by railroad, electric railway and steamboat lines in New England.

As regards the Connecticut Company the trustees to deal with the 400,000 shares of stock of that company, which controls the electric railways in Connecticut, now in the hands of the New England Navigation Company, are Walter C. Noyes, Old Lyme; Lyman B. Brainerd, Hartford; Charles Cheney, South Manchester; George E. Hill, Bridgeport, and William W. Hyde, Hartford. In this case the trustees are to try to have the sale completed by July 1, 1919.

The trustees to deal with the Rhode Island electric railways are Rathbone Gardner, John O. Ames, John P. Farnsworth, Theodore Francis Green, and Charles C. Mumford, all of Providence. The New Haven is to assign to them 96,855 shares of the Rhode Island Company, and the New England Navigation Company is to assign 9132 shares and $600,000 of bonds of the Providence & Danielson Railway, and 7000 shares and $600,000 bonds of the Sea View Railroad. These, as in the case of the Connecticut Company, are to be sold at the request or consent of the New Haven; but if they are not so disposed of by July 1, 1919, a public auction will be held of the remainder under the order of the court. The full proceeds of the sales of the bonds of the Providence & Danielson Railway and of the Sea View Railroad are to go to the New England Navigation Company, and the proceeds of the sale of the stock of their companies and of the Rhode Island Company to the New Haven. The same liberty of exchanging any of these Rhode Island securities for others in connection with a reorganization scheme is given to these trustees as was provided for in connection with the Boston & Maine and the Connecticut trustees.

Concerning all these three sets of trustees the court takes notice that they will have expenses without having funds, so the court orders the New Haven to advance the money needed. The Holding Company trustees are limited to $15,000 a year, but no limitation is put upon the Connecticut or Rhode Island trustees.

It is also ordered that the trustees shall issue to the New York, New Haven & Hartford Railroad and to the New England Navigation Company negotiable certificates of their interests in the properties held by them, and regulations are laid down concerning the action and the responsibility of the trustees. Of these the most important is:

"Each body of trustees in electing directors of any company, which it controls, and in all other actions shall exercise all the powers herein vested in such body so as to assure a management solely in the interest of such company without regard to the interest of the New Haven Company or any other corporation or person, but with due regard to the public interest. If deemed desirable by such body it may cause its own members or any of them to be elected directors of any company."

Then the court orders the sale of a number of blocks of securities held by the New York, New Haven & Hartford Railroad or its subsidiaries, which have given it the control of important transportation facilities. Thus it orders the sale before July 1, 1919, of the New Haven's 53,981 shares of the Berkshire Street Railway. This sale, however, must not be held until the commonwealth of Massachusetts has authorized it, or the Federal Court has issued a further order concerning it at a hearing at which Massachusetts has been invited to be present. The New York, New Haven & Hartford Railroad is also ordered to sell before July 1, 1919, its 5000 shares and $678,000 of bonds of the New York & Stamford Railway and its rights to the stock of the Westchester Street Railroad, when issued, and the New England Navigation Company must sell before July 1, 1919, its rights to the capital stock of the Shore Line Electric Railroad, when issued, and the $13,709,000 of gold notes of the New England Investment & Security Company, which it now owns. None of these shares or other securities shall be sold to anyone in the interest of the New Haven.

Costs are to be paid by the New Haven, the New England Navigation Company, the Boston Holding Company, and the Providence & Danielson Railway.

At the recent directors' meeting of the New York, New Haven & Hartford Railroad William Skinner, a director since 1902, and Morton F. Plant tendered their resignations, which were accepted. As the annual meeting of stockholders will occur Oct. 28 no steps were taken to fill the vacancies.

RESOLUTIONS HONORING CAPTAIN McCULLOCH

The directors of the United Railways, St. Louis, Mo., have passed unanimously resolutions in part as follows, lamenting the death of Capt. Robert McCulloch, late president and general manager of the company:

"We have found it difficult to prepare a proper memorial of Robert McCulloch. He had that rare faculty which won the love of men, and we cannot think upon his death without distressing emotion. The spell of the living man is still upon us. We remember, too vividly, his many and varied excellencies, his bluff, hearty sincerity, his kindliness, generosity, charm, firmness and high integrity, to be mindful of the lesser qualities which made him useful to the corporation. Fortunately, its record contains the history of his achievements. Called to the management of its affairs at an alarming crisis, he extricated it from embarrassment and restored it to public favor. He won not only the respect but the affection of its employees. By his personal influence he prevailed over all factious opposition and quieted discontent. All men trusted him; his word was never broken. He was zealous to promote the general welfare and tried constantly to provide a service which should disarm hostility. He listened to grievances, and when he promised to redress them men were content to wait upon his effort. Year by year the corporation has grown in public favor. Yet he was never neglectful of its welfare. His vigilance was incessant. He worked long, without rest, striving continually to perfect its system and enable it to realize a fair return upon the investment. No one knew better than he that the corporation's welfare depended upon the excellence and economy of its service. By his labor he created a great system worthy of a great city, and none now wish to withhold from him the credit which is due to his performance."

Regarding Richard McCulloch, who has been appointed general manager to succeed Captain McCulloch, the St. Louis *Republic* said editorially:

"St. Louis has long known and esteemed Richard McCulloch for his own sake. He is an engineer of note and a man among men. But his advancement to the position of general manager of the United Railways will be especially pleasing to the community because it continues the McCulloch succession.

"For many years the man who wanted to see the president and general manager of the United Railways went to the offices of the company at Park and Vandeventer Avenues and climbed the stairs to the second floor. A door stood open at the end of the hall and just inside it a gray-haired man sat at a long table. This was Capt. Robert McCulloch, and the formalities of obtaining an interview with him consisted of stepping inside the door and stating one's business. Here he met all sorts and conditions of human beings, from the traction magnate to the wife of the discharged employee who had come to plead for "just one more chance" for Tom or Bill. Here he sympathized with the unfortunate, helped the worthy man by giving him a chance to help himself, treated with a tact peculiar to himself the fussy and the unreasonable and entered with energy into every plan for a better, happier or wiser St. Louis in which it was possible for the United Railways to help.

"It is announced in the press that Richard McCulloch will continue to occupy his customary quarters at the offices of the United Railways. This is very much his own affair; but if the son who succeeds his father as executive head of our great system of surface transportation should, at his convenience, see fit to take that same place at the long table opposite the open door, those of us whose philosophy has still room in it for that outdated institution, the family, would be glad of it.

"The *Republic* extends its felicitation and best wishes to the new general manager. And it is unaffectedly glad that the McCulloch succession is to be continued."

HEARING ON BOSTON TRANSPORTATION IMPROVEMENTS

The Massachusetts Public Service Commission opened hearings on Oct. 20 upon a resolve of the last Legislature providing for an investigation of transportation conditions in Greater Boston and a subsequent report as to recommended improvements. The investigation is the direct outcome of the proposition of P. F. Sullivan, president of the Bay State Street Railway, last spring that legislation be enacted consolidating the Bay State company and the Boston Elevated Railway, with the object of establishing a single comprehensive transit system in the metropolitan district. All the principal steam and electric railways operating in Boston and vicinity were represented at the hearing, which was devoted mainly to an outline of desirable changes presented by W. C. Ewing, of the Boston City Planning Board. At a later hearing the companies will be given the opportunity to present any suggestions and facts which they deem pertinent.

Chairman McLeod said that the commission had lately acquired much data relative to urban transportation conditions through the visit of the chairman and Commissioner Stone to Madison, Wis., Chicago, Buffalo, Cleveland, Toronto and Indianapolis. The engineers and accountants of the commission have been investigating the accounts and relations of the Bay State Street Railway and the Boston Elevated Railway. For the planning board, Mr. Ewing pointed out that the problem of metropolitan transit is a terminal question. Within the area bounded by Broadway extension, Pleasant and Charles Streets and the harbor front, are twenty-seven subway, tunnel and elevated railway stations, and when the Dorchester tunnel is in operation, it will be possible to deliver every street railway passenger within a four-minute walk of his destination inside the business district. There are only three steam railway stations in the above area and one of these is approached by a ferry. The speaker said that the planning board favored state ownership of the transportation system. Representatives from the city of Malden urged the construction of a subway to that suburb, the electrification of various lines of the Boston & Maine Railroad, and an arrangement for the use of the Saugus branch of the latter by the Boston Elevated Railway. Residents of Watertown advocated the placing of the municipality within the 5-cent fare limit and the Roxbury board of trade urged relief from congestion at the Dudley Street elevated terminal.

CLEVELAND RAILWAY STOCK INCREASE AND TRAINMEN'S ARBITRATION

The Cleveland (Ohio) Railway was notified on Oct. 17 that its application for authority to issue $2,382,600 additional stock had been granted by the Public Utilities Commission.

The company has selected Attorney Charles Higley to represent it in the arbitration proceedings with the platform men. As already announced, Judge Willis Vickery will represent the men, but so far the two have not been able to agree on the third member.

Councilman Mayers has revived the measure to require street cars to stop on the near side of all street intersections. Peter Witt, street railway commissioner, is opposed to the plan, while Director of Public Safety Benesch favors it because he feels that it will enable the department to inaugurate the safety zone system in all parts of the city.

Many councilmen are opposing the proposed crosstown line on East 123d and East 125th streets, between Superior and St. Clair Avenues. They say the line will accomplish no other purposes than to increase the value of certain lands real estate men hold along the proposed line. A real estate firm is now building the streets that are to be used for the line, and expects to have them finished in the spring of 1915. According to Mr. Witt, the cost of the proposed line will be about $75,000.

Mr. Witt has made a new proposition to East Cleveland to prevent that municipality from resorting to its contract which requires through service to West Ninth Street, instead of the Public Square, where cars are looped at present. He has agreed to put on a four-minute service to the Windermere carhouse, with a three-minute service during rush hours, as well as to add fifteen runs between East Ninth Street and the East Cleveland Y, which is the eastern boundary line of the town. The proposal was recommended by E. A. Binyon, city solicitor of East Cleveland.

ALLEN & PECK, INC., TO MANAGE BUFFALO, LOCKPORT & ROCHESTER RAILWAY

C. D. Beebe, president of the Buffalo, Lockport & Rochester Railway, has announced that the company had accepted the resignation of H. C. Prather as general manager, and had made an arrangement with Allen & Peck, Inc., to take over the operation and management of the property, reporting to the president and the executive committee. Under the arrangement, C. Loomis Allen will become the active member of the firm of Allen & Peck on the property. He will be elected as vice-president of the company, in charge of operation. James P. Barnes, general manager of the Syracuse & Suburban Railway, will become resident general manager of the Lockport road, with headquarters probably in Rochester.

Mr. Beebe and the other officers and members of the board of directors regard the arrangement as one that probably will be of much advantage to the company, as through it they secure the services of men of high character and ability to take charge of the active operation and management of the road. Within the last few months the company has commenced the operation of its cars between Rochester and Buffalo. It also has recently closed a contract with Wells

Fargo Express whereby it will operate a through express service between Rochester and Buffalo, as well as inaugurating a package freight business of its own. The company, in connection with the Empire United Railways, has also made a contract with the Erie Railroad whereby after Nov. 1 it will use the new Erie freight station as a terminal for Rochester business. The company is now using the Erie passenger station for passenger traffic.

Mr. Prather has been with the Buffalo, Lockport & Rochester Railway ever since it began operations. Up until ten months ago, when he became general manager, he held the position of master mechanic and was in charge of the maintenance of rolling stock and other interests. He has been appointed local manager of the Rochester Division of the Empire United Railways.

For the present, the position of general manager of the Syracuse & Suburban Railroad, made vacant by the transfer of Mr. Barnes to the Lockport line, will not be filled. Edward F. Peck, president of Allen & Peck, Inc., will assume temporary charge of the road.

MR. HEWITT APPOINTED GENERAL MANAGER UNITED TRACTION COMPANY

On Oct. 1 C. F. Hewitt, who has been assistant general manager of the United Traction Company, Albany, N. Y., assumed the duties of general manager, succeeding James F. Hamilton, who will devote all of his time in future to the Schenectady Railway, which he has managed jointly with the United Traction Company. Mr. Hamilton, for a long time, has been desirous of lessening his duties and responsibilities and consented to continue his work with the United Traction Company until Mr. Hewitt had become familiar with local conditions in Albany.

Mr. Hewitt was formerly vice-president and general manager of the Des Moines (Ia.) City Railway and Inter-Urban Railway. He entered the electric transportation field in 1895 as superintendent of the Elmira Water, Light & Railroad Company. In 1900 he went to Indiana as general manager of the St. Joseph & Elkhart Power Company and the Elkhart Electric Company, being principally interested in the management of the latter company in a hydroelectric development of the former company. Upon the completion of this work Mr. Hewitt became operating manager of the St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo., remaining there until 1908, at which time he was transferred by the owners of the St. Joseph property to the operating management of the railway, lighting and other public utility properties of the East St. Louis & Suburban Company at East St. Louis, Ill. In July, 1912, Mr. Hewitt entered upon his duties with the Des Moines company as already outlined.

Mr. Hamilton entered the transportation department of the International Railway, Buffalo, N. Y., in 1896, and after serving in various positions was placed in charge of one of the largest stations. He resigned his position with that company in 1902 to become assistant superintendent of the Schenectady Railway, and was appointed superintendent of that company in 1909. Two years later Mr. Hamilton was engaged as general superintendent of the United Traction Company, and was retained by the Schenectady Railway in an advisory capacity. In 1912 he was appointed general manager of both companies.

New Line Opened in California.—The first section on the Sacramento Valley Electric Railway, Willows, Cal., which extends from Dixon and connects with the Oakland, Antioch & Eastern Railway, has recently been placed in regular operation.

Short Strike in East Liverpool.—Fifty union firemen, boiler tenders and ash haulers of the East Liverpool Traction & Light Company, East Liverpool, Ohio, struck on the morning of Oct. 6 because the company refused to reinstate eleven men who had been discharged. The places of the strikers were filled at once and little inconvenience was caused.

Sliding Wage Scale Rejected in Albany.—The employees of the United Traction Company who are members of the unions in Albany and Troy, N. Y., have by vote rejected the proposal of the company to put into effect the sliding scale of wages on these divisions. In June the men asked for a flat rate of 35 cents an hour, an increase of 8 cents an hour over the wages paid previously. It is expected that the point in dispute will now be submitted to a board of arbitration.

Public Utility Commission Decisions.—The Public Utility Commission Reports Company, Stock Exchange Building, Chicago, Ill., proposes to undertake the work of publishing the reports of the public service commissions arranged exclusively for the use of public utilities. All decisions affecting steam railroads will be eliminated unless they have a bearing upon pubic utilities. The decisions will be segregated into classes and indexed so as to be available for ready reference.

Service Conference in Pittsburgh.—At a recent conference between the members of the City Council, Mayor Armstrong and the city solicitor of Pittsburgh, Pa., the answer of the Pittsburgh Railways to the bill of complaint was discussed, and the Mayor was authorized to arrange a conference with officials of the company. The letter of J. D. Callery, president of the company, reviewing street railway conditions in the city was published in abstract in the ELECTRIC RAILWAY JOURNAL of Oct. 17, page 936.

Short Strike in Fort Smith.—The trainmen of the Fort Smith Light & Traction Company, Fort Smith, Ark., have returned to work following an agreement reached with the officers of the company. The strike continued for a period of twenty-four hours. Under the terms of the settlement the fifteen employees who were discharged recently will be reinstated, the seniority rule will be put in force, and in future all disputes will be referred to arbitration if the grievance committee which is appointed by the men cannot reach an agreement with the officers of the company.

The Detroit Appraisals.—In addition to the appraisal of the properties of the Detroit (Mich.) United Railway within the one-fare zone now being made by Prof. E. W. Bemis for the city railway commission of Detroit, Professor Cooley, of the University of Michigan, is now engaged in an appraisal of the properties not only within the city but outside as well. Professor Cooley is making the appraisal for the State Railway Commission. By reason of having practically finished his appraisal of the Pere Marquette Railroad, Professor Cooley has been able to turn a large number of his experienced men on the Detroit United Railway work and it is now thought the appraisal of these properties will be finished before Christmas.

San Francisco Municipal Railway Estimates.—The San Francisco (Cal.) Municipal Railway bond fund is insufficient for the construction of the new lines for which it was voted, according to a report by Leonard Leavy, bookkeeper of the Public Works Board. The deficit is attributed to the extra cost of the cable system for the Church Street hill, which the supervisors lately ordered. The bonds of the issue of $3,500,000 that have been sold amount to $2,642,500. They brought a premium of $23,658. Whether the remaining $857,500 can be sold now is considered doubtful because of market conditions. For work already undertaken $1,915,567 has been expended. For final payments on contracts and finishing the present work, $718,226 is required. For new work the city engineer's estimate is $1,020,240, making a total of $3,654,033. If the remaining bonds are sold the available cash will total $3,523,658, leaving a deficit of $130,374.

Conditions Normal on Joplin & Pittsburg Railway.—The receipts of the Joplin & Pittsburg Railway, Pittsburg, Kan., for the first few weeks after the resumption of traffic, succeeding the strike of nearly three months, have been quite up to the receipts of the same period last year. The line is now operating on all its branches. The company is, however, using only two of the power houses, those at Pittsburg and at Franklin. It gets power from the Empire District Electric Company, from the Joplin station, through substations a short distance north of Joplin, at Asbury, half way between Joplin and Pittsburg, and at Scammon. The Joplin & Pittsburg Railway maintained a power house at Scammon before the strike. At that time arrangements had already been made for the transformation of this station into a substation of the Empire Company. The Empire's substation equipment had already been put into the building and when traffic on the Joplin & Pittsburg was resumed the substation immediately began to supply current. The power house equipment in the Scammon building was not disturbed.

City Borrows from Chicago Traction Fund.—The Chicago City Council finance committee in seeking a means of raising $1,000,000 to insure the completion of a municipal recreation pier, devised a plan whereby this amount could be borrowed from the traction fund for four months, municipal bonds being deposited as security. At the present time this fund, which now includes approximately $14,000,000, is drawing 2¼ per cent interest when it is invested in anticipation of tax warrants. According to the new plan, the $1,000,000 fund for the completion of the recreation pier will draw 4 per cent interest. The finance committee decided to adopt this way of raising the necessary funds because bonds could not be sold except at a discount.

Western Massachusetts Transportation Hearings.—The transportation commission appointed by Governor Walsh of Massachusetts has been holding continued hearings within the past few days in the western part of the State. A strong general sentiment has developed in behalf of the construction of additional electric railways in Berkshire and Hampden Counties, the present train service and highway facilities being regarded as unsatisfactory. It was urged that if such lines could be built, water powers now running to waste could be utilized and a widespread movement started toward prosperity. It is expected that an appeal will be made to the next Legislature to have the State finance electric railway development in the Berkshire district unless private capital can be found to undertake the work.

Plans for Conference of Mayors.—Mayor Blankenburg of Philadelphia has been notified by the mayors of seventy-five cities throughout the country that they will attend the conference to be held in Philadelphia on Nov. 12, 13 and 14 to discuss public policies as to municipal regulation and control of public utilities. A general committee of well-known Philadelphians has been named by the Mayor to perfect plans for the conference and it has just agreed on a preliminary program. It is planned to have the sessions begin on the evening of Nov. 12, with a reception to mayors and delegates. The Friday morning session will be given over to a discussion of practical utility problems. In the afternoon the discussion will cover the regulation of utilities. Both these session will be held in the Bellevue-Stratford. The Friday evening session will be held in the auditorium of the Central High School and the subject for discussion will be local and state regulation of municipal utilities. Saturday morning, Nov. 14, in the Bellevue-Stratford, municipal ownership and operation will be discussed. In the afternoon the topic will be "Elements in the Constructive Utility Program." The evening session will adjourn to Witherspoon Hall, when holding companies and public utilities will be discussed by experts under the auspices of the American Academy of Political and Social Science.

Plea for Inventory Rejected.—The Supreme Court of Nebraska has decided against the State Railway Commission by refusing to issue a writ of mandamus to compel the Omaha & Council Bluffs Street Railway to file with the commission an inventory of its property. The company contended that a street railway does not come within the scope of the physical valuation law and that an inventory such as was desired by the commission would cost the company $7,500. A complaint asking for a reduction of car fares in Omaha is pending before the commission. The syllabus of the court's opinion follows: "The words 'railroad' and 'railway' as used in the physical valuation act (laws of 1909) held not to include street railways. Since such act declares that 'the term public service corporation when used in this article shall mean and embrace' certain named classes of such corporations, no other class of public service corporation is within its terms. The proper object of a court in construing a statute is to give effect to the intention of the Legislature, and where the language used in an act is ambiguous resort may be had to the history of its passage through the Legislature, if this throws any light on the meaning of the language used therein. When the Legislature has, upon the effort being made therein, refused to include certain classes of public service corporations in a physical valuation statute, the court will not include them therein by construction."

PROGRAMS OF ASSOCIATION MEETINGS

Central Electric Railway Association

The next meeting of the Central Electric Railway Association will be held at Fort Wayne, Ind., on Nov. 19.

New York Electric Railway Association

An executive committee meeting of the New York Electric Railway Association was held on Oct. 22 at the Transportation Club, New York. Those present were James F. Hamilton, Schenectady; John J. Dempsey, Brooklyn; S. Walter Mower, Cooperstown; William O. Wood, Long Island City; Frank Hedley, New York, and Charles C. Dietz, Brooklyn. It was decided not to hold a quarterly meeting in the month of December this year on account of the closeness of the annual meeting and the mid-year meeting of the American Electric Railway Association. The early spring meeting of the New York Electric Railway Association will, however, be held as usual. Other matters of importance were considered by the committee.

National Association of Railway Commissioners

The twenty-sixth annual convention of the National Association of Railway Commissioners will be held in the hearing room of the Interstate Commerce Commission in Washington, D. C., beginning Nov. 17. It is hoped that all the reports of the committees will be completed and sent to the secretary for printing and distribution at least thirty days in advance of the meeting. This will enable members to be better prepared intelligently to discuss the reports. James S. Harlan, chairman of the Interstate Commerce Commission, will deliver the address of welcome. Charles A. Prouty, director of valuation, will discuss the question of the valuation of common carriers subject to the act to regulate commerce. As no other special topics or addresses are scheduled, the time of the convention will be largely directed to the discussion and consideration of committee reports.

Association of Railway Electrical Engineers

The seventh annual convention of the Association of Railway Electrical Engineers will be held at the Hotel La Salle, Chicago, Oct. 26 to 30. During the term of the sessions the nineteenth floor of the hotel will be given over to exhibits of electrical manufacturers and supply dealers making a specialty of equipment for car-lighting and railroad service.

The technical program of the convention will open Tuesday morning, Oct. 27, with an address by the president, C. R. Gilman, illuminating engineer of the Chicago, Milwaukee & St. Paul Railway, to be followed by the report of Secretary Joseph A. Andreucetti, Chicago & Northwestern Railway, Chicago. At the afternoon session reports will be submitted by the committees on loose-leaf binders for filing specifications and keeping specifications and standards to date, J. R. Sloan, chairman; on reciprocal relations, L. S. Billau, chairman; on specifications for wire crossings for potentials above 100 volts, J. R. Sloan, chairman, and on data and information, Edward Wray, chairman.

On Wednesday at the morning session reports will be submitted by the committees on standards, D. J. Cartwright, chairman, and on headlamps, C. R. Sugg, chairman, followed by a paper entitled "Communication to and Between Trains by Telegraph-Wireless, Telephone-Wireless and Telephone," by F. H. Milner, Union Pacific Railway, Omaha, Neb. At the afternoon session reports will be submitted by the committees on industrial trucks; on electric traction, and on specifications.

On Thursday at the morning session there will be reports from the committees on axle equipment, H. R. Bucks, chairman; on head-end equipment, K. R. Hare, chairman, and on standard rules for car wiring, S. W. Everett, chairman. At the afternoon session the committee reports on outside construction and yard lighting, H. M. Warren, chairman; on illumination, L. S. Billau, chairman, and on shop practice, G. W. Cravens, chairman, will be presented.

On Friday at the morning session a report is scheduled from the committee on yard facilities for charging, D. B. Pastorius, chairman, to be followed by the election of officers. There will be a dinner-dance on Friday evening.

Financial and Corporate

RECENT FINANCIAL TENDENCY

Discussion of plans for opening the New York Stock Exchange has been revived by the visit to this country of Sir George Paish, the English financial authority. Except that general conditions have improved materially since the declaration of war, practically the same problems present themselves for settlement in connection with the reopening that existed weeks ago. The governing committee of the exchange has not yet gone on record, and the discussion regarding the reopening is purely speculative, representing what particular individuals think may transpire or what they would like to have take place.

Pronounced ease was the feature of the market for foreign remittances on Oct. 21. It was reflected in a decline of demand sterling from 4.95¼ at the beginning to 4.94¾. Cable transfers fell to 4.95¼. The Continental exchanges showed sympathetic weakness. Francs declined to 5.08½ for checks and 5.08 for cables, while marks went down to 91¼ for checks and 91½ for cables. Loans in time money were negotiated on Oct. 21 in New York in small amounts at rates ranging from 6 to 7 per cent, the maximum figure applying principally to the shorter maturities. Call money was put out in a few small lots at 6 per cent.

CHANGE IN STOCK CONTROL

The protective committee of the preferred shareholders of the New England Investment & Security Company, Springfield, Mass., composed of Moses Williams, Jr., Henry B. Cabot and E. V. R. Thayer, has concluded the purchase of the 1000 shares of common stock held by Sanderson & Porter, New York. Previous reference was made to this impending purchase in the ELECTRIC RAILWAY JOURNAL of Sept. 5. This stock, which was purchased by Sanderson & Porter in the summer of 1913, carried with it practical control of the New England Investment & Security Company, the vehicle through which the New York, New Haven & Hartford Railroad owned the electric railways in Springfield, Worcester and other towns in the western part of Massachusetts. The New Haven's interest is now represented by $13,700,000 of notes due in 1924. According to the New Haven dissolution decree, abstracted elsewhere in this issue, the railroad must also dispose of these notes before July 1, 1919, to parties not interested in its own organization.

Francis H. Dewey and Alexander G. Bullock, Worcester, and E. V. R. Thayer, Fitchburg, have been elected trustees in place of Sanderson & Porter's representatives, so that now the entire board of trustees represents the preferred stockholders. There are 40,000 shares of non-voting preferred stock outstanding, which are owned by about 1000 holders and on which dividends at 4 per cent are guaranteed by the New Haven Railroad. The purchase money was raised by a contribution of $10 a share by the preferred stockholders, which provided enough to carry the purchase through, although the purchase price itself is unknown.

Although no formal announcement has been made by the new management, Mr. Dewey in an interview expressed himself as follows:

"There will be no change of management at present. No attempt will be made to sell bonds or stock or to reorganize the properties, for the money market is not now in a condition for people to be interested in investments. As to the complete abolition of holding companies and what will be done in the matter of reorganization, these are matters that the trustees will decide in good time and of which the public will be kept informed through the newspapers."

Under the former arrangement the owners of the 1000 common shares selected four of the seven trustees and the owners of the 40,000 preferred shares selected only three. For several years all the properties, operating about 420 miles of street railway, have been controlled now by one set of owners of common stock and now by another set, the preferred stock, largely held by the investors in Springfield, Worcester and Boston, being legally in the position of a minority. Recently, however, several influential preferred shareholders became active in forming a protective committee, which has brought about the above change of control.

ANNUAL REPORTS

Boston Elevated Railway

The Boston (Mass.) Elevated Railway earned dividends of $1,193,970 during the fiscal year ended June 30, 1914, with a surplus of $63,199 for the period. The company's figures of operation, as reported to the Massachusetts Public Service Commission, showed operating revenues $820,709 greater than in the preceding year. The operating expenses were only $162,280 larger, yielding an increase of $658,428 in the net income from operation. Deductions from income increased $98,824 during the year. The deficit for 1913 was $496,377, and for 1912 it was $491,632, both of which are to be ascribed to the effect of the strike of 1912. There was no increase in the capital stock, which totals $23,879,400.

Below is a summary of the company's return to the commission, compared with the results for the preceding year:

	1914	1913
Operating revenue	$17,629,617	$16,808,908
Operating expense	11,297,862	11,135,581
Net income from operation	$6,331,755	$5,673,327
Miscellaneous income	156,361	159,419
Total income	$6,488,116	$5,832,747
Fixed charges	5,230,948	5,131,124
Balance	$1,257,168	$700,622
Dividends	1,193,970	1,197,000
Surplus	$63,198	*$496,377

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*Deficit.

Traffic and operating statistics for the two years ended June 30 compare as follows:

	1914	1913
Revenue car-miles	57,990,436	57,784,319
Revenue passengers	343,181,049	326,352,863
Employees	9,842	9,882
Maintenance of way and structures	$1,694,072	$1,761,842
Maintenance of equipment	$1,331,339	$1,282,655
General expenses	$1,729,665	$1,773,597
Traffic expenses	$13,157	$16,048
Transportation expenses	$6,529,626	$6,301,400
Operating ratio	64.08	66.25

New York Railways

The comparative statement of income, profit and loss of the New York (N. Y.) Railways for the years ended June 30, 1913 and 1914, follows:

		1914	1913
Gross operating revenue		$13,860,837	$14,065,158
Operating expenses		8,759,973	8,775,961
Net operating revenue		$5,100,864	$5,289,197
Taxes		1,092,105	1,169,895
Income from operation		$4,008,759	$4,119,302
Non-operating income		434,200	410,029
Gross income		$4,442,959	$4,529,331
Income deductions:			
Interest on underlying bonds, rents, etc.		$2,674,509	$2,695,555
Interest on New York Railways first real estate and refunding mortgage 4 per cent bonds		651,838	651,838
Total		$3,326,347	$3,347,393
Balance		$1,116,611	$1,181,938
Add:			
Surplus, June 30, 1913 and 1912:			
At beginning of year as adjusted	$46,101		
Additions during year	21,322		
		67,423	54,327
Total available for interest on New York Railways adjustment mortgage 5 per cent income bonds		$1,184,034	$1,236,265
Deduct:			
Interest on New York Railways adjustment mortgage 5 per cent income bonds		1,112,675	1,190,164
Surplus		$71,357	$46,101
Add:			
Net income from Williamsburg Bridge local car operations			12,129
Surplus June 30, 1914			$83,486

NOTE.—For purposes of comparison the operating expenses for the year ended June 30, 1913, are adjusted to include reserve for maintenance and depreciation.

Revenue from transportation for the year, excluding Williamsburg Bridge local car operation, was $13,421,681, a decrease of $184,172, or 1.35 per cent. For the first six months of the fiscal year there was an increase in both gross and net earnings and in the number of passengers carried. During the second six months, however, there was a decrease on account of the snow storms during February and March, the generally less favorable weather conditions and the widespread business depression. The aggregate loss to the company on account of the storms, in conduit cleaning, snow removing, damage to pavement and track structure, and on account of excessive wear caused by vehicular traffic, including loss of passenger revenue, was approximately $500,000. The interruptions caused by the city subway construction also had a harmful effect upon some of the company's revenues, for although during the six months ended Dec. 31 all the so-called north and south lines showed a gain in receipts, the Lexington Avenue line suffered a heavy loss on account of the fact that delays thus caused had diverted traffic from that line.

The other street railway operating revenues for the period were $439,157, a decrease of $20,148, or 4.39 per cent. The three largest items of revenue under this heading were advertising, $325,000; sale of power, $90,703, and rent of tracks and terminals, $15,969. The total decrease was accounted for by decreases in the sale of power and equipment rentals from other companies approximating $50,000, which was partly offset by increases in advertising and rent of tracks and terminals, approximating $30,000.

The operating expenses decreased $15,988, or 0.18 per cent. The operating expenses for 1914 and 1913 include amounts reserved for maintenance and depreciation, the reserve for the year ended June 30, 1914, being $324,773, a decrease as compared with 1913 of $376,936. The charges for paving included in operating expenses amounted to $555,191, an increase over 1913 of $167,328. There was also an increase of $146,184 in the cost of snow removal. The amount actually expended for maintenance of track and roadway, electric line, building structures, etc., was $1,614,443, an increase over 1913 of $397,684. The expenditures for maintenance of equipment amounted to $832,951, a decrease as compared to 1913 of $61,613. The total maintenance expenditures increased $336,071 over the preceding year. The extraordinary charges in the nature of improvements and replacements included in the maintenance accounts amounted to $707,322, an increase of $145,260.

Taxes assignable to street railway operations decreased $77,789, or 6.65 per cent. All classes of taxes as accrued showed decreases, the greater portion of the reduction applying to real estate, special franchise and gross earnings and taxes. The combined cost of claims for the current year and those arising out of operation during the receivership and liquidated during this year amounted to approximately 6.4 per cent of the gross passenger revenue, as compared to 6.6 per cent last year. The number of serious personal injuries was reduced more than 12.8 per cent and the total number of accidents 10.4 per cent. Plaintiffs won only 34 per cent of all cases tried in the courts. The company voluntarily settled 3316 claims for $273,152 before suit was brought and compromised 1058 suits for $234,687 before trial, leaving as a result of contested suits 185 judgments paid, amounting to $58,519.

The reserve for injuries and damages during the first six months of the year was reduced from 8 per cent to 7½ per cent of the passenger revenue, but restored to 8 per cent by order of the Public Service Commission. The percentage of 7½ per cent, however, was adopted during the last six months. The report states that it usually takes five years to liquidate and extinguish completely all liability for accidents in any year and that no adjustment can be had as to the reserves for 1912 and 1913 until the liability for these years shall have become extinguished by payment, litigation or the statute of limitations. It is also stated that the new workmen's compensation law will increase the cost of employees' accidents, so that no considerable change in accident reserve should be made at this time.

The company showed a net increase of $24,171, or 5.89 per cent in operating income, which is accounted for by the additional interest revenue received on special funds. The profit and loss surplus amounting to $83,486 was composed of $83,254 interest on the $650,000 note of the joint reorganization committee assumed by the company Oct. 3, 1912, and an undistributed balance of $232.

During the year the company completed and placed in service 175 stepless cars, 45 storage battery cars and 29 electric trucks. The report contains tables and schedules showing the capitalization of the company, the railroads leased and operated under agreement and the welfare work conducted by the company. In regard to the workmen's compensation law, it is stated that the difference between insurance in a stock company or the state fund and self-insurance appeared so disproportionate that when allowance was made for medical expense, the economy seemed to be on the side of self-insurance.

The report emphatically states that the very large expenditure for street paving in the past and at present is extraordinarily burdensome and interferes with the proper carrying out of plans for the physical improvement of the company's property. The company feels that a change in paving requirements is not only justified by existing conditions, but it is absolutely necessary to conserve its revenues for rendering efficient transportation service. It is believed that one party, preferably the city, should be responsible for the condition of the paving in all city streets from curb to curb, and that the railways should make some satisfactory arrangement with the city to pay a reasonable and proper proportion of the maintenance cost, say on the basis of a fixed sum per running foot of single track per annum, which would relieve the companies entirely of their existing paving obligations and place in the hands of the city the question of paving or repaving the public streets.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—The independent bondholders committee of the Birmingham, Ensley & Bessemer Railroad announced on Oct. 9 that A. R. Patterson, general auditor Stone & Webster Management Association, whom they had employed to investigate the affairs of the company, had been informed by the general auditor of the railway that he was unable to give any definite information regarding the railways' vouchers, for the books were being examined by certified public accountants employed by other interests.

Boston (Mass.) Elevated Railway.—Charles P. Hall has resigned as a director of the Boston Elevated Railway on account of his appointment as a trustee of a majority of the Boston & Maine Railroad stock under the recent decree entered in the government suit against the New York, New Haven & Hartford Railroad.

Brooklyn (N. Y.) Rapid Transit Company.—The Brooklyn City Railroad recently anticipated a payment of an instalment of $100,000 due on account of the debt to the Brooklyn Heights Railroad under the terms of the settlement for $1,650,000 of the suit brought against it by the latter. There is now said to be due about $400,000 of the amount.

City Service Company, New York, N. Y.—In a recent letter to stockholders H. L. Doherty, president Cities Service Company, stated that the machinery of credit in this country is gradually being adjusted to overcome the strain caused by war conditions but that there have been no developments which would warrant the directors in changing their policy of deferring dividends. According to Mr. Doherty, since July 30 action has been taken by various corporations in this country, discontinuing, deferring or reducing payments of interest and dividends on approximately $2,000,000,000 of capital and to the extent of practically $100,000,000 in annual payments to security holders. Every action of this character is depressing but should not be interpreted as an indication of added difficulties. On the whole, the properties of the Cities Service Company are making a satisfactory showing, with encouraging news from time to time of added improvement. With the exception of sales of crude oil, there has been no marked effect to lessen the earnings of the various properties. Concerning the recent injunction against the 3-cent fare ordinance in Toledo, Mr. Doherty said: "The effect of this restraining order will be to increase substantially the earnings of the Toledo street railway lines. It is very significant that the decision of Judge Killits was received with general approval by the Toledo public. Since the Toledo properties came under the present management the feeling toward the local utilities has been steadily changing until at present relations are extremely cordial."

Cleveland (Ohio) Railway.—As noted in the ELECTRIC RAILWAY JOURNAL of Oct. 17, the Ohio Public Utilities Commission has authorized the Cleveland Railway to issue $2,382,600 of common stock to be sold for the highest price obtainable, but not for less than par. The proceeds are to be used for the following additions, extensions and permanent improvements: land for terminals, $50,000; buildings, $1,065,000; track, $585,000; power, $284,500, and rolling stock, $400,000.

Columbus Railway, Power & Light Company, Columbus, Ohio.—The Ohio Public Utilities Commission on Oct. 17 granted the Columbus Railway, Power & Light Company permission to issue $7,876,000 of first mortgage gold bonds or an equal amount of 4 per cent preferred stock to refund outstanding bonds of its underlying companies.

Empire United Railways, Syracuse, N. Y.—C. W. Seamans, New York, W. A. Jones, Newark, and J. M. Gilbert, E. I. Edgcomb, and A. H. Cowie, all of Syracuse, have been elected directors of the Empire United Railways to succeed other men who acted as temporary directors. E. D. Metcalf has resigned as vice-president and a director.

Eastern Texas Electric Company, Beaumont, Tex.—Stone & Webster, Boston, are offering for sale at 98½ and interest, to yield about 6.9 per cent, three-year 6 per cent notes of the Eastern Texas Electric Company, due July 1, 1916. The notes are callable as a whole at 100 and interest on any date at thirty days' notice. The notes are a direct obligation of the company, which covenants that, if any new lien is placed on the property, the notes shall be secured equally with the new obligation. The notes are followed by $1,400,000 of 6 per cent preferred stock and $1,400,000 of common stock.

Humboldt Transit Company, Eureka, Cal.—The Railroad Commission of California has rendered a decision authorizing the Humboldt Transit Company to issue and pledge $50,000 of first mortgage 5 per cent bonds with the Pacific Coast Casualty Company as collateral security for a surety bond.

Long Island Railroad, New York, N. Y.—The Public Service Commission of the Second District of New York has approved an issue of $1,000,000 of the Long Island Railroad's 5 per cent gold equipment trust obligations, series A. The total issue will be for $1,060,000 to be sold at not less than par and accrued interest, pursuant to an arrangement with the Fidelity Trust Company and Edward P. Gest as trustee. The proceeds, plus a cash payment of $125,000, will be used in the acquisition of the following equipment: Twelve steel passenger cars, three steel passenger and baggage combination cars, forty steel motor passenger cars, fifteen steel motor passenger and baggage cars, twenty steel baggage and express cars, four steel baggage and mail cars, and three motor passenger, baggage and mail cars. The car trust certificates, guaranteed principal and interest by the Long Island Railroad, are to be taken up in ten annual payments of $106,000 and interest.

New York (N. Y.) Railways.—The following committee has been formed to represent large holdings of the New York Railways thirty-year 5 per cent adjustment mortgage income bonds: John P. Kingsley, president New York Life Insurance Company; William A. Day, president Equitable Life Assurance Society; Haley Fiske, vice-president Metropolitan Life Insurance Company, and Allan Ford, president State Street Trust Company, Boston. The committee announces that the bondholders are entitled to vote for and elect five directors at the annual meeting in December, and that it will receive proxies for such election.

Northampton (Mass.) Street Railway.—The stockholders of the Northampton Street Railway have elected William A. Stevenson, Florence, and Charles E. MacIntosh, Holyoke, directors to succeed N. D. Winter, Springfield, resigned, and the late W. S. Loomis, Holyoke.

Northern Electric Railway, Chico, Cal.—Judge Dooling in the United States District Court of San Francisco on Oct. 5 decided to appoint John P. Coghlan, attorney for the Pacific Gas & Electric Company, as receiver of the Northern Electric Railway. Mr. Coghlan is reported as not intending to make any changes in personnel. According to a circular issued by the Sloss Securities Company, when the trustees were appointed it was estimated that the revenues of the Northern Electric Railway would provide for betterments and interest except for an estimated shortage of from $200,000 to $250,000, which should be made out of the revenues on the Scloss Securities Company. In February and May, 1914, the trustees paid the note interest, but unusual rains and floods made extensive repair work necessary and the operating revenues also did not keep pace with the estimate. On June 1 the note interest was defaulted and since that time, notwithstanding substantial economies effected, earnings continued to fall off, the decrease being most marked after the outbreak of the European war. Not only were the revenues insufficient to meet the interest on underlying bonds due Oct. 1, but they also failed to provide for the necessary maintenance of the physical properties. In view of these conditions a receiver was necessary, but it is hoped to terminate the receivership as soon as a plan of reorganization can be agreed upon. At a recent meeting of creditors five protective committees were appointed to look after interests of the holders of the different classes of securities and of the unsecured creditors.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Railroad Commission of California has authorized the Oakland, Antioch & Eastern Railway to pledge $105,000 of first mortgage 5 per cent thirty-year bonds as collateral for a note of $62,500, provided the bonds be returned to the treasury upon the collection of the assessment delinquent on Oct. 8.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company is continuing its public offering of a block of its immediate issue of $12,500,000 of new first preferred cumulative 6 per cent stock at the original price of 82½, yielding 7.27 per cent on the investment. About $9,000,000 of this stock already has been sold to more than 3500 purchasers.

Richmond & Henrico Railway, Richmond, Va.—Carrying out the order of Judge Crump on Sept. 16 directing the sale of the properties of the Richmond & Henrico Railway, unless the company paid by Sept. 26 past-due interest of $250,000 on its bonds, Commissioners Samuel L. Kelley and Samuel A. Anderson have served notice that they will sell the property at public auction on Nov. 5. In accordance with the court order, the property will be disposed of as an undivided whole. Besides 7½ miles of railway track in the city of Richmond and a railway franchise, the holdings embrace valuable viaducts, a power house, carhouses, rolling stock and other railway appurtenances. The sale will bring to a conclusion the proceedings brought against the railway in June, 1913, by the Union Trust Company, Ltd., Toronto, Can., underwriter of its bond issue. At that time Judge Crump appointed the Virginia Trust Company as receiver, and this company has operated the road for more than a year, issuing receiver's certificates to meet expenses of operation.

San Diego (Cal.) Electric Railway.—The Railroad Commission of California recently authorized the San Diego Electric Railway to execute a mortgage to the Union Trust Company, San Francisco, to secure an authorized issue of $10,000,000 of general first lien 5 per cent forty-year sinking fund gold bonds and to issue thereunder $4,497,000 of bonds at 85. The proceeds are to be used to refund outstanding bonds and other debt, to return $302,438 to income and to pay for necessary additions and betterments. The application to the commission was noted in the ELECTRIC RAILWAY JOURNAL of July 11.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—W. W. Garthwaite, member of the advisory committee in charge of the F. M. Smith interests, has been named a director in the San Francisco-Oakland Terminal Railways, to take the place of George G. Moore, who recently relinquished control of the road following his failure, through war conditions, to carry out his proposed refinancing plans.

Scioto Valley Traction Company, Columbus, Ohio.—The income statement of the Scioto Valley Traction Company for the year ended June 30, 1914, shows gross revenue of $485,696, an increase of $21,460 over the previous year. Operating expenses totaled $279,858, an increase of $18,241, caused by flood ravages and the extension of facilities for handling freight. The latter charge arose from the policy of the company to build the road out of earnings. The surplus for the year was $31,054, an increase of $2,105, the total surplus and reserves being $172,160 at the end of the fiscal year. The road carried 1,380,405 passengers during the year, in comparison with 1,332,492 in 1913. It hauled 77,146,153 lb. of freight, a gain of 12,885,907 lb., over the previous year.

Southern Traction Company of Illinois, East St. Louis, Ill.—William F. Trautman, formerly United States district attorney of eastern Illinois, was recently appointed one of the receivers for the Southern Traction Company in Illinois and the Missouri receiver for the company by Judge Francis M. Wright of the District Court in East St. Louis. Mr. Trautman was chosen to fill the vacancy made by the resignation last June of William Lorimer, Chicago.

DIVIDENDS DECLARED

Bangor Railway & Electric Company, Bangor, Maine, quarterly, one-half of 1 per cent, common.

Cape Breton Electric Company, Ltd., Sydney, N. S., 3 per cent, preferred; 3 per cent, common.

East St. Louis & Suburban Company, East St. Louis, Ill., quarterly, 1¼ per cent, preferred.

Jacksonville (Fla.) Traction Company, quarterly, 1½ per cent, preferred; quarterly, 1¾ per cent, common.

Lewiston, Augusta & Waterville Street Railway, Lewiston, Maine, quarterly, 1½ per cent, preferred.

Montreal (Que.) Tramway, quarterly, 2½ per cent.

West Penn Railways, Pittsburgh, Pa., quarterly, 1¼ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$72,661	*$34,761	$37,900	$17,402	$20,498
1 " " '13	74,248	*30,832	43,416	17,354	26,062
12 " " '14	777,080	*371,629	405,451	208,897	196,554
12 " " '13	747,311	*339,598	407,713	206,398	201,315

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$100,717	*$73,837	$26,880	$17,185	$9,695
1 " " '13	111,253	*77,399	33,854	14,919	18,935
2 " " '14	198,085	*154,766	43,714	34,106	9,608
2 " " '13	215,051	*150,789	64,261	29,593	34,667

CONNECTICUT COMPANY, NEW HAVEN, CONN.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$823,697	*$571,018	$252,678	$98,889	$153,789
1 " " '13	860,800	*529,397	331,402	90,499	240,903
2 " " '14	1,644,350	*1,142,759	501,590	196,219	305,371
2 " " '13	1,717,643	*1,049,816	667,828	180,996	486,832

GRAND RAPIDS (MICH.) RAILWAY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$114,380	*$75,374	$39,006	$13,520	$25,486
1 " " '13	116,159	*80,279	35,880	15,173	20,707
12 " " '14	1,292,726	*832,618	460,108	154,718	305,390
12 " " '13	1,280,852	*765,667	515,185	178,334	336,851

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$180,508	*$107,927	$72,581	$41,900	$30,681
1 " " '13	178,431	*116,727	61,704	40,002	21,702
12 " " '14	2,249,944	*1,379,527	870,417	502,326	368,091
12 " " '13	2,168,166	*1,274,609	893,557	452,801	440,756

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$52,442	*$32,486	$19,956	$7,876	$12,080
1 " " '13	50,100	*29,437	20,662	7,699	12,963
2 " " '14	102,176	*63,425	38,750	15,752	22,998
2 " " '13	101,490	*59,374	42,116	15,253	26,863

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$38,561	*$42,967	$4,405	$11,564	†$15,969
1 " " '13	37,516	*48,999	11,483	9,750	†21,233
2 " " '14	78,769	*85,324	6,555	20,589	†27,144
2 " " '13	74,084	*96,443	22,359	20,552	†42,911

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Sept., '14	$1,949,440	$1,113,964	$835,476	$807,970	$27,506
1 " " '13	1,999,344	1,154,067	845,277	801,001	44,275
3 " " '14	5,813,676	3,362,684	2,450,993	2,426,099	24,894
3 " " '13	5,965,989	3,502,557	2,463,432	2,398,647	64,785

PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$487,264	*$275,914	$211,350	$186,186	$25,164
1 " " '13	556,152	*280,110	276,042	172,166	103,876
2 " " '14	6,575,622	*3,336,059	3,239,563	2,141,145	1,098,418
2 " " '13	6,683,992	*3,316,515	3,367,477	1,906,293	1,461,184

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Aug., '14	$537,859	*$351,133	$186,726	$121,035	$65,691
1 " " '13	558,784	*370,614	188,169	105,306	82,863
2 " " '14	1,075,832	*705,234	370,598	237,299	133,299
2 " " '13	1,138,649	*700,400	438,249	210,612	227,637

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*Includes taxes.
†Deficit.

Traffic and Transportation

FARE INCREASE DENIED

Railroad Commission of California Denies Fare Increase to the Southern Pacific Company

The petition of the Southern Pacific Company to raise its one-way and monthly commutation rates between San Francisco and Alameda County points has been denied by the State Railroad Commission of California. The commission has also denied all of the other petitions that were before it affecting rates within Alameda County. Some of these petitions were brought by citizens and commercial bodies of Oakland and other Alameda County places and asked for a reduction of certain rates charged by the company. The commission orders that within twenty days the Southern Pacific Company and other interested parties present in writing to the commission their proposed schedule of rates to and from points beyond Seminary Avenue and upon the Stonehurst line, both for commutation and single fares, and it announced that unless an amicable arrangement of these issues was determined by the company on one side and residents concerned on the other, the commission would make a subsequent order with reference thereto. Those portions of the applications and complaints applying to the rates involved in that case were reserved for future determination.

The commission states that the Southern Pacific Company has been very considerate of the people of the east bay territory in the extension of its line and the extension of its $3 commutation and 10-cent single-fare rates, and expresses the opinion that it does not believe the company should be required to accord such rates to portions of the east bay cities and Alameda County other than those points to which they have been voluntarily accorded or established. It is suggested, however, that on account of the confusion which exists, it would be better for the representatives of the company, the protestants and the rate department of the commission, to arrange a uniform and proper scale of commutation and single-fare rates between San Francisco and points not now accorded the $3 monthly commutation rate and the 10-cent single-fare rate.

In its opinion the commission says in part:

"While the commission would under no circumstances suggest that improvements and substitutions, such as those brought about by the company in electrifying these lines, should be made without hope of return on the part of the agency making them, yet it is well to bear in mind that often it is necessary to build for the future; and if, as a matter of fact, the officials making the substitution were aware that under the then existing arrangement an adequate return would be made, yet under the substituted arrangement such an adequate return could only be expected after a considerable lapse of time, this fact should be considered in passing upon an application to increase rates subsequent to the change.

"We do not believe that under the circumstances under which certain suburban lines of the company were constructed in Oakland and Berkeley, this company has a right to impose upon its patrons a rate sufficient to return to it the amount which otherwise should be returned, on the ground that it has constructed facilities in excess of the necessities of the patrons. We believe the company was justified in the electrification of these lines, but are not of the opinion that it was justified in the construction of some of the added lines, except in contemplation of increased traffic in the future. Utilities are always required to have an eye to the future and they should ultimately be paid for the expenditures made.

"In the case here involved we feel no hesitancy in saying that the strictest presumptions of law should be adhered to against this company, not for the purpose of confiscating its property, but for the purpose of preventing the confiscation of tremendous values in the property of the residents of Alameda County. Thousands upon thousands of people have built their homes in these suburban communities and have paid prices for their property in contemplation of the reasonableness of these rates voluntarily accorded by this carrier. When through a long period of years a transportation company has voluntarily accorded a rate to a community on the faith of which large investments have been made, and when again the same agency has voluntarily and under no legal compulsion incurred great expenditures and largely extended its facilities, the *prima facie* reasonableness which attaches to rates which have been voluntarily accorded becomes, if not conclusive, very strongly persuasive upon any regulatory authority.

"An increase of the commutation rate alone will confiscate or take away from (the term used is immaterial) the value of the residence of every person in the territory here involved who is forced by business reasons to commute to San Francisco. Confiscation in this case looks both ways, and it does not lie in the mouth of this carrier to urge its own confiscation in utter disregard of the confiscation which it, if permitted to have its way, will have brought about among innocent people who are its patrons. Besides, we do not treat as lightly the provisions in the franchises granted by the municipalities involved as the company seems willing to do."

HEARING ON CHARLESTOWN SERVICE

The Massachusetts Public Service Commission held a hearing on Oct. 15 on the petition of the Charlestown Improvement Association for the restoration of service on the lines of the Boston Elevated Railway between Sullivan Square and Dorchester Street via Main Street, and between Sullivan Square and Pleasant Street via Bunker Hill Street. It appeared that these facilities had been withdrawn following the trial installation of a complete loop service from Sullivan Square through Main Street and Bunker Hill Street to Sullivan Square, and vice versa, the latter having been ordered by the commission several months ago in an effort to meet a demand for local service. The petitioners generally favored the restoration of the old service, which afforded opportunities for through travel in and out of Boston via the Tremont Street subway.

For the company, H. B. Potter, assistant to the second vice-president, pointed out that the original service was preferable to the present facilities and expressed the willingness of the company to restore it. The company is opposed, however, to continuing the loop service, which yielded only twenty-six circuit passengers in an eighteen-hour day, and it is opposed to offering service which enables a patron to go to City Square, Charlestown, from Sullivan Square, do a certain amount of shopping and return home for a single fare. Chairman McLeod stated that he doubted the commission's power to order the company to grant such transfers, as the road's charter only requires it to give transfers covering a ride in the same general direction. It was proposed that the loop service be retained on a thirty-minute headway, but the company's view was that a city line which would not be profitable on a twenty-minute headway or less should not be maintained. Chairman McLeod said that in establishing the Bunker Hill-Main Street service experimentally the board intended to test the application of interchange facilities found useful elsewhere on the Boston rapid transit system and recognized that the company had always opposed the loop service. The case was taken under advisement.

Metal Tickets in Lexington.—The Kentucky Traction & Terminal Company, Lexington, Ky., has begun the sale of six metal disks for 25 cents in place of paper car tickets. The disks are wrapped at the office of the company in envelopes bearing the name of the company.

Increase in Fare Sought.—Officials of the Charleston-Isle of Palms Traction Company, Charleston, S. C., have filed a petition with the Railroad Commission of South Carolina asking for permission to increase the rates from 25 to 40 cents between Charleston and the Isle of Palms.

Increase in Fares Asked.—The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has filed a petition with the Railroad Commission of South Carolina for an increase in the rates on its line in that State from 1 cent to 2 cents a mile. A hearing on the application was set for Oct. 22.

Petition for Reduction in Fare Rejected.—The petition of Frank B. Fuller, Schofield, against the Wausau (Wis.) Street Railway, asking that a 5-cent fare be granted between Schofield and Wausau, has been dismissed by the State Railroad Commission, which declared upon investigation that the present fare is low enough.

Reducing Transfer Abuses in St. Paul.—No arrests have been made since July for violation of the ordinance passed in St. Paul in April, 1914, providing for the prosecution of persons attempting to use transfers not obtained by them on cars. The number of transfers issued by the St. Paul City Railway since the ordinance went into effect is said to have decreased materially over the same period last year.

Far Side Stop in Yonkers.—The Common Council of Yonkers, N. Y., has passed an ordinance requiring all the cars of the Yonkers Railroad to stop on the far side of crossings. The Common Council has also passed an ordinance prohibiting smoking on its cars. The company has had difficulty in enforcing the rule and the ordinance was passed to empower policemen to arrest passengers if necessary.

Recording Joy Riders.—Conductors and motormen of the Southwest Missouri Railroad, Joplin, Mo., have been supplied with cards on which they will make reports of fast or careless driving and other infractions of the traffic law by the drivers of automobiles. It is expected that these cards will be of value to the company in case of accidents in which a driver figures who has a "record" on the company's books.

Reduction in Fare on Municipal Line Rejected.—The Supervisors of San Francisco, Cal., by a vote of twelve to six, have rejected the plan to reduce the fares on the San Francisco Municipal Railway to six tickets for 25 cents or twenty-five for $1. The opinion prevailed that until the municipal system had been completed it was not good business policy to reduce the fares on the main lines, which are expected to sustain the system.

Increase in Fares on Municipal Line.—The City Councils of Port Arthur and Fort William, Ont., have approved a new schedule of fares for the municipal electric railways in the cities and on the lines connecting the two cities. The new fare is a straight 5-cent one, and the tickets are five for 25 cents. Limited tickets for workmen and school children's tickets will remain as at present. The new schedule went into effect on Oct. 1.

Baseball Traffic in Boston.—The Boston *News Bureau* of Oct. 14 said: "On Monday for forty-five minutes following the world series baseball game at Fenway Park, the Boston Elevated Railway handled 45,000 passengers, or 1000 a minute. Of course there were many thousands outside the park who were unable to gain admittance and who used the street railway. If the elevated carried to the game as many as it carried from it, the road must have handled 90,000 passengers in all—a new record in the annals of Boston street railway transportation."

"Seeing Wichita" Service.—The Wichita Railroad & Light Company, Wichita, Kan., put into service during the recent dry-farming congress a "Seeing Wichita" car which made two trips a day over the city. The charge for a trip was 25 cents for each person. The company also adorned all employees with red silk badges reading "Ask Me." The conductors especially were instructed to answer the questions of strangers so far as possible, as to the location of buildings and streets, and the badges are said to have produced a marked freedom of questioning among the passengers.

Extension of Cambridge Transfers.—The Massachusetts Public Service Commission has issued an order requiring the Boston (Mass.) Elevated Railway to extend the free transfer privileges at Central Square, Cambridge, so that passengers boarding inward-bound Western Avenue cars between Central Square and the intersection of Market Street and Western Avenue, Brighton, may transfer to cars for Pearl Street. Prior to the decision the transfer privilege was restricted to passengers boarding cars in Cambridge. Under the new arrangement complete journeys may be made for a single fare between points on two subordinate but connecting lateral lines.

St. Louis Traffic Figures for Three Months.—The quarterly report of the United Railways, St. Louis, Mo., filed with the city register, shows a falling off of about 4,000,000 in the number of passengers carried during the three months ended Sept. 30, as compared with the previous quarter. It also shows a loss of more than 2,000,000 as compared with the quarter ending Sept. 30, 1913. During the last quarter, 57,994,224 passengers were carried. During the previous quarter, 61,959,691 passengers were carried and during the quarter ending Sept. 30, 1913, a total of 81,593,938 was carried. During the last quarter, also, the number of trips made by the cars fell off about 30,000. The average number of cars operated on Sundays during the last quarter was 868; on Saturdays it was 1202 and on other week days, 1278.

Highway Accidents in New York in September.—Vehicles caused the death of seventy-two people in Greater New York during September, according to the National Highways Protective Society. Of this number forty-five were children and twenty-seven adults. Thirty-five of the children were killed by automobiles, eight by wagons and two by trolley cars. Of the twenty-seven adults killed in the city seventeen met their death by automobiles, five by wagons and five by trolleys. In New York State outside the greater city, seventy-one persons met their death by means of vehicles during September. Of these, forty-four were killed by automobiles, three by wagons, five by trolley cars and nineteen at highway railroad grade crossings. In New Jersey sixteen people were killed during September by automobiles, seven by wagons and eighteen at highway railroad grade crossings.

Connecticut Mail Suspension Order.—The Post-office Department at Washington, D. C., has modified its orders of June 23 relative to the electric car mail service, formerly performed by the Connecticut Company, so as to state the effective date of the order as June 20 instead of June 21, which was originally announced. The order discontinued the following electric railway mail routes: Hartford to South Glastonbury; Hartford to East Windsor Hill; Hartford to Wilson; Hartford to Unionville; Windsor to Rainbow; New Haven to Highwood Branch; Hartford to Station A; New Haven to West Haven Branch; Waterbury to North Woodbury; Rockville to Love Lane; Hartford to Gildersleeve; Hartford to Wethersfield; Stratford Station, Bridgeport, to Oronoque; Hartford to Newington. The statement of the company issued in connection with the discontinuance of the electric railway mail service was published in the ELECTRIC RAILWAY JOURNAL of June 27, 1914, page 1470.

Operating Figures Filed in Rochester Fare Case.—The New York State Railways has filed with the Public Service Commission of the Second District and with the corporation counsel of Rochester three sets of figures covering the cost of operating the lines of the Rochester division and the profits obtained from the lines for the years ending June 30, 1913 and 1914. The figures were compiled and submitted upon the application of Assistant Corporation Counsel Benjamin B. Cunningham, who is in charge of the interests of the city in its application to the commission for a 3-cent fare in Rochester in the rush hours of the morning and evening. The figures just filed supplement others filed recently which had to do only with the receipts in the rush hours, and the twenty-four hours for two months only. Those figures were desired by the commission for the purpose of showing what per cent of reduction was involved in the city's demand to decrease the fare in the 5-cent zone in the rush hours to 3 cents.

Public Safety Commission in Portland.—Mayor Albee, of Portland, Ore., has appointed a public safety commission for the city, with Harry P. Coffin as chairman. The commission will devote its entire attention to the prevention of accidents and the saving of human life through public education. The members of the commission are to take up various phases of public safety work. Each department head will organize the work of his section in the most effective way for carrying on the safety campaign. The commission is composed of the following gentlemen: Harry P. Coffin, chairman, in charge of traffic; B. F. Boynton, of the Portland Railway, Light & Power Company, secretary, in charge of electric transportation lines; F. L. Bruckhalter, railroad transportation lines; L. R. Alderman, schools; A. M. Churchill, Fire Chief E. F. Dowell, and Battalion Chief Stevens, fire prevention; Police Captain John T. Moore, general safety; Marshall N. Dana, industrial safety; Horace E. Thomas, publicity; Robert L. Witherol, building safety.

Personal Mention

Mr. E. D. Metcalf has resigned as vice-president and a director of the Empire United Railways, Syracuse, N. Y.

Mr. Arthur S. Pierce, formerly assistant treasurer of the Northwestern Elevated Railroad, Chicago, Ill., has been elected treasurer to succeed M. B. Van Zandt, deceased.

Mr. C. F. Hewitt, who has been assistant general manager of the United Traction Company, Albany, N. Y., has been appointed general manager, succeeding Mr. James F. Hamilton.

Mr. James P. Barnes, general manager of the Syracuse & Suburban Railroad, Syracuse, N. Y., will be appointed resident general manager of the Buffalo, Lockport & Rochester Railway, with headquarters probably in Rochester.

Mr. James F. Hamilton has resigned as general manager of the United Traction Company, Albany, N. Y., to devote all his time in the future to the Schenectady Railway, which he managed jointly with the United Traction Company.

Mr. Lee Howell, general freight agent of the Louisville & Nashville Railroad, with headquarters in Evansville, Ind., has been elected president of the Evansville Suburban & Newburg Railway, to succeed the late Frederick W. Cook.

Mr. George Theis, Jr., president of the Arkansas Valley Interurban Railway, Wichita, Kan., has been elected president of the Western Biscuit Company, Wichita, a company doing an extensive business in crackers and candy in the West.

Mr. J. G. Baukat, who was recently with the National Steel Car Company in Canada, has become connected with the Hydroelectric Power Commission of Ontario as mechanical engineer in charge of car design and the design of shops.

Mr. C. Loomis Allen will be elected vice-president of the Buffalo, Lockport & Rochester Railway, Rochester, N. Y., in charge of operation, arrangements having been made with Allen & Peck, Inc., by which that firm will take over the operation and management of the property, reporting to the president and the executive committee.

Mr. Harrison B. Riley, president of the Chicago Title & Trust Company, has been elected chairman of the executive committee and a member of the board of operation of the Chicago Surface Lines and chairman of the city railways controlling committee, succeeding Mr. Ira M. Cobe, resigned. Mr. Riley has also been elected a member of the governing committee of the Chicago Elevated Railways.

Mr. W. W. Freeman, president of the Columbia Gas & Electric Company, with headquarters in Cincinnati, Ohio, has been elected president of the Union Light, Heat & Power Company and the South Covington & Cincinnati Street Railway to succeed Mr. James C. Ernst, resigned. Mr. Polk Laffoon, secretary of the railway company, will succeed Mr. Ernst as a director in the company.

Mr. L. D. Pellisier, recently elected president of the Holyoke (Mass.) Street Railway to succeed the late William S. Loomis, was tendered a banquet at the Holyoke Club recently held by the head of the departments of the company. Mr. S. D. Nevins, secretary-treasurer of the company, presided as toastmaster. During the evening Mr. Pellisier was presented with a silver loving cup suitably inscribed as a token of esteem from the men.

Mr. George W. Anderson, of the Massachusetts Public Service Commission, has been nominated by President Wilson to the post of United States attorney for the district of Massachusetts. Mr. Anderson was born in Acworth, N. H., fifty-three years ago, was educated at Cushing Academy, Ashburnham, Mass., at Williams College and Boston University Law School. He began to practise law in Boston in 1890 and was prominent in the recent Haverhill Gas case before the Massachusetts Gas & Electric Light Commission. He was appointed to the Public Service Commission last year upon its creation and was active in the recent proceedings of the federal government in connection with the New Haven Railroad situation.

Mr. Ira M. Cobe has resigned all his Chicago connections and has gone to make his home permanently in Northport, Maine. The Chicago Surface Lines announce the resignation of Mr. Cobe as chairman of the executive committee of the surface lines, as chairman of the executive committee of the Chicago City & Connecting Railways, and as a member of the board of operation of the Chicago Surface Lines. Ill health was assigned as the cause. Mr. Cobe has tendered his resignation as member of the board of directors and executive committee of the Northwestern Elevated Railway and of the governing committee of the Chicago Elevated Railways. Mr. Cobe also has resigned from the directorate of the Chicago Title & Trust Company and it is expected that he will retire from the National Bank of the Republic.

Mr. Richard McCulloch, who has been vice-president and assistant general manager of the United Railways, St. Louis, Mo., has been appointed general manager in addition to vice-president to succeed his father, the late Capt. Robert McCulloch, but no successor has been elected to Captain McCulloch as president of the company. Mr. Richard McCulloch was born in St. Louis in 1869 and was graduated from Washington University in 1891. He engaged in mining and later became connected with the Cass Avenue & Fair Grounds Railway, St. Louis, and subsequently with the consolidated system. After several years spent in railway work in Europe Mr. McCulloch returned to the United States to accept a position under his father with the Chicago City Railway. When Captain McCulloch was appointed to the United Railways his son entered that company under him as assistant general manager.

OBITUARY

Isaac Ellsworth, one of the pioneers in street railway work in Milwaukee, Wis., is dead. He was eighty-two years old. Mr. Ellsworth was born in Ulster County, N. Y., and entered business in Milwaukee in 1856. In 1869 he and George F. Lynch purchased the property of the Milwaukee City Railway, with which he continued actively for many years.

M. J. Kenney, superintendent of the lighting department of the Little Rock Railway & Electric Company, Little Rock, Ark., is dead. Mr. Kenney was born in Elizabeth, N. J., and for the last fourteen years was continuously in the service of the Little Rock Railway & Electric Company. He is survived by a widow and daughter.

Stuart Richardson, who held the position of tramways engineer to the Wellington (N. Z.) City Corporation, died on Sept. 11 after a brief illness. Mr. Richardson was born at Swansea, England, on Jan. 9, 1863. He obtained his training as an electrical engineer with the Brush Company at Loughborough. After severing his connection with that company he entered the service of the Leicester Corporation and subsequently was appointed to the position of city electrical engineer, in which capacity he continued until he left for New Zealand to take up the management of the New Zealand Electrical Syndicate, which then controlled the electric lighting of the city of Wellington. On the termination of his engagement with this company Mr. Richardson entered the service of the tramway department of the Wellington Corporation and in 1905 was appointed tramway and electrical engineer, continuing in that position until his death.

John Lewis Matson, president of the Chicago & Interurban Traction Company and vice-president of the Hammond, Whiting & East Chicago Railway, died at his home in Chicago on Oct. 18, following an operation. Mr. Matson was forty-six years of age. He was born in Gottenborg, Sweden. He entered railway work as an apprentice in the general repair shops of the Illinois Central Railroad in Chicago, and in 1893 he was made assistant master mechanic of the South Side Elevated Railroad of Chicago. In 1902 he became superintendent of motive power of the Indiana Union Traction, and in 1905 resigned from the company to become superintendent of motive power of the Chicago & Milwaukee Electric Railroad. In 1906 he became associated with A. L. Drum & Company, and in 1907 was made manager of the South Chicago Street Railway, which was later consolidated with the Calumet Electric Street Railway, and now forms the Calumet & South Chicago Railway. In September, 1910, he was also elected vice-president of the Hammond, Whiting & East Chicago Railway. He was subsequently elected president of the Chicago & Interurban Traction, which operates between Chicago and Kankakee, Ill. Mr. Matson is survived by his widow.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Benicia, Cal.—A. D. Bowen, representing the Benicia Land & Terminal Company, has received a franchise from the Council in Benicia. This is a part of a plan to build an electric line between Benicia and Vallejo. [E. R. J., Oct. 12, '14.]

Los Angeles, Cal.—The Los Angeles Railway Corporation has asked the Council for a franchise for a double-track line as an extension of the East First Street line into the Huntington hills, east of Boyle Heights.

***Los Angeles, Cal.**—The Glen Alta Improvement Association has asked the Council for a franchise to build an electric railway from the intersection of North Broadway and Pritchard Street to Hermon Street. Robert T. Hale and F. J. Whiffen are interested.

San Lorenzo, Cal.—The San Francisco-Oakland Terminal Railways has received a franchise from the Council to extend its railway in San Lorenzo in a straight line from the cemetery to the terminus.

***Lewiston, Idaho.**—R. C. Dahlheim and associates will ask the Council for a franchise to build an electric line in Lewiston. Application will also be made at once to the Council in Clarkston to build an electric line in Clarkston. This is part of a plan to build an electric railway to connect Lewiston and Clarkston.

Pocatello, Idaho.—J. D. Browning, representing the Pocatello Traction Company, has received a franchise from the Council in Pocatello. The terms of the franchise call for the construction of 1½ miles of track the first year and the same amount of mileage in each of the following years. [E. R. J., Sept. 5, '14.]

Springfield, Ill.—The Lee County Electric Railway has filed with the Illinois Public Utilities Commission an application for a certificate of convenience and necessity to construct a line from its present terminus in Bradford, Ill., northeasterly to Rochelle and from a point of connection with the present line, thence northerly to Ashton. The company is also petitioning for authority to issue stock for the acquisition of property and for the construction, extension and improvement of its facilities.

New Orleans, La.—The Orleans-Kenner Electric Railway has asked the Council for a franchise for a line from the upper Protection Levee to the center of the business district in University Place in New Orleans. This 110-mile line will connect New Orleans, Hanson City, Harriban and Shrewsbury. J. A. Bowman, New Orleans, president. [E. R. J., July 18, '14.]

Amherst, Mass.—The Holyoke Street Railway has asked the Council for a franchise in South Amherst near Potwinlane.

St. Peter, Minn.—The Electric Short Line Railway has asked the Council for a franchise in St. Peter.

Orange, N. J.—The Public Service Railway has asked the Council for a franchise for the extension of the Central Avenue line through Orange to the Morris Street terminus of the Crosstown line.

Tonawanda, N. Y.—The International Railway and the city authorities have reached an agreement on the franchise to be granted the company to operate an electric line through Tonawanda over the right-of-way of the Frontier Electric Railway. In return for permission to operate the new line the International Railway will grant the city a 5-cent fare to Elmlawn Cemetery and restore the ticket system on the Kenmore line.

Wilmington, N. C.—The Wilmington-Carolina Beach Railway has received a franchise from the Council in Wilmington. This proposed 10-mile line will connect Wilmington and the Carolina Beaches. C. C. Chadbourne, Wilmington, president. [E. R. J., Aug. 22, '14.]

Cornwall, Ont.—The ratepayers of Cornwall have voted in favor of a by-law to grant the Cornwall Street Railway, Light & Power Company a twenty-year extension of time on its franchise in Cornwall.

Portland, Ore.—The Portland & Oregon City Electric Railway will retain its recently secured franchise as granted by the City Council. The attempts of Commissioner Brewster to have the action of the Council rescinded have failed.

***Harrisburg, Pa.**—The Perkiomen Electric Transit Company has asked the Public Service Commission for a certificate of public convenience to build a 40-mile trackless trolley line along the public highway from Phoenixville to Emaus. James L. Wolcott, Dover, Del., president.

Nashville, Tenn.—The Nashville Traction Company has asked the Council for a franchise from the end of its Fifth Avenue line, at the corner of Mulberry Street and Fifth Avenue, across to Second Avenue and thence to Lafayette Street, there to connect with the line that has been built to the city limits at the junction of the Murfreesboro Pike and the Tennessee Central Railroad in Nashville. [E. R. J., Oct. 12, '14.]

Snohomish, Wash.—The Puget Sound Electric Railway has received a franchise from the Council to extend its lines to the main street in Snohomish. The franchise allows the company to terminate its line at Union Avenue and First Street, reaching this point by way of Fifth Street, Maple Street and Fourth Street, thence west on Fourth Street to Cedar Street and down Second Street to Union and First Street in Snohomish.

TRACK AND ROADWAY

***Decatur, Ala.**—Plans are being contemplated to build an electric line to connect Decatur, Huntsville, Athens and Florence. Humphrey Read, Florence, is interested.

Hot Springs (Ark.) Street Railway.—Plans are being made by this company to extend its line to the golf club in Hot Springs. Through the efforts of Simon Cooper, Ernest Latta and W. O. Forbes, arrangements have been made with the local banks for the advancement of the necessary funds to build this extension. The general officers of the Public Utilities Company have been willing to make the improvement, but on account of the trouble at this time in securing capital found it difficult. With this arrangement made the work will be taken up at once in order to have the extension in operation by the opening of the season.

Sacramento Valley Electric Railway, Willows, Cal.—This company has placed in operation the first 12-mile unit of its railway which connects Dixon and Dixon Junction. Ultimately this line will be extended to Woodland, Willows, Corning and Red Bluff.

San Francisco, Cal.—Applications have been filed with the Board of Supervisors for the construction of twenty-eight branches of the Municipal Railway in San Francisco. These are in addition to the line for which a $3,000,000 bond was issued some months ago.

Sausalito, Cal.—The Marin County Electric Railways has asked the Railroad Commission for a certificate of public convenience and necessity to build an electric railway in Sausalito; to issue 150 shares of capital stock of a par value of $150,000, and permission to begin work on private funds during the time the sale of the stock is pending. [E. R. J., Oct. 12, '14.]

***Peoria, Ill.**—Estimates and preliminary surveys are being made to build an electric railway to connect Peoria and Washington, in Tazewell County. A. Black, Peoria, and W. H. Shott, Chicago, are interested.

Bloomington & Normal Street Railway, Bloomington, Ill.—M. G. Linn, superintendent of this company, states that grading and laying of new rails is contemplated preparatory to the pavement of Clinton Street between Emerson and Division Streets in Bloomington. It is the intention of the company to have the track in proper shape when the paving work is done.

Kankakee & Urbana Traction Company, Urbana, Ill.—This company is now laying 5 miles of new track between Rantoul and Ludlow. Cars will be running between Rantoul and Ludlow by Nov. 10. It is the intention of this company to build 5 miles of track next spring between Ludlow and Paxton, making in all 25 miles of track between Urbana and Paxton.

Waukegan, Fox Lake & Western Railway, Waukegan, Ill.—Plans are being considered by this company to double-track its line along Washington Street in Waukegan.

Des Moines (Ia.) City Railway.—Improvements are being planned by this company for its Center Street line in Des Moines. The line will be double-tracked as far as Twentieth Street and Clark Street.

Union Traction Company, Anderson, Ind.—Plans are being made by this company to build at once a new bridge over Greens Branch at Sixteenth Street in Anderson.

***Covington, Ind.**—The destruction by fire of a wooden bridge at Covington may delay the building of an interurban line from Danville, Ill., to Crawfordsville, Ind., intended to unite the Illinois Traction System with the network of Indiana and Ohio lines and to provide through service from St. Louis to Indianapolis, Louisville, Columbus, Cincinnati and many other points. It seems that one of the stumbling blocks in the construction of an interurban line from Danville to Crawfordsville was the expense of bridging the Wabash River. It is said that the Illinois Traction System has options on a right-of-way between Danville and Crawfordsville and that the company is to meet the officials of Warren and Fountain Counties and discuss what can be done in the way of a bridge to be mutually owned, the expense of construction being defrayed by the counties which are concerned and the company or companies involved.

Arkansas Valley Interurban Railway, Wichita, Kan.—A contract has been agreed upon by this company and the Hutchinson Street Railway for a connection giving the Arkansas Valley Interurban Railway an entry into Hutchinson. The Hutchinson Street Railway will be extended east 1 mile from the Larabee mill along what will be an extension of Avenue B, to the next section line 1 mile east, Halstead Avenue, south of the strawboard works. At this point the Arkansas Valley Interurban Railway will connect with the Hutchinson Street Railway coming in from Halstead and Burrton along the Santa Fé Railway.

New Orleans Railway & Light Company, New Orleans, La.—This company is asked to consider plans to build a new line from Poland Avenue in the Seventh Ward in New Orleans.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to extend its tracks in Boston from Summer Street over the viaduct to the Commonwealth fish piers, to Northern Avenue and on Northern to Atlantic Avenue.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—This company is asked to consider plans to extend its tracks to the fair grounds in Fitchburg.

Union Street Railway, New Bedford, Mass.—Plans are being made by this company to extend several of its lines in New Bedford. One proposition is to extend the tracks in Kempton Street from Summer Street east to Purchase Street.

Berkshire Street Railway, Pittsfield, Mass.—The extension from Blandford to Huntington, making a through line from East Lee, has been completed by this company and will soon be placed in operation.

Detroit (Mich.) United Railway.—This company is asked to consider plans to extend its Kercheval line to Connor's Creek Avenue in Detroit.

Mesaba Railway, Virginia, Minn.—Plans are under way by this company for an extension to Aurora. Work will be begun in the spring.

***Kansas City, Mo.**—Taking advantage of a special provision in the new electric railway franchise, the property owners in the Seventy-fifth Street district to be benefited have subscribed the money with which to build an electric line along Seventy-fifth Street from the state line to Broadway, where connection will be made with the Dodson extension of the Metropolitan Street Railway. Under the provisions of the franchise, the new line will be turned over to the Metropolitan Street Railway to operate under a lease for use of the tracks.

United Railways, St. Louis, Mo.—Plans are being considered by this company to build a line between Wellston and Lindenwood.

St. John (N. B.) Street Railway.—Work has been begun by this company on the extension to Marsh Road in St. John.

Westchester Electric Railroad, Mount Vernon, N. Y.—This company is considering the extension of its Mount Vernon-North Pelham line from its present terminal in North Pelham to the New York Central & Hudson River Railroad station in Tuckahoe. The route would lead along the public highways of Pelham and East Chester for about 2 miles.

New Castle Electric Street Railway, Youngstown, Ohio.—Plans are being made by this company to build more than 5 miles of extensions in New Castle.

Brantford (Ont.) Street Railway.—Work has been begun by this company on improvements to its lines in the east ward in Brantford.

***Guelph, Ont.**—Surveys are being made to build a hydro-electric radial railway between Guelph and Toronto, eventually to proceed through western Ontario.

Peterborough (Ont.) Radial Railway.—Work has been begun by this company on the construction of a branch in Peterborough to connect with the lines of the Canadian Pacific Railroad.

Toronto Suburban Street Railway, Toronto Junction, Ont.—The 12-mile extension to Woodbridge has been placed in operation by this company.

Nashville (Tenn.) Traction Company.—Construction work on the Shelby Avenue line in Nashville is progressing at the rate of one block a day, all necessary materials and equipment being on hand.

Nueces Valley, Rio Grande & Gulf Railroad, Belleville, Tex.—The 25-mile railway from Kitty along the Nueces River to Simmons and Live Oaks will be operated by steam and not by electricity. W. A. Malthaei, Belleville, president. [E. R. J., Nov. 15, '13.]

Dallas (Tex.) Consolidated Electric Railway.—The final contract has been signed for the extension of this line to the Southern Methodist University, and the Stone & Webster Engineering Corporation will begin work at once.

Houston (Tex.) Electric Railway.—Plans are being made by this company to double-track its line on Fannin Street and on Travis Street in Houston.

McKinney, Bonham & Paris Interurban Railway, McKinney, Tex.—Right-of-way is being obtained by this company in the vicinity of Brookston. A new line will be located from Honey Grove to Paris. L. A. Scott, president. [E. R. J., Oct. 3, '14.]

Salt Lake & Utah Railroad, Salt Lake City, Utah.—This company is extending its tracks on Academy Avenue from First North Street to Eighth North Street in Provo. It is the intention of the company to place in operation at once its lines now laid in Provo.

Gray's Harbor Railway & Light Company, Aberdeen, Wash.—It is reported that this company contemplates the extension of its tracks into North Aberdeen as far as Fernhill Cemetery. This could be done by extending a branch from the "B" Street line down Second Street and over the North Aberdeen Bridge or by connecting with the East Aberdeen line.

Tacoma, Wash.—The first definite steps toward the construction by the city of Tacoma of the tideflats line, for which $35,000 worth of utility bonds were ordered issued to the local banks recently, were taken when Commissioner Owen Woods closed the contract with the United States Steel Company for the purchase of 152 gross tons of steel rails. The rails will arrive this month, and the work of laying them will begin at once. The first bid calls for 118 gross tons of 70-lb. standard section Bessemer "T" rails. Another order includes 14 gross tone of "T" rails, in 30-ft. lengths. Talk of extending the tideflats line to the city limits at Sitcum Avenue, and the annexation soon by the city of the tideflats to the Bluffs, and the construction of the line to the east shore of the Bay, is being considered by the City Council. Mayor Fawcett indorses the proposition.

Princeton (W. Va.) Power Company.—Work has been begun by this company at the Princeton end of this company's proposed 12-mile electric railway between Princeton and Bluefield. [E. R. J., May 17, '14.]

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.—This company will award contracts to build its 1-mile extension to Mount Tom in the spring of 1915.

SHOPS AND BUILDINGS

Carmack Railway & Power Company, Opelika, Ala.—Plans are being considered by this company to build its new carhouse and repair shops at Opelika. Fulton Pace, Opelika, chief engineer. [E. R. J., Oct. 3, '14.]

Des Moines (Ia.) Railway.—Plans are being considered by this company to build a new carhouse and repair shop on the river bank, at the present site of the interurban terminal in Des Moines.

New Orleans Railway & Light Company, New Orleans, La.—A new passenger station is being contemplated by this company on New Basin Canal at West End in New Orleans.

Worcester Consolidated Street Railway, Worcester, Mass.—Land has been leased by this company just west of Main Street, near the junction of Sterling Street and Main Street in Clinton on which the company has just built a new freight house. Plans are being considered by this company and the Fitchburg & Leominster Street Railway to build a union freight house in Leominster to be used by both the companies.

Niagara Gorge Railroad, Niagara Falls, N. Y.—This company has awarded a contract to the Turner Company, Buffalo, to build its new carhouse, repair and paint shop. The structure will be 156 ft. x 200 ft. and of tile and reinforced concrete construction.

Cincinnati (Ohio) Traction Company.—Plans are being considered by this company for the construction of a new building to be used as an interurban passenger station and which will provide for convention hall facilities on the second floor. It is contemplated to construct this building on the site of the old hospital in Cincinnati.

Chattanooga (Tenn.) Traction Company.—This company is soon to open a new station on its line at Crystal City, the name given to the new resort being constructed at the foot of Signal Mountain. This improvement is well under way, construction work on the 12-acre lake, for which extensive excavations were made, having been completed and work on the concrete spillway of the dam has begun.

Texas Traction Company, Dallas, Tex.—Work has been begun by this company on the new freight house for the new interurban depot which is being built in McKinney. The structure will be 40 ft. x 40 ft. and of brick construction. The passenger station will be erected at a later date in addition to this new building.

Ogden (Utah) Rapid Transit Company.—This company has awarded a contract to C. F. Dinsmore, Ogden, to build its new interurban passenger station on Twenty-fourth Street in Ogden. The structure will be 50 ft. x 270 ft. The cost is estimated to be about $25,000.

POWER HOUSES AND SUBSTATIONS

Carmack Railway & Power Company, Opelika, Ala.—Plans are being made by this company to build a new power plant at Lake Carmack. H. A. Bedell, Opelika, president. [E. R. J., Oct. 3, '14.]

Fort Dodge, Des Moines & Southern Railroad, Des Moines, Ia.—Improvements and additions to cost more than $50,000 will be made on this company's power plant at Fraser.

Topeka (Kan.) Railway.—A. M. Patten, manager of this company, denied recently in an interview that the company was arranging to equip its old Second Street power house to supply itself with power. The report intimated that if the plant was so equipped the Edison Company would sell its equipment to the city. Mr. Patten said that the railway company was planning to use the Second Street building as a repair shop.

Holyoke (Mass.) Street Railway.—This company is now building its new power house in Mill Valley to be used for the Amherst and Suderland division.

Brantford (Ont.) Railway.—This company has purchased a Westinghouse 200-kw, twenty-five-cycle rotary for its power house in Brantford.

Manufactures and Supplies

ROLLING STOCK

Stroudsburg (Pa.) Passenger Railway has ordered one car body from The J. G. Brill Company.

Spokane, Portland & Seattle Railway, Portland, Ore., has ordered one 70-ft. gas-electric car from the General Electric Company.

Centralia & Central City Traction Company, Centralia, Ill., expects to purchase one pair of car trucks and two G. E. 54-A motors.

Charleston (W. Va.) Traction Company has ordered twelve double-truck city and suburban cars from the Cincinnati Car Company.

Danville (Va.) Traction & Power Company, noted in the ELECTRIC RAILWAY JOURNAL of Oct. 17 as having ordered two double truck pay-as-you-enter cars from the Southern Car Company, has specified that these cars will be built of T-iron construction, arched roof, St. Louis seats, Railway Utility Company's ventilators, Agasote ceiling and mahogany finish.

Brantford (Ont.) Municipal Railway has ordered six single-truck pay-as-you-enter cars from the Preston Car & Coach Company for delivery at the end of this year. The cars have steel underframes and are mounted on Taylor extra-heavy single trucks having an 8-ft. wheelbase. The cars are equipped with Westinghouse 101-B2 motors, K-10 controllers, Nuttall trolley bases, two Keystone illuminated signs per car, and Cleveland fare boxes.

Boston (Mass.) Elevated Railway, noted in the ELECTRIC RAILWAY JOURNAL of Oct. 17, 1914, as planning to send out this week specifications for a large number of trail cars, is in the market for from fifty to 100 trail cars for probable early use in the Boylston Street subway. The details of these cars have not yet been fully settled, but they will be of the center-entrance, prepayment type, weighing about 30,000 lb. each, and equipped with double trucks and a low step. The cars will be designed to operate in trains with the present No. 4 semi-convertible prepayment motor cars used on various subway and trunk lines.

TRADE NOTES

Walpole Tire & Rubber Company, Walpole, Mass., has appointed I. W. Penniman as Western sales manager. Mr. Penniman has charge of the Chicago office, located in the Brooks Building.

Ohmer Fare Register Company, Dayton, Ohio, on Oct. 7 distributed a large number of prizes among its employees for the best suggestions made during the past six months in regard to improvements in manufacture and for the welfare of its employees.

G. D. Peters & Company, Ltd., London, England, European correspondents of the Hale & Kilburn Company, announce that they supplied the seating material for the cars of the Constantinople (Turkey) Tramway, an article on which appeared in the Aug. 1, 1914, issue of the ELECTRIC RAILWAY JOURNAL.

E. E. Brownell, Philadelphia, consulting engineer, has been retained by the Memphis (Tenn.) Street Railway for about four years to supervise the installment of a mitigation system to prevent electrolysis of the water mains and pipes. The cost of the original installation will be approximately $1500, the railway company bearing the expense.

Independent Pneumatic Tool Company, Chicago, manufacturer of Thor pneumatic tools and electric drills, has appointed W. W. Robinson its representative in Michigan with headquarters at Detroit. F. J. Passino, the Michigan representative of the company, has been appointed to represent the company in the Southwest to succeed H. F. Finney, promoted to a position in the general sales office in Chicago.

Van Dorn & Dutton Company, Cleveland, Ohio, at a special meeting of its board of directors on Oct. 2, appointed H. H. Hodell, president of the Cleveland Galvanizing Works Company, and interested in several Cleveland enterprises, one of the founders of this company and for many years its vice-president, as president to succeed the late James H. Van Dorn. T. B. Van Dorn, now president of the Van Dorn Iron Works, Company, Cleveland, Ohio, was appointed vice-president to succeed Mr. Hodell. The active conduct of the company's affairs continues under the direction of F. W. Sinram, secretary and treasurer, and Franklin Schneider, manager and chief engineer.

Electric Service Supplies Company, Philadelphia, has been appointed exclusive selling agent of "Never Creep" anchors, manufactured by the Chance Manufacturing Company. These anchors are installed by boring a hole (preferably with an auger) at as near right angles to the line of strain as conditions will allow. The anchor rod is then forced down through solid earth, by driving, stopping the head of the rod about the center of the hole. After the anchor rod is installed, it is only necessary to lower the anchor plate into the hole, by means of a special tamping bar, engaging socket in plate with head of rod. The rod is then pulled up on and the anchor is ready for service. The anchoring of the rod in undisturbed earth renders impossible creeping of the anchor.

ADVERTISING LITERATURE

Transmission Engineering Company, Pittsburgh, Pa., has issued a folder which contains illustrations of installations of its steel work for electrical requirements.

Lutz-Webster Engineering Company, Inc., Philadelphia, has issued Bulletin No. 4 which outlines the details of a prize contest which this company has offered to all mechanics, involving eighteen cash prizes, ranging from $100 to $5, for the best reports bringing out the points of highest merit of the tools manufactured by the company.

Speer Carbon Company, St. Mary's Pa., has just issued a remarkably extensive book on carbon brushes under the designation of "Price List No. 7." The publication, however, not only contains such tabular matter as is necessary for ordering brushes, but also a great deal of data about the experiments which this company has made to perfect brushes for different kinds of service. Special attention is given to brushes for railway service including compressors. The tables show the brushes required for the oldest types of motors as well as for the latest commutating pole designs. The most instructive feature is the series of load curves which accompany the reference to each kind of brush.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has issued a special catalog, No. 1552, outlining in general the progress which this company has made during the last year. The catalog contains brief and characteristic descriptions, accompanied by photographs, of electrical installations recently made on the following electric railways: Pennsylvania Railroad, Norfolk & Western Railway, New York, New Haven & Hartford Railroad, Long Island Railroad, New York Municipal Railway, Chicago Elevated Railways, Boston Elevated Railway, Niagara Junction Railway, Waterloo, Cedar Falls & Northern Railway, Sand Springs Railway, Connecticut Company, Youngstown & Ohio River Railroad, Lewisburg & Ronceverte Electric Railway, Salt Lake & Utah Railroad, Ogden Rapid Transit Company, Michigan United Traction Company, Oakland, Antioch & Eastern Railway, Kansas City, Clay County & St. Joseph Railway, Grand Rapids, Holland & Chicago Railway, Ohio Electric Railway, Northern Ohio Traction & Light Company, Wilkes-Barre Railway, Jersey Central Traction Company, Third Avenue Railway, Manhattan Bridge Three-Cent Fare Line, Municipal Railway of San Francisco, Cleveland (Ohio) Railway, Colorado Railway & Light Company, Northern Texas Traction Company, Public Service Railway, Charlotte (N. C.) Electric Company, Rio de Janeiro Tramway, Light & Power Company, Toledo, Fostoria & Findlay Railway, Omaha & Council Bluffs Street Railway, Panama Tramways, St. Paul Southern Electric Railway and Jamestown, Westfield & Northwestern Railway. Another special publication No. 1549 contains a number of interesting illustrations showing operating conditions in traffic centers of about thirty large American cities. Circular No. 1550 gives a detailed illustrated description of recent installations of this company's 1500-volt d.c. substation equipment. Circular No. 1546 contains a collection of illustrations, with brief notes, showing some of the advantages of multiple-unit trains.

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MAINTENANCE OF TRACK DRAINS

Last week we discussed the report of the way committee, particularly its recommendations of drainage systems, but did not take up the question of the maintenance of these systems. The usual form of construction is the ordinary farm drain tile with butt joints, laid in the natural soil. If care is exercised in laying this tile to a uniform line and grade and sufficient fall is provided so that the tile becomes self-cleaning, it will not need further attention. But where these precautions have not been taken, the drainage system soon becomes valueless because it becomes clogged with silt. It must then be dug up and cleaned or else abandoned. The 1914 way committee provided against obstructed drains to a certain extent by recommending a filter area surrounding the tile. The character of tile used is also important. Some engineers employ a No. 2 grade vitrified bell and spigot tile in place of the ordinary clay drain tile. No attempt is made to seal the bell and spigot joints, but a cinder filter medium surrounds each joint. The fact that the flow line of the pipe is vitrified and smoother than with the ordinary porous clay tile helps such a drain to be self-cleaning on a slighter grade than would otherwise be the case. Attention is called to these points because they are of importance if there is any weight to the argument for drainage systems in paved streets, and we believe that there is.

EMPHASIZING LOCAL EXPENDITURES

Occasions frequently arise in railway operation where it is to the advantage of the company to set forth for the consideration of local communities amounts of money expended in new construction or maintenance within their limits during a stated period. The fundamental economic principles will bear a good deal of illustration in moderately populated places served by a progressive system. The amount of money which finds its way back to the people in connection with the replacement of ties, the feeding of construction gangs, patronage of local hardware and livery concerns, employment of carpenters from nearby villages, etc., is but little realized by the general public. On many lines a large percentage of the ties used may be produced along the lines of the road, benefiting farmers, owners of small woodlots, and local lumber companies. The proportion of native ties varies widely with the locality, but even where this is low it does not take long to discover that month by month a good deal of money is expended by transportation lines in the communities traversed by them. Every such agency bringing new and alert people into small towns is a stimulating influence and a constructive force in daily life. It may not pay to segregate minutely disbursements in small communities, but positive statements as to genuine cash outlays for equipment, labor and supplies furnish excellent material with which to combat the opinion that the company merely seeks to exploit a given neighborhood. It is almost always a case of give and take for value received, and the opportunity to bring this out with concrete examples is worth cultivating.

NATIONAL SOCIETIES GETTING TOGETHER

As this issue of the Electric Railway Journal is being mailed to our readers a meeting of technical society secretaries is being held in New York for the purpose of forming a society of such secretaries. This is the outgrowth of a movement begun about a year ago among the steam railroad associations. A similar movement has been on foot among the technical societies. The organization of the electric railway associations is such that co-operation among themselves is provided for by their constitutions. All of these efforts toward co-operation will now be combined, and an organization will undoubtedly be perfected that will mean much to all of the contributing societies. The first work will presumably be in the direction of rationalizing convention dates and locations. Something should be done in this line, for the array of conventions which the progressive railway or professional engineer is expected to attend is appalling, and they are held with little regard to economy of time, money and energy of the attendants. If the new association is successful in the first effort a still larger field for co-operation in activities will be opened up, and plans for minimizing duplication of effort can be laid. There have been many illustrations of the difficulties arising when two or more societies try to cover the same ground for practically the same purpose. Again there is a constant multiplication of organizations as the work of engineering, design and operation becomes more highly specialized. In some cases this is partly due to the ambitions of the organizers who wish to see their specialties receive public recognition. It will be a splendid achievement when all of our national societies are working in harmony. It is possible that when the millennium arrives means can be devised to reduce to a more rational size the number of societies which now apparently seem necessary.

THE CODE OF PRINCIPLES

At the Atlantic City convention a code of principles was adopted, and the question may be asked: "Why is any code necessary?" In reply, let us say first that the decision to have such a code was not snap judgment on the part of the association. It had been under serious consideration for at least two years, and the action at Atlantic City was simply the consummation of this plan. The principles, as adopted, are printed in the supplement which accompanies this issue.

The purpose of any code of this character is twofold: it should crystallize sentiment and thought both outside and inside the interest affected. In the case of the electric railway industry it will help the outside public to understand concretely the attitude of the companies. It will also assist railway companies themselves better to understand their own problems. There is nothing so helpful to clear thinking as to state one's ideas definitely in black and white.

The code as formulated contains an epitome of the problems confronting the industry at the present time and likely to confront it for years to come. It gives in tabloid form the substance of a great many published papers and addresses presented at meetings of electric railway associations. It helps to define the issues which are now before the electric railway companies, both in their own minds and in the minds of the public. The drafting of the code constitutes an important step in producing a better understanding between the company and the public. The next step is to convert the principles there expressed into vital energy by using them to the best advantage.

To do this every thinking individual connected with the electric railway industry should study the principles carefully, particularly as they affect his own surroundings. He should also test them by his own practical problems so that he will be familiar with them and their application. If the public utility men of the country do not understand just what the statements in the code mean and are not convinced of their correctness or fairness, they can hardly expect the public to understand and accept them.

Having studied the principles of the code carefully each company should bring it to the attention of its own public, especially to the thinking portion of its public. The association has a comprehensive plan for doing this on a large scale, but each member of the association can begin the work on a smaller scale in his own community. We suggest that this should be done at once and that the public relations committee be kept informed of the progress made in the various electric railway centers. A passive acceptance of the code will be of little service to anyone. It must be understood, used and pushed if it is to be of value to the industry.

In studying the principles of the code it is very important to associate the numbers with the respective principles, just as we do in the case of the amendments to our federal Constitution. This will give "handles" by which the principles can be promptly grasped when needed, but to make effective the use of such "handles" the numbers and the principles must be firmly tied together in the minds of the members of the electric railway profession.

CLAIM AGENTS AND THE PUBLIC

To our minds the most striking points in the claim agents' papers and the discussions at Atlantic City, published elsewhere in this issue, are those in connection with psychology in claims work, publicity of claim department work and education as an injuries and claims preventive. Every successful claim agent, whether he knows it or not, bases his work upon psychological principles, but success is more certain and more rapidly attained if he is consciously carrying out the psychological precepts outlined by Mr. Rice. We are particularly interested in Mr. Rice's recognition of the value of prohibiting a negative idea in the claimant's mind by injecting a positive idea. This procedure is directly in accord with the most advanced school of modern salesmanship, which lays great stress not upon the removal but upon the anticipation and the actual prevention of all inhibitions in the buyer's mind. This simply means blocking the other man's objections before he himself conceives them, and it offers a profitable field of study to claim agents.

The amount of publicity that should be given to claim department work is a disputed question, but we are inclined to believe that the good results obtained from jurors and judges being made to understand the cost of claims, the number of claims settled out of court, and the prevalence and ingenuity of fakirs' claims would overbalance the bad results accruing on account of the suggestive "playing up" of such stories to embryo malingerers and crooked claimants. The vital point is, of course, that the sensational newspaper, as the disseminator of such information, has a greater effect upon the undesired class. For this reason the question seems to go back to the fundamental advertising principle of choosing the proper medium. Here the claim department can help not only by using a judicious follow-up system to prove to past jurors the deception of claimants, but also by endeavoring to see that the mediums best suited to the responsible citizens of the city are furnished with an explicit, frank and truthful account of fakirs' activities. As regards claim department methods in circumventing fakirs, however, general publicity of such matters is comparatively as undesirable as the complete disclosure of secret service and diplomatic practices and is recommended by neither theory nor practice.

In general, the kind of publicity that the claim department needs, and can be benefited by, is the publicity that comes from proper operating equipment and treatment of passengers and from education of the public along the line of preventive methods. The "safety first" movement of to-day has placed the accident prevention and settlement work of electric railways in such a new and more favorable light that sight is being lost, to a considerable extent, of the word "claim" with its inevitable association of lawsuits and their resultant crop of bitter feelings. Instead emphasis is being laid in the work of the claim department upon "safety bureau" and "safety agent," with their clear accentuation of the humanitarian rather than the litigious side of the accident prevention department. This is a distinct step in advance and one of which full advantage should be taken.

This suggests that while no definite rule can be laid down for claim department publicity, it is not too utopian to believe that in safety education alone may lie the solution of the problem. Moreover, it may be the most efficacious method of creating in the individual a proper appreciation of the railways' interest in and efforts for the riding public.

THE 167 PER CENT CAR

The extraordinary rehabilitation of some 1600 cars on the Brooklyn Rapid Transit System, as described elsewhere in this issue, is a triumph of consistent maintenance. These cars have seen service anywhere from nine to seventeen years, yet their useful mileage has been climbing constantly from year to year as improvement after improvement reduced the shop time caused by defects of equipment. The standardization program of the Brooklyn surface rolling stock, begun in January, 1904, and completed in July, 1909, was the first and largest task of the kind ever undertaken. It was this program that raised the daily mileage per car during the period from 1908 to 1913 by permitting a uniform period of 600 miles between inspections. Even this record is to be surpassed by raising the period between inspections to 1000 miles—an extension made possible by the installation of air and geared brakes, automatic slack adjusters and pneumatic sanders under every car weighing more than 25,000 lb. In view of these circumstances it seems fitting to refer to the efficiency rating of the rehabilitated rolling stock not as 100 per cent but as 167 per cent. More than $1,000,000 has already been spent for the 1600 cars described, and another $176,000 has been authorized for similar improvements to 800 open cars.

That the car bodies must have been maintained in excellent condition during the past decade is clear from the fact that they were capable of an underframe reconstruction that left little more than the side and end sills in their original positions. The extra weight of the new equipment naturally made reinforcement of the underframe a necessity, and by carrying matters a little further the mechanical department also attained a uniform layout for each of the great car groups described in the article. It is certainly creditable to both the car builders and operators that these cars could be rebuilt, say, for an extra weight of 2000 lb., and still return to the line fit for harder service than ever.

To one not in close touch with the transportation problems of the Brooklyn Rapid Transit System it might have seemed the wiser policy to have replaced at this juncture the older part of the present rolling stock. But in view of the practical impossibility of foreseeing how greatly the vast rapid transit system now under way will cut into or readjust the surface traffic, it was surely better to spend $620 per car than more than ten times that amount per car for new rolling stock.

WHY NOT INVESTIGATE STANDARDS IN CAR DESIGN?

In last week's issue a correspondent has suggested the formation of a committee composed of representatives of the car builders and the railways for the purpose of standardizing, in so far as possible, the design of electric railway cars. The idea is unquestionably an excellent one for producing results. The electric railways of the country, thanks to the work of the American Electric Railway Association, form a more closely-knit organization than will be found in any other similar industry, and the possibilities for obtaining the benefits of co-operative action through a committee are large in promise. Opposed to such a scheme there is the bogey of "local conditions," together with the somewhat surprising question, which seems to be raised in some quarters, as to the benefits accruing from standardization of any kind. Of these two objections the former is undoubtedly the most difficult to overcome, not because of its soundness, but on account of its very impregnability to the effects of logical reasoning. Certainly no more successful answer than "local conditions" can be found for the natural question as to why a side-post spacing of 29⅝ in. is believed to be required in one city while 29¾ in. is put forward as the only dimension suitable for the needs of another locality. No other answer supplies so perfectly the demand of human nature for a catch phrase that will effect deliverance from the necessity for thought.

The question as to the concrete benefits of standardization is more readily met, although it is raised with an astonishing degree of regularity. Even our correspondent of last week, himself, seems to doubt the probability of making appreciable savings by uniformity in actual dimensions and advocates only standard methods. To this it is only necessary to advance the fact that, even to-day, one of the prominent builders of electric railway cars makes a practice of cutting the price of a car at least $100 and gives thirty days quicker delivery if a duplicate design is accepted, the actual saving depending upon the opportunity for distributing the development charges. This practice is not a surprise to anyone who has seen the vast number of different forms that the car builders are forced to construct, sometimes for orders of only three or four cars, owing to minor variations in dimension or outline. That a car with a roof contour formed in an ellipse is more efficient than one in which arcs of circles are used seems hardly reasonable. Yet every day the railways are being forced, by the lack of accepted standards, to pay for new dies that produce no more important changes than just this. It is a situation which will at least stand a thorough investigation, and even a committee that was organized only to investigate the subject could employ its time to excellent advantage.

Modernizing 2411 Cars

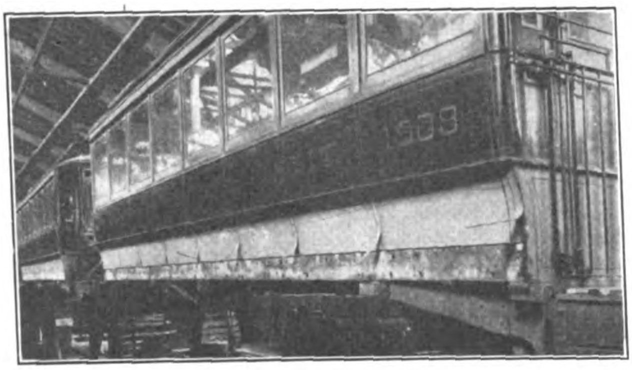
More than $1,000,000 Has Been Spent by the Brooklyn Rapid Transit System in Completing at Its Own Shops the Further Improvement and Rebuilding of 1612 Cars and Equipping 1133 of Them with Air Brakes—In Addition, Air Brakes Are to Be Installed on 800 Open Cars, Making a Total Expenditure of $1,250,000—The Grand Total for Improved Brakes Alone Will Be About $750,000

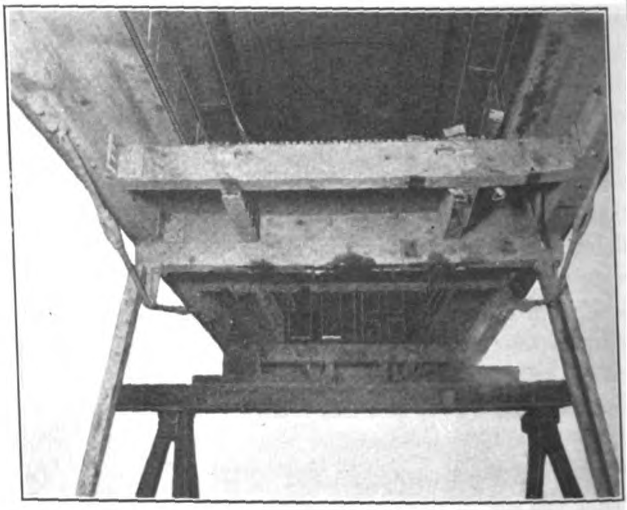
The mechanical department of the Brooklyn Rapid Transit System is completing the further rebuilding and thorough modernization of 1612 surface cars, or all of those exceeding 25,000 lb. dead weight each, to fit them for operation with improved maximum traction trucks with semi-automatic air brakes, automatic slack adjusters, emergency conductor's valve, geared hand brakes for contingency service and minor betterments. The work was begun on Oct. 1, 1913, at the Thirty-ninth Street shops, where it has since been prosecuted at the rate of seven cars a day. The job comprised passenger cars of the following types: 554 double-truck closed, 605 double-truck semi-convertible and 452 double-truck convertible cars.

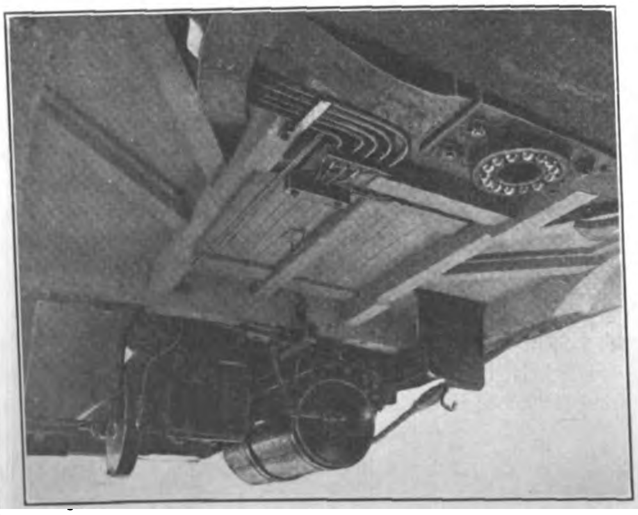
Included in these figures are fifty closed and twenty semi-convertible cars of the Coney Island & Brooklyn Railroad, recently taken into the Brooklyn Rapid Transit System and twenty semi-convertible cars of the Bridge Operating Company. The cost of the betterments on these cars, as hereinafter detailed, was estimated at $987,000. In addition, 800 double-truck open-bench cars will be equipped with air brakes during the next three winters, making a grand total of 2411 cars. One of the most remarkable features of this modernization was that so many cars were handled without affecting the transportation department. This was made possible by working on the closed cars during the periods when the open-bench cars could be used in their stead. Furthermore, the rebuilt cars were immediately available for an increase in continuous operating mileage because the addition of the air brakes, American Type F automatic slack adjusters and other improvements permitted the mileage between inspections to be raised from 600 to 1000 miles.

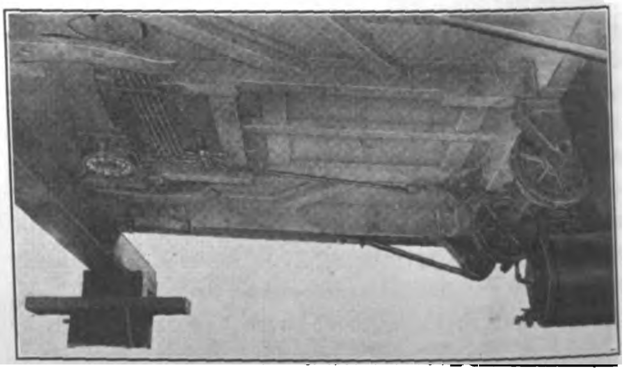
DETAILS OF IMPROVEMENTS ON CLOSED CARS

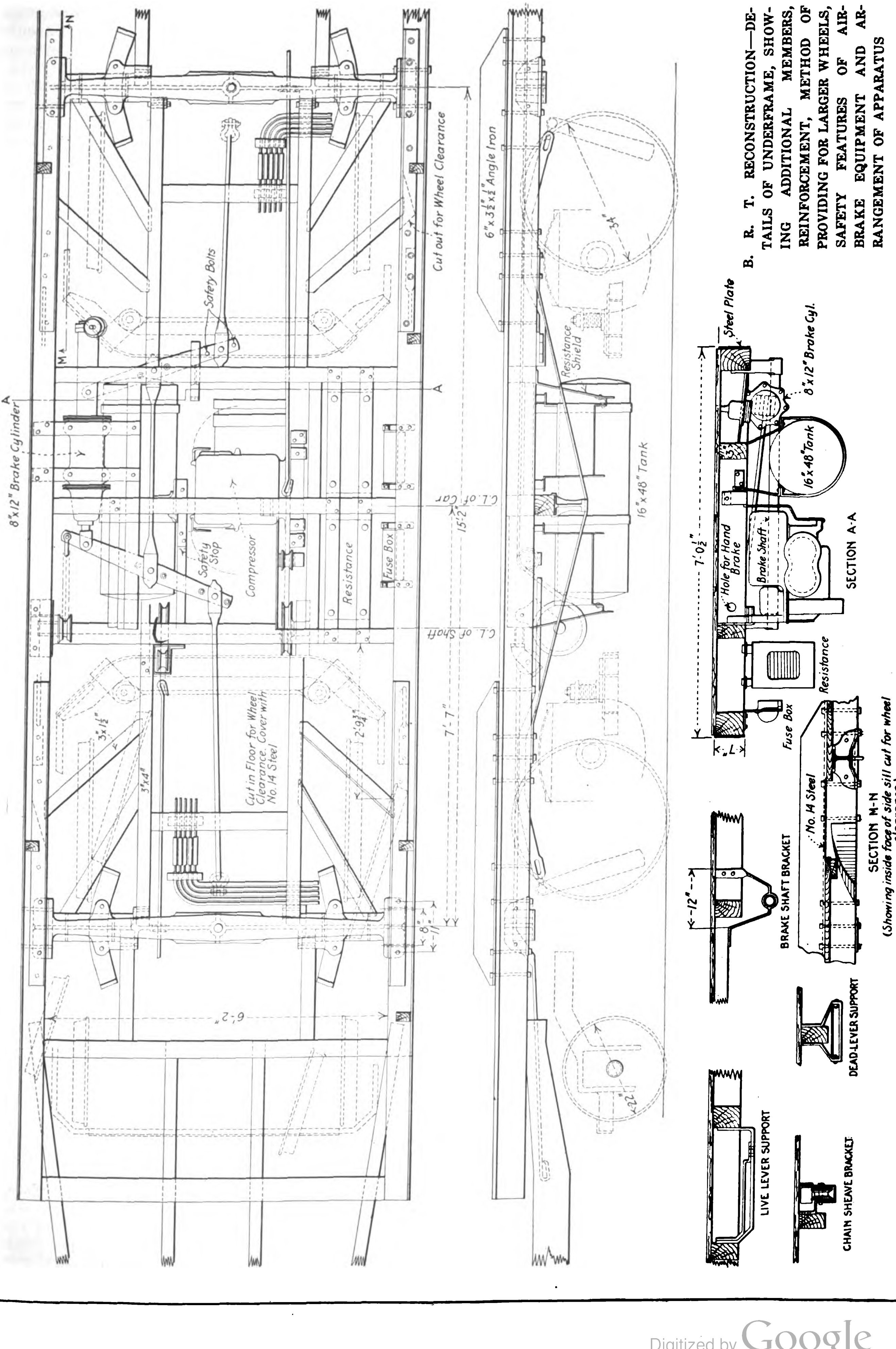
As several classes of cars were put through the shops the work may best be described by beginning with the cars that required the greatest degree of alteration. This group comprised 554 double-truck closed cars of the company's 300, 500, 700, 1100, 1700, 1900 and 2100 series, all of which have longitudinal seats, an average body length of 25 ft. and an average over-all length of 34 ft. 5 in. The average weight of these cars before


B. R. T. CAR RECONSTRUCTION—SIDE VIEW OF CAR, SHOWING SIDE SILL BEFORE ADDING REINFORCEMENT


B. R. T. CAR RECONSTRUCTION—UNDERSIDE OF CAR, SHOWING CONDITION AFTER STRIPPING


B. R. T. RECONSTRUCTION—UNDERSIDE, SHOWING NEW UNDERFRAME MEMBERS AND AIR BRAKE EQUIPMENT

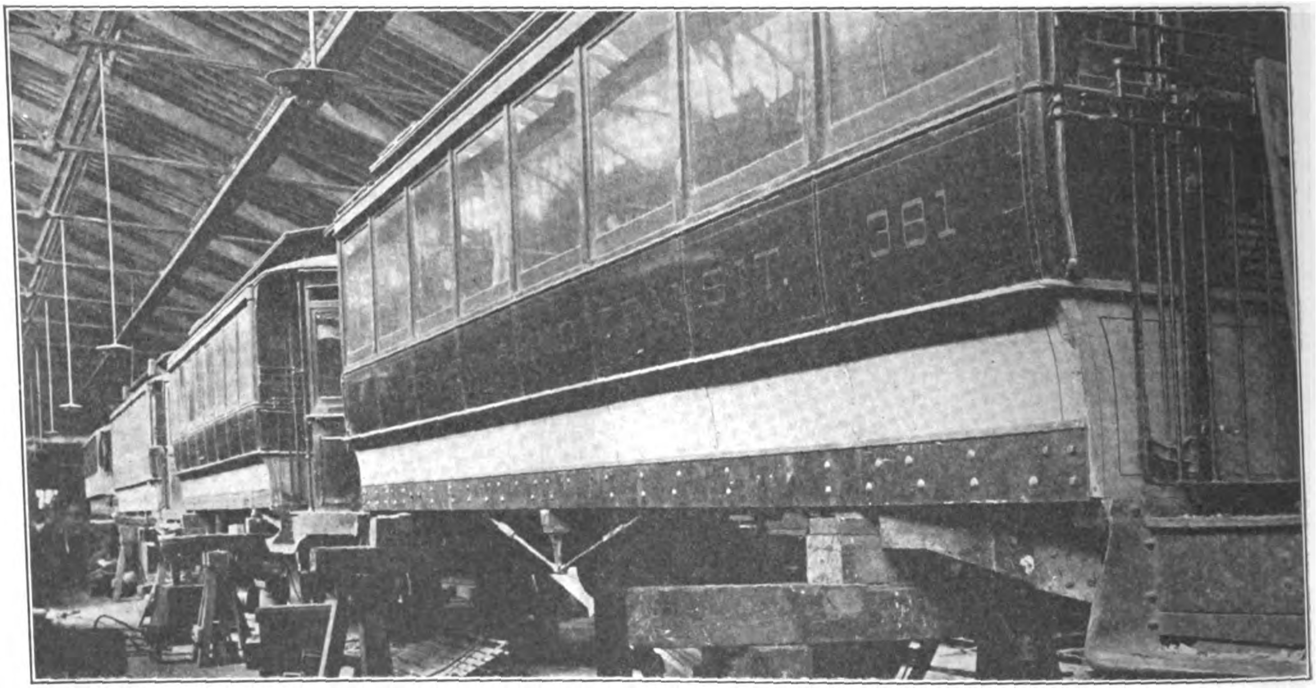

B. R. T. RECONSTRUCTION—REBUILT UNDERSIDE, SHOWING BRAKING SHEAVES, CONDUIT, ETC.


N
M
A
A
8"x12" Brake Cylinder
Safety Bolts
Cut out for Wheel Clearance
6"x3½"x½" Angle Iron
34"
Resistance Shield
16"x48" Tank
C.L. of Car
15'-2"
Safety Stop
Compressor
Resistance
Fuse Box
C.L. of Shaft
7'-7"
2'-9¾"
3"x½"
3"x4"
Cut in Floor for Wheel Clearance. Cover with No. 14 Steel
8"
11"
6'-2"
22"
Steel Plate
8"x12" Brake Cyl.
3½"
16"x48" Tank
7'-0½"
Hole for Hand Brake
Brake Shaft
SECTION A-A
Resistance
Fuse Box
L
No. 14 Steel
SECTION M-N
(Showing inside face of side sill cut for wheel clearance)
12"
BRAKE SHAFT BRACKET
DEAD-LEVER SUPPORT
LIVE LEVER SUPPORT
CHAIN SHEAVE BRACKET

B. R. T. RECONSTRUCTION—DETAILS OF UNDERFRAME, SHOWING ADDITIONAL MEMBERS, REINFORCEMENT, METHOD OF PROVIDING FOR LARGER WHEELS, SAFETY FEATURES OF AIR-BRAKE EQUIPMENT AND ARRANGEMENT OF APPARATUS rejuvenation was 27,740 lb. After the change it was 31,500 lb.

In this group the underframe was rebuilt and cast-steel bolsters were installed, owing to the substitution of the Brill 39-E-1 bolster type maximum traction truck for the original 22-E design. The use of the cast-steel bolster necessitated the installation of 3-in. x 4-in. yellow pine longitudinal members 5 ft. long between the bolster and the intermediate cross-members of the underframe. To allow proper clearance at curves for the center-bearing trucks it was necessary to cut the side sills and then to reinforce them with 6-in. x 3½-in. angles 5 ft. 6 in. long placed over the sills at the four locations indicated on an accompanying drawing. To strengthen the car framing still further because of the extra equipment concentrated at the center, a ½-in. x 7-in. machined steel plate was bolted on the outer side of the side sills for their full length, or approximately 25 ft. The body side bearings consist of flat steel pieces 1-in. x 4-in. x 24-in., properly curved at the ends.

The use of wheels of 34-in. diameter instead of 33-in. diameter made it necessary to get extra clearance. This was obtained by sawing out a portion of the flooring, covering it with No. 14 gage steel and nailing on the edge a pair of 3-in. x ½-in. wooden strips to make a wheel housing. The new steel flooring is invisible to passengers as it is covered by the usual maple stripping.


B. R. T. CAR RECONSTRUCTION—VIEW OF SEVERAL RECONSTRUCTED CARS, SHOWING SIDE SILL REINFORCING PLATES

The foregoing body changes were common to all of this rolling stock, but in many instances variations in cars which had been furnished originally by different builders were standardized for such features as platform knee clearance and spacing of cross-sills. The underframe changes were actually less troublesome and cheaper than the preparation of a large variety of brackets, hangers and other fittings aside from the fact that the completed cars now have the advantage of a standard layout of equipment.

The new trucks are of the ball-bearing center plate type. They are designated 39-E-1 as they differ from the 39-E in the way of hanging the pony brake shoes, that is to say, each pony shoe is carried from the upper part of the truck to permit both hangers to be connected by means of a solid beam. On the other hand, the 39-E truck had a sliding beam at the bottom of the truck, and the consequent irregular displacement of the hangers tended to eccentric wear of the shoes. The release springs of this truck are also of flat instead of coil type. The trucks have pressed-steel wheel guards which may be adjusted in accordance with wheel wear by using a bracket with properly spaced holes.

The air-brake equipment was furnished directly by the New York Air Brake Company, but it includes both Westinghouse and National parts, as noted. The same equipment was applied to all cars, except that 452 cars of the present group were equipped with D-1-EG compressors, reservoirs and cylinders transferred from the larger convertible cars as hereinafter described. Otherwise every car carries the following combination: Light-weight type-S brake cylinder with J-M expansion rings, 120-lb., 16-in. x 48-in. reservoir, 130-lb. National A-6-B compressor, 642-lb.; Westinghouse D-1-G governor, Westinghouse S-Y-2A motorman's valve, conductor's emergency valve installed outside of bulkhead and connected to a Westinghouse H-1 emergency valve installed under the seats to prevent freezing. The conductor's valve can be operated from any part of the car by pulling a red cord. The total weight of the air-brake system, including all piping and fittings is about 1500 lb. The range of braking pressures is 60 lb. to 75 lb. At 60 lb. the braking effort exerted is equivalent to 90 per cent of the car light. This practice is uniform for all types of B. R. T. surface rolling stock.

The compressor is the National A-6 Form B, which is an improvement over the manufacturer's A-5 Form B. The latter design is a light-weight type of which 200 were purchased by the Chicago Railways in 1913. When the A-5 Form B compressor was considered for Brooklyn it was subjected to a detail inspection by the railway's equipment engineers and maintenance foremen, and in accordance with their suggestions the manufacturer made four changes as follows:

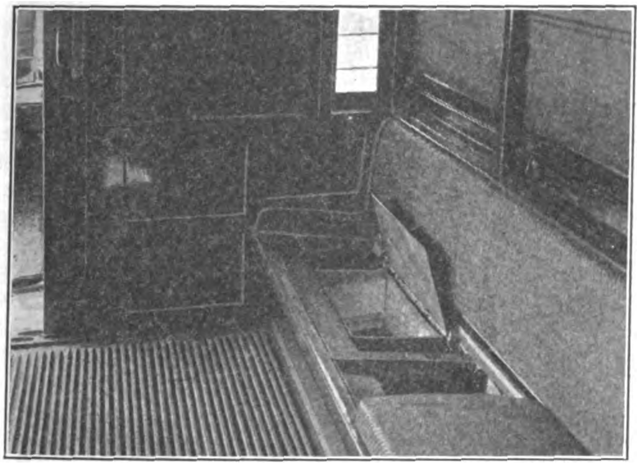
The rivets by which the field coil spring plates are secured to their tie pieces are driven flush in countersunk holes so that there is no projection about the surface of the spring plates on the coil side. This prevents an improperly driven rivet from penetrating the insulation of the coil.

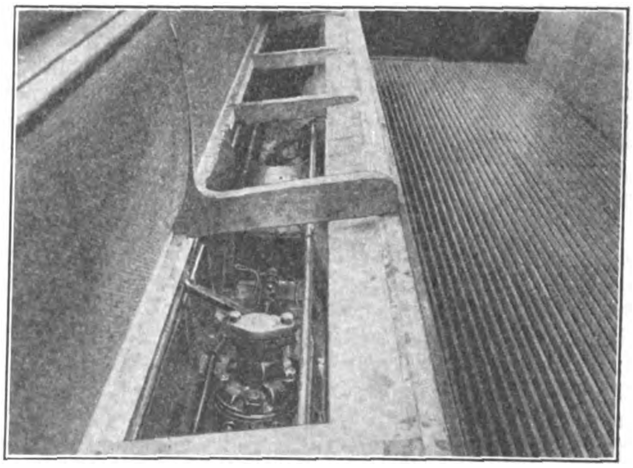
The counterbores for the lock washers which serve to prevent the nuts working loose from the bolts by which the laminated tips are secured to their poles were decreased in diameter from 1 in. to 13/16 in. Therefore, should a lock washer break it cannot work out from under the nut and thus permit the bolt to be drawn in against an armature.

An additional cleat is provided for the purpose of securing the lead which runs from the field coil to the brush-holder to the top of the motor frame.

An asbestos liner is placed under the sheet-iron top cover in order to seal this cover against moisture and also to afford greater protection from the brush-holders flashing to ground.

The geared hand brake is of the Peacock "Improved" type, geared 12:40. It is connected with a brake shaft consisting of a 2-in. double extra strength welded steel pipe to which the sheaves are attached. Two 12-in. diameter sheaves are pulled from the hand-brake rods, and these are on the same shafts as the 6-in. diameter sheaves which are connected to the live levers. The use of the sheaves instead of the customary combination of levers for multiplying the braking effort was due to the limited space and to the consideration that sheaves allow a straight pull to be obtained under all conditions. With the geared brake a braking effort of 40 lb. to 45 lb. at the handle is sufficient to take care of regular operating conditions. It may be interesting to point out here that it is customary for the Brooklyn company to operate the geared hand brake on air-brake cars in certain specified zones on each trip to be sure that it is in good working order. The geared brake will also replace the staff brake even on those cars which are not equipped with air brakes.


B. R. T. CAR RECONSTRUCTION—LOCATION OF PNEUMATIC SANDBOX UNDER SEAT


B. R. T. CAR RECONSTRUCTION—LOCATION OF EMERGENCY VALVE UNDER LONGITUDINAL SEAT

The brake rigging is of the closed jaw type with safety bolts, so that if the shopman omits any pins the brake rigging will continue to operate. It will be seen also that the hangers which support the live and dead levers have stops placed in such positions that the breaking of one of the truck pull-rods will still permit braking on the other truck.

The Wyoming pneumatic sanders which have replaced the old wooden sandboxes with hand mechanism were described in the ELECTRIC RAILWAY JOURNAL for Nov. 15, 1913, page 1063. These sanders can be operated by the motorman when his valve is in either the emergency or release positions. An interesting point about this installation is that the box, which is made of sheet metal, is set under the longitudinal seats with a gap of about 1 in. between the back of the box and the seat frame. Although the cover of the box is hinged to the seat frame, any water which might drip through the seat falls behind the box instead of into it.

The limited space conditions for the installation of the extra equipment will be appreciated from the fact that on this group of cars an area of 5 ft. x 6 ft. had to suffice for the cylinder, compressor, reservoir, brake sheaves, pull rods, levers, slack adjusters, fuse boxes, resistors and cooling coil. Both the slack adjuster and resistors have shields to throw off mud and wheel wash.

SEMI-CONVERTIBLE CARS

The 605 semi-convertible cars were made up of double-truck cars of the 700, 2300, 2500, 2700, 2900, 3100, 3300 and 3500 series and twenty Bridge Operating Company's cars which have a longitudinal seat layout and average 28 ft. over the body and 37 ft. 4 in. over all. Of this group 100 of the 2700 series, 100 of the 2900 series and fifty of the 3100 series had been equipped with the revised underframe and cast-steel bolsters in the year preceding the installation of air brakes, because of the adoption of the Brill 39-E, 39-E-1 and Standard 036 trucks. The layout of equipment on these cars is similar to that of the closed cars already described. Of the remaining cars in this group 100 had been equipped with Standard 045 trucks and 200 with Peckham 14-D-5 trucks, all of which have been retained under the same cars. These cars weighed from 33,000 lb. to 35,000 lb., and their increase in weight due to air brakes, etc., has averaged 1500 lb. to 2000 lb. As the area for the equipment was somewhat greater, namely, 8 ft. x 6 ft., the larger, or 16-in. x 60-in. reservoir was used and placed outside the brake rigging, while the resistors are at the ends instead of at the sides.

CONVERTIBLE CARS

The 452 double-truck convertible cars were made up from the 3700, 3900, 4100, 4300 and 4500 series. These cars are of the cross-seat type which immediately preceded the center-entrance type. Their body length averages 31 ft. 5 in., their over-all length, 42 ft. 6 in., while their weight varies from 49,000 lb. to 52,000 lb. Although these cars had originally been equipped with air brakes and slack adjusters it was held wise to replace the air-brake outfit with larger units in order to get increased mileage between inspections. The lower total brake leverage obtained by using 10-in. instead of 8-in. brake cylinders makes it possible for the slack adjuster to take care of the wheel shoe slack for 1000 instead of 600 miles. The 16-in. x 48-in. reservoir, therefore, was supplanted by one of 16-in. x 60-in., the 8-in. x 12-in. cylinder by one of 10-in. x 12-in. and the D-1-EG Westinghouse compressor by the National A-6-B. The motorman's S-Y-2A valve with connections to the Wyoming sander, the sander itself, the conductor's emergency valve and the emergency valve were also added. The replaced reservoirs, cylinders and compressors were applied to the smaller closed cars, as mentioned earlier in this article.

OTHER CARS

During the reconstruction period described the mechanical department also rebuilt and re-equipped seventy-two cars of the lately acquired Coney Island & Brooklyn Railroad, including the first installation on these cars of conduit, switchboards and other B. R. T. standard practices. Fifty of the heavier Coney Island open cars will also be fitted with air brakes. Of the rolling stock of this company as acquired, sixteen cars were equipped with air brakes and to these were added the emergency features of the semi-automatic equipments. The 800-odd open cars will be taken in hand late in the autumn. They will be fitted with the standard air-brake layout, but no slack adjusters will be used owing to the retention of the No. 22-E trucks under these short-season cars.

The Use of Vanadium in Steel Rails

A Small Percentage Reported to Produce Rails of Great Strength, Toughness and Resistance to Wear

In a report of a recent test of vanadium steel rails in comparison with plain carbon steel rails of the same section and manufacture it is stated that, through the addition of a small percentage of vanadium to standard rail steel, rails of exceptionally great strength, toughness and wearing quality are obtained. Briefly summarized, the salient facts as shown by analysis of the results of these tests are as follows:

In manufacture rails made from vanadium steel roll clean and show no tendency to crack or tear. No change is necessary in the gages, as vanadium steel takes the same standard gage as plain carbon steel. Nothing that is developed in the melting, casting, heating or rolling of vanadium steel indicates that the mill output will in any way be reduced. The percentage of yield of rails from the ingots is equal to or even greater than for simple carbon steel rails, and the evidence is that there will be less scrap from cracking or tearing in the rolls and also that the percentage of second quality rails will be less.

In the tests the vanadium steel rails met all the requirements specified for ductility and deflection and were stiffer or more resilient than the 100-lb. carbon steel rails of the same section with which they were compared. The vanadium steel rails deflected about the same amount from an 18-ft. blow as the carbon steel rails did from a 15-ft. blow.

The elastic limit or useful strength of vanadium steel rails averaged more than 40 per cent higher than the simple carbon steel rails, though the latter had 50 per cent higher carbon content. The ratio of elastic limit to tensile or breaking strength was 70 per cent or more for the vanadium steel rails, as compared with about 57 per cent for the carbon steel rails. The ductility or toughness of the vanadium steel rails also showed higher than for the carbon steel rails. These tests are a direct measurement of the superiority of the vanadium steel over the carbon steel rails.

Alternation impact tests proved that vanadium steel of high elastic limit had great endurance under repeated stresses and was free from brittleness. Although the vanadium rails were very much harder than the carbon steel rails with which they were compared, the bond tests were equally as good.

The vanadium steel rails showed great uniformity of hardness throughout the entire section and were from 10 per cent to 35 per cent harder than the carbon steel rails of 50 per cent higher percentage of carbon. This superior hardness, combined with the high elastic limit and the great toughness of the vanadium steel rails, indicated a great increase in wear resisting qualities.

Comparative tests to determine resistance to wear showed a very great increase in wear resisting qualities for the vanadium over the simple carbon steel rails. The vanadium steel rails showed no segregation, the variations in analysis noted being within the allowable limits of analytical error, although standard high carbon steel rails usually show segregation.

Sections from the vanadium steel rails etched with boiling dilute sulphuric acid showed a remarkably dense, uniform structure, free from piping, slag and other defects. The contrast in this respect with the etched sections of the carbon steel was very striking, although the carbon rails used in the tests were selected at random by the makers.

From the results of the tests the American Vanadium Company recommends the following chemical specification for vanadium steel rails:

	Per Cent
Carbon	0.45 to 0.60
Manganese	1.00 to 1.25
Silicon	over 0.10
Phosphorus	not over 0.05
Sulphur	not over 0.05
Vanadium	4 lb. added per gross ton

This specification is expected to give rails with from 30 per cent to 50 per cent higher elastic limit, or useful strength, combined with greater toughness and hardness than simple carbon steel rails with from 0.62 per cent to 0.75 per cent carbon content. The vanadium steel rails will show even greater superiority in comparison with carbon steel rails of 0.45 per cent to 0.60 per cent carbon. The relatively low percentage of carbon recommended, together with the great freedom from segregation of vanadium steel, should result in the practical elimination of the danger of failure from internal fissures, or silvery oval spots.

These rails were rolled by the Cambria Steel Company.

Praise from Governor-General of Philippine Islands

Reference has been made previously in the ELECTRIC RAILWAY JOURNAL to the damage done by the storm at Manila, P. I., on Wednesday, Sept. 2. This is said to have been the most dangerous and most destructive storm known in the history of the city, which at one time was threatened with total darkness and the loss of many lives. The Manila Electric Railroad & Light Company rose to the occasion and C. Nesbitt Duffy, vice-president, has received commendation from Francis Burton Harrison, Governor-General of the Philippine Islands, for the work which his company did in restoring service. In his letter to Mr. Duffy Mr. Harrison said that in view of the continued rains and the expectation of high seas the situation of the people in the flood districts would have been very much worse and the efforts to aid them would perhaps have been unsuccessful in many cases had not the company been able to furnish light.

Mr. Duffy read this letter to twenty-two members of the company's staff of officials, departmental heads and assistants who assembled at the bimonthly conference held Sept. 12. In this way the rank and file of the employees numbering about 1300 were apprised of the recognition accorded them by the Governor-General for the service which they performed. The work of the men connected with the company made it possible to light the entire city Wednesday night by 7 o'clock.

Depreciation, Repairs and Valuations

Abstracts of Papers by Halford Erickson and Dr. A. C. Humphreys Before American Gas Institute

Among the many papers presented at the annual meeting of the American Gas Institute held in New York last week were several of particular interest to the electric railway industry. The text of these papers, abstracts of which are published herewith, is subject to final revision for publication in the Gas Institute *Proceedings*. Halford Erickson, of the Railroad Commission of Wisconsin, presented a paper on "Depreciation Problems." Dr. A. C. Humphreys, president Stevens Institute of Technology, read a paper on "In Rate Fixing by Commission Should 'Depreciation' Be Deducted from Plant Valuation?" A report was presented by the committee on rates which recommended the establishment of a permanent standing committee to deal with this subject. The meeting recommended the creation of the committee, and the matter now goes to the board of directors for final action. The members of the committee on rates were: Dr. William McClellan, chairman; A. E. Forstall, R. G. Griswold, C. N. Jelliffe and A. S. Miller.

MR. ERICKSON ON DEPRECIATION

In his paper Mr. Erickson dealt mostly with financing and accounting for depreciation and with certain questions involved in distinguishing between depreciation and ordinary repairs. There is still considerable dispute as to how depreciation should be measured. Life tables properly kept, classified and used throw a great deal of light upon the question. This may also be said of personal inspections of the property and the conditions by which its life is affected, especially when they are made by competent parties. The best and most satisfactory way, however, is to use both methods.

Only in exceptional cases, such as the destruction of property due to unforeseen and undeserved calamities or causes, and under highly abnormal conditions in certain other respects, is it justifiable to charge renewals to capital. In order to prevent serious fluctuations in the operating expenses, it is best to provide for depreciation in advance through regular annual charges against earnings. Larger plants, such as railways, are often in position to adjust their renewals so that the cost remains fairly constant from year to year. In such cases it may not be necessary to provide for depreciation in advance, since the cost of the renewals can be charged directly to operating expenses. Under this practice, however, there is often a great deal of accrued depreciation that is not provided for through reserves.

That depreciation in a broad sense includes repairs is evidenced by the fact that it is the purpose of depreciation to keep the cost of the property intact. Yet the integrity of the investment cannot be maintained through depreciation allowances alone unless these allowances are large enough to cover repairs. While it is suggested that depreciation and repairs should be kept apart, these suggestions do not mean that it is believed that these items cannot possibly be properly dealt with if combined into one. On the contrary, such combinations might be practicable not only in the provisions that are made for these costs, but also in the expenditure of these provisions. Nevertheless, there are certain advantages in keeping depreciation and repairs apart that should not be overlooked, said Mr. Erickson. Such practice seems to be more natural and therefore more easily understood. It would seem to permit closer estimates of the respective costs of these items and to facilitate the closest practicable adjustment between actual physical depreciation and the accounting reservations made to offset such depreciation.

PAPER OF DR. HUMPHREYS

Dr. Humphreys said that, apart from the method pursued as to the making of the estimate and the accuracy of the estimate, however prepared, depreciation, meaning the accrued liability for the deferred or periodic renewals of plant, should not be deducted from the valuation of the plant. In opposing deduction from plant valuation for depreciation it is assumed that the plant is maintained through current expenditures for repairs and renewals in a condition to render to the ratepayer effective and economical service; that the cost of deferred or periodic renewals is included in the cost of service and that, therefore, the public service corporation can be held liable for the renewals when necessary; and that depreciation so defined is not the reduction in worth or value as viewed by a possible purchaser but is the accrued liability of the owner to renew all parts of plant as these parts become uneconomical or inefficient for operation because of physical decay, obsolescence, or inadequacy.

Dr. Humphreys added: "Unfortunately, the representatives of public service corporations are not infrequently led astray on this question. Some are misled by their failure to differentiate between actual depreciation and the accrued and accruing liability for renewals in prospect. Others are not so misled but weakly argue that, as the commissions and courts take the position that depreciation should be deducted, they might as well conform to this position. Not only is this not honest to the public service corporations but it is not honest to the commissions and courts, for the honest members of these bodies have the right to look to us to educate them in matters more particularly pertaining to our profession."

An earnest protest was entered by Dr. Humphreys against the methods "pursued by not a few 'valuation engineers,' namely, in following, more or less blindly, tables of average lives for the several types and parts of plant." These tables, if founded upon actual facts at all, are the result of averaging widely differing data. Such averages are not applicable to a specific case, though they might be of value in connection with generalizations. As a matter of fact, in Dr. Humphrey's opinion, these tables are, as a rule, not the average of actual results, though they may be the average of differing opinions.

Record for New Ties and New Rail on New Haven Lines

More new ties and more new rail were laid on the lines of the New York, New Haven & Hartford Railroad in the fiscal year ending June 30 than in any year of the past decade. The number of new ties laid last year reached the record figure of 2,060,485, an increase of 14 per cent over 1913. Out of the $1,758,023 spent for ties of all kinds last year there was distributed along the company's lines the sum of $1,374,160. This money went to farmers and owners of small woodlots, as well as to local lumber companies, payments for ties running all the way from $1.25 to $10,000. Figures compiled by the maintenance department of the road show that 25,783 tons of new rail were laid last year, an increase of 3173 tons over the previous year. Seventy-two per cent of the new rail laid was 100-lb. rail. In 1913, 22,610 tons of new rail was laid, of which 52 per cent was 100-lb. rail. The 100-lb. pattern is now used on all of the main lines of the system.

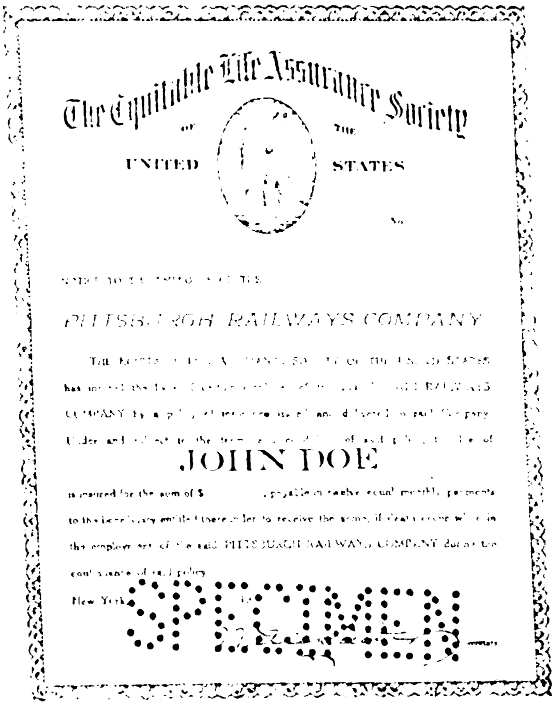
Group Insurance on Electric Railways

General Outline of Group Insurance Theory and Practice as Followed by the Equitable Life Assurance Society, the Travelers' Insurance Company and Others for Electric Railway Employees

One of the most interesting departures in electric railway welfare work for the benefit of employees within the last year has been the adoption of the plan of group insurance by several companies. The latest company to adopt the plan is the Meridian Light & Railway Company, Meridian, Miss. This follows the earlier adoption of similar plans by the Pittsburgh (Pa.) Railways and The Southwest Missouri Railroad, Webb City, Mo., and of slightly different arrangements by the Third Avenue Railway, New York, and the United Railroads of San Francisco, indicating that insurance of this character is attracting the attention of railway companies and deserves comment in these columns.

Meaning of Group Insurance

The term "group insurance," as it is in use to-day, indicates a particular kind of insurance under which a large number of lives that preserve the averages required for select life insurance are insured under one general policy or blanket contract. Where the group as a whole entails no element of adverse selection and is of sufficient size, and where all conditions as to environment, occupation, etc., are favorable, medical examinations are waived, provided every member of the group is insured and newcomers are subject to medical examination.



The Equitable Life Assurance Society
of the
United States

No.

PITTSBURGH RAILWAYS COMPANY

JOHN DOE

New York

SPECIMEN

FORM OF INDIVIDUAL POLICY PRESENTED TO EMPLOYEES, PITTSBURGH (PA.) RAILWAYS

Plan of Equitable Life Assurance Society

One of the leading exponents of this plan is the Equitable Life Assurance Society of the United States, whose insurance covers the Pittsburgh (Pa.) Railways, The Southwest Missouri Railroad, Webb City, Mo., the Meridian Light & Railway Company, Meridian, Miss., and the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa. The chief application of its plan lies in the insurance of all employees under one blanket policy that provides insurance protection to each employee as long as he remains in the service of the employer. The form of policy presented to the employees, which is reproduced herewith, is, for simplicity and clearness, an excellent example of what many insurance men have asserted could not be done with insurance policies. The back of the policy contains only the name and a place for the naming of the beneficiary. Where the group is of sufficient size, 100 or more lives, and of the required quality, the employees are not subjected to individual medical examinations, except in states where the law requires this. Under-aged and over-aged employees are accepted in the group if the proportion of such applications is not excessive. This does not mean, however, that any group of applicants of 100 or more would be acceptable under the group rule. Each group is investigated as a group, environment and general conditions under which the individual works being taken into consideration. While any group to be acceptable must be found to measure up to the requirements of the company, yet the fact that it is possible to do away with the medical examination allows the acceptance of many individual risks and classes of risks which otherwise might be rejected by the company.

The amount of insurance is usually one year's wage, with a maximum limit of $3,000 to any one employee. Any arbitrary sum of insurance within a reasonable requirement, however, will be granted, provided the amount of insurance follows certain class rules and is not left to individual selection. The plan used is the yearly renewal term plan. The cost of the insurance is vastly reduced over the cost to carry the same amount of insurance in individual policies, since the group insurance system eliminates most of the agency expenses, individual collection expenses and medical examination costs.

Cost Statistics

It would cost approximately $1,250 a month in premiums in order to insure 1250 employees with an average annual wage of $800 each and not above thirty-five years of age, with a payroll of $1,000,000. This gives an annual cost of $15 per thousand of insurance. A safe general estimate of the cost to insure all employees for a unit of one year's wages, as described above is, approximately 1½ per cent of the payroll. To obtain a correct statement of the cost, it is necessary for the electric railway to fill out census slips giving the wage, age and other desired information concerning the employees, such as occupation, particular duty, length of service, etc. The reason for this is that without knowing the distribution of ages and wages of any given group, it would be impossible for the insurance company to quote rates. If the company desires to insure on a flat sum basis, say, $1,000, it is necessary to submit a schedule showing only the age of each employee. From these returns the actuary of the company can compute quotations, but any calculations made are construed as approximate on account of the constantly changing ages and because of terminations, entrances and other changes in the group.

The cost of the group insurance as noted can be substantially reduced, however, according to the plan of the Equitable Life Assurance Society, whereby it segregates all group insurance transactions into one department and makes a premium refund each year in the form of a dividend determined by the year's experience. There must be taken into account, of course, the normal increases in rate from year to year following the increases in age under the yearly renewal term plan, but this is more than offset by the reduction in cost due to dividends and the tendency of a going group to maintain a stationary age limit. Under this plan the group patrons become co-insurers in a sense, and the net cost is materially reduced. The experience of some public utility groups indicates that a net cost of only about $1 per $1,000 of insurance is possible under this system. In one case in particular, that of The Southwest Missouri Railroad, which adopted the group insurance plan in March, 1913, the railroad was notified at the end of the first year that there was available under its group policy a dividend of $924.78, which it promptly applied toward increasing the insurance benefit to $1,200 per man, instead of $1,000.

CHANGES IN GROUP AND PAYMENTS

For the protection of the employer and the company a test of the insurability of new employees is required. This test is adapted to leave the employer reasonable latitude in the selection of new employees and yet to protect him from the physically unfit as well as to protect the insurance company in maintaining the standard of the group. Subject to this qualification regarding the new employees, the group policies respond to all changes in the units of the groups. The insurance company automatically increases the insurance when the wage is increased, and it is automatically relieved of a risk at the instant when any employee's services terminate or to the extent that his wage is reduced. Notice of all changes is simply required by the insurance company within a reasonably short time from the date thereof. For the purpose of rendering a railway easy facilities at short intervals for changing the units in the groupings as represented by changes in employees, the business is put on a monthly basis.

The method used by the company in paying claims is the lump sum cash payment, although the instalment method, whereby payments are made over a period of years, can be substituted and has advantages over the lump sum method when the amount of insurance supplied is sufficiently large. When the wage basis is used, a maximum limit of insurance is fixed so that the higher salaried employees share in the benefits only up to a certain amount, and sometimes a minimum is arbitrarily fixed so that no salaried employee will receive less than a certain sum. A popular feature of the plan based on wages is a fixed funeral benefit of $100 or more in addition to one year's wages. The funeral benefit is of equal amount to all, independent of wages.

ELECTRIC RAILWAY HAZARD

In view of the prevailing popular idea that the electric railway industry is full of extra hazards, it is interesting to note what William J. Graham, superintendent of the group insurance department of the Equitable Life Assurance Society, says on this point. According to Mr. Graham, instead of being a greater risk from an insurance standpoint, the electric railway and light industry presents one of the highest types of life insurance risks, as far as the employees are concerned. "There has been," continues Mr. Graham, "more good judgment exercised in selecting men of physical and mental fitness for work with street railways and light and power companies than for most other occupations within our experience. Our investigations show that health examinations and physical tests which are now generally coming into vogue have been for years an established fact in the electric railway and lighting field. The hazard from this industry has been so present in the public mind that the officials of the companies have centered their attention on it to its practical elimination. In a street railway group employing 1000 men not more than fifty can really be said to be subject to any extra occupational hazard. The remaining 950 are not in touch with any department in their business that adds hazard as life insurance understands hazard, whereas the whole 1000 are held up to a standard of physical and mental fitness higher than is required in almost any other business. Among the relatively small percentage coming in contact with the wires or other elements of hazard every precaution is taken to reduce this hazard to an almost disappearing point. This is one of our most pleasant revelations. Our group policies are issued without medical examination but under conditions that give us favorable mortality because the risks are favorably selected by the employer, and in no industry does the employer's selection amount to more with us than in the street railway and allied industries."

SUCCESS OF GROUP INSURANCE

From the managing officials of the different industrial plants and public service corporations where the group insurance plan has been adopted there have come words of general approbation and appreciation of its good points. It is generally stated that the adoption of the plan has resulted in a closer union between the companies and the employees, and it is felt that the goodwill established among the employees has been more than sufficient compensation for the money expended. Moreover, the railway reaps added gain through the retention of experienced men in the service on account of such added inducements. In speaking of the experience of the Pittsburgh, Harmony, Butler & New Castle Railway, S. H. Waddell, secretary of the company, said: "While our experience in this welfare work extends over a period of less than eleven months, we are satisfied that it has been a good investment for us and has resulted in bringing the employer and the employee closer together and has stimulated a better, more thorough and more consistent service on the part of all employees."

SYSTEM OF TRAVELERS' INSURANCE COMPANY

The Travelers' Insurance Company of Hartford, which has insured the Third Avenue Railway, New York, has a group insurance plan somewhat similar to that of the Equitable Life Assurance Society. It has the same factor as the Equitable Life Assurance Society and its rate is slightly lower, but it does not return anything in the form of dividends. The Travelers' Insurance Company has a group insurance plan for life, health and accident insurance. If the insurance is taken out covering life there may be also insurance for health, or for both health and accident insurance. The life rate is figured on the basis of $1,000, but employers figure on the basis of a certain percentage of the payroll. The accident insurance rate is figured as a payroll percentage. The Travelers' Insurance Company makes a preliminary investigation of all proposed risks and examines new employees. Changes in rates caused by changes in wages are adjustable at the beginning of the following month. Some of the questions that the company looks into in its preliminary examination are as follows: the number of each nationality represented among the employees when more than 10 per cent of the whole; the location, construction and sanitary condition of the plant; the provisions and equipment for treating accidents and illness at the plant; the examinations given to an employee before and after beginning service, the amount of welfare work done, the average salary per year, the proportion of employees having a yearly vacation with continuance of salary during that time, the working hours, the maximum and minimum ages of employees, and special hazards in the business.

OTHER SYSTEMS

The group insurance plan has also been adopted by the Aetna Life Insurance Company, the New York Life Insurance Company, the Metropolitan Life Insurance Company and the Connecticut General Life Insurance Company. The activities of these companies have been entirely along industrial lines, however, no policies being written for electric railways. Hence what provisions these companies would make for group insurance on electric railways could only be determined by an examination of individual groups.

Objections to Government Ownership

Address by W. J. Clark Before New England Street Railway Club Last Week

Government ownership was the subject of the evening at the regular monthly meeting of the New England Street Railway Club at the American House, Boston, on Oct. 22, the speaker being W. J. Clark, manager of the heavy electric traction department General Electric Company, New York. President John T. Conway occupied the chair and a large and enthusiastic audience listened to the reading of the paper, which is abstracted below:

The greatest possible value which can be derived from electric railway organizations is to so qualify their members that they at all times can intelligently, diplomatically and yet militantly set forth as quasi-public servants and as good citizens the maximums of economic truth on public utility questions. A moral obligation rests upon us to impart to the public the results of our experience obtained in its service. No one can foretell how soon it will become impossible to cause the masses of the people to think straight on public utility issues, until they have later on paid the penalties of government ownership, toward which they have secured a long start through improper leadership and misunderstanding. This agitation is very much alive and presents perhaps the most important economic problem confronting America to-day. The inauguration of public ownership would be an economic calamity to the entire country and to all citizens not so fortunate as to secure highly remunerative positions at public expense. It is most important to avoid establishing a precedent in the realization of this propaganda. Immediate danger confronts the industry, as the executives of two extensive systems have in a preliminary way been forced to cooperate with those favoring municipal ownership, in the working out of plans under which their properties may be taken over by the cities in which they are located. Sooner or later any or all of us may be forced into a like position when we can no longer consistently advise the public as to its real interests. If we do not enlighten the public, a portion at least of the responsibility is ours.

It is the duty of the industry to dispense the gospel of economic truth. There is scarcely a street railway in the country which has not been forced through unjust public pressure to make far greater capital investments, betterments and unprofitable extensions than were ever contemplated. The establishment of a flat 5-cent fare was a financial blunder from which the public has profited enormously. The monetary benefits of street railways to the public cannot be estimated, and these have been reaped without the slightest financial burdens being imposed upon the latter. There are those who would withhold from the companies the benefits of those increases in real estate and similar values which have been created by their operations alone. There is no such thing as an "unearned increment," for every increase in value is produced by human effort.

In every form of public utility effort America surpasses all other countries. Taking into consideration the comparative prices of labor, the initial cost of such facilities and the services rendered, the cost to the public is lower here than anywhere else. Wherever government ownership has been extensively undertaken the results have been unsatisfactory, fundamentally because of legislative methods and practice, which virtually prevent publicly owned enterprises being gaged by the same standards as economically owned undertakings of a similar character. The recent Congressional legislation for government railroads in Alaska exempts the roads from complying with the Interstate Commerce Commission's system of accounts. Experience with state-owned railroads in Pennsylvania and with state-owned canals in New York is most illuminating to the opponent of government ownership, which should be vigorously opposed in the interests of both public and private welfare.

Pamphlet on Needs of Latin-American Countries

A pamphlet giving the statements made by representatives of Latin-American countries at a trade conference with American bankers and business men in Washington recently, has been issued by the Bureau of Foreign and Domestic Commerce and is available for general distribution. The conference was called by the Secretary of State and the Secretary of Commerce to obtain a clear statement of the commercial needs of both the United States and the Latin-American countries and the facilities for co-operation in supplying those needs. The statements made by the Latin-American representatives set forth the conditions in their respective countries and the particulars in which the assistance of interests in the United States is desired. The opening statement by William Jennings Bryan, Secretary of State, and an address by William C. Redfield, Secretary of Commerce, are also included. The pamphlet may be obtained from the superintendent of documents, Government Printing Office, Washington, D. C., for 5 cents.

Dangers of Boycott in England

In England, since the beginning of the war, retaliatory measures have been suggested against local German-owned concerns. Recently, according to *Engineering*, a letter signed by twelve trade unionists in the employ of Siemens Brothers Dynamo Works has been sent to the press calling attention to the fact that 2000 men are engaged at the works, of whom only 4 per cent are foreigners, and not all these are Germans. If, as has been suggested, there should be a boycott of the firm these 2000 men would suffer an immediate loss of work. The town of Stafford would feel the withdrawal of some $500,000 a year now paid in wages, and for this there could be no compensation to be found in migration. The firm of Siemens Brothers, of which the Stafford firm is an off-shoot, was founded in 1847 by William Siemens.

Claim Agents' Papers and Discussions

Abstracts of Papers Presented at the Recent Atlantic City Convention of the American Electric Railway Claims Association, Together with Digests of the Printed Discussions on the Same Topics

The American Electric Railway Claims Association has just released for publication the papers and printed discussions thereon presented at the recent convention in Atlantic City, Oct. 12-16. These are in addition to the running reports of the association proceedings published in the ELECTRIC RAILWAY JOURNAL daily issues of Oct. 14, 15 and 16. Abstracts of these papers and discussions are published below.

LEGAL CONDUCT OF INVESTIGATIONS

BY E. P. WALSH, ATTORNEY UNITED RAILWAYS OF ST. LOUIS, ST. LOUIS, MO.

The foundation for a claim for damages and a suit at law is laid the moment an accident occurs. The foundation for a successful defense, if such is possible, against a claim for damages and a suit at law may also be laid at the same time if the trainmen intelligently and alertly obtain the names of the injured and of witnesses most favorably located to see what actually occurred, and also if the trainmen calmly exercise their powers of observation in order that they may afterwards relate intelligently all details of the accident. The success with which this work is done depends in great measure upon the ability of the employing officer to select proper material for trainmen and upon the instruction and training later given.

Under normal conditions, with the accident reported and the names of witnesses secured, it becomes the task of the claim department to handle the matter in the most efficacious way. If the accident is one where liability is certain, the necessity of speedy adjustment is readily apparent. The greater the delay the more danger there is of an exaggerated idea of the injuries as well as of the demands to be made. Yet from a legal standpoint it is not always safe to urge a speedy settlement for a serious accident, for the courts sometimes inquire carefully into such contracts because of the possibie inability of the injured person to comprehend fully the extent of the injury.

During the necessary interval between injury and settlement, however, whether long or short, the claim department must make an effort to ascertain all pertinent facts in connection with the accident and the injured person, such as the identity of the attending physician and facts concerning the claimant's business, his social and even his religious associations. At the outset a statement should be secured from the claimant as to the physical details of the accident, the extent of the injury itself, the previous suffering of similar or other injuries, prior claims against the company concerned or others, and the carrying of accident or liability insurance. This statement should be signed by the claimant and if possible attested before a notary public. It is desirable in large companies to have directly attached to the claim department several men possessing notary public commissions to do work of this kind.

The claimant should be examined at the earliest possible moment by the company's surgeon. If the claimant's doctor will not extend courtesies of this character or is forbidden to do so by the claimant, there is reason for suspecting the motives of both doctor and patient. The claim department must then try by its own efforts to ascertain the true situation. It is often better to risk a law suit and rely upon the time necessary to bring it to trial as giving opportunity for a more complete investigation. If it has not been possible to secure a medical examination of the claimant prior to the filing of the suit, a request should then be made as early as possible that the court compel the plaintiff to submit to an examination by some disinterested physician appointed by it. From this the defendant can determine whether it is desirable to adjust the claim or proceed with the trial.

As soon as suit is filed the plaintiff's deposition should be taken by a lawyer experienced in damage suits and not by young lawyers recently graduated from school. Depositions taken by the latter frequently contain nothing enlightening, although in importance they are equal, if not superior, to the actual cross-examinations of plaintiffs.

The particular methods the claim agent will pursue rest largely with the individual claim agent and his facilities. Expert investigators, however, should be trained for all branches of the work within the department itself, especially in companies in large cities, because their efforts are more efficacious, if later it is necessary to put them upon the witness stand, than if they were employed by agencies entirely separate from the claim department.

Within a reasonably short time after a serious accident in which a contest is apprehended, the motorman and conductor should be sent to the claim department and a very careful and comprehensive statement should be taken, acknowledged and signed before a notary public. The reported witnesses should be interviewed, their signed statements in writing taken, and, if possible, their affidavits secured. Efforts should be made to ascertain if they know witnesses whose names were not secured by the trainmen, for excellent witnesses for the defense are thus sometimes brought to light.

Employees as witnesses, in their desire to combat the attacks of opposing counsel on cross-examination, are quite likely to undo all the good work accomplished. Hence they should understand that their sole duty is to answer truthfully the questions asked. They should be reasoned with as to speed and distances, for their powers of observation are so undeveloped that if called upon suddenly to explain operating points they cannot do so with any degree of particularity. The lawyer, therefore, should be familiar with the operation of a car and the conditions accompanying the accident, and, in talking to the men before the trial, should be able to elicit from them all the facts and at the same time instill into their minds an ability to relate those facts so that the jurors may have a correct picture of the entire occurrence.

In large cities a police officer is usually present very shortly after an accident occurs and generally secures the names of the witnesses. Written and signed statements should be taken as early as possible from the witnesses whose names appear upon the police report, because this becomes public property and is generally the first source of information consulted by the "ambulance chaser." If the defense anticipates these men, there is some likelihood that a fair and impartial statement will be given.

In cases of apparently fraudulent or exaggerated claims, any sort of espionage that furnishes information as to the claimant's conduct and mode of living is valuable in determining what should be done by way of adjustment, but such espionage to be of value in the trial must be so conducted that its results can be shown to the jury. For instance, a system of photography has been used with splendid results, because at the trial pictures were shown of the claimant actively engaged in business or pleasure at times when his testimony declared him to be in bed or crippled.

The knowledge that a claimant has or has had accident or liability insurance is important as enabling the claim department to ascertain the extent of injury claimed under that policy and also to learn whether or not the company has a history of previous accidents. In this connection the index bureau is one of the most valuable sources of information, and it is to be regretted that all companies have not taken advantage of it.

The adjustment and defense of damage claims are becoming more strenuous propositions every day, as well as more expensive. The work reduces itself to a play of wits between the claimant and the claim agent, and the latter is often made a victim of unscrupulous, malingering fakirs and dishonest lawyers and doctors. A claim agent is hardly to blame if at times in repelling such assaults he meets fire with fire. The adjustment of the claim of the honest claimant is a simple proposition, but the quack, the fraud and the pettifogger cause the real troubles of the claim agent.

DISCUSSION BY MR. HOFFMAN

L. S. Hoffman, general attorney Public Service Railway, Newark, N. J., agreed with Mr. Walsh that the ability of an employee to discover flaws in the foundation of the lawsuit goes back to his selection by the employing officer. At the same time good work can be, and is, accomplished by calling to the attention of employees of average intelligence the great importance of obtaining all possible information before leaving the scene of an accident. It is particularly important to locate the exact spot and, if feasible, to call it to the notice of disinterested witnesses.

In Mr. Hoffman's opinion, the mere fact that the injured party does not comprehend the full extent of his injuries does not prevent the meeting of the minds of the parties so as to make a binding contract. Yet, if a physician employed by the defendant should either mistakenly or wilfully underrate the present extent of the injury, or disparage the future results, there would be ground for setting aside a release. A release would also be set aside where there was a mutual mistake of an actually existing fact, but a mistaken opinion as to the outcome of a known injury forms no ground for setting aside a release.

The usual excuse given when signed statements contain matter materially different from the testimony given in court is that they were signed without being read. In order to close this gap the Public Service Railway has adopted a practice of asking the signer of a paper to write above his signature, "I have read the above statement and it is correct," or words to a similar effect. Witnesses are usually quite willing to do this.

Mr. Hoffman called attention to one danger in taking depositions before trial. When the plaintiff's deposition is taken by the defendant, the defendant makes the plaintiff its witness, the result being that the plaintiff's lawyer has a right to cross-examine his client. The advantage of such a cross-examination to the plaintiff outweighs the advantage to be gained from the deposition by the defendant. In New Jersey the practice is to serve the plaintiff with interrogatories covering matters pertaining to the defense and sometimes a bill of particulars is also demanded, so that considerable information is secured which could have been obtained by taking the deposition of the claimant.

Mr. Hoffman said that his company very seldom used any secret service investigators except occasionally in criminal matters, but he considered the results of secret investigations very often important when used for the purpose of cross-examination. As to the advisability of having the court compel the plaintiff to submit to a physical examination by some disinterested physician appointed by the court, he deemed such a course of procedure not by any means satisfactory. When the claimant will not submit to a physical examination, there is usually something crooked about his claim, and a physician who is not accustomed to making physical examinations of claimants in accident cases is no match for a malingering claimant backed by the instructions of his physician and his attorney. The only proper physician to examine an unwilling claimant is an expert who, through experience, knows all the tests to be applied to determine malingering. Much depends upon the practice of the court, however, in appointing experienced men, and this can be known only through experience. It is often efficacious to bring out at the trial the request and the refusal for a physical examination, and follow this up by making a motion that the plaintiff submit himself then and there to a physical examination by a physician of the company's selection who is present. Very few attorneys dare risk refusing such a request because it would prejudice their case before the jury.

DISCUSSION BY MR. MUIR

According to Wallace Muir, assistant counsel Kentucky Traction & Terminal Company, Lexington, Ky., it is difficult to distinguish between investigating an accident from the standpoint of defense and investigating the same from the standpoint of adjustment. The object of investigating an accident is to determine legal liability. In order to determine this, the facts under which the person, or property, was injured must be fully and truthfully obtained, after which the law determines the question of responsibility and liability. Ordinarily no case should be adjusted where the company is not legally responsible for the injury inflicted, and when a case is once prepared so that a proper conclusion may be reached for the purpose of adjustment, the case should be in such a condition that it can be filed away and be ready for trial with but little additional work. In other words, preparation for adjustment is preparation for defense.

Mr. Muir drew one distinction, however, between preparation for adjustment and for defense. In adjustment the location of the accident is familiar to those concerned. In a trial before a jury all the jurors are not familiar with the surroundings, such as the character and grade of the street, its width, the position of the car tracks and the character of the car. Often it is essential that these points be brought out forcefully to a jury by photographs, diagrams and miniature constructions, and in some cases the jury may be taken to view the place of accident.

Mr. Muir emphasized the need of tact in trying to secure signed statements. The securing of a signed statement from the injured while in pain or in a semiconscious condition is of little benefit and often dangerous. The statement of a child, although bright and intelligent, should be taken in the presence of its parents, one of kin or someone closely connected with the injured. The investigator should have each person giving a statement read it over in the presence of another, the third party to witness the signature unless it is sworn to. It is not an advantage, however, as Mr. Walsh says, to have a statement sworn to before a notary public who is a claim agent or investigator of the company. The claim agent and investigator, as far as possible, should be kept in the background at the trial, for a verdict is often rendered against a company solely upon the ground of some supposed misconduct on the part of the claim agent.

In a certain character of accidents, such as when there is no question as to liability, it is very essential to see the injured as soon as possible and effect compromise. Every courtesy and attention should be extended to the injured party, frequent visits being made without any talk of compromise until the proper time arrives. The question of compromise or the merits of the case should not be discussed in the presence of any disinterested person, for in nearly every case the outsider is the one who puts the extravagant figure in the mind of the injured.

CLAIMS DEPARTMENT POLICIES AND PRINCIPLES

BY CECIL G. RICE, SUPERINTENDENT CLAIMS DEPARTMENT
PITTSBURGH RAILWAYS, PITTSBURGH, PA.

Upon my entrance into the claim business I was not particularly impressed with the attitude of the public toward the ordinary claim agent, but I concluded that something could be done to change this opinion of the public, through imitation, through trial and error or through reasoning. Not knowing where to find the thing I desired to imitate, I started by trial and error and finally took up the reasoning process. From scientific management and business efficiency, I realized there were five things to do: First, to investigate and standardize; second, to form an organization that would carry these standards into effect; third, to get the men to form the organization; fourth, to provide proper compensation for the men, and fifth, to get a relay of men so that when one left the vacancy could be filled immediately.

We changed the department into five separate and distinct bureaus—clerical, investigation, adjustment, medical and litigation. Each of these bureaus was put in charge of a chief, who was responsible for the work. When an accident occurs it is reported to the claim department and goes to each of the bureaus with the exception of the litigation bureau. This bureau has absolutely nothing to do with the adjustment of a claim. The investigation bureau is charged with getting the facts, whether favorable or unfavorable. The clerical bureau has to do with the records. The medical bureau is charged with learning the facts from a medical viewpoint and making and arranging examinations. The adjustment bureau takes care of the actual adjustment after the clerical bureau has made its records. If, after all the facts have been filed, an adjustment is not possible and suit is entered, the papers are turned over to the litigation bureau for the purpose of preparing a defense or making a settlement.

Every Saturday afternoon the different chiefs meet with myself for discussion. Each of these chiefs should know as much about all the departments as the superintendent. Once a month there is a meeting of all of the members of the departments with papers or discussions. Once a week each bureau has a meeting to talk over the details of its work. In this way every man in the department is supposed to be a claim agent, a superintendent or chief claim agent. The chiefs regard their own individual men as assistants to them, and in that way it is possible to develop men who are better acquainted with the business of claims.

In connection with office kinks, some trouble is often experienced in locating files where there is more than one office. This is overcome by a "cherry card." This must be made out and go to the central file showing the minute the file moves from one person to another, from one room to another. We have used as many as 500 cards a day, and a check for three months has shown only six errors in handling all those cases.

As to fixed principles, we have adopted for our own guidance the following six slogans: maximum accuracy, utmost expediency, absolute fairness, persistent courtesy, minimum consistent expenditures, and perfected co-operation and efficiency. By maximum accuracy we mean incontrovertible facts unearthed from all available sources. Utmost expediency means the promptest action in accord with propriety and correctness. Absolute fairness embraces a fixed, irrevocable policy of dealing with justice to all concerned. Persistent courtesy may be defined as constant politeness combined with kindliness. Minimum consistent expenditures are disbursements proportionate to all the facts, and perfected co-operation and efficiency mean working in harmony to produce the most satisfactory results with the least expenditure of time and effort.

These principles have been in use in our department for five years. In October, 1912, we had a very serious accident in which ninety-six people were injured. We started to give our principles a test on that particular case. One of the first men settled with was paid $50 for two broken ribs. When the adjuster told me how much he had paid, I sent him back with a letter and an additional $50. The man happened to be the president of the board of trade of that particular district, and he was so impressed with what he thought was an unprecedented act of courtesy that he, without any solicitation on our part, used his efforts to help us out in his territory. We built from that case right on up. Every man we went to see we told about the last man with whom we had settled, and we paid from $50 to $15,000. Despite the efforts of attorneys we disposed of every one of those ninety-six cases without a single suit being entered, at a cost of $104,000. They were handled throughout with this idea of fixed principles, which we advertised to everybody.

In addition to constantly and persistently dwelling upon these fixed principles, the chiefs of the different bureaus use the following seven guiding principles:

1. Street railway transportation companies do not insure passengers or pedestrians against injury or damage. It is wholly unreasonable to suppose all persons injured in connection with a street car are entitled to damages.

2. If an accident occurs the principal should not depend solely upon the conductor to make a report but should secure the number of the car or the number of the motorman or conductor, the exact location, and the exact time.

3. If any personal injury or property damage results for which the principal was not to blame and feels justified in making a claim, he should frankly report the details of the occurrence to the claim department, together with the names of the witnesses, and give every possible assistance in making an unprejudiced investigation of all the facts and circumstances. Only dishonest claimants object to a thorough inquiry being made to corroborate the facts.

4. A claim is purely a business proposition, not a matter of law, and should be presented and handled on the same basis as any other allegation of indebtedness. Proving a claim is the same as proving a bill for work done or goods furnished.

5. Any legitimate claimant making a reasonable request for reimbursement can secure a satisfactory disposition of his claim without the expense of assistance. Since a claim is the same as a bill it is bad judgment for a claimant to employ an attorney or enter into the embarrassment, delay and uncertainty of a suit without first presenting his proof of indebtedness direct to those whom he believes owe him.

6. Only three classes of people bring suits for damages against railways, viz: (*a*) prejudiced persons unacquainted with the principles governing the handling of claims; (*b*) persons entitled to something but who want more than they are entitled to; and (*c*) persons entitled to nothing but who want something regardless of their right to it.

7. Citizens who encourage litigation, whether "ambulance chasers," neighborhood gossips, misinformed friends, or someone seeking to profit from another's misfortune, should remember that in so doing they add a burden to every taxpayer, as the expense of the courts is assessed against them.

In addition to the above principles the company uses certain psychological processes in its claim work. The first is to overcome prejudice, the second to inspire confidence, the third to analyze and reduce to a business basis, the fourth to create a desire, the fifth to cause a determination, and the sixth is to close the transaction. By overcoming prejudice we endeavor to show by logical argument that what is true is right. To inspire confidence we mean both to trust and to rely, causing others to believe in us and realize that we are sincere in our desire to deal equitably with everyone. By analyzing and reducing to a business basis we mean to prove by calculation the weight of the facts and pay according to their value. By creating a desire we mean to bring into existence a desire for what will reasonably compensate claimants for their losses, considering the degree of such losses. To cause a determination we bring a man's mind to the opinion that he will exchange his claim for a fair price for the damage done or loss sustained. To close the transaction satisfactorily is to make amends for the injury and then satisfactorily terminate the matter.

One psychological point may well be emphasized. A person will believe anything that may be said to him unless some negative idea comes up in his mind. In order to prohibit a negative idea a positive idea must be injected, and in order to inspire a positive idea a negative idea must be prohibited. For instance, an adjuster says to a woman: "Will you submit to an examination?" or "Will you allow us to have an examination made?" or "Will you undergo an examination?" These questions immediately put a negative idea into her mind on account of the objectionable thought of undergoing or submitting to anything. In our company when an examination has been refused, declined or not granted, we write a letter simply instructing the claimant to arrange through his doctor with our doctor for an examination, without even suggesting the possibility of his being able to refuse such a request. Thus far in the list of cases handled, only one refusal to this plan has been made.

We even go so far as to prepare the claimant before he gets on the department floor. When he comes into the reception room there are many things to attract his attention and divert his mind from his real or fancied injury. There are pictures of President Taft and several local notables at a ball game in Pittsburgh, cartoons of "Mutt and Jeff" making claims, and the old picture of the cow with men at her horns and her tail pulling in opposite directions and an attorney milking—in other words, getting the cream while the claimant and the claim agent are fighting. These pictures have actually been known to turn people back to an offer already made.

The American Association has decided to adopt fixed principles and policies in order to appeal to the public. If the parent association finds this advisable, why would not the Claims Association also find it advisable? There is nothing in the principles enumerated that a company should not desire. Claim agents should assume that the public does know that there is such a thing as a claim department and that claims for damages are paid, and they should appeal to the public and put them on their honor until they do something dishonorable.

DISCUSSION BY MR. TICHENOR

In commenting upon the paper by Mr. Rice, William Tichenor, claim agent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., said that all communities contain many excellent people in all professions and callings, and that if all men, including claimants against railroad companies, were of this character, the public would be entitled to be treated with absolute courtesy, fairness, frankness and firmness, being given full credit for truthfulness and honesty. Unfortunately, however, the portion of the public met by the claim agent and dealt with by the claim department of the present day is not composed of this kind of people. The claim agent comes in contact with only a very small fraction of the public, and a very large part of that fraction seems to be seeking something for nothing without being over-particular as to the source of supply or the method of obtainment. This class is seemingly growing larger and less scrupulous as time moves on.

It appears to be the policy of some companies to treat lawyers and doctors with great courtesy, taking care of their bills, especially the doctor's bills, for the purpose of inducing them in some way to change their methods and give the company a square deal instead of rendering all assistance possible to prosecute "fake" claims. Mr. Tichenor mentioned the case of one company that had a great number of unsettled lawsuits. In this instance the plaintiffs' lawyers were taken into the company's confidence and were treated so courteously in the settlement of the suits that the company now seldom has a suit filed against it and has not lost a suit in three years. If claim agents and claim departments generally could pursue the same policy with the same sort of success, it would be well for such a policy to be widely adopted.

In another case the claim agent of a city and interurban line said it had become such a custom with him to visit the doctor, direct him to take care of the patient until recovery and then present his bill for payment, that it really might be counted as the policy of the company. Both of the above men, the friend of the lawyer and the friend of the doctor, evidently were successful with the policy of dealing with the public in the way suggested, but Mr. Tichenor felt that the experience of claim agents has not been such as to justify the adoption of such customs as a general policy of claim departments.

Mr. Tichenor believed that while a particular claim department may adopt particular policies and principles and adhere to them more or less religiously, general policies on "the relation of claim departments to the public," "the psychology of claim adjustments," "efficiency in claim department work," or "office kinks in claim departments," are wholly impractical, if not impossible. If a general policy were adopted by the association in order to meet the exigencies of any particular case, it would necessarily have to be so modified and reconstructed to meet the peculiar circumstances and conditions of particular cases that it would not be recognized by its author.

DISCUSSION BY MR. HANDLON

J. H. Handlon, claim agent United Railroads of San Francisco, San Francisco, Cal., noted the change in the attitude of the claim departments of street railways to the public within the last few years. Many street railway claim agents early in the field prided themselves to such an extent on their detective ability that they became dominated by their suspicions and grew to consider every person dishonest who had the temerity to file a claim against their employers. They treated the claimants accordingly. Not only was it morally wrong, however, for claim agents to do so, but experience has shown that it was not good business judgment, for unfair settlements are always extensively advertised and to-day jurymen often cite such instances as their excuse for penalizing companies by awarding excessive verdicts.

The successful claim agent realizes that there are honest claimants and that the good-will of the claimant, and particularly of all attorneys and physicians with whom he has business relations, is a personal asset. Moreover, he strives to secure this good-will without any other consideration than fair and courteous treatment.

Certain electric railways are now required to pay unreasonable sums in settlement of personal injury claims owing to the fact that competitive companies are very liberal in their settlements. Other claim agents are unable to reduce their settlements to a fair basis for the reason that their predecessors, in their generosity, educated the public to expect to profit materially from street car injuries. It is very difficult under these circumstances for a conscientious claim agent to instill in the minds of claimants the fact that accidents are regrettable, that the company is adopting every reasonable precaution to prevent them, and that claimants should not seek to profit thereby.

Mr. Handlon said that it is often wise to relieve attorneys of the necessity of visiting the office of the claim agent until the claim is ready for adjustment. This can be done by having a representative gather all available facts from the attorney at his office, or, if he consents, to visit the claimant at his residence. By accommodating the attorney in this respect he is often induced to file the claim rather than litigate a case.

DISCUSSION OF CLAIMS PUBLICITY

BY JOHN J. REYNOLDS, CLAIM ATTORNEY BOSTON (MASS.) ELEVATED RAILWAY

Mr. Reynolds in his written discussion said no substantial ground exists for believing that claim departments have been benefited by publicity of accidents and the sensational illustration of fake, fraudulent, or exaggerated claims, upon which money has been paid or awarded. Claim agents should not allow themselves to be borne away, far beyond the bounds of reason, by a sudden passion to see their fake cases dramatized in story. Such publicity gives specific suggestions with examples of their application and hence serves as a guide to aid the fakir to improve on existing methods and lessen the danger of discovery. That efficiency in claim department work is made more difficult by publicity is unquestionable, and it may well be doubted whether such publicity, beyond imparting to the public the underlying principles that have actuated claim fakirs, has really accomplished the object sought. Most states have publicity laws regarding accidents, under which the public is informed, sufficiently, of all important cases.

Mr. Reynolds at this point introduced numerous newspaper stories to illustrate the reporters' method of "playing up" or "featuring" accidents, with a resulting handicap to the claim department. In his opinion, if newspapers request information concerning accidents, they should be referred to the operating department, and only in the most serious accidents, where persons are injured and removed to hospitals, should the newspapers be given the names and addresses of the injured. Such a course is the proper one for the best results of the claim department, and it is not at all inconsistent with the propagation of that necessary and desirable co-operative relation between the railways and the public.

With regard to magazine publicity claim agents should always be careful to keep in mind the distinction between publicity regarding serious accidents, and publicity concerning the methods of the accident fakir and the methods of the claim department in circumventing him. Take, for instance, said Mr. Reynolds, the magazine publication of the methods by which claim department detectives procured photographs of a farmer plaintiff at work during the haying season. While the evidence procured was of paramount importance to the claim department and perfectly proper to be used either in that department or as evidence in court, such publicity is wholly ineffectual in assisting claim agents to prevent dishonest persons from presenting fraudulent claims. It equips such persons beforehand with an accurate knowledge of what they can do to defeat the most carefully laid plans to trap them. Even admitting the interesting and entertaining character of the numerous fakir stories in magazines, Mr. Reynolds maintains that they are not helpful to claim departments, nor do they help the average citizen to realize that his individual interests, represented by minimum fares and maximum service, are menaced every time the fakir's ill-gotten gains come out of the treasury of the public service company.

To deny such publicity, however, does not mean that these fakirs should not be punished. Mr. Reynolds believes that they should be punished to the limit, but, in so doing, all things should be avoided that may offer suggestions to would-be fakirs. The sort of publicity that will help the claim department is immediate attention to complaints; prompt betterment of service conditions when they can be bettered, and the employment of trainmen who will try to please the public, who will answer inquiries as they should, who will be careful to stop cars when signals are given and who will not jostle people unnecessarily. Publicity of the fact that those essentials are not observed is bound to be felt in the claim department.

It is no exaggeration to say that the claim department of the future will be benefited by publicity. This, said Mr. Reynolds, will be caused not by publicity of accidents and claims, but primarily by the sweeping changes which will have taken place in methods of education in vogue at the present time. That a comprehensive plan of educational publicity is considered necessary to set forth the problems confronting the railways is seen in the parent association's plan for establishing a publicity bureau. A well-organized bureau should be maintained for the purpose of correcting authoritatively and publishing widely all misstatements of fact as fast as they appear. Except in cases of flagrant fraud which are prosecuted in court and which in consequence receive advertisement in that way, the claim department should be kept out of publicity schemes. Expense for publicity should be directed rather toward education along the line of preventive methods.

The accident prevention campaign which is now being seriously conducted by many electric railways is undoubtedly reaching a large portion of the public with excellent results, and claim agents should do every reasonable thing necessary to the end that no longer shall the educational leader hesitate to recognize the widespread demand for a curriculum which will better fit pupils to avoid accidents. Care, however, is to be constantly exercised to keep suggestive matter in the background.

No inexorable rule to be followed blindly under all circumstances should be laid down for claim department publicity. The point to be emphasized is the unwisdom of a pronounced tendency in the matter of claim publicity. What may be justifiable in a given case may be unjustifiable or even pernicious as a general practice. The ultimate adoption of a distinct policy in favor of education is most desirable.

With regard to publicity between claim departments of various roads, there are two general objects to be kept in mind: First, to carry on as widely as possible, with the aid of the index bureaus, a consistent campaign of education through interchange of information relative to claimants reported by the Hooper Holmes or other bureaus. Second, to assist by special work through the local index bureaus in keeping track of claimants that do an interstate business or those whose operations seem to be exceptionally active and extensive. If claim agents at all times keep in touch with this aspect of the business, they will be developing a publicity that will prove a real and permanent benefit to their departments.

NEWSPAPER PUBLICITY DISCUSSED

BY J. S. KUBU, CLAIM AGENT NEW YORK STATE RAILWAYS, UTICA, N. Y.

There is a limit to publicity in connection with claim departments just as to anything else, according to Mr. Kubu's written discussion. The real objection to the general policy of full publicity is the "ambulance chaser," who sometimes creates embarrassing situations. How much embarrassment the claim agent is put to depends a good deal on the efficiency of the department. If the claim agent takes his time and allows the "chaser" to obtain possession of the facts of a case before he himself knows them, the company will find it unprofitable in dollars and cents and will have to bear an additional burden in defending a law suit. Unfortunately, the greatest difficulty is the foreigner who cannot read and does not understand the language, for there are plenty of "ambulance chasers" who speak the foreign languages and have no difficulty in securing clients.

There ought to be a cordial co-operation between the newspapers and the claim department. When an accident occurs which has news value, the claim agent should get in touch with the newspapers and give them definite information that will correct any and all rumors. Very often it will save the city editor the task of assigning a reporter to a job. This line of work in the company should be assigned to one man. News of all accidents and litigation should reach him first and he can then use his discretion in communicating such information to the newspapers. He must, however, know how, and when, to act, and aim at the right kind of publicity rather than at more publicity.

Mr. Kubu remarked that in the matter of litigation the public records are open to inspection and it is a very easy matter to get a copy of a petition or a complaint. When an action at law has just been brought out and is called to the attention of the newspaper man, he will, if he is friendly to the company, get in communication with it and give it a chance to defend itself before publishing the case.

The "safety first" campaigns have been given great publicity by the newspapers throughout the states, and their liberal support has contributed greatly toward the success of such campaigns. This only emphasizes the great interest which newspapers have in the subject and makes clearer the value of the co-operation which should exist between newspapers and railway companies in connection with accident publicity.

Changes In New York Subway Track Practice

At the Oct. 16 meeting of the New York Railroad Club, O. O. Dixon, assistant engineer Interborough Rapid Transit Company, read a paper describing the changes that have been made in the track standards of the subway division since its opening Oct. 27, 1904.

The ballast of ¾-in. trap rock 5 in. deep has been retained, but the 5-in. x 8-in. x 8-ft. ties are renewed with 6-in. x 8-in. x 8-ft. timbers, and on curves the tie spacing has been reduced from 22-in. to 18-in centers.

Originally the inclined guard rail on curves was bolted to the low rail about every 3 ft., using adjustable cast-iron separators to take up the wear. It was soon found that the inclined guard rail was so flexible that it concentrated the pressure on bolts, causing frequent breakages. When the bolts held the wheels were allowed to side slip between the bolts, due to the flexibility of the guard rail, and much corrugation was so caused. This guard rail has been replaced by another of the same section as the running rail, having one flange sheared off, and the adjustable separators were replaced by a one-piece separator to give the correct flangeway. The gage has been widened from 4 ft. 8½ in. to 4 ft. 8¾ in. for curves between 200 ft. and 500 ft. and to 4 ft. 9 in. for curves less than 200 ft. radius.

The first 100 lb. A. S. C. E. rails were manufactured by the bessemer process of the following composition: Carbon, 0.58 to 0.63 per cent; manganese, 1 to 1.10 per cent; phosphorus, 0.09 per cent; sulphur, 0.05 per cent; silicon, 0.07 per cent. However, the specifications were gradually changed to higher carbon rails to get better wear. At present the company specifies carbon 0.75 to 0.90 per cent with an average of not less than 0.90 and manganese 0.60 to 0.90 per cent. Since 1909 the side of the rail head has been sloped to conform more closely to the shape of the wheel. Thus the vertical wear has been slightly increased and the horizontal wear decreased, thereby increasing the life of the rail. A comparison of the life of the rails and tonnage passing over a curve, which has a radius of 220 ft. and a grade of 1.15 per cent down and over which the average speed is 18 m.p.h., shows that in comparing bessemer and open hearth rails the wear is about 1 to 2 in favor of open hearth. The ratio of wear of manganese to bessemer is 1 to 9 and the ratio of wear of manganese to open hearth is 1 to 4½. The soft bessemer rails have proved more liable to corrugation than the harder rails. The manganese rail was satisfactory except that, like all other rails, it was liable to corrugate. Manganese rails are being used on most of the important curves with somewhat varying results, but the company believes that it pays to use manganese if the price is not too high, because less renewals are required.

Switches have been reinforced and the high speed switches lengthened from 16 ft. 6 in. to 24 ft. Where the former bessemer switch point gave a service of three weeks, cast manganese gives about thirty weeks, and in frogs and crossings about five times that of bessemer. Rolled manganese stock rails help greatly to increase the life of the switch points and are in general use.

The ballast in front of stations is renewed about every two years at express stations and every five years at local stations. Few ties have been renewed except at switches and on curves where they have split, due to frequent rail renewals, also where they were decayed due to dry rot. In making the renewals one rail is removed and new ties complete are installed for a rail length.

Screw spikes have not been used much because of the changes they would require and also because of the difficulty they would involve in making rapid renewals of rails.

Railway Electrical Engineers' Convention

Electric Headlights and Electrification Were Among the Subjects Discussed

The seventh annual convention of the Association of Railway Electrical Engineers opened at the Hotel LaSalle, Chicago, with a reception and dance on the evening of Oct. 26. Electrical manufacturers made exhibits in thirty-five booths and in the hotel ballroom. On Tuesday morning the first regular session was opened by President C. R. Gilman, Chicago, Milwaukee & St. Paul Railroad, who reviewed the history of the association and referred with pride to the work accomplished by it since it was formed six years ago. Following his address, Secretary J. A. Andreucetti, Chicago & Northwestern Railway, reported the association in a flourishing condition with a membership exceeding 500.

Reports of the committees on loose-leaf binders for filing specifications on reciprocal relations, and on specifications for wire crossings were brief and indicated progress. The report of the committee on data and information consisted of a tabulation of car-lighting statistics, shop and station equipment and motors for traveling cranes. On the latter topic the committee reported a chaotic condition in the matter of motor sizes, and this will probably be a subject for standardization during the coming year.

On Wednesday morning the report of the committee on standards was received and was followed by the report of the committee on electric headlights. The latter report discussed types of machine, location of generator, voltage adjustment, cab lamps, reflectors, wiring and repair parts. On the question of incandescent headlights, it was stated that while all railroads have been experimenting for some time with Mazda, tungsten and nitrogen lamps for headlights, there was none on the market with a concentrated filament, high candle-power and sufficiently long life to justify its use. The committee, however, was of the opinion that such a lamp would be produced within the next few months, as many manufacturers are now working along that line. It was predicted that when these lamps were a commercial article, the arc lamp would be a relic of the past on engines, as well as for shop and yard lighting. The report also called attention to the battery headlights which are being used with good results on the Southern Pacific Railroad. These lamps are 140-cp nitrogen-filled tungstens and require 13 amp at 6 volts.

At the Wednesday afternoon session the committee on industrial trucks recommended a standard capacity, a standard speed, a standard for tires and wheel sizes and a standard potential of 24 volts for general industrial truck service.

REPORT ON ELECTRIC TRACTION

This was followed by the report of the committee on electric traction, which was a description of existing railroad electrifications. This report was of a preliminary nature and further data, particularly as to operating costs, will be supplied in subsequent reports. Among the topics covered this year was a review of the different electric traction systems, including low-voltage and high-voltage direct current and the three different types of alternating-current systems. Regarding the choice of system, the committee states that it will depend on the extent of electrification, character of traffic and local conditions, but that it will be principally an engineering determination. The report also discusses the reasons for electrification, and the benefits to be derived from the electrification.

Upon the question of electrification of single-track roads the report states that it is a demonstrable fact that more traffic can be handled electrically than by steam on account of the facility of train movement and that it is possible to maintain higher schedule speeds without increasing the maximum speed. It can be shown in the case of a single-track road operating at full capacity, that electrification will enable it to handle additional traffic, thus postponing double tracking. The fixed charges saved on the cost of double tracking for this period may properly be credited to the electrification annual expense in calculating the economics. Other points of interest discussed included the electrification of passenger and freight yards, the sources of power supply, the construction costs and annual expense, locomotive maintenance and the economics of electric traction.

The Wednesday afternoon session closed with a report of the committee on wire specifications which was devoted to improving this association's specifications to make them conform with latest engineering practice.

New National City Bank Publication

The National City Bank of New York has this month begun the publication of a magazine called *The Americas* in the hope of bringing the business men of the United States and South America closer together and providing an instrument for the interchange of ideas regarding the aims and projects of Pan-American commerce. The October issue contains articles on the following subjects: "The Opportunities and Responsibilities of Trade Expansion," by Frank A. Vanderlip, president National City Bank; "A Message from the Argentine Republic," by Enrique Carbo, minister of finance; "The Government Work for Trade Expansion," by William C. Redfield, Secretary of Commerce; "Advantages of Direct Foreign Exchange," by John E. Garden, vice-president National City Bank, and miscellaneous articles regarding the new South American branches of the National City Bank, trade and finanical conditions and requirements in South America and also South American traveling, shipping rates and general statistics.

The National Associations and the Educational Institutions

In connection with the suggestion made by the committee on public relations of the American Electric Railway Association that lectures should be given in educational centers by leaders in the industry it is interesting to note that the National Electric Light Association has a committee on relations with educational institutions of which John F. Gilchrist, vice-president Commonwealth Edison Company, Chicago, is chairman. This committee has just announced the plan of its work for the coming year and has appointed four sub-committees on lectures, employment of graduates and undergraduates, courses and curriculums, and supplying information to economic departments, respectively. Each of these sub-committees is under the chairmanship of a prominent educator and the vice-chairmanship of a prominent electric lighting company executive. The membership of the sub-committees is made up of men conspicuously identified with lighting and educational interests.

The Peoria (Ill.) Railway has been appealing to the public and especially to lady passengers to observe carefully the right and the wrong ways of leaving a car. An advertisement is being carried in the Peoria papers showing two women leaving a car, one of whom steps in the direction the car is moving and alights in safety, while the second woman steps in the opposite direction to the motion of the car and falls into the street.

Signal Maintenance on the New York Subway

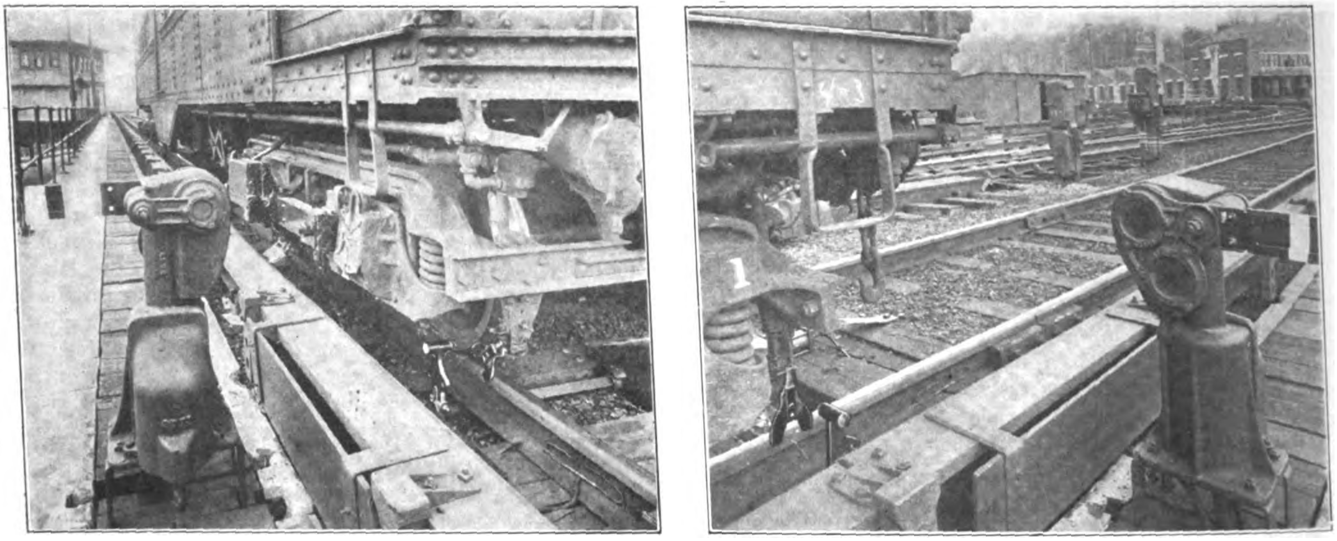
The Methods and Organization of the Signal Maintenance Department of This High-Speed Rapid Transit Line are Described in Detail and Statistics Covering the Number of Signal Failures on the Line are Given

The automatic block signals on the New York Subway, which is operated by the Interborough Rapid Transit Company, undoubtedly exercise a more potent influence on traffic than those of any other railway system in the world. A practically unlimited number of additional trains could be filled with passengers if they could be operated upon the line, but there is no possibility for the installation of additional tracks. In consequence, an extraordinary premium is placed upon any means whereby traffic can be accelerated, and the subway is now handling actually twice the traffic for which it was originally designed. The large part that signals have played in accomplishing this result may be judged by the fact that the rush-hour train headway has been reduced from 124 seconds to 100 seconds. In addition it should be noted that since the subway was built more than 2,000,000,000 passengers have been carried without a single serious collision between trains.

The signal installation by which this extraordinary result has been accomplished consists of 1233 automatic block signals, of which the majority are of the light-signal type owing to the fact that they are installed in the covered section of the subway tube. In addition there are 561 automatic stops of the mechanical trip type, one of these being placed at every main-line signal mast. All of these signals are controlled by a single-rail-return track-circuit system which was installed in 1903 by the Union Switch & Signal Company. Naturally the organization by which this apparatus is maintained is of unusual importance, especially in view of the fact that on account of the short headway any delay causes a blockade of serious proportions.

In general the signal department is made up of two organizations that report to the signal engineer, J. M. Waldron, one of them having to do only with the construction of new work and the other being responsible for the maintenance and operation of all signals, automatic stops, transformers, motor-generators, storage batteries, air compressors, signal wiring and interlocking plants that are actually installed. The interlocking plants are an important feature in the general scheme of operation, as they are located not only at points where shifting movements normally take place, but also at several points along the line where crossovers are installed to provide for emergencies that require trains to be turned back before reaching a terminal.

All maintenance work is carried on by employees classed as signal maintainers and helpers, the line being divided into a series of sections, on each of which at least one man is stationed during every hour of the day. On each section is provided a cabin for the signal maintainer in charge, and these cabins are generally located at interlocking plants so that the maintainers can operate the interlocking machines in case of blockades. The cabins are usually placed on the station platforms giving the signal maintainers ready opportunity to consult with motormen of passing trains, so that they can be called upon to do emergency repair work upon any part of the subway equipment should occasion demand it.



NEW YORK SUBWAY SIGNALS—VIEW OF DWARF SIGNAL AND AUTOMATIC STOP, SHOWING AIR-BRAKE VALVE ON TRUCK BEFORE AND AFTER RUNNING BY TRACK-TRIP

METHODS OF INSPECTION

The inspections of each section by the signal maintainers to whom it is assigned are not made at any set intervals, owing to the fact that the amount of attention required at different points varies from day to day; but, in general, all apparatus is inspected at least once in every twenty-four hours. Some of the signals are, however, regularly inspected twice daily, and the prevalence of iron dust, the difficulty of pumping sewage and the requirements of track maintenance may even involve practically continuous attention to certain signals or to a certain part of the section for several days at a time. Stuck signal relays, which prevent a signal from clearing after the train which has set it has left the block, are of rare occurrence. However, the rule is in force that, in automatic territory whenever a stop signal is encountered, the train may proceed under control after a wait of one minute. In such cases the automatic stop, which would normally prevent the passage of a train, is held in clear position by the conductor, who is provided with a special key for unlocking the stop, and the train is thus enabled to pass it. After "keying by" a stop signal, if the next signal is found to show that the track ahead is clear, it is obvious that the signal passed has displayed an improper indication. In such cases the motorman gives a whistle signal when he comes into the next station where there is a signal maintainer. The signal maintainer upon receipt of the whistle signal goes back along the track until he finds the signal that is in bad order.

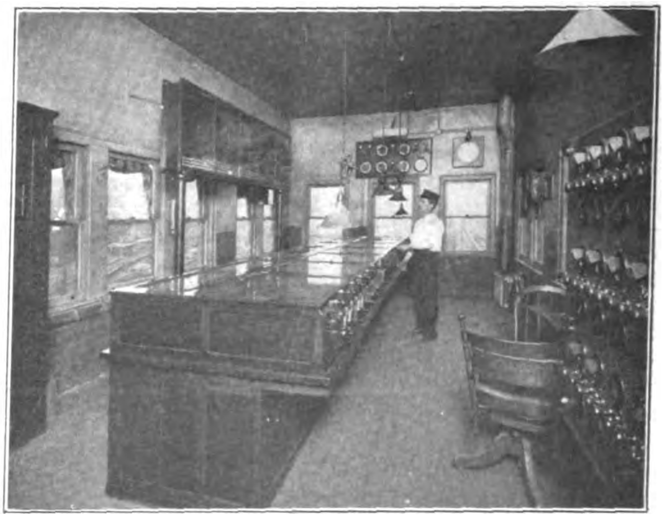
As an example of the results that can be obtained by the continual application of this close attention to the maintenance of the signals a statement of signal failures on the subway is reproduced in Table 1.

TABLE I—SIGNAL FAILURE RECORD ON NEW YORK SUBWAY

	1911-1912	1912-1913
Number of signals	1,212	1,233
Number of stops	552	561
Total	1,764	1,794
Total number of signal failures	273	173
Total number of stop failures	240	163
Total mechanism failures	513	336
Total number of signal movements	109,504,253	124,333,070
Total number of stop movements	66,683,176	70,800,273
Number of signal movements per signal failure	401,115	718,688
Number of stop movements per stop failure	277,846	434,357
Number of failures per signal per year	0.225	0.140
Number of failures per stop per year	0.435	0.291
Number of failures per mechanism per year	0.284	0.186

By this is shown that a large decrease in the number of failures of signal apparatus characterized the year 1912-1913, the fiscal year of the Interborough Rapid Transit beginning July 1 and ending June 30 of the following year. This large decrease was principally due to the work of fire protection which had been done on the signal system during the year 1911-1912. The record of over 700,000 signal movements per signal failure undoubtedly establishes a high record even for lines where intensive traffic is carried on. In the table the term "signal failure" is used in its broadest sense and is understood to mean any stoppage of a train for reasons other than that of a train in the block beyond. Cases of outside interference, such as where a bundle of newspapers is dropped from a passing train upon a track trip, and where motormen improperly report a signal out of order are, of course, not included.

NEW YORK SUBWAY SIGNALS—TRAIN STOPPED BY MAIN-LINE SIGNAL, TRACK-TRIP AT STOP IN FOREGROUND



NEW YORK SUBWAY SIGNALS—INTERIOR OF TYPICAL INTERLOCKING TOWER

An analysis of the signal failures occurring during the year 1912-1913 is also published in Table II. This divides the failures into various classes of defects and shows the number of each kind of failure that occurred during each of the twelve calendar months. It will be seen that only two of the signal failures occurring during the year were due to unknown causes. The five cases of signal failures charged to "broken or defective grid resistances" were due to defects in the resistance which is installed in series with the track relays in order to prevent the return propulsion current from passing through the relay and thus burning it out. This is necessitated by the fact that the installation is of the single insulated rail type in which the operation of the signals and the compressed-air valves for the switches and interlockers is effected by d.c. relays, the alternating current being used only for controlling the track relays and for the signal lights. The solenoid signals referred to in the table are of a home-made type in which the usual slot coil is replaced by a solenoid that operates the semaphore blade directly.

ARRANGEMENT OF MAINTENANCE FORCE

As mentioned before, each section is inspected complete every day, but as the main-line sections are ap-

TABLE II—CLASSIFICATION OF SIGNAL FAILURES FOR 1912-13, NEW YORK SUBWAY

Cause of Failure	July	August	September	October	November	December	January	February	March	April	May	June	Total
Scale on insulating joint	3	4	2	4	..	..	4	2	2	3	2	6	32
Defective insulating point	..	3	1	1	1	2	2	..	1	2	3	..	16
Broken boot leg wire	..	1	1	2	..	1	..	2	..	..	1	..	8
Blown or defective transformer or track fuse	1	5	1	4	2	2	2	3	2	3	2	1	28
Broken or defective grid resistance	1	..	..	..	1	..	..	1	..	..	2	..	5
Defective d. c. relay	..	3	..	..	..	..	..	..	1	..	..	..	4
Short circuit of track circuits	3	1	1	2	4	3	1	1	1	..	1	..	18
Short circuit of wires	1	..	..	..	1	..	..	..	..	..	..	..	2
Defective or open wires, broken at terminal	1	..	..	..	3	1	..	1	..	..	..	..	6
Defective track leads	..	..	1	..	..	1	..	2	..	..	..	..	4
Trouble on a. c. mains	..	..	..	..	1	..	..	..	..	2	..	..	3
Cause unknown	..	..	..	..	..	..	1	..	1	..	..	..	2
Defective dash pot	..	..	..	..	..	1	..	..	..	..	..	..	1
Broken rail	1	..	..	..	..	..	..	..	..	..	..	..	1
Cold weather, freezing	..	..	..	..	..	..	1	..	..	..	..	..	1
Defective circuit breaker on solenoid signal	..	..	1	1	1	..	..	..	..	..	..	..	3
Blown or defective fuse on solenoid signal	1	..	1	..	..	..	..	..	..	..	..	..	2
Third-rail short-circuit	..	1	..	1	..	2	1	..	..	..	..	..	5
Lights out due to open circuit	1	..	..	..	..	..	1	..	..	..	..	..	2
Defective spring on interlocking machine	..	..	..	..	..	..	..	..	2	..	..	..	2
Defective a. c. relay	..	..	..	1	1	1	..	1	1	2	..	..	7
Defective circuit breaker on signal	..	..	..	..	..	..	..	1	2	..	..	..	3
Defective circuit contact on switch point	3	2	..	..	1	..	2	1	..	1	..	..	10
Defective or burnt out transformer	1	..	1	..	..	1	1	1	1	2	..	..	8
Total	17	20	9	17	16	14	16	16	14	14	13	7	173

proximately 1½ miles in length the difficulties of transportation are negligible. The section length of 1½ miles is maintained quite closely except in the case of certain complicated places, such as the terminals and at the points of diverging routes like the Ninety-sixth Street junction. The number of signals in each section varies approximately between forty and eighty with about half as many automatic stops, and under normal conditions three signal maintainers keep in repair all of the apparatus on each section. These three signal men, however, work in three ten-hour shifts, the attention to signals, therefore, being continuous. The ten-hour shifts are so arranged that the overlap comes during the early morning hours, because all of the heavy work is done between 1 a. m. and 7 a. m., this being the only period when the traffic is relatively light, the train headway on the local tracks being increased to 7½ minutes during this period.

At the points where interlocking plants are kept normally in continuous operation and where there are air compressors, storage batteries and transformers, each signal maintainer is provided with a helper, and it is from this force of helpers that the signal maintainers are developed. Owing to the fact that the main-line sections are of an approximately constant length and are arranged almost regardless of the number of signals, certain of the sections are considerably easier to maintain than others. On the easy sections the less experienced men are placed and they are advanced to the more difficult positions as their experience becomes extended. Ordinarily, the helpers serve in that position for about two years, after which time they are generally capable of maintaining some of the easier sections. In general, the force of helpers is recruited from construction gangs, as a certain amount of construction work is being carried on all the time.

The signal maintainers do no actual repair work to damaged parts of signal apparatus, the replacement method of field work being carried out in all cases and the maintainer being required only to make the necessary replacements and adjustments. Practically all repairs to damaged apparatus are made at a central repair shop that is located at one end of the line. Here three repair men are employed continually in rewinding coils and in doing other heavy repair work on apparatus that has been sent to the shop. In addition an extra signal maintainer is kept at work in the repair shop during normal conditions so that in case of the failure of any one of the regular signal maintainers to report for duty the spare man can be called upon to take the temporary vacancy. Practically no repair work has to be sent to the signal manufacturers, and, as shown by the number of repair shop men employed in proportion to the number of signals and automatic stops that are maintained, the repair work is normally very light.

No lightning damage has been experienced even in the case of the outlying sections of the subway that run upon an elevated structure. This unusual condition is ascribed to the fact that an iron fence is run along the entire length of the elevated structure and is grounded to the steel framing.

A plan has been formed to construct new carshops in south Russia, and negotiations are going on for the organization of a stock company. The originator of the plan is said to be a well-known banker and manufacturer. It has been reported that the manager of the Compagnie Centrale de Construction Haine-St. Pierre, the largest car and locomotive works in Belgium, has gone to south Russia to determine the location of the proposed works.

COMMUNICATIONS

Operation Without Train Orders

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION
DALLAS, TEX., Oct. 10, 1914.

To the Editors:

Referring to the article in the Oct. 3 issue of the ELECTRIC RAILWAY JOURNAL entitled "A New Method of Traffic Acceleration" and to your editorial on the same subject, the writer operated one of the early interurbans twenty years ago and introduced somewhat the same plan as that used by the Scranton & Binghamton railroad. On this line the question of operating under signals or under train orders was discussed, and while the signals of that time were rather crude, cumbersome and somewhat unreliable, they seemed, in conjunction with the time-card and a delay-time-limit, strictly enforced, to be able to eliminate a great deal of waste time, and would also tend to increase vigilance and accuracy on the part of the trainmen.

The interurban road was about 15 miles long, and very often it ran trains of two cars, having at times heavy rush traffic. It was divided into six signal sections, approximately equal in length, but some allowance was made on certain sections for the delaying action of curves and grades and the sections were really divided more by a question of time than by exact distance. The trainmen were made to equip themselves with standard watches, which were inspected weekly and compared with a standard clock at the starting point at the office on every trip, and they were thoroughly trained in the observance of the delay-time-limit principle.

The practice was that a car, on time at a regular passing point, waited for a scheduled meet for the length of time that it would take the opposing car to run from the turnout in advance. It then started on its way with caution, that is to say, at danger points, such as curves or where the meeting car could not be seen at a fair distance, the car was brought under control for immediate stop. Signals were accepted at their face value and the signal system was so arranged that any failure on its part to act resulted in a caution indication. No stop signal was instituted, the signals showed either that the block was certainly clear in front or that it supposedly was not. In the former case the signal governed, in the latter case the delay-time-limit governed.

Where a car broke down between turnouts, say centrally between them, there was a certain amount of delay, but as each car on both sides of that broken-down car followed the same rules, the final result was that they soon came up on each side of it, transferred their passengers around it and from it and returned on the schedule time of the next, or succeeding car.

Every car or train going over the road had its train number and each motorman was daily furnished with a group of printed cards giving the scheduled time of arrival and departure, at termini and at each turnout, of every car or train on the schedule for the day, and in case of a break-down certain of the interurban cars would temporarily lose their train place so far as the schedule was concerned. Every car had on the front of it, on the left side, a plate carrying its train number for the day, the plate being illuminated at night. On regular schedule, with no accidents or delays, every motorman knew the number of the train that should meet him at each turnout, and the instructions to motormen were that, when they met with a car or train carrying some other train number than that which should be at the turnout under normal schedule, immediate inquiry should be made and information given by the other car crew as to the reason for this. This tended to make the man who was on schedule time more careful, as he was then informed that the regular schedule was broken and that extra caution was necessary and, also, that extra exertion was desired so that the regular schedule might be again resumed as quickly as possible.

These orders and operations, in conjunction with the block signals, allowed the road to be operated at what was, at that time, a very high speed, that is to say, with some six or eight stops the cars averaged over 30 m.p.h. with some heavy grades and some curves of small radius. During one year's operation of this road, with very heavy traffic, there was only one collision, and that was caused by absolute wilful disregard of the rules.

It is surprising even on a road of considerable length and many passing points, how soon the trainmen become habituated to the system if proper supervision is given and the watches strictly checked. There is also an astonishing amount of time saved by this system over that of train orders, especially on rush days. The writer has, since that time, operated roads under the dispatcher system simply because that system had been installed from the beginning, everyone was used to it and it seemed unwise or undesirable to change it. But in starting to operate a new road of this character it should most decidedly be operated entirely by block signals and proper delay and cautionary rules. With the same check and supervision given to each one, the chances of accident are greater with the dispatcher system than with the other, and there is very much less delay and a better opportunity to straighten out the schedule when it becomes temporarily disorganized.

It may be that, under the best arrangement of the block system, more turnouts will be necessary than with the dispatcher system, but this is a matter in which the original cost and maintenance may be definitely fixed and known, whereas the added risk and the delay consequent upon the dispatcher system is an unknown quantity. There may, also, be interurban lines so situated that they are compelled to depend upon individual dispatching, but in a trip made a few years ago over most of the high-speed electric interurban roads in the country, with this particular point in view among others, the conclusion of the writer was that there was not one of all the roads visited in which schedule and safety could not be bettered by abolishing the dispatcher, as a dispatcher, and leaving him merely as a "trouble man" who could be communicated with at every turnout but who, except under extraordinary conditions —provided for in the rules—would not interfere with the movements of the cars, or with the schedule for the day.

It should be said that only a very few rules are needed to cover such a system for the reason that these rules need only govern the contingencies. Once the men are trained into the principle of the system, ordinary operation goes on like clockwork and the new men absorb the idea, by practice, in a very short time. It is being more and more appreciated that the human element is a vital factor in producing both safety of operation and perfection of schedule, and that the nearer the trainmen approach the condition of automatons or dummies the less the good results, as a whole. While, under the signal and delay-time-limit system there are rigid rules that are concerned mostly with absolute safety of operation, yet the matter of maintenance and resumption of schedule after delay or accident is largely in the hands of the trainmen.

The writer has not given this matter much attention the last few years and really was not aware that so little had been done in the line which the Scranton & Binghamton has taken up. He is not very well acquainted with the latest modern systems of block signaling, but from what he has read and observed it should certainly be much more easy and more safe to operate at this time with the improved and more reliable signal systems, than it was twenty years ago with the rather crude and imperfect systems that were then in use.

H. S. COOPER.

ILLINOIS TRACTION SYSTEM

SPRINGFIELD, ILL., Oct. 10, 1914.

To the Editors:

We have read your description of train operation on the Scranton & Binghamton Railroad and your editorial commenting on it in the issue of Oct. 3. This is particularly of interest because we have 175 miles of interurban equipped with track-circuit-controlled automatic block signals of the semaphore type.

We note that movements of trains on the Scranton & Binghamton road are governed entirely by signal indications, and that trains are operated regardless of time-card meeting points and are not under the jurisdiction or handling of a train dispatcher. You have evidently given but a small part of the requirements or duties of the train crews or the method of operation. What happens when a signal or signals are not in operative condition? It appears to me that, in the absence of a train dispatcher, this would create a situation of too much importance to be covered by operating rules or left to the judgment of the trainmen. We note that sidings average 1 mile apart, which requires an approximate running time of three minutes from one to the other, and that there cannot be delay of more than three minutes to any train.

We admire block signals not only for the increased safety they afford but, in addition to this, for the increased confidence which they give to the trainmen, especially in bad weather. In consequence, we think that you are unduly severe when you state that block signals hinder rather than accelerate interurban high-speed traffic and that they comprise merely a safeguard superimposed upon the structure of operating rules. We operate hourly service through signaled territory and we are very frank in saying that the installation of the signals did not in any way hinder operation. On the contrary, we feel that operation has been helped and that it is easier to keep our trains on time since the installation of the signals. In connection with this, however, it should be said that the performance of our block signal is practically perfect, showing a percentage of 99.97 perfect operation. We note your query whether high-speed interurban roads can take full advantage of signal equipment unless they accept signal indications at their face value and run on signals rather than orders, but we are not able to see how the high-speed interurban lines of the north central states, which are now equipped with signals, could operate in the manner which you suggest. The procedure involved in changing the method of operation to provide for the acceptance of signal indications at their face value so that trains can proceed in accordance with signal indications regardless of time-card meeting points is a situation confronted by many physical obstacles on our property and also, I think, on every other high-speed interurban line in the Central States.

Some of the things which I believe absolutely necessary of attainment before this method of operation could ever be considered for our lines include the following: The continuous track circuit would have to be extended from one end of the road to the other, exceptionally thorough inspection of the signal system would be necessary, siding locations would have to be adjusted, time-card would have to be laid out for the new scheme of operation, and trainmen would have to be educated and trained with that end in view.

Not being familiar with all of the existing operating rules of the Scranton & Binghamton Railroad we do not feel capable of making a statement as to the success or failure of the operation of that road on signals alone, yet we do feel that, after all of the things that have above been enumerated have been done, we would not want to undertake the operation of our road through its signaled territory depending on the signals alone to govern the movement of trains. We believe that we would prefer to give the train movements close supervision, provide the best of inspection for equipment, and control the movement of the trains by train dispatcher rather than to undertake and be responsible for operations depending wholly upon block signals. We are basing our opinion in this regard upon the fact that automatic signals have been known to give clear indications when they should give stop indications, and, with service as frequent as every fifteen minutes and trains operating under block signal control, you can readily see what a false clear indication would mean. You can also see what a bad order signal would mean without telephone communication or control of movement by train dispatcher.

Please understand we are not criticising the operation of the Scranton & Binghamton Railroad as a railroad. We are taking exception only to your statement that high-speed interurban roads should take advantage of signal equipment by running their trains under signal control alone, and in doing this we are giving our opinions so that more may be brought out about the real operation of this road which is depending entirely upon its signals for train movements.

C. F. HANDSHY, Assistant General Manager.

Insert Special Work Failures

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Oct. 16, 1914.

To the Editors:

In reading the various articles that have appeared in the ELECTRIC RAILWAY JOURNAL on the subject of insert special work it has seemed to me that what I might write would be simply a repetition to a considerable extent of what has already been written, and a good many of the points discussed are what engineers, or at least some of them, have known for some time. On the other hand, to further this work, I want to add these remarks:

Concerning insert special work, I believe that the construction giving the longest life is that having the machined bed as a bearing. I find that spelter eventually will come out, although I have some frogs that have been in service for seven or eight years where the spelter has come out around the sides but the insert is not yet loose. Of course at these points the traffic has not been as heavy nor the wheelage as great as it has at some other points. The completely machined-fit, bolted-down type appears to be giving the best service and the longest life.

It is folly to expect that any kind of an insert will last forever. The raising of flangeways, for instance, I do not think is going to increase indefinitely the life of a frog or a mate, but I think it is a step toward lengthening the life. All of the photographs that have appeared in the articles showing the floors of frogs and mates cut down by flangewear, are simply the result of natural wear, since these flanges riding on the throatway floors will evidently wear out the material, no matter what it is. On the other hand, I believe we are getting better manganese from the manufacturers now than we did a few years ago. They have learned about the manufacture of this material as well as the engineers have about the use of it.

The cause of inserts becoming loose, I believe, is nothing more nor less than the rolling of the wheels over these inserts. Inasmuch as they are not a part of the casting, the vibration and the impact, due to the wheels, gradually loosens the insert from the material which is holding it in place. The nearer you can bind the insert to the casting itself, or approach making the insert a part of the casting by providing machined bearings and bolts which transmit the stress through the bearings, the better will this insert resist impact and remain firm. Whether or not a solid manganese piece is warranted, I believe depends upon the special conditions of traffic in any given city. I do not believe that with us the expenditure is warranted, but in other cities with more frequent service and greater wheelage, it might be found to be economical to use solid manganese frogs and mates.

With reference to the loose arms in cast-iron bound work, some manufacturers, I believe, make the rail arm in the casting too short. On the other hand, if the joint at the end of the arm hasn't the proper support, it is liable to break. I have never had a frog arm break outside of the casting, but I have had a good many of them come loose in the casting. This leads me to believe that the bond between the rail and the casting is not what it should be. Moreover, we cannot always get first-class joints at the end of the arm in special work, any more than we can at other places, so that a certain factor of safety must be added to the grip area to improve the bond for these contingencies.

L. A. MITCHELL, Superintendent of Roadway.

Effect of Car Wheel Diameter on Motors

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY
LEWISTON, MAINE, Oct. 9, 1914.

To the Editors:

I have read with interest the article by H. J. Parks in the ELECTRIC RAILWAY JOURNAL of Oct. 3, 1914, on the "Effect of Car Wheel Diameter on Motors," but do not fully agree with him regarding this effect. As the speed of a railway motor is governed by the load it is carrying, I do not believe that the difference of ¼ in. in the diameter of the wheels on a two or four-motor equipment will make any material difference in the load on the motors. I have made numerous tests in the past few years and have failed to find any difference in the temperature of the motors operating on axles with different size wheels.

With cars on which cast-iron wheels are used, it frequently becomes necessary to change a pair of wheels which are not entirely worn out; and if new wheels are installed the difference in diameter is sure to be ½ in. or more. In these cases I have made tests with the results stated. I have had under my observation cars operating with steel wheels with 33-in. diameter when new. It became necessary to change one pair of these wheels on account of flange wear when the diameter was reduced to 32¼ in. A new pair of wheels was installed, but careful tests failed to show any noticeable difference in the temperature of the motors. I have also had installed under the same conditions turned wheels which were 1⅛ in. smaller than the other three pair, and I still failed to find any difference in the temperature of motors. I do not, however, recommend operating wheels with such a difference in diameter.

When making these tests the motors on several cars operating under the same conditions should be tested in order to make a fair comparison, as many complications might arise to cause the overheating of a particular motor or set of motors. I should like very much to hear from other experienced men on this subject, as I believe it is a benefit to exchange ideas.

C. H. NOTTAGE, Master Mechanic.

OHIO ELECTRIC RAILWAY
COLUMBUS, OHIO, Oct. 10, 1914.

To the Editors:

I feel that I must challenge the statement of brother Parks from East St. Louis in your Oct. 3 issue, page 623, where he writes that a difference of ¼ in. in the diameter of his car wheels caused two armatures to burn out.

I do not question the sincerity of Mr. Parks nor the accuracy of his statement of fact, but I cannot agree with his conclusions. It is possible that this is a typographical error and that 1¼ in. was meant, in which case I would be inclined to think Mr. Parks had some grounds for his belief that this was the cause of the burn-outs.

This question of the effect of different diameters of wheels on motor load has been one of great interest to me for some years, and I have been hoping for some time that someone would come forward with a demonstration. That a difference in the diameter of the wheels on the same car will cause unequal loading of the motors is an accepted fact, but just how much this is I have never been able to find out. I have even appealed to the experts of one of the best-known companies making railway motors and equipment for a solution of this problem, but received only an evasive answer.

On the property that I represent it is a rule to keep the diameter of wheels on any car within 1 in. of each other, but cases have been known where we have found wheels differing as much as 2 in. In one particular case a careful test of temperature rise was made on motors on a car with wheels differing by more than 2 in. While a difference of temperature rise was shown, the expert making the test could not say how much of this was due to the difference in diameter and how much to other causes, such as different ventilation, etc.

Mr. Parks does not give the diameter of the wheels used, so that it is impossible to compute the percentage of difference, but assuming that his wheels were only 30 in. in diameter, which is about the limit for city cars, we would get for ¼ in. a difference of 0.8 per cent in diameter, which I cannot by any stretch of imagination conceive as the cause of the armature burn-outs.

There is one fact that possibly may not be well known in this connection, namely, that on interurban cars, or cars that run at fair speed, the rear motor of a four-motor equipment will always show the greatest temperature rise. For this reason, if it is necessary to use wheels of different diameters, the longer wheels should be placed in the front end of car and the small ones at the rear so that the motor doing the most work will have the best ventilation.

This subject is of great interest to me and I believe that a practical solution would be of great value, since if we know about what the effect of different diameters is we will be in position to decide how much expense will be justified in keeping the diameters of wheels within certain limits.

This communication has not been written in a spirit of criticism, but rather in the hope that it will bring out discussion and further facts.

F. J. FOOTE, Master Mechanic.

ASSOCIATION NEWS

PUBLIC SERVICE COMPANY SECTION MEETING

At the meeting of the Public Service Company Section of the association, held in Newark, N. J., on Oct. 29, papers were delivered by W. J. Clark, manager heavy traction department General Electric Company, and Martin Schreiber, engineer maintenance of way Public Service Railway. Mr. Clark spoke on "European Public Utility Conditions" and gave a wealth of data showing the comparative results of public and private operation and ownership of utilities in Europe and the United States. His paper was illustrated with numerous charts projected on the screen. Mr. Schreiber described in considerable detail, with the aid of lantern slides, the plans of the Newark terminal, now under construction. He traced the development of the enterprise from its inception less than two years ago and concluded by showing interesting progress pictures of construction. He stated that at the present time a considerable proportion of the caissons for the column footings have been sunk. The operation of sinking the caissons was explained with the aid of a diagram prepared especially for the purpose and adding materially to the value of the paper.

After the addresses the annual election of officers of the section was held and the following were unanimously elected: President, P. F. Maguire, chief clerk maintenance of way department; vice-president, W. R. Ricker, shop foreman mechanical department; secretary, A. T. Warner, traffic investigator transportation department; treasurer, D. H. Roszel, division engineer engineering department; director (one-year term), Thomas Leahey, general foreman distribution department; director (two-year term), George L. Walsh, claim agent Passaic division.

DENVER TRAMWAY COMPANY SECTION NOTES

The Denver Tramway Company Section is now entering upon its third year of work, having been organized Sept. 19, 1912, with a charter membership of forty-eight. The meetings are held in a fine auditorium with a seating capacity of 500, provided by the company at the company's building in Denver.

The opening meeting of the current year was mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 10. At this meeting, which was devoted to safety matters, the value of section work was illustrated most effectively. The section first heard an account of the safety work of the Union Pacific Railroad. It was learned that during the preceding two years 3000 recommendations were received by the safety bureau of that company from employees, and 90 per cent of these recommendations were acted upon favorably. The discussion of local problems under the lead of Vice-President John A. Beeler brought out clearly how strenuously the Tramway Company is endeavoring to reduce the number of accidents. An effort was made to connect the accident efficiency of the men with their coasting records, recording fare-register records, etc., but it was found that valuable as these and other mechanical devices are the personal element remains the controlling factor. Mr. Beeler said that the Denver Tramway was the first company in the United States to adopt the center-entrance car and was one of the first to adopt the automotoneer, the straight air brake with emergency feature and other devices. He pointed out a record on one line of 54,000 car-miles per accident, including those of the most trivial character, and stated that a record of 100,000 car-miles would soon be reached. He also showed how proper training with the coasting recorder can produce remarkable results. H. G. Munkhenk is the secretary of the section.

among the employees when more than 10 per cent of the whole; the location, construction and sanitary condition of the plant; the provisions and equipment for treating accidents and illness at the plant; the examinations given to an employee before and after beginning service, the amount of welfare work done, the average salary per year, the proportion of employees having a yearly vacation with continuance of salary during that time, the working hours, the maximum and minimum ages of employees, and special hazards in the business.

OTHER SYSTEMS

The group insurance plan has also been adopted by the Aetna Life Insurance Company, the New York Life Insurance Company, the Metropolitan Life Insurance Company and the Connecticut General Life Insurance Company. The activities of these companies have been entirely along industrial lines, however, no policies being written for electric railways. Hence what provisions these companies would make for group insurance on electric railways could only be determined by an examination of individual groups.

Objections to Government Ownership

Address by W. J. Clark Before New England Street Railway Club Last Week

Government ownership was the subject of the evening at the regular monthly meeting of the New England Street Railway Club at the American House, Boston, on Oct. 22, the speaker being W. J. Clark, manager of the heavy electric traction department General Electric Company, New York. President John T. Conway occupied the chair and a large and enthusiastic audience listened to the reading of the paper, which is abstracted below:

The greatest possible value which can be derived from electric railway organizations is to so qualify their members that they at all times can intelligently, diplomatically and yet militantly set forth as quasi-public servants and as good citizens the maximums of economic truth on public utility questions. A moral obligation rests upon us to impart to the public the results of our experience obtained in its service. No one can foretell how soon it will become impossible to cause the masses of the people to think straight on public utility issues, until they have later on paid the penalties of government ownership, toward which they have secured a long start through improper leadership and misunderstanding. This agitation is very much alive and presents perhaps the most important economic problem confronting America to-day. The inauguration of public ownership would be an economic calamity to the entire country and to all citizens not so fortunate as to secure highly remunerative positions at public expense. It is most important to avoid establishing a precedent in the realization of this propaganda. Immediate danger confronts the industry, as the executives of two extensive systems have in a preliminary way been forced to cooperate with those favoring municipal ownership, in the working out of plans under which their properties may be taken over by the cities in which they are located. Sooner or later any or all of us may be forced into a like position when we can no longer consistently advise the public as to its real interests. If we do not enlighten the public, a portion at least of the responsibility is ours.

It is the duty of the industry to dispense the gospel of economic truth. There is scarcely a street railway in the country which has not been forced through unjust public pressure to make far greater capital investments, betterments and unprofitable extensions than were ever contemplated. The establishment of a flat 5-cent fare was a financial blunder from which the public has profited enormously. The monetary benefits of street railways to the public cannot be estimated, and these have been reaped without the slightest financial burdens being imposed upon the latter. There are those who would withhold from the companies the benefits of those increases in real estate and similar values which have been created by their operations alone. There is no such thing as an "unearned increment," for every increase in value is produced by human effort.

In every form of public utility effort America surpasses all other countries. Taking into consideration the comparative prices of labor, the initial cost of such facilities and the services rendered, the cost to the public is lower here than anywhere else. Wherever government ownership has been extensively undertaken the results have been unsatisfactory, fundamentally because of legislative methods and practice, which virtually prevent publicly owned enterprises being gaged by the same standards as economically owned undertakings of a similar character. The recent Congressional legislation for government railroads in Alaska exempts the roads from complying with the Interstate Commerce Commission's system of accounts. Experience with state-owned railroads in Pennsylvania and with state-owned canals in New York is most illuminating to the opponent of government ownership, which should be vigorously opposed in the interests of both public and private welfare.

Pamphlet on Needs of Latin-American Countries

A pamphlet giving the statements made by representatives of Latin-American countries at a trade conference with American bankers and business men in Washington recently, has been issued by the Bureau of Foreign and Domestic Commerce and is available for general distribution. The conference was called by the Secretary of State and the Secretary of Commerce to obtain a clear statement of the commercial needs of both the United States and the Latin-American countries and the facilities for co-operation in supplying those needs. The statements made by the Latin-American representatives set forth the conditions in their respective countries and the particulars in which the assistance of interests in the United States is desired. The opening statement by William Jennings Bryan, Secretary of State, and an address by William C. Redfield, Secretary of Commerce, are also included. The pamphlet may be obtained from the superintendent of documents, Government Printing Office, Washington, D. C., for 5 cents.

Dangers of Boycott in England

In England, since the beginning of the war, retaliatory measures have been suggested against local German-owned concerns. Recently, according to *Engineering*, a letter signed by twelve trade unionists in the employ of Siemens Brothers Dynamo Works has been sent to the press calling attention to the fact that 2000 men are engaged at the works, of whom only 4 per cent are foreigners, and not all these are Germans. If, as has been suggested, there should be a boycott of the firm these 2000 men would suffer an immediate loss of work. The town of Stafford would feel the withdrawal of some $500,000 a year now paid in wages, and for this there could be no compensation to be found in migration. The firm of Siemens Brothers, of which the Stafford firm is an off-shoot, was founded in 1847 by William Siemens.

Claim Agents' Papers and Discussions

Abstracts of Papers Presented at the Recent Atlantic City Convention of the American Electric Railway Claims Association, Together with Digests of the Printed Discussions on the Same Topics

The American Electric Railway Claims Association has just released for publication the papers and printed discussions thereon presented at the recent convention in Atlantic City, Oct. 12-16. These are in addition to the running reports of the association proceedings published in the ELECTRIC RAILWAY JOURNAL daily issues of Oct. 14, 15 and 16. Abstracts of these papers and discussions are published below.

LEGAL CONDUCT OF INVESTIGATIONS

BY E. P. WALSH, ATTORNEY UNITED RAILWAYS OF ST. LOUIS, ST. LOUIS, MO.

The foundation for a claim for damages and a suit at law is laid the moment an accident occurs. The foundation for a successful defense, if such is possible, against a claim for damages and a suit at law may also be laid at the same time if the trainmen intelligently and alertly obtain the names of the injured and of witnesses most favorably located to see what actually occurred, and also if the trainmen calmly exercise their powers of observation in order that they may afterwards relate intelligently all details of the accident. The success with which this work is done depends in great measure upon the ability of the employing officer to select proper material for trainmen and upon the instruction and training later given.

Under normal conditions, with the accident reported and the names of witnesses secured, it becomes the task of the claim department to handle the matter in the most efficacious way. If the accident is one where liability is certain, the necessity of speedy adjustment is readily apparent. The greater the delay the more danger there is of an exaggerated idea of the injuries as well as of the demands to be made. Yet from a legal standpoint it is not always safe to urge a speedy settlement for a serious accident, for the courts sometimes inquire carefully into such contracts because of the possibie inability of the injured person to comprehend fully the extent of the injury.

During the necessary interval between injury and settlement, however, whether long or short, the claim department must make an effort to ascertain all pertinent facts in connection with the accident and the injured person, such as the identity of the attending physician and facts concerning the claimant's business, his social and even his religious associations. At the outset a statement should be secured from the claimant as to the physical details of the accident, the extent of the injury itself, the previous suffering of similar or other injuries, prior claims against the company concerned or others, and the carrying of accident or liability insurance. This statement should be signed by the claimant and if possible attested before a notary public. It is desirable in large companies to have directly attached to the claim department several men possessing notary public commissions to do work of this kind.

The claimant should be examined at the earliest possible moment by the company's surgeon. If the claimant's doctor will not extend courtesies of this character or is forbidden to do so by the claimant, there is reason for suspecting the motives of both doctor and patient. The claim department must then try by its own efforts to ascertain the true situation. It is often better to risk a law suit and rely upon the time necessary to bring it to trial as giving opportunity for a more complete investigation. If it has not been possible to secure a medical examination of the claimant prior to the filing of the suit, a request should then be made as early as possible that the court compel the plaintiff to submit to an examination by some disinterested physician appointed by it. From this the defendant can determine whether it is desirable to adjust the claim or proceed with the trial.

As soon as suit is filed the plaintiff's deposition should be taken by a lawyer experienced in damage suits and not by young lawyers recently graduated from school. Depositions taken by the latter frequently contain nothing enlightening, although in importance they are equal, if not superior, to the actual cross-examinations of plaintiffs.

The particular methods the claim agent will pursue rest largely with the individual claim agent and his facilities. Expert investigators, however, should be trained for all branches of the work within the department itself, especially in companies in large cities, because their efforts are more efficacious, if later it is necessary to put them upon the witness stand, than if they were employed by agencies entirely separate from the claim department.

Within a reasonably short time after a serious accident in which a contest is apprehended, the motorman and conductor should be sent to the claim department and a very careful and comprehensive statement should be taken, acknowledged and signed before a notary public. The reported witnesses should be interviewed, their signed statements in writing taken, and, if possible, their affidavits secured. Efforts should be made to ascertain if they know witnesses whose names were not secured by the trainmen, for excellent witnesses for the defense are thus sometimes brought to light.

Employees as witnesses, in their desire to combat the attacks of opposing counsel on cross-examination, are quite likely to undo all the good work accomplished. Hence they should understand that their sole duty is to answer truthfully the questions asked. They should be reasoned with as to speed and distances, for their powers of observation are so undeveloped that if called upon suddenly to explain operating points they cannot do so with any degree of particularity. The lawyer, therefore, should be familiar with the operation of a car and the conditions accompanying the accident, and, in talking to the men before the trial, should be able to elicit from them all the facts and at the same time instill into their minds an ability to relate those facts so that the jurors may have a correct picture of the entire occurrence.

In large cities a police officer is usually present very shortly after an accident occurs and generally secures the names of the witnesses. Written and signed statements should be taken as early as possible from the witnesses whose names appear upon the police report, because this becomes public property and is generally the first source of information consulted by the "ambulance chaser." If the defense anticipates these men, there is some likelihood that a fair and impartial statement will be given.

In cases of apparently fraudulent or exaggerated claims, any sort of espionage that furnishes information as to the claimant's conduct and mode of living is valuable in determining what should be done by way of adjustment, but such espionage to be of value in the trial must be so conducted that its results can be shown to the jury. For instance, a system of photography has been used with splendid results, because at the trial pictures were shown of the claimant actively engaged in business or pleasure at times when his testimony declared him to be in bed or crippled.

The knowledge that a claimant has or has had accident or liability insurance is important as enabling the claim department to ascertain the extent of injury claimed under that policy and also to learn whether or not the company has a history of previous accidents. In this connection the index bureau is one of the most valuable sources of information, and it is to be regretted that all companies have not taken advantage of it.

The adjustment and defense of damage claims are becoming more strenuous propositions every day, as well as more expensive. The work reduces itself to a play of wits between the claimant and the claim agent, and the latter is often made a victim of unscrupulous, malingering fakirs and dishonest lawyers and doctors. A claim agent is hardly to blame if at times in repelling such assaults he meets fire with fire. The adjustment of the claim of the honest claimant is a simple proposition, but the quack, the fraud and the pettifogger cause the real troubles of the claim agent.

DISCUSSION BY MR. HOFFMAN

L. S. Hoffman, general attorney Public Service Railway, Newark, N. J., agreed with Mr. Walsh that the ability of an employee to discover flaws in the foundation of the lawsuit goes back to his selection by the employing officer. At the same time good work can be, and is, accomplished by calling to the attention of employees of average intelligence the great importance of obtaining all possible information before leaving the scene of an accident. It is particularly important to locate the exact spot and, if feasible, to call it to the notice of disinterested witnesses.

In Mr. Hoffman's opinion, the mere fact that the injured party does not comprehend the full extent of his injuries does not prevent the meeting of the minds of the parties so as to make a binding contract. Yet, if a physician employed by the defendant should either mistakenly or wilfully underrate the present extent of the injury, or disparage the future results, there would be ground for setting aside a release. A release would also be set aside where there was a mutual mistake of an actually existing fact, but a mistaken opinion as to the outcome of a known injury forms no ground for setting aside a release.

The usual excuse given when signed statements contain matter materially different from the testimony given in court is that they were signed without being read. In order to close this gap the Public Service Railway has adopted a practice of asking the signer of a paper to write above his signature, "I have read the above statement and it is correct," or words to a similar effect. Witnesses are usually quite willing to do this.

Mr. Hoffman called attention to one danger in taking depositions before trial. When the plaintiff's deposition is taken by the defendant, the defendant makes the plaintiff its witness, the result being that the plaintiff's lawyer has a right to cross-examine his client. The advantage of such a cross-examination to the plaintiff outweighs the advantage to be gained from the deposition by the defendant. In New Jersey the practice is to serve the plaintiff with interrogatories covering matters pertaining to the defense and sometimes a bill of particulars is also demanded, so that considerable information is secured which could have been obtained by taking the deposition of the claimant.

Mr. Hoffman said that his company very seldom used any secret service investigators except occasionally in criminal matters, but he considered the results of secret investigations very often important when used for the purpose of cross-examination. As to the advisability of having the court compel the plaintiff to submit to a physical examination by some disinterested physician appointed by the court, he deemed such a course of procedure not by any means satisfactory. When the claimant will not submit to a physical examination, there is usually something crooked about his claim, and a physician who is not accustomed to making physical examinations of claimants in accident cases is no match for a malingering claimant backed by the instructions of his physician and his attorney. The only proper physician to examine an unwilling claimant is an expert who, through experience, knows all the tests to be applied to determine malingering. Much depends upon the practice of the court, however, in appointing experienced men, and this can be known only through experience. It is often efficacious to bring out at the trial the request and the refusal for a physical examination, and follow this up by making a motion that the plaintiff submit himself then and there to a physical examination by a physician of the company's selection who is present. Very few attorneys dare risk refusing such a request because it would prejudice their case before the jury.

DISCUSSION BY MR. MUIR

According to Wallace Muir, assistant counsel Kentucky Traction & Terminal Company, Lexington, Ky., it is difficult to distinguish between investigating an accident from the standpoint of defense and investigating the same from the standpoint of adjustment. The object of investigating an accident is to determine legal liability. In order to determine this, the facts under which the person, or property, was injured must be fully and truthfully obtained, after which the law determines the question of responsibility and liability. Ordinarily no case should be adjusted where the company is not legally responsible for the injury inflicted, and when a case is once prepared so that a proper conclusion may be reached for the purpose of adjustment, the case should be in such a condition that it can be filed away and be ready for trial with but little additional work. In other words, preparation for adjustment is preparation for defense.

Mr. Muir drew one distinction, however, between preparation for adjustment and for defense. In adjustment the location of the accident is familiar to those concerned. In a trial before a jury all the jurors are not familiar with the surroundings, such as the character and grade of the street, its width, the position of the car tracks and the character of the car. Often it is essential that these points be brought out forcefully to a jury by photographs, diagrams and miniature constructions, and in some cases the jury may be taken to view the place of accident.

Mr. Muir emphasized the need of tact in trying to secure signed statements. The securing of a signed statement from the injured while in pain or in a semi-conscious condition is of little benefit and often dangerous. The statement of a child, although bright and intelligent, should be taken in the presence of its parents, one of kin or someone closely connected with the injured. The investigator should have each person giving a statement read it over in the presence of another, the third party to witness the signature unless it is sworn to. It is not an advantage, however, as Mr. Walsh says, to have a statement sworn to before a notary public who is a claim agent or investigator of the company. The claim agent and investigator, as far as possible, should be kept in the background at the trial, for a verdict is often rendered against a company solely upon the ground of some supposed misconduct on the part of the claim agent.

In a certain character of accidents, such as when there is no question as to liability, it is very essential to see the injured as soon as possible and effect compromise. Every courtesy and attention should be extended to the injured party, frequent visits being made without any talk of compromise until the proper time arrives. The question of compromise or the merits of the case should not be discussed in the presence of any disinterested person, for in nearly every case the outsider is the one who puts the extravagant figure in the mind of the injured.

CLAIMS DEPARTMENT POLICIES AND PRINCIPLES

BY CECIL G. RICE, SUPERINTENDENT CLAIMS DEPARTMENT
PITTSBURGH RAILWAYS, PITTSBURGH, PA.

Upon my entrance into the claim business I was not particularly impressed with the attitude of the public toward the ordinary claim agent, but I concluded that something could be done to change this opinion of the public, through imitation, through trial and error or through reasoning. Not knowing where to find the thing I desired to imitate, I started by trial and error and finally took up the reasoning process. From scientific management and business efficiency, I realized there were five things to do: First, to investigate and standardize; second, to form an organization that would carry these standards into effect; third, to get the men to form the organization; fourth, to provide proper compensation for the men, and fifth, to get a relay of men so that when one left the vacancy could be filled immediately.

We changed the department into five separate and distinct bureaus—clerical, investigation, adjustment, medical and litigation. Each of these bureaus was put in charge of a chief, who was responsible for the work. When an accident occurs it is reported to the claim department and goes to each of the bureaus with the exception of the litigation bureau. This bureau has absolutely nothing to do with the adjustment of a claim. The investigation bureau is charged with getting the facts, whether favorable or unfavorable. The clerical bureau has to do with the records. The medical bureau is charged with learning the facts from a medical viewpoint and making and arranging examinations. The adjustment bureau takes care of the actual adjustment after the clerical bureau has made its records. If, after all the facts have been filed, an adjustment is not possible and suit is entered, the papers are turned over to the litigation bureau for the purpose of preparing a defense or making a settlement.

Every Saturday afternoon the different chiefs meet with myself for discussion. Each of these chiefs should know as much about all the departments as the superintendent. Once a month there is a meeting of all of the members of the departments with papers or discussions. Once a week each bureau has a meeting to talk over the details of its work. In this way every man in the department is supposed to be a claim agent, a superintendent or chief claim agent. The chiefs regard their own individual men as assistants to them, and in that way it is possible to develop men who are better acquainted with the business of claims.

In connection with office kinks, some trouble is often experienced in locating files where there is more than one office. This is overcome by a "cherry card." This must be made out and go to the central file showing the minute the file moves from one person to another, from one room to another. We have used as many as 500 cards a day, and a check for three months has shown only six errors in handling all those cases.

As to fixed principles, we have adopted for our own guidance the following six slogans: maximum accuracy, utmost expediency, absolute fairness, persistent courtesy, minimum consistent expenditures, and perfected co-operation and efficiency. By maximum accuracy we mean incontrovertible facts unearthed from all available sources. Utmost expediency means the promptest action in accord with propriety and correctness. Absolute fairness embraces a fixed, irrevocable policy of dealing with justice to all concerned. Persistent courtesy may be defined as constant politeness combined with kindliness. Minimum consistent expenditures are disbursements proportionate to all the facts, and perfected co-operation and efficiency mean working in harmony to produce the most satisfactory results with the least expenditure of time and effort.

These principles have been in use in our department for five years. In October, 1912, we had a very serious accident in which ninety-six people were injured. We started to give our principles a test on that particular case. One of the first men settled with was paid $50 for two broken ribs. When the adjuster told me how much he had paid, I sent him back with a letter and an additional $50. The man happened to be the president of the board of trade of that particular district, and he was so impressed with what he thought was an unprecedented act of courtesy that he, without any solicitation on our part, used his efforts to help us out in his territory. We built from that case right on up. Every man we went to see we told about the last man with whom we had settled, and we paid from $50 to $15,000. Despite the efforts of attorneys we disposed of every one of those ninety-six cases without a single suit being entered, at a cost of $104,000. They were handled throughout with this idea of fixed principles, which we advertised to everybody.

In addition to constantly and persistently dwelling upon these fixed principles, the chiefs of the different bureaus use the following seven guiding principles:

1. Street railway transportation companies do not insure passengers or pedestrians against injury or damage. It is wholly unreasonable to suppose all persons injured in connection with a street car are entitled to damages.

2. If an accident occurs the principal should not depend solely upon the conductor to make a report but should secure the number of the car or the number of the motorman or conductor, the exact location, and the exact time.

3. If any personal injury or property damage results for which the principal was not to blame and feels justified in making a claim, he should frankly report the details of the occurrence to the claim department, together with the names of the witnesses, and give every possible assistance in making an unprejudiced investigation of all the facts and circumstances. Only dishonest claimants object to a thorough inquiry being made to corroborate the facts.

4. A claim is purely a business proposition, not a matter of law, and should be presented and handled on the same basis as any other allegation of indebtedness. Proving a claim is the same as proving a bill for work done or goods furnished.

5. Any legitimate claimant making a reasonable request for reimbursement can secure a satisfactory disposition of his claim without the expense of assistance. Since a claim is the same as a bill it is bad judgment for a claimant to employ an attorney or enter into the embarrassment, delay and uncertainty of a suit without first presenting his proof of indebtedness direct to those whom he believes owe him.

6. Only three classes of people bring suits for damages against railways, viz: (*a*) prejudiced persons unacquainted with the principles governing the handling of claims; (*b*) persons entitled to something but who want more than they are entitled to; and (*c*) persons entitled to nothing but who want something regardless of their right to it.

7. Citizens who encourage litigation, whether "ambulance chasers," neighborhood gossips, misinformed friends, or someone seeking to profit from another's misfortune, should remember that in so doing they add a burden to every taxpayer, as the expense of the courts is assessed against them.

In addition to the above principles the company uses certain psychological processes in its claim work. The first is to overcome prejudice, the second to inspire confidence, the third to analyze and reduce to a business basis, the fourth to create a desire, the fifth to cause a determination, and the sixth is to close the transaction. By overcoming prejudice we endeavor to show by logical argument that what is true is right. To inspire confidence we mean both to trust and to rely, causing others to believe in us and realize that we are sincere in our desire to deal equitably with everyone. By analyzing and reducing to a business basis we mean to prove by calculation the weight of the facts and pay according to their value. By creating a desire we mean to bring into existence a desire for what will reasonably compensate claimants for their losses, considering the degree of such losses. To cause a determination we bring a man's mind to the opinion that he will exchange his claim for a fair price for the damage done or loss sustained. To close the transaction satisfactorily is to make amends for the injury and then satisfactorily terminate the matter.

One psychological point may well be emphasized. A person will believe anything that may be said to him unless some negative idea comes up in his mind. In order to prohibit a negative idea a positive idea must be injected, and in order to inspire a positive idea a negative idea must be prohibited. For instance, an adjuster says to a woman: "Will you submit to an examination?" or "Will you allow us to have an examination made?" or "Will you undergo an examination?" These questions immediately put a negative idea into her mind on account of the objectionable thought of undergoing or submitting to anything. In our company when an examination has been refused, declined or not granted, we write a letter simply instructing the claimant to arrange through his doctor with our doctor for an examination, without even suggesting the possibility of his being able to refuse such a request. Thus far in the list of cases handled, only one refusal to this plan has been made.

We even go so far as to prepare the claimant before he gets on the department floor. When he comes into the reception room there are many things to attract his attention and divert his mind from his real or fancied injury. There are pictures of President Taft and several local notables at a ball game in Pittsburgh, cartoons of "Mutt and Jeff" making claims, and the old picture of the cow with men at her horns and her tail pulling in opposite directions and an attorney milking—in other words, getting the cream while the claimant and the claim agent are fighting. These pictures have actually been known to turn people back to an offer already made.

The American Association has decided to adopt fixed principles and policies in order to appeal to the public. If the parent association finds this advisable, why would not the Claims Association also find it advisable? There is nothing in the principles enumerated that a company should not desire. Claim agents should assume that the public does know that there is such a thing as a claim department and that claims for damages are paid, and they should appeal to the public and put them on their honor until they do something dishonorable.

DISCUSSION BY MR. TICHENOR

In commenting upon the paper by Mr. Rice, William Tichenor, claim agent Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., said that all communities contain many excellent people in all professions and callings, and that if all men, including claimants against railroad companies, were of this character, the public would be entitled to be treated with absolute courtesy, fairness, frankness and firmness, being given full credit for truthfulness and honesty. Unfortunately, however, the portion of the public met by the claim agent and dealt with by the claim department of the present day is not composed of this kind of people. The claim agent comes in contact with only a very small fraction of the public, and a very large part of that fraction seems to be seeking something for nothing without being over-particular as to the source of supply or the method of obtainment. This class is seemingly growing larger and less scrupulous as time moves on.

It appears to be the policy of some companies to treat lawyers and doctors with great courtesy, taking care of their bills, especially the doctor's bills, for the purpose of inducing them in some way to change their methods and give the company a square deal instead of rendering all assistance possible to prosecute "fake" claims. Mr. Tichenor mentioned the case of one company that had a great number of unsettled lawsuits. In this instance the plaintiffs' lawyers were taken into the company's confidence and were treated so courteously in the settlement of the suits that the company now seldom has a suit filed against it and has not lost a suit in three years. If claim agents and claim departments generally could pursue the same policy with the same sort of success, it would be well for such a policy to be widely adopted.

In another case the claim agent of a city and interurban line said it had become such a custom with him to visit the doctor, direct him to take care of the patient until recovery and then present his bill for payment, that it really might be counted as the policy of the company. Both of the above men, the friend of the lawyer and the friend of the doctor, evidently were successful with the policy of dealing with the public in the way suggested, but Mr. Tichenor felt that the experience of claim agents has not been such as to justify the adoption of such customs as a general policy of claim departments.

Mr. Tichenor believed that while a particular claim department may adopt particular policies and principles and adhere to them more or less religiously, general policies on "the relation of claim departments to the public," "the psychology of claim adjustments," "efficiency in claim department work," or "office kinks in claim departments," are wholly impractical, if not impossible. If a general policy were adopted by the association in order to meet the exigencies of any particular case, it would necessarily have to be so modified and reconstructed to meet the peculiar circumstances and conditions of particular cases that it would not be recognized by its author.

DISCUSSION BY MR. HANDLON

J. H. Handlon, claim agent United Railroads of San Francisco, San Francisco, Cal., noted the change in the attitude of the claim departments of street railways to the public within the last few years. Many street railway claim agents early in the field prided themselves to such an extent on their detective ability that they became dominated by their suspicions and grew to consider every person dishonest who had the temerity to file a claim against their employers. They treated the claimants accordingly. Not only was it morally wrong, however, for claim agents to do so, but experience has shown that it was not good business judgment, for unfair settlements are always extensively advertised and to-day jurymen often cite such instances as their excuse for penalizing companies by awarding excessive verdicts.

The successful claim agent realizes that there are honest claimants and that the good-will of the claimant, and particularly of all attorneys and physicians with whom he has business relations, is a personal asset. Moreover, he strives to secure this good-will without any other consideration than fair and courteous treatment.

Certain electric railways are now required to pay unreasonable sums in settlement of personal injury claims owing to the fact that competitive companies are very liberal in their settlements. Other claim agents are unable to reduce their settlements to a fair basis for the reason that their predecessors, in their generosity, educated the public to expect to profit materially from street car injuries. It is very difficult under these circumstances for a conscientious claim agent to instill in the minds of claimants the fact that accidents are regrettable, that the company is adopting every reasonable precaution to prevent them, and that claimants should not seek to profit thereby.

Mr. Handlon said that it is often wise to relieve attorneys of the necessity of visiting the office of the claim agent until the claim is ready for adjustment. This can be done by having a representative gather all available facts from the attorney at his office, or, if he consents, to visit the claimant at his residence. By accommodating the attorney in this respect he is often induced to file the claim rather than litigate a case.

DISCUSSION OF CLAIMS PUBLICITY

BY JOHN J. REYNOLDS, CLAIM ATTORNEY BOSTON (MASS.) ELEVATED RAILWAY

Mr. Reynolds in his written discussion said no substantial ground exists for believing that claim departments have been benefited by publicity of accidents and the sensational illustration of fake, fraudulent, or exaggerated claims, upon which money has been paid or awarded. Claim agents should not allow themselves to be borne away, far beyond the bounds of reason, by a sudden passion to see their fake cases dramatized in story. Such publicity gives specific suggestions with examples of their application and hence serves as a guide to aid the fakir to improve on existing methods and lessen the danger of discovery. That efficiency in claim department work is made more difficult by publicity is unquestionable, and it may well be doubted whether such publicity, beyond imparting to the public the underlying principles that have actuated claim fakirs, has really accomplished the object sought. Most states have publicity laws regarding accidents, under which the public is informed, sufficiently, of all important cases.

Mr. Reynolds at this point introduced numerous newspaper stories to illustrate the reporters' method of "playing up" or "featuring" accidents, with a resulting handicap to the claim department. In his opinion, if newspapers request information concerning accidents, they should be referred to the operating department, and only in the most serious accidents, where persons are injured and removed to hospitals, should the newspapers be given the names and addresses of the injured. Such a course is the proper one for the best results of the claim department, and it is not at all inconsistent with the propagation of that necessary and desirable co-operative relation between the railways and the public.

With regard to magazine publicity claim agents should always be careful to keep in mind the distinction between publicity regarding serious accidents, and publicity concerning the methods of the accident fakir and the methods of the claim department in circumventing him. Take, for instance, said Mr. Reynolds, the magazine publication of the methods by which claim department detectives procured photographs of a farmer plaintiff at work during the haying season. While the evidence procured was of paramount importance to the claim department and perfectly proper to be used either in that department or as evidence in court, such publicity is wholly ineffectual in assisting claim agents to prevent dishonest persons from presenting fraudulent claims. It equips such persons beforehand with an accurate knowledge of what they can do to defeat the most carefully laid plans to trap them. Even admitting the interesting and entertaining character of the numerous fakir stories in magazines, Mr. Reynolds maintains that they are not helpful to claim departments, nor do they help the average citizen to realize that his individual interests, represented by minimum fares and maximum service, are menaced every time the fakir's ill-gotten gains come out of the treasury of the public service company.

To deny such publicity, however, does not mean that these fakirs should not be punished. Mr. Reynolds believes that they should be punished to the limit, but, in so doing, all things should be avoided that may offer suggestions to would-be fakirs. The sort of publicity that will help the claim department is immediate attention to complaints; prompt betterment of service conditions when they can be bettered, and the employment of trainmen who will try to please the public, who will answer inquiries as they should, who will be careful to stop cars when signals are given and who will not jostle people unnecessarily. Publicity of the fact that those essentials are not observed is bound to be felt in the claim department.

It is no exaggeration to say that the claim department of the future will be benefited by publicity. This, said Mr. Reynolds, will be caused not by publicity of accidents and claims, but primarily by the sweeping changes which will have taken place in methods of education in vogue at the present time. That a comprehensive plan of educational publicity is considered necessary to set forth the problems confronting the railways is seen in the parent association's plan for establishing a publicity bureau. A well-organized bureau should be maintained for the purpose of correcting authoritatively and publishing widely all misstatements of fact as fast as they appear. Except in cases of flagrant fraud which are prosecuted in court and which in consequence receive advertisement in that way, the claim department should be kept out of publicity schemes. Expense for publicity should be directed rather toward education along the line of preventive methods.

The accident prevention campaign which is now being seriously conducted by many electric railways is undoubtedly reaching a large portion of the public with excellent results, and claim agents should do every reasonable thing necessary to the end that no longer shall the educational leader hesitate to recognize the widespread demand for a curriculum which will better fit pupils to avoid accidents. Care, however, is to be constantly exercised to keep suggestive matter in the background.

No inexorable rule to be followed blindly under all circumstances should be laid down for claim department publicity. The point to be emphasized is the unwisdom of a pronounced tendency in the matter of claim publicity. What may be justifiable in a given case may be unjustifiable or even pernicious as a general practice. The ultimate adoption of a distinct policy in favor of education is most desirable.

With regard to publicity between claim departments of various roads, there are two general objects to be kept in mind: First, to carry on as widely as possible, with the aid of the index bureaus, a consistent campaign of education through interchange of information relative to claimants reported by the Hooper Holmes or other bureaus. Second, to assist by special work through the local index bureaus in keeping track of claimants that do an interstate business or those whose operations seem to be exceptionally active and extensive. If claim agents at all times keep in touch with this aspect of the business, they will be developing a publicity that will prove a real and permanent benefit to their departments.

NEWSPAPER PUBLICITY DISCUSSED

BY J. S. KUBU, CLAIM AGENT NEW YORK STATE RAILWAYS, UTICA, N. Y.

There is a limit to publicity in connection with claim departments just as to anything else, according to Mr. Kubu's written discussion. The real objection to the general policy of full publicity is the "ambulance chaser," who sometimes creates embarrassing situations. How much embarrassment the claim agent is put to depends a good deal on the efficiency of the department. If the claim agent takes his time and allows the "chaser" to obtain possession of the facts of a case before he himself knows them, the company will find it unprofitable in dollars and cents and will have to bear an additional burden in defending a law suit. Unfortunately, the greatest difficulty is the foreigner who cannot read and does not understand the language, for there are plenty of "ambulance chasers" who speak the foreign languages and have no difficulty in securing clients.

There ought to be a cordial co-operation between the newspapers and the claim department. When an accident occurs which has news value, the claim agent should get in touch with the newspapers and give them definite information that will correct any and all rumors. Very often it will save the city editor the task of assigning a reporter to a job. This line of work in the company should be assigned to one man. News of all accidents and litigation should reach him first and he can then use his discretion in communicating such information to the newspapers. He must, however, know how, and when, to act, and aim at the right kind of publicity rather than at more publicity.

Mr. Kubu remarked that in the matter of litigation the public records are open to inspection and it is a very easy matter to get a copy of a petition or a complaint. When an action at law has just been brought out and is called to the attention of the newspaper man, he will, if he is friendly to the company, get in communication with it and give it a chance to defend itself before publishing the case.

The "safety first" campaigns have been given great publicity by the newspapers throughout the states, and their liberal support has contributed greatly toward the success of such campaigns. This only emphasizes the great interest which newspapers have in the subject and makes clearer the value of the co-operation which should exist between newspapers and railway companies in connection with accident publicity.

Changes In New York Subway Track Practice

At the Oct. 16 meeting of the New York Railroad Club, O. O. Dixon, assistant engineer Interborough Rapid Transit Company, read a paper describing the changes that have been made in the track standards of the subway division since its opening Oct. 27, 1904.

The ballast of ¾-in. trap rock 5 in. deep has been retained, but the 5-in. x 8-in. x 8-ft. ties are renewed with 6-in. x 8-in. x 8-ft. timbers, and on curves the tie spacing has been reduced from 22-in. to 18-in centers.

Originally the inclined guard rail on curves was bolted to the low rail about every 3 ft., using adjustable cast-iron separators to take up the wear. It was soon found that the inclined guard rail was so flexible that it concentrated the pressure on bolts, causing frequent breakages. When the bolts held the wheels were allowed to side slip between the bolts, due to the flexibility of the guard rail, and much corrugation was so caused. This guard rail has been replaced by another of the same section as the running rail, having one flange sheared off, and the adjustable separators were replaced by a one-piece separator to give the correct flangeway. The gage has been widened from 4 ft. 8½ in. to 4 ft. 8¾ in. for curves between 200 ft. and 500 ft. and to 4 ft. 9 in. for curves less than 200 ft. radius.

The first 100 lb. A. S. C. E. rails were manufactured by the bessemer process of the following composition: Carbon, 0.58 to 0.63 per cent; manganese, 1 to 1.10 per cent; phosphorus, 0.09 per cent; sulphur, 0.05 per cent; silicon, 0.07 per cent. However, the specifications were gradually changed to higher carbon rails to get better wear. At present the company specifies carbon 0.75 to 0.90 per cent with an average of not less than 0.90 and manganese 0.60 to 0.90 per cent. Since 1909 the side of the rail head has been sloped to conform more closely to the shape of the wheel. Thus the vertical wear has been slightly increased and the horizontal wear decreased, thereby increasing the life of the rail. A comparison of the life of the rails and tonnage passing over a curve, which has a radius of 220 ft. and a grade of 1.15 per cent down and over which the average speed is 18 m.p.h., shows that in comparing bessemer and open hearth rails the wear is about 1 to 2 in favor of open hearth. The ratio of wear of manganese to bessemer is 1 to 9 and the ratio of wear of manganese to open hearth is 1 to 4½. The soft bessemer rails have proved more liable to corrugation than the harder rails. The manganese rail was satisfactory except that, like all other rails, it was liable to corrugate. Manganese rails are being used on most of the important curves with somewhat varying results, but the company believes that it pays to use manganese if the price is not too high, because less renewals are required.

Switches have been reinforced and the high speed switches lengthened from 16 ft. 6 in. to 24 ft. Where the former bessemer switch point gave a service of three weeks, cast manganese gives about thirty weeks, and in frogs and crossings about five times that of bessemer. Rolled manganese stock rails help greatly to increase the life of the switch points and are in general use.

The ballast in front of stations is renewed about every two years at express stations and every five years at local stations. Few ties have been renewed except at switches and on curves where they have split, due to frequent rail renewals, also where they were decayed due to dry rot. In making the renewals one rail is removed and new ties complete are installed for a rail length.

Screw spikes have not been used much because of the changes they would require and also because of the difficulty they would involve in making rapid renewals of rails.

Railway Electrical Engineers' Convention

Electric Headlights and Electrification Were Among the Subjects Discussed

The seventh annual convention of the Association of Railway Electrical Engineers opened at the Hotel LaSalle, Chicago, with a reception and dance on the evening of Oct. 26. Electrical manufacturers made exhibits in thirty-five booths and in the hotel ballroom. On Tuesday morning the first regular session was opened by President C. R. Gilman, Chicago, Milwaukee & St. Paul Railroad, who reviewed the history of the association and referred with pride to the work accomplished by it since it was formed six years ago. Following his address, Secretary J. A. Andreucetti, Chicago & Northwestern Railway, reported the association in a flourishing condition with a membership exceeding 500.

Reports of the committees on loose-leaf binders for filing specifications on reciprocal relations, and on specifications for wire crossings were brief and indicated progress. The report of the committee on data and information consisted of a tabulation of car-lighting statistics, shop and station equipment and motors for traveling cranes. On the latter topic the committee reported a chaotic condition in the matter of motor sizes, and this will probably be a subject for standardization during the coming year.

On Wednesday morning the report of the committee on standards was received and was followed by the report of the committee on electric headlights. The latter report discussed types of machine, location of generator, voltage adjustment, cab lamps, reflectors, wiring and repair parts. On the question of incandescent headlights, it was stated that while all railroads have been experimenting for some time with Mazda, tungsten and nitrogen lamps for headlights, there was none on the market with a concentrated filament, high candle-power and sufficiently long life to justify its use. The committee, however, was of the opinion that such a lamp would be produced within the next few months, as many manufacturers are now working along that line. It was predicted that when these lamps were a commercial article, the arc lamp would be a relic of the past on engines, as well as for shop and yard lighting. The report also called attention to the battery headlights which are being used with good results on the Southern Pacific Railroad. These lamps are 140-cp nitrogen-filled tungstens and require 13 amp at 6 volts.

At the Wednesday afternoon session the committee on industrial trucks recommended a standard capacity, a standard speed, a standard for tires and wheel sizes and a standard potential of 24 volts for general industrial truck service.

REPORT ON ELECTRIC TRACTION

This was followed by the report of the committee on electric traction, which was a description of existing railroad electrifications. This report was of a preliminary nature and further data, particularly as to operating costs, will be supplied in subsequent reports. Among the topics covered this year was a review of the different electric traction systems, including low-voltage and high-voltage direct current and the three different types of alternating-current systems. Regarding the choice of system, the committee states that it will depend on the extent of electrification, character of traffic and local conditions, but that it will be principally an engineering determination. The report also discusses the reasons for electrification, and the benefits to be derived from the electrification.

Upon the question of electrification of single-track roads the report states that it is a demonstrable fact that more traffic can be handled electrically than by steam on account of the facility of train movement and that it is possible to maintain higher schedule speeds without increasing the maximum speed. It can be shown in the case of a single-track road operating at full capacity, that electrification will enable it to handle additional traffic, thus postponing double tracking. The fixed charges saved on the cost of double tracking for this period may properly be credited to the electrification annual expense in calculating the economics. Other points of interest discussed included the electrification of passenger and freight yards, the sources of power supply, the construction costs and annual expense, locomotive maintenance and the economics of electric traction.

The Wednesday afternoon session closed with a report of the committee on wire specifications which was devoted to improving this association's specifications to make them conform with latest engineering practice.

New National City Bank Publication

The National City Bank of New York has this month begun the publication of a magazine called *The Americas* in the hope of bringing the business men of the United States and South America closer together and providing an instrument for the interchange of ideas regarding the aims and projects of Pan-American commerce. The October issue contains articles on the following subjects: "The Opportunities and Responsibilities of Trade Expansion," by Frank A. Vanderlip, president National City Bank; "A Message from the Argentine Republic," by Enrique Carbo, minister of finance; "The Government Work for Trade Expansion," by William C. Redfield, Secretary of Commerce; "Advantages of Direct Foreign Exchange," by John E. Garden, vice-president National City Bank, and miscellaneous articles regarding the new South American branches of the National City Bank, trade and finanical conditions and requirements in South America and also South American traveling, shipping rates and general statistics.

The National Associations and the Educational Institutions

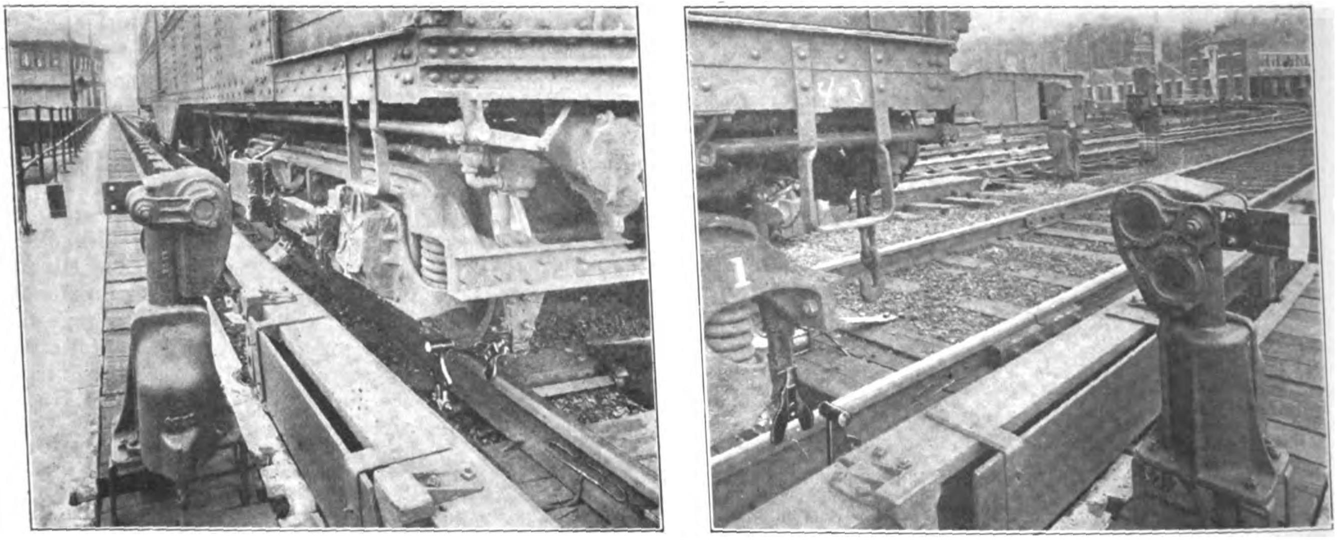
In connection with the suggestion made by the committee on public relations of the American Electric Railway Association that lectures should be given in educational centers by leaders in the industry it is interesting to note that the National Electric Light Association has a committee on relations with educational institutions of which John F. Gilchrist, vice-president Commonwealth Edison Company, Chicago, is chairman. This committee has just announced the plan of its work for the coming year and has appointed four sub-committees on lectures, employment of graduates and undergraduates, courses and curriculums, and supplying information to economic departments, respectively. Each of these sub-committees is under the chairmanship of a prominent educator and the vice-chairmanship of a prominent electric lighting company executive. The membership of the sub-committees is made up of men conspicuously identified with lighting and educational interests.

The Peoria (Ill.) Railway has been appealing to the public and especially to lady passengers to observe carefully the right and the wrong ways of leaving a car. An advertisement is being carried in the Peoria papers showing two women leaving a car, one of whom steps in the direction the car is moving and alights in safety, while the second woman steps in the opposite direction to the motion of the car and falls into the street.

Signal Maintenance on the New York Subway

The Methods and Organization of the Signal Maintenance Department of This High-Speed Rapid Transit Line are Described in Detail and Statistics Covering the Number of Signal Failures on the Line are Given

The automatic block signals on the New York Subway, which is operated by the Interborough Rapid Transit Company, undoubtedly exercise a more potent influence on traffic than those of any other railway system in the world. A practically unlimited number of additional trains could be filled with passengers if they could be operated upon the line, but there is no possibility for the installation of additional tracks. In consequence, an extraordinary premium is placed upon any means whereby traffic can be accelerated, and the subway is now handling actually twice the traffic for which it was originally designed. The large part that signals have played in accomplishing this result may be judged by the fact that the rush-hour train headway has been reduced from 124 seconds to 100 seconds. In addition it should be noted that since the subway was built more than 2,000,000,000 passengers have been carried without a single serious collision between trains.



NEW YORK SUBWAY SIGNALS—VIEW OF DWARF SIGNAL AND AUTOMATIC STOP, SHOWING AIR-BRAKE VALVE ON TRUCK BEFORE AND AFTER RUNNING BY TRACK-TRIP

The signal installation by which this extraordinary result has been accomplished consists of 1233 automatic block signals, of which the majority are of the light-signal type owing to the fact that they are installed in the covered section of the subway tube. In addition there are 561 automatic stops of the mechanical trip type, one of these being placed at every main-line signal mast. All of these signals are controlled by a single-rail-return track-circuit system which was installed in 1903 by the Union Switch & Signal Company. Naturally the organization by which this apparatus is maintained is of unusual importance, especially in view of the fact that on account of the short headway any delay causes a blockade of serious proportions.

In general the signal department is made up of two organizations that report to the signal engineer, J. M. Waldron, one of them having to do only with the construction of new work and the other being responsible for the maintenance and operation of all signals, automatic stops, transformers, motor-generators, storage batteries, air compressors, signal wiring and interlocking plants that are actually installed. The interlocking plants are an important feature in the general scheme of operation, as they are located not only at points where shifting movements normally take place, but also at several points along the line where crossovers are installed to provide for emergencies that require trains to be turned back before reaching a terminal.

All maintenance work is carried on by employees classed as signal maintainers and helpers, the line being divided into a series of sections, on each of which at least one man is stationed during every hour of the day. On each section is provided a cabin for the signal maintainer in charge, and these cabins are generally located at interlocking plants so that the maintainers can operate the interlocking machines in case of blockades. The cabins are usually placed on the station platforms giving the signal maintainers ready opportunity to consult with motormen of passing trains, so that they can be called upon to do emergency repair work upon any part of the subway equipment should occasion demand it.

METHODS OF INSPECTION

The inspections of each section by the signal maintainers to whom it is assigned are not made at any set intervals, owing to the fact that the amount of attention required at different points varies from day to day; but, in general, all apparatus is inspected at least once in every twenty-four hours. Some of the signals are, however, regularly inspected twice daily, and the prevalence of iron dust, the difficulty of pumping sewage and the requirements of track maintenance may even involve practically continuous attention to certain signals or to a certain part of the section for several days at a time. Stuck signal relays, which prevent a signal from clearing after the train which has set it has left the block, are of rare occurrence. However, the rule is in force that, in automatic territory whenever a stop signal is encountered, the train may proceed under control after a wait of one minute. In such cases the automatic stop, which would normally prevent the passage of a train, is held in clear position by the conductor, who is provided with a special key for unlocking the stop, and the train is thus enabled to pass it. After "keying by" a stop signal, if the next signal is found to show that the track ahead is clear, it is obvious that the signal passed has displayed an improper indication. In such cases the motorman gives a whistle signal when he comes into the next station where there is a signal maintainer. The signal maintainer upon receipt of the whistle signal goes back along the track until he finds the signal that is in bad order.

As an example of the results that can be obtained by the continual application of this close attention to the maintenance of the signals a statement of signal failures on the subway is reproduced in Table 1.

TABLE I—SIGNAL FAILURE RECORD ON NEW YORK SUBWAY

	1911-1912	1912-1913
Number of signals	1,212	1,233
Number of stops	552	561
Total	1,764	1,794
Total number of signal failures	273	173
Total number of stop failures	240	163
Total mechanism failures	513	336
Total number of signal movements	109,504,253	124,333,070
Total number of stop movements	66,683,176	70,800,273
Number of signal movements per signal failure	401,115	718,688
Number of stop movements per stop failure	277,846	434,357
Number of failures per signal per year	0.225	0.140
Number of failures per stop per year	0.435	0.291
Number of failures per mechanism per year	0.284	0.186

By this is shown that a large decrease in the number of failures of signal apparatus characterized the year 1912-1913, the fiscal year of the Interborough Rapid Transit beginning July 1 and ending June 30 of the following year. This large decrease was principally due to the work of fire protection which had been done on the signal system during the year 1911-1912. The record of over 700,000 signal movements per signal failure undoubtedly establishes a high record even for lines where intensive traffic is carried on. In the table the term "signal failure" is used in its broadest sense and is understood to mean any stoppage of a train for reasons other than that of a train in the block beyond. Cases of outside interference, such as where a bundle of newspapers is dropped from a passing train upon a track trip, and where motormen improperly report a signal out of order are, of course, not included.

NEW YORK SUBWAY SIGNALS—TRAIN STOPPED BY MAIN-LINE SIGNAL, TRACK-TRIP AT STOP IN FOREGROUND

NEW YORK SUBWAY SIGNALS—INTERIOR OF TYPICAL INTERLOCKING TOWER

An analysis of the signal failures occurring during the year 1912-1913 is also published in Table II. This divides the failures into various classes of defects and shows the number of each kind of failure that occurred during each of the twelve calendar months. It will be seen that only two of the signal failures occurring during the year were due to unknown causes. The five cases of signal failures charged to "broken or defective grid resistances" were due to defects in the resistance which is installed in series with the track relays in order to prevent the return propulsion current from passing through the relay and thus burning it out. This is necessitated by the fact that the installation is of the single insulated rail type in which the operation of the signals and the compressed-air valves for the switches and interlockers is effected by d.c. relays, the alternating current being used only for controlling the track relays and for the signal lights. The solenoid signals referred to in the table are of a home-made type in which the usual slot coil is replaced by a solenoid that operates the semaphore blade directly.

ARRANGEMENT OF MAINTENANCE FORCE

As mentioned before, each section is inspected complete every day, but as the main-line sections are ap-

TABLE II—CLASSIFICATION OF SIGNAL FAILURES FOR 1912-13, NEW YORK SUBWAY

Cause of Failure	July	August	September	October	November	December	January	February	March	April	May	June	Total
Scale on insulating joint	3	4	2	4	..	..	4	2	2	3	2	6	32
Defective insulating point	..	3	1	1	1	2	2	..	1	2	3	..	16
Broken boot leg wire	..	1	1	2	..	1	..	2	..	..	1	..	8
Blown or defective transformer or track fuse	1	5	1	4	2	2	2	3	2	3	2	1	28
Broken or defective grid resistance	1	..	..	..	1	..	..	1	..	..	2	..	5
Defective d. c. relay	..	3	..	..	..	..	..	..	1	..	..	..	4
Short circuit of track circuits	3	1	1	2	4	3	1	1	1	..	1	..	18
Short circuit of wires	1	..	..	..	1	..	..	..	..	..	..	..	2
Defective or open wires, broken at terminal	1	..	..	..	3	1	..	1	..	..	..	..	6
Defective track leads	..	..	1	..	..	1	..	2	..	..	..	..	4
Trouble on a. c. mains	..	..	..	..	1	..	..	..	..	2	..	..	3
Cause unknown	..	..	..	..	..	..	1	..	1	..	..	..	2
Defective dash pot	..	..	..	..	..	1	..	..	..	..	..	..	1
Broken rail	1	..	..	..	..	..	..	..	..	..	..	..	1
Cold weather, freezing	..	..	..	..	..	..	1	..	..	..	..	..	1
Defective circuit breaker on solenoid signal	..	..	1	1	1	..	..	..	..	..	..	..	3
Blown or defective fuse on solenoid signal	1	..	1	..	..	..	..	..	..	..	..	..	2
Third-rail short-circuit	..	1	..	1	..	2	1	..	..	..	..	..	5
Lights out due to open circuit	1	..	..	..	..	..	1	..	..	..	..	..	2
Defective spring on interlocking machine	..	..	..	..	..	..	..	..	2	..	..	..	2
Defective a. c. relay	..	..	..	1	1	1	..	1	1	2	..	..	7
Defective circuit breaker on signal	..	..	..	..	..	..	..	1	2	..	..	..	3
Defective circuit contact on switch point	3	2	..	..	1	..	2	1	..	1	..	..	10
Defective or burnt out transformer	1	..	1	..	..	1	1	1	1	2	..	..	8
Total	17	20	9	17	16	14	16	16	14	14	13	7	173

proximately 1½ miles in length the difficulties of transportation are negligible. The section length of 1½ miles is maintained quite closely except in the case of certain complicated places, such as the terminals and at the points of diverging routes like the Ninety-sixth Street junction. The number of signals in each section varies approximately between forty and eighty with about half as many automatic stops, and under normal conditions three signal maintainers keep in repair all of the apparatus on each section. These three signal men, however, work in three ten-hour shifts, the attention to signals, therefore, being continuous. The ten-hour shifts are so arranged that the overlap comes during the early morning hours, because all of the heavy work is done between 1 a. m. and 7 a. m., this being the only period when the traffic is relatively light, the train headway on the local tracks being increased to 7½ minutes during this period.

At the points where interlocking plants are kept normally in continuous operation and where there are air compressors, storage batteries and transformers, each signal maintainer is provided with a helper, and it is from this force of helpers that the signal maintainers are developed. Owing to the fact that the main-line sections are of an approximately constant length and are arranged almost regardless of the number of signals, certain of the sections are considerably easier to maintain than others. On the easy sections the less experienced men are placed and they are advanced to the more difficult positions as their experience becomes extended. Ordinarily, the helpers serve in that position for about two years, after which time they are generally capable of maintaining some of the easier sections. In general, the force of helpers is recruited from construction gangs, as a certain amount of construction work is being carried on all the time.

The signal maintainers do no actual repair work to damaged parts of signal apparatus, the replacement method of field work being carried out in all cases and the maintainer being required only to make the necessary replacements and adjustments. Practically all repairs to damaged apparatus are made at a central repair shop that is located at one end of the line. Here three repair men are employed continually in rewinding coils and in doing other heavy repair work on apparatus that has been sent to the shop. In addition an extra signal maintainer is kept at work in the repair shop during normal conditions so that in case of the failure of any one of the regular signal maintainers to report for duty the spare man can be called upon to take the temporary vacancy. Practically no repair work has to be sent to the signal manufacturers, and, as shown by the number of repair shop men employed in proportion to the number of signals and automatic stops that are maintained, the repair work is normally very light.

No lightning damage has been experienced even in the case of the outlying sections of the subway that run upon an elevated structure. This unusual condition is ascribed to the fact that an iron fence is run along the entire length of the elevated structure and is grounded to the steel framing.

A plan has been formed to construct new carshops in south Russia, and negotiations are going on for the organization of a stock company. The originator of the plan is said to be a well-known banker and manufacturer. It has been reported that the manager of the Compagnie Centrale de Construction Haine-St. Pierre, the largest car and locomotive works in Belgium, has gone to south Russia to determine the location of the proposed works.

COMMUNICATIONS

Operation Without Train Orders

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION
DALLAS, TEX., Oct. 10, 1914.

To the Editors:

Referring to the article in the Oct. 3 issue of the ELECTRIC RAILWAY JOURNAL entitled "A New Method of Traffic Acceleration" and to your editorial on the same subject, the writer operated one of the early interurbans twenty years ago and introduced somewhat the same plan as that used by the Scranton & Binghamton railroad. On this line the question of operating under signals or under train orders was discussed, and while the signals of that time were rather crude, cumbersome and somewhat unreliable, they seemed, in conjunction with the time-card and a delay-time-limit, strictly enforced, to be able to eliminate a great deal of waste time, and would also tend to increase vigilance and accuracy on the part of the trainmen.

The interurban road was about 15 miles long, and very often it ran trains of two cars, having at times heavy rush traffic. It was divided into six signal sections, approximately equal in length, but some allowance was made on certain sections for the delaying action of curves and grades and the sections were really divided more by a question of time than by exact distance. The trainmen were made to equip themselves with standard watches, which were inspected weekly and compared with a standard clock at the starting point at the office on every trip, and they were thoroughly trained in the observance of the delay-time-limit principle.

The practice was that a car, on time at a regular passing point, waited for a scheduled meet for the length of time that it would take the opposing car to run from the turnout in advance. It then started on its way with caution, that is to say, at danger points, such as curves or where the meeting car could not be seen at a fair distance, the car was brought under control for immediate stop. Signals were accepted at their face value and the signal system was so arranged that any failure on its part to act resulted in a caution indication. No stop signal was instituted, the signals showed either that the block was certainly clear in front or that it supposedly was not. In the former case the signal governed, in the latter case the delay-time-limit governed.

Where a car broke down between turnouts, say centrally between them, there was a certain amount of delay, but as each car on both sides of that broken-down car followed the same rules, the final result was that they soon came up on each side of it, transferred their passengers around it and from it and returned on the schedule time of the next, or succeeding car.

Every car or train going over the road had its train number and each motorman was daily furnished with a group of printed cards giving the scheduled time of arrival and departure, at termini and at each turnout, of every car or train on the schedule for the day, and in case of a break-down certain of the interurban cars would temporarily lose their train place so far as the schedule was concerned. Every car had on the front of it, on the left side, a plate carrying its train number for the day, the plate being illuminated at night. On regular schedule, with no accidents or delays, every motorman knew the number of the train that should meet him at each turnout, and the instructions to motormen were that, when they met with a car or train carrying some other train number than that which should be at the turnout under normal schedule, immediate inquiry should be made and information given by the other car crew as to the reason for this. This tended to make the man who was on schedule time more careful, as he was then informed that the regular schedule was broken and that extra caution was necessary and, also, that extra exertion was desired so that the regular schedule might be again resumed as quickly as possible.

These orders and operations, in conjunction with the block signals, allowed the road to be operated at what was, at that time, a very high speed, that is to say, with some six or eight stops the cars averaged over 30 m.p.h. with some heavy grades and some curves of small radius. During one year's operation of this road, with very heavy traffic, there was only one collision, and that was caused by absolute wilful disregard of the rules.

It is surprising even on a road of considerable length and many passing points, how soon the trainmen become habituated to the system if proper supervision is given and the watches strictly checked. There is also an astonishing amount of time saved by this system over that of train orders, especially on rush days. The writer has, since that time, operated roads under the dispatcher system simply because that system had been installed from the beginning, everyone was used to it and it seemed unwise or undesirable to change it. But in starting to operate a new road of this character it should most decidedly be operated entirely by block signals and proper delay and cautionary rules. With the same check and supervision given to each one, the chances of accident are greater with the dispatcher system than with the other, and there is very much less delay and a better opportunity to straighten out the schedule when it becomes temporarily disorganized.

It may be that, under the best arrangement of the block system, more turnouts will be necessary than with the dispatcher system, but this is a matter in which the original cost and maintenance may be definitely fixed and known, whereas the added risk and the delay consequent upon the dispatcher system is an unknown quantity. There may, also, be interurban lines so situated that they are compelled to depend upon individual dispatching, but in a trip made a few years ago over most of the high-speed electric interurban roads in the country, with this particular point in view among others, the conclusion of the writer was that there was not one of all the roads visited in which schedule and safety could not be bettered by abolishing the dispatcher, as a dispatcher, and leaving him merely as a "trouble man" who could be communicated with at every turnout but who, except under extraordinary conditions —provided for in the rules—would not interfere with the movements of the cars, or with the schedule for the day.

It should be said that only a very few rules are needed to cover such a system for the reason that these rules need only govern the contingencies. Once the men are trained into the principle of the system, ordinary operation goes on like clockwork and the new men absorb the idea, by practice, in a very short time. It is being more and more appreciated that the human element is a vital factor in producing both safety of operation and perfection of schedule, and that the nearer the trainmen approach the condition of automatons or dummies the less the good results, as a whole. While, under the signal and delay-time-limit system there are rigid rules that are concerned mostly with absolute safety of operation, yet the matter of maintenance and resumption of schedule after delay or accident is largely in the hands of the trainmen.

The writer has not given this matter much attention the last few years and really was not aware that so little had been done in the line which the Scranton & Binghamton has taken up. He is not very well acquainted with the latest modern systems of block signaling, but from what he has read and observed it should certainly be much more easy and more safe to operate at this time with the improved and more reliable signal systems, than it was twenty years ago with the rather crude and imperfect systems that were then in use.

H. S. COOPER.

ILLINOIS TRACTION SYSTEM

SPRINGFIELD, ILL., Oct. 10, 1914.

To the Editors:

We have read your description of train operation on the Scranton & Binghamton Railroad and your editorial commenting on it in the issue of Oct. 3. This is particularly of interest because we have 175 miles of interurban equipped with track-circuit-controlled automatic block signals of the semaphore type.

We note that movements of trains on the Scranton & Binghamton road are governed entirely by signal indications, and that trains are operated regardless of time-card meeting points and are not under the jurisdiction or handling of a train dispatcher. You have evidently given but a small part of the requirements or duties of the train crews or the method of operation. What happens when a signal or signals are not in operative condition? It appears to me that, in the absence of a train dispatcher, this would create a situation of too much importance to be covered by operating rules or left to the judgment of the trainmen. We note that sidings average 1 mile apart, which requires an approximate running time of three minutes from one to the other, and that there cannot be delay of more than three minutes to any train.

We admire block signals not only for the increased safety they afford but, in addition to this, for the increased confidence which they give to the trainmen, especially in bad weather. In consequence, we think that you are unduly severe when you state that block signals hinder rather than accelerate interurban high-speed traffic and that they comprise merely a safeguard superimposed upon the structure of operating rules. We operate hourly service through signaled territory and we are very frank in saying that the installation of the signals did not in any way hinder operation. On the contrary, we feel that operation has been helped and that it is easier to keep our trains on time since the installation of the signals. In connection with this, however, it should be said that the performance of our block signal is practically perfect, showing a percentage of 99.97 perfect operation. We note your query whether high-speed interurban roads can take full advantage of signal equipment unless they accept signal indications at their face value and run on signals rather than orders, but we are not able to see how the high-speed interurban lines of the north central states, which are now equipped with signals, could operate in the manner which you suggest. The procedure involved in changing the method of operation to provide for the acceptance of signal indications at their face value so that trains can proceed in accordance with signal indications regardless of time-card meeting points is a situation confronted by many physical obstacles on our property and also, I think, on every other high-speed interurban line in the Central States.

Some of the things which I believe absolutely necessary of attainment before this method of operation could ever be considered for our lines include the following: The continuous track circuit would have to be extended from one end of the road to the other, exceptionally thorough inspection of the signal system would be necessary, siding locations would have to be adjusted, time-card would have to be laid out for the new scheme of operation, and trainmen would have to be educated and trained with that end in view.

Not being familiar with all of the existing operating rules of the Scranton & Binghamton Railroad we do not feel capable of making a statement as to the success or failure of the operation of that road on signals alone, yet we do feel that, after all of the things that have above been enumerated have been done, we would not want to undertake the operation of our road through its signaled territory depending on the signals alone to govern the movement of trains. We believe that we would prefer to give the train movements close supervision, provide the best of inspection for equipment, and control the movement of the trains by train dispatcher rather than to undertake and be responsible for operations depending wholly upon block signals. We are basing our opinion in this regard upon the fact that automatic signals have been known to give clear indications when they should give stop indications, and, with service as frequent as every fifteen minutes and trains operating under block signal control, you can readily see what a false clear indication would mean. You can also see what a bad order signal would mean without telephone communication or control of movement by train dispatcher.

Please understand we are not criticising the operation of the Scranton & Binghamton Railroad as a railroad. We are taking exception only to your statement that high-speed interurban roads should take advantage of signal equipment by running their trains under signal control alone, and in doing this we are giving our opinions so that more may be brought out about the real operation of this road which is depending entirely upon its signals for train movements.

C. F. HANDSHY, Assistant General Manager.

Insert Special Work Failures

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Oct. 16, 1914.

To the Editors:

In reading the various articles that have appeared in the ELECTRIC RAILWAY JOURNAL on the subject of insert special work it has seemed to me that what I might write would be simply a repetition to a considerable extent of what has already been written, and a good many of the points discussed are what engineers, or at least some of them, have known for some time. On the other hand, to further this work, I want to add these remarks:

Concerning insert special work, I believe that the construction giving the longest life is that having the machined bed as a bearing. I find that spelter eventually will come out, although I have some frogs that have been in service for seven or eight years where the spelter has come out around the sides but the insert is not yet loose. Of course at these points the traffic has not been as heavy nor the wheelage as great as it has at some other points. The completely machined-fit, bolted-down type appears to be giving the best service and the longest life.

It is folly to expect that any kind of an insert will last forever. The raising of flangeways, for instance, I do not think is going to increase indefinitely the life of a frog or a mate, but I think it is a step toward lengthening the life. All of the photographs that have appeared in the articles showing the floors of frogs and mates cut down by flangewear, are simply the result of natural wear, since these flanges riding on the throatway floors will evidently wear out the material, no matter what it is. On the other hand, I believe we are getting better manganese from the manufacturers now than we did a few years ago. They have learned about the manufacture of this material as well as the engineers have about the use of it.

The cause of inserts becoming loose, I believe, is nothing more nor less than the rolling of the wheels over these inserts. Inasmuch as they are not a part of the casting, the vibration and the impact, due to the wheels, gradually loosens the insert from the material which is holding it in place. The nearer you can bind the insert to the casting itself, or approach making the insert a part of the casting by providing machined bearings and bolts which transmit the stress through the bearings, the better will this insert resist impact and remain firm. Whether or not a solid manganese piece is warranted, I believe depends upon the special conditions of traffic in any given city. I do not believe that with us the expenditure is warranted, but in other cities with more frequent service and greater wheelage, it might be found to be economical to use solid manganese frogs and mates.

With reference to the loose arms in cast-iron bound work, some manufacturers, I believe, make the rail arm in the casting too short. On the other hand, if the joint at the end of the arm hasn't the proper support, it is liable to break. I have never had a frog arm break outside of the casting, but I have had a good many of them come loose in the casting. This leads me to believe that the bond between the rail and the casting is not what it should be. Moreover, we cannot always get first-class joints at the end of the arm in special work, any more than we can at other places, so that a certain factor of safety must be added to the grip area to improve the bond for these contingencies.

L. A. MITCHELL, Superintendent of Roadway.

Effect of Car Wheel Diameter on Motors

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY
LEWISTON, MAINE, Oct. 9, 1914.

To the Editors:

I have read with interest the article by H. J. Parks in the ELECTRIC RAILWAY JOURNAL of Oct. 3, 1914, on the "Effect of Car Wheel Diameter on Motors," but do not fully agree with him regarding this effect. As the speed of a railway motor is governed by the load it is carrying, I do not believe that the difference of 1/4 in. in the diameter of the wheels on a two or four-motor equipment will make any material difference in the load on the motors. I have made numerous tests in the past few years and have failed to find any difference in the temperature of the motors operating on axles with different size wheels.

With cars on which cast-iron wheels are used, it frequently becomes necessary to change a pair of wheels which are not entirely worn out; and if new wheels are installed the difference in diameter is sure to be 1/2 in. or more. In these cases I have made tests with the results stated. I have had under my observation cars operating with steel wheels with 33-in. diameter when new. It became necessary to change one pair of these wheels on account of flange wear when the diameter was reduced to 32 1/4 in. A new pair of wheels was installed, but careful tests failed to show any noticeable difference in the temperature of the motors. I have also had installed under the same conditions turned wheels which were 1 1/8 in. smaller than the other three pair, and I still failed to find any difference in the temperature of motors. I do not, however, recommend operating wheels with such a difference in diameter.

When making these tests the motors on several cars operating under the same conditions should be tested in order to make a fair comparison, as many complications might arise to cause the overheating of a particular motor or set of motors. I should like very much to hear from other experienced men on this subject, as I believe it is a benefit to exchange ideas.

C. H. NOTTAGE, Master Mechanic.

OHIO ELECTRIC RAILWAY
COLUMBUS, OHIO, Oct. 10, 1914.

To the Editors:

I feel that I must challenge the statement of brother Parks from East St. Louis in your Oct. 3 issue, page 623, where he writes that a difference of ¼ in. in the diameter of his car wheels caused two armatures to burn out.

I do not question the sincerity of Mr. Parks nor the accuracy of his statement of fact, but I cannot agree with his conclusions. It is possible that this is a typographical error and that 1¼ in. was meant, in which case I would be inclined to think Mr. Parks had some grounds for his belief that this was the cause of the burn-outs.

This question of the effect of different diameters of wheels on motor load has been one of great interest to me for some years, and I have been hoping for some time that someone would come forward with a demonstration. That a difference in the diameter of the wheels on the same car will cause unequal loading of the motors is an accepted fact, but just how much this is I have never been able to find out. I have even appealed to the experts of one of the best-known companies making railway motors and equipment for a solution of this problem, but received only an evasive answer.

On the property that I represent it is a rule to keep the diameter of wheels on any car within 1 in. of each other, but cases have been known where we have found wheels differing as much as 2 in. In one particular case a careful test of temperature rise was made on motors on a car with wheels differing by more than 2 in. While a difference of temperature rise was shown, the expert making the test could not say how much of this was due to the difference in diameter and how much to other causes, such as different ventilation, etc.

Mr. Parks does not give the diameter of the wheels used, so that it is impossible to compute the percentage of difference, but assuming that his wheels were only 30 in. in diameter, which is about the limit for city cars, we would get for ¼ in. a difference of 0.8 per cent in diameter, which I cannot by any stretch of imagination conceive as the cause of the armature burn-outs.

There is one fact that possibly may not be well known in this connection, namely, that on interurban cars, or cars that run at fair speed, the rear motor of a four-motor equipment will always show the greatest temperature rise. For this reason, if it is necessary to use wheels of different diameters, the longer wheels should be placed in the front end of car and the small ones at the rear so that the motor doing the most work will have the best ventilation.

This subject is of great interest to me and I believe that a practical solution would be of great value, since if we know about what the effect of different diameters is we will be in position to decide how much expense will be justified in keeping the diameters of wheels within certain limits.

This communication has not been written in a spirit of criticism, but rather in the hope that it will bring out discussion and further facts.

F. J. FOOTE, Master Mechanic.

ASSOCIATION NEWS

PUBLIC SERVICE COMPANY SECTION MEETING

At the meeting of the Public Service Company Section of the association, held in Newark, N. J., on Oct. 29, papers were delivered by W. J. Clark, manager heavy traction department General Electric Company, and Martin Schreiber, engineer maintenance of way Public Service Railway. Mr. Clark spoke on "European Public Utility Conditions" and gave a wealth of data showing the comparative results of public and private operation and ownership of utilities in Europe and the United States. His paper was illustrated with numerous charts projected on the screen. Mr. Schreiber described in considerable detail, with the aid of lantern slides, the plans of the Newark terminal, now under construction. He traced the development of the enterprise from its inception less than two years ago and concluded by showing interesting progress pictures of construction. He stated that at the present time a considerable proportion of the caissons for the column footings have been sunk. The operation of sinking the caissons was explained with the aid of a diagram prepared especially for the purpose and adding materially to the value of the paper.

After the addresses the annual election of officers of the section was held and the following were unanimously elected: President, P. F. Maguire, chief clerk maintenance of way department; vice-president, W. R. Ricker, shop foreman mechanical department; secretary, A. T. Warner, traffic investigator transportation department; treasurer, D. H. Roszel, division engineer engineering department; director (one-year term), Thomas Leahey, general foreman distribution department; director (two-year term), George L. Walsh, claim agent Passaic division.

DENVER TRAMWAY COMPANY SECTION NOTES

The Denver Tramway Company Section is now entering upon its third year of work, having been organized Sept. 19, 1912, with a charter membership of forty-eight. The meetings are held in a fine auditorium with a seating capacity of 500, provided by the company at the company's building in Denver.

The opening meeting of the current year was mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 10. At this meeting, which was devoted to safety matters, the value of section work was illustrated most effectively. The section first heard an account of the safety work of the Union Pacific Railroad. It was learned that during the preceding two years 3000 recommendations were received by the safety bureau of that company from employees, and 90 per cent of these recommendations were acted upon favorably. The discussion of local problems under the lead of Vice-President John A. Beeler brought out clearly how strenuously the Tramway Company is endeavoring to reduce the number of accidents. An effort was made to connect the accident efficiency of the men with their coasting records, recording fare-register records, etc., but it was found that valuable as these and other mechanical devices are the personal element remains the controlling factor. Mr. Beeler said that the Denver Tramway was the first company in the United States to adopt the center-entrance car and was one of the first to adopt the automotoneer, the straight air brake with emergency feature and other devices. He pointed out a record on one line of 54,000 car-miles per accident, including those of the most trivial character, and stated that a record of 100,000 car-miles would soon be reached. He also showed how proper training with the coasting recorder can produce remarkable results. H. G. Munkhenk is the secretary of the section.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Types and Cost of Guard Rails

BY CARL H. FULLER, FORMERLY ENGINEER MAINTENANCE OF WAY MACON (GA.) RAILWAY & LIGHT COMPANY

The assertion is frequently made that it is cheaper to buy the raw material and work it up with company forces than to buy the finished product from the specialist. Hence the trackman is often compelled to economize in directions against which his instinct protests, but if he lacks the data to back up his better judgment, he is compelled to yield to the demands for "economy" from the man higher up.

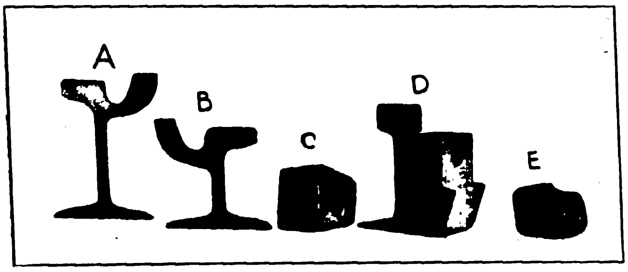
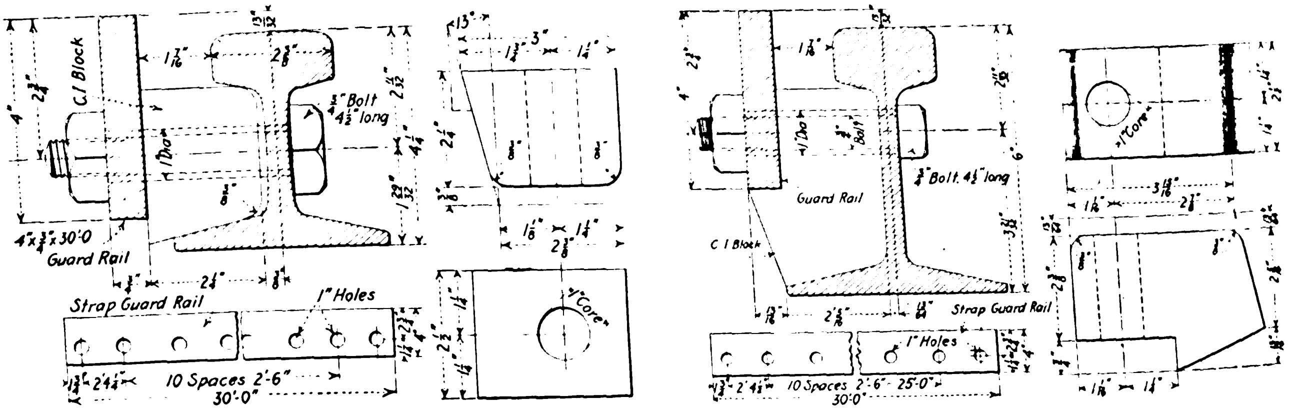


FIG. 1—RAIL SECTIONS AND BLOCKS FOR GUARD RAILS

This point is one that comes up in such a matter as guard rails on curves. The writer has always believed that it was impossible to obtain the same satisfactory service and economy from the home-rolled curve. guarded with makeshift devices, as from the machine-rolled rail with the guard attached or made an integral part of the rail. (See *A* and *B* of Fig. 1.) During the past two years he has had an opportunity, not of his own selection, to make a comparison between the cost and mechanical qualities of the shop-rolled curve with guard attached and of the home-rolled kinds. The results of these observations are presented herewith. For the sake of comparison all data will be confined to the use of the standard 60-lb. A. S. C. E. rail section. All labor was paid $1.35 or $1.50 a day and $2.50 for the foreman. All drilling except that done in the shop was carried out with a Duntley electric track drill.



FIGS. 2, 3, 4 AND 5—APPLICATION AND DETAIL OF GUARD RAIL AND BLOCKS

In casting around for a substitute for the shop-rolled curve the writer found that the company had been using old rail or new bar iron bolted to the running rail. The old rail proved unsatisfactory in dirt roads because the working of dirt under its flanges caused the rail to rise until the wheel flanges severed the bolts, and no amount of spiking would hold it down. Further, the strap guard used was of various sizes and drillings, occasionally more than one size being used on the same curve and seldom more than 16 ft. long. In an effort to standardize the use of this material, details were drawn up for a 4-in. x ¾-in. bar-iron guard attached by cast-iron blocks and bolts to the 60-lb. and 72-lb. rail. (See Figs. 2, 3, 4, 5 for details and *C* and *D* of Fig. 1 for views of the finished blocks.) Patterns were made and the blocks cast in quantities at the local foundry for $0.12 and $0.155 respectively.

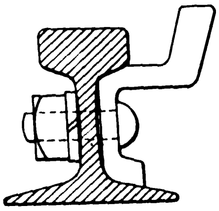


FIG. 6—MILL GUARD

The next step was to buy 2000 ft. of bar iron. The mill quoted $0.174 per ft. with $0.03 added for drilling. We ordered the plain bars and found that we could unload from the cars and carry to the shop, drill on power drill press and put in stores for $0.0291 per ft., or $0.0022 per lb., or $0.0515 per 13/16-in. hole. A second and a third order of the same material was handled for a shade less.

The bending of rails for curves was done on the job with an ordinary trackman's roller and a crew of five men and foreman. Accurate figures cannot be given for this work, but stop-watch observations indicate that owing to conditions it cost an average of $0.077 per ft. and upward.

The following figures for four jobs include the handling of the bars from the storeroom to the job, the drilling of the holes in the running rail with the track drill and the application of the bars, blocks and bolts.

Job 1,	268 ft., at	$0.0286 per ft.
Job 2,	236 ft., at	0.054 per ft.
Job 3,	1560 ft., at	0.0392 per ft.
Job 4,	400 ft., at	0.041 per ft.
Average total		$0.034 per ft.

Assembling our figures we find the inner rail of the curve cost as follows:

60-lb. rail	$0.300	per ft.
Labor bending rail	0.077	per ft.
4-in. x ¾-in. strap iron	0.193	per ft.
Drilling and applying	0.034	per ft.
Cast-iron blocks, bolts, etc.	0.095	per ft.
Total	$0.699	per ft.

Where the track is on private right-of-way where we did not have to contend with the working of dirt under the flange of the rail we used old 40-lb. rail for guard, having a scrap value of $10 per ton, which cost in place as follows:

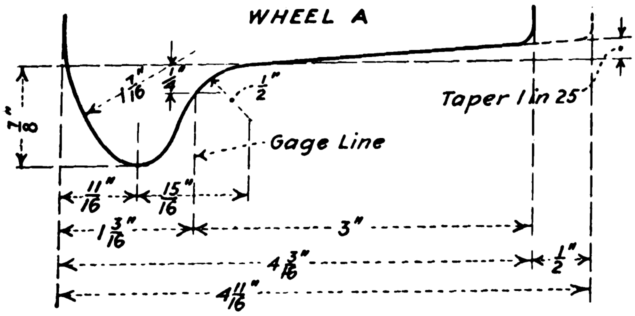


FIG. 7—CONTOUR OF STANDARD A. E. R. A. WHEEL FLANGE

60-lb. rail	$0.300	per ft.
40-lb. rail at $10 per ton	0.065	per ft.
Bending 60-lb. rail	0.077	per ft.
Drilling and applying guard	0.074	per ft.
Cast-iron blocks, bolts, etc.	0.106	per ft.
Total for inner rail	$0.622	per ft.

Recently there was an opportunity to install several curves in solid concrete paving where in order to get smoother riding curves, the mill guard shown in Fig. 6 was used at the following average cost:

60-lb. rail	$0.300	per ft.
Bending rail	0.077	per ft.
Mill guard, Fig. 6	0.533	per ft.
Labor applying guard	0.055	per ft.
Total	$0.965	per ft.

The guard rail section, *B* of Fig. 1, can be bought curved at the mill to a given radius with easements on each end of the curve and delivered on the job for $0.655 per lin. ft.

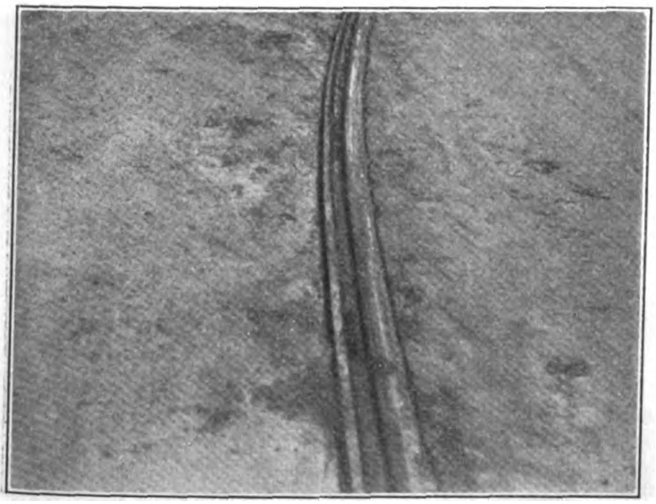


FIG. 8—EARLY STAGES OF WAVE ACTION IN STRAP-GUARD RAIL CONSTRUCTION

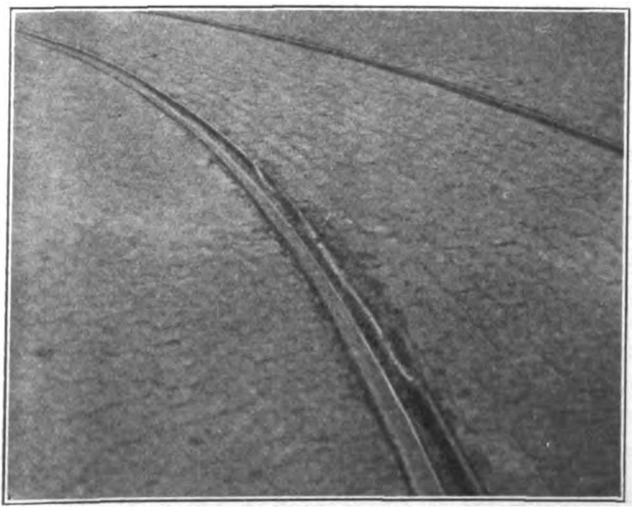


FIG. 9—ADVANCED STAGE OF TROUBLE WITH STRAP-GUARD RAIL CONSTRUCTION

Anyone who will study the contour of the standard A. E. R. A. wheel flange (Fig. 7) a few moments must admit that this rail section is better suited, mechanically, than the guards we have been considering for use on curves. Therefore, we will consider this section as 100 per cent efficient and make comparison of the cost of curves on this basis:

A—Solid guard rail section	$0.655	or	100	per cent
B—4-in. x ¾-in. strap guard	0.699	or	107	per cent
C—Rail guard	0.622	or	95	per cent
D—Mill guard	0.965	or	147	per cent

There is no doubt that the mill guard Fig. 6, is nearly though not quite as good as the solid rail section, *B* of Fig. 1, but it is attached with bolts. The home-rolled curve is bound to be inferior to the shop-rolled curve, and even ignoring the labor to apply it costs more than the solid guard. Consequently, the home-rolled curve cannot be recommended even on the basis of first cost. From the standpoint of cost the strap guard, Fig. 2, and the rail guard, both of which are makeshifts whose only reason for existence is economy of first cost, approach so close to the cost of the mill-rolled curve of solid guard rail that any advantage of initial economy might as well be dismissed.

But when we consider the matter of ultimate maintenance the solid guard with its solid lip is there to stay until it wears out. The mill guard is of good shape and gives an easy riding curve which requires little attention, but bolts will break occasionally where the service is rough on the track. When they do it is sometimes necessary to break out and replace every bolt in the piece owing to the invasion of dirt under it—an expensive and troublesome operation.

A rail section can be used to make a good stiff guard, but owing to its climbing proclivities the rail is unsuitable for use in dirt roads where it is covered up; nor is it suitable for very sharp curves where the bolts break with such annoying frequency that their entire renewal may be required every six months. With a scrap value of $10 per ton there is no economy in trying to use old rails for guards, and even with a still lower scrap value it is questionable if it is not cheaper in the long run to sell the rail and buy the mill-rolled solid guard-rail section.

As for the strap guard, this has proved the veriest makeshift without the argument of first cost to commend it. It will remain smooth for any length of time only on long flat curves. The sharper the curve the quicker does the strap guard develop wavy places, bulging outward under the action of the wheel between the bolts, owing to its lack of stiffness, until the nosing of the cars becomes an inherent feature of the curve. Fig. 8 shows a case where this wave action is beginning to develop. The mismatching of the joint is also noticeable—a trouble that is quickly accelerated by the breaking of a bolt and the possible derailment of a car. In the picture, which shows a curve in a street paved with solid concrete, we see the effect of vibration due to the rough riding of a guard which failed to wear smooth under the cutting action of the wheel. The pounding pulverized the adjacent concrete until the rail lay loose as in a slot.

In Fig. 9 we see the result of wear on the strap guard. First the guard is cut out until it approximates the shape of the mill guard and then it breaks through because of insufficient metal. The views of Figs. 8 and 9 were taken less than two years after this track was laid and on a section where car travel seldom exceeded eight cars an hour. An increase in the thickness of the strap to 7/8 in. or 1 in. only increases the life slightly at an appreciable increase in cost.

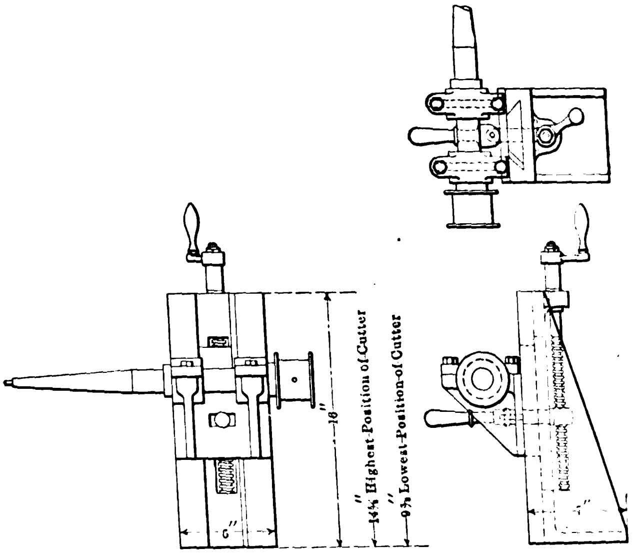
In addition the strap and rail guards require more attention from the track greaser than the solid and mill guards, while fully 100 per cent more grease is required, with most of it wasted. If curves of this type are numerous the expense of lubrication may easily become quite an item.

Commutator Slotter with Rotary Suction Fan

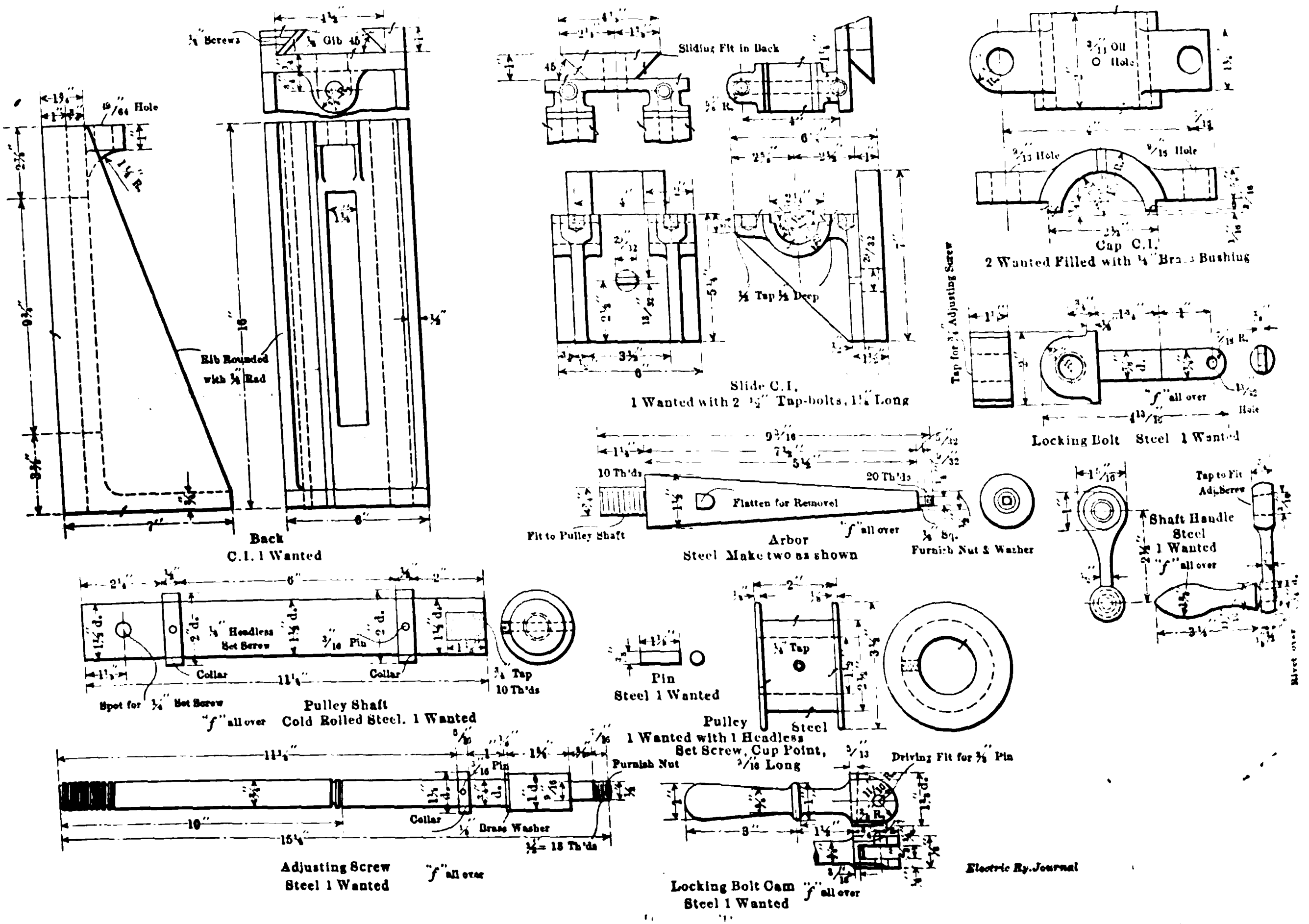
BY E. J. HAINES, ACTING ASSISTANT SUPERINTENDENT OF EQUIPMENT BAY STATE STREET RAILWAY, BOSTON, MASS.

The slotting of commutators on railway motors has overcome so many commutating and other motor troubles that it is now almost a universal practice.

Where commutators are not slotted, unless a highly abrasive brush is used the copper is worn away faster than the mica. The mica which then projects above the segment surface causes poor brush contact with the resulting sparking and flashing over. Flat commutators also result from the fact that the mica does not wear evenly at all points on the commutator. This trouble is entirely done away with by slotting the commutator. In addition to the elimination of troubles, a great saving is effected in maintenance costs by slotting commutators. A higher grade brush can be used, the brush-holder spring tension can be cut down and regulated with greater accuracy, and commutator wear can be reduced to a minimum. The brush tension, however, has to be closely followed, as track conditions play an important part, for too little tension will cause flashing on a rough rail.


18"
14¼ Highest Position of Cutter
9⅞ Lowest Position of Cutter
6"

BAY STATE STREET RAILWAY—ASSEMBLY OF COMMUTATOR UNDERCUTTING ATTACHMENT


Screws
Gib
19/64 Hole
Rib Rounded with ¼ Rad
Back
C.I. 1 Wanted
Sliding Fit in Back
Slide C.I.
1 Wanted with 2 ½" Tap-bolts, 1½ Long
¼ Tap ¼ Deep
Oil Hole
Cap C.I.
2 Wanted Filled with ¼" Brass Bushing
Tap for Adjusting Screw
Locking Bolt Steel 1 Wanted
10 Th'ds
20 Th'ds
Flatten for Removel
Fit to Pulley Shaft
Arbor
Steel Make two as shown
Furnish Nut & Washer
Tap to Fit Adj. Screw
Shaft Handle
Steel
1 Wanted
"f" all over
Headless Set Screw
Pin
Collar
Tap
Spot for ¼" Set Screw
Pulley Shaft
"f" all over Cold Rolled Steel. 1 Wanted
Pin
Steel 1 Wanted
Pulley Steel
1 Wanted with 1 Headless Set Screw, Cup Point, 3/16 Long
Driving Fit for ⅛ Pin
Furnish Nut
Collar
Brass Washer
13 Th'ds
Adjusting Screw
Steel 1 Wanted
"f" all over
Locking Bolt Cam
Steel 1 Wanted
"f" all over
Electric Ry. Journal

BAY STATE STREET RAILWAY—DETAILS OF COMMUTATOR UNDERCUTTING ATTACHMENT

For a number of years the Bay State Street Railway has made it a practice to slot commutators, and for this purpose the commutator slotting device shown in detail on the accompanying drawings is used. This tool is mounted on the carriage of a lathe, the operator aligning and advancing the circular saw or miller by hand. The arbor on which the saw is mounted is driven by a 1½-in. belt, a friction pulley with counterweight keeping the belt tight throughout the operation.

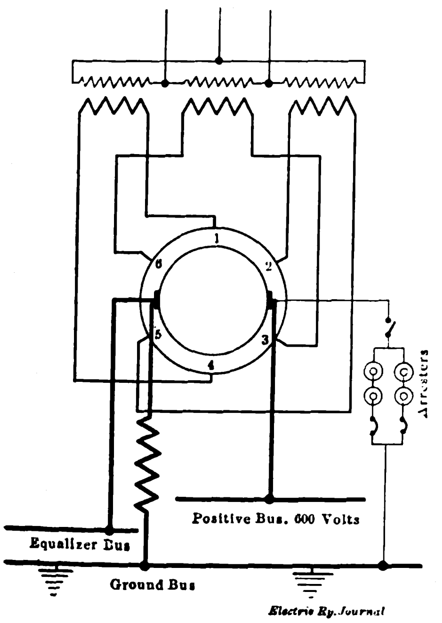
The saws used have twenty teeth, are 0.025 in. thick, and are made of special tempered steel. They can be purchased at very small cost, or manufactured in the shop, a large number being milled out on an arbor at one time and then tempered individually. As the copper dust and mica chips have proved troublesome, a small rotary suction fan has been installed. This fan gives very good protection to the operator.

On the average one man can slot one commutator an hour. After slotting care must be exercised to free the commutator from burrs and pieces of mica which, if not removed, would give a great deal of trouble. One saw will last approximately during the slotting of two to three commutators, depending on the hardness of the mica. It has been found that the use of a glass brush on slotted commutators, at every inspection of armatures in service, keeps the slots cleaned out and prevents carbon dust from accumulating, thus preventing a lot of trouble.

Aluminum Arresters Overcome Rotary Converter Flashovers

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES, SAULT STE. MARIE, ONT.

In a newly-built substation, where the incoming voltage of 25,000 had to be stepped down and converted to 600 volts direct current, much difficulty arose due to flashovers from the positive to the negative brushes or to the frames of the three 500-kw six-phase diametrically-connected rotary converters. The exact cause of the disturbance was not determined, but it was observed that whenever a short-circuit occurred in the carhouse or repair shop, only 50 ft. distant from the substation, a big flashover followed on the rotaries. Sometimes these flashovers were so bad that we had to use a commutator stone to grind down the commutators to a smooth finish.



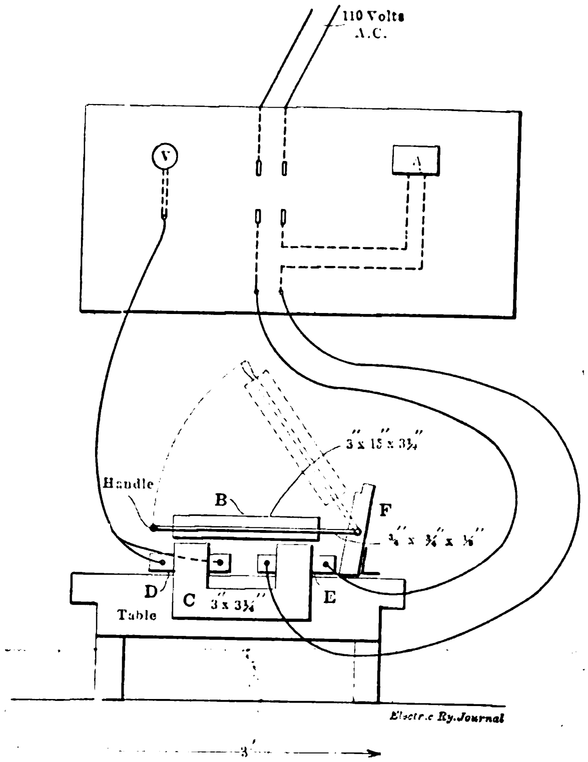
WIRING OF ROTARY CONVERTER SHOWING USE OF ARRESTERS TO OVERCOME FLASHOVERS

Our circuit breakers were of "Conduit" make with two trip coils. These breakers appeared to be in perfect order, and we thought that if a circuit-breaker was placed in the carhouse the troubles would stop. We did so, but the flashovers came as before. We then hit upon the plan of installing aluminum cell lightning arresters of the 300-volt type. The cells were connected between the positive terminal of each rotary and the ground bus, the connections being made as shown in the accompanying sketch.

We found that for a 500-kw unit the arrangement usually desirable was to employ four cells connected two in series with the two pairs of cells in multiple. A 30-amp fuse was inserted in series with each pair of cells in addition to the fuse between the ground bus and the parallel circuits formed by the cells. Since the installation of these arresters very little trouble has been experienced, and the only attention required is an occasional renewal of the arrester electrolyte. Their value is indicated by the phenomenon that during the operation of the rotaries a slight but almost continuous discharge may be observed between the two concentric plates of the arrester.

Field Coil Testing Apparatus

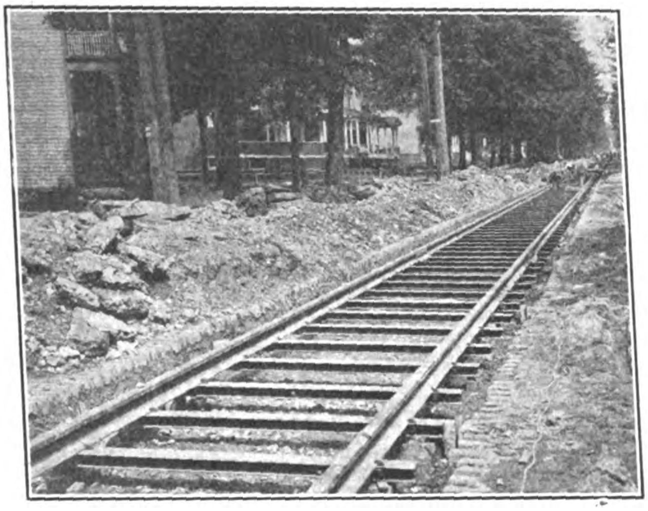
At the St. John Street shops of the Portland (Maine) Railroad Company, the field coil testing device shown in the accompanying drawing is in use, the apparatus having been made at the shops. A 110-volt, sixty-cycle, single-phase service is brought to a switch on a panel located on the wall, and an edgewise type ammeter is connected between one of the switch terminals and an exciting coil, *E*, which surrounds a laminated pole piece at the end of a core, *C*. The magnetic circuit is closed by letting an armature, *B*, drop upon the pole pieces after the coil to be tested, *D*, is dropped around the pole piece, as shown. This second coil is connected with a voltmeter, *V*, on the panel. If a coil is sound, full voltage according to a previously marked scale will appear on the voltmeter when the switch is closed, and the condition of the coil can also be detected by the sound of the laminations.



SKETCH OF FIELD AND TESTING DEVICE USED BY THE PORTLAND (MAINE) RAILROAD

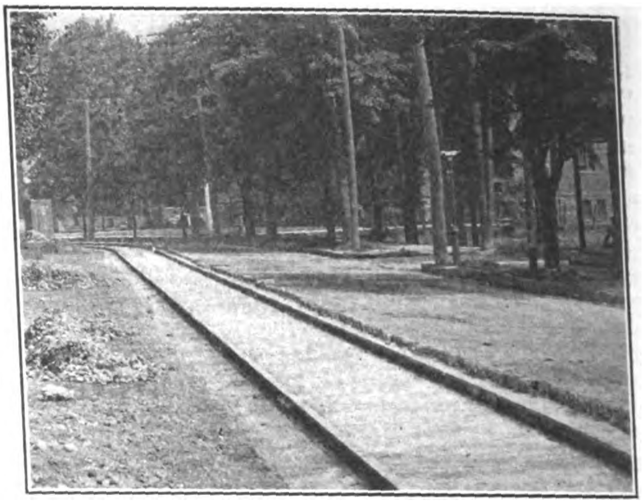
The Public Utilities Commission of Illinois has rendered an opinion to the effect that newspapers in Illinois cannot exchange advertising space for railroad transportation.

Steel Tie Construction at Buffalo



BUFFALO TRACK—READY FOR CONCRETE

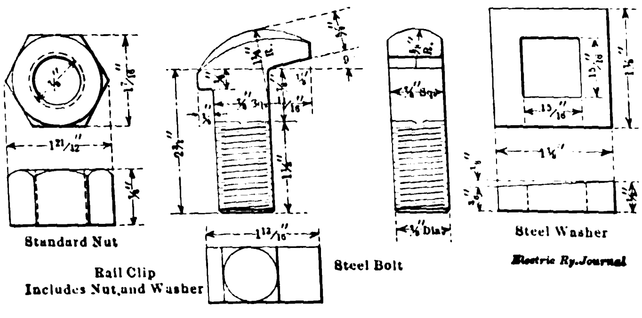
The International Railway, New York, has recently completed 4¼ miles of single track with steel cross-ties throughout. The steel tie used is the Carnegie Steel Company's section M-24, I-beam shape, with base, 5 in.; narrow flange, 3 in.; depth, 3 in.; weight, 9½ lb. per foot. The ties were cut 6 ft. 6 in. long. The track was laid partly with 85-lb. A. S. C. E. rail and partly with Lorain section 116-434 girder rail. All mechanical joints were of continuous type. The tie fastening, which is known as the "Carnegie No. 25-A," is illustrated in an accompanying drawing. This fastening is simply a bolt with a head resembling a spike head, the nut and washer being secured to it under the flange of the tie. A fastening of this kind was used because the paving made it necessary to get all the depth possible.



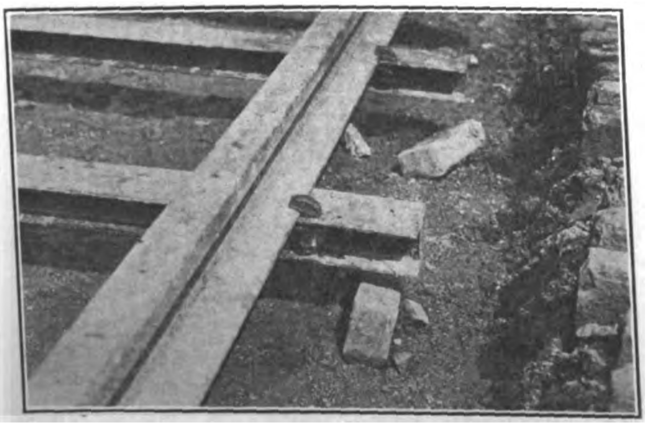
BUFFALO TRACK—CONCRETED FOR BRICK PAVING

The spacing of the ties is 30 in. center to center, except at joints where it was reduced to 24-in. They were laid in a solid block of concrete, 8 ft. 6 in. wide to a depth of 8 in., or 5 in. under the bottom of the tie. The concrete mixture consisted of one part cement, three parts sand and eight parts gravel, mixed with a Foote 1-yd. mixer. This track was laid on Delaware Avenue, from the city line to Young Street, Tonawanda, N. Y., and on Ferry Street, Buffalo, N. Y., from Fillmore Avenue to Bailey Avenue. The latter section was laid with girder rails and welded joints. Of the three accompanying halftones, one shows the fastening, a second the track laid ready for concrete and a third the track concreted ready for paving, which was of brick throughout.

The work was designed and the construction was under direct charge of H. L. Mack, superintendent of track and lines, International Railway.



BUFFALO TRACK—STEEL TIE FASTENING



BUFFALO TRACK—TIE FASTENING IN PLACE

Comparison of Maintenance of Way Expenditures on the New Haven

Aggregate maintenance expenditures in the past year on the New York, New Haven & Hartford Railroad were $19,220,522, an increase of $1,726,764, or practically 10 per cent. It has been said that such expenditures as were made during the past year were needed to put the property in good shape physically. The ratio of maintenance to gross revenues was 28.86 per cent against 25.49 per cent in 1913 and 22 per cent in 1912. Expenditures on way per mile of road were the largest ever, amounting to $4,156, an increase of $517, or 13 per cent over 1913 figures. A four-year comparison of maintenance of way expenditures reduced to per mile of road and per mile of track follows:

	1914	1913	1912	1911
Maintenance of way...	$8,149,288	$7,238,113	$6,211,288	$6,398,854
Per mile of road......	4,156	3,639	3,122	3,215
Per mile of track.....	1,853	1,625	1,415	1,467

Shortage of Arc Lamps and Carbons in England

The *Engineer*, of London, says that the war has shown the extent to which England has depended upon Austria and Germany for its supply of arc lamps and carbons. Before the war began there was only one firm in Great Britain regularly engaged in this business. That firm built its carbon factory twelve years ago and "owing to persistent price cutting on the part of foreign competitors it has had on its own acknowledgment to face a loss of over £70,000." Since the war commenced the demand on the English factory has been enormous. In less than a week the firm could have sold a year's output.

Portable Concrete Houses

The growth of the use of reinforced concrete for small buildings, such as waiting stations, telephone booths, outhouses, switchmen's shelters and the like has been seriously handicapped in the past by the question of price, although the losses through incendiarism or rapid deterioration in the case of small unoccupied wooden buildings have been considerable. Recently, however, the manufacture of concrete houses on a large scale in specially-equipped factories has effected an astonishing reduction in the first cost, and this has now reached the point where the concrete structure with all its advantages of long life, absence of repair charges, neat appearance and fireproof construction, is actually cheaper than a similar wooden building.

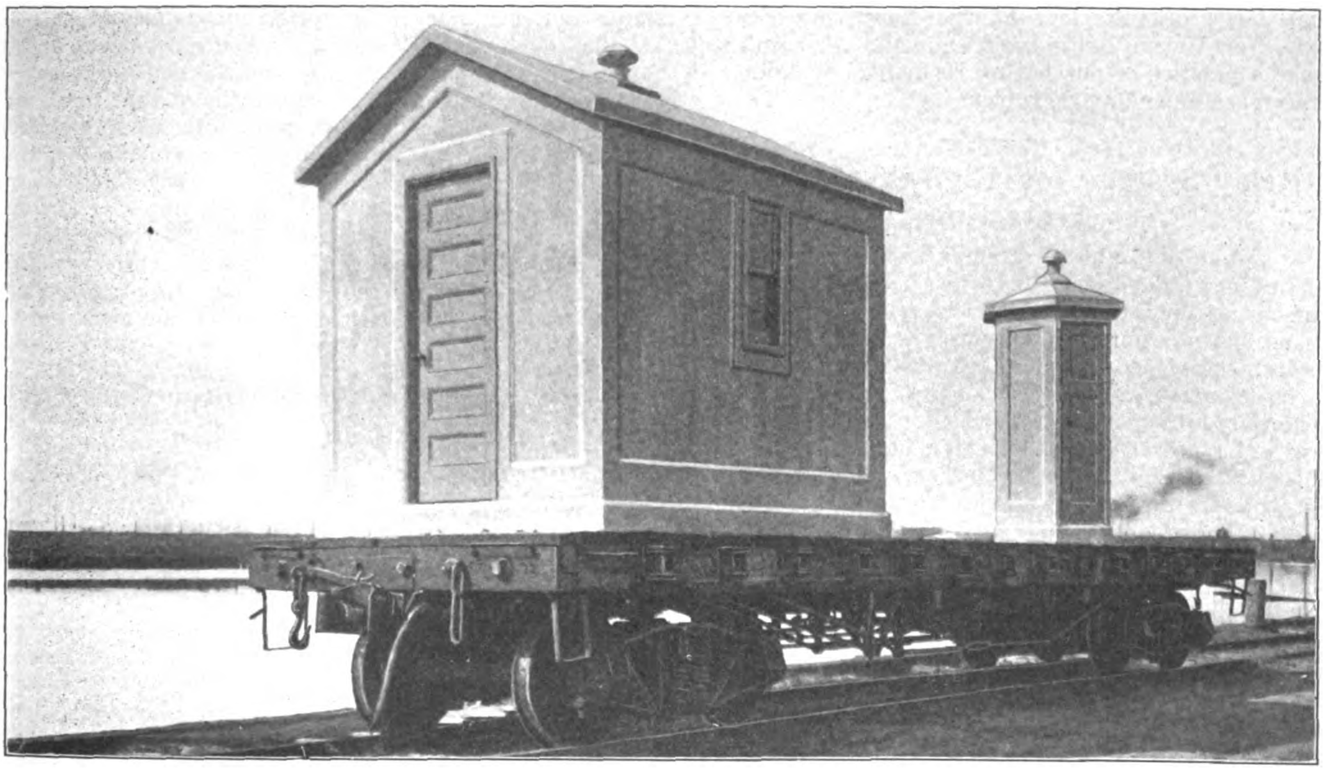
To cite an example: A well-built wooden waiting station, 8 ft. x 10 ft. in dimensions may be expected to cost, when built by a railway company, about $250 exclusive of overhead charges. A portable concrete house of the same size sells at the factory for $200, and as the latter structure is monolithic it can be unloaded from a freight car and leveled in position at any desired point with a minimum of labor. It is claimed that $25 should cover this expense under all ordinary circumstances, so that the use of concrete may be expected to effect a saving of about 10 per cent in first cost alone. The cost of freight is a negligible item as the houses are built in a dozen different parts of the country. The rate in the vicinity of Chicago, for example, is approximately 5 cents per hundredweight per 100 miles.

Among the electric railways which have been quick to grasp the economies resultant from the use of reinforced concrete for the numerous small buildings that are required for various purposes is the Lackawanna & Wyoming Valley Railroad, and the accompanying illustration shows two of the widely different types of portable concrete structures that have been purchased by the road.

One of the concrete structures is intended for housing a train-staff machine and the operator in charge at the end of a stretch of gauntlet track in a long tunnel. The other is intended for an outhouse. Both houses, as will be seen, have been loaded upon a flat car for shipment, and this illustrates one of the most remarkable features inherent in the design. The buildings are handled on and off the cars by a derrick or crane just as if they were solid, the line from the boom of the crane being passed through the hole for the ventilator in the middle of the roof and attached to a block of wood that distributes the strain along the ridge of the roof. The weight of the 8-ft. x 10-ft. house shown in the illustration is 20,000 lb., the small octagonal structure which is 4 ft. in diameter weighing 4400 lb.

As the houses are provided with floors that are homogeneous with the walls they may be set down anywhere without elaborate foundations, and they can be readily moved from place to place in case the necessity arises. The reinforcement, which consists of bars in the larger houses and bars and mesh in the small ones, is carried across the floor and roof so that there is no danger of cracks caused by uneven settlement. In general the roofs of rectangular buildings are made up of a grid of reinforcing bars, the octagonal houses, which are made in sizes ranging from 4 ft. up to 7 ft. 6 in. in diameter, having the reinforcement extend radially from a ring at the top of the roof.

No paint is applied either externally or internally nor is it ever necessary to paint these structures. The finish is made smooth and white in manufacture so that the appearance is exceptionally neat. Waterproofing is effected by using a rich mixture of concrete and in addition by introducing a special waterproofing compound while the mixing is going on. No leakage of water either through the roof or through the sides has been experienced. The walls of the large-size houses are approximately 4 in. thick, the floors being 3 in. thick and the roofs tapering from 4 in. down to 3 in. For the small houses these thicknesses are re-



MONOLITHIC CONCRETE STRUCTURES READY FOR SHIPMENT TO THE LACKAWANNA & WYOMING VALLEY RAILWAY duced in proportion, the sides approximating 2½ in. in thickness.

As mentioned above the cost of an 8-ft. x 10-ft. monolithic concrete house is about $200, but in the smaller sizes the costs are even lower in proportion. The price of the 4-ft. octagonal house shown in the illustration is only $65 and that of an octagonal house 7 ft. 6 in. across the flats, which is specially designed for interurban waiting stations, is $150. These prices include doors and windows, which can be made with metal frames if necessary, and any desired equipment may, of course, be installed, telephone booths, for example, being furnished with a shelf, a drawer for train orders, and suitable entrances for wires; oil houses having tanks and self-measuring pumps and watchmen's shelters being equipped with movable sash, a seat and a coal box. Practically any design of house can be supplied as the manufacturer, C. F. Massey Company, New York and Chicago, keeps a large variety of standard forms available for casting the buildings in monolithic form. It is interesting to note that even such large organizations as the New York Central, Erie, New Haven, Baltimore & Ohio and other railroads make a practice of purchasing ready-made buildings in preference to making their own.

Relay System for Highway Crossing Protection

A system of highway crossing signal protection involving new relay apparatus which may be adapted to a number of operating requirements in connection with an oscillating contactor attached to the rail has been recently developed by the Protective Signal Manufacturing Company, Denver, Col. The system meets four general requirements as follows: For single-track crossings, (1) no cut-out at crossing—highway bell permitted to ring out predetermined time, and (2) bell cut out when train reaches crossing. For double-track crossings, (1) movements only in direction of current of traffic, bell cut-out at crossing, and (2) movements in both directions on both tracks, bell cut out at crossing.

With a simple single-track crossing, when no cut-out at the crossing is desired and the highway bell is to be permitted to ring out a predetermined time, a train passing over either of the oscillators which are secured to the rail at the point from which the indication is desired opens the line circuit to the relay, de-energizing the relay coils and dropping its armature, which closes the bell circuit. The instant that circuit is closed through the bell magnet coils and the bell armature is drawn to its poles, the time element ratchet wheel is propelled around one tooth and through its contacts opens the line circuit to the relay and keeps the local or bell circuit closed. This continues until the time wheel has completed its set time and its contact cam is again brought in contact with the contact brush of the relay circuit, closing the line circuit and opening the bell circuit ready for another operation. Any desired ringing time can be given up to two minutes and forty seconds, the proper time being determined by speed and length of trains.

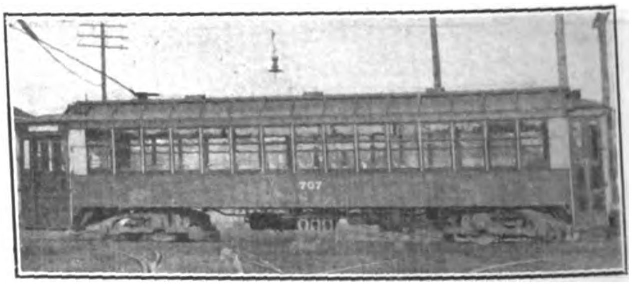
With a simple single-track crossing with a cut-out for the bell when the train reaches the crossing an additional cut-out oscillator at the crossing is connected direct to the terminal board and thence to the cut-out relay in the time unit. In this case the bell rings after the train passes over the first distant oscillator until it reaches and passes over the cut-out oscillator at the crossing, at which moment the cut-out relay in the time unit is de-energized and its armature drops, picking up the line relay and opening the bell circuit through the brush on the stick coil of the time relay. This causes all operations in the time unit to cease and the bell to stop ringing. As the train proceeds and passes over the distant oscillator on the other side of the crossing, for movement in the opposite direction, the vibration of the line oscillator again opens the line circuit to the line relay and its armature is again dropped. This action closes the circuit to the time relay which immediately continues its operation until the time wheel has completed its set time and restores the line relay ready for the next operation without causing the bell to ring. The reason for the non-ringing is that after the bell circuit is once broken through the stick coil of the time relay by the cut-out oscillator at the crossing, it is not again picked up until the time relay has reset.

With double-track crossings, when movements are only in the direction of the current of traffic and cutting the bell out at the crossing is desired, the crossing is protected by a relay system nearly similar to that last mentioned, except that each track has only one distant oscillator and each track is protected independently.

With double-track crossings, when movements are in both directions on both tracks and the bell is cut out at the crossing, the connections from the distant line oscillators are the same as with the ordinary single-track crossing, and the installation and operation of this equipment is the same as with single-track where a cut-out is used, excepting that one common line wire and one bell for the two tracks are used. The interior wiring of the time unit is also somewhat different. Otherwise this installation would be the same as two independent single-track crossings with cut-out at the crossing.

Seattle Single-End Two-Motor Cars On 7 Per Cent Grades

The Puget Sound Traction, Light & Power Company placed in service during August, 1914, twelve new single-end prepayment cars of the type illustrated. These cars weigh 40,300 lb. each fully equipped, are 49 ft. 2 in. long over all, and seat sixty passengers. The equipment per car includes two Westinghouse 310-C motors, K-35 control, and two Standard No. 0-36 maximum traction trucks. The company had previously been under the impression that it could not economically operate anything but a four-motor equipment in Seattle owing to the heavy grades. It still has a number of lines on which it cannot operate a maximum traction truck, but it has others on which a car equipped with maximum traction trucks will maintain the same schedule as a four-motor equipment. After trying one car with such trucks, it purchased ten more in 1913 and twelve this year, making a total of twenty-two. The company operates these cars over a 7 per cent maximum grade.



SEATTLE SINGLE-END TWO-MOTOR CAR OPERATED OVER 7 PER CENT GRADE

News of Electric Railways

REPORT ON TRANSIT CONDITIONS IN ST. LOUIS

Summary of Recommendations Made by Engineer Harrop to the Missouri Commission and Comment of General Manager McCulloch

J. L. Harrop, engineer for the Public Service Commission of Missouri, has filed with the commission his report regarding the adequacy of the service rendered by the United Railways and the near-future transportation requirements of the city of St. Louis. His definition of adequate service is that it means the operating of enough cars to carry all who desire to ride, with a maximum degree of safety to both the passengers and to the traffic on the street, with a maximum degree of comfort to passengers in well-heated and well-ventilated cars, with the highest speed consistent with safety, over the shortest practicable routes, for a single fare to any part of the city, with a reasonable return to the company. He says that unless operating or financial conditions render it impossible or impracticable, seats should be furnished for all who desire to ride during the non-rush hours. From personal experience he found the existing transfer system in St. Louis to be very satisfactory.

Other recommendations made by Mr. Harrop are as follows:

"That an ordinance be enacted making it a misdemeanor for vehicles to use the street railway tracks when there is sufficient room on the sides for their passage.

"That the city establish additional safety zones as a measure to promote safety and convenience of the people who use street cars.

"That the practice of pedestrians crossing street intersections diagonally be prohibited.

"That all of the company's cars be equipped with forced ventilation heaters or other equally satisfactory heating device ready for service during the winter of 1915-1916."

In answer to complaints that cars were unsanitary and dirty the report says:

"The examination of hundreds of cars in operation and just leaving the carhouses showed the cars to be in excellent sanitary condition."

The company is commended for its action in beginning to equip car platforms with sliding doors and folding steps so that the platform is completely closed while the car is under way.

With reference to the track conditions, Mr. Harrop says:

"A careful examination of all the tracks shows, in general, that their physical condition is good. There are, of course, and always will be on a system of this size, pieces of track that are in poor condition."

The practice of certain manufacturers of dismissing some of their departments at 5 p. m., others at 5:15 and others at 6 p. m. is strongly commended by Mr. Harrop as tending to lessen the congestion at the peak. Comparing the speed at which the United Railways cars are operated, Mr. Harrop finds that it is fully up to the standard maintained on the street railways in Cleveland, Detroit, Milwaukee, St. Paul and Minneapolis. He says that the cars of any street railway system should be operated at the highest speed consistent with safety. He finds that the average number of passengers carried monthly during 1912 was 29,800,000, in 1913 31,400,000 and during 1914 31,600,000. The service furnished during the months of the traffic survey—June, July and August—was found to be excellent, and the "safety first" movement recently inaugurated is highly commended. He finds that the "owl" car service, generally speaking, is entirely adequate. Observations in the downtown districts show that there is considerable congestion at some street intersections during the morning and evening rush-hour periods. To alleviate this condition additional loops are recommended for construction during 1915, 1916, 1917 and 1918. There are a number of proposed extensions which are not recommended, but which are set out in the report. For various reasons it is said that it is not deemed advisable to recommend them at this time.

Richard McCulloch, vice-president and general manager of the United Railways, is quoted in part as follows:

"The report of J. L. Harrop, the engineer of the Public Service Commission, gives evidence of the thoroughness with which the observations were conducted. Of course, I have not seen the official report as yet. The question of 'adequate service,' which we are compelled to maintain, depends on what is a car load.

"The very things Mr. Harrop recommends regarding the downtown loops we have had in mind for a long time. We have had the matter up with the Board of Public Improvements, but were denied the privilege of making the changes. The board held it could not issue the necessary permits to lay new tracks and could only give us permission to connect tracks with curves and switches when the tracks were already down. Now, with the recommendation from the State Board, I trust it will be a simple matter to obtain the necessary franchises. The plan for the loop of the Hodiamont line conforms exactly to what in my estimation would be the best thing possible. All of the changes which have been recommended in regard to the loops are for the better, and if we are permitted the privilege of carrying out the recommendation, the downtown congestion will be relieved."

NEW INCOME TAX RULE

The commissioner of internal revenue, with the approval of the Secretary of the Treasury, has amended the income tax regulations so as to enable corporations to make income tax returns for fiscal years under which they operate instead of for the calendar year. In order to take advantage of this ruling, a corporation must give notice in writing to the collector of internal revenue for the district in which the corporation is situated at least thirty days prior to March 1 that it has designated the last day of some month as the close of its fiscal year. The fiscal year so designated must cover a twelve-month period. The regulation on the subject issued by the commissioner of internal revenue to the collectors of internal revenue is as follows:

"Reference is made to Treasury Decision No. 2001, relative to the designation by corporations of a fiscal year other than a calendar year as a basis for making returns of annual net income.

"You are informed that every corporation amenable to the income tax law in existence at the close of the calendar year is required to file a return to cover all or any part of the preceding calendar year during which it may have been in existence on or before March 1, provided such corporation has not established or does not establish a fiscal year.

"In order to establish a fiscal year it is necessary for the corporation to give notice to you in writing designating the last day of some month as the close of its fiscal year. This notice must be filed not less than thirty days prior to March 1 of the year in which the fiscal year period of twelve months closes. A return for that portion of the calendar year preceding the commencement of the fiscal period of twelve months is required to be filed on or before March 1 of the year next following the calendar year of which it is a part, and the return for the first full fiscal year is required to be filed on or before the last day of the sixty-day period following the close of the fiscal year.

"Example: A corporation desiring to establish its fiscal year as ending on June 30, 1915, must file notice not less than thirty days prior to March 1, 1915, or on or before Jan. 29, 1915. A return for the period Jan. 1 to June 30, 1914, must then be filed on or before March 1, 1915, and a return for the first fiscal year period (July 1, 1914, to June 30, 1915), must be filed on or before Aug. 29, 1915.

"That portion of the year preceding the beginning of an established fiscal year is held to be a fractional part of the calendar year, and as the return of a calendar year is not required to be filed until on or before the first day of March next following, there is no provision of law whereby the return covering a fraction of a calendar year is required to be filed earlier than 'on or before' the next March first, though it is preferred that the return for this fraction shall be filed as early as possible after the close of the period.

"The above instructions are supplemental to Treasury Decision 2001, and rulings or decisions heretofore issued in conflict with the foregoing are hereby revoked."

ANNUAL NEW HAVEN MEETING

The Report Includes References to Costs of the Electrified Division, Increase in Power Station Capacity and Probability of Buying Central Station Energy

The annual meeting of the stockholders of the New York, New Haven & Hartford Railroad was held at New Haven, Conn., on Oct. 28. Benjamin Campbell, Frank W. Matteson, J. B. Russell, Eli Whitney and Harris Whittemore were elected directors to succeed William Rockefeller, George F. Baker, John L. Billard, Morton F. Plant and William Skinner.

At the meeting the report of the company for the year ending June 30, 1914, was presented. This report in pamphlet form contains 112 pages dealing with the activities of the company. The general remarks of Howard Elliot, chairman of the board of directors and president of the company, dealt with the related subjects of operating results, additions and betterments, the work of affiliated companies, the electrical department and the changes in the scheme of organization of the company. In addition a review was presented of the negotiations with the department of justice of the United States regarding the segregation of the various companies, and the results were appended of the court decree entered into between the company and the department of justice, as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 24. Mr. Elliott said that in order to obtain a complete and thorough history of the charters, mortgages, leases and the character of the different securities of the company, a thorough investigation was made of all the papers and that a most complete history of this part of the system had been prepared for use as a basis during the coming year for drawing up a financial plan intended to permit the refunding of the companies' floating debt if the necesary legislation can be obtained. Mr. Elliot also referred to the change in the status of the electric railways and to their being given independent organizations separate from the New Haven with complete staffs of officials, all of whom gave their entire time and attention to their respective properties. He said that this was expected to result in greater efficiency. The summary of the earnings of the various electric railway properties as contained in the report was published in the ELECTRIC RAILWAY JOURNAL of Aug. 31. In referring to electrical department of the company Mr. Elliot said in part:

"Between New York and New Haven, including all yards and sidings, and the Cedar Hill yard at the latter point, the company has 518 miles of track equipped for electrical operation, excluding that part of the New York Central company between Woodlawn and Grand Central Terminal used under lease but maintained by that company. The volume of passenger and freight business moving between New Haven and New York is very heavy and the necessity for the most effective organization is very essential.

"The investment in the electrification between New York and Cedar Hill in power, locomotive, transmission lines, distributing system, electrical shops, when all the business is handled electrically, will be about $20,000,000.

"For the purpose of supervising closely and making the most effective use of these large investments and because the operation and maintenance of this extensive electrical installation is very technical, an electrical department was organized on March 18, 1914, consisting of a consulting electrical engineer, with necessary assistants, having advisory jurisdiction over matters pertaining to the engineering, construction and operation of the electrical system and equipment. Better results are being gradually obtained by having this new department act in co-operation with the divisional operating officers.

"The electrification of the Harlem River and Van Nest yards, including all freight sidings west of Stamford, has been completed and electric switching, including freight service, inaugurated in these yards.

"The installation of machinery in the shops at Van Nest was completed and the transfer of the heavy repair work on electrical equipment from Stamford to Van Nest was made in September, 1913. The increased facilities offered by these shops has resulted in a marked improvement in the maintenance of electric equipment, and should effect a decrease in costs.

"The electrification of main line tracks, the freight yards at South Norwalk and Bridgeport, and the sidings at intermediate points, has been completed and placed in operation, commercial passenger service having been inaugurated on June 22, 1914. At present forty passenger trains are being operated electrically between New Haven and New York, and approximately sixteen freight trains are being hauled daily by electric locomotives between Harlem River, Bridgeport and New Haven. This includes approximately 50 per cent of the passenger train service between Stamford and New Haven on week days and on Sundays the entire passenger train service.

"The present eastern terminus of the electric zone is at New Haven. The extension to Cedar Hill will be completed and put into service some time in October, when the transfer from steam to electric motive power will be made at Cedar Hill.

"The electric haulage of freight trains should result in increasing the capacity of this part of the road, and giving beetter service to the public.

"The new system of electric power distribution was inaugurated in January, 1914, resulting in the practical elimination of disturbances in the circuits of the telephone and telegraph companies paralleling the electric zone and in improved conditions of operation in the railway circuits.

"Power for operation in the New Haven's electrification zone is provided from the company's Cos Cob power station. The capacity of the Cos Cob power station has been increased from 15,000 kw to 35,000 kw, this work having been completed during the year. Steps are now being taken to increase the output at Cos Cob, and to purchase power from the New York Edison Company on such terms as will justify the company in deferring the outlay of capital for that purpose. With this additional power the maximum use of the electrical installation can be made with the electric locomotives now owned by the company."

The report also gives the first published figures on the cost of maintaining the electric locomotives used on the main line. This cost for 1914 covers 102 units which made runs totaling 2,913,000 revenue-miles, giving for 1914 a maintenance cost per electric locomotive-mile of 18.2 cents. The corresponding figures for 1913 were eighty-five units in service, which made 2,430,000 revenue-miles and were maintained at a cost per mile of 13.3 cents.

CONFERENCE OF MAYORS ON PUBLIC UTILITIES

The program has been issued for the conference of American mayors on public policies concerning municipal utilities to be held in Philadelphia on Nov. 12 to 14. The conference was called by Mayors Blankenburg of Philadelphia, Mitchel of New York, Harrison of Chicago, Baker of Cleveland and Shroyer of Dayton. A reception to visiting mayors will be held on the evening of Nov. 12 at the Bellevue-Stratford Hotel. Governor Tener of Pennsylvania is to make an address of welcome.

The first business session will be held at the Bellevue-Stratford Hotel at 10:30 a. m. on Friday, Nov. 13. The general subject is "Practical Utility Problems." Mayor Blankenburg will preside. The following addresses are on the program: "Fundamental Planks in a Public Utility Program," by Delos F. Wilcox, franchise expert, New York; "The Regulation of Municipal Utilities," by Nathaniel T. Guernsey, general counsel of the American Telephone & Telegraph Company, New York; "Philadelphia's Transit Problems," A. Merritt Taylor, director of city transit, Philadelphia; "Municipal Lighting Rates," by Ray Palmer, commissioner of gas and electricity, Chicago, Ill.; "Laborers' Interest in Public Utilities," open discussion.

The program for the afternoon session, on the general subject of "Regulation of Utilities," is as follows: "Some Present-Day Issues in Regulation," by Prof. Edward W. Bemis, board of supervising engineers Chicago Traction; "What Certain Cities Have Accomplished Without State Regulation," by Stiles P. Jones, secretary Voters' League, Minneapolis, Minn.; "A Constructive Policy for Public Service Corporations," by Charles Day, of Day & Zimmermann, Philadelphia; "What Regulation Must Accomplish if It Is to

Be Permanent," by John M. Eshleman, president of the Railroad Commission of California. The third session, under the auspices of the American Academy of Political and Social Science, is to be held at the Central High School at 8:15 p. m. on Nov. 13 and is to be devoted to local and state regulation of municipal utilities. Mayor Mitchel of New York is to preside, and addresses are to be heard from Halford Erickson, Railroad Commission of Wisconsin; Milo R. Maltbie, Public Service Commission of the First District of New York; Charles E. Merriam, professor of political science, University of Chicago, and Ira W. Straton, Mayor of Reading, Pa.

The fourth session is to be at the Bellevue-Stratford at 10:30 a. m. on Nov. 14 and is to be on municipal ownership and operation. Mayor Baker of Cleveland will preside. An address on "Municipal Ownership—the Testimony of Foreign Experience," will be made by Frederick C. Howe, commissioner of immigration, New York. Fifteen-minute reports will be heard from managers of typical municipal plants. There will be an open discussion led by Clarke M. Rosecrantz, of general counsel of The Milwaukee Electric Railway & Light Company, and Congressman Robert Crosser of Ohio. The fifth session, in the afternoon, will be executive and open only to mayors and delegates. There will be a round-table discussion on "elements in a constructive utility program."

The sixth session will be held at Witherspoon Hall under the auspices of the American Academy of Political and Social Science on the evening of Nov. 14 and will be devoted to holding companies and the public welfare. Secretary of the Interior Franklin K. Lane will preside. Addresses will be made by Francis T. Homer, of Betron, Griscom & Company, New York; Charles F. Mathewson, counsel of the Consolidated Gas Company, New York; James P. Goodrich, director of the National City Bank, Indianapolis, Ind., and Louis D. Brandeis, Boston.

So far the mayors of 124 cities have indicated their intention of attending the conference in person or by delegate. Delegations have also been appointed by civic organizations and public service commissions.

The program contains a reference to the Utilities Bureau, organized by the mayors who called the conference. The purposes of the bureau are given as follows: (1) To serve as a national agency through which American cities may co-operate in exchanging data as to rates, service standards and cost factors in municipal utilities; (2) to advise cities as to the best plans and methods for their utility campaigns; (3) to publish and disseminate information pertaining to service standards, rates, franchises, public contracts, and any and all other matters of interest and value to the public regarding the operation, construction, maintenance and regulation of public utilities; (4) to assist, upon request, in the proper and adequate presentation of the interests of the city and the public in hearings on utility matters before public service commissions or other regulative or judicial bodies. The trustees are Louis D. Brandeis, lawyer, Boston; Frederick A. Cleveland, political economist, New York; S. S. Fels, manufacturer, Philadelphia; Felix Frankfurter, professor of law, Harvard University; Charles F. Jenkins, proprietor of the *Farm Journal*, Philadelphia; Leo S. Rowe, professor of political science, University of Pennsylvania; Frederick W. Taylor, consulting engineer, Philadelphia, and Charles R. Van Hise, president of the University of Wisconsin.

STREET RAILWAY QUESTION AN ISSUE IN DETROIT

Notwithstanding that the Detroit (Mich.) United Railway is operating under a day-to-day arrangement with seven-for-a-quarter tickets and that an appraisal is now being conducted with a view to purchase by the city of the company's properties within the one-fare zone, the street railway question is again an issue in the Detroit municipal elections. Mayor Marx, under whose administration the seven-for-a-quarter agreement was made, is campaigning with the plea that the street railway patrons have been saved thousands of dollars. His opponent, F. F. Ingram, charges that the agreement was a betrayal of the city's municipal ownership program; that it gave the company new rights in the streets where its franchises have expired, and that the rate of fare is higher than in any offer which the company has made for a settlement within a number of years. Mr. Ingram also contends that the agreement made under Mayor Marx has caused to a very large extent the elimination of the eight-for-a-quarter tickets in workingmen's hours because of the inconvenience of handling two sets of tickets. The election is to be held on Nov. 3.

Corporation Counsel Lawson has advised the Detroit Street Railway Commission that the title to the pavement between the tracks of the Detroit United Railway rests unequivocally in the city and that no allowance for the same should be permitted in the appraisal now under way. The company, in its reproduction value inventory filed with the commission last December, set a value of $1,154,720 on the pavement between the tracks. Mr. Lawson, in his opinion, points out that the Michigan Supreme Court in the Fort Street rental case ordered that in the event the company was required by the Common Council to remove its tracks from the streets it must place the pavement in its proper condition, and he relies upon this decree to bear out his opinion that the pavement between the tracks belongs to the city.

Service on the Junction Avenue portion of the new Grand Belt line in Detroit was inaugurated by the Detroit United Railway on Oct. 28. This line runs from Fort Street to Warren Avenue and connects with the Michigan, Baker and Crosstown lines. Operation has been held up several months pending a court decision as to the right of the company to install a clearance curve at Junction and Dix Avenues. Judge Murphy of the Circuit Court held that the company had not received specific authority from the Common Council for the curve and therefore could not construct it. The Common Council, because the clearance curve cut into the curb and sidewalk, refused permission, but granted the right for a non-clearance curve, the construction of which, however, will be held in abeyance for the present. It is estimated that 100,000 people will be served by this one section of the proposed belt line. People have been endeavoring for years to have the line constructed because they were without any adequate facilities, but it was not until this year that the company had the right conferred on it to build the line under the day-to-day agreement of Aug. 7.

Inasmuch as a seven-for-a-quarter fare obtains to all the limits of the city, the Detroit United Railway and the city, through counsel, have obtained a postponement for one year of argument before the United States Supreme Court in the cases brought by the company to determine whether or not it should extend one-fare privileges to Fairview Village and a part of Greenfield Township, both of which were annexed by the city. The State Supreme Court held that the company's contract called for the inclusion in the one-fare zone of all territory within the city limits.

THE NEW UNION STATION IN KANSAS CITY

The last week has seen much rerouting of street cars in Kansas City in preparation for the formal opening of the new Union Station one minute after midnight on Nov. 1. While the formal arrangements for rerouting are not wholly complete, cars were run over many new tracks in the neighborhood of the station. One of these new tracks immediately serves the station, the cars turning west on Twenty-fourth Street from Grand to Main Street, then north over a viaduct which heretofore has never been used. The Metropolitan Street Railway has double tracked its line on Walnut Street between Eighteenth and Nineteenth Streets and on Nineteenth Street between Main and Walnut Streets. The board of control completed before Oct. 26 its plans for rerouting in view of station travel, and submitted recommendations to the City Council, which has the authority, by ordinance, to route and reroute street cars.

The Metropolitan Street Railway has completed the new special work at Eighteenth Street and Prospect Avenue which was necessary for the rerouting of the Indiana line. This line had previously reached the business district by way of Eighteenth Street, and its exit had been by way of Nineteenth Street; both in and out it ran through one district of negro business houses and tenements; the residents served by the suburban part of the line where good homes have been built in the past few years desired the change so that they could reach town through the better class surroundings of Fifteenth Street, which is an unusually wide and beautiful thoroughfare.

One feature of the new Union Station in which the Metropolitan Street Railway is at present a factor and which has not yet been completed is the mail service to and from the Kansas City post-office. The mails are now carried between the depots and the post-office on special street cars, but there is no track by which the Metropolitan Street Railway can enter the new station grounds for the purpose of getting or delivering mail to trains or to station post-office facilities. Negotiations are said to be temporarily suspended between the Terminal Company and the Metropolitan Street Railway over the lease of station ground on which a track for mail cars might be built. The post-office officials are said to be considering the matter of using trucks for transporting the mails between the station and the post-office.

PROPOSED CANADIAN HYDROELECTRIC RAILWAYS APPROVED

Eleven municipalities out of the thirteen voting on the project carried the by-laws submitted on Oct. 19 authorizing their respective Councils to enter into contracts with the Hydro-Electric Power Commission of Ontario for the construction of the proposed Hydro-Electric Municipal Railway from Toronto to Newmarket and Port Perry. Newmarket and Uxbridge Township were the only corporations which voted not to support the scheme. According to Sir Adam Beck the next move of the municipalities is to secure from the Canadian government an assurance that the federal subsidy taken into account by the engineers in making their estimates of the cost of the line will be available. The general impression has prevailed that while the administration at Ottawa had given no formal answer to the request of the municipalities for a subsidy, little risk was being taken in proceeding with the votes. It is stated now, however, that no such assurance has been received. That a second vote would be necessary if the subsidy was not obtained was intimated by Sir Adam Beck during the campaign. The only way out would be by the preparation of new plans that would permit construction without the need of the subsidy. The Council of Goderich, Ont., has decided to ask the Hydro-Electric Power Commission to take up the matter of operating the defunct West Shore Railway as a hydro radial line.

CLEVELAND RAILWAY MATTERS

At their regular meeting on Oct. 24 the directors of the Cleveland (Ohio) Railway decided that, with the approval of the Council, all the money found in the fare boxes on the day before Thanksgiving above the amount found on the same day last year be turned over to the Associated Charities to meet the $35,000 deficit that now exists. John J. Stanley, president of the company, said that this money will be given only in recognition of the peculiar position the organization occupies in the community and the exceptional demands that have been made and will be made upon it.

An indictment was returned by the Cuyahoga County Grand Jury on Oct. 21 against George A. DeGraff on the charge of obtaining money under false pretenses from the Cleveland Railway. He is charged with receiving $500 damages on the claim that his spine was fractured by a fall from a Cedar Avenue car last January. At the same time Dr. Sidney J. Havre and Dr. Charles D. Triester were placed under indictment on the allegation that they represented that the X-ray photograph of the fracture showed it to be a recent injury, whereas it is claimed by the prosecution that the injury was suffered eight years ago.

On Oct. 21 Judge Estep of the Common Pleas Court upheld the rule of the company prohibiting passengers from standing on the rear platform of cars. Joseph Nesper had brought suit against the company for $5,000 because he was ordered off the rear platform of a car by the conductor.

It seems likely that the arbitrators who are to pass on the demands made by the motormen and conductors of the Cleveland Railway will have some trouble in deciding upon the points at issue. Judge Willis Vickery, representing the men, says that the question of the eight-hour minimum work day is one of the points to be decided. Under the contract between the company and the union it is claimed this point cannot be raised. The company offered a nine-hour day and an increase in wages in order to meet the men half-way, but seemingly the contract, as viewed by the company, does not provide for raising this point in case of arbitration.

WESTERN MASSACHUSETTS TRANSPORTATION HEARINGS

At a continued hearing at Worthington, Mass., by the legislative commission on transportation facilities, Calvin Coolidge, president of the State Senate, expressed the hope that something might yet be done to secure electric railway extensions in the Berkshire district through the New York, New Haven & Hartford Railroad. The speaker said that in his opinion questions of monopoly could not be raised in the case of electric railway extensions into new territory for the purpose of feeding the existing steam railroad lines, and he suggested that an appeal be made to the New York, New Haven & Hartford Railroad to carry into effect its former plans with respect to electric railway extensions in the hill towns of western Massachusetts. Mr. Coolidge said that he believed that the federal government has no objection to the continued ownership of the Berkshire Street Railway by the New Haven company, and he advanced the view that the company would probably be willing to undertake the extensions in due course. The speaker condemned state buildings and ownership of short electric railway extensions. Another speaker, in pointing out the need of electric railway facilities, stated that it costs $4 a ton to ship freight by gasoline trucks over the highway from Cummington to Williamsburg, a distance of 10 miles. At present it is impossible to go to Springfield and return on the same day from that section of the Berkshires.

BOSTON TRANSPORTATION HEARINGS

Hearings were resumed during the week ended Oct. 31 by the Massachusetts Public Service Commission upon transportation service in the Boston metropolitan district. A general sentiment developed on behalf of the proposed consolidation of the Boston Elevated Railway and Bay State Street Railway. In order to counteract the impression that the consolidation would result in the extension of 5-cent fares to all parts of the district, Chairman McLeod informed representatives from Waltham, Watertown, Stoneham, Revere, Chelsea and other points wholly or partially outside the Boston Elevated system that there must be no delusion to the effect that the establishment of a single system would mean a straight 5-cent fare everywhere within its confines. He said that there is a limit beyond which passengers cannot profitably be carried for 5 cents. Regarding the traffic conditions at the Boston Elevated Dudley Street Station, Mr. McLeod said that the commission realized the importance of the transportation problem in the Dudley Street region, and that an engineer of the board has been assigned to study the conditions and report his findings. Discussing transportation facilities between Stoneham and Boston, A. S. Parker, of Stoneham, pointed out that since the establishment of through car service via Middlesex Falls and Sullivan Square by the Bay State and the Boston Elevated companies, most of the competing steam service of the Boston & Maine Railroad on the Stoneham branch has been withdrawn. A representation from the town of Arlington advocated the operation of surface cars in trains from Arlington to Boston via the Cambridge Subway and Dorchester tunnel upon the completion of the latter. The railway companies will be heard later.

Arbitration Board at Lexington.—The board of arbitration formed at Lexington, Ky., to pass on the dispute between the Kentucky Traction & Terminal Company and the carmen's union growing out of the discharge of Motorman Robert E. Walker has been completed by the appointment of Judge W. B. Smith, a lawyer of Richmond, Ky., by Governor James B. McCreary. George McLeod represents the company and Robert G. Ross the carmen.

Municipal Street Railway Inspectors.—The Civil Service Commission of San Francisco, Cal., has announced that an examination will be held on the evening of Oct. 31 to secure candidates for promotion by the San Francisco Municipal Railways from the ranks of motormen and conductors to the rank of inspector. The subjects of the examination and the relative weights on a scale of 100 are: general knowledge of duties, 50; writing of reports, 25; arithmetic, 10; experience, 5; ascertained merits, 10.

A Decade of Subway Operation in New York.—On Oct. 27, 1904, three special trains containing Mayor McClellan and other officials of Greater New York left the Brooklyn Bridge station for the initial trip through the New York subway preparatory to the first section of the system being placed in regular operation. On Jan. 9, 1908, the extension under the East River to Brooklyn was opened. Originally designed to carry 600,000 people a day the subway system now, ten years after its inception, is averaging more than 1,000,000 passengers a day.

The New Haven Grand Jury Inquiry.—The special Federal Grand Jury which has been investigating the affairs of the New York, New Haven & Hartford Railroad was excused at the end of its session on Oct. 26 until Nov. 1. The Grand Jury was summoned to investigate responsibility for the acts of the company, which according to the government amounted to a violation of the Sherman law by the railroad, its subsidiaries and its directors. Of the witnesses who have been called before the Grand Jury only one, Charles S. Mellen, former president, has ever been a director. No statement has been made in regard to the purpose of the Department of Justice at Washington with respect to the preparation of indictments in this case.

Proposed Rapid Transit Road at Cincinnati.—The Rapid Transit Commission, with the convention hall commission and representatives of the Cincinnati Traction Company, inspected the proposed route of the rapid transit road in Cincinnati on Oct. 20, in order that the commission might secure a better idea of the work it will be called upon to perform. Frank Krug, city engineer, and F. B. Edwards, a subway engineer, were also members of the party, while a rapid transit engineer, Mr. Drum, accompanied Walter A. Draper, vice-president of the Cincinnati Traction Company. The loop near Fountain Square will probably be placed underground and a combined station and convention hall will be built in this vicinity. The convention hall commission has thus become interested in the rapid transit proposition.

Suit in Tacoma Over Franchise Terms.—The Old Colony Trust Company, Boston, trustee under the mortgage securing the $1,500,000 of bonds of the Tacoma Railway & Power Company, a subsidiary of Puget Sound Traction, Light & Power Company, has secured from the federal court an order restraining the city of Tacoma from removing trolley wires and poles of the street railway company. A similar order asked by the Puget Sound Traction, Light & Power Company was denied. A controversy over the right of the company to occupy the streets with its poles and wires has existed for some time and a friendly suit was agreed upon to test the question. Within a day after the bringing of the suit the Council revoked the franchise of the company despite an agreement with the trustee for the bonds that the franchises would not be interfered with.

Municipal Operation Outside Corporate Limits.—Scott Z. Henderson, assistant attorney general of Washington, in an opinion to the State Bureau of Inspection holds that cities are not authorized to buy or operate street railway systems outside of their own corporate limits and that municipal corporations cannot legally levy a tax for such purposes. This opinion, it is announced, affects the Highland Park & Lake Burien Line, Division "C," of the Seattle Municipal Railway, as practically half of this road lies outside of the city limits of Seattle. Mayor Gill recently stated that it may be necessary for Seattle to go before the next Legislature to obtain permission to operate a street railway outside the city limits. The Lake Burien line extends from Riverside and California Avenue, west of the Duwamish drawbridge to Lake Burien, a distance of about 9 miles, 4½ of which is outside of the limits of the municipality.

Past-President Black Wins the Bag.—Those who attended the recent A. E. R. A. convention in Atlantic City are probably wondering who won the genuine walrus traveling mag offered by the National Tube Company to the person estimating the weight of its exhibit at the convention. The company now announces that the combined weight of its exhibit, boxed and ready for shipment, was 12,595 lb. The three nearest estimates were as follows: 12,600 lb., Charles N. Black, vice-president and general manager of the United Railroads of San Francisco; 12,585 lb., Charles E. Coleman, manager of the Mica Insulator Company, Chicago, Ill.; 12,575 lb., H. B. Chamberlain, salesman with the Transportation Utilities Company, New York. The bag was, therefore, awarded to Mr. Black, whose estimate was most nearly correct, winning over Mr. Coleman by a margin of 5 lb. Several hundred estimates were made.

Massachusetts Street Railway Association.—At the regular monthly meeting of the Massachusetts Street Railway Association at Young's Hotel, Boston, on Oct. 21, with President H. H. Crapo, New Bedford, in the chair, an informal address upon the signs of the times was delivered by W. J. Clark, manager of the heavy electric traction department of the General Electric Company. Mr. Clark delighted his audience by many personal reminiscences of the early days of electric traction, and after passing to present problems discussed the economic disadvantages of government ownership. The rest of the meeting was occupied with comments on the recent Atlantic City convention. Among the speakers were C. V. Wood, Springfield, Mass.; H. B. Potter, Boston; John T. Conway, Brockton, Mass., and Howard F. Eaton, Plymouth, Mass. The last speaker emphasized the importance to electric railways of following the tendencies in workingmen's compensation legislation during the coming winter.

Appreciative Editorial Tribute.—J. Brodie Smith, vice-president and general manager of the Manchester Traction, Light & Power Company, Manchester, N. H., who has recently resumed his duties, was the subject of the following editorial tribute in the Manchester *Union* recently: "The news of the restoration to health of J. Brodie Smith will be received with sincere rejoicing by the entire Manchester public. He has occupied a position of great responsibility for many years and has met its requirements so successfully that there is not only no serious controversy between a great public service corporation and the public which it serves, but a feeling of hearty co-operation, much of which is due to the unassuming but efficient management by that corporation's immediate representative. But Mr. Smith has been as quietly and unassumingly useful in many other ways. He has given of his time and effort to help forward the things which were destined to be of substantial benefit to the community which he has made his home for so many years, and because he has been so unassumingly but efficiently helpful, there is universal rejoicing at his return to health and to the work which still remains for him to do."

The Bus as an Adjunct.—George Gunther, a real estate dealer at the end of the Highland Park & Lake Burien line of the Seattle (Wash.) Municipal Railway, has made a proposition to the utilities committee of the City Council to provide two motor buses of a type and value to be approved by the board of public works of Seattle, the city to operate the vehicles as a connection between the two municipal railway lines. The buses are to be paid for with bonds bearing 5 per cent interest which are to be a lien on the earnings of the railway lines. Councilman George R. Cooley reported to the committee that property owners in the vicinity of Thirty-fifth Avenue S. W., are planning the operation of a motor-bus line over Thirty-fifth Avenue S. W., Avalon Way, and Spokane Street, into the city, a distance of about 9 miles. They will ask that the Council order the improvement of Thirty-fifth Avenue S. W. by paving 18 ft. in the center of the thoroughfare. At a meeting of the public utilities committee of the Council recently it developed that at least five members favor trying out the auto bus as a solution of the problem of extending and connecting the city's two railway lines. Mayor Gill has not yet taken a definite stand on the bus matter.

Financial and Corporate

RECENT FINANCIAL TENDENCY

Matters of importance in finance have developed more rapidly during the last week than for some time past, but none of the events that have transpired is considered likely to be depressing in its ultimate results, although one or two did tend momentarily to disturb conditions. The cutting of the common stock dividend by the United States Steel Corporation from 1½ per cent to one-half of 1 per cent quarterly was not unexpected, and seems to have been accepted with much grace, particularly as the figures of earnings made public by the company were better than had been expected.

How the process of conserving cash resources through the reduction or deferring of dividends is working is reflected in the total reduction of $7,851,421 so far in dividend payments scheduled for November, 1914, as compared with the same month in 1913. Of this total reduction $5,772,553 is in industrial company payments.

While a number of transportation companies continue to report decreases in traffic, the general situation in regard to the public utilities is considered very favorable. The quarterly report of the Brooklyn Rapid Transit Company, published elsewhere in this issue, and marking a significant change in the policy of this company regarding the publication of its earnings, is particularly interesting in view of present conditions. Other public utility companies, included among them the Pacific Gas & Electric Company, the Byllesby companies and the Cities Service Company, show increases in earnings. The Edison Illuminating Company, Detroit, for instance, reports an increase of 13 per cent in gross over last year and of 16 per cent in September. A gain of 14 to 15 per cent for the year is expected.

As further reflecting the improvement in the bond market in New York it is reported that a considerable volume of trading has taken place recently through the committee of seven which was appointed to pass upon trading in bonds. *Financial America* said in this connection that while some difficulty was reported in the transaction of business, owing to the exactions of the committee, the feeling prevailed that betterment was due and the outlook favorable. Chicago reports a marked improvement in the Western bond market, with prospects for renewed activity in municipal issues. In Boston actual sales of bonds have not been large, but the demand is reported as improving. Such business as exists is largely in tax-exempt municipals, which are now on a basis ranging from 4.05 per cent to 4.20 per cent. The buying continues to come largely from individuals and trustees, institutions being still out of the market.

Only in one direction did the war seem last month to improve trade, and that was in regard to foodstuffs. Exports during September showed an increase of $45,968,000 over the exports for the first month of the war, for which the European demand for food was largely responsible. Everything except foodstuffs, both manufactured goods and crude materials, showed a loss of $61,902,000 in all exports for September of this year, as compared with the same period last year. These figures are obtained from a bulletin issued on Oct. 27 by the bureau of foreign and domestic commerce of the Department of Commerce.

The work of preparing for the inauguration of the federal reserve bank system on Nov. 16 is being rushed. On Oct. 27 the comptroller of the currency gave out detailed statements showing the total amount of reserves that will be released by the national banks in each of the twelve federal reserve districts when the new reserve requirements take effect, based upon the deposits of the banks as shown by the latest report to the comptroller, dated Sept. 12, 1914. The figures show that when the new banks open there will be released in cash and other reserves under the minimum requirement the sum of $464,919,076 to be added to the resources available for transacting business. The more liberal provisions of the new banking and currency law permit the national banks to reduce their reserves and generally enable them to utilize resources that heretofore have been held as security.

BROOKLYN RAPID TRANSIT QUARTERLY REPORTS

The Brooklyn (N. Y.) Rapid Transit Company has adopted the policy of giving out a quarterly report of its earnings, supplementing the official reports which are filed with the Public Service Commission, in accordance with the requirements of that body. The first of these quarterly reports, for the three months ended Sept. 30, 1914, was made public on Oct. 22. Abnormal increases in gross earnings and operating expenses were shown in this report because the operation of the lines of the Coney Island & Brooklyn Railroad is now included in the Brooklyn Rapid Transit System, whereas in the three months of 1913, with which comparison was made, such earnings were not included, inasmuch as the Coney Island & Brooklyn Railroad was not then part of the Brooklyn Rapid Transit System.

Surplus earnings in excess of operating expenses, taxes and fixed charges amounted to $1,920,223 for the three months ended Sept. 30, 1914, a gain of $342,810 over the corresponding period of 1913. Fixed charges, notwithstanding the inclusion of the Coney Island & Brooklyn lines in this quarter's Brooklyn Rapid Transit statement, showed a net decrease of $71,725, as compared with the corresponding period of 1913. Gross operating receipts for the quarter ending Sept. 30, 1914, were $7,239,787, compared with $6,606,299 for the corresponding period of 1913. The abnormal gain indicated by these figures, namely, $633,487, was due to the operation this year, as a part of the system, of the lines of the Coney Island & Brooklyn Railroad. Operating expenses for 1914 were $3,837,865 against $3,430,933 a year ago. This increase of $406,931 is due to the fact that 1914 operations embrace the Coney Island & Brooklyn Railroad. Fixed charges for the same reason would—normally—show an increase, but by reason of the conversion of Brooklyn Rapid Transit Company's refunding 4's an actual net reduction is shown of $71,725. The surplus figures compare as follows: 1914, $1,920,223; 1913, $1,577,413, a gain of $342,810. The figures in statement form follow:

Three Months Ended Sept. 30	1914	1913
Gross operating revenues	$7,239,787	$6,606,299
Expenses	$3,837,865	$3,430,933
Taxes	434,870	468,819
Operating income	$2,967,051	$2,706,546
Non-operating revenue	115,707	105,128
Gross income	$3,082,758	$2,811,674
Income deductions	1,162,535	1,234,260
Net	$1,920,223	$1,577,413

MAINE RAILWAY AND POWER DEAL

The Androscoggin Electric Company filed a copy of its articles of incorporation with the registrar of deeds at Lewiston, Maine, on Oct. 26. The company has an authorized capital stock of $2,000,000, of which $1,500,000 is common stock and $500,000 preferred stock. The officers of the company are Harold S. Libbey, president; Julius Parkhurst and John A. Morrill, directors. The purpose of incorporation is to carry out the deal which has been pending for some time for uniting the interests of the Libbey properties in and about Lewiston with the power development at Rumford under the control of Hugh J. Chisholm, Portland. It is announced that the management of the properties which are to be brought together will be in the hands of Hugh J. Chisholm, ex-Governor Cobb of Maine and Maynard S. Bird, Rockland.

It is stated that before his death Hugh Chisholm had in mind the extension of the high tension transmission lines from Rumford to other parts of the State. His son, Hugh J. Chisholm, has worked along the same lines, and is said to have had a plan long in mind for acquiring large interests in central Maine with an outlet to Portland for the Rumford Falls power as yet unused and undeveloped. The Lewiston & Auburn Electric Light Company, the property of which is included in the transaction, was a consolidation of the Lewiston & Auburn Electric Light Company and the E. W. Gross Electric Light & Power Company, competing companies. Libbey & Dingley, at that time, were in the woolen mill business and were the owners of the Lincoln mill. Mr.

Gross established his power and light plant in this mill. As the business of Libbey & Dingley developed they bought land and flowage rights on the Androscoggin River above Lewiston Falls. Subsequently Stone & Webster, Boston, bought the water-power rights and other privileges of the Union Water Power Company at Deer Rips. This property was later bought by W. S. Libbey, and Libbey & Dingley began to carry out consolidation plans along their own lines. The Portland, Lewiston & Gray Railroad was built under the personal supervision of W. S. Libbey, who died a few weeks prior to the opening of the road in July of this year. The road is 30 miles in length between its terminal points on the Lewiston, Augusta & Waterville Street Railway in Auburn and the Portland Railroad at Deering Junction. There is a surplus of power available at the development of the Rumford Falls Electric Light & Power Company. Some years ago the Chisholms began purchasing a right-of-way from Rumford Falls through to Portland, which was to be used for a pole line which would carry high-tension transmission wires from that point into Portland.

Auburn & Syracuse Electric Railroad, Syracuse, N. Y.—The directors of the Auburn & Syracuse Electric Railroad on Oct. 16 voted to defer the current quarterly dividend on the $1,500,000 of 6 per cent non-cumulative preferred stock on account of the present business conditions. Dividends at the rate of 6 per cent have been paid from the year 1907 to date.

California Street Cable Railroad, San Francisco, Cal.—The California Street Cable Railroad on Oct. 22 filed an application with the Railroad Commission of California requesting authority to issue $384,000 of serial bonds, par $1,000, at a price not less than 90. These bonds will bear 6 per cent interest and will mature in blocks annually, from Jan. 1, 1916, up to and including Jan. 1, 1927. The proceeds are to be used in refunding part of the outstanding bonded indebtedness due Jan. 1, 1915, amounting to $900,000. The difference will be made up from moneys now in the sinking fund.

Cape Breton Electric Company, Ltd., Sydney, N. S.—The Cape Breton Electric Company has an application before the Nova Scotia Utility Commissioners for sanction of a proposed bond issue. The application states that the company does not propose in the meantime to issue the bonds but to give them as collateral for advances. The Commonwealth Bank of Massachusetts and the Canadian Bank of Commerce have, it is stated, advanced $75,000 to the company. In case the company is called upon to pay the advances at once the bonds would be sold now. The last issue of similar bonds was sold at 91 per cent, but it is not likely that this percentage would be realized now.

Central Electric Railway, Kansas City, Mo.—The committee representing the holders of the bonds of the Central Electric Railway deposited under the agreement dated March 10, 1914, has announced that interest due on Nov. 1 will be paid on receipts for deposited bonds at the New York Trust Company and on undeposited bonds at the Equitable Trust Company, both of New York.

Chicago & Oak Park Elevated Railroad, Chicago, Ill.—Samuel Insull, receiver of the Chicago & Oak Park Elevated Railroad, has applied to the United States District Court for authority to issue certificates ranking ahead of the company's bonds to provide for track elevations in Oak Park.

Cincinnati (Ohio) Traction Company.—According to the report made to the city auditor of Cincinnati the gross earnings of the Cincinnati Traction Company for July, August and September were $1,343,554, or about 20 per cent less than for the same period last year. It is said, however, that an improvement has been shown recently.

City Light & Traction Company, Sedalia, Mo.—The City Light & Traction Company, which is controlled by the Doherty interests, is now offering for subscription $25,000 of one-year 6 per cent coupon gold notes, par $100, dated Oct. 1, 1914, interest payable quarterly. The first mortgage bonds of the company are pledged as collateral to secure the issue of notes, in the ratio of $200 par value for every $100 of notes outstanding. The notes are being offered at par and accrued interest.

Cleveland (Ohio) Railway.—The operating report of the Cleveland Railway for September shows that the 1 cent charge for transfers yielded $58,682, but even with this addition to the regular income a net ordinance deficit of $22,947 was shown, including the $18,000 special allowance for the old equipment fund. The actual deficit was $89,452.44. The ordinance deficit still further reduced the interest fund which at the beginning of October was $200,706. The report showed 26,191,761 fares collected, a decrease of 492,216 from the number recorded for September, 1913.

Coney Island & Brooklyn Railroad, Brooklyn, N. Y.—The board of directors of the Coney Island & Brooklyn Railroad has been increased from nine to thirteen by the addition of T. S. Williams, J. H. Bennington, George D. Yeomans and William Seibert, all of the Brooklyn Rapid Transit Company.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has issued an order authorizing the Fresno Interurban Railway to issue $12,000 of stock and $24,000 of bonds, being a part of 600 shares of common stock and $120,000 of first mortgage bonds previously passed upon by the commission. This company has 2 miles of line in operation between Fresno and Belmont Avenues in Fresno and Alvina Heights.

Gary, Hobart & Eastern Traction Company, Hobart, Ind.—It is reported that on Oct. 20 the South Side Trust & Savings Bank, Gary, Ind., trustee for the bondholders of the Gary, Hobart & Eastern Traction Company, filed suit in the Circuit Court at Crown Point, asking for the foreclosure of the company's mortgage on account of a default in interest payments. This road was incorporated in Indiana in 1911 with $125,000 of stock to build an electric railway between Gary, Hobart and Valparaiso, and at present nine miles of line between Gary and Hobart are in operation.

Kentucky Traction & Terminal Company, Lexington, Ky.—Chandler Brothers & Company, Philadelphia, recently said in a circular that the actual surplus available for dividends on the preferred stock of the Kentucky Securities Corporation, which owns the Kentucky Traction & Terminal Company, had increased from $94,000 in 1912 to $156,000 in 1914. After the complete rehabilitation in 1911, a stipulated maintenance charge was set aside rising from 12 per cent for 1911 to 16½ per cent for the year 1914-1915. It is stated that expenditures out of earnings have already built up a large equity for the bonds and preferred stock of the two companies, Kentucky Traction & Terminal Company bonds showing a surplus of 80 per cent over fixed charges.

Lehigh Valley Transit Company, Allentown, Pa.—The gross earnings of the Lehigh Valley Transit Company for November, 1913, were $173,648, almost as much as for August, which was the largest month's business in the history of the company. The net earnings were $90,479, an increase of $6,626. According to an authoritative report, the subsidiaries of the company are doing well, particularly the Easton Consolidated Electric Company and the Lehigh Valley Light & Power Company. No large capital expenditures will be necessary for some time to come, for the improvement program undertaken several years ago has been completed. The earnings of the system are not likely to be adversely affected by the prevailing business depression because of the great diversity of industries in the company's territory and the fact that orders on hand are large.

London (Ont.) Street Railway.—At a recent meeting of the shareholders of the London Street Railway authority was given to issue additional bonds of $50,000.

Marion & Suburban Railway, Marion, Ohio.—The hearing of the suit of A. E. McBee, New York, against Newton J. Catrow and other directors of the Marion & Suburban Railway was begun before United States District Judge Hollister at Cincinnati on Oct. 19. Mr. McBee is endeavoring to recover from the directors several thousand dollars alleged to be due on bonds purchased from Webb & Company. He charges that fraud entered into the issue and guarantee of the bonds and that only a small portion of the road was built at a cost of $15,000, the remainder of the proceeds of the $250,000 bond issue being diverted from the treasury of the company.

Northern Electric Railway, Chico, Cal.—At meetings of security holders held in San Francisco on Oct. 13 and 14, committees were chosen for the holders of the Northern Electric Company bonds, the Northern Electric Railway bonds, the Sacramento & Woodland Railway bonds, the Marysville & Colusa Railroad bonds (and the respective notes secured thereby), and also for the unsecured creditors. John S. Drum, one of the Sloss Security Company's trustees, said that the Northern Electric Railway system had cost $12,500,000, of which $3,500,000 was realized from the sale of underlying bonds, $5,500,000 from the flotation of securities and notes and $3,500,000 from advances by the chief stockholders, without including $750,000 of advances by members of the Sloss family not directly interested in the property. The latter two items are held junior to all other claims and liens. It is understood that the securities sold and pledged are as follows: Northern Electric Railway, first mortgage 5's, sold to the public, $952,000, pledged as collateral for notes, $5,700,000; Northern Electric Company, first mortgage 5's, sold, $2,544,000; pledged, $1,206,000; Sacramento & Woodland Railway, first mortgage 5's, sold, $435,000; pledged, $315,000; Marysville & Colusa Railroad, first mortgage 5's, sold, $385,000; pledged, $365,000. Meetings of the committees were adjourned for three weeks. Rudolph Spreckels has issued a statement opposing the reorganization of the Northern Electric system. On Oct. 23 the Railroad Commission of California rendered a decision authorizing notes amounting to $2,116,575 previously issued by the company without the approval of the commission, and also notes amounting to $37,079 issued by the Marysville & Colusa branch and notes amounting to $118,750 of subsidiaries of the Northern Electric Railway. The purpose was to place the creditors holding notes now invalid in the same position as they would have been had their notes been issued with the approval of the commission.

Ogden, Logan & Idaho Railroad, Ogden, Utah.—The Ogden, Logan & Idaho Railroad was formed on Oct. 15 in Utah with $5,000,000 of authorized capital stock as a consolidation of the Ogden (Utah) Rapid Transit Company and the Logan (Utah) Rapid Transit Company. It is stated that two and one-half shares of the new stock will be given in exchange for each share of the Ogden Rapid Transit Company's stock and one and one-quarter shares for each ten shares of the Logan Rapid Transit stock. The articles of incorporation permit the following extensions: 44 miles between Logan and Brigham City, 21 miles between Logan and Preston, Idaho, and 6 miles between Idlewild and Huntsville, thus completing the Ogden & Preston interurban line and the extension on the Ogden Valley line. The officers at incorporation are as follows: President, M. S. Browning; vice-president, L. R. Eccles; second vice-president, Joseph Scowcroft; treasurer, R. B. Porter, and secretary, Royal Eccles. The directors are: D. C. Eccles, A. P. Bigelow, W. H. Wattis, A. T. Wright and H. H. Spencer, of Logan, and Mariner S. Eccles, Joseph Quinney, D. C. Budge, Joseph Howell and H. E. Hatch, of Logan. P. D. Kline is general manager.

Ohio River Electric Railway & Power Company, Pomeroy, Ohio.—The Public Utilities Commission has received an application from the Ohio River Electric Railway & Power Company for permission to issue $300,000 of stock, of which one-half is to be common and the remainder preferred, for the purchase and unification of the lines between Racine and Hobson, passing through Middleport and Pomeroy. The section between Racine and Middleport is owned by a Delaware corporation of the same name, and that between Middleport and Hobson is the property of Richard E. Ellis.

Waukegan, Rockford & Elgin Traction Company, Chicago, Ill.—Judge Jesse Baldwin of the Circuit Court of Chicago on Oct. 19 appointed R. L. Peck receiver of the Waukegan, Rockford & Elgin Traction Company on application of Peter Knowe, a stockholder and owner of outstanding notes. This road is projected from Waukegan via Roselle to Palatine and also to Fox Lake, Elgin, etc., and at last accounts was in operation for fifteen miles from Palatine to Waucomda.

Woodstock & Sycamore Railway, Genoa, Ill.—At a meeting held in Chicago on Oct. 19 stockholders of the Woodstock & Sycamore Traction Company and the Chicago, Waukegan & Fox Lake Railway voted to consolidate the two roads into the Woodstock & Sycamore Railway. Arrangements were made for the issuance of bonds and stock to complete the construction of the road from Genoa north to Marengo, Ill. The main office of the company will be in Genoa, Ill. J. P. Mason, Elgin, was elected president, and P. E. Ryan, St. Charles, was chosen vice-president

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Ltd., Toronto, Ont., quarterly, 1½ per cent.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1¼ per cent, preferred, series B; quarterly, 1¼ per cent, common.

Cumberland County Power & Light Company, Portland, Maine, quarterly, 1½ per cent, preferred.

Easton Consolidated Electric Company, Allentown, Pa., one third of 1 per cent, monthly.

Grand Rapids (Mich.) Railway, quarterly, 1¼ per cent, preferred.

Lincoln (Neb.) Traction Company, quarterly, 1½ per cent, preferred.

Ohio Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred.

Union Street Railway, New Bedford, Mass., quarterly, 2 per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BATON ROUGE (LA.) ELECTRIC COMPANY						
1m., Aug.,	'14	$14,158	*$9,423	$4,735	$2,070	$2,665
1 " "	'13	13,862	*9,422	4,440	2,126	2,314
12 " "	'14	177,200	*115,622	61,579	25,223	36,356
12 " "	'13	153,605	*93,473	60,132	23,253	36,879
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.						
1m., Aug.	'14	$16,237	*$8,250	$7,987	$1,090	$6,897
1 " "	'13	17,289	*9,253	8,037	1,096	6,941
12 " "	'14	119,492	*100,066	19,425	12,809	6,616
12 " "	'13	124,842	*95,708	29,134	13,005	16,129
CAPE BRETON ELECTRIC COMPANY, SYDNEY, N. S.						
1m., Aug.,	'14	$32,742	*$17,485	$15,258	$6,408	$8,850
1 " "	'13	33,454	*17,300	16,154	6,082	10,072
12 " "	'14	371,858	*209,574	162,284	75,904	86,380
12 " "	'13	375,071	*202,584	172,488	71,060	101,418
DALLAS (TEX.) ELECTRIC COMPANY						
1m., Aug.,	'14	$174,776	*$103,474	$71,302	$33,476	$37,826
1 " "	'13	180,735	*103,646	77,089	25,011	52,078
12 " "	'14	2,277,091	*1,353,852	923,240	342,730	580,510
12 " "	'13	2,072,483	*1,202,222	870,261	296,289	573,972
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.						
1m., Aug.,	'14	$61,088	*$33,858	$27,230	$8,801	$18,429
1 " "	'13	48,322	*29,102	19,220	8,201	11,019
12 " "	'14	650,739	*394,772	255,967	100,029	155,938
12 " "	'13	380,633	*202,138	178,501	38,247	140,254
EL PASO (TEX.) ELECTRIC COMPANY						
1m., Aug.,	'14	$86,433	*$51,225	$35,208	$4,178	$31,030
1 " "	'13	67,201	*37,078	30,123	4,174	25,949
12 " "	'14	1,002,472	*559,617	442,854	51,330	391,524
12 " "	'13	877,023	*467,492	409,530	48,663	360,867
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.						
1m., Aug.,	'14	$228,733	*$109,226	$119,506	$36,209	$83,298
1 " "	'13	223,139	*118,014	105,126	34,644	70,482
12 " "	'14	2,460,399	*1,357,393	1,103,006	439,606	663,400
12 " "	'13	2,289,112	*1,308,638	980,474	412,532	567,942
HOUGHTON (MICH.) COUNTY TRACTION COMPANY						
1m., Aug.,	'14	$24,573	*$14,183	$10,390	$5,599	$4,791
1 " "	'13	25,115	*13,722	11,393	5,626	5,767
12 " "	'14	284,379	*180,993	103,386	67,085	36,301
12 " "	'13	309,301	*179,643	129,658	67,881	61,777
JACKSONVILLE (FLA.) TRACTION COMPANY						
1m., Aug.,	'14	$55,798	*$38,689	$17,108	$12,476	$4,632
1 " "	'13	55,255	*34,537	20,718	12,976	7,742
12 " "	'14	731,660	*468,982	262,678	153,502	109,176
12 " "	'13	607,296	*403,451	203,845	133,202	70,643
NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEX.						
1m., Aug.,	'14	$174,663	*$95,120	$79,543	$26,059	$53,484
1 " "	'13	185,886	*105,137	80,748	24,166	56,582
12 " "	'14	2,158,253	*1,205,238	953,015	305,329	647,686
12 " "	'13	2,078,037	*1,116,554	961,483	289,769	671,714
PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.						
1m., Aug.,	'14	$24,804	*$15,750	$9,054	$7,495	$1,549
1 " "	'13	26,312	*16,325	9,988	7,583	2,405
12 " "	'14	306,771	*196,674	110,097	91,468	18,629
12 " "	'13	290,675	*193,059	97,616	88,733	8,883

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*Includes taxes.

Traffic and Transportation

BROOKLYN SAFETY WORK

A Review Is Presented of the Safety Campaign Plan of the Brooklyn Rapid Transit Company for 1914-1915

The public safety campaign in the Brooklyn public schools for the school year, that of 1914-1915, has been begun by the bureau of public safety of the Brooklyn Rapid Transit Company under the renewed patronage of the Brooklyn committee of public safety. The safety lecturers have already started again on their rounds of the public schools and from now until the close of the school year concrete safety teachings will be presented in attractive form to all the school children of the borough. Parochial and other sectarian schools are included in this work.

The campaign for the current school year will include several of the features which proved so attractive during the preceding year and in addition many new features. New lectures have been prepared for the schools by Mrs. Jessica P. McCall, supervisor of the bureau of public safety. In place of the large accident drawings used in the public schools last year, each lecturer has been provided with a stereopticon machine and a large collection of stereopticon slides, consisting for the most part of photographs specially posed to illustrate the common dangers to which children are exposed in a crowded city.

As far as practicable, moving pictures will again be used in the Brooklyn school campaign, the bureau of public safety having worked out an arrangement with the fire department whereby "The Price of Thoughtlessness" and other moving picture films to be employed will be transferred to a non-inflammable substance, thereby making the security against fire hazard greater than ever before. A new moving picture film for use in the Brooklyn safety campaign has been produced and is shortly to be in shape for exhibition. The organization of safety patrols is being continued. Eight new patrols have already been organized, the current news furnishing a constant variety of material for the bulletins which are maintained in connection with the various safety patrols.

In response to a request from Miss M. E. Bacon, principal of Public School 107, a lecturer from the bureau of public safety organized a safety patrol and a careful club from a group of pupils selected by Miss Bacon as representative leaders of safety in her school and school community. On Oct. 2 Mrs. McCall, supervisor of the bureau of public safety, met with Miss Major, director of safety organizations in Public School 125. Miss Major had selected a group of boys and girls for membership in the safety patrol and the careful club and the meeting was called at 3 o'clock. Very able work was done by the safety patrol of this school last year.

The opening lecture in the fall campaign was presented to the pupils of St. Agnes School by Mrs. M. F. Van Riper, now a member of the staff of lecturers of the bureau of public safety. Nine hundred children were reached at this assembly. On Oct. 5, Mrs. McCall gave a talk on safety to the pupils in Public School No. 115. Charles W. Lyons, district superintendent, was present at the assembly, after which he called a fire drill as a part of the safety program. Members of the parents' association were also present. Miss Callahan organized a safety patrol and has requested a bulletin board for the safety reports. In cooperation with the fire department, the lecturers spoke on fire prevention in the public schools on Oct. 9, the day set aside by Fire Commissioner Robert Adamson of New York for the formal observance on that subject.

On Oct. 6, Miss Lillian Shipp gave a talk illustrated with accident drawings to 200 kindergarten children in the Sacred Heart School. On Oct. 7, at the school of St. Mary's Star of the Sea 1300 children were reached. There are police guards among the boys of this school who will be appointed to the duties of the safety patrol.

A broadcast distribution of safety buttons is under way in the public schools. The button for general distribution shows a picture of a woman standing on an isle of safety in a public street with a little child on either side and trolley cars, carriages and automobiles operating about her. An official button adopted by the Brooklyn committee of public safety and having a symbolic female figure, signifying the Goddess of Caution, with a child on either side on a pedestal bearing the injunction "Be Careful" has been provided and will be presented to the members of the safety patrols and other deserving of special recognition by reason of their service to the public safety cause. A new edition of safety calendars is in process of preparation for 1915 and will be provided for all the school classrooms in due time.

A complete report of the activities in the summer schools and playgrounds and a forecast of the work in the public schools for the year 1913-1914 was made to the Brooklyn committee of public safety at its recent annual meeting.

Since the fall campaign opened the bureau of public safety has received requests for safety lectures from several outside cities.

NEW ZONE FARE SCHEDULE SUSPENDED PERMANENTLY

The Public Service Commission of the State of Washington has issued an order permanently vacating and suspending the new zone schedule of passenger rates filed by the receivers of the Seattle, Renton & Southern Railway several months ago, which anticipated the collection of an additional 5-cent fare from all passengers beyond Orcas Street, making a 10-cent fare for every patron beyond that point within the city limits. Early last summer announcement was made that on July 10 the new schedule of rates on the Seattle, Renton & Southern Railway would go into effect, the commission at that time granting the increase asked for by the receivers without protest from any source. The City Council directed the corporation counsel to combat the order, with the result that Assistant Corporation Counsel Ralph S. Pierce spent several months in preparing for the hearing before the commission which was concluded recently and has resulted in the permanent suspension of the proposed increased rate of fares.

Figures presented by the receivers indicated that the property is not paying interest and operation cost on the valuation of $1,601,315 which was fixed by H. L. Gray, formerly chief engineer of the commission.

The commission points out that Mr. Gray started with a figure of $832,527 as the cost of reproducing the line, then arbitrarily added 1 per cent for engineering, legal and general expenses, 7½ per cent for interest during construction and 10 per cent for discounts and commissions. F. S. Burroughs, the present engineer of the commission, by eliminating the arbitrary multiple found a reproduction value of $1,171,227 and a present value of $959,955. In this connection the commission says in part in its decision:

"Shippers and passengers are now paying interest upon millions of dollars that have no existence outside of the imagination or arbitrary notion of a so-called expert. Mismanagement of a utility requiring heavy payments for litigation and legal services is not chargeable to the patrons in increased fares.

"While this commission has been unable to find in any city in the United States outside of Seattle any street railway which charges more than 5 cents for one continuous trip within the city limits, we have found many cities where the charge is less.

"It is the opinion of the commission that if the present company should remove all its property from this right-of-way, either the city of Seattle or private enterprise would rebuild a better road and serve the public at as reasonable if not better rates than we will now by order establish.

"For the foregoing reason it is the conclusion of the commission that the proposed shedule of rates filed with this commission and suspended by our orders are unjust and unreasonable, and that the rates now in force and effect are just, reasonable and sufficient."

Scott Calhoun and Joseph Parkin, receivers of the company, have filed with the clerk of the court a suit in equity against the members of the Public Service Commission and Attorney General W. V. Tanner, asking the United States District Court to set aside the order of the commission refusing to permit the railway to increase its fares and to enjoin the commission from enforcing the provision of its decree. The company claims that the order is confiscatory.

Folding Steps and Doors in Montreal.—The Montreal (Que.) Tramways has decided to equip the rear platform of all its double-truck cars with folding steps and doors.

Service Complaint Hearing Continued.—On request of City Solicitor Walter M. Schoenle, the hearing of the complaint of the city of Cincinnati, Ohio, against the Interurban Railway & Terminal Company has been continued to Nov. 24. A compromise schedule has been worked out by the company officials and Mr. Schoenle, and it is desired to test operation for an experimental period of some days before the case is heard.

Rehearing in Service Case Refused.—The Public Service Commission of the First District of New York has denied the application of the Nassau Electric Railroad and the Brooklyn Heights Railroad for the abrogation or a rehearing of its final order regulating the service on the Vanderbilt Avenue and Sixteenth Avenue lines, which required the operation of an increased number of cars in the morning and evening rush hours.

Ruling in Suburban Fare Case.—The State Public Utilities Commission of Illinois has ruled that while 2 cents a mile is the maximum passenger fare in Illinois, a rate as much cheaper as may be deemed desirable and adequate may be established with the permission of the commission. The ruling was made in the suit of the cities of LaGrange and Brookfield against the Suburban Railroad and the Chicago & West Towns Railway to discontinue a new passenger rate placed in operation on July 1, 1913. The commission directs the companies to return to the old rate until the commission can inquire into its reasonableness. The former rate was less than 2 cents a mile and was raised to 2 cents a mile, the maximum by law.

Hearing on Rush-Hour Fares in Rochester.—The Public Service Commission of the Second District of New York fixed the date for a second hearing on the application by the Mayor of Rochester for an order requiring the New York State Railways, Rochester Lines, to charge only a 3-cent fare in rush hours, for the abandonment of the State Street carhouse for regular storage purposes and for rerouting of certain lines for Saturday morning, Oct. 31. After the first hearing the company on the order of the commission furnished to the city a statement of receipts in rush hours for two months, and also a statement of receipts and expenditures in the company's last fiscal year. These statements of receipts were referred to in a brief item which was published in the ELECTRIC RAILWAY JOURNAL of Oct. 24, page 986.

Use of Front End Defended.—The City Commissioners of Lexington, Ky., heard a number of citizens and representatives of commercial organizations and a committee of the company's trainmen recently in regard to the front door rule adopted by the Kentucky Traction & Terminal Company. No action was taken nor will any be taken until the commission is advised as to its authority in the premises. F. W. Bacon, vice-president of the company, defends the use of the front door as a step in the interest of safety and reduction of hazard. He cites the use of similar plans in Chicago, Philadelphia and other cities and says that since the cars have been operated under the new plan in Lexington there has been a marked reduction in the number of accidents which could be classed as step accidents.

"Safety First" Meeting in Ohio.—At a joint conference of representatives of steam and interurban railroads and the members of the State Utilities Commission to be held in Columbus, Ohio, in January, the State-wide "safety first" movement will be placed in concrete form. A preliminary conference was held in Toledo on Oct. 23 between the managers of the interurban railroads and the State Commission at which some thirty electric railway men reviewed the measures taken by their roads to prevent accidents. The Toledo & Western Railroad reported that not a passenger had been killed in five years. It was the consensus of opinion that automobiles were responsible for most accidents at grade crossings. At the suggestion of G. O. Smith, supervisor of safety for the Toledo Railways & Light Company, a committee was appointed, with F. W. Coen, vice-president and general manager of the Lake Shore Electric Railway, as chairman, to consider the question of organization and to prepare drafts of "safety first" measures thought desirable to be presented to the next General Assembly of the State for passage.

Court Rules on Smoking.—Holding that smoking on street cars, other than on open coaches such as are used on cable lines, is a nuisance, and should be abated, Judge Everett Smith, in the Superior Court of King County, recently entered an order enjoining the Puget Sound Traction, Light & Power Company, Seattle, from further permitting this privilege to passengers, and directed the company to pay John Mills Day $10 damages. Mr. Day complained that he and members of his family have been made ill by the tobacco fumes on Wallingford and Meridian cars, and asked for damages and an injunction. A. L. Kempster, manager of the Seattle division of the company, testified that he would obey an order if issued by the court. Judge Smith said: "In the present instance as well as in all other conditions of complex modern civilization, the individual must yield his preferences and indulgences to the welfare and advancement of society at large. Personal liberty is not licensed to offend." The company is required to remove its notices permitting smoking from all cars except those having seats facing an open exterior such as cable cars.

Electric Railway Freight Service Urged for Washington.—Establishment of electric railway freight service for bringing food into Washington from points in Virginia and Maryland, and a news agency whereby the public may be kept accurately informed as to the state of the market are suggestions advanced in the annual report of John H. Sherman, superintendent of weights, measures and markets of the District of Columbia for improving cost of living conditions in the capital. The recommendation for the electric railway freight service carries with it a proposed plan for the conversion of the Georgetown market into a receiving station for produce brought in from Virginia. Mr. Sherman says: "One of the most important steps which must be taken if we are to make full use of the resources of the surrounding territory to feed the city cheaply is the establishment, within the city, of electric railway freight service between midnight and 4 a.m. and for two or three hours at some other part of the day, when traffic is now lightest. Such service should extend on all lines of the city and should provide for running loaded cars directly from the country section to their destination in the city without rehandling the load. Our local produce markets are now supplied, in the main, by wagons from a radius of about 20 miles. With electric railway freight service and switches to both municipal and private markets we can supply the markets by electric railway from a radius, in some directions, of 50 miles, with greatly increased supply of goods, at lower cost."

Traffic in Toronto.—A hearing was held before the Ontario Railway Board in Toronto on Oct. 21 regarding the service of the Toronto Railway. The company contended that the closing down of factories and the reduction in the forces of mercantile establishments had reduced traffic and automatically relieved such traffic congestion as had previously existed. The gross earnings for August decreased $30,000, as compared with the same month in 1913, while the gross earnings for September, 1914, decreased $50,000, as compared with September, 1913. Up to the time of the hearing on Oct. 21 gross earnings for the month had increased over the same period of last year on only three days. During the year 201 new cars had been added to the system. The daily schedule was 699 cars between rush hours and 836 cars during the periods of heavy traffic. C. R. Barnes, electric railway inspector of the Public Service Commission of the Second District of New York, who, at the request of the Ontario Railway Board, reported recently on traffic in Toronto, said on Oct. 21 that his recommendation favoring more cars and extensions was not intended to cover a situation such as had developed following the outbreak of the war. He thought the present time was hardly favorable for the spending of any considerable amount of money to be charged to capital account. Chairman McIntyre, of the Railway Board, agreed with Mr. Barnes that conditions had altered. He is said to have expressed the opinion, however, that the money stringency should not prevent the company from carrying out plans for re-routing and perfecting other work which would tend to improve accommodations and service.

Personal Mention

Mr. W. B. Nantel, formerly Minister of Inland Revenue in the Canadian government, has been appointed to the Dominion Railway Commission, succeeding Mr. N. E. Bernier.

Mr. J. P. H. de Windt, vice-president and general manager of the Birmingham Railway, Light & Power Company, Birmingham, Ala., has been elected president of the Alabama Light & Traction Association.

Mr. F. W. Hoover, vice-president and general manager of the Nashville Railway & Light Company, Nashville, Tenn., and also vice-president of the Tennessee Power Company, has been elected president of the Nashville-Gallatin Interurban Railway to succeed Mr. H. H. Mayberry, who is now chairman of the board.

Gen. George H. Harries, president of the Louisville Gas & Electric Company, Louisville, Ky., has been elected president of the Omaha Electric Light & Power Company, Omaha, Neb. General Harries will devote part of his time to the Omaha property, although maintaining his home at Louisville, where he will continue in charge of the local gas and electric properties for H. M. Byllesby & Company.

Mr. C. W. Kellogg has been appointed manager of the Mississippi River Power Company, Keokuk, Ia., to succeed Mr. J. A. Trawick, who resigned recently. Mr. Kellogg was graduated from the Massachusetts Institute of Technology. Since 1905 he has been representing the Stone & Webster interests in Texas, being manager of the El Paso Electric Railway and the Stone & Webster light and railway properties at Port Arthur and Beaumont.

Mr. W. H. McGrath, who has been assistant to Mr. A. W. Leonard, vice-president and general manager of the Puget Sound Traction, Light & Power Company, has been appointed manager of the company, with headquarters at Seattle. Mr. McGrath was born in Massachusetts and has been identified with Stone & Webster since 1901. He entered the employ of the firm at the home office in Boston following his graduation from Harvard University.

Mr. George S. Rice has been appointed by the Public Service Commission of the First District of New York division engineer for the sixth division, which includes the new tunnels to be constructed under the East River and the Fourth Avenue subway in Brooklyn. Mr. Rice succeeds Mr. Frederick Noble, who recently resigned to take up private practice. Mr. Rice was formerly the chief engineer of the commission, but has been out of its service for some years.

Mr. J. A. Rosenberger has been appointed superintendent of the Owosso and Corrunna division of the Michigan United Traction Company's lines to succeed Mr. R. A. Barnett, resigned. Mr. Rosenberger was connected with the Indianapolis & Eastern Railway from 1903 until 1905, when this property became a part of the Terre Haute, Indianapolis & Eastern Traction Company. At the time of this consolidation he was made cashier of the company and later was appointed assistant auditor. In 1912 he resigned from the Terre Haute, Indianapolis & Eastern Traction Company to become chief clerk to the chief engineer of the Michigan United Traction Company, in which position he has continued up to the present time.

Mr. W. W. Freeman, who has been elected president of the Union Light, Heat & Power Company, Cincinnati, and the South Covington & Cincinnati Street Railway Company, subsidiaries of the Columbia Gas & Electric Company, vice Mr. James E. Ernst, resigned, was previously connected with the Alabama Power Company at Birmingham, Ala., and prior to that was for many years vice-president and general manager of the Edison Electric Illuminating Company, Brooklyn. He is a past-president of the National Electric Light Association and of the Association of Edison Illuminating Companies. Mr. Freeman was born in Exeter, Ont., on June 8, 1872, and took up work in the lighting industry as a stenographer with the Brooklyn (N. Y.) Edison Company, advancing step by step to be vice-president and general manager.

Mr. Frederick S. Pratt of Stone & Webster was elected chairman of the board of directors of the Puget Sound Traction, Light & Power Company, Seattle, Wash. Mr. Pratt is forty-two years of age. He was graduated from Harvard and has been identified with the Stone & Webster interests for nearly twenty years. His first position was in the engineering department in the Boston offices. Soon after the Seattle fire in 1889, when the late Jacob Furth began the work of reorganizing and reconstructing the various electric railways in Seattle under one management, Mr. Pratt took the active management of the properties for a year subsequently, returning to Boston. During his identification with Stone & Webster Mr. Pratt's work has been largely with the company's interests on Puget Sound, although his headquarters have been in the East. He will remain in Boston. Mr. Pratt was formerly vice-president of the Puget Sound Traction, Light & Power Company.

Mr. A. W. Leonard, for the last two years vice-president and general manager of the Puget Sound Traction, Light & Power Company, with headquarters in Seattle, Wash., was on Oct. 24 elected president of the company and member of the board of directors to succeed Jacob Furth, deceased. Mr. Leonard was born in Monmouth, Maine, forty-one years ago. Nineteen years ago he entered the employ of Stone & Webster as bookkeeper for the Edison Electric Illuminating Company, and was promoted to general manager and superintendent of the company twelve years ago. He was transferred to Houghton, Mich., as superintendent of the Houghton County Electric Light Company, and was subsequently manager of that property and the Houghton County Traction Company for four years. He then went to Minneapolis as manager of the Minneapolis General Electric Company. In this position he had practical supervision over all the Stone & Webster properties and plants in the Middle West. On Oct. 12, 1912, he was appointed vice-president and general manager of the various Puget Sound companies.

Mr. Victor T. Noonan, secretary of the general safety committee of the Rochester Railway & Light Company, Rochester, N. Y., has been appointed director of industrial and public safety for the State of Ohio. The position is a newly created one, and is directly under the Governor. Mr. Noonan, who is a former Rochester newspaper man, was appointed editor of the *Gas and Electric News* when that publication was started by the Rochester Railway & Light Company in 1911. In 1912 Mr. Noonan was appointed secretary of the general safety committee of the company. In the two years that he has been secretary of the committee the safety work of the company has become known throughout the country. He is said to have been the first safety man in the electric industry to prepare lantern slides showing right and wrong ways of working, and the first in the same industry to prepare a motion picture play along the same lines. This was "The Lineman." In September, 1913, Mr. Noonan organized the Employees' Benevolent Association of the company with a membership of forty men. At present this association includes practically all the company's employees. Mr. Noonan is a member of the safety committees of the Empire State Gas & Electric Association, the National Electric Light Association and the National Industrial Safety Council, and is also a member of the Lecture Bureau of the National Association of Manufacturers.

OBITUARY

John Campbell, superintendent of transportation of the Connecticut Company at Bridgeport, Conn., is dead. Mr. Campbell was born in Scotland. He was employed by the Bridgeport Traction Company and its successors for twenty-two years.

Jay Newal Ward, formerly secretary of the Central City Railway, Peoria, Ill., died recently at his home in Los Angeles. For many years Mr. Ward was one of the active business men of Peoria identified with street railway, banking and manufacturing industries.

George Matthews Morrison, motor instructor of the subway division of the Interborough Rapid Transit Company, New York, died on Oct. 14 after a brief illness. Mr. Morrison entered the service of the company thirty-two years ago. He was engine foreman, and for some time was employed in the engine shops at Ninety-eighth Street and Third avenue. When the subway opened ten years ago he was appointed instructor of motormen of that division. He is survived by his widow and his mother.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Quincy & Hamilton Electric Railway, Quincy, Ill.**—Incorporated in Illinois to build an electric railway from Quincy to Hamilton. Capital stock, $525,000. Incorporators: Charles H. Petsch, Philip G. Petsch, William W. Hodgman, James E. Sturms and Olaf Seagust.

***Androscoggin Electric Company, Lewiston, Maine.**—Application for a charter has been made by this company in Maine. In the incorporation of this enterprise, the interests of the Libbey properties of Lewiston are united with the power development at Rumford under control of Hugh J. Chisholm of Portland. Electric railway and power development will be undertaken by the new firm. Capital stock, authorized, $2,000,000. Common stock, $1,500,000. Preferred stock, $500,000. Officers: Harold S. Libby, president; Julius E. Parkhurst, treasurer; directors, H. M. Dingley, Harold S. Libby, John A. Morrill and others.

***Ogden & Idaho Railway, Ogden, Utah.**—Application for a charter has been made by this company in Utah as a consolidation of the lines of the Ogden Rapid Transit Company and the Logan Rapid Transit Company and to build 71 miles of electric lines extending to form links and extensions of the consolidated Ogden, Brigham and Logan systems. The lines to be constructed include 44 miles for the connections between Brigham and provide 21 miles between Smithfield and Preston, Idaho, and 6 miles between Idlewild and Huntsville. Capital stock, $5,000,000. Officers: M. S. Browning, president; L. R. Eccles and Joseph Scowcroft, vice-presidents; R. B. Porter, treasurer, and Royal Eccles, secretary.

FRANCHISES

***Bisbee, Ariz.**—W. E. Bradley has asked the Board of Supervisors for a franchise to build an electric railway from Bisbee to Naco.

Fresno, Cal.—The Fresno Traction Company has received a franchise from the Council to double-track its lines over certain streets in Fresno.

Los Angeles, Cal.—The Board of Public Utilities has recommended to the City Council that Louis Ginger be granted a franchise to construct an incline railway in Griffith Park, Los Angeles. The board suggests that the type of design be placed under the control and supervision of the Park Commission, to whom Colonel Ginger applied for the original franchise about a year ago.

Los Angeles, Cal.—The Public Utilities Committee of the Council has recommended to the Council the request of the residents in the Malibar Improvement district for a franchise for an extension of the East First Street line to the east city limits of Los Angeles. [E. R. J., Sept. 19, '14.]

West Hartford, Conn.—The Connecticut Company has asked the Public Utilities Commission for approval of its proposed method of construction of a second line of tracks on Farmington Avenue in West Hartford, from the end of the present double track westward to a point west of the armory of Troop B, Cavalry, C. N. G. The petition of the company for approval of the reconstruction of tracks on Brooklawn Avenue in Bridgeport has been granted.

Wilmington, Del.—The Wilmington City Railway has received an extension of time until May 1, 1915, in which to lay its tracks in the Ninth Ward in Wilmington.

Brockton, Mass.—The Bay State Street Railway has asked the Council for a franchise to relocate its tracks on South Street and on Pleasant Street in Brockton.

Franklin, Mass.—The Milford, Attleboro & Woonsocket Street Railway has received a franchise from the Council for the relocation of its tracks on West Central Street in Franklin.

Lowell, Mass.—The Bay State Street Railway has asked the Council for a franchise for the relocation of its tracks on First Street from a point on Llewellyn Street to the carhouses in Lowell.

New Bedford, Mass.—The Union Street Railway has asked the Council for a franchise for extensions and relocations of its tracks in New Bedford.

Pittsfield, Mass.—The Berkshire Street Railway has asked the Council for an extension of time on its franchise in which to double-track and build the addition to its line in North Street and Wahconah Street in Pittsfield.

St. Peter, Minn.—The Electric Short Line Railway has received a forty-nine-year franchise from the Council to build an electric line in Pekin.

St. Louis, Mo.—The Southern Traction Company's fifty-year franchise for a downtown loop at the St. Louis approach of the municipal bridge across the Mississippi River, was repealed by the House of Delegates recently. The Council already has taken similar action and the Mayor has promised to sign the bill.

Brantford, Ont.—The Brantford Street Railway has asked the Council for a franchise to extend its lines and construct a loop in Brantford. Work has been begun on the reconstruction of the east-end section of this company's lines in Brantford.

London, Ont.—The London Street Railway has asked the Council for an extension of time on its franchise in which to complete its line on Wharncliffe Road in London.

Snohomish, Wash.—The Everett Railway, Light & Water Company has received a fifty-year franchise from the Council to extend its line from a connection with the Northern Pacific Railroad to the intersection of Union Avenue and First Street in Snohomish. It is said that work on this line will be begun at once.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—After the completion of the fencing, work on this electric railway will stop for this year. About 31 miles of grading have been completed and culverts placed; 26,000 ties are required. Farncombe & Inkster, Edmonton, are the engineers. D. S. Hogan, Edmonton, general contractor.

Fresno (Cal.) Interurban Railway.—About 750 tons of rails are now en route to Fresno, and work on the second unit of this company's line from Fresno Avenue to the Normal school will be begun by Nov. 1.

Pacific Electric Railway, Los Angeles, Cal.—This company has placed in operation its new Magnolia Avenue line between Sixth Street, Main Street and Harrison Avenue in Arlington. On Oct. 16 this company filed with the State Railroad Commission application for authority to build tracks at grade across certain public highways in Riverside County. This is the initial step in the construction of the proposed 8-mile line from Harrison Street, Riverside, to Corona. It is stated that $25,000 is being spent on the North Pomona cut-off which will enable through cars on the Los Angeles-San Bernardino line to have about twenty minutes. Work on the cut-off is being carried out by company forces.

California Terminal Railway, Sacramento, Cal.—Right-of-way is being obtained by this company through Jamison Canyon. The company plans to build an interurban railway from San Rafael to Sacramento through Marin, Sonoma, Napa, Solano, Yolo and Sacramento Counties. C. W. Conlisk, San Francisco, is interested. [E. R. J., Oct. 17, '14.]

Connecticut Company, New Haven, Conn.—This company is asked to consider plans for the extension of the Dixwell Avenue line from its present terminus, 2 miles beyond the city limits, over the railroad bridge and around the loop to the Centerville town hall, making a belt line with the Whitney Avenue line in Hamden.

Jacksonville (Fla.) Traction Company.—Plans are being considered by this company to extend its lines on Albert Street and Spearing Street in Jacksonville.

Miami (Fla.) Traction Company.—It was recently decided by the directors of this company to continue its line in Miami, out Twelfth Street to Avenue U, instead of stopping at Avenue S as was originally intended, and from there up Avenue U to Fifth Street. B. B. Tatum, Miami, president. [E. R. J., Sept. 19, '14.]

Charlotte (N. C.) Electric Railway.—The Myers Park line extension, a distance of 1 mile, has been placed in operation in Charlotte.

***Algiers, La.**—Local capital is interested in the construction of an electric railway on the lower coast of Algiers. Meyer Eiseman, Algiers, is interested.

Cumberland & Westernport Electric Railway, Cumberland, Md.—The Public Service Commission is considering the petition asking for the proposed belt line extension of this company's line from the Gladstone Hotel, its present terminus in Cumberland, to Washington, connecting with the Lonaconing line, a distance of 2 miles.

East St. Louis & Suburban Railway, East St. Louis, Mo.—This company is asked to consider plans to extend its lines to Mascoutah, 7 miles east of Belleville, as one of the provisions of the granting of a new twenty-year franchise.

Monmouth County Electric Company, Red Bank, N. J.—Plans are being made by this company to improve the condition of its tracks on Union Avenue, Liberty Street and Washington Street in Long Branch.

Kansas City, Mo.—Negotiations are under way as to arrangements for street car traffic across the Kaw River between Kansas City and Bonner Springs while the Central Avenue viaduct is being reconstructed. The plans for the viaduct work are not yet complete, and when they are decided upon the question of traffic will be definitely determined. The viaduct is a part of the elevated system of tracks through the "West Bottoms," and surface travel would take longer for the cars that now use the elevated. The Metropolitan Street Railway and other lines using the viaduct may operate over it while it is being reconstructed, or arrangements may be made for using the Intercity viaduct.

United Railways, St. Louis, Mo.—This company is asked to consider plans to extend its Fourth Street line to Carondelet Park in St. Louis and to extend the Lee Avenue line northwest to bisect the district between the city limits, Union Boulevard, Florissant Avenue and Easton Avenue in St. Louis.

St. Paul (Minn.) City Railway.—This company is asked to build a line on St. Clair Street from West Seventh Street to Oxford Street in St. Paul.

***Long Branch, N. J.**—The city of Long Branch will cooperate with the Freehold Merchants' Association to build an electric line between Trenton and the seashore by way of the county seat. The Long Branch committee favors a terminal in Long Branch. Already considerable work has been done by the Freehold business men to obtain a right-of-way to the shore. The distance between Long Branch and Freehold is 16 miles.

Fallon (Nev.) Electric Railway.—This company has awarded a contract to the Berney Construction Company for the completion of the grade of this railway from a point on the east line of Phillips & Gibbs ranch, working on to Sand Springs, a distance of 16 miles. It is expected that the grade will be completed in a couple of months, and as soon as it is done plans will be made for the sale of the bonds, which have already been arranged for as soon as the work of grading is finished.

Long Island City, N. Y.—The contract for the concrete piles in the foundation for the new elevated structure in connection with the subway extension in Long Island City has been awarded to the Raymond Concrete Pile Company, 140 Cedar Street, New York. Snare & Triest Company, Woolworth Building, New York, are the general contractors.

Cincinnati (Ohio) Traction Company—The route for the proposed belt line in Cincinnati is being planned by this company.

Brantford (Ont.) Street Railway.—Extensive work is to be carried on by this railway this fall. Among the prospects for this year are the rebuilding of the eastward loop and the construction of a loop to connect the railway ending at Palmerston Avenue with the Brant Avenue line, by way of St. Paul's Avenue.

Ottawa & St. Lawrence Electric Railway, Toronto, Ont.—Grading for this railway has been begun. The main line will be 119 miles in length, extending from Ottawa via Morrisburg to River Beaudette on the Quebec border, with a branch line from Metcalfe to Russell. Contracts for grading have been let at various points. [E. R. J., March 28, '14.]

San Antonio (Tex.) Traction Company.—This company is extending and relaying sections of its lines in San Antonio.

Utah Light & Traction Company, Salt Lake City, Utah.—Material is on the ground for the extension of the Holliday line of this company to the mouth of Cottonwood Canyon. Construction is to be begun at once in order that cars may be in operation for the summer business next year. Five miles of new track will be laid from the present terminus to the company's Granite power station at the entrance to the canyon. The extension will follow the county road to Knutsen's Park, then over a private right-of-way to Big Cottonwood Creek and along Big Cottonwood Creek on its south bank on property owned by the company to the terminal near the power station.

Charlottesville (Va.) Interurban Railway.—As soon as financial backing can be secured this company will build its 15-mile line between Charlottesville and Alberne via Albermarle County. Power will be purchased. Walter Washabaugh, Charlottesville, chief engineer. [E. R. J., Aug. 16, '14.]

***Spokane, Wash.**—An independant corporation to build a gasoline railway, to connect with one or both of the Spokane electric systems and extending to Whitworth College and the Country Club was recommended at a recent meeting of the building committee of the Whitworth College Board of Trustees. It is reported that one of the railways companies had offered to operate such a line if it should be built.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Three new passenger stations will be built at once by this company at points on its new San Bernardino line. The stations are to be erected at Etiwanda, Alta Loma and Rialto. The contract for their construction has been awarded to the King Company, Los Angeles. Each station will be 30 ft. x 120 ft., single story and of reinforced concrete and hollow tile construction. The three depots will cost in the aggregate about $20,000.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The new three-story building of this company at Twenty-second Street and Grove Street in Oakland has been completed and the company will move all its departments there at once. The new structure will devote the two upper stories to the executive and operation departments, while the lower floor will be used for a waiting room and for the electrical supply department.

Ogden (Utah) Rapid Transit Company.—Work has been begun by this company wrecking the building on the ground at Twenty-fourth Street in Ogden on which it plans to build its new interurban depot. The structure will be 50 ft. x 20 ft. The contract to build this depot will be awarded in the near future.

POWER HOUSES AND SUBSTATIONS

Corning & Painted Post Street Railway, Corning, N. Y.—This company's cars are now being operated over the entire line by power furnished from the Big Flats power station of the Elmira, Corning & Waverly Railroad and henceforth power is to be regularly supplied to the local line from that source. The operation of the power house of the Corning & Painted Post Street Railway on the North Side in Corning will be discontinued.

Ithaca (N. Y.) Traction Corporation.—Ford, Bacon & Davis, New York, engineers, are building an addition to the power house of this company, in which they are installing one 750-kw bleeder type General Electric turbo-generator with Worthington condenser and auxiliaries. Two 400-hp Edgemoor boilers are now being installed in a new boiler house.

London & Port Stanley Railway, London, Ont.—Bids are being asked by this company for two motor-generator sets to be used in connection with the electrification of this railway.

Manufactures and Supplies

ROLLING STOCK

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio, expects to purchase three cars within the next week.

Danville (Ill.) Street Railway & Light Company will put in service four more prepayment cars on the Roselawn-Oaklawn line.

Sandpoint & Interurban Railway, Sandpoint, Idaho, expects to purchase within the next few weeks trucks with quadruple motors and snowplow equipment.

Boston (Mass.) Elevated Railway is building two new snow plows for the winter season. They will be equipped with Westinghouse No. 306 quadruple motors and type HL unit switch control.

Geary Street Municipal Railway, San Francisco, Cal., has ordered a total of only 125 cars during 1914, and has not ordered fifty more cars, as recently reported.

Pacific Electric Railway, Los Angeles, Cal., is contemplating the purchase of twenty-four all-steel cars through its controlling company, the Southern Pacific Railroad, New York, N. Y.

Richmond Light & Railroad Company, New York, has specified the following details for the thirty-two closed passenger cars recently ordered from the Osgood-Bradley Car Company:

Seating capacity	46	Cables	West.
Bolster centers, length,	17 ft. 2½ in.	Control	K 35
Length of body	28 ft.	Curtain material	Pantasote
Length of vestibule,	41 ft. 4 in.	Designation signs	Hunter
Width of sills	8 ft. 3 in.	Fenders	H. B.
Width over all	8 ft. 4⅛ in.	Gears and pinions	West.
Body	metal	Handbrakes	Lord
Interior trim	ash	Heaters	Consol.
Headlining	Agasote	Headlights	Golden Glow
Roof	arch	Motors	4 West. 323, outside hung
Underframe	metal	Seats	H. & K. No. 300
Air brakes	National A 6	Seating material	rattan
Axles	Standard	Trolley catchers	Earle
Bumpers	Hedley	Trolley base,	West. (Union)

TRADE NOTES

Taylor-Wharton Company, Easton, Pa., expects to complete the construction of its new buildings early next year.

Dallas Equipment Company, Portland, Maine, has been organized to manufacture, build, purchase, sell and deal in street railway cars and other cars and vehicles. The authorized capital stock is $200,000. John H. Pierce, of Portland, is president; William E. Tucker, Chelsea, Mass., treasurer.

Consolidated Car Fender Company, Providence, R. I., has received an order through Wendell & MacDuffie Company, New York, to equip all the cars of the Hattiesburg (Miss.) Traction Company with H. B. lifeguards as a result of a recent successful demonstration conducted with a dummy on this line.

Swedish Ljungström Steam Turbine Company, Ltd., Finspong, Sweden, is constructing at its works a 10,000-hp turbo-generator for the Willesden Power Station in London, England, which was ordered after a 1500-hp unit had been thoroughly tested in the same station, since the beginning of 1913, since which time the turbine has been in daily use.

G. J. Slibeck, formerly sales representative with the Buda Company, has resigned to become sales representative of the St. Louis Steel Foundry Company, and will handle solid manganese steel track work exclusively. This company's solid manganese steel track work business has increased so that it became necessary to appoint a special representative.

Hess-Bright Manufacturing Company, Philadelphia, announces that notwithstanding the European war and the temporary suspension of shipments to the company from Germany, it is now receiving large quantities of DWF bearings from Berlin, more than 125,000 of assorted sizes having come through since Sept. 1. This shipment in connection with the company's large stock on hand when war was declared, together with the increase of its own Philadelphia facilities for manufacture, place the company in an exceptionally good position to minimize any inconvenience which the war might otherwise have inflicted upon users of ball bearings.

Westinghouse Air Brake Company, Wilmerding, Pa., at a meeting of its board of directors elected Henry Herman Westinghouse president to succeed his brother, the late George Westinghouse, founder of this company and numerous other Westinghouse industries. Mr. Westinghouse was born at Central Bridge, Schoharie County, N. Y., in 1853. He attended the schools of Schenectady, and later entered Sibley College of Engineering at Cornell University. Like his brother, Mr. Westinghouse inherited from his father a fondness for mechanics and invention. He invented the well-known high-speed, single-acting Westinghouse steam engine, for the manufacture of which the Westinghouse Machine Company was organized in 1880. In 1873 George Westinghouse invited his younger brother to Pittsburgh to assist him in the management of the air brake company, with which organization he has been connected ever since, for many years past being its first vice-president. He has also been prominently identified with several other of the Westinghouse industries. He was also the organizer and for a number of years the guiding spirit in the management of the Westinghouse Church Kerr Company.

ADVERTISING LITERATURE

Dielectric Manufacturing Company, St. Louis, Mo., has issued "Bullet" No. 2, which describes its graphon paint for metal protection.

Hunter Illuminated Car Sign Company, Flushing, N. Y., has issued a folder which contains a list of large orders for signs received during 1914.

American Electric Works, Phillipsdale, R. I., has issued a price list for Oct. 15, of its wire and cable material, also a price list of its Enduro spark coils.

Ohmer Fare Register Company, Dayton, Ohio, has issued a folder which contains a large list of the companies from which it has received new and renewed contracts during the past several months.

Steel City Electric Company, Pittsburgh, has issued Bulletins Nos. 22, 23 and 24 describing its universal insulator supports and Fullman adjustable and non-adjustable floor outlets, respectively.

Robert W. Adams, Providence, R. I., electrical engineer, has issued a bulletin describing the new engineer's addition of his transmission line calculator, a practical device for the accurate calculation of electrical circuits.

Walter B. Snow, Boston, publicity engineer, has issued an illustrated folder which shows the large variety of technical subjects which have been treated in advertisements, articles, booklets and treatises by members of this company's staff for its clients.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a folder which contains a report presented at the annual meeting of the American Society for Testing Materials held in Atlantic City in July, 1914, on the results of steel-fence paint tests.

Sterling Varnish Company, Pittsburgh, Pa., has issued an unusually comprehensive and useful catalog on the subject of insulating varnishes and compounds. The catalog contains descriptions of the various types of insulating varnish manufactured by this company and also describes methods of testing insulating varnishes when considering the adoption of any particular varnish. The catalog concludes with general directions for using insulating varnishes.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 46390 describing its Type CB-5 test meter for use on 100 to 120 and 200 to 240 volt circuits. The construction of the meter is described in detail and the bulletin contains diagrams of connections. This meter combines in one standard several capacities covering a range from light load to full load and making possible rapid testing since no time is lost in changing standards. Bulletin No. 42800 contains a reprint of an article appearing in the *General Electric Review* and devoted to the use of electrically driven air compressors in foundries.

Electric Railway Journal

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HIGHER VOLTAGE DIRECT CURRENT

The abstract of the Institute paper on the Butte, Anaconda & Pacific electrification which appears elsewhere in this issue is a most encouraging statement for electrical operation, the reported profit of 20 per cent on the initial cost that was effected through savings over the cost of steam operation being enough to deserve the attention of any railroad management. The statements regarding the negligible effects experienced in service with flash-overs at the high potential of 2400 volts are especially interesting, because this has been a point subject to considerable discussion in the past. In view of the satisfactory results obtained from this step another material increase in d.c. voltage may be expected in the near future. Of course, the proposed installation on the Chicago, Milwaukee & Puget Sound Railroad with 3000 volts constitutes an actual step ahead, but so much has been heard of the practical possibilities and experimental installations of d.c. equipment at voltages far in excess of this that it seems not unreasonable to expect, in the near future, some d.c. installations at 5000 volts or even more, especially in situations where the motor is not restricted in size. This prospect, together with that of the practically accomplished development of the mercury-arc rectifier for railway service, constitute possibilities in the art of electrification of steam railroads that were almost undreamed of when it first began on a large scale ten years ago.

ENCOURAGING RATE DECISION

Elsewhere in this issue is printed an extended abstract of one of the most important rate decisions that have lately been handed down on the subject of electric railway fares. In granting a substantial increase in rates to the Middlesex & Boston Street Railway, the Massachusetts Public Service Commission has done far more than to approve measures of financial relief to a deserving company. It has enunciated most significantly its belief that the future of private ownership under public regulation depends upon a living wage to capital no less than to labor. Its unequivocal stand upon this question, as well as the clarity of its findings, the soundness of its methods in dealing with the evidence before it and its constant alertness in drawing conclusions of general application from the material assembled, will interest the student of rate-making from start to finish. The Middlesex & Boston Street Railway, operating many miles of thinly-populated country lines in addition to suburban lines in Newton & Waltham, has been struggling to earn a bare 4.35 per cent on its investment, unable adequately to care for depreciation but forced to pay relatively high rates for borrowed money, to satisfy the public's demands on high-class service and to meet rising costs of material and an arbitrated wage increase. On account of these conditions the company asked for a 6-cent fare on the entire system and an additional charge of 1 cent per transfer, which would add $110,000 to the company's annual revenues. The commission approved only the former request, with the provision that the company sell nine tickets for 50 cents on those portions of its system where a 5-cent fare now prevails, and give free transfers at all existing transfer points. The granted increase is estimated by the board to yield the company about $70,000 per year. This, the commission says, should enable the company to maintain its property in safe condition by expending for maintenance and revenues, until some general basis for dealing with depreciation is ordered or indicated by the board, substantially 20 per cent of its gross revenue, and also to provide very moderate dividends.

IMPORTANT QUESTIONS DECIDED

This Middlesex and Boston opinion discusses a number of important questions which may only briefly be indicated here. The right of the commission to deal broadly with the company's fare problem, regardless of prior franchise agreements concerning fares on its constituent lines, is admirably set forth. In the light of previous court decisions this was not unexpected, but it is wholesome for the powers of the board thus to be brought prominently and clearly before the public. The reckoning of the return upon the basis of capital investment instead of upon reproduction cost is also significant. The commission does not concede for a moment that money lost during the earlier stages of a public service enterprise soundly and honestly managed should be irretrievably gone from the stockholders. In its opinion, public utilities are never finished, and unless they are kept on good trading terms with the public the whole experiment of private ownership under public regulation must fail. Then, too, the commission feels that the more prosperous lines should, to a large extent, pay the losses on the less patronized routes. It is not unreasonable, it is said, to suppose that some advance over the original fares might now be necessary even upon the better-paying lines if these had continued to be separately operated. These various changes and others allowed by the commission are anticipated to produce the minimum hardship upon the communities served, and their working out will be of considerable interest. Welcome as would have been a complete granting of the company's petition, the foregoing points sufficiently show the desire of the commission to protect electric railway investors, and it is a splendid thing for the whole policy of private ownership under public regulation to have a state commission standing as high as that of Massachusetts take such an unmistakable stand. Unless all signs fail, too, the public will cheerfully meet the situation in this fuller recognition of the rights of the electric railway investor. As the opinion of the commission will have a wide circulation, it should be a help to managers of properties far and wide who may be confronted with the question of giving service for less than cost.

ELECTRIC RAILWAYS IN AND ABOUT MANILA

A remarkable illustration of efficient service performed by an Oriental street railway system in the face of a number of singular operating problems is shown by the account of electric railway operation in Manila, published elsewhere in this issue. The success of this pioneer traffic system which has enabled it to give good service can be attributed largely to the development of the Philippine Islands under the American administration.

The street railway and lighting property in Manila, which received its franchise in 1903, two years after the inception of the American regime, has developed with the city. The replacement of lax Spanish educational methods by a modern system or elementary schools, the improvement of the harbor of Manila and the establishment of bureaus of forestry, health, agriculture and constabulary, all contributed to the furtherance of more peaceful civil relations and to the enlargement of the Filipino's producing power. Increased production stimulated important commercial relations with America, which, with the large increase in tourist travel have been responsible for the rapid growth of Manila and, incidentally, of its traffic system. In its turn the street railway company has reciprocated by providing better service through the expenditure of a large portion of its net earnings for extensions and for new power and car equipment.

A successful struggle has been conducted by the resourceful street railway officials of Manila in protecting their equipment against the natural eccentricities of the Philippine climate, such as torrential rains and the ravages of white ants in devouring wood. Other questions, such as the low per-capita wealth of the city served, present difficulties which can be eradicated only with time. The results obtained by the company in maintaining in the face of these physical and economic obstacles a standard of service unexcelled by the street railway system of the neighboring more densely populated cities of Tokyo, Yokohama and Shanghai in point of promptness, reliability, area served and completeness of equipment should serve as an example of accomplishment to other more highly-favored roads.

INSERT FASTENINGS IN SPECIAL WORK

Our study of insert special work failures and the opinions of engineers expressed in the communications which have followed its publication clearly emphasize that the renewable insert is far superior to the non-renewable insert and that in its setting and fastening, simplicity and accessibility are the most important features. Under heavy traffic most of the plates with any type of insert fastening will come loose at some time during their wear life. Hence, the most desirable fastenings and settings are those which will reduce this number to a minimum, eliminate complications in the rest of the track structure after they do become loose and permit replacements or repairs to be made by the average track laborer. Other important features are provision in the setting to overcome the side thrust of canted trucks and sufficient weight in the insert plate to prevent the peening or cold-rolling action from shearing off or stretching the bolts.

In the past some engineers have demanded fastenings which were too easily released under traffic vibration. Others, going to the opposite extreme, have specified fastenings which practically require the removal of the frog or crossing when refastening or renewal is necessary. While the latter fastening has reduced the number of loose inserts to some extent, it manifestly entails considerable expense when repairs are necessary and may obstruct traffic if the entire piece must be removed. But on light-traffic lines such a fastening has proved very satisfactory and loose inserts are rarely found.

In our insert special work articles we expressed the belief that the setting necessary to meet modern heavy traffic conditions and reduce to a minimum the complications following the loosening of an insert should be the completely or partially-machined bearing type. The approval with which this opinion has been received in the communications sent to us is most gratifying. Obviously a setting which will permit the average track laborer to place an insert in its correct position should prove most satisfactory. It is also believed that a machined-fit, mitered joint between the insert plate running rails and the arms will further assist in obtaining a secure initial setting. It will make the resetting more positive and unquestionably will reduce impact at these points as well as eliminate the tendency of the plate to tilt.

Larger plates with gentle approaches to the narrow throatways, or plates set in special work with the throatways through the arms gently leading up to the narrow throatways in the plate, will gradually right canted trucks and thereby eliminate side thrust. The use of a welder in iron-bound work or provision in the mold of steel-bound work will supply this remedy. This also applies to the method of building up the throatway floor in the rail arm so as to provide a gentle approach to a flange, or equal flange and tread bearing in the insert.

If all of these precautions are taken in the manufacture of track special work, they will have a tendency to reduce materially the number of loose inserts and thus greatly prolong the average life of insert special work.

A WAR STRICKEN CONTRACT

As our readers may know, the London, Brighton & South Coast Railway is undertaking a large work of electrification, including all its suburban lines, and as a whole about 120 miles of lines are to be converted, a task which was expected to cover some four years. Work is already under way and now comes the war to interfere seriously with the original program. As it happens the cable was of Belgian make, and it is not yet clear how much of the material has already been shipped. The cable making was under way a year ago, but of course the works are now closed by the war, and even if not destroyed in the progress of hostilities it may yet be a long time before the supply can be obtained from this source. It is quite certain, however, that the cables can readily be made in England if the strain of the war in the matter of workmen does not become too severe. At all events the American, Italian and Swiss factories could fill the demand, so that this part of the work will not be seriously interfered with.

The general contractors for the equipment, however, ordered the motors and controllers from the Allgemeine Elektricitäts Gesellschaft of Berlin. Nobody can guess intelligently how long the war is going to continue, but, whether long or short, it is quite certain that no British money will go to German manufacturers for a very long time to come. The general contractors will certainly have to cancel their German agreement even if they have not already done so.

In the class of apparatus required for this contract there are relatively few makers having facilities and experience enough to turn out a first-class product promptly. The American makers can meet all the requirements either through their factories here or through the allied British companies. The only other neutral sources where such apparatus could be obtained are in Switzerland, whence egress is troublesome. Moreover, the two great Swiss electrical works are situated dangerously near the German frontier and are somewhat crippled as to labor conditions by the Swiss mobilization. Whether Switzerland can actually keep out of the war remains to be seen. It seems evident, therefore, that the American makers, either directly or through their British establishments, are in line to get this important work, and it goes without saying that the contract in their hands would be filled well and promptly.

This is only one example of the necessary work of the world that is headed this way. When the returns are all in it will probably be found that there are many other German contracts scattered over the world which must be turned over to neutrals, and the aggregate amount of work thus coming to the United States ought to be very considerable, since customers cannot be expected to wait the outcome of an indeterminate and paralyzing struggle like the present one.

POLITICS AND PETITIONS TO COMMISSIONS

One of the most trying duties of the conscientious railway officer is the effort to combat an appeal made to a state commission for political purposes. An operating man can always tell whether petitions for altered service, reduced fares or extended transfer privileges arise out of a genuine local desire for the modification of existing conditions or whether the cause is an attempt on the part of someone to advance his political prospects. But in most cases the adjudicating tribunal is obliged to go through the proceedings just the same, and the burden upon the companies in the weeks prior to municipal and state elections is sometimes most exasperating.

No gain whatever comes from allowing a feeling of irritation at such often needless proceedings to manifest itself on the part of the company, and where cases of this kind reach the public hearing stage, the only thing to do is to marshal the facts, figures and deductions with the same care that would be brought about by an inquiry directed by the commission itself. Fortunately it is seldom a difficult problem in transportation technique to "call the bluff" of the politician who is trying to use the company merely as a pretext for his own selfish ends, and a commission composed of men of insight is not easily deceived as to the motive behind petitions. The chief burden of such proceedings is twofold. They tend to stimulate agitation against the company in various neighborhoods influenced by the politician in charge of the movement, and they add to the existing heavy cares of the operating man and take up his valuable time.

Agitation fostered by self-seekers must be faced with entire frankness, and an open attitude on the part of the company with respect to the reasons for its methods of operation in various localities is the best safeguard against political attack. The public hearing is often a sort of safety valve, at which considerable steam can be let off harmlessly. But after this is done all the pressure against the company will be apt to disappear in the face of facts and man-to-man explanations of service and fare difficulties and the efforts being made by the company to solve them. Where little ground exists for complaint, the occasion may be turned to real account along the line of better acquainting the public with real conditions. There is no relief from the necessity of doing this. It is a part of modern public service, and only by training competent subordinate officials to represent the company in such proceedings can the higher executives of a road be spared some of these burdens.

Commissions are more and more seeing the benefits of informally adjusting complaints through conferences with the interested parties, and the proportion of this class of procedure to the number of formal petitions handled is likely to increase as time goes on. The new Maine public utilities commission act provides that the board may investigate rates or service, "being satisfied that the petitioners are responsible and that a hearing is expedient," and this provision is decidedly in the interest of eliminating lengthy procedure with respect to doubtful appeals of questionable ancestry. If managers make the best of the situation, we are disposed to believe that the commissions will more and more endeavor to protect their dockets against political exploitation.

MORE ABOUT THE CODE OF PRINCIPLES

In last week's issue we suggested the necessity for study of the principles formulated in the code adopted at Atlantic City. To assist our readers in this study a statement has been secured from Thomas N. McCarter, who was chairman of the committee on public relations of the association during the formulation of the code by that committee. Mr. McCarter states some of the ideas which should be suggested by the code of principles or, to use a somewhat technical word, he suggests the proper connotation of the principles. It is not so much what the principles say as what they signify to the rank and file of the industry that will make them effective. The statements made by Mr. McCarter are intended to be merely suggestive. We hope that they will provoke lively discussion.

The code as a whole outlines the big problems of the electric railway industry to-day. Without disparagement to the engineering department which supplies necessary motive power, the equipment department which gives us good cars and maintains them, the transportation department which supplies the human element and keeps it in good training and humor, the accounting department which adds up the nickels and distributes expenses in accordance with the standard classification, and the claims department which insures equitable settlement of accident cases, their problems are less difficult than that of the management which deals with the fickle and inconsistent public. The reason for this is that the departments named deal largely with material and technical matters which follow certain fixed and ascertainable laws. We do not forget that the uncertain human element enters into the work of all of these departments, too, and to that extent complicates their work. But think, in comparison, of the task of defending a property against opposition which possesses the power to confiscate the equity in it and which is apt to be dominated by the ignorant demagogue who achieves cheap notoriety by railing at vested interests!

The electric railways believe that they will get fair treatment from an intelligent and informed public; they fear only ignorance and graft. As we pointed out last week the average citizen does not seem to be able to distinguish between capital and affluence. He puts a railway capitalized at a million dollars in the same class as a millionaire capitalist, and forgets that the capitalization is borrowed money for the use of which regular payments are demanded by the owners. There must come a different point of view before permanent improvement is possible, because the public service commissions can only reflect public sentiment after all. The industry has a big educational job ahead, and it devolves upon the incoming committee on public relations to carry on the work, which so far has resulted in the completion and adoption of the code of principles.

THE FORERUNNER OF TRADE

In a number of recent issues of this paper we have had occasion to comment briefly upon the close sequence between investment and trade which has always been exhibited in the history of the world's commerce. This point is emphasized again by the interesting discussion of European tramway investments by W. J. Clark, published elsewhere in this issue. Up to this time the citizens of this country have been contented largely to look within their own borders for their electric railway investments. The only exceptions of tramway enterprises controlled by American capital, outside of this continent and the United States insular possessions, which we now recall, are a few in South America and in the West India Islands. But the conditions are very different abroad, and before the war London, Brussels and Paris were the centers of electric railway holding companies operating properties not only throughout Europe but the world over.

We are referring to this fact at the present time because it is so closely associated with the South American trade of which so much has been said recently. Our country has never had its logical share of the commerce of South America. It has perhaps been logical that our country, being itself a debtor nation, has been content to devote its enormous resources to domestic enterprises, supplementing them from time to time with foreign capital. The result has been, however, that our manufacturers last year sold to South America only about 12 per cent of her imports and only 6 per cent of our exports, and these percentages were devoted mostly to articles in which we as a nation possessed special advantages.

On the whole, our capital investments in South America have been absurdly small as compared to those of European capitalists. Great Britain and Germany, the commercial powers of Europe, have not only had money for South American investment but have been willing to take a lower interest rate than seems popular here. British capitalists have gone into South America in groups with immense corporate funds for extended investments, while the Germans with less capital have through the establishment of agencies and a diligent study of the South American people and methods carried on their invasion more through a perfecting of trade channels. According to Sir George Paish, formerly the editor of the London *Statist* but now in this country representing the English Exchequer, the total investment of Great Britain in South American countries is as follows: Argentina, $1,600,000,000; Brazil, $739,000,000; Chile, $305,715,000; Peru, $170,865,000, and the other countries, $180,620,000. That these sums have not resulted entirely from operations in the distant past is shown by the fact that during 1913 the investments of Great Britain in these countries amounted to: Argentina, $93,205,000; Brazil, $104,350,000; Chile, $12,920,000; Peru, $4,500,000, and the other countries, $7,195,000. The effect of these investments may be realized when it is considered that in Argentina Great Britain has more than twice the trade of her nearest competitor, Germany, and for all South American countries combined Great Britain far surpasses any other nation.

Vast as the above investments have been, there is still room for additional capital in South America. John Barrett, director of the Pan-American Union in Washington, D. C., believes that the United States can profitably invest $7,000,000,000 in South America within the next twenty years. Colombia with its need of money to build railroads, open mines and market lumber can well utilize $25,000,000 in the next ten years, while Brazil and Argentina should each have $100,000,000 in the near future. There are certainly real opportunities in these and other southern countries for Americans interested in making loans and investments, and creating those conditions of prosperous development which are the forerunner of trade and which lead the beneficiaries naturally to turn for advice and commerce to the nation whose helping hands have thus been outstretched. The sooner our banks realize that investment of American capital in legitimate South American development is the surest way to bind our sister republics to us, the more quickly will we secure that expansion of trade now so strongly desired. The only South American country in which American capital is at all well represented is Brazil, and in 1912 American electrical exports to this country predominated. When this is considered in connection with British investment and trade supremacy in Argentina, the inference is plain.

THE CASE OF THE RAILROADS

The war events still occupy practically all of the first pages of our metropolitan dailies as well as most of the second and third pages, so that between war news and politics little space is left for accounts of current events of importance which are happening in this country. There is no doubt that the present war is a catastrophe to the human race. Its tremendous losses are almost if not quite too great to be comprehended. We intend in no way to depreciate the seriousness of the conditions abroad, but the war should not blind up to serious conditions in this country. In fact, judged purely from the standpoint of money involved, there are certain matters at stake in this country which compare in importance with the stupendous amounts involved in the destruction going on in Europe.

Articles have appeared in some of the foreign papers and have been copied in the American papers estimating the amount of financial injury which has been suffered by Belgium and some of the other contending countries, and speculating upon the sum which the Allies, if successful, will force Germany to pay at the close of the war as reimbursement for the losses inflicted. Is it to be the five milliards of francs, or the $1,000,000,000, which Germany demanded of France at the close of the Franco-Prussian war, or is it to be two times, or five times, or ten times this amount? This is necessarily a question of the future, but a hearing has been going on in Washington during the past few weeks which has involved property worth not merely $1,000,000,000 but more than twenty times that amount, yet it has attracted comparatively little public attention.

We refer, of course, to the hearing before the Interstate Commerce Commission which involves directly the investment in the steam railroads of the country, which has been conservatively estimated at $20,000,000,000, and only less directly the investment in the electric roads, which has been estimated at from $3,000,000,000 to $4,000,000,000, as well as that in the manufacturing industries which depend for their prosperity upon the supply of material to both of these classes of roads. We include the electric roads because while their interests are not as closely bound up in the rate hearing at Washington as are those of the steam roads, yet favorable action there and a clear-cut statement on the part of the commission of the needs of the steam roads would undoubtedly give moral support to the demands of the electric roads on the state commissions and municipal authorities for fairer treatment.

Both classes of railroads have explained their needs to the public and to the properly constituted authorities. With both the present situation has been brought about largely by the same causes—the higher cost of materials and labor and higher taxes. With both the conditions arising largely from the war have involved the necessity of paying higher interest rates in the future. With both the question of an advance of rates is not one which can be postponed indefinitely. In the steam railroad field, for instance, the companies are facing the necessity of providing some method of refunding their short-time notes, debentures and other bonds which have an early maturity. It has been estimated that $547,000,000 of securities of this kind must be refunded during the next three months alone, and of this amount $303,000,000 represent the applications of three so-called typical systems, namely the Pennsylvania, Baltimore & Ohio and New York Central systems. This sum, $537,000,000, which is to be accounted for within the next few months, is equal to more than half of the entire national debt of the United States, yet how much public attention has this fact attracted?

While waiting for a decision in the steam railroad situation it is a satisfaction to record a step in the right direction as regards the electric roads. After an extended and carefully conducted hearing, the Massachusetts Public Service Commission has granted to the Middlesex & Boston Railway permission to charge a 6-cent fare, as described in another part of this issue. We hope that this ruling will suffice as a precedent to other commissions to grant similar relief to companies in other states. The need is great not only so far as the railways and their stockholders are concerned but to the public as well, because the public depends for its prosperity upon the maintenance and extension of proper transportation facilities. We believe that if there was a wider knowledge of the conditions under which our transportation systems are suffering, there would be little difficulty in securing the relief so anxiously sought and urgently needed.

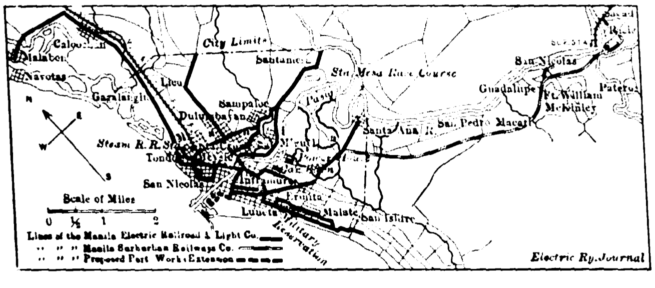
Electric Railway Service in Manila

Historical, Operating and Engineering Features of the Electric Railway Properties in a Large Oriental City—Many Difficulties Overcome in the Construction of the Railways

Electric railway, lighting and power service in and about the city of Manila, P. I., is furnished by the Manila Electric Railroad & Light Company and the Manila Suburban Railways Company, the properties of both companies being operated under the supervision of The J. G. White Management Corporation of New York.

In 1903 Charles M. Swift of Detroit obtained a franchise from the city of Manila to build and operate an electric lighting, power and railway system in that city. The only electric and transportation facilities of importance in Manila at that time were owned by two Spanish corporations, La Electricista and Compania de los Tranvias de Islas Filipinas, the former having been organized in 1892 and furnishing electricity for city lighting and private use, and the latter, organized in 1885, operating horse-car lines in the city and a steam dummy line to Malabon.

The properties and franchises of both Spanish companies were purchased and together were turned over with the new franchise to the Manila Electric Railroad & Light Company, which was incorporated under the laws of the State of New Jersey. In 1906 a franchise for a suburban railway and electric system to Pasig was obtained and turned over to the Manila Suburban Railways Company of Connecticut. The property which was subsequently constructed, as well as that of the first-named company, was constructed under the supervision of J. G. White & Company, Inc., of New York.



RAILWAY SERVICE IN MANILA—ELECTRIC ROAD CHART

TERRITORY SERVED

Since the American occupation in 1898 Manila has undergone a steady and rapid growth until it is now known as the "Pearl of the Orient" and has a population, including suburban districts, of about 350,000. Due to its increased wealth and commerce it has been made a regular port for the most important trans-Pacific steamships, thus providing the city with frequent and regular transportation service to and from the United States and principal oriental points.

The main business portion of the city lies north of the Pasig River and includes the principal retail business street known as the "Escolta." The city is in general quite low, a large portion being only a few feet above tide water, and abounding in "esteros" or waterways, which overflow at high tide and flood the low lands. These periodically inundated areas are constantly being reclaimed by materials brought from the higher districts east of the city.

A large population is supported in the rich farming districts surrounding Manila and served by suburban lines which carry passengers and market commodities to and from the urban markets. The development of suburban railway facilities has played an important part in the rapid growth of outlying districts which were previously reached only by various primitive modes of transportation, such as the two-wheeled cart drawn by the "carabao," the native water buffalo, which is commonly used in the islands as a draft animal.

The principal suburban line terminates at Pasig, a city of about 20,000 inhabitants, located about 6 miles southeast of Manila. This line serves various intermediate communities including Fort William McKinley, the principal military post on the islands. Another suburban line reaches Malabon, about 4 miles north of Manila, and runs over the route originally used by the steam dummy line.

Climatic conditions have aided greatly in the development of car riding for both business and pleasure purposes. During the greater part of the year the heat of the day renders walking any distance difficult and very unpleasant. Even before the construction of the Manila railway system the natives had developed the riding habit; in addition to the horse trams there were in 1903 about 5000 private and public vehicles in the city, most of which were drawn by native ponies.

The Filipino is very fond of amusement and his tastes in this regard are accountable for a considerable volume of railway traffic. Various amusements are frequently provided, such as evening band concerts on the "Luneta" (public park), cockpits, "fiestas" of various kinds on numerous holidays, and frequent games of baseball in which the natives have taken very great interest since its introduction by Americans.

OPERATING STATISTICS

During 1913 the Manila company carried 16,952,975 revenue passengers, 5,933,767 transfer passengers, and 1,234,202 passengers were carried free. The total of these is 24,120,944. The respective figures for the suburban company are 3,984,948, 382,736 and 88,648. The grand total of passengers for the year was 28,577,276, or approximately 520,000 per mile of track.

The total revenues from transportation of the two companies were $712,941.04 and $128,726.29 respectively; the corresponding car-miles operated were 3,356,165 and 493,804, and the corresponding car-hours 456,687 and 50,739. Taking the population served by the railways at 325,000, the transportation income per inhabitant is found to be $2.58. The transportation revenue for the city lines was 21.2 cents per car-mile or $1.56 per car-hour. The respective figures for the suburban line were 26 cents and $2.54.

The operating expenses for the city lines were $351,156.39, that is 10.45 cents per car-mile or 76.8 cents per car-hour. Of this the labor cost for trainmen for passenger, freight and express cars was $84,167.45, or 2.5 cents per car-mile, or 18.4 cents per car-hour. The operating expenses for the suburban line were $51,023.34, which corresponds to 10.3 cents per car-mile or $1.01 per car-hour. The labor cost in the latter case was $8,801.16, which is 1.78 cents per car-mile or 17.4 cents per car-hour.

RAILWAY CONSTRUCTION

The actual construction of the properties involved many difficulties due to the great distance from sources of American manufactures and the necessity of using untrained native labor requiring more than ordinary supervision. The older parts of the city presented unusual problems in overhead construction, due to narrow streets on which the second stories of buildings on either side frequently extended beyond the curb line.

Since the completion of the original constructions in 1905 the properties have undergone more or less continual extension and betterment, until they now comprise nearly 55 miles of standard gage track, almost all of which, within the city limits, is in paved streets. In macadamized streets and those without pavement, tracks are constructed of 70-lb. T-rail, creosoted redwood or native hardwood ties and stone ballast. In city streets having more permanent types of paving, track construction is of 92-lb. grooved girder rail laid on concrete foundations. The overhead trolley wires are supported mostly by means of native hardwood poles. There are also quite a number of steel poles set in concrete, and in more recent construction most of the poles are of concrete.

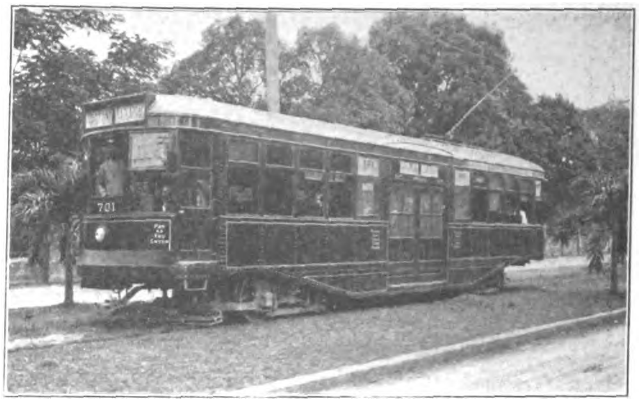
The offices, shops and carhouse are located at Calle Zobel and San Marcelino and are of modern concrete steel construction. The power house, also of concrete and steel, is near by on the Isla Provisora. The shops are very completely equipped, due principally to the distance from the United States and consequent necessity of handling all repair work in Manila.

ROLLING STOCK

The rolling stock of the Manila companies includes a total of 140 cars of the following types: sixty-seven closed double-truck motor cars, fifty-four single-truck and five double-truck open motor cars and fourteen general utility cars.

Passenger cars are divided into two sections to provide for separation of first and second-class riders, those of the first class being seated in the front section. On cars having end platforms, first-class passengers enter and leave at the front platform and second-class passengers at the rear. Cars are provided with two fare registers, one for each class.

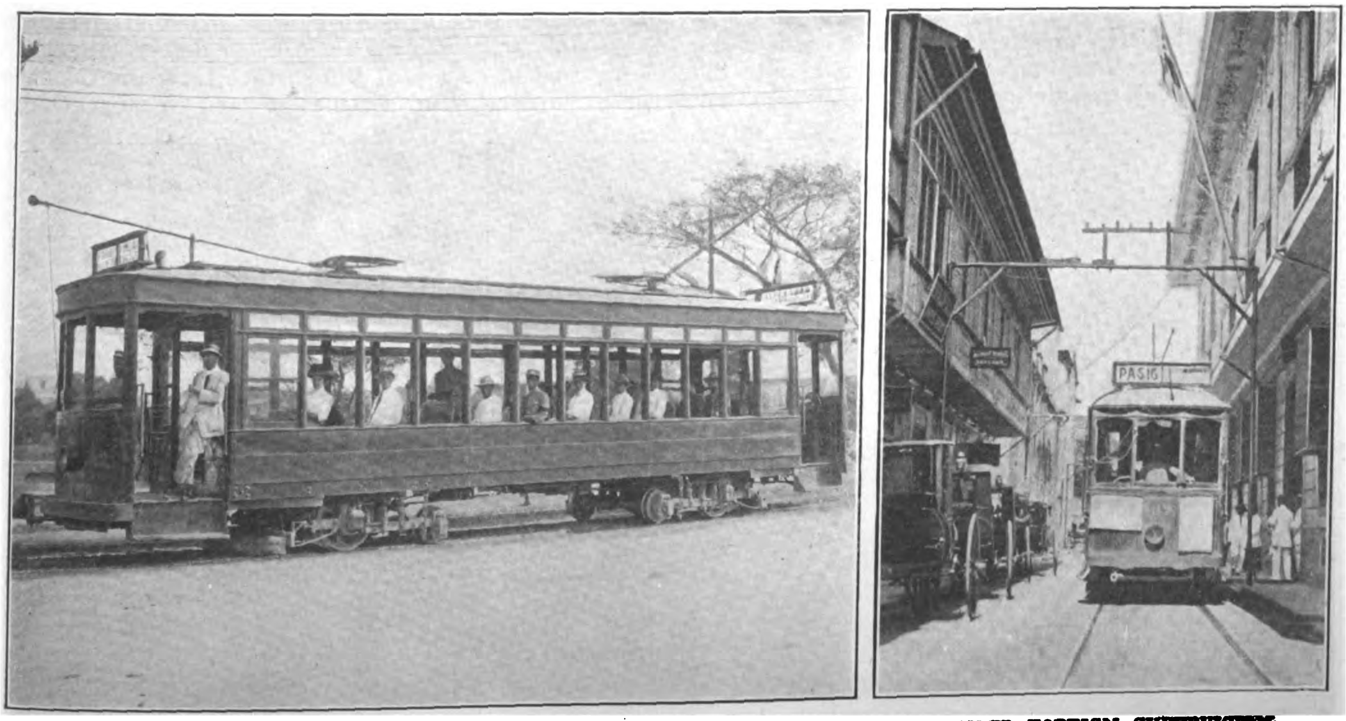
After a great deal of experimenting with various types of cars shipped to Manila from the United States, the company has adopted as standard for city service a semi-steel center-entrance car constructed in its own shops in Manila. These cars, twelve of which have been built, are very similar to the center-entrance cars in service on the lines of the Brooklyn Rapid Transit Company. They have steel underframes and sides and curved T-iron overhead construction, are 45 ft. in overall length, have a seating capacity of fifty-four persons, weigh 18 tons, are equipped with electrically lighted routing signs at either end, and are mounted on Brill 39-E maximum-traction trucks. Six of the center-entrance cars are equipped with Westinghouse 68-C motors, and the remainder with GE-203 motors. All twelve are operated by K-36 single-end control.



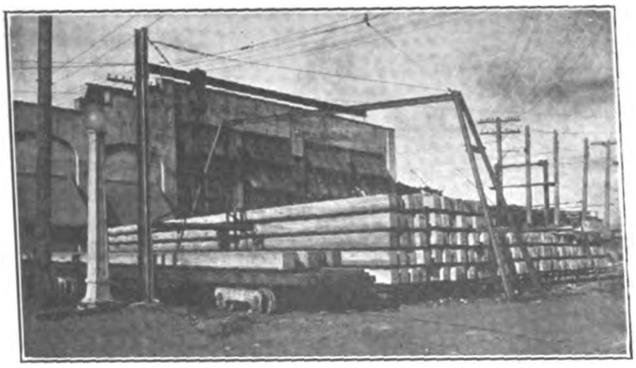
RAILWAY SERVICE IN MANILA—NEW SEMI-STEEL CENTER-ENTRANCE CAR

The stepless principle has proved especially adaptable to Philippine service owing to the small stature and short limbs of the average Filipino, and provides convenience to native women carrying large market baskets on their heads. The center-entrance cars are able to make the regular schedule speeds and are very popular with the public. They lend themselves particularly well to the separation of the two classes.

The monitor roof has been abandoned in favor of the arched type owing to troubles experienced with leakage of the former at times of heavy rainstorms which are



RAILWAY SERVICE IN MANILA—VIEW OF CAR BUILT BY PHILIPPINE NATIVES UNDER FOREIGN SUPERVISION—TYPICAL NARROW STREET SHOWING OVERHEAD PIPE CONSTRUCTION



RAILWAY SERVICE IN MANILA—CONCRETE POLES

frequent in Manila during the rainy season, which is from June to October.

RATES OF FARE

The following rates of fare, expressed in terms of United States gold, are in force on the city lines: For first-class passengers, at all hours, 6 cents cash or a 5½-cent ticket; for second-class passengers, 5 cents cash or a 4-cent ticket with a special 3-cent cash fare in effect before 7 a.m.; special ticket fares for school children, 3 cents first class and 2½ cents second class.

The suburban line to Malabon is divided into three zones with fares as follows: First zone to Maypajo, same as city lines; second zone, Maypajo to Sangandaan, cash fares first class 5 cents, second class 2½ cents; third zone Sangandaan to Malabon, same fares as on the second zone.

The suburban line to Pasig is also divided into three fare zones with the following rates in force: First zone, to Santa Ana Junction, same as on city lines; second zone, Santa Ana to Fort McKinley, cash fares, first class 5 cents; second class 2½ cents, and special school ticket fares of 2½ cents and 1¼ cents for first and second class, respectively; third zone, Fort McKinley to Pasig, cash fares, first class 4 cents, second class 2½ cents.

On all lines one-half cash fares for children are in effect.

The company provides special market-car service on some of its lines, the cars having space for market baskets, etc., for which a small extra charge is made. The heavy market travel begins between five and six in the morning and continues until noon. A complete system of inspection is in force for checking the registration of fares; the amount of inspection required has been considerably reduced however by the use of center-entrance cars.

OVERHEAD CONSTRUCTION

Climatic and local conditions have presented difficulties in electric line construction which were unexpected by American engineers. Untreated crossarms shipped to Manila from the United States were found to have a life of only about two years; when creosoted, their life is increased to about six years.

In the case of poles, American and Australian woods rotted or were destroyed by white ants so quickly as to bring about the complete abandonment of their use. A native wood called "ipil" was then adopted and proved very satisfactory except for its scarcity and high cost. This wood is very hard and close-grained, and is heavier than water. An ipil pole lasts from twenty-five to thirty years and costs, in a 30-ft. length, about $18. The company's standard pole is now of concrete, 1:2:3 gravel mixture, reinforced with four ⅝-in. twisted rods which are laced together with No. 12 galvanized iron wire. These poles have a 12-in. square butt and a 6-in. square top, are 30 ft. long and cost $11.50 each. The company has several hundred of them in service at the present time.

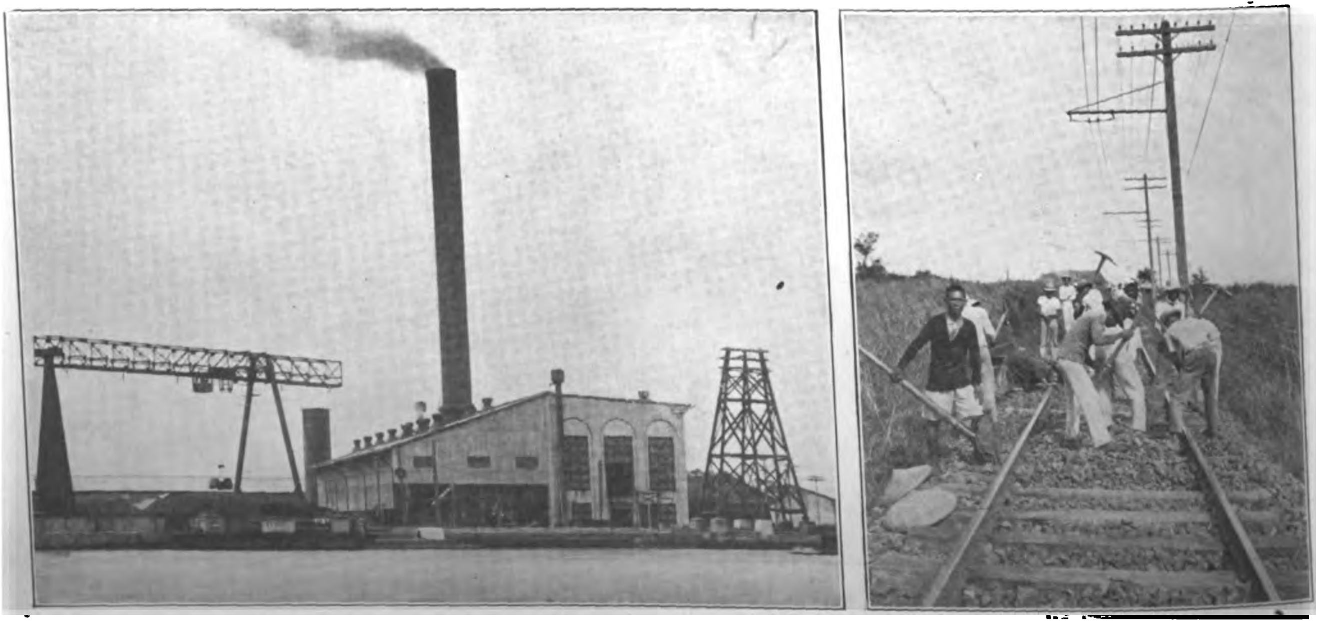
Heavy winds during typhoons reach velocities as high as 100 m.p.h. and usually cause troubles with electric lines by blowing branches of trees across the wires, etc.

POWER GENERATION

The initial plant installation of the Manila company was completed in 1904 and included three 750-kw Westinghouse-Parsons turbo-generators and eight 400-hp British Babcock & Wilcox boilers. In 1905 an additional 1500-kw unit together with three 500-kw and one 300-kw rotary converters were installed to provide for the railway load. The old La Electricista plant was completely abandoned in 1906.

Since then the company's power-plant equipment has been increased from time to time until the rated generating capacity now amounts to a total of 10,000 kw. The present generating equipment is all turbine driven and includes two 750-kw Westinghouse-Parsons units, one 1500-kw Westinghouse unit, one 2000-kw Westinghouse unit and two 2500-kw Allis-Chalmers units.

All condensers are of the surface type, the complete equipment including circulating and vacuum pumps



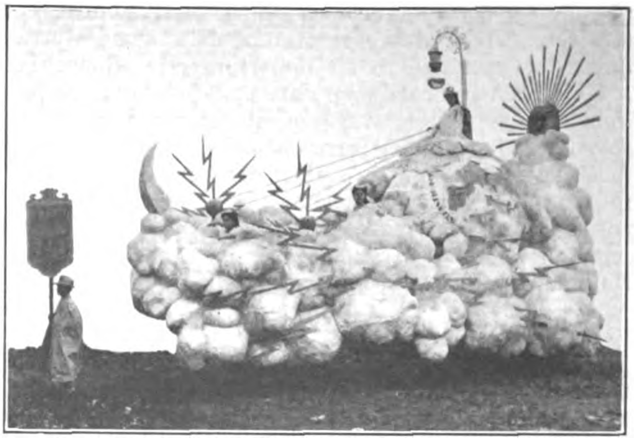
RAILWAY SERVICE IN MANILA—POWER HOUSE—TRACK GANG ON SUBURBAN LINE having been furnished by Alberger & Company. The exciting equipment comprises two 37½-kw direct-connected Westinghouse exciters, one 50-kw Westinghouse exciter direct connected to a three-phase induction motor and one 100-kw Allis-Chalmers exciter direct connected to an induction motor. All excitation is furnished at 125 volts.

The railway equipment in the main station includes four 500-kw Westinghouse rotary converters and one 1000-kw Westinghouse motor-generator set. One 300-kw rotary converter is located in the substation at Fort McKinley and supplies direct current to the interurban line at that point. The same substation includes equipment for distribution of alternating current for lighting and power to the military post and the city of Pasig.

The boiler plant equipment includes twelve 400-hp Babcock & Wilcox water-tube, hand-fired boilers served by a steel stack 9 ft. in diameter and 175 ft. high. Ten of these boilers are of British manufacture, and two were built in the United States; all are equipped with superheaters. Feed water is heated by two closed heaters of the Goubert type.

The power plant is adjacent to navigable water, as shown in the accompanying illustration, and coal is transferred directly from barges onto the coal pile by means of an Alliance coal conveyor driven by a d.c. motor and having a capacity of 20 tons per hour.

The price of coal has recently been advancing until coal now costs the Manila company $4.80 per ton for Chinese fuel delivered on the pile. Australian coals of higher heating values have been tried, but their use has been given up due to excessive cost and unreliable deliveries. Engineers of The J. G. White Management Corporation have several times investigated the use of fuel oil both on the Manila property and on the Philippine railway located on the islands of Cebu and Panay, with the conclusion that under present conditions the use of coal is more economical. The Manila company has recently obtained a franchise for a water-power development on the Caliraya River about 40 miles southeast of Manila, and it is expected that this development, when completed, will solve the fuel problem. The steam plant, however, will be operated as an auxiliary.



RAILWAY SERVICE IN MANILA—CARNIVAL FLOAT RECENTLY SHOWN BY THE LOCAL COMPANY

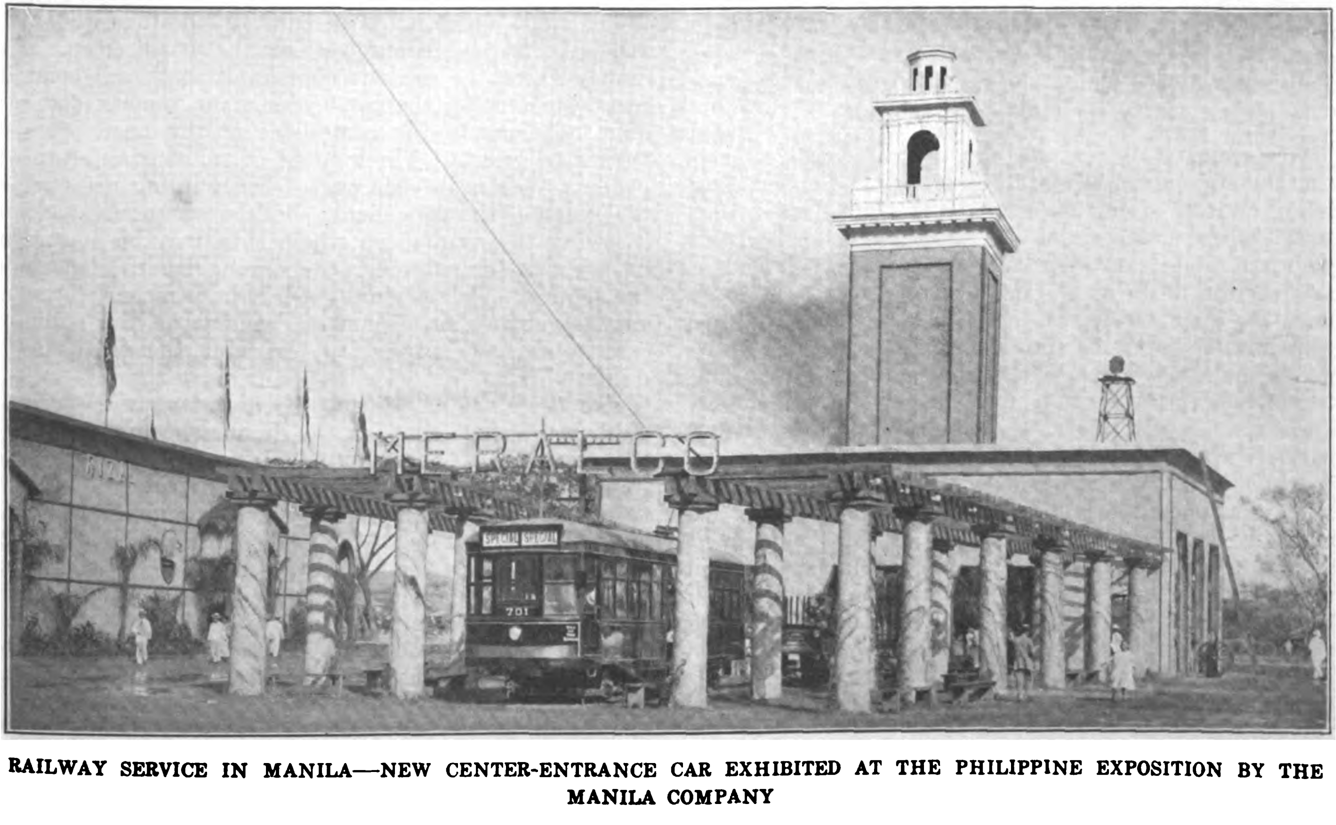
During 1912 the maximum peak on a five-minute basis was 6480 kw and the annual load factor amounted to 32 per cent.

LABOR CONDITIONS, ETC.

The various department heads of the local operating organization are mostly Americans and Englishmen. Native Filipinos constitute the greater part of the company's labor except that nearly all of the carpenter work is done by Japanese.

The company has established regular classroom instruction for native employees and has found verbal instruction the most satisfactory method of teaching. Student trainmen usually spend an apprenticeship period of about sixty days under instruction before being placed in the company service.

Filipinos make good motormen and conductors after being thoroughly trained in their duties, and intoxication is practically unknown among them. They develop into good firemen, switchboard attendants, wiremen and linemen, and make excellent workers under competent supervision. The company's policy is to advance native employees to positions of greater responsibility and



RAILWAY SERVICE IN MANILA—NEW CENTER-ENTRANCE CAR EXHIBITED AT THE PHILIPPINE EXPOSITION BY THE MANILA COMPANY remuneration in accordance with their abilities and services. Under this system many Filipinos have risen to be foremen and to fill important clerical positions.

Motormen and conductors are paid 8½ cents per hour. The average hourly wage of all labor on the weekly payroll including platform men is 7½ cents. While these rates are low in comparison with corresponding rates in the United States, they are very high as compared with labor wages in China and India. The most common languages spoken among company forces are English, Spanish and "Tagalog," the native dialect.

WELFARE WORK

The company has followed the lead of American companies in the establishment of facilities for athletic games among employees and the provision of free medical service.

Two and a half years ago a baseball team was organized and later a band of seventy-two pieces. The "Meralco" baseball team, composed of native employees, has twice won the amateur championship of the islands and last February won the amateur championship of the Orient, having defeated the champions from Miji University, Japan. The ball team and the band have both been very effective toward promoting the physical and mental development of the native employees.

The company employs a doctor who takes care of sick and injured employees at the company's expense. Tuberculosis is quite prevalent in the islands but since the American occupation the number of cases has been greatly reduced by improved sanitary conditions.

ORGANIZATION

The personnel of the executive and operating organization is as follows: Charles M. Swift, president; Frederic H. Reed, vice-president; John H. Pardee, vice-president; C. Nesbitt Duffy, vice-president and general manager; T. W. Moffat, secretary; R. B. Marchant, treasurer; L. S. Cairns, assistant general manager; W. M. McGeachin, manager electric department; J. C. Rockwell, manager railway department, and J. B. Russell, auditor.

Effect of War on British Tramways

Enlistment of Men Forces Reduction in Service, Compensating for Falling Off in Traffic

According to Sir A. Stanley, managing director of the Underground Electric Railways, Ltd., London, England, the total of employees of the District London Electric, Central London and City, South London Railways who had gone to war up to Sept. 19 was 936. The result of this drain on the body of employees was to reduce the train service on the District Railway by 2 per cent and on the Tube Railway by 26 per cent. As regards the London General Omnibus Company, the number of men in the service up to the same date was 3399. Consequently it reduced the number of omnibuses in service, averaging 300 to 450 per day. The early closing hour of 10 o'clock has materially affected the traffic after that hour and all services are being reduced. The company now has in training a sufficient number of men to replace those who will enlist from time to time and also to bring the railway and omnibus services up to a sufficient strength to deal with the traffic. It is not expected that any necessity will arise for considering the use of women for any of the work heretofore done by men, and the company has taken steps to care for the wives and families and other dependents of men who have gone to the front.

A. W. A. Chivers, inspecting officer of the British Electrical Federation, Ltd., London, states that the outbreak of the war had an adverse effect upon the traffic receipts of the companies comprising the federation, although the falling off in revenue was not so great as expected. For the first month since the beginning of hostilities the traffic receipts showed a decrease of 4.05 per cent. The effect on the receipts varied in different parts of the country. In some places revenue increases have been recorded owing to activities caused by the war in certain industries, while in other sections increases have been noted on account of activities brought about by the formation of new military stations. The decreases are most marked in seaside towns. This is largely caused by the fact that the railways have been required by the government to furnish military transport service, and with the temporary suspension of excursions and the issuing of cheap tickets has resulted in a reduction in the number of seashore visitors during the middle part of the holiday season. Unfavorable weather conditions also have an adverse effect upon the revenues of certain lines.

During the mobilization period all soldiers, sailors and nurses in uniform were carried free of charge, which in some cases interfered with the ordinary traffic. On Sept. 16 about 1240 men and twenty officials left their employment to join the national forces. The reduction in service to meet the traffic requirements has enabled all undertakings to continue without the necessity of discharging any employees. Moreover, by curtailing the service, economy has been effected in the operating expenses.

On the outbreak of war the management promptly issued notices granting facilities to all men wishing to join the colors and assuring them that upon their return they would be reinstated in their former positions or would be found suitable employment with the federation. The management has also instituted a mutual aid fund for the relief of all employees' dependents. The officers and men contribute a small sum weekly out of their earnings and the companies contribute an equal amount with a minimum of 3d. per week per man employed. Thus far the experience with the fund indicates that the contributions are ample to meet all calls likely to be made upon it. The fund is administered by a specially formed committee at the head office. The managers of the various companies and local committees representing the employees make reports and recommendations to the committee at the head office in regard to grants. The amount of relief granted to dependents varies in each case. The guiding principle is that none of the dependents shall be worse off financially owing to any man on whom they may be dependent having left for service. The arrangements made with the salaried officials who have left to join the colors also vary according to circumstances, but all the affiliated companies have agreed to pay half the salary as a minimum.

The Tramway & Railway World in its issue of Oct. 8 published a table showing the number of employees and the per cent of the total number employed who had joined the colors up to Sept. 30. The total number of tramway employees now serving England in the army and navy is 10,688. In the order of the number of employees in service the first five ranking corporations are Glasgow, 1500; London County Council, 1294; Manchester, 740; Birmingham, 697; Liverpool, 600, and Bristol, 499. The first six companies in the order of the percentage of the total number of employees at war are Kilmarnock, 41 per cent; Dover, 38 per cent; Brighton, 33.33 per cent.; Burnley, 27.5 per cent; Glasgow, 27 per cent and Liverpool, 26 per cent.

The Code of Principles

Why the Code Was Prepared—How It Should Be Used—Brief Discussion of Each Principle by the Chairman of the Public Relations Committee Which Drafted the Code

BY THOMAS N. M'CARTER, PRESIDENT PUBLIC SERVICE CORPORATION OF NEW JERSEY

The electric railway industry has a code of principles prepared after much study and discussion and designed to show clearly what the industry believes to be the fundamental economic basis of its business. Such a code of principles is needed as a guide both to the practice of electric railway companies and to the ruling of courts and commissions. To be effective it must have not only the passive and verbal assent of the railways but their active, constructive co-operation as well. The code must also commend itself to the public by its reasonableness and its fairness.

At no other time in the history of the industry has there been so logical a reason for a declaration of principles or so great a necessity for it. Under the early forms of franchise, contracts were matters of barter between individual companies and communities. Contracts were unscientific, illogical and uneconomic. They generally lacked provision for the protection of capital investment by failing to permit adjustment of rates of fare to suit varying conditions and by limiting the length of franchise term. The tendency to ignore the conditions which must inevitably accompany the termination of a franchise has been general, the intention being apparently to shirk the responsibility by passing it on to future generations.

The present epoch is one of adjustment. It is a crisis in the development of the electric railway industry, and it has become essential that the railways should be able to present their case in such a way that the commissions will realize that there is a railway, as well as a public side to regulation.

The Century Dictionary states that a principle is "that which is professed or accepted as a law of action or a rule of conduct." It is also "a truth which is evident and general." The combination of these two elements in the code is essential to its general acceptance. Whenever a body of people comes to consider certain general principles to be sound and worthy of practice it formulates a creed or code. This crystallizes the existing sentiment and conviction and forms the basis for active and effective propaganda. The electric railways are now in this creed-creating period.

The association has accepted the code of principles. The practical question now arises as to the next step to be taken. It will not be sufficient to compliment the committee on public relations and the sub-committee on the code of principles upon the excellent work which has been done and then proceed to pigeon-hole and forget the whole subject. The code must now be promulgated by educational campaigns of one form and another as outlined in the committee's report. It must be studied by every man in the industry who has any influence with the public.

To further this study the following statements amplifying and illustrating the principles have been prepared with a view to stimulating interest and giving in concise terms the principles underlying the declarations.

I. The first obligation of public utilities engaged in transportation is service to the public. The first essential of service is safety. Quality of service must primarily depend upon the money received in fares. For this reason it is necessary that the rate of fare should be sufficient to permit the companies to meet the reasonable demands of patrons and to yield a fair return on a fair capitalization.

The prime consideration of all transportation service should be safety. Following this, the public is entitled to the best service which can be given for the fare received. Good service means equitable adaptation of available facilities to the needs of the community. It involves cars kept as clean as the nature of the business permits, courteous attendance, reasonable seating capacity and convenient and direct routes so far as the needs of the entire community are concerned. All of this is on the assumption that the public is willing to do its part in granting the use of the streets and operating conditions which, with reasonably good management, will insure a fair return upon the investment. In demanding good service the public must remember that it is the greatest good to the greatest number that is the desideratum. The running of unnecessary cars or the furnishing of unnecessary seats in one direction lessens the facilities that can be furnished in another.

The public is becoming more exacting in demanding more and better cars and longer rides for which it does not offer a larger fare. Frank R. Ford in an article in the ELECTRIC RAILWAY JOURNAL for Oct. 10 showed that the railways are meeting the costs imposed by the demand for better service through more efficient management, but that the net results of this economy are being appropriated by the public in increased taxes. He states further that the development of and investment in the industry are not keeping pace with the increase of traffic. This is due to the small incentive offered to capital to invest in electric railway properties.

II. Regulated private ownership and operation of electric railways is more conducive to good service and the public welfare than government ownership and operation because the latter are incompatible with administrative initiative, economy and efficiency, and with the proper development of cities through the extension of transportation lines. The interests of the public are fully protected by the authority given to regulatory bodies.

Public ownership and operation of electric railways under the present political conditions of American cities would be disastrous. The principal expense in electric railway operation is for labor. The labor expenses are larger in proportion to the total expenses in electric railway work than in any other quasi-public utility, like the distribution of water, gas or electric light. Municipal operation of electric railway systems would injure the credit of the municipality which attempted it because the operation would not be conducted on economical lines, and it would add to the power of the local political machine because it would greatly increase the number of positions to be filled by the party boss. The number of employees in government service is already very great, involving large political patronage. It would be unfortunate if this number should be augmented by the vast army of electric railway employees.

From the standpoint of efficiency there is practical difficulty in securing economical administration of public office. Even in our federal enterprises where politics plays a much less important part than in city and state governments this is the case. Private ownership and operation under fair and intelligent regulation tend to safeguard the rights of the public while affording the stimulus necessary to the fullest development of the industry.

III. In the interest of the public and good service local transportation should be a monopoly and should be subject to regulation and protection by the state rather than by local authorities.

That local transportation service should be conducted as a monopoly is a fact requiring no proof in these days. Direct competition between electric railways is absolutely destructive. The interests of the public, the companies and the investors are all best served by regulated monopolies, thereby making possible, on the one hand, the elimination of duplication of investment and the attainment of increased efficiency of operation, and, on the other, the guarantee of protection against unreasonable costs of competition to be eventually saddled upon the public.

The present tendency in regulation is entirely toward state regulation as opposed to municipal regulation. One reason for this is that few important public utilities are confined to one municipality. The regulation of such utilities by a large number of independent municipal commissions would work great hardships on the utilities and would appear to give no advantage to the public. Moreover, under our system of government a state commission is more apt to be independent of politics than a city commission.

IV. Short-term franchises are detrimental to civic welfare and growth because they ultimately check the extension of facilities and discourage good service.

Where a franchise is issued for a definite term with no provision for its renewal, the public utility company must invest a large amount of money in property in the street which cannot be removed and may be useless when the franchise expires. The shorter the term the greater the difficulty which the company would experience in trying to recoup its investment during the franchise period. If an electric railway could be built in final form at the beginning and no improvements should be required during the life of the franchise, it would be possible for a company to determine definitely the extent of its investment which it would have to amortize each year so that its stockholders would receive back their capital at the end of the franchise term. But in any growing community the transportation facilities have to be increased with the needs of the public, and any plan of continuous amortization of the investment so that it will all be extinguished at the end of the franchise is not practicable.

The theory upon which the short-term franchise has been defended has been that the public cannot trust the company for a longer period of time. But if the public will not trust the company, why should it expect that the company will trust the public to give fair treatment to the company at the end of the franchise term? Every electric railway franchise should have sufficient life to warrant the company in building and developing a good railway system, and it should contain a provision by which if the municipality should not renew the franchise it will pay the company the fair value of its property.

V. In order to render good service, electric railways must be allowed to earn a fair return on a fair capitalization, and the foundation for this result will be obtained if the issuance and sale of securities representing such fair capitalization shall be legally authorized on such terms as will produce the requisite funds.

That a return commensurate with the risks involved in the business must be offered to investors, if sufficient capital to properly develop the electric railway industry is to be secured, is axiomatic. This is a condition and not a theory. Money is a commodity, varying in price, due to the prevalence of different conditions at different times. Sufficient elasticity in the selling price of bonds and obligations, by way of discount, must be allowed to meet the conditions prevailing at the time the disposition of securities is consummated. Otherwise, the new money, so necessary for development, cannot be procured. In short, the electric railway business, while differing in some aspects, is subject to the same laws of economic trade as are all other business propositions.

VI. Securities which have been issued in accordance with the law as it has been interpreted in the past should be valid obligations on which an electric railway is entitled to a fair return.

The valuation upon which an electric railway is entitled to a fair return should take into account the fair investment that has been required to develop the property. The value should not be merely the physical valuation whether depreciated or not but should include all reasonable expenses that have been incurred in the progress of the art to bring the condition of the company up to what it is to-day. For instance, the expenses that arose from the substitution of cable power for horse power and later of electricity for the cable are legitimate parts of the cost of enabling a railway to render its service to-day. Such changes were instituted primarily for the benefit of the public, and it should not accept these benefits without rendering due returns to the investors whose capital made their provision possible. The non-recognition of securities that have been legally issued in the past causes both the company and the public to suffer.

VII. The relation of adequate wages to efficient operation should always be recognized, but electric railways, being public servants regulated by public authorities, should be protected against excessive demands of labor and strikes.

While every industry should receive all of the protection from the authorities which it needs in the peaceful conduct of its legitimate business, a public utility has a special right to make such a demand because it supplies a public necessity under the regulation of the public. No one is obliged to take service with an electric railway company unless he desires to do so, and a strike among the employees of such a railway company should be regarded with as much public disfavor as a strike in the police department of the municipality.

VIII. The principle of ownership of securities of local companies by centralized holding companies is economically sound for the reason that the securities of the latter have protection against the varying business conditions of a single locality or company and because money for construction and improvements can thus be more readily obtained.

The principle of distributed risks and of economies by doing things by wholesale apply to electric railways as well as to other lines of business. A holding company can operate a number of properties more economically by dividing the overhead charges among them than each property can be operated individually. It can also issue securities which will be more attractive to the investor because his risks are not concentrated in any one property. Hence an electric railway operated by a holding company can give a better service, other conditions being equal, than can a company which has to maintain an independent organization.

IX. In the appraisal of an electric railway for the purpose of determining reasonable rates, all methods of valuation should have due consideration.

When a property is valued for the purposes mentioned, the question is not altogether one of original investment, present investment or reproductive cost new. For instance, if the actual investment is less than the present value a return upon this investment alone denies the right to use the difference between these values and hence impairs the property right to a reasonable return upon the whole. Each of such valuation figures, however, is persuasive evidence of the real valuation of the property. The fact is that, since the property has no fixed market value, the determination of a just valuation means the consideration of as many items as possible, such as the original cost of construction, the amount expended for permanent improvements, the reproductive cost new, the amount and market value of stocks and bonds, the going concern value and all intangible elements that have served to bring both the physical properties and the business to their present stage of development.

X. Full and frank publicity should be the policy of all transportation companies, to the end that proper information may be available to the investor and the public.

Owing to their public character electric railway companies believe that the public has a right to a complete knowledge of their accounts and affairs. Supervised and regulated as the companies are by commissions and doing a public service, they have nothing to conceal but everything to gain by a frank and open policy. Some people believe that every electric railway is rich and prosperous because of the amount of money invested in it. These people forget that an income must be earned on this investment and that labor and materials cost money. There is a vast difference between the million dollars capital of an electric railway company and the nickel which it receives as carfare, and the interest on this capital must be paid out of the margin left in the nickel after operating expenses have been paid.

Investigations of Boiler Explosions

In a recent editorial *Power* strongly advocates that the law, which the committee of the American Society of Mechanical Engineers is to recommend as a model for legislation to restrict the slaughter and damage occasioned by the abuse of boilers and other pressure vessels, should provide for a thorough investigation as to the cause of every serious accident to a boiler.

The board of boiler rules, or some other competent body, should be authorized to carry out this examination. empower to subpœna witnesses, to call for books, papers and other pertinent evidence, and be required to submit a report within a reasonable time, showing the cause and manner of the explosion, and fixing the responsibility. The owner and operator of a plant in which an explosion occurs should be required immediately to report it to the investigating authorities, and penalties should be provided for failure to do so. Insurance companies also should be required to report claims for losses. In this way a vast amount of valuable and authentic information regarding explosions would be accumulated, stress thrown upon the causes which most frequently produce explosions, and a way pointed out to avoid them.

The Chesterfield Tramways Committee, Chesterfield, England, is issuing tokens for free transportation on its tramcars and motor buses to Belgian refugees who are quartered in the district traversed by its lines.

Chicago & Joliet Railway's Safety Campaign

Illustrated Lectures Are Conducted to Interest School Children—Co-operation of Automobile Owners Is Sought

In conjunction with the heads of the city and parochial schools of Joliet, Ill., and the Illinois Steel Company, the Chicago & Joliet Electric Railway has conducted a series of lectures with slides and motion pictures, in the interest of a safety campaign among school children. The pictures shown included reels and slides pertaining to safety methods and precautions used at the Illinois Steel Company's mills, followed by slides and reels pertaining to street and street railway accidents and their prevention. To give the children something to carry away with them and remind them of the lessons of the "safety first" lecture, 6000 blotters calling attention to the urgent need of the safety habit were distributed among them.

The campaign this year was the second of its kind, and the company believes that it has greatly assisted in eliminating accidents, particularly to children. While it is difficult to determine the exact extent to which these lectures have served in promoting safety, it is interesting to note that not a single child has been injured by the street railway within the corporate limits of Joliet since the first safety lecture was given, more than a year ago. It is also interesting to state that out of a total attendance of 958 children at the Joliet schools, the average attendance at the safety lectures was 725. The railway company arranged to transport the children from the various schools to the point where the lectures were given. There were eight lectures in all, requiring a total free car mileage of 314.4, with total car hours of 110, which included the time the cars were held waiting for the completion of the lecture.

CAMPAIGN WITH AUTOMOBILE OWNERS

In conjunction with the safety campaign among school children, another campaign was conducted among automobile owners. The following is a copy of circular letter which was sent to all automobile owners in the city of Joliet.

"As an automobile owner your interests are so identical with our own as regards the avoidance of accidents, we ask for your co-operation in our endeavor to reduce accidents to the lowest possible minimum.

"In the past nine months there have been thirty-five collisions between automobiles and street cars on our system. More care would have avoided these accidents, which, as you are aware, result in more or less injury to persons and damage to property.

"Our car men are instructed always to think of safety first and use of good judgment by having cars under control at dangerous places so as to take no chances.

"Will you kindly bear in mind, and also instruct your drivers, to use all possible care and look and listen when operating across or near car tracks? Also caution them in regard to operating machines past cars when passengers are alighting.

"Too much speed is the cause of most collisions.

"The co-operation of all automobile owners is being solicited to obtain the results we know you would yourself wish to see, and we shall appreciate your assistance."

With this letter to owners of automobiles, a blotter containing safety cautions and suggestions was included. In both of these campaigns the railway company had the full co-operation of the local newspapers, which gave considerable publicity to the various lectures and the results of the campaign.

Electrical Operation On the B., A. & P. Ry.[*]

The Electrification of this Ore Handling Line Results in Greater Operating Efficiency and In a Saving of More Than 20 Per Cent in Operating Cost

BY J. B. COX, RAILWAY ENGINEERING DEPARTMENT GENERAL ELECTRIC COMPANY

The Butte, Anaconda & Pacific Railway was built in 1892, principally for transfer service between the ore mines in Butte and a smelter in Anaconda. The tracks connecting these two cities are approximately 26 miles in length, but the yards and sidings which were included in the recent electrification of the line bring the total mileage up to about 90.

Work on the electrification began in the spring of 1912, and the first electric locomotive was run experimentally in Anaconda on May 14, 1913. Two weeks later a double-unit electric locomotive took over the regular day service of hauling the ore from East Anaconda yards to the concentrator yards, the distance between which is approximately 7 miles. The load per trip in this service was gradually increased from sixteen cars to twenty-five cars, which is to be the standard for the present. The average time for the up-hill trip with twenty-five cars is about twenty-six minutes so that eight trips per shift are easily made, making possible a delivery of 200 cars, an increase of slightly more than 108 per cent over what had been possible for the crew with steam locomotives. These loaded ore cars average from 70 tons to 72 tons each, making the trailing load for a twenty-five car train from 1750 to 1800 tons.

The regular passenger service between Butte and Anaconda was taken over for electrical operation on Oct. 1, 1913. The distance between the stations—Anaconda to Butte—is 25.7 miles, and the schedule for the trip is one hour. No change has been made in this time, though were it desired a reduction of 20 per cent would be possible with the electric locomotives. As had been done in the freight service, the steam engineers in the passenger service were transferred from the steam to the electric locomotives with but little previous instruction, and after the first day or so were left mostly to themselves. It may be of interest to note here that on the day shift, averaging four trips per day, no passenger train came in late on account of engine trouble during the first five months. There follows a comparison of the delays to the passenger trains for the month of June, 1913, under steam operation with the same month in 1914 under electrical operation.

	No. of Trains	Meeting Points, Hr.Min.	No Power, Hr.Min.	Engine Failure, Hr.Min.	Lost Running Time, Hr.Min.	All Causes, Hr.Min.
Steam, 1913.......	272	15 49	.. ..	.. 44	4 13	20 46
Electric, 1914.....	280	3 54	.. 27	.. 24	.. 25	5 10
Decrease	8*	11 55	.. 27*	.. 20	3 48	15 36
Percentage of saving due to electrical operation.	2.94*	75%	....	45%	90%	75%

*Increase.

On Oct. 10 a double-unit electric locomotive was put in the day-freight service on the main line between East Anaconda and Rocker, a distance of 20.1 miles. The standard train that had been hauled on the trip was about fifty loaded ore cars weighing approximately 3500 tons gross, and the average running time of such trains where no stops were made was about one and one-half hours, corresponding to an average speed of approximately 13.4 m.p.h. In the beginning the electric locomotive took only the standard train but it made the trip without stop in about one hour, corresponding to an average speed of 20 m.p.h. The ruling gradient on the westward trip is 0.3 per cent grade, and with a fifty-five car train the steam locomotive made about 7 m.p.h. The electric locomotives with similar trains now make about 16 m.p.h. on the same grade. The weights of the trains hauled by the electric locomotives on this run have been gradually increased up to sixty-five loaded ore cars averaging about 71 tons each, making the trailing load about 4620 tons. Adding 160 tons for the weight of the double-unit electric locomotives and 20 tons for the caboose makes a gross train weight of approximately 4800 tons.

The remainder of this class of freight traffic was gradually taken on during the months of October and November, thus completing the electrification of the main-line service. A comparison of the month of June, 1913, under steam operation, with the same month, 1914, under electrical operation, shows that with a slight increase in the total tons of ore hauled the average tonnage per train was increased from 1761 to 2378, or 35 per cent, thus decreasing the average number of trains per day from 12.5 to 9.3. The average time per trip during steam operation was approximately two hours and twenty-five minutes, while with the electric locomotive it was approximately one hour and forty-five minutes, showing a decrease of forty minutes, or 27.5 per cent. These figures represent the time put in by the crews between Rocker and Anaconda, the distance being 21.8 miles. The result of these improvements is that the overtime in this particular service has been decreased 73.5 per cent and the total time 42 per cent, resulting not only in greater economy to the railway company but in shorter and easier hours for the crews.

During the year's operation difficulties especially attributable to the higher potential have been negligible, and while there have been occasional instances of arcing and flashing or short-circuits due to ordinary causes, the resultant damage has been really smaller than might be expected from a like occurrence on a 600-volt installation of equal capacity.

The original brushes supplied in the motors chipped badly, and before all these had been replaced it was often found when the units were brought in for regular inspection that some of the brushes were broken entirely into pieces, and while there was evidence that a flashover might have occurred at some time no harm had resulted other than the blowing of the motor fuse, on the replacement of which the engine was continued in service until its regular time for inspection when the cause of the fuse blowing would first be discovered.

The fact that the locomotives continued in service thus is sufficient evidence of the harmlessness of the arc-over, and in no instance of the kind has any real damage been done. The locomotives have made from 25,000 miles to 50,000 miles each and without exception the motors are in excellent condition. The wear on the commutators is imperceptible and the general performance of the entire equipment is quite as satisfactory and promising as that of any railway equipment with which the writer has had experience in service of similar kind.

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[*] Abstract of a paper presented at the Pacific Coast meeting of the American Institute of Electrical Engineers, Spokane, Wash., Sept. 10, 1914, and printed in the *Proceedings* of the Society for November.

The overhead construction has been satisfactory and a recent examination of the trolley wire shows no indication of unusual wear. The roller pantographs are operating quite successfully, the average life being from 10,000 to 12,000 miles per roller. Where a double-unit locomotive is operated, the two pantographs are connected electrically by a main bus line, and the average current collected by each, when ascending the grades with standard loads, is from 350 amp to 400 amp. Two pantographs operating in multiple thus will collect more than double the current that can be successfully collected by a single pantograph for the reason that sparking is usually due to the momentary breaking of contact between the trolley wire and the roller caused by hard spots in the line. When two pantographs are operated in multiple both do not encounter these hard spots at the same instant, hence one of the two is more apt always to be making good contact, so that the flow of current is not so frequently interrupted and the sparking is greatly reduced. The double units operating on Smelter Hill were run experimentally for several days with only a single roller making contact with the wire, the operation being quite successful with the single roller collecting an average of 650 amp to 750 amp while running at 16 m.p.h. or 17 m.p.h. and from 800 amp to 1000 amp during the accelerating period in multiple. The sparking was not serious except at hard points in the line, and with two rollers in multiple there should be no difficulty in collecting 500 amp or 600 amp per roller. This at 2400 volts should be equal to the requirements of any ordinary locomotive unit.

The bearings first used in the rollers were provided with ordinary bushings lubricated with oil, but when the bushings became slightly worn the oil was thrown out along the spindle and had to be replenished at comparatively frequent intervals. Later, roller bearings with grease lubrication were installed with excellent results. As yet these have not been in operation a sufficient length of time to definitely indicate how long they may be expected to last, but it would appear that the bearing will last much longer than the roller and that the attention required for the adjustment and lubrication of the bearing or the roller will be negligible.

Only minor changes have been made in the personnel of the maintenance or operating departments of the railway on account of the electrification and there has been no reduction in salaries or wages. An extra man with electrical experience was placed in the shops to supervise the electrical repairs to the locomotives and three linemen were retained for the maintenance of the trolley system.

Three steam switching locomotives used for concentrating the ore at, and distributing supplies from, the Butte Hill yards have been continued in this work. Another steam locomotive is used on the Georgetown branch and a fifth one operates at intervals over unelectrified tracks at the Anaconda end. Approximately 20 per cent of the total locomotive miles now being operated is by these five steam locomotives, the cost of which is upwards of 40 per cent of the total cost of all locomotive performance.

From the regular monthly locomotive performance sheets of the railway company the principal saving resulting from electrification appears to be due to the partial substitution of electric power for coal, at the rate of $150,727 per year. The approximate price of coal for locomotives is $4.25 per ton. With a single exception, that for depreciation of equipment which is taken at $2,711 per month for electric locomotives as against $1,340 for steam, every item of expenditure in the locomotive performance sheet shows a substantial percentage of decrease in favor of electrical operation.

The total saving from locomotive performance alone is at the rate of $237,582 per year, to which should be added credit for handling an increase of traffic at the rate of 13,938,136 ton-miles per year, or 8.77 per cent more than was handled by the steam locomotives during the period compared. To this saving from locomotive performance should be added the saving from trainmen's wages, which is at the rate of $31,146 per year, or a decrease of approximately 21 per cent, due largely to the elimination of overtime. This makes the total saving from these two items $268,728 per year. From this should be deducted $10,839 for maintenance of the distribution system, leaving $257,889 as the net saving per year due to electrical operation.

The roadmaster states that it is quite evident that the electric locomotives are much easier on the track at curves but that there is no noticeable difference on tangent track, and that while sufficient time has not yet elapsed to form definite conclusions, present indications lead him to expect that any difference relative to his work will be favorable to the electric locomotives.

Arranging the items of expense in the order of usual appearance in the summary of a standard locomotive performance sheet and placing them on a yearly basis results as follows:

Item of Operating Expenses	Steam, 1913	Electric, 1914	Decrease, 1914	Per Cent Decrease
Fuel and power.....	$315,235.74	$164,508.70	$150,727.04	47.81
Repairs	124,787.90	92,278.08	32,509.82	26.05
Enginemen's wages.	104,461.18	71,225.88	33,335.30	31.80
Enginehouse expense	29,907.80	18,638.38	11,269.42	37.68
Water	4,953.66	1,193.70	3,759.96	75.90
Lubricants	9,751.44	4,942.32	4,809.12	49.30
Other supplies	5,823.52	4,552.36	1,271.16	21.83
Total locomotive performance ...	$594,921.24	$357,339.42	$237,581.82	39.93
Trainmen's wages...	147,632.30	116,486.00	31,146.30	21.10
Grand total	$742,553.54	$473,825.42	$268,728.12	36.19
Ton-miles hauled ...	158,917.720	172,855,856	13,938,136	8.77

The total cost of the electrification, including a change of signal system on Smelter Hill, an extra motor-generator set recently installed at Anaconda, interest during construction and all incidentals due in any way to the electrification, was in round numbers $1,200,000. This does not include the stepdown transformers which are the property of the power company, but on the other hand no deduction has been made for the salvage due to the elimination of twenty steam locomotives.

If a correction be made for the item of depreciation (which does not appear in full on the 1914 records) the total net saving would be reduced to $242,299, which is equivalent to 20.02 per cent on the entire cost of the electrification, to say nothing of the increased capacity of the lines, the improvement in the service and more regular working hours for the crews.

If taken on the basis of the increase shown in net operating revenue, or operating income, this percentage is slightly greater, the rate of increase per year for these items being $288,150 and $282,016 respectively. The estimate on which the decision to proceed with the electrification of the road was made placed the annual net saving expected at 17.5 per cent of the cost, so that the results financially have been quite as satisfactory as the general performance of the equipment.

To assist in caring for the large number of wounded brought to Vienna, from the Galician battlefields, the Vienna Tramways has converted sixty trailers into hospital cars which were made available for four stretchers each by removing the seats. The wounded soldiers are transported in trains of four cars consisting of an ordinary motor car and three of these converted hospital cars.

The Bow Trolley on the Indianapolis & Cincinnati Traction Company's Lines

The Bow Trolley, Which Is Widely Used in Europe, Has Received Very Little Consideration in This Country, But Its Ability to Reduce Arcing Has Proved Very Satisfactory on This Interurban Railway

A recent inspection of the overhead contact system on the lines of the Indianapolis & Cincinnati Traction Company has disclosed the fact that the bow trolleys installed on all of the railway company's cars have proved to be thoroughly satisfactory after nine years of operation. This form of contact device, notwithstanding its extended use in Europe, has received but little attention in the United States, and an account of the Indianapolis & Cincinnati Traction Company's experience with it affords a considerable amount of interesting data.

The line, which has been described in detail in previous issues of the ELECTRIC RAILWAY JOURNAL, extends from Indianapolis, Ind., to Connersville, Ind., via Rushville, a distance of 58 miles; and from Indianapolis, Ind., to Greensburg, Ind., via Shelbyville, a distance of 50 miles, making the total length of the road 108 miles. There are three grades, each about 1 mile long, with gradients of 2 per cent, 2½ per cent and 3 per cent. The remainder of the line has no gradients of more than 2 per cent.

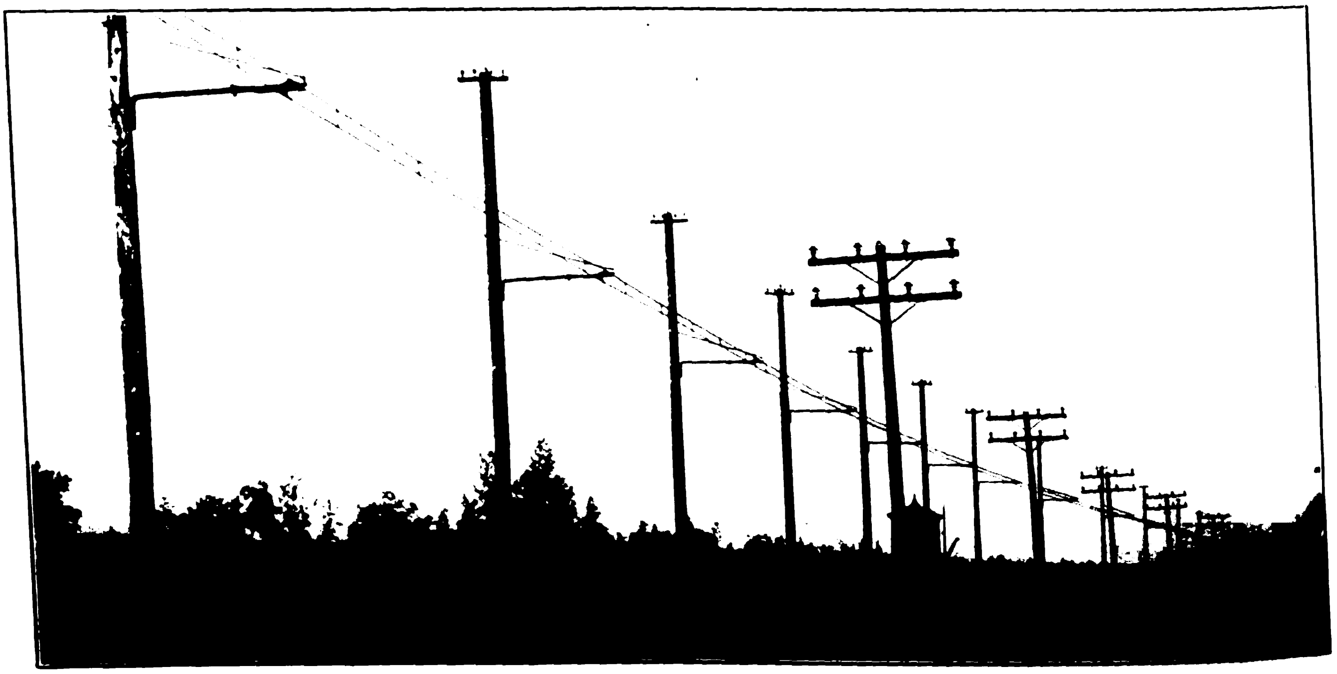
The passenger cars are 55 ft. long, and have four Westinghouse 100-hp motors, 22.61 gear ratio, 37-in. wheels and Westinghouse "AB" control. Each weighs, complete with equipment but without load, 50 tons. These cars are operated as single units. The freight cars are 55 ft. long and are equipped with four 100-hp motors having a gear ratio of 16.67 and mounted on 37-in. wheels. These freight cars are equipped to pull freight trailers.

An hourly schedule is maintained by the passenger cars. Considerable freight traffic is handled, one train being run each way on each division. The maximum speed of passenger cars is approximately 60 m.p.h. on straight, level track and while drawing power from the trolley.

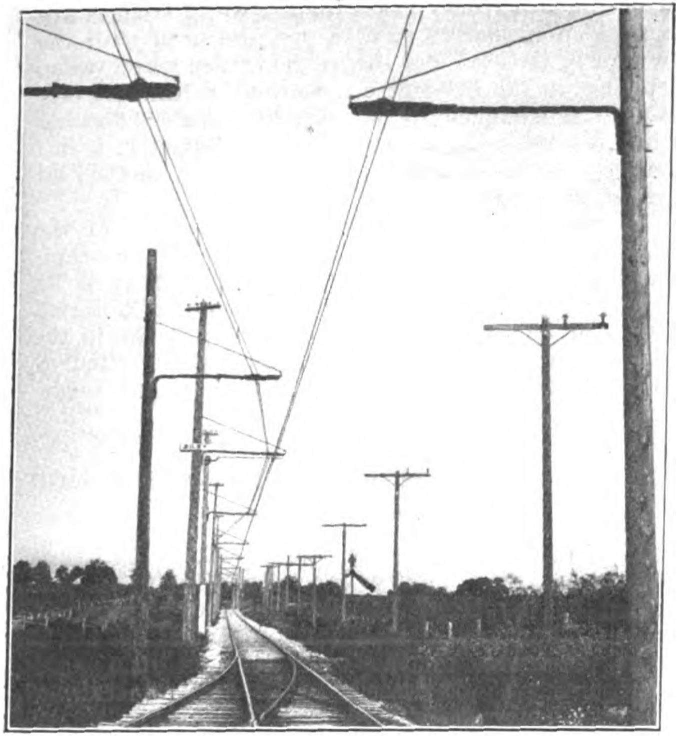
The main trolley line is made up of No. 000 standard grooved wire supported on catenary construction with rigid hangers. It is supplied with single-phase current at 3300 volts, except for about 3 miles within the city limits of Indianapolis where, upon the lines of the Indianapolis Traction & Terminal Company, ordinary span-type construction is used with 500-volt direct current. All of the electrical equipment was installed by the Westinghouse Electric & Manufacturing Company. C. L. Henry, president, and G. W. Skipton, master mechanic and superintendent of overhead, state that the overhead construction has been eminently satisfactory. During the nine years of operation on the 41-mile division from Indianapolis to Rushville and the seven years of operation on the remainder of the road, there have been only six breaks in the trolley wire. In a recent breakage of the messenger wire, the trolley wire, then in use more than nine years, accepted the additional strain without difficulty. Traffic was held up but twenty minutes, or until the two ends of the messenger cable could be tied around near-by poles. During the few hours required to repair the messenger wire no difficulty in maintaining traffic was experienced.

No difficulty has been encountered from the rigidity of catenary construction, and "hard spots" in the overhead lines are unknown. It is claimed that a considerable amount of inherent flexibility is present in the construction, and the operating officials do not believe that any additional flexibility is required. However, the satisfactory operation secured with the rigid construction is considered to be due largely to the inherent flexibility of the bow trolley which is used.

Slack is taken out of the line at no regular intervals. In a number of cases this condition is cared for by straightening up of poles at the curves, since it was found that, after several years of operation, the poles have leaned slightly. Straightening the poles has per-



INDIANAPOLIS & CINCINNATI BOW TROLLEY—VIEW SHOWING RIGID CATENARY OVERHEAD TROLLEY CONSTRUCTION

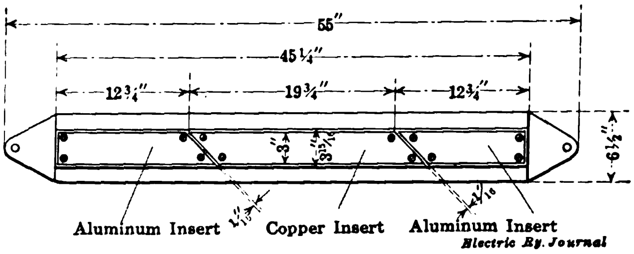


INDIANAPOLIS & CINCINNATI BOW TROLLEY—VIEW SHOWING RIGID CATENARY OVERHEAD CONSTRUCTION

formed the same function, in a particular locality, as the renewal of 1 ft. or 2 ft. of the copper trolley wire. However, it is expected that, during the coming spring, sections will be removed from the trolley wire on several of the tangents.

Bow Trolleys

The bow trolleys installed on the cars have, in the opinion of Messrs. Henry and Skipton, rendered excellent service. It has, however, been suggested that the weakest point of the bow trolley ought to be near the base. At present the weakest point of the construction is where the bow, which holds the contact shoe, connects with the poles or uprights. In one or two cases the trolley has failed at this point, and the uprights have torn down the messenger wires, striking them when the car was moving at a high speed. The company is reinforcing the bows at the present time by inserting a tube about 18 in. long inside of the bow to strengthen it at this point.



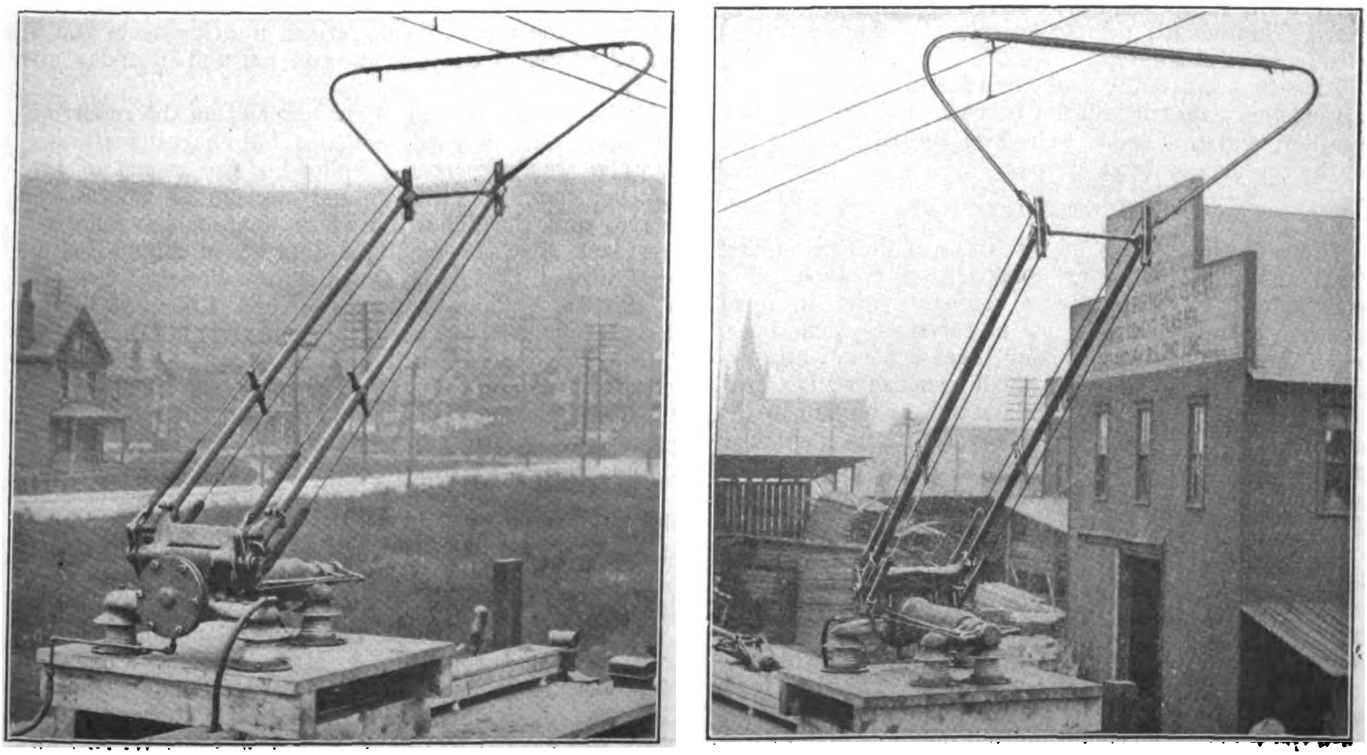
Electric Ry. Journal

INDIANAPOLIS & CINCINNATI BOW TROLLEY—APPROXIMATE OUTLINE OF BOW-TROLLEY SHOE SHOWING INSERTS IN FACE

In addition, since the trolley wire has to be raised at railroad crossings from the normal height of 18 ft. to provide a clearance of 22 ft. the bow trolley does not operate reliably because it is adjusted for the 18-ft. height of trolley wire. It is, of course, primarily important that the cars should always have power at railroad crossings, and instructions are in the hands of the transportation men to use the wheel trolleys at all such points. It is impossible, however, for the bow trolley to be made to operate reliably under different heights of trolley wire. The wheel trolleys with which the cars are equipped are ordinarily used with the 500-volt system in the city of Indianapolis.

Pressure of Contact on Trolley Wire

A pressure of 12 lb. is used for the contact of the bow trolley against the trolley wire, and the trolleys are adjusted to give this. The trolley wire is prone to deflect when the bow trolley is against the wire, as no steady strains are used except on the curves. This arrangement presented the possibility of the contact strik-



INDIANAPOLIS & CINCINNATI BOW TROLLEY—FRONT AND REAR VIEW OF BOW-TYPE TROLLEY ing the messenger cable, and the pressure on contacts was therefore reduced until this danger was eliminated.

The actual weights of the detailed parts of the bow trolley, not including the base, are as follows:

Slide or contact, without inserts	13 lb.
Copper inserts	3½ lb.
Aluminum inserts	4¾ lb.
Tubing	7 lb.
Poles or uprights	32 lb.
Necessary clamps for holding tubing	5 lb.
Suspension rods (four)	4 lb.

These details, with the necessary screws for holding the copper inserts in place and the several bolts required, will give a total of about 70 lb. for the bow trolley, excepting the base.

CONTACT SHOES

The diagram on page 1053 shows the general form and dimensions of the contact shoes and also the relative position of the copper and aluminum inserts. The aluminum inserts are of extruded aluminum, purchased from the Aluminum Company of America at a price varying from 46 cents to 58 cents per pound, depending upon the market conditions. The two aluminum contacts at both ends of the slide are ⅕ in. thick.

The copper insert at the center slide is of a fairly hard grade of rolled copper, ⅕ in. thick. The life of the copper inserts is, under ordinary conditions, about 2000 miles. During sleet storms, however, it is customary to replace these copper inserts, and sometimes the entire contact, after one day's operation, or about 400 miles of service. But in excellent weather the life of the copper inserts exceeds 2000 miles.

The life of the aluminum inserts at both ends of the slide is a little less than that obtained from the copper inserts at the middle of slide. The operating department estimates this to be about 1800 miles on the same basis as the estimated life of 2000 miles given for the copper inserts.

The trolley wire of the Indianapolis & Cincinnati Traction Company is not staggered, and difficulty exists at times due to the wire wearing grooves in the copper contacts, requiring replacement within three or four days. There are instances where a groove has been worn in one of the aluminum inserts at either end of the slide. This condition is to be corrected as the trolley wire is to be staggered.

There is used on the contacts a heavy grease of such a consistency that it will not become liquid even in hot weather, and this tends to reduce the frictional wear on the contacts and trolley wire.

CURRENT COLLECTION

The collection of current by means of the bow trolley from the rigid catenary construction is thoroughly satisfactory to the railway company, and in good weather there is said to be no arcing. Sometimes, when the weather is rainy, and there is some water deposited on the trolley wire, small arcs are visible, particularly in the evening. This seems to be due to the water on the trolley wire. It occurs at no particular place on the trolley wire; that is, arcing is no more apparent at the hangers than between the hangers. The wheel trolley is used at times on the high-tension trolley, but only in cases of emergency. Where there is water on the trolley wire, the arcing with the trolley wheel is somewhat more noticeable, particularly at the hangers. The theory held is that the ears of the rigid hangers prevent proper contact of the trolley wheel.

Wear on the No. 000 trolley wire has caused no trouble to date. Samples taken from the trolley wire indicate the remarkable condition that only one-fifth or one-sixth of its useful life has been utilized notwithstanding that it has been steadily in use for nine years.

The standard trolley bases for the wheel trolleys are mounted on insulators similar to those used with the bow type of trolley. The life of the trolley wheel, when operating on the 500-volt d.c. sections within the city limits of Indianapolis, is between 2000 and 3000 miles. It has the following characteristics: diameter, 6 in.; bearings, ¾-in. diameter, 1¾-in. length; method of lubrication, graphite grease.

The members of the operating department of the Indianapolis & Cincinnati Traction Company are unanimously in favor of the bow trolley on account of its flexibility. The difficulty of adjustment for different heights of trolley wire and of operating a car in the reverse direction with the bow trolley is admitted by the operating men, but it is felt that the many advantages outweigh these objections.

Railway Electrical Engineers Convention Proceedings

An account was published last week of the early sessions of the Railway Electrical Engineers convention at the Hotel LaSalle, Chicago. The meeting on Thursday, Oct. 29, was opened by H. R. Bucks, chairman of the committee on axle lighting equipment. It described the general tendency of steam railroads toward axle lighting in preference to other systems, but called particular attention to the high cost of maintenance for the dynamos as compared with other parts of equipment. That for the storage battery, for instance, was found to amount to only about one-half that for dynamos. The report of the committee on rules for car wiring included specifications for complete systems to conform with the underwriters' rules. This report was read by Chairman F. W. Everett, Atchison, Topeka & Santa Fé Railroad.

J. L. Minick, chairman of the committee on outside construction and yard lighting, submitted a complete report which recommended close adherence to the rules of the National Electrical Code and standard specifications of the National Electric Light Association for railroad crossings. This was followed by the report of the committee on illumination which investigated the subject of illumination in classification yards, a completion of the report on day-coach lighting tests and a résumé of recent developments in arc and incandescent lamps.

At the Friday session of the association the report of the committee on yard facilities for charging storage batteries was presented. Following the report of the auditing committee the annual election of officers occurred, and the following were unanimously chosen: President, H. C. Meloy, Lake Shore & Michigan Southern Railroad, Cleveland, Ohio; senior vice-president, E. W. Jansen, Illinois Central Railroad, Chicago; junior vice-president, E. J. Causland, Pennsylvania Lines West, Chicago, and secretary-treasurer, Joseph A. Andreucetti, Chicago & Northwestern Railroad, Chicago. L. B. Hensel, Frisco Lines, St. Louis, Mo., and J. L. Minick, Pennsylvania Railroad, Altoona, Pa., were elected to the executive committee.

At the annual election of the Railway Electric Supply Manufacturers' Association, which holds an exhibit in connection with the Association of Railway Electrical Engineers, the following officers were chosen: President, W. F. Bauer, Edison Storage Battery Company, Chicago; vice-presidents, T. Mount, Consolidated Railway Electrical Lighting & Manufacturing Company, New York, and Fred F. Skeel, Crouse-Hinds Company, Chicago. J. Scribner, General Electric Company, Chicago, was elected secretary, and A. J. Cole, W. A. Fawsett, Edward Wray, T. W. Bender and J. Scribner were elected directors of the association.

Middlesex & Boston Rate Decision

Massachusetts Public Service Commission Authorizes Increased Fares on Middlesex & Boston Street Railway —Résumé of One of the Most Exhaustive Discussions of the Fare Problem Ever Applied to a Suburban Electric Railway System—Enunciation of Broad Policy of Protecting Electric Railway Investments

The Massachusetts Public Service Commission on Oct. 28 handed down a decision of nearly 20,000 words in the Middlesex & Boston Street Railway fare case, which has been pending since July 3. Accounts of the progress of this case have appeared in the news columns of this paper. The company desired to establish a 6-cent fare throughout its system, with an additional charge of 1 cent for every transfer issued. The prevailing fares at the time of the company's notice of the proposed change were 5 cents within Newton and Waltham, with an additional cent for every transfer, except that 6 cents was charged on the old lines of the Newton & Boston Street Railway. The fares on the other lines were 6 cents with free transfer privileges, and the company issued a fifty-ticket book for $2.50, good west of Newton Lower Falls. The average fare received per passenger was 5.44 cents, and the desired increase, if allowed, would have produced an annual increase of about $110,000, or from 10 to 12 per cent upon the company's present passenger revenue of about $950,000. After exhaustive public hearings and investigations by the commission, the company was authorized to establish a uniform fare of 6 cents throughout its territory, but was required to sell nine tickets for 50 cents good between fare limits where the present cash fare is 5 cents and to furnish free transfer privileges at all existing transfer points.

RIGHT TO CHARGE MORE THAN 5 CENTS

A fundamental question presented by the remonstrants was as to a lawful right to charge more than 5 cents for a single fare on certain lines in Newton, Wellesley and elsewhere. It was asserted that a maximum fare of 5 cents had been agreed upon in connection with location grants made by municipal authorities. The commission holds, however, that the public service act (Chap. 784, Acts of 1913) empowers the commission to regulate and prescribe just and reasonable rates notwithstanding any such agreements. (Springfield vs. Springfield Street Railway, 182 Mass., 41; Clinton vs. Worcester Consolidated Street Railway, 199 Mass., 279; Keefe vs. Lexington & Boston Street Railway, 185 Mass., 183; Westwood vs. Dedham & Franklin Street Railway, 209 Mass., 213.) The commission rules "as a matter of law that any alleged conditions or limitations as to fares contained in original grants of locations or growing out of agreements or attempted agreements between municipal authorities and the petitioning railway or any of its antecedent constituent corporations are not valid and controlling as against the rate-making power now vested in this commission by the public service act."

BASIS FOR FAIR RETURN

An extended discussion of value as determined by invested capital rather than by reproduction cost is included in the decision. Some remonstrants contended that the present value of the property used by the company is the only amount upon which it should earn a return. In the board's opinion, however, there is a widespread attempt to misinterpret the real meaning of the United States Supreme Court in opinions dealing with fair value in computing a reasonable return. The refusal of that court to base a return upon securities issued with little or no regard to the value of the property put at the public service, cannot be fairly construed as a ruling that the capitalization laws of Massachusetts and the necessary corollaries therefrom are obnoxious to the Constitution of the United States.

In Massachusetts during recent years reproduction cost as a basis for rate-making has been urged on behalf of certain public utilities, mostly gas companies, that have accumulated out of excess earnings or by unearned increments in land values, large amounts of property not represented by the original capital invested or by the securities issued under the local anti-stock-watering laws. The commission concedes that this cost of reproduction is frequently illuminating and is often the best method of checking up unsatisfactory accounting, particularly that dealing with depreciation. It believes, however, that as a fundamentally controlling principle no theory could work out grosser injustice. In cases of excessive rates, by means of which the companies have accumulated large amounts for capital expenditures, the reproduction cost theory requires the ratepayer to pay a rate that will not only provide for a return upon the capital furnished by the investor but also furnish additional capital and a return thereon. This theory is also grossly unjust to prospective investors, for, if under the most honest and prudent management the plant in building up business depreciates below the fair cost to the investors, the rates must be made adequate to allow a return upon only the reproduction cost of the property in its depreciated condition. This amounts to saying that money lost during the earlier stages of a public service enterprise is irretrievably lost by the stockholders; that if rates have not paid the cost of service, this is the permanent misfortune of the stockholders.

The commission characterizes this theory as being as inexpedient as it is unjust. Public utilities are not finished; they are in process and are constantly calling for new capital in increasing amounts. They must be kept on good trading terms with the investing public or the whole experiment of private ownership and public regulation will fail. It is as necessary to attract capital into public utilities as it is to prevent mismanagement of, or extortion by, such companies. In the long run the rate-paying and the investing publics will be best served if regulation makes as its fundamentally guiding principle the protection of investments honestly and prudently made and wisely managed. Any other theory involves essential injustice, tends to make the development of public utilities a speculation instead of an investment, operates as a premium upon various kinds of fraud and makes every rate case an almost interminable and labyrinthine inquiry into values, with endless conflicts between so-called experts.

Partly owing to the limited scope of the rate-making power possessed by the (former) Railroad Commission, the commission says that there has hitherto been little occasion to deal in detail with the principle that investment and not reproduction cost is in Massachusetts the basis of the relation between the rate-paying public and the investing public. Any other theory, however, will be found to be utterly inconsistent with Massachusetts law. From the time of the granting of the earliest railroad charters in the State, legislation has gone upon the theory that capitalization should be limited to the actual investment and that rates were to be figured on the capital. The Massachusetts public utility code is in striking contrast to the loose and haphazard legislation as to capitalization in many other states, which has frequently resulted in compelling their regulating commissions to resort to reproduction cost as perhaps the least unsafe basis for determining a fair rate.

FINANCIAL CONDITION OF COMPANY

The Middlesex & Boston Street Railway is the result of the consolidation of ten companies. Its capital stock is $1,987,000; its funded debt, $1,983,000, and its floating debt, $1,250,000. The average dividend paid upon the capital stock of the constituent companies from the time of their respective organizations down to the date of consolidation into the Middlesex & Boston Street Railway was 3.09 per cent. The average dividend paid on the stock of the consolidated company is 4.35 per cent. The interest upon the floating debt, amounting, at 6 per cent, to about $70,000 per year, has been a heavy charge against revenue. The company now carries a deficit of more than $265,000, or, including bond discount, of more than $300,000.

PROFITABLE LINES VERSUS UNPROFITABLE LINES

The cities of Newton and Waltham argued that it was unfair for the company serving them to be saddled with a debt growing out of the past unprofitable operation of certain other lines. They asserted that the stockholders of such lines, seeing no reasonable possibility of making earnings on their own lines adequate to insure dividends, obtained through a voluntary association, the Boston Suburban Electric Companies, control of profitable lines. They contended that rates in the more densely populated communities should not be increased above 5 cents, in order to pay interest on debts incurred or operating deficits now alleged to have accrued on the poorer lines. The commission holds, however, that while it would be its duty to refuse to approve a consolidation if it appeared that because of it facilities for travel were to be diminished or fares increased, it is not sound to say that a consolidated company must give exactly the same rates of fare when the traveling facilities are radically increased. The thin lines operate as feeders for the lines in thickly settled communities, thus increasing the traffic on the latter by an unascertainable amount. If the commission should rule that, in determining a just and reasonable rate upon any short line where traffic is dense, it must recreate the conditions which might have existed on that short line if it had remained in the ownership and control of the single company formerly owning it, the result would be inextricable confusion and a sort of chaotic adoption of the zone system found in many European cities.

The commission rules that the Middlesex & Boston Street Railway must be dealt with as a single company, but the prudence of its investments is to be considered in fixing the return. While the commission feels that it would not be in the public interest to rule that any of the capital invested in the creation of any of these lines was so recklessly and imprudently invested as now to warrant the adoption of a policy likely to result in abandoning or tearing up some of them, it believes that undoubtedly in more optimistic days street railways were built in Massachusetts upon which a full return cannot now be earned without charging rates intrinsically unfair and perhaps destructive to traffic. Public interest and public sentiment require, however, that, within all reasonable limits, such lines should be conserved, not only for a probable increase in population, but for a probable increased handling of express, light freight and farm produce. There are reasonable limits to the arguable discrimination growing out of requiring patrons of street railway lines in the thickly settled communities to pay more than the cost of their short carriage in order to contribute to losses incurred in the longer hauls through the thinly settled sections. But the "short riders" of to-day may be the "long riders" of to-morrow. Moreover, population centers profit in many indirect ways from street railway lines ramifying into rural sections. A sound transportation policy requires consideration of the relations between transportation facilities and living conditions. The commonwealth, which expends the taxpayers' money in the construction of good roads all over Cape Cod and through the Berkshires, would not be content with a policy which promoted the abandonment and destruction of existing street railway facilities in Eastern Massachusetts.

CAPITALIZING PROPERTY PURCHASED FROM RECEIVER

One of the components of the Middlesex & Boston company is the former South Middlesex Street Railway, which was purchased at a receiver's sale in 1907. In accordance with the statute (Acts of 1906, Chap. 483, Part 3), that part of the company's debt growing out of its attempt to purchase the South Middlesex company for $125,000 in excess of the latter's replacement cost, is illegal and must be cancelled. (Commissioner White dissents from this view, and the decision says the company can test the impending order of cancellation by appeal to the Supreme Judicial Court.)

RELATIONS WITH HOLDING COMPANY

Discussing the relations of the road with the Boston Suburban Electric Companies, the board finds that the control of a street railway by a holding company, which loans large sums to the former at a substantial profit to the latter; which controlled a company selling power to the railway (not the Edison Electric Illuminating Company of Boston referred to elsewhere), and also controls a park company to which large annual payments are made by the street railway, is obnoxious to sound principles of corporation management and confusing to a proper system of regulation. Such interlocking management calls in question the validity and advantage to the street railway of all contracts growing out of the common control. As regards the park, the board looks with displeasure upon investments of electric railways off their lines, although favoring within narrow limits expenditures for advertising of direct probable return.

RATES PAID FOR BORROWED MONEY

Since the consolidation, the largest single function performed by the holding company has been that of loaning to the railway more than $1,000,000 at an average rate of 6 per cent. While the propriety of this rate is said to be not fully sustained, the commission concedes that the railway, without having its credit buttressed by this pooling device of the stock, might not have been able to procure this sum in the open market at a substantially lower rate. In the last six years the holding company has furnished the railway about $3,308,109 at an average rate of 4.59 per cent.

COST PER MILE OF SINGLE TRACK

The cost per mile of single track, compared with the average cost for fifty-two other Massachusetts street railways exclusive of the Boston Elevated and the West End Street Railway, is:

	Middlesex & Boston	Other Roads
Construction	$23,440	$23,098
Equipment	9,867	7,732
Other permanent property	7,678	8,254
Total cost per mile	$40,985	$39,084

This showing, the board finds, is on the whole favorable to the company.

COST OF POWER

The commission concludes that the company has not fully sustained the burden of showing that its contract made with the Boston Edison Company for power, contemporaneously with the sale by the holding company to the Edison company of the plant at Waltham formerly furnishing a considerable portion of the power used by the railway, was the best available arrangement for the latter. The railway receives energy from the Edison company on a ten-year contract at the rate of about 1.75 cents per kw-hr., present average. The company is ninth in a list of Massachusetts roads in its power cost per car-mile, at 4.76 cents, as compared with minima of 2.96 cents for the Bay State Street Railway and 2.26 cents for the Boston Elevated Railway. Maintenance of power equipment is included in these figures. The commission is of the opinion that the power cost is high, although probably not more than $12,000 per year. The commission holds that the company cannot be permitted to buy its power at a high price and to keep, permanently, unused power plants of its own. Within a reasonable time it should equip and use its own plants or sell the unused property and apply the proceeds to a diminution of the obsolescence. The commission recognizes the tendency toward tidewater generating stations of large capacity, but suggests that the large power business of the Edison company be regulated as to price by the Gas & Electric Light Commission. It also points out the desirability of more competition in this field, touching upon the possible advantageous supply of electricity from railways with plants on tidewater to interior companies.

DEPRECIATION

The commission points out that few Massachusetts companies have of recent years charged enough to operating expenses to cover real depreciation. In this particular case, an analysis of the company's operations, allowing 20 per cent of gross revenue to cover maintainence of way, structures and equipment from 1908 to 1914, shows that the company has undercharged operating expense by $277,059. This indicates that the net revenue has fallen far short of being adequate to keep intact the fair cost of the property put by the company into the public service.

SERVICE AT LESS THAN COST

Considering the low dividends paid from the time of organization and the above lack of proper depreciation charges, the commission finds that the rate-paying public has been receiving service at substantially less than cost. At no time have the rates charged been adequate to meet the fair cost of the service, and as between investors and patrons, the patrons have had much the better of the bargain. Regarding the payment of even moderate dividends without taking care of depreciation, the commission says that there is a great practical difference between the payment of dividends averaging 4.35 per cent (no more, perhaps even less, than an investment rate on money, which tends to keep the corporation in some sort of credit), and the payment of dividends so in excess of the investment rate as to put the stock on a speculative basis.

FINAL TEST OF COMPANY'S FINANCES

From the charges against income the commission deducted the annual interest on the $125,000 excess replacement cost of the South Middlesex Street Railway; assumed that the deficits of the constituent companies were cancelled at the time of consolidation; deducted all payments to the Norumbega Park Company; reckoned 6 per cent as the annual interest on the floating debt; assumed that 20 per cent of the gross revenue had been expended yearly to meet the cost of maintenance and depreciation, and assumed that the company is entitled to an annual dividend of 6 per cent. On this basis there would still be an annual operating deficit of more than $34,500. Even if the estimated excess cost of power of $12,000 per year were deducted, the annual revenues would still be insufficient by more than $22,500 to pay 6 per cent on the stock. The application of the present arbitrated wage schedule would increase this operating deficit to a total of more than $67,000 per year.

INFLUENCE OF WAGE ARBITRATION

The immediate occasion for the company's application is increased operating expense, due to increased labor cost resulting from the award of the board of arbitration dated June 22, 1914. This award requires the company to pay for labor during the coming year about $37,000 more than for the same labor under the old rates, besides perhaps $8,000 more due to change of hours, etc. The award also provided for the payment of about $30,000 of retroactive wages. The commission accepts the award as doing no more than justice to the employees, and doubts not that the patrons of the company will likewise accept it and the consequent increased cost of transportation as a proper charge.

CONCLUSIONS LEADING TO RATE INCREASE

The commission concludes that without an increase of fares, earnings adequate for the payment of any dividend cannot reasonably be expected. Both justice and expediency require that capital as well as labor employed in the public service should have its fair living wage. As a broad proposition, it is in the public interest that railway companies should earn and pay such dividends as to keep their stock at or a little above par. Under present financial conditions nothing less than a dividend of 5 or 6 per cent would bring a carrier's stock, otherwise reasonably sound, up to a par value.

The commission states that the petitioner's request for a change of fares would, if allowed, give a probable increased revenue of about $110,000 a year. On all the facts, a schedule of fares showing an increase of probably not more than two-thirds of that amount is in the public interest and required in justice to the company. It is not unreasonable to suppose that some advance over original fares might now be necessary even upon the better paying lines if these had continued to be separately operated. While some increase may even be justified upon the lines where a 5-cent far is now charged, yet these lines should continue to enjoy a somewhat more favorable rate than the remainder of the system.

The commission believes that its award, as outlined in the opening paragraph of this abstract, is just and equitable as between the different communities involved, and will cause as little hardship to patrons as any scheme that can be devised to provide the additional revenue to which the company is entitled. The schedule approved, with rigid economy—which includes the purchase of power on more advantageous terms—will enable the company to obtain sufficient revenue to maintain its property in safe and sound condition, expending for maintenance and renewals, until some general basis for dealing with depreciation is ordered or indicated by the commission, substantially 20 per cent of its gross revenue, and also to provide for the paying of moderate dividends.

European Public Utilities

Effect of Present War on European Capital and Engineering —British and German Tramway Statistics

W. J. Clark, of the General Electric Company, presented an address on European public utility conditions at the Public Service Railway section of the American Electric Railway Association at Newark, Oct. 29. He said that he would have to describe the conditions before the war, as no one can foretell the radical changes which must come to both the engineering profession and public utilities as a result of the destruction now going on in Europe.

Contrary to the general supposition, a great portion of the European public utilities, except the government-owned railroads, telegraph and telephone systems, are controlled by European international capital, instead of being owned within the countries where such projects are located. This plan, which has also been followed the world over, explains to a large extent the dominating position of the European countries in foregn trade. It is impossible even to approximate the total of such European investments, but recently the earnings from those of the United Kingdom have been estimated by economists to be about $600,000,000, while the combined similar investments of Germany and France have been estimated at approximately the same amount. Looking to the future, it is but logical to suppose that European countries must dispose of many such investments to secure the necessary capital to replace that which is being destroyed in Europe, while the bonds which have hitherto bound European international capital together have doubtless been severed.

The disastrous future effects of the present war will be marked upon European engineers and engineering, because probably more than 75 per cent of all of the active engineers in Europe are now in military service, and this includes, of course, the flower of the profession. The casualties in the engineering regiments have been greater than in other branches of service. In one regiment which went to the front over 1700 strong, there are now less than 180, and in another which mobilized at 2200 less than 350 remain. If the present terrible condition continues, seemingly before the European engineering profession can regain its former numerical strength and efficiency, another generation must be so educated and acquire its practical engineering experience.

STATISTICS ON EUROPEAN TRAMWAY ENTERPRISES

Statistics on European tramway enterprises as existing before the war are difficult to compile and compare. They differ greatly in character and extent, and in no two countries have they been compiled on the same basis. Heretofore, Belgium has been the headquarters for a number of the public utility holding companies because of its supposed neutrality.

A comparison of the wages paid on tramways in America and Great Britain show that the British wages are about half of the wages paid in this country. From this it is obvious that if American rates were paid in Britain its tramways could not meet their fixed charges. On the other hand, if British wages of labor prevailed here, our street railways could be operated at about 30 per cent of their gross receipts or other equally surprising things could be accomplished. In spite of this fact the roads as a whole are not a commercial success. The total capital investment in the British and municipally-owned tramways is $246,493,034, and after the payment of interest and fixed charges, the deficit from operation last year was about $660,000. This unfavorable showing is made greater by the fact that less than 2 per cent on the investment was charged in operating expenses to depreciation and renewal funds.

According to the British Municipal Year Book of 1914, as regards England and Wales: "In 1912-1913, the sums transferred in aid of rates from the accounts of electricity and gas supply undertakings, harbors, docks, piers, canals and quays, tramways, light railways and water works, was £41,000. The total of the sums transferred from rates to meet deficiencies in the accounts of such undertakings was £151,000.

GERMAN STATISTICS

The conditions in Germany are described by Dr. Richard Passow as follows: "Out of thirty-six municipal street railways in 1908, nine were operating without profit. Further, twelve showed that some financial assistance was required from the municipality, partly due to the extensive number of employees and administrators appointed by the state authorities."

Quite complete German tramway statistics are available, and the following is a translation of the summaries shown by them.

STATISTICS ON STREET RAILWAYS IN GERMANY—1912

	Company Plants	Municipal Plants	Total Municipal and Company
Length of track (kilometers):			
On street	3,113	1,785	4,898
On private right-of-way	368	156	524
Total	3,481	1,941	5,422
Number of employees	30,470	17,278	47,748
Rolling Stock:			
Steam locomotives	59	5a	64
Electric locomotives	25	22	47
Number of passenger cars	13,331	8,650	21,981
Total all cars	15,284	9,199	24,483
Total seating and standing space provided in passenger cars	457,821	310,644	768,465
Average carrying capacity per car	......	......	35
Passenger car kilometers	433,831,507	306,188,099	740,019,606
Number of passengers carried	1,526,153,644	1,203,072,641	2,729,226,285
Cost of erection (marks)	768,590,580	394,501,728	1,163,092,308
Invested capital (marks):			
From government	11,371,803	1,694,600	13,066,403
From province	3,653,467	10,501,250	14,154,717
From county	16,625,237	9,538,312	26,163,549
From parties interested	28,641,396	352,912,372	381,553,668
From other sources	733,998,230	50,807,694	784,805,924
Total invested capital	794,290,133	425,454,228	1,219,744,260
Passenger receipts (marks)	162,114,210	130,054,929	292,169,139
Freight receipts (marks) Postal receipts (marks)	1,523,784	162,638	1,686,422
All other receipts from railway service	7,070,574	2,001,924	9,072,498
Summary of receipts	170,708,568	132,219,691	302,928,259
Summary of expenditures	106,483,296	75,008,146	181,491,442
Allowance for depreciation	8,409,636	6,634,409	15,044,045

NOTE: "a," gas locomotives.

The following is apparent from these statistics:

About 36 per cent of the trackage is government owned. The total trackage is approximately 14 per cent of the similar length of line in the United States. The number of cars is equivalent to 26 per cent of those in this country, but the average carrying capacity of the German cars is but thirty-five, whereas such average in this country is about double that figure.

The number of passengers carried is equivalent to 22.5 per cent of those carried in the United States. The total passenger receipts are the equivalent of $73,042,285, equal to 14.7 per cent of those in this country. The total operating revenue is equivalent to $75,932,065, or 13.5 per cent, of the similar item in the United States.

Operating expenses are almost exactly 60 per cent of operating revenues. The passenger car-miles run are approximately 462,515,000, equivalent to 24.5 per cent of those run in America.

Officials of the Louisville (Ky.) Railway were hosts recently to the members of the Louisville Engineers' & Architects' Club at an inspection of the new shops and a new power station of the company, which have been put into operation.

COMMUNICATIONS

Operation by Signals Preferable to Train-Order System

SCRANTON & BINGHAMTON RAILROAD

SCRANTON, PA., Nov. 4, 1914.

To the Editors:

In response to your request for an explanation of the points raised in Mr. Handshy's communication (published in last week's issue) I might say that the duties of trainmen, under our system of operating by signals alone, have been very much simplified. The elimination of the complications of the train-order system, with its tax upon the memory and its necessity for experience in interpretation, has, to all intents and purposes, reduced our procedure to that figuratively outlined in your editorial of Oct. 3.

The question as to what is done when a signal failure occurs may best be answered by quoting from our standard book of signal rules as follows: "When a train is stopped by an automatic signal that is evidently out of order, the motorman, ... after waiting five minutes, will proceed at a speed not to exceed 8 m. p. h., being prepared to stop within one-half his range of vision until he has reached the next proceed signal, expecting to find a train, open switch, broken rail or other obstruction on the block. At curves, or during fog or other weather conditions that obscure the view, the conductor must go ahead of the train far enough in advance to stop, within a safe distance, any opposing train."

You will understand, of course, that the direction indicator, which is located some 200 ft. in advance of each siding home signal, will not give its proceed indication in case an opposing train has entered the block in advance of the defective signal. Therefore, the train which proceeds under the above rule is not confronted with the possibility of advancing against a high-speed opposing movement unless both the signal and the direction indicator fail at the same time—a contingency that is so remote as to be a practical impossibility.

The possibility of false clear indications, to which Mr. Handshy refers, was, of course, thoroughly investigated before our signal system was adopted, and we consider that the combination of intermediate signals and direction indicators which has been installed constitutes as perfect a check against head-on collisions due to false clear indications as can well be conceived in the practical art of automatic signaling.

As a matter of fact, we have had no clear failure as yet, although it may be that we shall have one some day. However, clear failures in general are of such rare occurrence as to be of the order of one per 1,000,000 movements, and, on at least one line equipped with Union Switch & Signal Company's apparatus (as is also the Scranton & Binghamton Railroad) clear failures have happened only once in about 60,000,000 movements. Consequently, they cease absolutely to be worthy of special consideration when, to be dangerous, they must occur in conjunction with abnormal failures of several pieces of apparatus at exactly the same time. In addition, since it is necessary to have cars in certain narrowly defined positions before a collision can occur, even when there is a clear failure of a signal as well as all of the checks upon its operation, the odds against the contingency rise practically to infinity. To be perfectly frank, I consider the signal system on the Scranton & Binghamton to have safeguards and checks which are considerably more effective in practice against dangerous false clear indications than would be the check provided by train orders.

R. W. DAY, General Manager.

Methods of Calculating Depreciation

PACIFIC GAS AND ELECTRIC COMPANY

SAN FRANCISCO, CAL., Oct. 21, 1914.

To the Editors:

I have read with much interest the article on "Depreciation" by Ralph U. Fitting, published in the ELECTRIC RAILWAY JOURNAL of Sept. 26, and believe that Mr. Fitting's very complete presentation of various classes of depreciation and the methods of computing allowances to meet depreciation will assist very materially to a better understanding of this very complex question.

In following the discussions of this subject that have appeared from time to time, and in talking to many who are interested in the financing and operating of public utilities, it has seemed to me that there is a very evident tendency to take the depreciation question too seriously, that the theory of depreciation is being allowed to cloud the issue, and that we are losing sight of some very practical and commonsense facts.

We have at the present time two separate, although related, problems involving depreciation:

1. Accrued depreciation and its effect on value.
2. Deduction from revenue to take care of property retired from service.

In discussing the first problem we find many arguments, theories and illustrations used both pro and con as to how the accrued depreciation should be considered in valuing property and, as far as I have been able to analyze the attitude of mind of those presenting the different sides of the question, the real difference lies in a fundamentally different conception of depreciation. I believe that, expressed very generally and briefly, these conceptions are:

(*a*) Depreciation is a part of the value of the property which is being taken away from the property, just as the coal taken out of a coal mine is a part of the value of the mine being taken away.

(*b*) Depreciation is nothing more nor less than an accounting method of equalizing the cost of replacing and retiring property over a long period of time in order to avoid distorting the operation and maintenance accounts in any relatively short period.

The first theory loses sight of the fact that a public utility property is not a simple structure that is here to-day and gone to-morrow, but is a complex structure that is permanent in its function and existence.

The second theory holds that as long as an existing property is giving the equivalent in service and efficiency of a new property there is no depreciation in value beyond some possible deferred maintenance. It must, of course, be admitted that there are some cases where this will not hold true, but for a normal healthy public utility I believe this theory to be the correct one.

The computing of the proper amount to be set aside, out of earnings, to meet the retirements of property from time to time is, as Mr. Fitting points out, difficult, but I cannot agree with his conclusions that the percentage of gross earnings method is the best. It seems to me self-evident that while we may perhaps for some particular property hit upon a percentage of the gross earnings that will fill the requirements, this same percentage in some other property would not be satisfactory. The useful life of the different parts of a property is a function of the make-up of those parts and has nothing to do with the earnings. We may not now be able to estimate exactly the proper percentage of the value of the various classes of property to put aside, but it should be remembered that a public utility is made up of many classes of property, and while we may overestimate the percentage on one class we in all probability will underestimate the percentage on other classes. It is only by experience that we shall be able to determine the proper percentage, and if we continue on an arbitrary method based on earnings we shall never be any wiser than we are now. On the other hand if we base the annual allowance on percentages of value and use every effort to compile data for checking and revising these percentages, we shall be able, as time goes on, to determine from actual experience with a greater degree of accuracy what these percentages should be. JOHN A. BRITTON,

Vice-President and General Manager.

Insert Special Work Failures

OMAHA & COUNCIL BLUFFS STREET RAILWAY

OMAHA, NEB., Oct. 17, 1914.

To the Editors:

Having read carefully the interesting articles in your issues of Sept. 19 and 26, I state below a few observations we have made in the construction and maintenance of special work of the hard-center type.

Most of our experience has been with the 7-in. type, made up of iron-bound 107-lb. and 108-lb. girder guard sections. We also have some of 97-lb. section, and all are fitted with manganese centers of various types. About two years ago we adopted the practice of using 6-in. x 8-in. sawed white-oak timbers of different lengths, as a support for all special work in paved streets. On the special work blueprint we locate the ties most advantageously and use different lengths as needed to give the steel proper bearing on the foundation. This facilitates tamping as compared with the old practice of weaving a number of 7-ft. ties throughout the layout. Such practice sometimes made it impossible to tamp the ties solid at points where proper tamping was absolutely essential. Moreover, a much stiffer foundation results at only a slight increase in cost, when special ties are used, and tamping is more easily accomplished.

Our sub-grade is generally of hard yellow clay, and with a 6-in. bed of well-tamped crushed rock under our ties, a very uniform bearing is obtained. Our drainage is good as the streets all have considerable grade. Wherever the sub-soil is of poor quality, as, for instance, where fills have been made, we use a combination construction consisting of a 6-in. concrete slab on which we surface the switch ties with 2 in. of stone screenings.

In handling iron-bound special work we use an electric crane and usually make the installation at night. We stake off the work accurately so that the steel may be installed, spiked and bolted to line without necessitating the strenuous use of screw jacks and drift pins to obtain alignment after the layout is in place. The use of screw jacks and drift pins in pushing and drawing frogs to line is, no doubt, very injurious to iron-bound construction. We find it necessary, however, to use jacks occasionally in lining, but this is done under very careful supervision. Drift pins must be used also to bring joints together, but only for a slight movement of the frog with spikes loosened. This does not entail harmful results. We find it important, when bolting up the splices, to have all joints drawn tight. After the installation is complete the surfaces of all joints are ground smooth. We believe grinding will add to the life of the joints and in turn to the special work as a whole.

Our loose-center trouble is confined almost wholly to 90-deg. crossings. We have had some trouble with the centers in curved crossings after having been in use several years, but the most serious trouble exists with the 90-deg. type of crossing, of which we have a great many. Present-day cars, which weigh from 18 tons to 22 tons empty, cross over flangeways in center plates 1⅜ in. wide every two or four minutes, exert considerable lateral thrust on plates and make the problem of special work construction and installation increasingly difficult. We have found on 90-deg. crossings that an entire spelter bed for the plate soon settles and excessive pounding results which ultimately breaks down the foundation. Some of our centers are set on lead slugs before pouring the spelter. These do not stay to surface as well as those with either a partially machined bearing or those set on steel shims before pouring. We also find that unless a hard-center plate has a tight fit at all four points where it joins the arms, it will not stay tight for any reasonable length of time.

Another serious condition to meet, which affects our hard-center maintenance, and is mentioned in the article, is the thin-flanged steel wheel. Our cars are all of the single-end type, the operation of which tends to cause unusual wear of wheel flanges. A continuous crowding of one rail (usually the inside) results in one wheel flange wearing thin, while the opposite wheel develops what might be called a double flange. When they strike a hard center the wheels must be pulled over at the flangeway. This throws a lateral strain which, on any hard center of present design, must be resisted by the spelter-filled edge. We have noticed that the manufacturers do not always carefully provide for such a condition. In grinding flangeways, care should be exercised to make the approach to the narrow throat of the hard center as easy a transition as possible, even though it might mean an increase in the size of the manganese plate.

Rail arms in iron-bound 90-deg. construction should not be longer than 4 ft. We find in some cases that longer arms up to 6 ft. or 7 ft. have been provided in the past to meet existing joints. In these the compromise joint weakens sooner or later, and if this is not detected at the time of slight movement, an excessive bending moment will occur at the casting which it cannot resist, and a rupture occurs. In order to reduce difficulties to a minimum we employ special repairmen on joints and special work. As soon as a piece appears to be loose on its foundation it is promptly resurfaced. We endeavor to guard against any loose joints in special work and carefully inspect and repair it as soon as they are detected. A loose compromise or ordinary joint will allow a pumping action which causes the arms to cut into the tie and within a short time the arm is loose in the casting.

The comparatively new process of using the electric welder for building up special work intersections, seems to offer a most promising field for the development of a solution for hard-center troubles. The perfection of the qualities of the steel which can be welded to intersections will bring a demand for the use of the one which will successfully amalgamate with manganese centers. Perhaps the frogs themselves can be cast of some alloy other than manganese steel, to which the electric welding process may be applied satisfactorily. With this developed, the flange bearings and intersections could be readily kept in proper condition, thereby satisfying the public demand for less noise at intersections, and at the same time conserving the life of rolling stock. F. H. FINDLEY,

Superintendent Track and Roadway.

The Daily Report of the Convention

THE SOUTHWESTERN ELECTRICAL & GAS ASSOCIATION
DALLAS, TEX., Oct. 30, 1914.

To the Editors:

I have again been in prompt receipt of your convention daily issues and again wish to express to you my appreciation of these. The comfort, convenience and pleasure of having the daily proceedings of the convention "hot off the bat" at this long distance away should certainly be appreciated by those who are compelled to be absent from the convention, and it should also certainly be appreciated by those at the convention nearly as much as by the absentees.

I did not notice that the various associations gave you a vote of thanks for your enterprise in this matter, but they certainly should have done so and made it a "rising vote"! H. S. COOPER, Secretary.

Public Relations Number

Newspaper Comments on Our Convention Issue—General Approval Expressed

The two score of articles devoted to electric railway progress and improvement and the general subject of public relations, published in the convention number of the ELECTRIC RAILWAY JOURNAL, issued on Oct. 10 in connection with the annual convention of the American Electric Railway Association, were well received in the daily newspaper field, as shown by both reprints of many of the articles and editorial comment on them.

The articles in this number that were drawn upon for reprint material varied widely as to subject matter discussed, and the excerpts published ranged from single paragraphs in a few instances to solid columns in such newspapers and other publications as the Philadelphia *Public Ledger*, Chicago *Daily Tribune*, Boston *Evening Transcript*, *Wall Street Journal*, Rochester *Democrat*, Boston *Christian Science Monitor*, Grand Rapids *News*, Salt Lake City *Tribune*, *The Times Annalist*, Boston *Commercial* and many others. A few of the articles that received the greatest newspaper publicity were the following: "Proposed Co-operative Arrangement at Philadelphia," by A. Merritt Taylor; "Financial Relations Between Cities and Utilities," by Bion J. Arnold; "Electric Railroading in Utah," by Simon Bamberger; "Winning the Confidence of the Public," by Robert M. Searle; "Is Publicity a Cure-All?" by A. W. Warnock; "The Importance of Good Public Relations," by Theodore P. Shonts; "Improvement of Relations Between Electric Railways and Employees," by Charles W. Eliot; "Public Utility Regulation—A Cloud on the Horizon," by H. H. Crowell; "Five Years' Development of the American Electric Railway," by Frank R. Ford; "The Electric Railway and the Farmer," by John R. Graham; "Aspects of Rush-Hour Service," by E. C. Foster; "Local versus State Regulation," by Richard McCulloch, and "Co-operation in Transit Contracts," by Timothy S. Williams.

One of the most interesting features in connection with such newspaper publicity was the geographical distance which often separated the author of the article and the newspaper in question, showing that the ideas presented and not merely the personality of the author led to the abstracting of the paper. For example, portions of the paper of Richard McCulloch (St. Louis, Mo.) were published in New York; by A. W. Warnock (Minneapolis, Minn.) in Manchester, N. H.; by Jesse W. Lilienthal (San Francisco, Cal.) in Butte, Mont.; by Robert M. Searle (Rochester, N. Y.) in Camden, N. J., and Springfield, Ohio.; by E. C. Foster (Manchester, N. H.) in Paterson, N. J., and by Frank R. Ford (New York, N. Y.) in Boston, Mass. The remarks of Dr. Eliot (Cambridge, Mass.) were quoted in New York, Freeport, Me.; Newark, N. J., and Chicago, Ill., and other cities, while the article by John R. Graham (Bangor, Me.) reached Chattanooga, Tenn.

As examples of the editorial comment aroused by the above-mentioned and other articles, the following three have been picked at random. Referring to Dr. Eliot's article, the Chicago *Tribune* says:

"Some of these reforms are in actual operation in European countries. Some have been tried in this country with success. The combining of all of these measures into one system affecting and modifying the wage relations of to-day to the extent to which Dr. Eliot would have them modified, has not yet, however, been attempted. It may be some time before the American people are ready to consider Dr. Eliot's program. To the extent, however, that his suggestions stimulate serious thought about present industrial conditions, they are of immediate value and helpfulness."

The Brooklyn (N. Y.) *Daily Times* comments on Mr. Williams' article in part as follows:

"As Colonel Williams well points out, the danger exists and will continue to exist, that the commission in its desire to please local interests or to gain political advantage may lose sight of the great public function with which it is entrusted. For it must not be forgotten that, although somewhat crudely, we have, at least in an approximate sense, taken municipal affairs out of politics, while no such change has been effected in state affairs, and it is questionable if it ever will or should be.

"When a tremendous undertaking, such as the completion of our subway system, is discussed as rationally and intelligently as by Mr. Williams, and when the principles in such a transaction are so transparently clear and candid, there can be no doubt that we have reached in our own dealings with large transit problems an era and a condition that would have been pronounced the millennium a few years ago."

Concerning Mr. Taylor's outline of the Philadelphia program, the *Public Ledger* of that city says:

"Director Taylor's illuminating summary of the rapid transit program revives interest in the momentous proposition and serves to stimulate fresh interest in the approaching loan election. No other measure of city development has ever been promulgated which will propel Philadelphia forward to the same extent. The more the plan is studied the more feasible it appears, safeguarding well the public's interest and justly caring for the rights of the transit company."

Association of Technical Associations' Secretaries

As announced in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 31 a meeting of technical association secretaries was held in New York on that date, and an association was formally launched. The temporary organization will continue until the meeting which is to be held on some date between Jan. 1 and March 1, at which time the nominating committee will report a list of suitable nominations for the officers provided for in the adopted by-laws. The American Electric Railway Association was represented informally at the organization meeting by C. W. Stocks, statistician, and H. H. Norris, ELECTRIC RAILWAY JOURNAL, who attended in place of Secretary E. B. Burritt. An important feature of the work of the new association will be the distribution of information regarding convention dates and places of technical societies. It is expected also that the getting together of representatives of the societies will be helpful in preventing duplication of work and in enabling the secretaries to benefit by each other's experiences.

Equipment and Its Maintenance

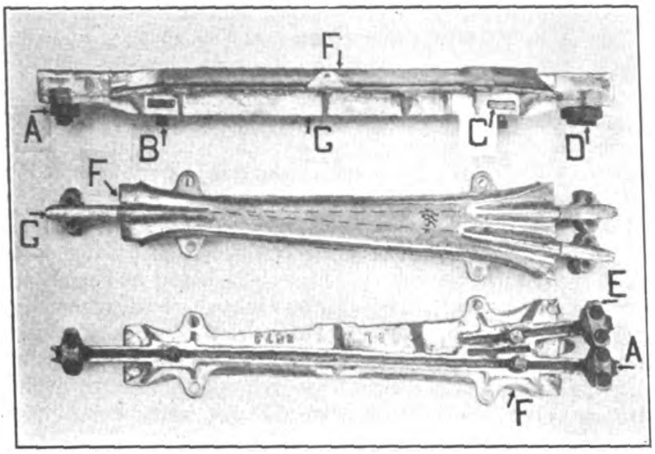
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

A Method for Locating the Correct Position of Overhead Frogs

BY ROBERT D. DIXON, MAINS SUPERINTENDENT NEW SOUTH WALES GOVERNMENT TRAMWAYS, SYDNEY, AUSTRALIA

Of the various fittings used on overhead construction for tramways and street railways, none has been the cause of more trouble than the frog. From the earliest days, when the angle between the tongue containing the branch trolley wire and the tongue on the main line was 45 deg. down to the present time when this angle has been reduced to about 6 deg., the frog has been a fruitful source of annoyance. In the infancy of electric traction the pole, more frequently than not, left the trolley wire when taking the turnout. Even when the car took the frog at a snail's pace, the conductor had to hold the trolley rope, so that the pole might be placed on the wire after refusing to travel in the required direction.

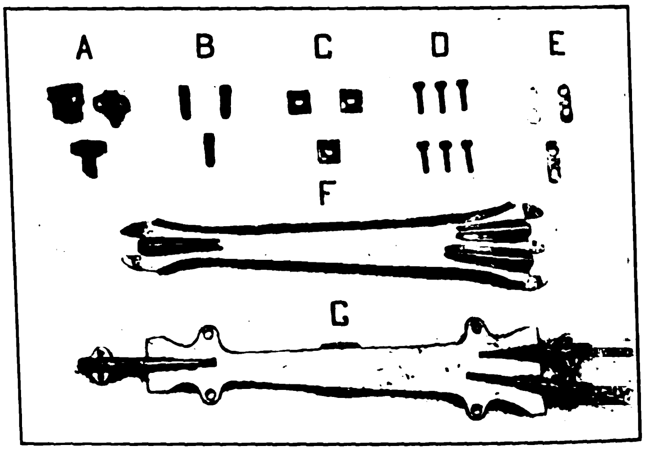


SYDNEY TRAMWAYS—ASSEMBLY OF FROG

As it became necessary to increase the speed of cars at junctions, so the limitations of the frog, as first designed, became more exasperating. The angle between the tongues was gradually reduced, with a corresponding decrease in the number of poles leaving the line. When the angle had been reduced to 9 deg. the length was greatly increased, and the weight of the frogs, which were of gunmetal, became excessive. In order to reduce this angle still further the frogs were made of an aluminum alloy, but the wearing parts were protected with thin steel plates.

These frogs gave very satisfactory results, but, together with all other previous designs, they had a serious disadvantage, as the whole frog required removal when the tongues and sides had become worn out. It was, therefore, necessary to evolve a new design in which the body, or backing, of the frog is made of an aluminum alloy (aluminum 98 per cent, copper 2 per cent), and a pressed-steel plate comprising the bottom, flanges and tongues is attached to the aluminum body. All the wearing parts are thus made of steel. When the frog requires renewal all that is necessary is to remove the old pressed-steel plate and attach a new one. The saving of time and money, as well as the reduction of interference with traffic, with this type of frog is of the greatest importance. It has also the advantage that when the frog is once correctly set the renewal of the steel plate does not in any way affect its position.

As far as the author can learn, a satisfactory method for accurately locating the correct positions for leading frogs has not yet been developed elsewhere. It has been seriously stated that the best method of locating frogs is to run a car on the branch line while leaving the trolley wheel on the wire over the straight track, the point where the wheel leaves the straight wire determining the position for the frog. Another method is given as the center of the triangle which is formed by the width of track at the points as its base, the apex being the point where the outer rail crosses the straight. Such methods naturally do not give satisfactory results, especially in cases where the car travels at high speeds. The method adopted on the Sydney, New South Wales, system has for some years been in operation with most satisfactory results, and it is a very rare occurrence for a pole to leave the wire at a frog, even when the speeds are excessive.



PARTS

Part	Weight
A—Cast-iron tongues	Weight 3 lb.
B—Set screws	
C—Nuts	
D—Bolts	
E—Locking strips	
F—Stamped steel plate	Weight 2 lb.
G—Aluminum body	Weight 5 lb.
Total weight	10 lb.

SYDNEY TRAMWAYS—DETAILS OF FROG

Some years ago special measurements were taken of the radius of track, superelevation of both straight and branch roads, and the exact position of the frog (9 deg.) in cases where it was known that frogs had given very good results. From these measurements it was calculated that the angle made by the plane of the trolley wheel with the trolley wire was in the vicinity of 15 deg., with one particular type of car. When the new type of frog ($5\frac{1}{2}$ deg.) was adopted, it was decided that its position should be such that the angle made by the plane of the trolley wire with the plane of the trolley wheel should be 11 deg.

The method of determining the position for the frog is as follows: Starting from the switch points, the superelevation (if any) of the straight track is measured at intervals of 5 ft. If the trolley wire be 19 ft. above rail level, and track gage 4 ft. $8\frac{1}{2}$ in., the superelevation obtained must be multiplied by $\frac{19\text{ ft. }0\text{ in.}}{4\text{ ft. }8\frac{1}{2}\text{ in.}} = 4.$ This would then give the theoretical offset in which the trolley wire should be placed on the straight track. However, as trolley wheels are not invariably placed in the same plane as the trolley pole, an additional offset of 2 in. is allowed, so that when a car is taking the straight track the trolley wheel tends to hug the guiding flange of the frog. When making allowance for superelevation it must be borne in mind that the car wheels are in advance of the trolley wheel, and that the superelevation of the track at the car wheels affects the position of the trolley wheel at its point of contact with the wire, which, in the case of a four-wheeled truck, would be about 11 ft. to the rear of a point vertically over the truck center.

Again, starting from the points, measure the superelevation on the turnout at intervals of 5 ft. Owing to the pivotal point of the trolley pole on the car roof—more especially on double-truck cars with the trolley pole in the center of the car—not being vertically above the center of the track, measurements must be taken to ascertain this offset. The easiest method is as follows:

The distance between truck centers being known—say, 22 ft.—the tape is run out to 22 ft. and placed as a cord across the arc made by the rail, and the versine measured, the tape being moved forward 5 ft. after each measurement is taken. To these figures must be added the offset of the pivotal point of the trolley pole due to superelevation. The superelevation of the track is, in this instance, not multiplied by 4, as the height of the pivotal point is not 19 ft. 0 in. above the track, but, say, 11 ft. The superelevation must, therefore, be multiplied by $\frac{11\text{ ft. }0\text{ in.}}{4\text{ ft. }8\frac{1}{2}\text{ in.}}$, or 2.34. These measurements thus give the curve traced out by the pivotal point of the trolley pole as the car takes the curve. The horizontal projection of the trolley pole in use on the Sydney system is about 11.4 ft. with a trolley wire height of 19 ft., and it can readily be seen by reference to the diagram that all that is now necessary is to lay down on the track the position of the trolley wire on the straight track and the position of the curve traced out by the pivotal point of the trolley pole, fix the point where the distance between them is 2.19 ft.—which is the base of an isosceles triangle having for its two sides the horizontal projection of the trolley pole (11.4 ft.) the angle included between them being 11 deg.—then measure 11.4 ft. back toward the switch points, which gives the position of the frog.

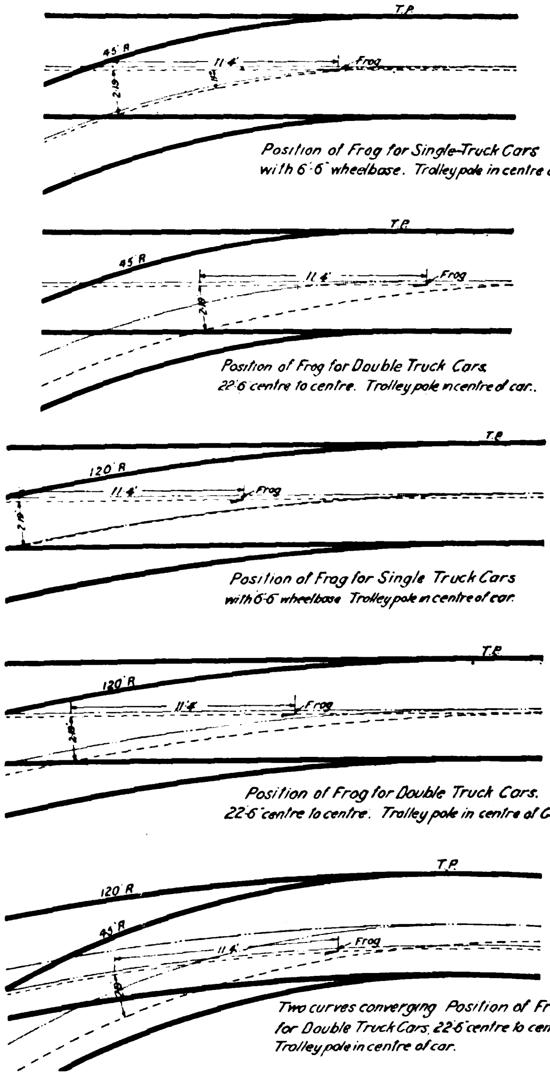
The explanation of the method takes longer to write than does the whole process of the location of the frog on the ground. When the engineer has become proficient in the work of setting out frogs, the operation should not take more than a few minutes.

Owing to local conditions the superelevation is occasionally the reverse of that ordinarily experienced, and the engineer must make allowances accordingly.

The most difficult frog to set in its correct position is that at the junction of two curves which are converging. (See diagram.) In this case the straight tongues are set for the track having the curvature of larger radius, and the branch tongue for that of smaller radius, The position of the frog on the curve of larger radius is on the trolley wire curve, as shown in the writer's article, published in this journal on May 7 last, except that the additional offset of 2 in. is given, as before mentioned, for the purpose of forcing the trolley wheel to bear against the guiding flange. Its position in relation to the curve of smaller radius is determined as before.

It will be noticed from the diagram that the position for the frog with a four-wheeled car with trolley pole in center of car is considerably in advance of the position in which it would be placed for a double-truck car with the trolley pole in the center of car.

In the case of a very sharp curve, the position for the frog is sometimes at a spot before the points are reached. As the radius increases the position for the frog moves toward the curve in advance of the points. If the turnout were always a true circular arc the position of the curve traced out by the trolley base could be tabulated, but in almost every instance it is a transition curve, and the most practical method is to measure the versine of a cord equal in length to the distance between the truck centers.


T.P.
45' R
11.4'
Frog
2.19
Position of Frog for Single-Truck Cars with 6'-6" wheelbase. Trolleypole in centre of car.
T.P.
45' R
11.4'
Frog
2.19
Position of Frog for Double Truck Cars. 22'-6" centre to centre. Trolleypole in centre of car..
T.P.
120' R
11.4'
Frog
2.19
Position of Frog for Single Truck Cars with 6'-6" wheelbase Trolleypole in centre of car.
T.P.
120' R
11.4'
Frog
2.19
Position of Frog for Double Truck Cars. 22'-6" centre to centre. Trolley pole in centre of Car
T.P.
120' R
45' R
11.4'
Frog
2.19
Two curves converging. Position of Frog for Double Truck Cars. 22'-6" centre to centre. Trolley pole in centre of car.

SYDNEY TRAMWAYS—FROG LOCATIONS FOR DIFFERENT COMBINATIONS OF CARS AND CURVES

With the increase in distance between the leading and trailing tongues of the frog, it has been necessary to maintain the trolley wheels more carefully to insure that the planes of the trolley wheel and trolley pole coincide. The carhouse foremen have a special tool for making the necessary adjustments.

It might be added that there are approximately 900 frogs on the Sydney system, and that at some of the busy junctions from 1200 to 1500 cars pass over the same frog during the period of twenty-four hours.

A Home-Made Anti-Straddler

BY K. A. C.

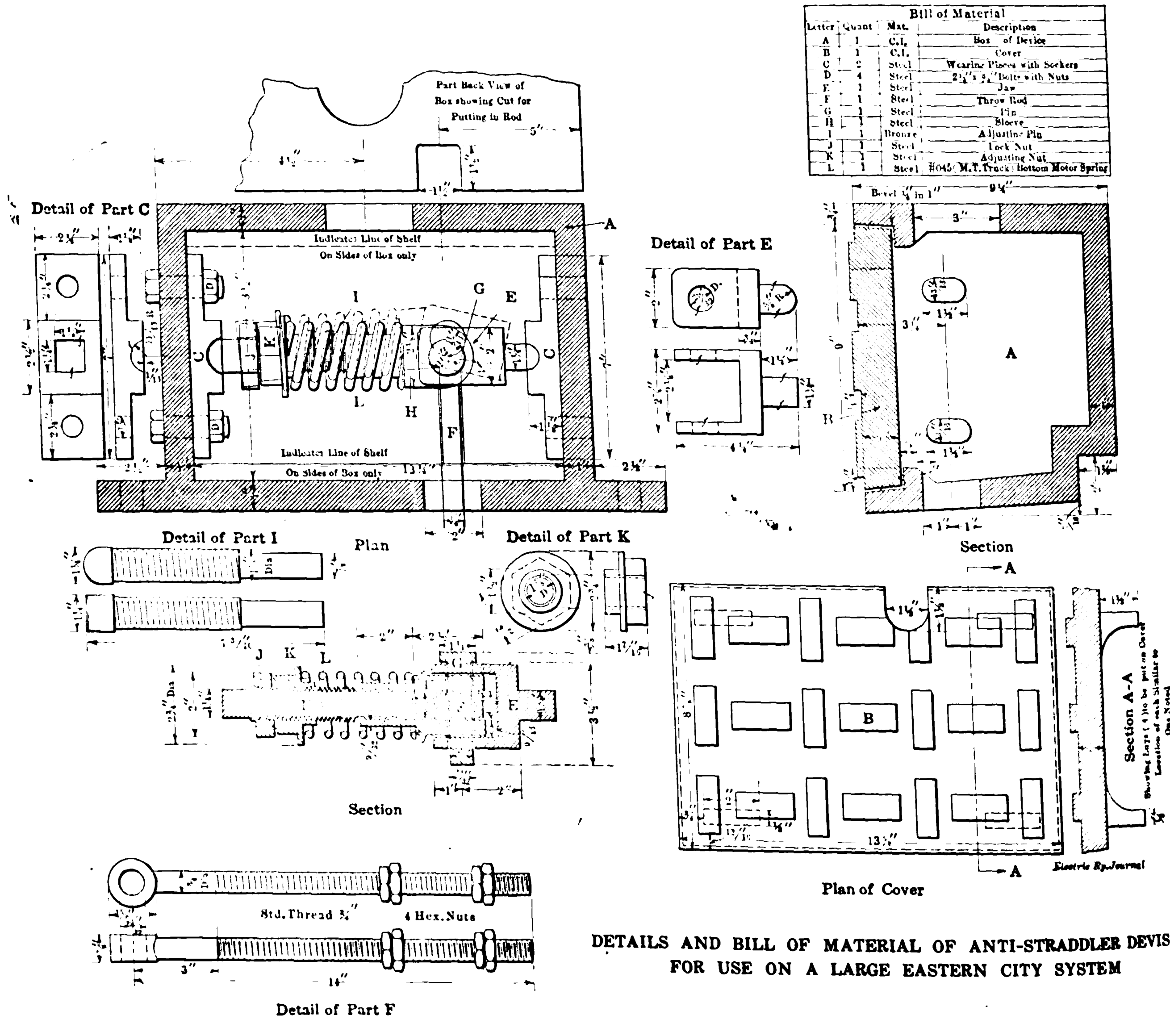
In electric railway operation no condition is so annoying to the operator as that met with in facing switches and generally known as "splitting." The causes for this are quite common and the results frequently disastrous. The accompanying diagram illustrates, in detail, a simple and effective preventive device recently adopted as a standard by one of the large Eastern systems.

Up to the present time this company has had in service numerous devices for the same purposes but all have been found deficient in some respect, some because they were too complicated and others because they were adapted to but one style of switch. After patient experiment with these contrivances it was finally decided to attempt the manufacture of one which would be simple and applicable to any switch in use, and the one herein described is the result. It has proved satisfactory under all conditions and is now in service generally, our own shops manufacturing all the parts.

This anti-straddler contains, exclusive of the box and bolts, nine parts, which are simple and strong, making renewals and repairs economical and easily performed. The parts *C* and *G* and *F* are the only wearing parts; the parts *I* and *E* which are bronze and steel respectively, resist wear to a very satisfactory degree.

The device can be assembled and maintained by an ordinary trackman. Drainage is obtained by means of a hole in the back of the box and consequently this particular requires little attention. All adjustments are made, after the original installation, by means of the nuts *J* and *K*, which are of steel on a bronze screw.

This device is not only an efficient anti-straddler but it can be applied to a spring or derail switch by lengthening or shortening the hold on the tongue rod *F*, according to which way the switch is to be set, so that the throw of the switch will not pull point *X* over center. The different styles of lugs can be cared for by fashioning this rod. The box will fit any of the numerous 9-in. construction switches in use. It can be entirely dismantled without removing any paving. The cover is so designed with lugs that it will remain stationary and be safe for horses and vehicular traffic, even under the most severe trucking.



Bill of Material			
Letter	Quant	Mat.	Description
A	1	C.I.	Box of Device
B	1	C.I.	Cover
C	2	Steel	Wearing Pieces with Sockets
D	4	Steel	2¼" x ¾" Bolts with Nuts
E	1	Steel	Jaw
F	1	Steel	Throw Rod
G	1	Steel	Pin
H	1	Steel	Sleeve
I	1	Bronze	Adjusting Pin
J	1	Steel	Lock Nut
K	1	Steel	Adjusting Nut
L	1	Steel	#045 (M.T. Truck) Bottom Motor Spring

DETAILS AND BILL OF MATERIAL OF ANTI-STRADDLER DEVISED FOR USE ON A LARGE EASTERN CITY SYSTEM

A Suggested Car-Mileage Meter

BY A MISSOURI CONTRIBUTOR

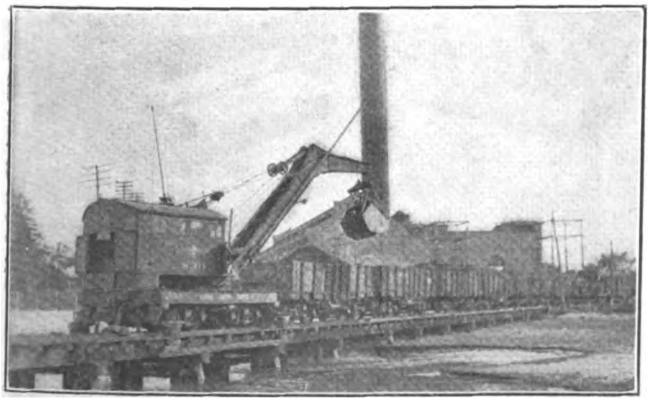
The system of keeping account of the number of miles a car has traveled by figuring up the number of blocks on the route does not seem to be a very accurate one because cars are sometimes switched from one line to another during heavy traffic. Also when trippers are used a few hours in the morning and evening a lot of figuring would be required, after six months of service, to tell how many miles the car had run.

I wish to suggest a system that would be accurate and labor-saving, namely, the use of a meter to register the number of miles traveled. If some manufacturer will put a meter of this order on the market it will do away with much clerical work by the railways. The meter should be made without any time attachment, as it is not wanted as a speed indicator, but it should register plainly the number of miles traveled—say, up to 100,000 miles or whatever other figure is desired.

Suppose a car is equipped with this meter. Then a card index can be kept with the names of the different equipment parts of the car, such as armature bearings, fields, motor bearings, etc. When the car is disabled or turned in the shop man, by referring to the card, will be able to see in a moment how many miles of service have been given by the part which has failed. After repairs, the number of miles shown by the meter could be recorded or the meter could be reset to zero. This meter need not be complicated or expensive.

Under-Water Coal Storage of Illinois Traction System

The Illinois Traction System has two large under-water coal-storage tanks, one located midway between its Peoria and Bloomington plants and the other close to its Riverton plant. The accompanying halftone shows the method of reclaiming coal from these storage tanks. This view was taken at Riverton, and illustrates the use of the company's wrecking crane for loading wet coal into the cars for transfer to the power-station bunkers. Briefly, this pit may be described as a reinforced concrete reservoir, 225 ft. long x 120 ft. wide x 20 ft. deep. Its walls and sides are of 10-in. reinforced concrete slabs protected with a waterproof coating. Along the middle of the storage tank is a timber trestle on which the coal cars are run for loading and reclaiming the fuel.

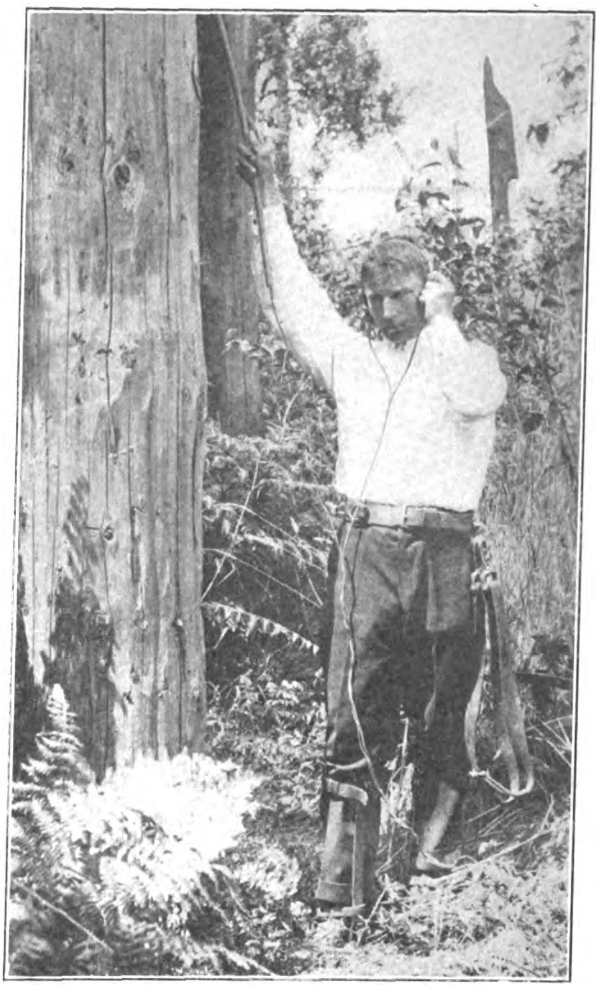


ILLINOIS TRACTION WRECKING CRANE RECLAIMING COAL FROM UNDER-WATER STORAGE TANK

It is stated that the two coal-storage tanks have been very profitable investments. The Illinois Traction System has physical connection with more than 100 mines, and when fuel, especially screenings, can be bought at a particularly low figure, the coal-storage tanks provide capacity for economical under-water storage. This fuel is kept without loss in heat value until such time as a general scarcity of screenings arises and much higher prices prevail.

Detecting Defective Insulators

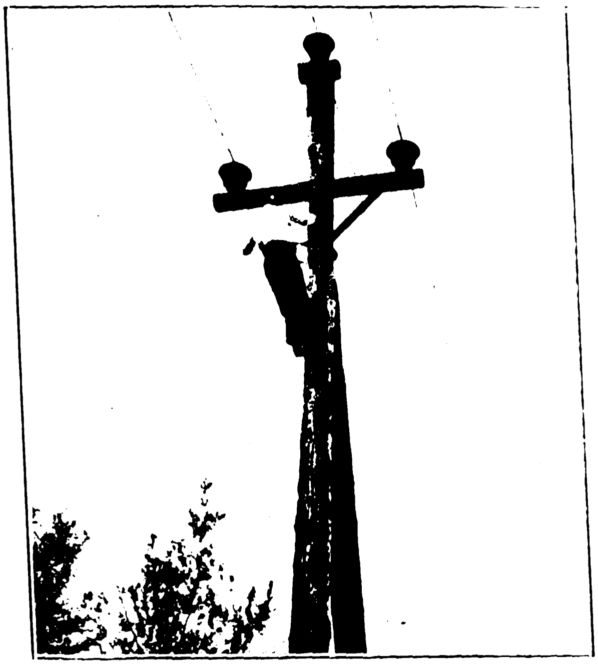
On the system of the Puget Sound Traction, Light & Power Company, of Seattle, Wash., M. T. Crawford, in charge of the transmission lines, has devised a convenient and rapid means for detecting defective insulators. The scheme was outlined briefly at the Pacific Coast meeting of the A. I. E. E. in Spokane, Wash. Recently the porcelain pin insulators used on one of the company's lines began to give a great deal of trouble. Investigation showed that the insulators do not usually have a large radial crack, but that a small crack starts on the head or in the side groove and extends around on the top of the insulator. These cracks enlarge until a leakage current starts through the top two or three shells and discharges over the surface of the lower shell. The tendency of a brush discharge to pass in the positive direction more than in the negative has a rectifying effect on the leakage current. This results in a unidirectional current from the bottom shell to the pin, and signs of electrolytic corrosion of the pinhead in the cement have frequently been found. Once started, this will soon crack the entire insulator, as the high tensile stress put on the porcelain by this internal expan-



TESTING LINE FOR DEFECTIVE INSULATORS

sion will lower its dielectric strength. In many cases insulators have been found which were leaking noisily, and when the line was killed and an examination made the insulator was found intact, although a number of cracks were visible. As soon as the tie wire was removed, however, the entire insulator fell apart.

The expense of replacing all of the insulators was prohibitive, and the practice heretofore was to replace them one by one when the leakage became so great that it could be detected from the ground. As they were at an advanced stage of deterioration before this condition was reached, and frequently failed, causing an arcing ground that punctured other insulators, a heavy charge against maintenance resulted because of the emergency nature of the repair work. In locating defective insulators at first, use was made of a megger, but unless the testing wire was over the leaking crack and this crack extended clear through to the pin, the result was unsatisfactory. After considerable experimenting, a device was perfected by which these insulators could be located at an early stage of the depreciating process. This enabled them to be replaced economically and before they finally broke down and damaged other insulators or interrupted service.



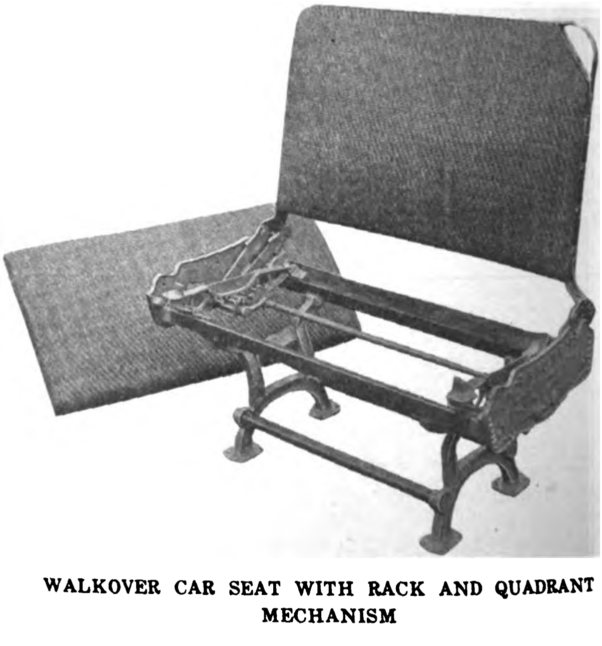
LOCATING DEFECTIVE INSULATOR

The device used for this purpose is shown on page 1065. It consists of a pair of 2000-ohm wireless-telegraph receivers fitted up for the convenience and safety of the inspector in testing. A hand pick is driven into the pole about 7 ft. from the ground, and a pin is driven into the ground several feet from the pole. The receiver set is connected between these two, and if all insulators are sound, there is a clear audible hum of the same tone as the telegraph line due to the shunting of a part of the capacity current of the insulators on the pole top. If, however, an insulator is leaking, a scratching noise is superimposed on the hum which comes and goes as the neutral shifts to and from the wire on the defective insulator. The inspector then climbs the pole and tests between each insulator pin and the center of the cross-arm and thus locates the defective insulator. The device can be used in a similar manner on steel tower lines. Insulators can be found in this way which have started only a very small crack and which will not puncture on the test below 100,000 volts. Insulators with a crack clear around the head were taken off and tested, puncturing at from 60,000 volts to 65,000 volts, but no sound was audible from them while on the line without the use of the detecting set. One or two lower petticoats were usually found intact, the leakage current passing over their surface during the test until the puncture point was reached. In the device used on the Puget Sound lines the hand pick consists of an insulated tube with a sharp-pointed steel terminal on one end which is thrust into the pole or cross-arm. The other terminal, which is driven into the ground or in the pole under the cross-arm in locating the insulator, consists of a sharp steel pin. A fuse and short-circuiting jack with plug on the receiver set is inserted in the circuit if there is any probability of a considerable voltage to ground.

A Cross-Seat with Rack and Quadrant

The name "Triumph" has been given by the United Electric Car Company, Ltd., Preston, England, to a new form of walkover seat, thousands of which have already been bought by several of the larger English tramways. The mechanism for operating the seat back is the special feature, as will appear from the following explanation.

The seat is carried on a tilter with angle corner stops on the upper side in place of the usual dowel pins, thereby permitting the seat to be easily fitted in position, even in the dark. On the bottom of the tilter is arranged a rack, which engages a quadrant carried on a stud. This quadrant is wide enough to engage with another quadrant which is secured on a solid steel shaft. A similar quadrant is fixed on the other end of the shaft and operates a similar mechanism, to insure the travel of the seat in a parallel direction. The back is carried on two short operating levers at each side, one of these levers being fixed to the solid steel shaft, while the other is carried loose on a stud which also carries a quadrant. All the castings are made of the finest malleable cast iron and are set and drilled to jig so that all parts are interchangeable. The seats can be supplied in any type and upholstered in any kind of material. The invention is that of J. E. Anger, manager of the United Electric Car Company, Ltd., and patents have been taken out in England and other countries.



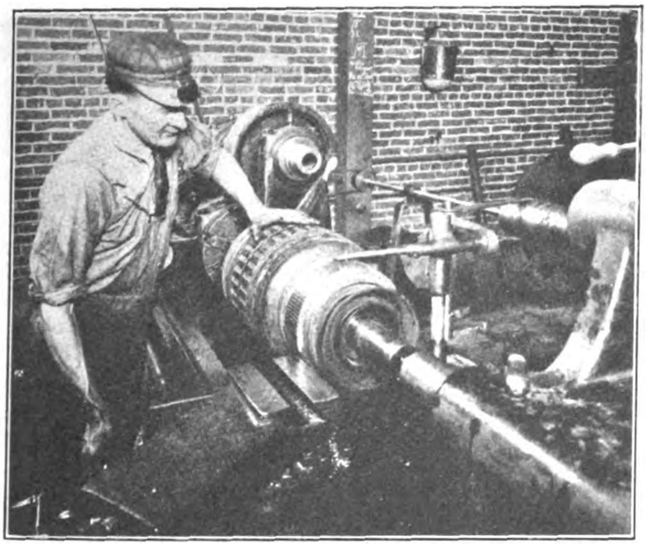
WALKOVER CAR SEAT WITH RACK AND QUADRANT MECHANISM

Actual Uses of a Double-Spindle Lathe

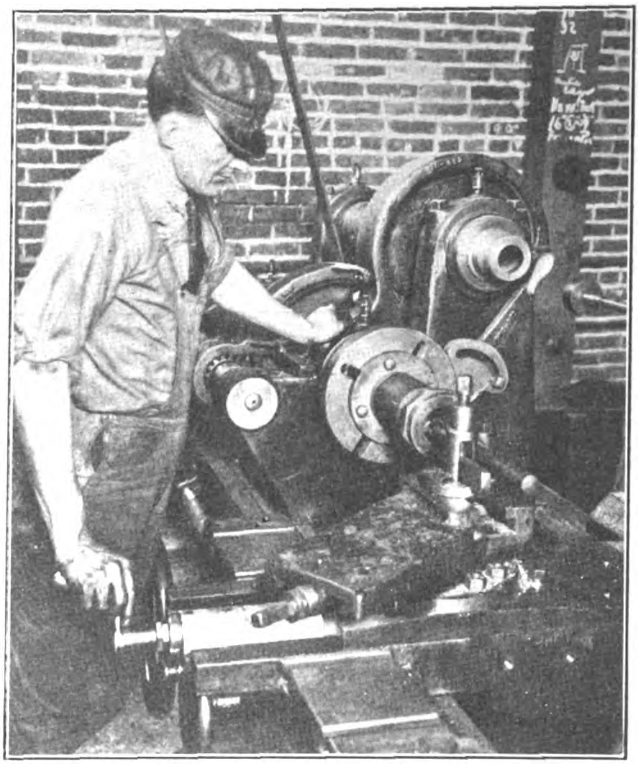
The "2-in-1" lathe with 26-in. back-geared and 48-in. triple-geared swing lathe, made by J. J. McCabe, New York, is a familiar object in many electric railway shops which are not large enough to keep specialized tools reasonably busy. Even the largest companies, however, find good use for this lathe. Thus one of the largest systems in the country uses three as stand-by wheel lathes in addition to handling miscellaneous jobs like the turning of piston rings for the power plants. Some of the possibilities of this machine were revealed recently in visiting one shop in Connecticut and another in New Jersey.

On the Connecticut railway the lathe handles the total repair input of eight sets of wheels a week in addition to a great variety of other work. If used for wheel work alone the lathe can turn out four to five pairs of wheels a day. When used as an ordinary lathe, the large faceplate is removed by means of a block and tackle overhead. This particular lathe is driven by a 7½-hp motor, the control and drive of which embody several commendable features. Thus the lathe movement is controlled from the center of the tool so that the operator does not have to walk over to the motor at the headstock every time he wants to throw the switch. The controller is covered with a wooden casing, which also protects the men from contact with the gearing. Formerly, the circuit breaker was mounted on the motor but it is now mounted on a column because in the old position the jarring of the lathe during the making of heavy cuts sometimes opened the breaker.

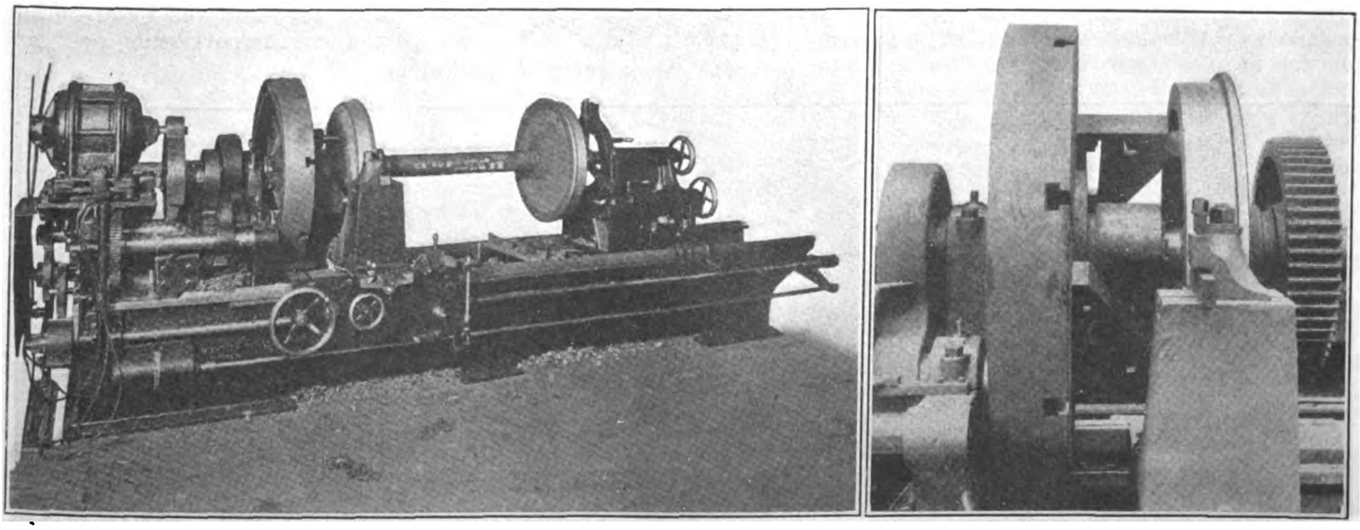
In the New Jersey shop the lathe is belt-driven. It handles anything from the turning of 34-in. diameter steel wheels to the boring of axle and armature housings and compressor cylinders. Among its special applications are threading bolts, making pipe couplings and crosshead keys and boring valve bonnets. This lathe, as adapted for slotting commutators, is shown in one of the illustrations. The frame for the shaft pulleys and idlers of the slotting drive is of heavy bar iron bolted to the base of the lathe. The saw arbor is sleeved on a vertical post with a stop for adjusting it to any desired height. The perfect alignment and the reciprocating movement of the armature are provided by its position in the lathe without the use of extra fittings.



COMMUTATOR SLOTTER ATTACHMENT IN USE ON A DOUBLE-SPINDLE LATHE



DOUBLE-SPINDLE LATHE IN SERVICE FOR THE TURNING OF ARMATURE BEARINGS



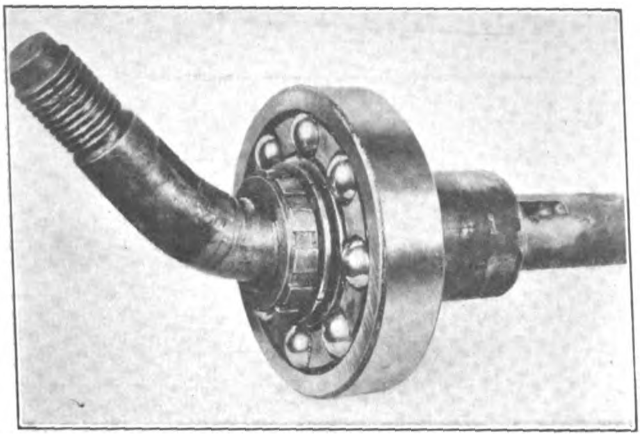
MOTOR-DRIVEN DOUBLE-SPINDLE LATHE SET UP FOR WHEEL WORK; WHEEL TURNING REST AND WHEEL-TURNING ATTACHMENT USED TO INSURE GOOD GRIP AND FREEDOM FROM CHATTERING

The same lathe may also be fitted with an emery wheel to grind flat spots on chilled iron wheels.

The maker calls special attention to the new wheel-turning rest and wheel-holding attachment illustrated in detail alongside the general view of the complete lathe. These changes improve the grip on the wheels, eliminating chattering and insuring uniform cuts.

Strength of Ball Bearings Proved by a Collision—Some Installations

The accompanying illustration is a striking example of what the standard S.K.F. No. 412 size ball bearings, now applied to electric railway motors and car lighting generators, will withstand. This is an armature shaft taken from a car lighting generator which has been in a wreck. The shaft, which was of 1½-in. flanged steel, was bent over the ball bearings as a fulcrum. From the illustration it will be noted that, although there is no crack in the steel at the bend, there is a double wrinkle on the top side, which gives an idea of the great stress imposed upon the ball bearing when the wreck occurred.



SHAFT BENT IN WRECK WITHOUT AFFECTING BALL BEARINGS

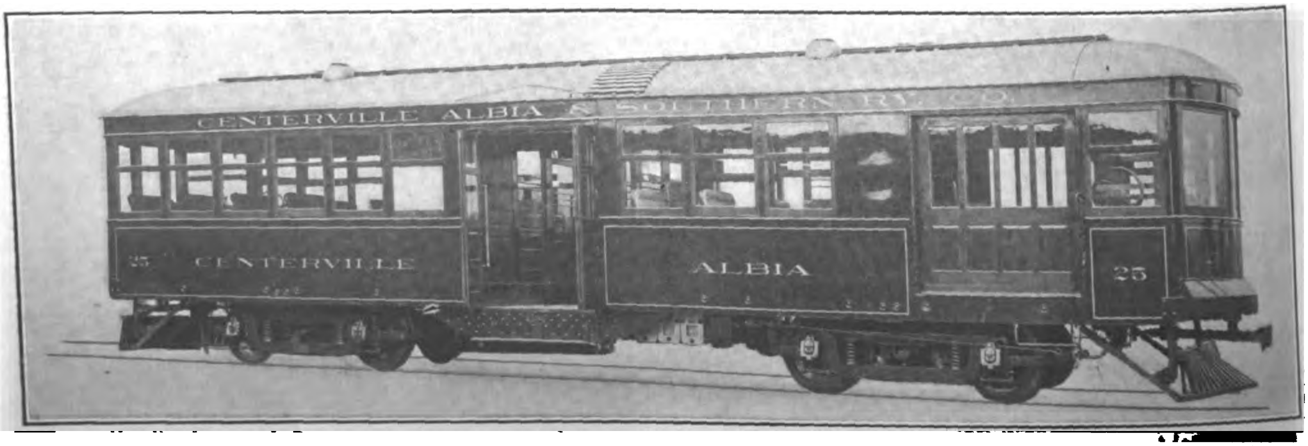
Assuming a strength of 60,000 lb. per sq. in. a force of 23,000 lb. applied 3 in. in from the face of the bearing would be required to bend this shaft. As a matter of fact, each 1-in. ball would stand a crushing load of 97,000 lb. so even under such severe service as a wreck there is a good factor of safety for the ball bearing.

The car to which this generator was applied was a Santa Fé combination coach and mail car. The accident, which occurred on the Colorado Southern Railway tracks in Colorado, was caused by high water. The engine went through a culvert, with the baggage car on top of it and the combination coach and mail car crashing on top of that. The dynamo pulley was entirely broken up, only the hub remaining. The suspension of the dynamo, which was a Bliss type "O," was badly bent, and the generator frame was sprung out of round, so that two of the pole faces bound on the armature, causing trouble in removing it. The armature itself, which was mounted on two ball bearings, was not damaged in the least, and as soon as a new shaft was applied it was ready for service. Neither of the ball bearings showed any effect of their strenuous experience and have been returned to service. Both end housings of the generator covering the bearings were so badly broken that they had to be scrapped.

S.K.F. bearings are in use now on sixty-five cars of the Third Avenue Railway System, New York. Ten storage battery cars were equipped in October, 1910, with both journal and motor bearings, and in June, 1913, the company ordered thirty additional equipments. The excellent service which these bearings have given is emphasized still further by an order placed in September, 1914, for the equipment with journal bearings of twenty-five radial truck low-level trolley cars. The S.K.F. Ball Bearing Company has also recently furnished journal bearings for two Brill storage-battery cars of the Carolina Traction Company, Rock Hill, S. C., and for one Brill storage-battery car of the Cambria & Indiana Railroad, Colver, Pa. The last is a double-truck car operated at a schedule speed of 18 m.p.h., and the weight on the eight journals is fully 56,000 lb.

Combination Passenger and Baggage Side-Entrance Car

The Southern Iowa Traction Company has lately received from the American Car Company two 45-ft. 2-in. arch-roof interurban cars, as illustrated, which are unusual in combining the side-entrance feature with a standard passenger compartment, a smoking compartment and a baggage room. This design is 9 ft. wide over the sills and 9 ft. 4 in. over the trolley boards. A motorman's cab with hinged door is built in at opposite corners of the car. Four-leaf folding doors are used at the side entrance, a single hinged door is installed for each passenger compartment and the usual sliding door is provided for the baggage room except that the upper panels are of clear glass. The car underframe is of steel and wood while the sides are sheathed with steel. Each car is mounted on two Brill 27 M.C.B.-1 trucks equipped with four Westinghouse 323-A motors and K control. Other specialties on these cars are Nichols-Lintern air sanders, Hale & Kilburn reversible seating, Dayton sash fixtures, Ohmer registers and Peter Smith heaters. The two passenger compartments per car seat thirty-eight people.



SIDE-ENTRANCE CAR FOR SOUTHERN IOWA TRACTION COMPANY WITH ONE BAGGAGE AND TWO PASSENGER COMPARTMENTS

LONDON LETTER

Tramway Receipts and Extensions and Parliamentary and Civic Matters Are Reviewed

(From Our Regular Correspondent)

The effect of the war on tramway systems is reflected in the official returns of sixty of the principal tramway undertakings of the United Kingdom for the week ended Sept. 19. The report for this period shows total receipts of £226,838, or £7,747 less than in the corresponding week of last year. Receipts were at the rate of £79 4s. 7d. per track-mile, a decrease of £3 8s. as compared with last year.

The general manager of the Belfast Corporation Tramways has reported that since the outbreak of war the tramway receipts have decreased about £450 weekly, some 130,000 fewer passengers being carried. To meet this decrease he has been taking measures to arrange the tramway service week by week proportionately to the public requirements. He and his committee have received the support of the City Council to the steps so far taken.

The tramways department of the Glasgow Corporation has been able to resume the normal services of cars. Owing to the remarkably loyal response of the tramwaymen to Lord Kitchener's appeal for additional soldiers, the car service suffered considerably from the thinning in the ranks of the staff. In filling the vacancies married men who in ordinary circumstances were not eligible for the new army were selected first. Many of these men have since been trained for tramway work, and a full service is now available.

The Leeds tramways department is hurrying several pieces of work, with the object of providing employment for those who are out of work. The construction of the new tramway line at Guiseley will also be proceeded with, and a start is to be made with the erection of the overhead equipment for the railless cars which will run from the White Cross, Guiseley, through Otley to Burley. It is hoped also to begin the construction of the tramways extension from York Road to Halton.

The Leeds tramways department is hurrying several pieces recommended that the town clerk be authorized to make all necessary preliminary arrangements for the promotion of a tramways bill in the next session of Parliament. It is understood that the bill will include provisions for the extension of the tramways to Elland and to Stainland and for the operation of motor omnibuses to Ripponden and Cragg Vale. It may possibly be proposed to extend the tramways from the center of Brighouse borough to Rastrick. Nearly two years ago the ratepayers rejected a Parliamentary bill for these extensions and some street widenings in Halifax. Since then Huddersfield has taken trams to Elland, and Halifax traders have asked the tramways committee to construct lines to Elland and Stainland.

After a few tri-weekly performances, the experimental electric trolley bus at Hove has been withdrawn. It is understood that the vehicle has served its purpose for the time being. One of the objects of the experimental installation was to ascertain the relative efficiency of the over-running and under-running trolley systems in its bearing upon the scheme prepared by the Brighton authorities for the "through route" service.

As the result of the passing of the Bristol Corporation tramways bill, 1914, the corporation is prepared to work the local tramways if it exercises its power to acquire the property of the Bristol Tramways & Carriage Company. The tramways committee recommends that, before giving notice to purchase, it be authorized to negotiate with the company with the view of ascertaining what rent or other sum the company would be willing to pay to the corporation if the latter agreed to refrain from exercising its option of purchase for seven, fourteen or twenty-one years.

The tramway committee of the Edinburgh Town Council has discussed a draft minute of agreement between the Lord Provost, Magistrates and Council of Edinburgh and the Edinburgh & District Tramway, Ltd., and Dick, Kerr & Company, Ltd. (lessees of the Edinburgh Corporation Tramways). It is provided in the draft agreement that the corporation shall take over the rolling stock, cables and other plant used by the tramway company in working the tramways under the lease and that the tramway company shall sell and deliver the same to the corporation on the expiration of the lease, namely, on June 30, 1919, or at an earlier date if agreed upon between the parties. The tramways company is to continue to maintain and, where necessary, replace the stock during the lease. The price to be paid by the corporation on the transfer of the stock and effects is to be fixed, failing agreement, by an arbiter to be agreed upon between the parties or to be appointed by the Board of Trade. In fixing the price the contingencies of the cable system are to be kept in view, but without any consideration of good-will. It is further provided that the tramway company is to allow the corporation, free of charge, to experiment with self-propelled cars upon such portions of the present tramways as may be arranged between the two parties, the trials, however, to be so conducted as not to interfere with the ordinary working of the system. The tramway company is not to be responsible for any loss or injury through such experiments.

At the last meeting of the Edinburgh tramways committee a proposal was considered for providing a tramway to Queensferry. Two alternative routes are to be considered by a sub-committee.

The London County Council wishes to install the overhead trolley system in two streets in Stepney, but the proposal is opposed by the Borough Council, which desires the underground conduit system. In a report on the subject the works committee states that the Borough Council has most consistently adhered to the opinion that the only system of traction suitable for the two roads is the underground conduit system.

The London County Council has authorized a plan to bring before Parliament proposals respecting the establishment of a new electricity undertaking for Greater London. The details have not yet been submitted to the finance committee, but the draft was sanctioned in order that it may be dealt with without delay by Parliament. The proposals, roughly, mean a combination of municipal and private enterprise designed to insure full control by, and an adequate share of profits to, the public, with the flexibility and commercial enterprise of company management. The best features of both systems of working will thus be retained. The scheme involves the co-operation of the authorities in outer London with the London County Council, but no compulsory purchase of existing undertakings will be entailed.

The London & South-Western Railway has just issued £1,000,000 of preference stock, redeemable in ten years. The proceeds are required for the large electrification scheme which is being carried out on the company's Thames Valley suburban system. When the war broke out a temporary suspension of the work was ordered. The tracks are well advanced and the conductor rails have been laid over many miles of the first section of lines. The high tension distributing cables, carried on brackets on short posts alongside the railway, are also in position for long distances. The generating station, which is being erected at Wimbledon, is nearing completion and should soon be ready for the electrical machinery.

With regard to the extension of the electrical equipment of the London, Brighton & South Coast Railway, much of the electrical material hitherto has been secured from the Allegemeine Elektricitäts-Gesellschaft, Berlin, from which, of course, delivery cannot now be obtained. As is well known, this line has been equipped on the single-phase, high-tension system, the Berlin firm having been the contractors for the electrical portion of the work since the original electrification scheme some years ago. Nothing has yet transpired to indicate that any transference of the contracts for equipment will be made by the London, Brighton & South Coast Railway.

The ceremony of transferring the Kelham Island power station from the tramways committee to the electric light committee of the Sheffield Corporation has been formally carried out. The transfer was made as a result of a recommendation by a joint sub-committee of the tramways and the electric supply committees. All current supplied to the tramway feeders and for Board of Trade requirements, except certain booster units, is to be charged at the flat rate of 0.8d. per unit. This price is subject to a revision at the end of three years, and is based on the conditions already existing at the station and the present system of distribution.

A. C. S.

News of Electric Railways

INDIANAPOLIS LABOR SITUATION

Federal Court Injunction to Prevent Strike on Indianapolis Traction & Terminal Company

Hearings were held in the United States Circuit Court at Indianapolis on Oct. 27, 28 and 29, on the petition of the Guaranty Trust & Safe Deposit Company, Philadelphia, trustee under the mortgage of the Indianapolis Traction & Terminal Company, for an injunction to prevent W. D. Mahon, other officials of the Amalgamated Association and labor leaders in Indianapolis from attempting to induce trainmen to violate the award of the arbitration board made on Feb. 9, 1914, and go upon a strike, and to prevent the men individually and as a body from violating the arbitration award contract. At the close of the hearing Judge Arthur B. Anderson declared his intention to grant a temporary injunction, pending litigation.

A temporary restraining order was issued by Judge Anderson in this case on Sept. 23 when attorneys for the plaintiff appeared in the Federal Court and showed that an effort was being made by officials of the Amalgamated Association from Detroit to bring about a strike that night on the lines of the Indianapolis Traction & Terminal Company in violation of the award contract. This action was referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 3, page 640. Oct. 2 was then set as the date of the hearing, but the case was postponed on request of attorneys for the union.

During the hearing nineteen persons were called as witnesses. The case against the labor leaders was presented in such thorough detail that practically no effort was made by their attorneys to controvert any of the facts by cross-examination of the witnesses, and this was commented upon by the court at the close of the arguments. Ralph Belch, business agent and secretary of the local, admitted on the stand that an affidavit signed by him, stating that twenty men were discharged by the company for the sole reason they were union men, was not true, and he asked the forgiveness of the court. Judge Anderson called the attention of the witness to the penalty for perjury and reminded him that the Federal grand jury met the following week. A long deposition of W. D. Mahon, international president of the Amalgamated Association, containing copies of correspondence between the officers of the local and officials of the Amalgamated Association at Detroit was entered as part of the testimony. It showed that appeals were made for a "leader" to come on and save the situation at Indianapolis, as men were continually leaving the union and signing the company's service contract, until now the company had more than 70 per cent of the men signed up.

The correspondence further showed that since last May plans had been discussed for calling a strike; that they were only seeking an opportune time, and that they now felt their last chance was slipping by. It was further shown that a drastic ordinance which had been passed on Oct. 19, 1914, by the City Council of Indianapolis, providing for thirty days' instruction for new motormen and conductors on both city and interurban cars by men who had been in the employ of the company at least one year, and providing a penalty of $300 a day for each man allowed to operate a car in violation of the ordinance, was prepared by Secretary Reeves of the Amalgamated Association at Detroit and sent to the local officers of the union to have put in shape by their attorneys and passed by the Indianapolis City Council. Mr. Latta, attorney for the plaintiff, showed that in the case of a strike it would have cost the company in penalties $100,000 a day to operate its cars, under the ordinance. This ordinance has since been vetoed by Mayor Bell of Indianapolis.

Edward McMorrow, member of the executive board of the Amalgamated Association, admitted that he called on the various labor leaders in Indianapolis and that he was to address the men at the midnight mass meeting on Sept. 24 which was interrupted by a United States marshal serving notice of the restraining order. He said to the men at the meeting that "there were some things I had intended saying which I can't now talk about." Being questioned by the court as to what they were, he declared they were in reference to the "wonderful benefits of membership in the Amalgamated Association, its insurance benefits, and many things too numerous to mention." Judge Anderson later remarked that there was no question but that Mr. McMorrow had intended to talk about a strike and nothing else. Mr. McMorrow admitted that he had advised the renting of vacant houses or other property adjacent to the carhouses for use as headquarters for bodies of men in case of a strike.

W. D. Mahon followed Mr. McMorrow as a witness. He admitted sending Mr. McMorrow to Indianapolis and that Mr. McMorrow reported to him and six members of the executive board at Chicago on Sept. 20. Mr. Mahon's testimony showed that the 50 per cent of the dues from the Indianapolis local received at Detroit had decreased from $626.50 in November, 1913, to $343.50 in September, 1914. During that time $9,000 had been expended on the Indianapolis local.

The question of the company's service contract was one of the principal subjects of argument. The attorneys for the union had filed with their answer a cross-bill asking for injunctive relief against the Indianapolis Traction & Terminal Company in what they claimed was a violation of the arbitration award contract. It was shown by Mr. Winter, counsel for the plaintiff, that as this cross-bill was brought by a co-defendant to a suit it had no validity whatever and could not be considered. The court expressed willingness to hear any evidence which might show that the individual or "service contract" was in violation of the award contract of the Public Service Commission, but attorneys for the Amalgamated Association said they did not care to submit any evidence but would argue the case.

The service contract was a result of the award of the Public Service Commission of Feb. 9, 1914, which contained a provision that each motorman and conductor should be permitted and required to be off one Sunday in each month, and that they should be permitted and required to have eight consecutive hours' rest between runs. The award also provided a minimum wage of $45 a month for extra men. Under these conditions the company found it impossible to take care of the extra baseball, park and theater travel on Sundays and holidays. The company therefore drew up a contract substantially in the same form as the arbitration contract, but with provisions which permitted car service men who signed this contract to work during all Sundays if they so desired, and providing eight hours rest in each twenty-four hours, but not necessarily eight consecutive hours between runs if the public service should at times prevent it. All the non-union men signed this contract and also many of the union men. In fact about 70 per cent of the men became parties to the modified contract. Officials of the Amalgamated Association had sought before the arbitration board, consisting of three members of the Public Service Commission of Indiana, to prove that the service contract was invalid and conflicted with the award contract in the agreement as to working conditions. The arbitration board held that the contract was valid in all provisions in which it did not conflict with the award contract, and that if the company succeeded in getting all the signatures of the employees to the service contract that instrument would then become effective in all particulars.

Judge Anderson, in the injunction hearing, held that the company was not in any way violating the award contract by securing signatures to the service contract, and that it was his opinion that the men who had not signed the service contract could not in any way interfere with those men who had signed it enjoying the privileges it provided; that it was very evident that the company could not secure all the names at once, and the fact that it had already secured 70 per cent, and was still continuing to secure signatures was very much in the favor of the company and could not be criticised.

Mr. Latta, in summing up the case for the plaintiff, asked the labor attorneys if they intended to rely on the Clayton bill in seeking to defeat the granting of an injunction by the court. Upon an affirmatory answer, Mr. Latta argued that the Clayton law was not applicable in this suit, quoting from Section 20, which provides that no judge may grant an injunction or restraining order in cases "between an employer and employees, or between employers and employees, or between employees, or between persons employed or persons seeking employment, involving or growing out of a dispute concerning terms or conditions of employment, unless necessary to prevent irreparable injury to property, or to property right, of the party making the application, for which injury there is no adequate remedy at law." It was shown that the plaintiff, the Guaranty Trust & Safe Deposit Company, is in none of the positions set out in the law, but is in the position of third party holding rights under a contract. The rights of the bondholders are involved, and there could be no adequate remedy at law because the Amalgamated Association (not being an incorporated body) and the other parties set out in the complaint could not make reparation for the damages set out as about to be sustained. Mr. Latta pointed out the unconstitutionality of the Clayton bill, in that under the constitution Congress has no authority to take away the power of the Federal Court, and it follows of necessity that Congress cannot take away the means of enforcing the power held by the court under the constitution. Judge Anderson in the remarks which he made following the argument concurred in this opinion.

Mr. Esarey, attorney for the Amalgamated Association, sought to show that the Federal Court could not enjoin further proceedings in the suit for receivership in the Marion County Circuit Court, in which William Dobson, secretary of the Bricklayers, Masons and Plasterers Union, is seeking to have the lease of the Indianapolis Street Railway to the Indianapolis Traction & Terminal Company cancelled. It was shown by depositions and testimony that five shares of stock were purchased by Mr. Dobson, after conference with labor union leaders, at the time of the strike in November, 1913, and the suit was brought and has been maintained in court for use in case of another strike, "to force the company to come to terms." Judge Anderson interrupted Mr. Esarey's argument by saying that such a suit could not be upheld in any court, and that he would not take time to discuss the matter, but that if he should think it necessary he would enjoin any such proceedings, and that it was his intention to issue such an injunction as would prevent "the raiders from the north—these citizens of Detroit" from interfering with the affairs of the company in Indianapolis.

Judge Anderson took exception to the closing argument of Frank S. Roby, one of the attorneys for the Amalgamated Association, in which Mr. Roby asked for an injunction against the company, intimating that such a decision should be made in answer to a demand by public opinion if an injunction was also issued against the men striking. The court said that if public opinion was represented by Mr. Roby it was founded upon a misapprehension so far as the evidence before him showed. "I think it is about time for us to take stock in the facts and not indulge in too much loose talk about public opinion," said Judge Anderson. "If I were manager of a property, I would discharge any man who stole from us; I would discharge a man if he got drunk; I would discharge a man for disobeying or violating rules—and the fact that he was a union man would not affect it at all." He said that the uncontradicted evidence showed that no man was discharged because of his union affiliations, and none was reinstated because he dropped out of the union. He said that the defendants themselves admitted that their charges to the contrary were untrue.

The temporary restraining order was then extended by the court for ten days, in order that attorneys for the defense might be given an opportunity to file briefs in connection with their cross bill for an injunction to prevent the company from putting its service contract into effect before it has secured the signatures of all the employees.

INJUNCTION GRANTED IN FRANCHISE CASE

The South Covington & Cincinnati Street Railway has been granted a restraining order by Judge A. M. J. Cochran of the United States Court at Covington, Ky., against the city of Covington to prevent its accepting bids for a new franchise over its streets. The court holds in short that the South Covington & Cincinnati Street Railway has a perpetual franchise in the streets of the city. While the order was not made permanent, it is believed that the final decree will not be different.

The movement to receive bids for a new franchise on the streets was inaugurated by former City Solicitor S. L. Blakely in behalf of the General Council and the company, in order to protect its rights, asked for an injunction. It asserted that receiving bids would work irreparable damage to its interests, cause the destruction of its rights and that it would be deprived of its property without due process of law.

The company contended that it owns a perpetual franchise on all the streets occupied, with the exception of the Rosedale line, and that the ordinance of 1864, limiting the street railway franchise granted thereunder to twenty-five years, was not of a general nature and applied only to the Covington Street Railway, which was referred to in the ordinance. When Council, therefore, enacted the ordinance of 1869, giving Mr. Abbott and others the right to construct and operate a railway on certain streets and made no mention of a date of expiration, with the exception of the statement that the grant shall terminate upon the failure of the company to construct its lines and operate its cars or fail to pay the annual stipend, it was the intention that no limit should be placed upon the right as long as these requirements were complied with fully.

Judge Cochran said that it is not necessary that the grant should state in so many words that it is perpetual. Among other things he said:

"Both in the ordinance of Dec. 13, 1869, and the contract of Dec. 23, 1869, made pursuant thereto, it was provided that the defendant (the city of Covington) granted Abbott and associates 'all the authority and right' that it had 'the capacity to grant.' We have seen that it had the capacity to grant to them a perpetual franchise. The provision, then, that there was granted all the authority and right that the city had the capacity to grant was the same as if it had said in so many words that it granted the perpetual franchise. The English language is not so poor that the same idea cannot be expressed."

The court further said that in 1882 the city granted the South Covington & Cincinnati Street Railway a franchise expressly stipulating that it was to operate under the Abbott grant.

NEW KANSAS CITY STATION OPENED

Kansas City's new Union Station was formally opened to traffic at 12:01 o'clock the morning of Nov. 1. A celebration was held on Oct. 30 and 31 which brought many thousand visitors to the city over the railroads and interurbans, and resulted in local traffic over the Metropolitan Street Railway which perhaps established a record. A feature of the celebration was an industrial parade by local manufacturers, with nearly 150 floats. The operation of cars on streets in the business district was suspended during the parade.

Some of the reroutings due to the opening of the station began Friday with the passing of one line through the station grounds. A new line was started which is called the station loop line. Other reroutings were established Sunday. These reroutings are the result of study by the members of the board of control, and were suggested by them to the receivers, who issued the order for the rerouting. The new schedules had to be approved by the City Council, and this formal action was taken before the station was opened.

The subject of handling mail in and out of the new station was not decided upon until Oct. 29, when the Metropolitan Street Railway and the Terminal Company finally got together on the details of an agreement for tracks for mail cars on the station grounds.

The Metropolitan Street Railway will probably use a temporary structure on or near the present Central Avenue bridge and viaduct, while the new viaduct is being constructed. This structure is part of the elevated railway system and provides a shorter route than the surface line between Kansas City, Kan., and Kansas City, Mo. Efforts had been made to induce the company to use the long inter-city viaduct, over which street cars have not been run for several years. It is reported that an interurban line may possibly use the inter-city viaduct.

An interesting feature of the rerouting in Kansas City is that the Independence line of the Metropolitan Street Railway will run on Twelfth Street to and through the business district. This is the first time that Twelfth Street, one of the main east and west arteries, has ever carried any other than the Twelfth Street car line, and it is the only downtown street that, except for a block or so, has been devoted to a single line. This routing puts the Independence cars through the south edge of the office and shopping district, while most of the non-Metropolitan interurbans pass through the office and shopping district north and south.

PUBLIC RELATIONS IN OKLAHOMA

The following editorial complimentary of the Oklahoma Railway, Oklahoma City, Okla., was published recently in the *Daily Oklahoman:*

"Hundreds of visitors during the State Fair period have had occasion to appreciate the kindly courtesy of street car men. Motormen have been careful to watch for belated, hastening passengers and have not followed the Eastern custom of 'failing to see' some breathless runner only a short distance out of line.

"Implicit confidence has been reposed by scores and scores of passengers in the street car conductors of Oklahoma City's lines, and they have not been betrayed. They have relied upon the car men to notify them when they reached certain streets, to direct them how to get to various points, to inform them of this and that, which, in reality, is no part of the conductor's duty except in the first-named instance.

"Little neglect or forgetfulness has been apparent on the part of conductors during this rather strenuous period, and Oklahoma City owes quite a debt of gratitude to the street car men for assisting in impressing upon strangers this city's reputation for hospitality. Politeness and acts of accommodation pay. And because some have been thoughtless of the courtesy extended them by the street car men we take this occasion publicly to express appreciation of it."

Following the publication of the editorial the company through George W. Knox, vice-president and general manager, caused the following notice to be posted:

"ATTENTION BOYS!

"Does It Pay to Be Courteous?

"Here is an unsolicited editorial which was in this morning's *Oklahoman*, and is a direct result of our talks on courtesy in our trainmen's meetings and your response and efforts toward promoting courtesy and good-will to the patrons of this road.

"You should appreciate this editorial and I want you to know that this company appreciates it and your efforts in bringing about conditions which prompted the writing of this article, as it means so much to you and to the Oklahoma Railway, namely, to have the kind consideration and friendly feeling of the people with whom you are dealing.

"Keep up the good work and still greater reward will be yours."

CLEVELAND RAPID TRANSIT RAILWAY FILES $50,000,000 MORTGAGE FOR RECORD

A mortgage for $50,000,000 in favor of the Central Trust Company, New York, was filed at Cleveland, Ohio, on Oct. 23 by the Cleveland Rapid Transit Railway. This is the first step toward financing the proposed underground railway in the city. W. R. Hopkins, president of the company, said that the present ordinance calls for the construction of a line east from the Public Square and another west, as soon as the high-level bridge across the Cuyahoga River will permit operations. The first funds derived from the sale of the bonds secured by the mortgage will be devoted to the construction of these two lines. Stock of the company will also be sold and the proceeds devoted to the same purpose.

It will be necessary to have the franchise ordinance amended in order to carry out the plans. It is now proposed to make the tube 12.6 ft. high and 21.8 ft. wide instead of 8 ft. high and 13.2 ft. wide, as originally designed. It will accommodate surface and interurban cars, under the modified form, while as originally designed only the Du Pont type of underground car could be operated. Two of the interurban lines leave the city on the east side and two on the west. While definite statements have not been made in regard to them, the subway would undoubtedly offer them an excellent means of increasing their running time between Cleveland and other points.

W. F. Thompson, president of the City Council, favors a liberal franchise to the company, but believes that an entirely new grant should be made if the city is to be asked for changes in the original grant. He also believes that the company should furnish the city with a certified check for a substantial amount as a guaranty that the company will begin the work within a specified period and will comply with the terms of the ordinance in other respects. The first grant to the company was made under the administration of the late Tom L. Johnson in 1908. Later the ordinance was modified to give the company an extension of time within which to commence work. Other changes will now be requested.

DECISION OF PITTSBURGH ARBITRATORS

The decision of the arbitrators in the wage dispute between the Pittsburgh (Pa.) Railways and the motormen and conductors employed by the company was handed down late on Nov. 2. An adverse decision to the employees was made by the arbitrators, Congressman Stephen G. Porter, representing the men, dissenting from the joint opinion of Judge Joseph Buffington of the United States Circuit Court of Appeals, who was the third arbitrator, and Attorney James C. Gray, representing the company.

The employees wanted a flat wage rate of 35 cents an hour instead of wages based on the length of service. The present rate is 23½ cents an hour for the first six months, 26 cents for the second six months, 26½ cents for the second year, 28 cents for the third year, 29 cents for the fourth year and 30 cents an hour for the fifth year and thereafter. All the points of contention of the employees were refused. In the matter of Sunday pay, both the company and the employees were refused, the company having asked for a decrease and the employees for an increase in wages. The present Sunday wage rate will be continued.

The wage question has been up for settlement in Pittsburgh since last spring.

NEW HAVEN DIRECTORS INDICTED

Twenty-one directors, past and present, of the New York, New Haven & Hartford Railroad were indicted on Nov. 2 by the Federal Grand Jury for conspiracy to monopolize interstate commerce by acquiring the control of practically all the transportation facilities of New England. This is the result of the government investigation of New Haven affairs which has been in progress for more than a year and which, as regards the civil aspect of the case, was settled by a decree to which both sides agreed before it was presented for Judge Mayer's signature two weeks ago. Charles S. Mellen, formerly president of the company, who was the chief witness before the Grand Jury and thus gained immunity, was not indicted. The defendants named in the true bill were William Rockefeller, George Macculloch Miller, Charles F. Brooker, William Skinner, D. Newton Barney, Robert W. Taft, James E. Elton, James S. Hemingway, Lewis Cass Ledyard, Charles M. Pratt, A. Heaton Robertson, Frederick F. Brewster, Henry K. McHarg, Edward D. Robbins, Alexander Cochrane, John L. Billard, George F. Baker, Thomas De Witt Cuyler, Theodore N. Vail, Edward Milligan and Francis T. Maxwell. Nearly fifty men, some of whom are now dead, were mentioned in the indictment as having conspired with the twenty-one, although they were not indicted. The indictment was handed up in the morning to Judge Foster, who was sitting temporarily in the Federal District Court in New York, Assistant Attorney General Frank M. Swacker,

R. L. Betts, and James W. Osborne were present for the government, and Mr. Osborne asked that bench warrants might issue immediately for the defendants. This was ordered by the court, and the federal officials immediately began to notify the defendants who were in the city. On Nov. 6 only three of the indicted men had not yet appeared before the court to enter pleas. They were Messrs. Cuyler, Elton and Brooker. Interest centered in the appearance of William Rockefeller on Nov. 5.

State Utilities Board Appointed in Maine.—Governor Haines of Maine on Oct. 30 appointed Benjamin F. Cleaves, Biddeford, William B. Skelton, Lewiston, and Samuel W. Gould, Skowhegan, as member of the Board of Public Utility Commissioners created by a new law. All three of the men are lawyers.

Barcelona Development Plans.—It is reported that the construction work of the Barcelona Traction, Light & Power Company remains at a standstill because of the inability of the French bankers to continue payment upon securities underwritten shortly before the war broke out. It is said there is a market in Spain for all the power the company can produce, even under present conditions. The main construction of the company, however, is hung up because of the lack of funds.

Another Pittsburgh Subway Franchise.—Another subway ordinance has been presented to the City Council of Pittsburgh, Pa. The new measure provides that the downtown terminus of the proposed subway be at least as far west as Ferry Street and the eastern terminus as far east as Kelly Street. The route would be through the Oakland district, or, if not, there would be a spur run into Schenley Park and near-by territory. The ordinance has been referred to the committee on surveys.

Communication of Toledo League to the Council.—The City Council of Toledo, Ohio, received a communication from the Municipal Ownership League recently urging that all negotiations with the Toledo Railways & Light Company be abandoned and that legislation be enacted looking toward the acquirement of the company's property by the city. The league contends that the remaining franchises held by the company expired on Nov. 7, 1914. The letter has been referred to the committee on railroads and telegraphs of the Council for consideration.

Loyal Railway Purchase Negotiations.—A committee comprising Councilmen Cooley, Haas, Hesketh, Marble and Lundy and Superintendent of Public Utilities Valentine of Seattle, Wash., has been appointed by the city utilities committee of the City Council to confer with Harry Whitney Treat in regard to purchasing the Loyal Heights Electric Railway, owned by Mr. Treat. The property has been offered to the city for $80,957, which Mr. Treat asserts he has invested in the property. Mr. Valentine has estimated that the line could be duplicated for $53,366. If the City Council should decide to purchase the line it will be made an adjunct to the Seattle Municipal Railway.

Mexican Operators Embarrassed.—The syndicate, headed by Dr. F. S. Pearson, New York and London, which owns the electric tramways in the city of Mexico and the hydroelectric plant at Necaxa, and the lighting and power system of the capital and other cities, has been greatly embarrassed in the conduct of its business by the attitude displayed toward its interests by the Constitutionalist government. A few weeks ago when the demand of the Mexican employees of the tramways for a 100 per cent increase in wages was not granted, General Carranza ordered the federal district authorities to take over and operate the property pending a settlement of the trouble between the men and the management. No settlement has yet been reached and the government is still operating the lines.

Public Relations in Las Vegas.—W. P. Southard, manager of the Las Vegas (N. M.) Transit Company, has been unanimously re-elected president of the Commercial Club of that city. In commenting upon the election, the Las Vegas *Optic* states that "during the twelve months in which he has been at the head of the Commercial Club, Mr. Southard has accomplished more for the club than has anyone ever before during the period of the club's existence." In placing Mr. Southard in nomination, speakers of the evening gave him unstinted praise for his great work in promoting the interests of the organization. It is the policy of the Federal Light & Traction Company, which controls the property at Las Vegas, to urge its representatives to take an interest in the affairs of the cities in which the company operates.

Intra-Mural Railway at Exposition Under Construction.—A shipment of rails and ties for the miniature railway at the Panama-Pacific Exposition, San Francisco, Cal., has arrived on the grounds and about fifty men are at work grading and laying track. Although the locomotives and other equipment, except in the interior of the cars, as described in the ELECTRIC RAILWAY JOURNAL of June 13, 1914, are just one-third standard size, the system is expected to handle a great volume of traffic across the grounds. The gage is 19½ in., and cars 20 ft. long have been built with seats for twenty passengers. With ten cars per train and eight trains in operation, the maximum operating capacity of the system will be 1600 passengers. Conforming to speed regulations, the trains will make about 10 m.p.h. between stations, of which there are to be seven, including three terminals, for which elevated tracks, train sheds and turntables are being built.

City Checks Chicago Elevated Railroad Valuation.—A new appraisal of the Chicago elevated railroad properties, ordered by the local transportation committee of the Chicago City Council as a preliminary to reopening negotiations for a merger of the surface and elevated lines, is being conducted by the department of public service. In connection with this valuation Montague Ferry, commissioner of public service, has undertaken to determine the value in dollars and cents of the franchise of the elevated railroads. In all its dealings with the traction companies, the local transportation committee has never recognized franchise or other intangible values. In a statement regarding what the franchise value might be, Commissioner Ferry said that he had as yet not reached a definite conclusion. It is understood that as soon as these valuation figures have been completed negotiations will again be resumed for the merger of the elevated and surface lines with a one-city, one-fare offer as the basis.

St. Louis Bridge Franchise.—Mayor Kiel of St. Louis says that he will sign the repeal of the Lorimer-Howe franchise which the City Council has already passed and which the House of Delegates is now about to approve. "Jep" Howe, a former "boss" in St. Louis has admitted to W. C. Niblack, receiver for the LaSalle Street Trust & Savings Bank, Chicago, William Lorimer's defunct banking institution, that he received $300,000 of the bonds of the Southern Traction Company as attorney's fees for assisting the passage of a franchise through the House of Delegates and the City Council of St. Louis and that the bonds were pledged when the LaSalle Street Trust & Savings Bank went into the hands of a receiver. Mr. Howe now demands the return of the bonds by the receiver. Three times the people of St. Louis have refused to vote a bond issue to build an eastern approach to the municipal bridge, on the grounds that no one company had an exclusive right to the use of the bridge.

Investment Bankers of America.—The third annual convention of the Investment Bankers' Association of America will be held at the Bellevue-Stratford Hotel, Philadelphia, on Nov. 12 and 13. President George B. Caldwell will call the convention to order at 10 o'clock Thursday morning. A considerable part of that day will be devoted to reports of officers and committees. In the afternoon Howard S. Graham, president of Graham & Company, Philadelphia, will discuss the 5 per cent railroad rate case and Sir George Paish will talk on the English moratorium. Friday will be devoted to a number of important addresses by prominent financiers, the election of officers closing with a banquet. The addresses include: "An Equitable Solution of Our Public Utility Problems," by Andrew J. Frame, president of the Waukesha National Bank, Waukesha, Wis. "Railroad Maintenance and Depreciation," by William H. Coverdale, president of William H. Coverdale & Company, Inc., New York, and "The Federal Reserve Bank and Its Effect on Investment Securities," by H. Parker Wills, secretary of the Federal Reserve Board, Washington, D. C.

Bay State Street Railway Wages to be Arbitrated.—Negotiations between the employees of the Bay State Street Railway, Boston, Mass., and the company have resulted in an agreement to arbitrate wages. The usual method of selection will be followed, the company and the men naming one arbitrator each, the third being chosen by the two thus named. The company offered the platform men an increase of half a cent an hour for the first year under the desired new agreement and an additional half cent an hour for the second year, the graduated scale, which requires a man to work seven years to obtain the maximum rate, remaining the same. A further guarantee was offered to extra men of at least a five-hour work day. The present scale of wages is 24 cents an hour for the first year, 25 cents for the second, 26 cents for the third to fifth years inclusive, 27 cents for the sixth and seventh years, and 28 cents thereafter. The present agreement expired on Oct. 1. In the negotiations preceding the making of the arbitration agreement, the company refused to reduce the hours of the shopmen and the employees in other departments from ten to nine a day. The company also refused to grant shopmen an increase in wages at this time.

Public Relations in Meridian.—The Meridian *Star* recently contained an illustrated description of the activities of the Meridian Light & Railway Company, Meridian, Miss. The sub-title to the article was "A public service corporation that has won the good-will and consideration of the community in which it is operated through its liberal, fair and equitable treatment of the public and efficiency of its service in every department. An important factor in the growth and progress of Meridian, the metropolis of Mississippi." The article concluded with the following tribute to the management of the company: "A distinguishing characteristic of this operation is the recognition which it constantly manifests, of its identity with the city in which its operations are conducted and the unity of interests that subsists between it and the people whom it serves. No movement of any kind is inaugurated in the name of progress for material, moral or social advancement that it does not give hearty and generous support, while its service is constantly laid under contribution in behalf of some worthy cause or occasion that needs it. It is, essentially, and logically, a city builder, it realizes that its profits and prosperity depend upon the growth of the city and a constant increasing demand for the utilities which it supplies. Moreover, it understands that its best asset lies in the good-will and the approval of this public, and that to secure these an efficient and adequate service in every department of its activities must be maintained, while justice, consideration and right treatment must govern its relations with every patron."

PROGRAM OF ASSOCIATION MEETING

Central Electric Railway Association

The program has been announced for the meeting of the Central Electric Railway Association, which is to be held in Fort Wayne on Nov. 19 and 20. This meeting will be preceded by a meeting of the executive committee on the evening of Nov. 18. The meeting of the Central Electric Traffic Association will be held on Nov. 19. The program for the meeting of the Central Electric Railway Association is as follows:

Nov. 19

Report of standardization committee, by R. N. Hemming, chairman, superintendent of motive power of the Union Traction Company of Indiana, Anderson, Ind.

Paper, "Treatment of Ties or Wood Preservation," by W. F. Goltra, president of the W. F. Goltra Tie Company, Cleveland, Ohio.

Paper, "Inter-Mating Tool-Steel Pinions with Untreated Gears," by E. S. Sawtelle, assistant general manager of the Tool Steel Gear & Pinion Company, Cincinnati, Ohio.

Nov. 20

Paper, "Interurban Headlights," by J. W. Esterline, president and general manager of the Esterline Company, Indianapolis, Ind.

Paper, "Oxy-Acetylene Welding," by H. E. Smith, engineer of the Prest-O-Lite Company, Indianapolis, Ind.

Paper, "Selection of Railway Equipment," by J. F. Layng, engineer of the General Electric Company, Schenectady.

Financial and Corporate

CONDITION OF THE COUNTRY

Many auspicious events have marked the operations of the financial and money markets during the last week. The deficiencies in cash reserves registered each week since the outbreak of hostilities have been wiped out, and sterling exchange rates have actually been brought down below the gold export point. Moreover, with the end of the British moratorium outstanding credits in our favor have been released and the exchange market is again in equilibrium. These are not the only causes of optimism, however, on the part of commercial representatives. The promised opening of the federal reserve banks on Nov. 16 will place at the command of industry and trade hundreds of millions of dollars. Foreign orders for American products continue to pour in, and large credits have been established with New York bankers by foreign interests to support their purchases. Exports, while much behind last year, are showing monthly increases, and a balance of trade in our favor is being accumulated which should relieve the effect upon foreign-held American securities when the stock markets open.

An interesting analysis of this whole situation, although at first glance pessimistic, has just been made by Wm. Morris Imbrie & Company, New York. According to this banking house, a decline in business in September as compared to the corresponding period for last year, was shown in the following cases: New buildings, total bank clearings, bank clearings excluding New York, failures, imports and exports of merchandise, balance of trade, railroad earnings, New York deposits, new securities issued, gold production and idle cars. Offsetting this poor showing, however, are the facts that in commodity prices and New York bank loans there was an active business as compared to last year, that crops and production have increased and that railroad earnings, money in circulation, New York bank loans and deposits, exports and the balance of trade exhibit more favorable results for September than for August of this year. These increases for September may be taken as indicative of the more extended improvement that took place during October and will develop even more so now. The condition of business is still not satisfactory, but there is at least ground for increased cheerfulness.

STABILITY OF UTILITY EARNINGS

S. R. Bertron Finds Gratifying Stability of Such Earnings Under Conditions Caused by the European War

S. R. Bertron, of Bertron, Griscom & Company, New York, in speaking of present conditions to a representative of the ELECTRIC RAILWAY JOURNAL, said that the stability in earnings of public utility corporations is a gratifying, although not an unexpected, element in the situation.

"We believe that public service company securities are the best that we can offer to our customers where the companies themselves have good franchises and are well managed," said Mr. Bertron. "They supply public necessities at a minimum cost under special franchise requirements, and every dollar of revenue is received in cash. There is less shrinkage in income in properties of this character in bad times than in any others that we know. Even under the present depressed conditions the earnings of most electrical central stations and gas companies are ahead of last year, while street railways show only a very small shrinkage from last year, varying from 1 per cent to 4 per cent. Up to the present the lighting companies in which we are interested show an average increase in gross earnings over last year of about 6 per cent and the street railways about three quarters of 1 per cent. The net result is that, instead of showing a normal increase in business, public service companies as a whole show some increase, even though a small one."

Mr. Bertron, when asked about the effect of the conditions arising from the European war upon capital expenditures of public service properties, said:

"The companies which we represent spend normally about $7,000,000 annually in new capital. On account of the difficulty of raising new capital now, expenditures of this character are being made only in necessary cases. Just when this policy will change depends upon financial conditions here. It is not necessary to assume, and we do not conclude, that we shall need to wait until the end of the war before undertaking new financing. It is probable that before the war is over financial conditions will permit the resumption of something like normal extensions.

"As business becomes adjusted to conditions and as the new currency act produces the promised release of a large volume of funds, and as economies of the people generally begin to tell in increased bank balances, the result should produce more comfortable rates for money. There are indications now that we are gradually approaching that stage of the situation. The improvement of conditions in the South resulting from the extension of credits now promised by bankers to the cotton growers will be a material factor and a favorable factor throughout the country at large."

Mr. Bertron was asked how he regarded present conditions as compared with those experienced in 1907.

"I am not sure," he said, "but that public service companies are in better shape now for the reason that conditions which preceded the panic of 1907 were very different from the conditions which preceded the outbreak of the war this year. Prior to 1907 general business of this character had been exceedingly active and was so up to the time of the panic, and the companies were expanding in full expectation of a continuance of prosperity and favorable markets for securities. At this time, however, on account of the lessened activity in general business and the depression throughout the country, public service properties were not making normal extensions and improvements at a normal rate. Consequently their construction operations did not have to be curtailed suddenly to as great an extent as was the case seven years ago."

INTERVIEW WITH MR. SCOTT

Holton H. Scott, president National Electric Light Association and general manager Doherty Operating Company, New York, gave some interesting views on the business situation in an interview this week with a representative of the Electric Railway Journal. The operations of Mr. Scott's company extend over sections in all parts of the United States except the Pacific Coast, and it tries to keep closely in touch with general business conditions in the communities served. Mr. Scott said that the Southern States dependent upon the cotton industry directly feel present conditions more than do other parts of the United States, with the possible exception of the districts dependent upon the oil market, but conditions for both are reflecting the improvement resulting from the marketing of part of their products.

Mr. Scott had just returned from a trip to Oklahoma, Kansas and other Middle Western states. Except in certain parts of Oklahoma directly affected by the oil market, he found things normal. In fact, Kansas and the other largely agricultural states seemed to be very prosperous and the people were decidedly optimistic. In Ohio, where his company operates several public utilities, large steel works were under construction in Warren and Massillon when the European war broke out. In spite of this, however, work on these new factories has been continued without a break. Many of the manufacturing towns in Ohio are operating, at least up to this date, at their normal capacity. Mr. Scott spoke as if the greatest amount of pessimism seen by him was found in New York.

He said, referring particularly to lighting companies, that public utilities have been affected by present conditions. Yet there are so many fields for enlarging the use of gas and electrical energy that, even if the increment of increases is reduced, the general average gross and net earnings should continue to increase. Many central station companies are curtailing construction expenditures and endeavoring instead to increase their business without extending their lines and enlarging their power stations, which will eventually be reflected in renewed prosperity and increased sales of appliances by manufacturers and jobbers.

In conclusion, Mr. Scott said that he had had occasion during the last few months to come into contact with many heads of electric lighting companies, and these men, instead of being pessimistic, are confident that the present disturbed conditions are being rapidly readjusted.

ANNUAL REPORT

Boston & Worcester Electric Companies

The comparative statement of income, profit and loss of the Boston & Worcester Electric Companies, Boston, Mass., for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Income:		
Dividends on Boston & Worcester Street Railway shares owned	$55,688	$50,625
Other income	15,349	19,057
Total income	$71,037	$69,682
Disbursements:		
Dividend of $1 per share on preferred shares, payable Jan. 1, 1914	$33,936	$33,936
Dividend of $1 per share on preferred shares, payable July 1, 1914	33,936	33,936
Miscellaneous expenses	1,063	1,388
United States income tax	651	......
Total disbursements	$69,586	$69,260
Surplus for year	$1,451	$422
Surplus brought forward	14,917	14,495
Surplus	$16,368	$14,917

The comparative statement of income, profit and loss of the Boston & Worcester Street Railway for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Revenue from transportation:		
Passenger revenue	$638,212	$631,169
Mail revenue	452	451
Freight and express revenue	71,171	24,938
Miscellaneous transportation revenue	649	200
Total revenue from transportation	$710,484	$656,758
Miscellaneous revenue	6,452	12,180
Total revenue	$716,936	$668,938
Expenses of operation:		
For conducting transportation	$258,279	$209,853
For maintenance	128,459	133,802
For general expense	78,339	74,192
Total expenses of operation	$465,077	$417,847
Net revenue above operation	$251,859	$251,090
Interest on funded and floating debt	$120,693	$124,241
Taxes	46,669	47,971
Total	$167,362	$172,212
Net surplus for year	$84,497	$78,878
Dividends on preferred stock paid during year	$23,832	$23,687
Dividends on common stock paid during year	55,688	50,625
Total	$79,520	$74,312
Surplus for year after dividends	$4,977	$4,566

The gross earnings increased from $656,758 in 1913 to $710,484 in 1914, the largest increases being from $631,169 to $638,212 for passenger revenue and from $24,937 to $71,171 for freight and express revenue. The expenses for conducting transportation increased from $209,853 to $258,279 and general expenses from $74,192 to $78,339, while maintenance expenses decreased from $133,802 to $128,459. The chief maintenance items for 1914 were repairs to track and roadway and line, $63,110, and repairs to rolling stock and miscellaneous equipment, $54,514. The net revenue of the company remained practically constant, but taxes and interest decreased from $172,212 to $167,362, giving an increase in net surplus from $78,878 to $84,497. Dividends increased from $74,312 to $79,520, leaving a surplus for the year of $4,977, as compared to $4,566 for the year previous. The car-miles operated during the year amounted to 2,108,294 and the car-hours to 132,174.

Dick, Kerr & Company

The annual meeting of Dick, Kerr & Company, the British electrical manufacturers, was held in London on Oct. 15. The chairman said that the net profits, which two years ago were £3,000, had increased to £30,000 a year ago and for the past year were £45,000. The fiscal year ended June 30, so that the accounts for the past year showed no effect of the war. Originally the firm was a contracting one, but with the development of the electric tramway the construction of electrical apparatus had been undertaken. With the diminution of new tramway construction, however, the company had again taken up general contracting, large work done during the last year including the construction of a steam railroad in Portuguese East Africa and a reservoir for the Metropolitan Water Board. The company had recently a contract for the electrification of the complete suburban system of the London & South-Western Railway and the Manchester lines of the Lancashire & Yorkshire Railway. It was stated that certain departments, such as the contracting department, would be detrimentally affected by the war, as the construction of public works would be deferred. Other departments should be stimulated, and the company now did not have the German competition for electrical equipment. Claud T. Cayley, chairman of the board, was re-elected to the board at the annual meeting.

ANNUAL MEETING OF BOSTON ELEVATED RAILWAY

At the annual meeting of the Boston Elevated Railway on Nov. 2, Sydney Harwood, Newton, Mass., was elected a director in place of Charles P. Hall, resigned. In his annual report, President Bancroft pointed out that the cost per running foot of building the Cambridge subway was the lowest for all subways recently built in Boston. The most serious problem before the company in the year had been the demands of labor. As a result of the findings of the board of arbitration, published in the ELECTRIC RAILWAY JOURNAL of Jan. 15, 1914, operating expenses were increased by not less than $480,000, or about 2 per cent upon the capital stock. The increase dated from May 1, 1913, so that there was charged to surplus $53,000 as not being applicable to this fiscal year. On May 1, 1914, a second increase required by the award became effective, and another is due May 1, 1915.

Reference was made by Mr. Bancroft to the opening of the Boylston Street subway on Oct. 3, which reduced the surface running time on the round trip from Kenmore Street to Charles Street by 14.5 minutes. The construction of the Dorchester tunnel has proceeded as far as Dewey Square, but the opening of this route, with that of the East Boston tunnel extension in the West End, cannot now be determined. During the year the company added 3.77 miles of surface track, making its total trackage 514.76 miles. A new cut-off line to City Point, South Boston, from Dewey Square, was opened last spring, giving the company three double-track lines to this resort. The company has received all of the 175 new cars mentioned in the last report. Thirty-two stepless, prepayment, middle-entrance, vestibule articulated cars have been placed in service and forty-three more have been authorized. Work has been suspended on the elevated extension to Everett from Sullivan Square pending the approval of national and state authorities.

During the year the capacity of the Coolidge Corner substation was increased from 4000 kw to 6000 kw; a 2000-kw transformer was added to the Harvard power station and arrangements were made to extend the boiler house at the main generating plant in South Boston, to provide for four new boilers and also to build and equip a new 4000-kw substation near Andrew Square. An agreement was reached with the Edison Electric Illuminating Company of Boston for the interchange of energy in case of a surplus or need on either side, through a 9000-kva frequency changer set. The net cost of workmen's compensation insurance for the year is estimated at $55,849. The work of the company's safety committees has reduced the cost of insurance, and employees' accidents decreased 21.7 per cent during the year.

A brief report of the company for the fiscal year ended June 30, as presented to the Massachusetts Public Service Commission, was published in the ELECTRIC RAILWAY JOURNAL of Oct. 24. The total revenue passengers carried during the year were 343,181,049, an increase of 16,828,186, or 5.16 per cent for the year. The number of revenue miles run was 57,990,436 and the revenue car hours 5,406,132. The miles of track equipped with electric third rail system were 36.24 and the miles equipped with electric overhead system 488.409. The stockholders of record June 30 are divided geographically in number as follows: Massachusetts, 5055; other states, 576; Cuba, 1; British provinces, 21; Europe, 12; South America, 1; Asia, 1, or a total of 5667. Grouped by shares the sections rank as follows: Massachusetts, 216,101; other states, 20,877; Europe, 1164; British provinces, 616; Cuba, 25; Asia, 10, and South America, 1.

DETAILS OF COLUMBUS REFUNDING ISSUE

As noted in the ELECTRIC RAILWAY JOURNAL of Oct. 24, the Columbus Railway, Light & Power Company has been authorized by the Ohio Public Utilities Commission to issue its first refunding and extension sinking fund 5 per cent mortgage gold bonds to refund underlying bonds. This refunding is to be accomplished from time to time as the holders may agree, as follows: (1) For the $3,000,000 of first consolidated mortgage forty-year 5 per cent gold bonds of the Columbus Street Railway, dated July 1, 1892, an even exchange at face value. (2) For the $572,000 of first mortgage forty-year 5 per cent gold bonds of the Crosstown Street Railway, dated June 1, 1893, an even exchange at face value. (3) For the $409,000 of the first mortgage twenty-year 5 per cent sinking fund gold bonds of the Central Market Street Railway, dated Jan. 1, 1902, an even exchange at face value. (4) For the $300,000 of first mortgage 5 per cent gold bonds of the Columbus Edison Electric Light Company, dated April 1, 1899, an even exchange at face value. (5) For the $3,145,000 of first consolidated mortgage forty-year 4 per cent gold bonds of the Columbus Railway, dated Oct. 2, 1899, or as much as the Columbus Railway, Power & Light Company is unable with the consent of the holders to retire by issuing its 4 per cent prior preference stock, an exchange on the basis of $850 face value of the petitoner's first refunding 5 per cent gold bonds for each $1,000 face value of these Columbus Railway bonds. (6) For the $450,000 of first mortgage 6 per cent gold bonds of the Columbus Electric Company, dated Nov. 1, 1897, or as much as the petitioner is unable with the consent of the holders to retire by issuing its 6 per cent preferred stock, series A, an exchange on the basis of $1,100 face value of the petitioner's first refunding 5 per cent gold bonds for each $1,000 face value of Columbus Electric Company bonds.

The company was further authorized to issue: (1) An amount of $3,145,000 of its 4 per cent prior preference stock at par, to refund the first consolidated mortgage 4 per cent bonds of the Columbus Railway at face value from time to time as the holders of these bonds may agree, with the option to these stockholders to exchange the stock back at any time before Oct. 1, 1924, for the petitioner's first refunding 5 per cent gold bonds at $850 face value of the bonds for $1,000 face value of the stock; (2) an amount of $450,000 of the company's preferred stock, series A, at par, to refund the first mortgage 6 per cent bonds of the Columbus Electric Company at face value, as may be agreed.

It is provided by the commission, however, that the above stated authority to issue 4 per cent prior preference stock as well as to issue the bonds in refunding the outstanding 4 per cent bonds of the Columbus Railway is an alternative authority. In so far as any of the bonds of the Columbus Railway are refunded into the first refunding 5 per cent gold bonds of the petitioner, the authority granted to refund the bonds of the Columbus Railway into an equal amount of prior preference stock is to be of no further force. As regards the refunding of Columbus Railway bonds into prior preference stock, the same holds true, except that the Columbus Railway, Light & Power Company may in turn issue its first refunding 5 per cent gold bonds in exchange for the prior preference stock theretofore issued in refunding the Columbus Railway bonds as authorized, if the stockholders exercise their option on or before Oct. 1, 1924. The authority granted to issue the 6 per cent preferred stock, series A, or bonds in refunding the $450,000 of 6 per cent bonds of the Columbus Electric Company, is also a similar alternative authority.

City Light & Traction Company, Sedalia, Mo.—The City Light & Traction Company, which is controlled by the Cities Service Company, recently offered in Sedalia at par and interest $25,000 of secured one-year 6 per cent coupon gold bonds, par $100, dated Oct. 1, 1914. The notes are issued for improvements and are backed by $50,000 of the company's first mortgage bonds as security.

East St. Louis & Suburban Company, East St. Louis, Ill.—The East St. Louis & Suburban Company, registered at Camden, N. J., on Oct. 31 decreased its capital stock from

$14,000,000 to $1,000,000. The stock will now be divided into 600 shares of preferred stock and 9400 shares of common stock at $100 par.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has issued a supplemental order authorizing the Fresno Interurban Railway to issue $86,000 of ten-year 6 per cent bonds at not less than 90, and 460 shares of capital stock, par value $100, at not less than 80. The proceeds derived from the sale of these securities are to be used for the construction of an electric railway between Fresno and Clovis, a distance of approximately 9 miles. The parties promoting this line have already signed bonus agreements amounting to more than $17,000. These bonuses and any others acquired will be placed in a special fund to be used in making up any deficits that may occur during the early years of operation. If after three years the company's earnings are sufficient to pay its bond interest, operating expenses and taxes, any surplus remaining in the fund will be held as a sinking fund for the redemption of the bonds. The previous order of the commission was noted in the issue of the ELECTRIC RAILWAY JOURNAL of Oct. 31.

International Traction Company, Buffalo, N. Y.—Henry Morgan has been elected a director of the International Traction Company to succeed T. DeWitt Cuyler.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The Railroad Commission of California has authorized the Los Angeles & San Diego Beach Railway to issue a sufficient amount of bonds to yield $250,000 in cash, the proceeds to be used for the electrification of the company's line, the improvement of its properties, and the payment of certain obligations due to E. S. Babcock. The company has also filed an application with the commission requesting authority to issue two promissory notes amounting to $11,000 at 7 per cent interest for the purpose of refunding other notes outstanding.

New York (N. Y.) Railways.—The Public Service Commission for the First District of New York has granted the application of the New York Railways for authority to purchase all the outstanding capital stock of the Twenty-third Street Railway (6000 shares of $100 each), but on the condition that the company, in issuing its thirty-year 4 per cent gold bonds not to exceed $2,100,000 in payment, provide for the amortization of the difference between the par value and the market value of such bonds. The company proposes to purchase 4305 shares immediately, and the remainder are to be acquired from time to time as arrangements may be made. The commission authorizes the purchase upon the following conditions: (1) That the bonds be delivered only to holders of the stock at the rate of $350 face value of bonds for one share of stock; (2) that no such bonds be issued except in exchange for such stock; (3) that the railway provide for the amortization of 22 per cent of the face value of all bonds so issued, this representing the discount on the bonds; (4) that it keep open until Dec. 31 its offer of $350 face value of bonds for one share of stock, and notify all stockholders of the Twenty-third Street Railway of the acquisition of the majority of the stock and of its willingness to acquire the remainder upon the same terms on or before a specified date, not earlier than Dec. 31, 1914, and (5) that the time in which the bonds are to be issued shall expire Jan. 31, 1915.

Ohio Service Company, Dennison, Ohio.—The Public Utilities Commission of Ohio on Oct. 14 issued a final order authorizing the Ohio Service Company to issue $929,808 of three-year convertible notes, bearing interest at 6 per cent payable semi-annually and convertible into mortgage bonds within three years after their date. These notes are to be transferred in full and final payment for the properties purchased under the authority of the commission, as follows: $70,000 in payment for the purchase of the street railway property of the Twin City Traction Company at Dennison and Uhrichsville; $400,000 for the purchase of the electric lighting, ice manufacturing and street railway properties of the New Midland Power & Traction Company, Cambridge, Ohio, and the line running from Cambridge to Pleasant City; $424,000 for the purchase of the electric lighting plant at Canal Dover, the electric lighting and steam-heating plant at New Philadelphia, and the electric lighting plants at Dennison and Uhrichsville of the County Electric Company; and $35,808 for the purchase of the transmission line now being erected by the Lafayette Light & Power Company in Coshocton, Cambridge, Dennison, Uhrichsville, New Philadelphia and Canal Dover. This order supplements those noted in the ELECTRIC RAILWAY JOURNAL of Jan. 3, June 27 and Oct. 10.

Pacific Gas & Electric Company, San Francisco, Cal.—The Pacific Gas & Electric Company recently announced that it would purchase and accept delivery, as of Oct. 31, at the lowest prices offered, of $2,500,000 of its one year 5 per cent gold notes maturing March 25, 1915. These notes are part of an outstanding issue of $7,000,000. Owners of these notes were invited to forward sealed tenders to the Bankers' Trust Company, New York, on or before Oct 27, the tenders to be exclusive of accrued interest. A committee consisting of representatives of the Bankers' Trust Company, Harris, Forbes & Company and N. W. Halsey & Company was to supervise the transaction and had the right to accept or reject any or all bids in whole or in part. The Railroad Commission of California on Oct. 23 authorized the Pacific Gas & Electric Company to renew a promissory note of $100,000 to the National Conduit & Cable Company, bearing 6 per cent interest and payable not later than Oct. 20, 1915.

Portland, Eugene & Eastern Railway, Portland, Ore.—The annual report of the Portland, Eugene & Eastern Railway for the fiscal year ended June 30, which was recently submitted to the Oregon State Railroad Commission, shows a profit on the electric lines and a large deficit on the steam line of the company. According to this report, the company owns 105.68 miles of line and operates under lease or contract 3.05 miles, a total of 108.73 miles. Capital stock outstanding amounts to $508,800; funded debt outstanding, $1,200,000; capitalization per mile of line, $16,061; investment for road and equipment, $4,253,070; per mile of line, $30,974; operating revenues, electric, $190,219; operating expenses, electric, $171,752; operating revenues, steam, $88,405; operating expenses, steam, $121,801; operating deficit, $14,929; passengers carried, 3,687,700.

Richmond & Henrico Railway, Richmond, Va.—The Virginia Trust Company, Richmond, Va., which was appointed receiver for the Richmond & Henrico Railway on June 3, 1913, sold this company's property on Nov. 5 to E. Randolph Williams, counsel for the Virginia Railway & Power Company, for a consideration of $700,000. The company has an authorized capital stock of $1,250,000 and $2,500,000 of first mortgage 5 per cent bonds. It was organized about four years ago as a competing company to the Virginia Railway & Power Company. The receiver was appointed following a default in interest.

San Joaquin Light & Power Corporation, Bakersville, Cal.—The Railroad Commission of California has authorized the San Joaquin Light & Power Corporation to renew certain promissory notes, aggregating $64,156, for such periods of time as the applicant may desire, provided the aggregate of such renewal does not exceed one year from the date of the order. The new notes are to be issued at full face value and at the rate of interest which is specified in the company's application.

Seattle (Wash.) Municipal Railway.—The total receipts of Division "A" and Division "C" of the Seattle Municipal Railway for September showed a decrease of $732 as compared to the revenues for the preceding month, according to Superintendent of Public Utilities Valentine. The Lake Burien line showed the greatest drop in revenues, the freight and passenger revenues for September being $1,277 as compared to $1,888 in August, a decrease of $611. It is expected that the decrease in receipts in the autumn, on account of lighter passenger travel with the retirement of campers and summer tenants, will bring greater loss. Members of the Council are considering the adjustment of the Lake Burien schedule so that one car will be taken off part of the day. It is estimated that the municipal railway property was operated at a loss of approximately $2,000 during the summer months.

United Railways of St. Louis, St. Louis, Mo.—The Missouri Public Service Commission has authorized the United Railway of St. Louis to issue $600,000 of 5 per cent bonds, the proceeds of which are to be used in taking up an outstanding issue of 6 per cent bonds of the St. Louis & Suburban Railway.

Washington-Virginia Railway, Washington, D. C.—A dividend of 1 per cent has been declared on the $1,378,300 of common stock of the Washington-Virginia Railway along with the usual semi-annual payment of 2½ per cent on the $1,000,000 of preferred stock. These dividends were both payable on Nov. 1 to holders of record on Oct. 19. On May 1, 1½ per cent was paid on the common stock.

DIVIDENDS DECLARED

Boston (Mass.) Elevated Railway, quarterly, 1½ per cent.

Connecticut Railway & Lighting Company, New Haven, Conn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Detroit (Mich.) United Railway, quarterly, 1½ per cent.

Illinois Traction System, Peoria, Ill., quarterly, three-fourths of 1 per cent, common.

Lehigh Valley Transit Company, Allentown, Pa., 1 per cent, preferred.

Rio de Janeiro Tramway, Light & Power Company, Ltd., Rio de Janeiro, Brazil, quarterly, 1¼ per cent.

Sao Paulo Tramway, Light & Power Company, Ltd., Sao Paulo, Brazil, quarterly, 2½ per cent.

Tampa (Fla.) Electric Company, quarterly, 2½ per cent.

Washington-Virginia Railway, Washington, D. C., semi-annual, 2½ per cent, preferred; 1 per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AMERICAN RAILWAYS, PHILADELPHIA, PA.						
1m., Sept.,	'14	$460,132	....	......	......	......
1 " "	'13	459,833	....	......	......	......
3 " "	'14	1,486,068	....	......	......	......
3 " "	'13	1,489,694	....	......	......	......
AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.						
1m., Aug.,	'14	$205,384	$118,854	$86,530	$35,475	$51,055
1 " "	'13	210,926	113,899	97,028	34,095	62,933
12 " "	'14	416,146	338,743	177,403	70,986	106,417
12 " "	'13	419,677	229,689	189,987	67,558	122,429
COLUMBUS (GA.) ELECTRIC COMPANY						
1m., Aug.,	'14	$54,600	*$23,985	$30,615	$28,792	$1,823
1 " "	'13	50,403	*23,706	26,698	24,489	2,209
12 " "	'14	655,653	*277,119	378,534	309,114	69,420
12 " "	'13	639,591	*293,482	284,787	249,380	96,727
LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.						
1m., Sept.,	'14	$173,649	$83,170	$90,479	$57,916	$32,563
1 " "	'13	164,620	80,768	83,853	47,224	36,628
12 " "	'14	1,863,249	898,861	964,389	689,732	274,657
12 " "	'13	1,739,737	863,235	876,503	547,639	328,864
PENSACOLA (FLA.) ELECTRIC COMPANY						
1m., Aug.,	'14	$22,669	$14,772	$7,897	$7,189	$708
1 " "	'13	24,953	15,470	9,483	7,055	2,428
12 " "	'14	283,238	177,469	105,770	86,237	19,533
12 " "	'13	285,036	181,988	103,048	77,819	25,229
PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.						
1m., Aug.,	'14	$689,028	*$404,450	$284,578	$177,899	$106,679
1 " "	'13	723,529	*410,022	313,507	174,427	139,080
12 " "	'14	8,657,137	*5,060,019	3,597,118	2,105,359	1,491,758
12 " "	'13	8,657,137	*5,060,019	3,533,575	2,045,015	1,488,560
REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.						
1m., Sept.,	'14	$245,879	*$148,779	$97,100	$83,389	$13,710
1 " "	'13	250,962	*152,349	98,613	86,034	12,579
9 " "	'14	2,259,173	*1,348,329	910,844	747,171	163,673
9 " "	'13	2,193,403	*1,374,950	818,453	759,316	59,137
SAVANNAH (GA.) ELECTRIC COMPANY						
1m., Aug.,	'14	$71,339	*$46,517	$24,822	$22,933	$1,889
1 " "	'13	70,985	*46,311	24,674	22,800	1,874
12 " "	'14	851,035	*566,663	284,372	274,089	10,283
12 " "	'13	803,661	*558,688	244,873	237,639	7,334
TAMPA (FLA.) ELECTRIC COMPANY						
1m., Aug.,	'14	$82,811	*$42,522	$40,289	$4,458	$35,831
1 " "	'13	71,624	*39,665	31,959	4,354	27,605
12 " "	'14	957,024	*522,397	434,626	55,732	378,894
12 " "	'13	796,303	*427,875	368,429	55,126	313,303

*Includes taxes.

Traffic and Transportation

REROUTING CASE DECIDED

Decision by Commission in Important Buffalo Case—Company's Attitude Highly Commended

The public Service Commission of the Second District of New York has rendered its decision in the case which has been pending since October, 1911, regarding the complaint made to it about the rerouting of the Elmwood and the Hoyt Street cars of the International Railway, Buffalo. The commission has denied the petition with reference to the rerouting of the Elmwood line, and has approved a suggestion made by the company about the Hoyt Street cars as a satisfactory adjustment of the principal question. This suggestion in substance provides for a change in the route of the Hoyt Street cars, taking them across Allen Street and Day's Park to Main Street, and thence down Main Street and out Seneca Street to the easterly terminus of that line and returning over Main and Allen Streets, and also rerouting the Grand Street cars by bringing them across Tracy Street from the corner of West Avenue and Carolina Street to South Elmwood Avenue and thence downtown.

The International Railway changed the routes of its Elmwood and Hoyt Street lines in Buffalo, which had, for many years, given crosstown service from the west side of the city to and down Main Street, and thence to the railroad stations; the new routes of said car lines were taken over South Elmwood Avenue, Chippewa and Franklin Streets. This action was the cause of many complaints to the commission from property owners and business men on upper Main Street, who alleged that the changing of the routes worked great damage to upper Main Street interests; counter petitions and remonstrances from the area traversed by such new routes were presented to the commission urging that such new routes be retained. The whole service in Buffalo, and particularly on the so-called west side, was fully discussed, and the conclusion was reached that adequate service for the west side requires crosstown service to and down Main Street of some of the existing lines of cars.

The commission holds that, in the settlement of these questions, the right of the public to adequate, convenient and proper service is paramount to all other considerations; that there is no duty imposed upon either the railway company or the commission so to route the cars of the company that the property values and business conditions along such routes will be preserved or enhanced; that such considerations have no place in the decision which should be arrived at in the case, except as they bear directly upon the convenience and necessity of the traveling public; and that even such convenience and necessity must be controlled in large measure by the ability and facilities of the railway company to satisfy them.

In its syllabus of the case the commission says:

"It is the settled practice of this commission that a street railway has the first right and duty to route its cars in order to satisfy the necessary demands of the traveling public; and if it shall appear to the commission that such routing does not give ample and proper service which the public interests demand, then it is clearly the duty of the commission to change such routes accordingly, giving due consideration, however, to such ability and facilities of the railway company.

"When it appears that the cars of a street railway are carrying substantially all of those who would avail themselves of transportation over its lines in a certain territory, no matter what changes are made in the routes, and it also appears that there would be no substantial increase in income, the commission should hesitate in making an order for a new line of railroad or the increase in the number of cars then in use, which would add considerably to the operating expenses of the company; for it is equally the duty of the commission to conserve the interests of the railway while satisfying the demands of the traveling public."

Referring to the attitude of the company toward the whole proceeding the commission says:

"The attitude of the International Railway throughout this inquiry, and particularly at the present time, has been most helpful to the commission in its efforts to reach a proper decision in this case; and this is clearly shown by the communication, which was recently received by the commission from the president of the company, by which it appears that, after the lapse of so many years, during which time the chief question in this case has remained unsettled, the company announces its willingness to pave the way for the rerouting of the Hoyt Street cars, by putting the Grant Street cars in their place on South Elmwood Avenue and Franklin Street; all this involves the necessity of widening Tracy Street and building new tracks across that street from Carolina Street to South Elmwood Avenue, which will require the expenditure of about $40,000 by the company.

"The position of the respondent is very fair; indeed, the determination of the company, at the request of many of the interested parties, to make an outlay of so large an amount of money as will be required to reroute the Grant Street cars across Tracy Street, in order to help settle this controversy, is so public spirited that such action should receive more than passing notice from this commission; it should be commended; and the best commendation we can give is to approve of the suggestions made concerning the changes in the routes of the Hoyt Street and Grant Street cars, and use them as the basis for the decision in this case."

I. C. C. ACCIDENT BULLETIN

Accident Bulletin No. 51 of the Interstate Commerce Commission for the three months ended March, 1914, contained the following statement of collisions and derailments on electric railways for the period covered:

No.	Classes	Number	Number of Persons Killed	Injured	Damage to Road and Equipment and Cost of Clearing Wrecks
	Collisions:				
1	Rear	12	2	66	$3,422
2	Butting	3	1	11	2,025
3	Trains separating	..	..	..	......
4	Miscellaneous	9	..	19	1,895
	Total	24	3	96	$7,342
	Derailments due to—				
5	Defects of roadway	1	..	1	$10
6	Defects of equipment	2	..	10	1,850
7	Negligence of trainmen, signalmen, etc.	1	..	2	150
8	Unforeseen obstruction of track, etc.	1	..	4	150
9	Malicious obstruction of track, etc.	..	..	..	......
10	Miscellaneous causes	3	..	5	100
	Total	8	..	22	$2,260
	Total collisions and derailments	32	3	118	$9,602
	Total for same quarter of—				
	1913	65	5	383	$48,137
	1912	79	5	402	48,074
	1911	52	1	195	10,173

Inquiry Into Brooklyn Service.—The Public Service Commission for the First District of New York has decided to inquire into the service and equipment of the elevated lines included in the Brooklyn Rapid Transit System. The case will be opened with a hearing on Nov. 9.

Accidents in New York in September.—According to the summary of accidents for September, presented to the Public Service Commission for the First District of New York, it is shown that the number of accidents for the month totaled 6083, in comparison with a total of 6189 for September, 1913. The number of persons injured for the month was 4220, compared with 3995 for the year before; but the number of serious injuries declined from 222 in September, 1913, to 172 in September, 1914. The number killed was thirty for September in each year.

Southern Pacific Transbay Service at San Francisco.—Changes in dispatching via the Eighteenth Street line extension in Oakland, Cal., have made it possible to eliminate a transfer and give faster service between points in Oakland and San Francisco. The change was announced by J. C. McPherson, superintendent of interurban lines, and became effective on Nov. 2. Five trains per hour now run each way between Fourteenth Street and San Francisco boats, the running time to the ferry building in San Francisco now being thirty-five minutes.

Modification of Joplin Near-Side Stop.—The City Commission of Joplin, Mo., has modified the ordinance recently passed which required street cars to stop on the near side of crossings. Under the amendment, Charles Patterson, Commissioner of Public Utilities, may grant permission to stop cars on the far side. There are many waiting stations built by the railways in the outskirts of the city on the far sides of the crossings, and there are some crossings in the business district where boarding or leaving cars on the near side would be inconvenient for passengers.

Passenger Rates Increased in Central States.—In accordance with the decision of the Interstate Commerce Commission handed down last July, the railroads included in the Central Passenger Association will increase their rates effective on Dec. 1. In the future a charge of 2½ cents a mile will be made on interstate fares in the territory north of the Potomac River, east of the Mississippi River and west of Buffalo, Pittsburgh and Wheeling. Heretofore passenger rates have been based on an approximate 2-cents-a-mile basis, with the charge between stations calculated via the short route.

Joint Electric Railway and Steam Excursion.—Officials of the Fort Wayne & Northern Indiana Traction Company, Fort Wayne, Ind., and the New York, Chicago & St. Louis Railway, reached an agreement recently whereby through tickets were sold from Peru, Ind., and points east of Cleveland on Oct. 24. Tickets were also sold over the Fort Wayne & Northern Indiana Traction Company's line from Bluffton and points north to Cleveland on the same date. This is the first time in the history of the Fort Wayne & Northern Indiana Traction Company that an excursion has been run in conjunction with a steam road. Transfers were issued in Fort Wayne.

Service and Labor Questions in Lexington.—According to the opinion of James G. Denny, city solicitor of Lexington, Ky., if they feel that public safety demands such action the City Commissioners of Lexington have authority to compel the Kentucky Traction & Terminal Company to abandon the "front end only" system of handling passengers and return to the former system of one door at each end of the car. As to the differences between the union employees of the company and the company over the discharge of a motorman, Governor McCreary has named a second arbitrator to adjust the differences. Judge W. B. Smith, Richmond, Ky., who was named by the governor, declined to serve and on behest of both parties Governor McCreary now names Charles C. Bagby, Danville, as umpire.

Chicago & Oak Park Elevated Asks Fare Increase.—In a petition filed by Samuel Insull, receiver for the Chicago & Oak Park Elevated Railroad, Chicago, Ill., in the United States District Court, requesting that he be permitted to issue receiver certificates to pay the cost of elevating the tracks in Oak Park, he also requested the right to increase the fares between Oak Park and Chicago. This move on the part of the receiver is in accordance with the order of the court when it issued a temporary injunction restraining the Illinois Public Utilities Commission from enforcng its order on the elevated railroad to elevate its tracks in Oak Park. In this petition requesting an increase in the fare between Oak Park and Chicago it is stated that the competitors of the elevated line receive a 10-cent fare. It is estimated that if the fare was raised to 8 1/3 cents it would increase the earnings of the railroad $15,000, while if the fare was increased to 10 cents it would increase the earnings $20,000.

New Work Advertised in the Twin Cities.—A. W. Warnock, general passenger agent of the Twin City Rapid Transit Company, Minneapolis, Minn., prepared three full-page advertisements recently for use in the daily papers in Minneapolis and St. Paul. They were headed "Dale Street Car Line to Open," "New Street Car Lines to Open" and "Street Car Lines and Signs." The page headed "Dale Street Car Line to Open" appeared in the St. Paul daily papers. It not only showed the new lines built by the company this year, but reviewed all the work done by the company in St. Paul during 1914, the new lines, the extensions of old lines, the reconstruction of old car lines and new paving.

The page headed "New Street Car Lines to Open" gave the complete story of what the company has done in Minneapolis this year. The page "Street Car Lines and Signs" contained a complete list of all the company's lines, showing the signs carried by the cars and the routes of the cars. This is the first time the company has ever assembled such information about its lines for publication. The typographical arrangement of the pages was excellent.

City of Denver Cautions "Safety First."—The official publication of the city of Denver, Col., recently contained the following statement in regard to the need for care on the streets and the work that the police and the Denver City Tramway are doing in connection with the "safety first" movement: "The most frequently broken of the city's laws are the traffic rules. Therefore the police department has issued orders to all patrolmen and traffic officers to arrest all persons violating any portion of the law. The Denver City Tramway has co-operated with the department of safety along these lines, inasmuch as all employees of the company are required to secure the number of the machine of any offender, report same to the company, which in turn gives it to the police department. The tramway company has issued cards, which are placed in various conspicuous places throughout the city, pointing out the common violations which prove fatal in a great many cases. It may be well for any person owning an automobile or vehicle, if not in possession of a copy of the traffic ordinances of the city, to apply to the city clerk, room 102 City Hall, and secure one." This announcement was accompanied with reproductions of six drawings showing the results of carelessness in driving automobiles.

Monthly Commutation Increase Refused.—Contending that its present monthly commutation rate of $5, applicable to parties or associations of 100 individuals or more, between Napa and Vallejo, is insufficient to pay its proper proportion of expenses, the San Francisco, Napa & Calistoga Railway, Napa, Cal., petitioned the Railroad Commission of California for permission to increase such commutation rate to $6 per month. The commission held as follows: That the method used by the applicant of applying a car-mile basis to all items of expenditure irrespective of the relationship of the expense to the particular trains, the operating expense of which it is desired to determine, permits of such a number of inaccuracies as to make it impossible to reach a conclusion that the increase applied for has been justified; also in view of the fact that the applicant agreed to place in effect such a rate, provided that 125 commuters were secured, and that the Chamber of Commerce of Napa paid the deficit until the required number purchased commutation books, the application is denied without prejudice. Suggestions are made whereby applicant may effect economies by discontinuing a Sunday morning train and consolidating two of its daily trains running under a few-minute headway, without inconveniencing its passengers.

Transfer Decision Affecting Interurban Railways.—In a ruling just announced the Illinois Public Utilities Commission holds that under ordinances requiring interurban railways to give transfers to passengers for use over the city lines and vice versa, the transfer applies only to intra-urban traffic and cannot be applied on travel outside the city. The ruling is in the case of the application of the citizens of Wood River and Benbow City for a reduction of fare over the Alton, Granite City & St. Louis Traction Company's line into Alton. The citizens thought the fare ought to be reduced from 15 cents to 10 cents. The company answered that the fare to the city limits of Alton is now 10 cents and that the additional 5 cents represents the travel over the city lines. The commission fixes the fare at 12 cents from the down-town station, or 10 cents from the city limits, a transfer to be good to the city limits. The company can charge 3 cents a mile when passengers fail to purchase tickets. On the use of the transfer, the commission says: "The commission is of the opinion that all passenger traffic originating outside the city must be considered as interurban business which is not affected by the conditions of the present ordinances granted the respondent by the city of Alton. The commission is also of the opinion that the transfer privileges provided for in those ordinances relate to the intra-urban business only."

Personal Mention

Mr. Logan G. McPherson has resigned as director of the bureau of railway statistics at Washington, which is maintained by the steam railroads.

Mr. M. B. Knapp, formerly with the Republic Railway & Light Company, Youngstown, Ohio, has been appointed superintendent of the Hocking Power Company at Nelsonville, Ohio.

Mr. H. C. Harford has been appointed manager of the employees' stores of the Interborough Rapid Transit Company and the New York (N. Y.) Railways, to succeed Mr. F. H. Gard, resigned.

Mr. W. I. Frost has been appointed superintendent of station service of the New York, New Haven & Hartford Railroad, vice Mr. G. L. Graham, resigned to accept service with another company.

Mr. J. P. Mason has been elected president of the Woodstock & Sycamore Railway, Genoa, Ill., a consolidation of the Woodstock & Sycamore Traction Company and the Chicago, Waukegan & Fox Lake Railway.

Mr. P. E. Ryan has been elected vice-president of the Woodstock & Sycamore Railway, Genoa, Ill., a consolidation of the Woodstock & Sycamore Traction Company and the Chicago, Waukegan & Fox Lake Railway.

Mr. William B. McKinley, president of the Illinois Traction System, Peoria, Ill., who acted as campaign manager for Mr. William Howard Taft in 1912, in the election on Nov. 3 recaptured the seat in Congress which he lost two years ago.

Mr. Lewis W. Henry, who has been acting as right-of-way agent for the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., for the last two years, has been appointed traffic manager of the company to succeed Mr. Charles O. Warfel, now superintendent of the company.

Mr. R. S. Buck, formerly chief engineer of the Dominion Bridge Company, Canada, and previously with the engineering firm of Sanderson & Porter, New York, N. Y., has been appointed engineer of maintenance of way of the New York (N. Y.) Railways, to succeed Mr. W. T. Dougan, resigned.

Mr. A. R. Layman, safety appliance inspector for the State Public Utilities Commission of Illinois, has accepted an appointment with the Interstate Commerce Commission as a railroad inspector. Mr. Layman was appointed to the State Public Utilities Commission in 1909 by Governor Deneen, of Illinois.

Mr. Francis E. Baldwin has resigned as associate and chief assistant counsel of the State Public Utilities Commission of Illinois to become a member of the legal firm of Veeder & Veeder, Chicago. Mr. Baldwin was formerly judge of the County Court of Morgan County, Ill., and resided at Jacksonville.

Mr. Charles O. Warfel has been appointed superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., to succeed Mr. Oscar Lively, who has become connected with the Michigan United Traction Company. Mr. Warfel started in as an agent on one of the lines of the company about ten years ago, and advanced to the position of traffic manager, also having charge of the purchasing department.

Mr. Travis H. Whitney was entertained at dinner recently by members of the staff of the Public Service Commission of the First District of New York at the Martinique in honor of his seven years' service as secretary of the commission. The chair was taken by Mr. James Blaine Walker, assistant secretary. Among others present besides Mr. Whitney and Mr. Walker were Chairman McCall, Commissioners Maltbie and Williams, ex-Commissioners McCarroll and Eustis and Judge W. L. Ransom of the City Court.

Mr. Oscar Lively resigned on Oct. 31 as superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, Ind., to accept a position with the Michigan United Traction Company at Jackson, Mich. Mr. Lively started in the electric traction field as a motorman with the Indianapolis, Shelbyville & Southeastern Traction Company about eleven years ago. He was later made trainmaster and has been superintendent of the combined lines of the Indianapolis & Cincinnati Traction Company for the last three years.

Mr. H. W. Magruder was elected president of the Kansas Gas, Water, Electric Light & Street Railway Association at the seventeenth annual convention of that body held at Arkansas City, Ark., on Oct. 22, 23 and 24. Mr. Magruder was born in Edina, Mo., in 1880 and was educated in the schools at Pratt, Kan. In early manhood he entered the government railway mail service and later financed the electric plant at Liberal, Kan., and was made president of the new company, the Liberal Light, Ice & Power Company, in which capacity he has since continued.

Mr. William Seibert, superintendent of surface lines of the Brooklyn (N. Y.) Rapid Transit System, has been elected a director of the Coney Island & Brooklyn Railroad, which is now controlled by the Brooklyn Rapid Transit Company. Mr. Seibert is one of the best-known traffic men in the United States. He began his career as a conductor with one of the companies now included in the system of the Brooklyn Rapid Transit Company and has advanced through all of the intermediary transportation department positions to the one which he now holds.

Mr. Theodore P. Shonts, president of the Interborough Rapid Transit Company and the New York (N. Y.) Railways and former president of the Panama Canal Commission, contributed to the magazine supplement of the New York Sunday *Times* for Nov. 1 an article dealing with an elaborate plan suggested by him for the reconstruction of the Port of New York. He favors the plan of having the railroads pool their present properties. This accomplished, he says that the improvement as outlined by him could be carried out at relatively small expense.

Mr. Frederick W. Whitridge, president of the Third Avenue Railway, New York, N. Y., has answered Germany's appeals in a volume entitled "One American's Opinion of the European War." It will be recalled that Mr. Whitridge made a tour of the Continent just previous to the declaration of war and that he was in Scotland at the time hostilities were commenced. His opinion is that Germany is in the wrong and is following false gods. He noted a decided change in the people themselves just previous to the war, from the simplicity and modesty that formerly prevailed among them.

Mr. John P. Coghlan, who has been appointed receiver of the Northern Electric Railway, Chico, Cal., is manager of the claim department of the Pacific Gas & Electric Company, San Francisco, Cal. Mr. Coghlan was for many years a newspaper reporter in San Francisco and occupied his spare time with reading for the bar. Shortly after his admission to practice he was taken into the office of the city attorney of San Francisco under Mr. Percy V. Long and was entrusted with a most important line of work in which he gained distinction. He has been with the Pacific Gas & Electric Company now for several years.

Mr. James F. Hamilton, retiring general manager United Traction Company, Albany, N. Y., was tendered a complimentary dinner on Oct. 29 by the employees of the company, and was presented with a chest of silver as a token of esteem from the men. The presentation was made by Mr. Charles H. Armatage, formerly traffic manager of the company, who was in turn presented with a fur cap and fur gloves to match his other automobile apparel. As previously stated in the ELECTRIC RAILWAY JOURNAL Mr. Hamilton will in the future devote all his time and attention to the Schenectady (N. Y.) Railway.

Mr. William Osgood Morgan has been elected vice-president of the Empire United Railways, Inc., Syracuse, N. Y. Mr. Morgan is a New York attorney, who has been associated with electric railways for the last decade, during most of which time he was vice-president of the Sheboygan Railway & Electric Company, Sheboygan, Wis. For a time he was also an officer of the Greensboro (N. C.) Electric Company. Mr. Morgan has actively participated in the operation of railways, handling finances and legal matters connected with properties which have heretofore been under the management of Mr. Ernest Gonzenbach, now general manager of the Empire United Railways, Inc., and formerly president of the Sheboygan Railway & Electric Company. Mr. Morgan has contributed some interesting articles to the technical press, among them a summary of the Public Utility Law of the State of Wisconsin.

Mr. William T. Dougan has resigned as engineer of maintenance of way of the New York (N. Y.) Railways and in future will engage in the building and construction of business for himself in New York City. Mr. Dougan was graduated from Union College in 1892 and was at once made assistant to the chief engineer on construction of the Fonda, Johnstown & Gloversville Railroad, in which position he continued until he was made chief engineer of construction of the Herkimer, Ilion & Frankfort Electric Railway, now included in the Utica lines of the New York State Railways. In 1897 Mr. Dougan entered the employ of the Metropolitan Street Railway. He was engineer of construction of the underground conduit system until 1906, when he was made engineer of maintenance of way of the company, which has been succeeded by the New York Railways.

OBITUARY

John Kilgour, president of the Cincinnati (Ohio) Street Railway, which is operated by the Cincinnati Traction Company, is dead. Mr. Kilgour was born in Cincinnati in 1834 and was graduated from Burlington College in New Jersey. He entered business with his father in the wholesale grocery house of Kilgour, Taylor & Company, but left that firm to serve under his father with the Little Miami Railroad. Later he and his brother Charles became partners in the wholesale grocery firm of Neave, Brown & Kilgour. Subsequently he and his brother assisted in building the Pendleton & Fifth Street Railroad in Cincinnati. In 1873 the railways in Cincinnati, including the Pendleton line, were consolidated and Mr. Kilgour was elected a director. Nine years later he was elected president of the company. Mr. Kilgour was also interested in telephone development in Ohio and was for many years president of the local telephone company at Cincinnati. In addition he was interested financially in the Toledo, Bowling Green & Southern Traction Company and the Ohio Traction Company. Mr. Kilgour retired from active business about five years ago. Two years ago he resigned as head of the telephone company, but continued as president of the Cincinnati Street Railway up to the time of his death.

Charles O. Kruger, president of the Philadelphia (Pa.) Rapid Transit Company, died suddenly on Nov. 4. Mr. Kruger had apparently been in the best of health. About an hour before his death he left his office with several other representatives of the company to take luncheon at the Racquet Club. While they were walking from the dining room, Mr. Kruger collapsed and died almost instantly. Heart disease was given as the cause of his death. Mr. Kruger was born in Philadelphia on Dec. 14, 1864. His education was secured in the public schools of that city. He decided early to embark in a commercial business and received his first training in the office of S. & W. Welsh, who at that period were leading merchants and foreign bankers. One year later he became secretary of the company which took over all the arc light companies doing business in Philadelphia. He remained in this capacity until 1885, when he was made secretary and treasurer of the Penn Traffic Company, a corporation identified with the Cambria Steel Company. In 1893 he was chosen secretary and treasurer of the People's Traction Company and in 1895 he was made secretary and treasurer of the Union Traction Company, Philadelphia. Three years later he was advanced to the office of second vice-president and assistant general manager, being made vice-president and general manager in 1899. When the Philadelphia Rapid Transit Company, which absorbed the Union Traction Company, was formed in 1902, Mr. Kruger assumed the position of secretary. Subsequently he was elected vice-president and general manager. In 1909 he was advanced to the position of president. Mr. Kruger was a director of the Jenkintown National Bank, Jenkintown, Pa., and of the Northern National Bank, Philadelphia. He was a member of the Union League, Art, Racquet and Manufacturers' clubs of Philadelphia, the Huntingdon Valley Country Club and the Logan Country Club, and was an associate member of the American Electric Railway Association.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Lula-Homer Railroad, Lula, Ga.—Chartered in Georgia to build a 15-mile electric line from Lula to Homer. Connection will be made at Lula with the Southern Railway. Incorporators: S. S. Carter, W. A. Boling, E. E. Chapman and Joel Coffee, Lula.

***Quincy & Hamilton Electric Railway, Hamilton, Ohio.**—Chartered in Ohio to build an electric railway from Quincy to Hamilton. Capital stock, $525,000. Incorporators: Charles S. Carscallon, Charles D. Warner, Edward D. Parkelee, Charles H. Petsch, Warren H. Orr, Earl W. Wood and Robert R. Wallace.

FRANCHISES

***Bisbee, Ariz.**—The Board of Supervisors has been asked to grant a franchise to build an electric railway from Bisbee to Naco.

Los Angeles, Cal.—The Public Utilities Commission has approved the proposed franchise for an extension on Evergreen Avenue, Wabash Avenue, Zonal Street and Marengo Avenue, in Boyle Heights. The Council will call for bids for this franchise.

Clearwater, Fla.—H. A. Murphy and associates have received a franchise to build an electric railway from St. Petersburg to Tarpon Springs.

Methuen, Mass.—The Boston & Northern Street Railway has asked the Council for a franchise for a relocation of tracks in the east section of Methuen.

Southbridge, Mass.—The Worcester Consolidated Street Railway has asked the Council for a franchise to relocate its tracks in Southbridge.

Winnipeg, Man.—The Winnipeg Electric Railway has been instructed by the city to file plans for an extension in the northwest section of Winnipeg.

West Newton, Pa.—The West Penn Traction Company has asked the Council for a year's extension of time on its franchise in which to build an extension between West Newton and Hunker Station.

Montreal, Que.—The Montreal & Southern Counties Railway has received permission from the Council to connect its tracks with the tracks of the Grand Trunk Railway and the tracks of the Montreal Tramways Company in Montreal.

Dallas, Tex.—E. P. Turner, representing the Dallas Southwestern Traction Company, has received a second extension of time on its franchise from the County Commissioners to build the proposed electric line to connect Dallas, Glen Rose, Grand Prairie, Mansfield, Alvarado and Cleburne. The franchise was first extended to Dec. 31, and is now extended to June 30, 1915. [E. R. J., Aug. 29, '14.]

Mexia, Tex.—The Commercial Club has received a franchise to build an electric railway in Mexia.

TRACK AND ROADWAY

Huntsville & Florence Interurban Railway, Huntsville, Ala.—Preliminary arrangements are being made by this company to begin work soon on its line between Huntsville and Florence. Plans have been made for the necessary power, which will be secured from waterfalls in that section. Tracy W. Pratt, Huntsville, is interested.

Pacific Electric Railway, Los Angeles, Cal.—This company has placed in operation the new lines over the extension of Magnolia Avenue, which has been built with a view to its becoming a part of the interurban line ultimately to be built by way of Corona, La Habra and Los Angeles.

San Francisco (Cal.) Municipal Railway.—The Board of Public Works has awarded a contract to the United States Steel Products Company for track special work.

Connecticut Company, New Haven, Conn.—Plans are being made by this company to double track a number of its lines in New Britain.

Rome, Ga.—It is reported that the preliminary survey for the proposed interurban electric railway between Gadsden and Center, Ala., will be made by C. L. March, former city engineer of Gadsden.

Waycross Street & Suburban Railway, Waycross, Ga.—This company has placed in operation its extension to Hebardville.

Springfield, Ill.—The Illinois Public Utilities Commission has approved the issue by the Lee County Central Electric Railway Company of 1010 shares of common capital stock of a par value of $100 per share. The commission has also issued to the company a certificate of convenience and necessity permitting it to extend its present line from Middleburg, Lee County, to Rochelle, Ogle County. [E. R. J., Oct. 24, '14.]

Indianapolis, Ind.—The new Mars Hill line of Indianapolis has been placed in operation, the route of the West Indianapolis line being used to its terminal, thence over special tracks to Minnesota Street and on to Mars Hill, a distance of 2.66 miles from the downtown center of Indianapolis.

LaFayette & Northwestern Railway, LaFayette, Ind.—Offices have been established in LaFayette to direct the construction of this new line, and stakes have been driven to mark out the right-of-way. The railway will run northwestward from LaFayette to Montmorenci, thence north to Remington and Morocco, and thence northwest to Rensselaer, St. Mary's, St. Anne and Kankakee, Ill., where it will connect with the line of the Chicago & Interurban Railway into Chicago. O. L. Brown is the general manager, and he has just appointed Harry Shelhous as chief engineer. [E. R. J., Oct. 17, '14.]

Des Moines (Ia.) Railway.—It is reported that surveys are being made by this company on North Avenue in East Des Moines for a new crosstown line to extend from Waveland Park almost due east to the fair grounds. It will afford direct service between the residence districts of East and West Des Moines.

Covington, Ky.—The South Covington & Cincinnati Street Railway has received a perpetual franchise from the Council in Covington.

Louisville (Ky.) Railway.—Extension of the Market Street line of this company from the end of the track on Frankfort Avenue, out Haldeman Avenue and thence up the Brownsboro road is a possible developments, according to the response of President T. J. Minary, of the company, to a committee representing the Crescent Hill Forward Club.

Boston (Mass.) Elevated Railway.—Plans are being made by this company to extend its line from the present terminus on Playstead Road, West Medford, to Madison Street, on Playstead Road.

Cushing (Okla.) Traction Company.—Contracts have been awarded by this company to build a 13-mile line from Cushing to Drumright. The Cushing Construction Company was estopped from raising the appeal as regards this McAlester, Okla., general manager.

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—Work has been begun by this company on the section of its line at Russell. The first division of the railway is to be 119 miles in length and will extend from Ottawa to Morrisburg and on to Beaudette with a branch line from Metcalfe to Russell.

Sudbury-Copper Cliff Suburban Electric Railway, Sudbury, Ont.—Surveys have been made by this company from Sudbury to Copper Cliff, 5 miles; grading has been completed from Sudbury 4.5 miles out, and about 6 miles of track has been laid through paved streets in Sudbury. Construction will be resumed in the spring on this line between Sudbury and Copper Cliff. J. H. Mackey, Sudbury, president. [E. R. J., Oct. 12, '14.]

Toronto Suburban Street Railway, Toronto, Ont.—That this company must build a line on Annette Street from Keele Street to Jane Street in Toronto, is the result of a decision in the Appellate Division at Osgoode Hall on Oct. 22. The company appealed from the order of the Ontario Railway & Municipal Board requiring a single track to be constructed on these streets. The court held that the company was estopped from raising the appeal as regards this order, but under an agreement between counsel there will be a stated case for the determination of the general question of law as to whether the Railway Board has power to direct the company to build tracks on a street on which, under the company's agreement, dated 1899, the company had an option to build or not.

Toronto, Ont.—Work on the Bloor Street civic line from Dundas Street to Quebec Avenue in Toronto will be begun by the city at an early date. It is stated that special legislation is not necessary.

Uxbridge, Ont.—It is stated that the Provincial Hydro-Electric Commission, in conjunction with the various municipalities, will begin the construction of the following lines this fall: Toronto to Unionville, 14 miles; Unionville to Uxbridge, via Vandorf, 25 miles; Unionville to Brooklyn through Markham; Unionville to Stouffville and Port Perry; also spur line from Vandorf to Newmarket. The cost per mile of the line from Unionville to Uxbridge is estimated at $27,650, including roadbed, buildings, bridges, roadways, etc.

Toronto (Ont.) Railway.—Arrangements have been made by this company and the city of Toronto for the reconstruction of the track on College Street in Toronto from Spadina Avenue to Lansdowne Avenue. The section between Spadina Avenue and Bathurst Street will be built at once.

Glenada, Ore.—The operation of an electric railway from Glenada to the lakes south of the Siuslaw to connect with a steamboat line across the lakes, is a project under way to be financed by Siuslaw capital in the development of extensive plans for this territory. A townsite has already been laid out on the south side of Tsiltcoos Lake. It is proposed to electrify the present narrow-gage tramway constructed by Porter Brothers, railroad contractors, from Glenada south 3 miles to Clear Lake which connects with Tsiltcoos and Long Lake. The railroad contractors will have no further use for the tramway and they have offered the line for a nominal sum to represent the sale value of the material minus the cost of tearing it down and shipping it away. Power is to be obtained, if the project is carried out, from the Florence Electric Company, which has wires already strung across the harbor and which supplies the town of Mapleton with current.• [E. R. J., Oct. 17, '14.]

West Penn Traction Company, Pittsburgh, Pa.—Plans are being considered by this company for a line between West Newton and Hunker Station.

Memphis (Tenn.) Street Railway.—This company is asked to consider plans to extend the Crosstown line north from Poplar Avenue and the Overton Park Avenue line out Overton Park Avenue to Evergreen. By extending the Crosstown line the Beale and Main line and the Jackson Avenue line could be tapped in the northeastern part of the city of Memphis.

***Brenham, Tex.**—Plans are being considered to build an electric railway in Brenham and through Washington County. Frank Eberle, secretary of the Brenham Young Men's Business Association, is interested.

Gulf, Freeport & Northern Railway, Freeport, Tex.—This company is asked to consider plans to extend its line through Rosenberg. Beginning at Freeport, the proposed line extends through Columbia, Damon's Mound and Fairchilds, and the surveying lines are now within a few miles of Rosenberg. Grading of some 20 miles from Fairchilds south has already been completed. D. A. Barr, Freeport, is interested. [E. R. J., Oct. 3, '14.]

***Dayton, Tex.**—Plans are being considered to build an electric line between Dayton, Houston, Beaumont and Liberty.

San Antonio, San Jose & Medina Interurban Railway, San Antonio, Tex.—Citizens of Castroville, La Costa, Rio Medina and Red Wing have raised a bonus of about $35,000 to aid in the construction of an interurban line to extend between San Antonio and the Medina dam, via San Jose, Kirk, La Coste, Castroville and other points. It is planned to begin construction of the line between La Coste, 25 miles west of San Antonio, on the Sunset division of the Southern Pacific Railroad, and the Medina dam within the next few weeks. J. G. Miller, 400 Swearingen Building, San Antonio, general manager. [E. R. J., Sept. 26, '14.]

Morgantown (W. Va.) Interstate Railway.—This company has awarded a contract to Joseph Vandergrift, New York, to build an electric line from Morgantown to Point Marion, Pa.

SHOPS AND BUILDINGS

Miami (Fla.) Traction Company.—Plans are being prepared by this company to build new carhouses in Miami.

Bay State Street Railway, Boston, Mass.—The company has opened a new passenger station on School Street in the Washburn Block in Brockton.

Kansas City, Clay County & St. Joseph Railway, Kansas City, Mo.—This company has recently erected an addition to its car shops and offices in North Kansas City at a cost of about $1,000. One of the new stations on the line is that at Camden Point, Mo., about half-way between Kansas City and St. Joseph. The station is of the company's special design, frame and stucco, and is arranged as a residence for the agent. The station also has a little store, to be operated by the agent. The cost of this station was $2,500.

New York Consolidated Railroad, Brooklyn, N. Y.—The Public Service Commission has extended the time within which this company will build a new passenger station upon its Myrtle Avenue elevated line at Cumberland Street and Myrtle Avenue in Brooklyn, from Oct. 1, 1914, to Jan. 31, 1915.

Chambersburg, Greencastle & Waynesboro Railway, Waynesboro, Pa.—Work has been begun by this company on the new addition to its carhouse on East Main Street in Waynesboro. The structure will be 40 ft. x 100 ft. and will be frame, with galvanized roof and sides. It is being built for the purpose of storing the summer cars and will have a capacity for twelve cars.

Ogden (Utah) Rapid Transit Company.—This company has awarded the contract for the new interurban passenger station on Twenty-fourth Street in Ogden to C. F. Dinsmore, Ogden. The contracts for the electric wiring and heating have not been awarded. This terminal will be erected for the joint use of the local company and the Salt Lake & Ogden Railway Company.

West Virginia Traction & Electric Company, Wheeling, W. Va.—This company has received a shipment of material for the construction of a large pumping station to be located at or near Majorsville. Plans are being made to build a new passenger station at Majorsville.

POWER HOUSES AND SUBSTATIONS

South Covington & Cincinnati Street Railway, Covington, Ky.—This company will install new substation equipment consisting of two 1500-kw synchronous rotary converters, six 525-kva transformers, two switchboards and accessories. All the apparatus will be furnished by the General Electric Company.

Interborough Rapid Transit Company, New York, N. Y.—This company will install new substation equipment, comprising two 4000-kw, six-phase commutating pole rotary converters, seven 1400-kva transformers and accessories. The contract to build all the apparatus has been awarded to the General Electric Company.

Nashville Railway & Light Company, Nashville, Tenn.—This company will place in operation in one of its substations a 500-kw motor generator set which was recently purchased from the General Electric Company.

Corpus Christi Railway & Light Company, Corpus Christi, Tex.—This company will add to its substation equipment a 200-kw, three-bearing synchronous motor-generator set of General Electric make with 8.5-kw exciter.

San Antonio Gas & Electric Company, San Antonio, Tex.—This company will place in operation new substation equipment consisting of a 1000-kw, six-phase commutating pole rotary converter, three 350-kva transformers and accessories. This apparatus has been purchased from the General Electric Company.

Monongahela Valley Traction Company, Fairmont, W. Va.—This company will place in operation new power plant equipment comprising three 1250-kw, a.c. generators and 100-kw motor-generator set. The contract for the apparatus has been placed with the General Electric Company.

Manufactures and Supplies

ROLLING STOCK

Chicago, Milwaukee & St. Paul Railway, Chicago, Ill., has ordered one 1500-volt 50-ton electric locomotive from the General Electric Company.

Interborough Rapid Transit Company, New York, N. Y., is having ten work cars built by the Magor Car Company.

Bolivian Rubber & General Enterprise Company, La Paz, Bolivia, a new line in that city, has placed an order for rolling stock with The J. G. Brill Company.

Shore Line Electric Railway, Saybrook, Conn., is expecting to purchase several new interurban cars with seating capacity of not less than fifty-two persons, to replace those recently destroyed by fire.

Wilkes-Barre & Hazleton Railway, Hazleton, Pa., has under consideration the purchase of five interurban cars and ten city cars, as well as six or eight freight cars. These cars will probably be of all-steel construction.

Dallas (Tex.) Consolidated Electric Street Railway has specified the following details for the thirty-five closed prepayment motor cars recently built by the American Car Company:

Seating capacity	40
Bolster centers, length,	19 ft. 2 in.
Length of body	20 ft. 6 in.
Length over vestibule,	39 ft. 6 in.
Width over sills,	8 ft. 3 13/16 in.
Width over all	8 ft. 7 5/16 in.
Height, rail to sills	32⅜ in.
Height, sill to trolley base,	8 ft. 10⅞ in.
Body	composite
Interior trim	statuary bronze and malleable iron
Roofing	Agasote
Roof	arch
Underframe	metal
Air brakes	West.
Axles	Brill
Bumpers	American
Cables	G.E.
Car trimmings	Dayton
Control,	G.E. type, M.K., double-end
Couplers	Tomlinson
Curtain fixtures	Cur. Sup. Co.
Curtain material	Pantasote
Destination signs	Hunter
Fare boxes	Johnson
Fenders	H.B.
Pinions	Tool Steel
Gongs	Wall Mfg. Co.
Hand brakes	Dayton, with Peacock improved drum
Heaters	Consol.
Headlights	Esterline
Journal boxes	Brill
Motors,	2 G.E. No. 201, outside hung
Registers	International
Sanders	Elec. Ser. Sup. Co.
Sash fixtures	O. M. Edwards
Seats	Hey. Bros. & Wake, reversible
Seating material	rattan
Springs	Brill
Step treads	American Abrasive Metals Co.
Trolley catchers	Keystone
Trolley base	G.E.
Trucks	Brill 39 E
Ventilators	American

TRADE NOTES

C. M. Paxton has resigned from the Peter Smith Heater Company, Detroit, Mich., to re-enter the operating field.

Nachod Signal Company, Inc., New York, N. Y., has received orders from the Lehigh Valley Transit Company for four automatic signals, Types CD and MD. Part of this equipment will be used for the Eighth Street Bridge in Allentown, Pa., which is one of the notable concrete structures in America.

John A. Roeblings Sons Company, Trenton, N. J., has received a $50,000 order for telephone cable from the New York Municipal Railway which will be used for the first of a progressive series of instalments of the telephone train dispatching system on the new rapid transit lines of this company.

General Electric Company, Schenectady, N. Y., has received orders for electrical equipment from the following electric railways: Boston (Mass.) Elevated Railway, forty MK control equipments; Springfield (Mass.) Street Railway, ten air-brake equipments; Dayton & Troy Electric Railway, Tippecanoe City, Ohio, ten GE-88, 40-hp form B split-frame railway motors; Worcester (Mass.) Consolidated Street Railway, ten air-brake equipments; Cincinnati & Columbus Traction Company, Cincinnati, Ohio, four GE-73, 75-hp railway motors.

General Railway Signal Company, Rochester, N. Y., has appointed M. Wuerpel assistant to president. S. G. Johnson, vice-president, will be in full charge of the sales department (which includes all branch and foreign office, commercial engineering, commercial inspection and contract installation business) reporting to the president and general manager and with headquarters at Rochester. All those in the sales department formerly reporting to the president and general manager will now report to and receive all instructions from Vice-President Johnson. This company has created a department of publicity and education. H. M. Sperry has been appointed as manager of this department, reporting to the president and general manager and co-operating closely with all departments.

ADVERTISING LITERATURE

MacGovern & Company, Inc., New York, has issued a catalog of its used electrical and steam machinery, including cars and car equipment.

Prepayment Car Sales Company, New York, N. Y., has issued a folder entitled "Blunders," which calls attention to the saving from blunders effected by equipping new cars or re-equipping old ones with prepayment platforms.

Lutz-Webster Engineering Company, Inc., Philadelphia, Pa., has issued a folder describing its compression wrenches, drill posts, compression ratchets, double-end sockets, no-set-screw lathe dogs, drill sockets and bridge and extension sockets.

Eugene C. Mills, chief engineer Sacramento Valley Irrigation Company, Willows, Cal., has issued a booklet describing the corrugated iron construction on the Sacramento Valley Irrigation project. American Ingot Iron is used in this construction.

J. D. Este Company, Philadelphia, Pa., has issued a folder illustrating the game of "Skee-Ball," which recently attracted so much attention at the A. E. R. A. convention at Atlantic City. The game may be readily used as a drawing feature for amusement parks reached by electric railways.

Goldschmidt Thermit Company, New York, has issued pamphlet No. 16, second edition, describing and illustrating the thermit process of pipe welding. Pamphlet No. 39, just issued, describes some recent improvements in methods and practice made by this company in its thermit insert fully-welded rail joint.

Fiber Conduit Company, Orangeburg, N. Y., has issued the third edition of its complete fiber conduit catalog. The catalog gives detailed and illustrated descriptions of this company's various types of conduit, including the socket joint, sleeve joint, Harrington joint, screw joint and "Linaduct" types. A number of photographs show several installations of this conduit.

SKF Ball Bearing Company, New York, N. Y., has issued a compact catalog on the SKF ball bearing as applied to electric railway service. Of particular interest is the company's installation of these bearings on the new stepless cars of the Third Avenue Railway, New York, after SKF bearings had made good in four years' service on the same railway's storage-battery cars. The booklet reviews the merits of the ball bearing from many angles, including that of energy and lubrication economies, shorter motor length, better maintenance of armature air gap and improved meshing of gearing.

Swedish Ljungström Steam Turbine Company, Ltd., Finspong, Sweden, has issued its first catalog describing its "Stal" steam turbines of the radial-flow type, especially adapted to the driving of generators. In these turbines the reaction principle has been applied, which is said to result in unusually good steam economy, reliability and saving of space. In elaborating the design of this turbine special attention has been devoted to the effect of hot steam on its components and arrangements have been made so as to avoid any unfavorable influence of varying steam pressure and steam temperature on the adjustment of the different parts. The expansion and contraction of the material may take place without altering either the centering and balancing of revolving parts or the clearance between revolving and stationary parts. Consequently the working safety of the turbine is insured both at high and low temperatures, and this turbine system can therefore be applied in conjunction with the highest steam temperatures and steam pressures that are obtainable with existing types of boilers and superheaters.

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THE NEW HAVEN INDICTMENTS

A recent issue of the Springfield *Republican* comments editorially on the indictment of the New Haven directors as follows: "The time when the dead past will be permitted to bury its dead in the matter of criminal conspiracy to monopolize commerce seems far away." This puts in a graphic and figurative manner a fact which puzzles railway managers and others and worries them too, namely, that the federal administration seems disposed to hold all directors during the period when the consolidations were effected as responsible for the alleged extra-statutory acts committed. The inquisitorial dragnet includes not only those who were directors during all or most of the period under consideration, but such men as Theodore N. Vail, Edward Milligan and others who served only a short time under the old administration. Without going into the merits and demerits of the New Haven case, which have already been considered at length in the public press and will soon be rehearsed in much greater detail, it would seem that if the constituted authorities for many years did construe the consolidations effected by the New Haven Railroad as acts in restraint of trade, an effort to bring criminal charges on this basis now is little less than persecution. The public as a whole in the states affected feel the same way, if the result of the elections last week in New England and the East generally are any criterion of their sentiments.

ELECTROLYSIS WITHOUT STRAY CURRENTS

We take pleasure in printing a very unusual article in this issue of the Electric Railway Journal on the subject of electrolytic corrosion. This article is by E. H. Scofield, engineer of power and equipment, and L. A. Stenger, chemist of the Twin City lines. The authors were led to suspect that electrolysis might be caused by currents self-generated in pipes, their suspicions having been aroused by apparent signs of such corrosion in localities where return currents from electric railways could not possibly have existed. Having circumstantial evidence to confirm their suspicions they proceeded in a scientific manner to reproduce the observed results by simple and convincing experiments. These have covered a long period of time, and the electric railway industry is fortunate in having available the data which have thus far been secured. The conclusions are entitled to great respect on account of the manner in which they have been obtained, and they will be the source of considerable comfort to many electric railway operators at whose doors have been laid the blame for all corrosion of pipe which occurred within a wide range surrounding their return circuits and upon whom the public has been inclined to fasten the entire burden of introducing expensive corrective measures. The results of the tests illustrate the importance of considering all aspects of a problem as complicated as that involved in pipe corrosion. We feel sure that the authors will feel repaid if the publication of the results of their work leads to constructive discussion of a complicated subject.

SPECIAL WORK STANDARDIZATION

In a recent communication to this paper from R. C. Cram, assistant engineer of way and structures Brooklyn Rapid Transit Company, attention was directed to the lack of standard specifications for track special work. Mr. Cram suggested that a study of this subject should be conducted by a committee of the American Electric Railway Engineering Association. Our recent studies have impressed upon us most forcibly the need for such action, not only with the object of standardizing design, but also of enabling competing manufacturers to bid on the same character of material and design. At present railway engineers cannot compare bids because each manufacturer furnishes his own design, which may or may not be best adapted to the service conditions. Consequently, the order must be placed either on a price basis, or because a certain design is favored, a state of affairs which must be very unsatisfactory to manufacturers and engineers alike. A committee which would prepare a set of specifications enabling them to obviate these difficulties would receive universal approval. Probably the most perplexing phase of the problem of standardizing track special work is the extent to which it can be carried without conflicting with local conditions or automatically exiling certain designs from the field of competition. We believe that the prevalent condition affords an excellent opportunity for constructive work without extending to the point where the standards could not be generally used. To accomplish the best results and at the same time to make such an analysis thorough, it seems proper that such a study should begin with the foundations and cover the size, spacing and arrangement of ties under typical layouts, from a simple turnout to a grand union. Even if the work of the committee for one year was confined to the foregoing suggestion, it would, no doubt, find a wide diversity of opinion and an abundance of data for analysis sufficient to warrant definite recommendations.

THE PUBLIC UTILITY DRAFT BILL

This week has seen the culmination of three years' work on the part of the National Civic Federation in the publication of its draft bill for the regulation of public utilities, which is abstracted elsewhere in this issue. In reality, from the time when in 1907 the commission on public ownership and operation issued its conclusion that effective regulation in this country was preferable to public ownership and operation, the thoughts of the federation have been directed toward the question of what constitutes adequate regulation which would be fair alike to the investor, the operator and the public. In 1911, the increase in importance of the matter led to the formation of the department on regulation of public utilities and the selection thereby of the executive council of nine to prepare a tentative draft of a model public utility bill. The first two years of the committee's activities were devoted to the compilation of data, now available in printed form, showing the composition, method of creation and precise powers of every public body charged with the regulation of public utilities in our various states. Having thus obtained a basis for intelligent study, the committee devoted a year to the preparation of a model statute to be used as a basis for uniform legislation.

When tentatively drafted, the proposed bill was laid before those who it was thought were most competent to assist in reducing it to its final form, but the result served to emphasize fully the complicated and difficult nature of the problem involved. While of the more than 300 sections of the bill only sixty were criticised by anyone, yet the differences of opinion on these sixty points arising from different points of view on the part of federation members and others made it impracticable for the federation to obtain any general concord on the subject. If the association had been a legislature, it would naturally have bent every effort to secure the judgment of the majority of its membership in regard to the bill. Under existing conditions, however, its only function is to publish the results of the investigation as they stand, with the hope that they will be useful in throwing various light upon the issues involved.

A bill of this character is essentially a compromise measure, not representing in all probability the exact views of any single member of the council. Its chief value lies in the fact that it strikingly portrays the still very incomplete state of public utility legislation. Actually, there are as many radical variations in the legislative acts authorizing these commissions as there are states. This itself is not surprising when we consider the extent of the changes from former ideas of American methods of government which are involved in commission regulation. It will probably take many years of painful experience before the proper status of the commissions and the extent of the powers which should be committed to them will be even approximately determined.

When the investigation of the National Civic Federation began, forty-three states had regulatory bodies, although some of these bodies had very limited powers. During the compilation of the draft bill a number of these states greatly increased the powers of their commissions, notably Massachusetts, Illinois and Pennsylvania, and now only three states, Delaware, Wyoming and Utah, have no commissions. This suggests the question of the extent to which any standard bill drafted now will be adopted. It is difficult to satisfy oneself that the same differences in point of view that rendered it impracticable for the National Civic Federation to adopt a truly model bill will not prevent state legislatures also from adopting uniform regulatory practices. The tenacity with which existing commissions are hanging on to their accounting idiosyncrasies in the face of the Interstate Commerce Commission uniform system is a pertinent example. We would not be understood as inferring that the work was not worth the effort, for any move toward standardization is praiseworthy. In view of the still experimental stage of public utility legislation, however, we believe that the bill in its immediate effects will be of value principally in calling attention to the points that are still devoid of a widespread, to say nothing of a universal and final, solution.

Although the bill purports to be in advance of existing legislation it has a number of serious defects. For instance, we are surprised that there should not have been better recognition of the frequent changes of commission personnel and that the term of office was not made at least ten or preferably fifteen years, instead of five, so as to make a commissioner's tenure of office more independent of politics. Again, while deliberate violations of commissions' orders and offences of moral turpitude should be punished, some of the penalties enumerated in the bill are excessive, such as accumulating fines of $5,000 per day for failure to file a report within a specified time or to make a specific answer to any question propounded by the commission; imprisonment for five years for wilfully destroying or mutilating accounts, records or memoranda prescribed by the commission, or failing to make full entries of all facts, and penal sentences for any public utility officer or agent who neglects to comply with every order of the commission. One can also well criticise the restrictions as to the issue of securities which limit them to the amounts necessary to the "performance of duty to the public" instead of to the fulfilment of the purposes of incorporation, thus preventing a company from creating such a valuable adjunct as a legitimate park property for increasing its income. Again, the bill excludes all municipal public utility enterprises from the jurisdiction of the commission except so far as the regulation of their accounts is concerned. In the conduct of public utility enterprises, municipalities are as liable to make serious errors as private companies, and if any machinery is to be established for public utility regulation, municipal enterprises should certainly be included in its jurisdiction. These are by no means all of the clauses to which exception might be taken but are cited to show some of the points where changes should be made.

TAKING UP THE SLACK IN INTERURBAN SERVICE

Recent first-hand experience with a well advertised interurban service which competes effectively with a steam railroad between terminals suggests that a good deal of lost motion remains to be taken up on not a few such properties before the full benefits of the facilities offered can be enjoyed. The case is typical. The line traversed by the through electric cars has earned a well deserved popularity for the punctuality of its service; the rolling stock is clean and comfortable; the schedule speed over the interurban right-of-way is about 30 m.p.h.; but the through running time is nearly double that on the strictly interurban section on account of the slow movement in the terminal cities.

This cause of delay is an old offender, but it is just as important a factor in deflecting travel to the parallel steam road as though it had never been heard of by the managements of the three companies over whose tracks the through cars run in making a complete trip. Few business men are willing to take two hours for a journey in the middle of the day that can be covered in an hour by steam, even though the latter may cost 30 or 40 cents more than the former. Constructive criticism may be offered along general lines, not so much with the idea of discovering new principles as with the hope of calling attention to certain requisites of good service which are sometimes overlooked even in these enlightened days. The probabilities are that interurban companies realize these essentials better than a good many of the city roads, but as the end of the line is the best place to take up the slack, no apology is offered for emphasizing the failure of not a few local companies to render that alert co-operation in handling through and foreign cars which makes such a vast difference in the patronage and consequently in their own receipts at the terminal ends of the road.

So far as is humanly possible, through interurban cars should have the right-of-way. That is to say, they should be scheduled so as not to be delayed to any greater extent than necessary, and they should not attempt to do a local business. This can be accomplished by running the cars on some limited stop plan such as that of making stops only for boarding passengers on the trip out of the terminal city and for discharging passengers during the trip into the terminal city. A study should be made of the possibilities of short-cut lines within the city, and the movement of the cars can often be expedited through the congested districts by greater attention to the problem of police traffic regulation and street inspection. Too often an interurban car receives no more consideration from the traffic police officers than a local car, yet the time lost in slowdowns and in "inching along" with uncomfortable jerks and frequent dead stops in the vicinity of busy corners is by no means inconsiderable. Stop-watch studies of factory processes have accomplished wonders in a reduction of time for operations, and a complete time analysis of controller movements in getting into and out of interurban terminal cities would show some surprising inefficiencies of car movement in more instances than a few. The time is coming when automobile traffic at street intersections will have to wait for the passage of the interurban car; when freight trains and switch engines will not be allowed deliberately to ignore the rights of an interurban car waiting to cross a steam railroad track; when single-track entrances into cities will give way to double track; when conferences will be held to see if interurban crews cannot make the entire run without change, just as they now often run an overlap of a mile or so on the foreign system if the meeting crew is behind time; when all crew changes will be made quickly; when loading and unloading stops at the terminal cities will be made in squares or streets wide enough to allow free movement of passengers, and when every possible effort will be made to get local cars out of the way of through service. A few minutes saved here and a few there will soon be effective in stimulating increased patronage and without any demand for excessive speeds on the intercity stretches.

TRAFFIC INSPECTORS BY EXAMINATION

The traffic inspector usually does not earn more per hour than the platform man. His actual earnings, however, are greater because he can work more hours with less fatigue. The position is also attractive as a step upward to better things. In selecting this noncommissioned officer of the electric railway army, the management usually places more stress upon a pleasing but firm personality and record of meritorious service than on seniority and education. On one large property after the candidate is chosen he is sent to the instruction department to familiarize himself with the duties of a conductor if he has been a motorman, or with the duties of a motorman if he has been a conductor. Thus he is equipped to deal with problems at either end of the car. As finishing touches he makes a fresh study of the operating rules before the last quiz by the superintendent of transportation.

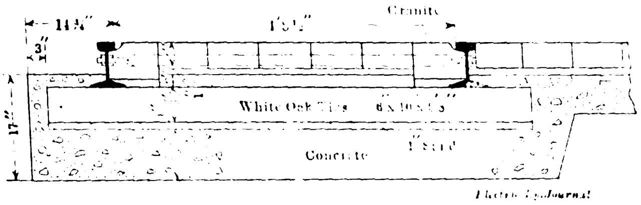
An entirely different principle for the selection of inspectors has been adopted by the Municipal Railways of San Francisco. In compliance with the law, the San Francisco Board of Public Works conducted on Oct. 31 a formal civil service examination for promotions from the platform to inspectorships. As recorded elsewhere in this issue, the examination allowed 85 out of a possible 100 points for accuracy in making out reports, local geographical knowledge and arithmetic. The low maximum of five points for experience is understandable because no man who had not seen at least three years' service was eligible, but only ten points were assigned for meritorious behavior.

The San Francisco examination should certainly bring forward the most literate of the men already employed and encourage the entrance of better educated men to electric railway service. We believe that the method would be greatly strengthened, however, if due allowance is made for personality. Such an allowance is not impracticable, as is shown by the experience of the Board of Education of New York City which makes such an allowance in conducting examinations for school teachers.

Renewing Rail On Twelve-Year-Old Ties and Foundations

An Interesting Piece of Track Rehabilitation on One of the Detroit United Railway's Principal Trunk Lines—In This Article the Character of the Work and the Facilities for Doing It are Described

Since the Detroit (Mich.) United Railway is recognized as one of the pioneers in the use of the sand cushion with concrete track foundations, no small interest will be attached to the rehabilitation of this type of construction after twelve years' service. Extremely heavy traffic, including both city and interurban equipment and averaging 63.6 cars per hour during the 365-day year, or an average of 1018 tons per hour during the same period, accounts in a measure for the depreciation of the track. Other items affecting the life of the track, in fact forming the real reason for rehabilitation, include the use of mechanical instead of cast-welded joints and a shallow-head 9-in. girder-grooved rail. On the other hand, when the fact is made known that only rail renewal was necessary at this time, the ties and track foundation being found in excellent condition requiring little or no expense to prepare them to receive the new rail, it will be seen that there really is some truth in the present-day term "permanent track construction."

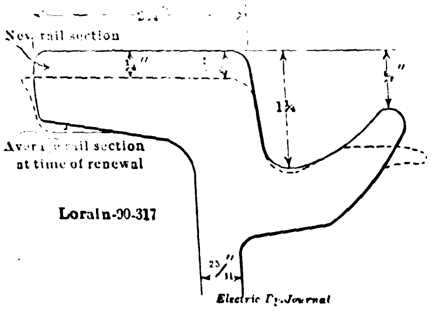


D. U. R. TRACK REHABILITATION—CROSS-SECTION OF OLD TRACK

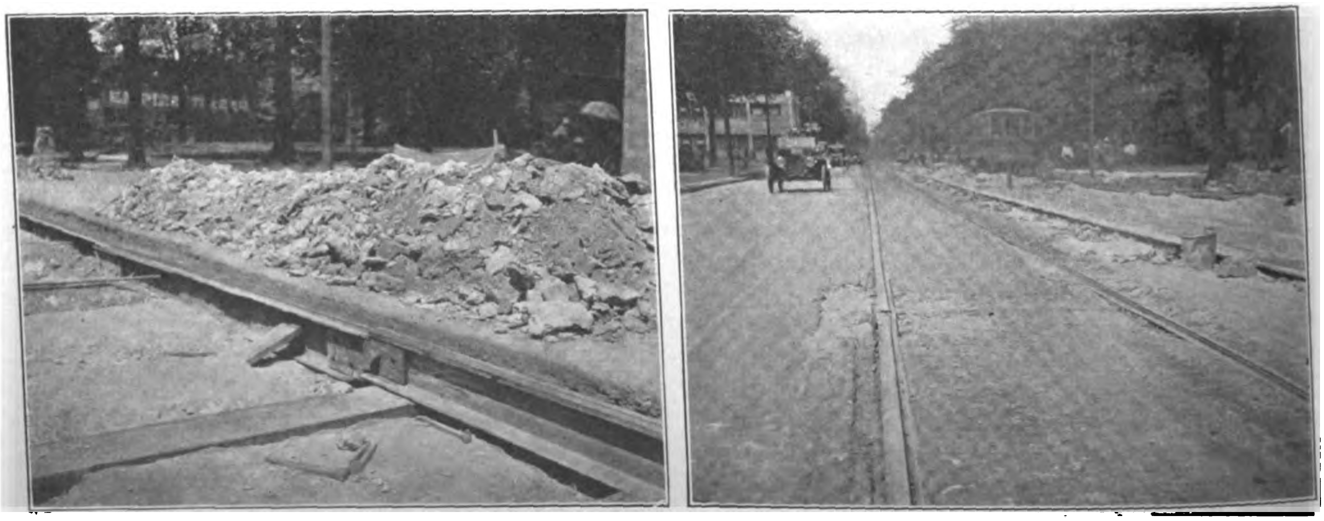
Prior to the beginning of actual reconstruction work, John Kerwin, superintendent of track, decided that although it was possible to obtain more service out of the old 90-lb. girder-grooved rail by making repairs, this would be done at the expense of the track foundations, which it was believed could be saved if the old rails and joints were renewed immediately. An investigation of the concrete foundation and ties indicated that both were as good as on the day they had been installed, except in a very few instances where extremely bad joints had crushed the concrete beneath the ties. Accordingly it was decided that by renewing the concrete in these spots, shimming the rail for slighter surface variations, and using a 7-in. 91-lb. T-rail in place of the 9-in. 90-lb. girder-grooved rail, thus providing additional wear life in the rail head, at least twenty years of additional track life could be obtained. Accordingly the reconstruction work of this main trunk line on Woodward Avenue was planned for this partial renewal, and after the work had been opened, that is, the old rail and paving surface removed, it was found that the decision based on the test was a good one, hence, the actual cost of rehabilitation would be greatly reduced.

CHARACTER OF OLD TRACK CONSTRUCTION

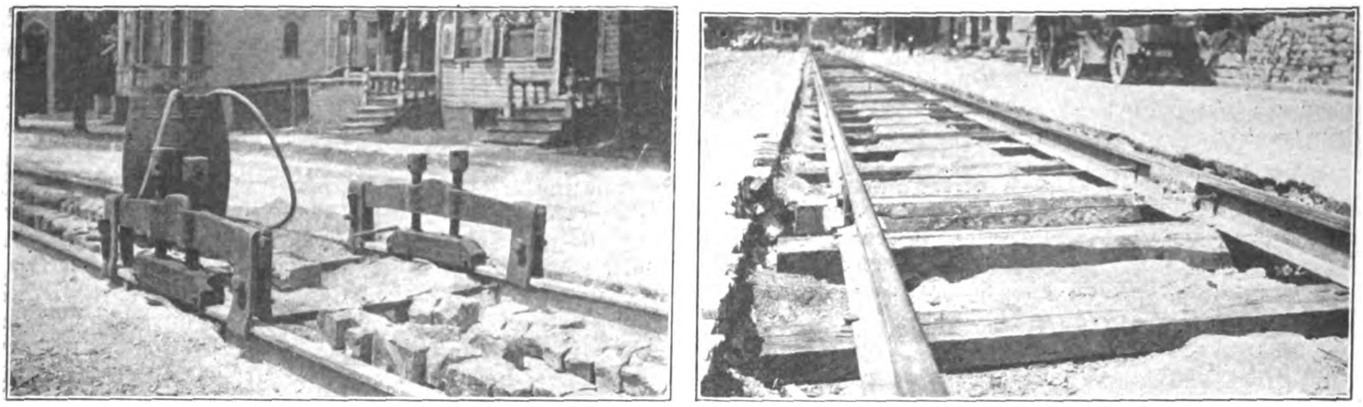
In 1902 the track department of the Detroit United Railway laid a double track on Woodward Avenue, using what was then termed this company's standard permanent track construction. This included an 8-in. concrete slab laid in the bottom of a prepared trench, and over this slab a 1-in. washed sand cushion was spread to receive the ties. These ties were white oak, 6 in. x 10 in. x 6 ft. 8 in. in size, spaced at 36-in. intervals. As mentioned before, the rail used was a 9-in. 90-lb. girder-grooved rail with eight-bolt angle-bar



D. U. R. TRACK REHABILITATION—SKETCH SHOWING AVERAGE RAIL WEAR



D. U. R. TRACK REHABILITATION—VIEW OF JOINT BETWEEN NEW AND OLD RAIL SHOWING CHARACTER OF CONCRETE REMOVED, ALSO VIEW OF OLD TRACK



D. U. R. TRACK REHABILITATION—VIEW OF CAST-WELD MOLDS AND COOLING CLAMPS IN POSITION, ALSO VIEW OF TRACK OAK AND STEEL SHIMS, TEMPORARY JOINTS AND TIE-RODS

joints. These rails were maintained at gage by 3/8-in. x 1¾-in. x 5-ft. 3-in. flat tie rods, installed at 10-ft. intervals. The depth of the rail allowed 4 in. of concrete over the surface of the ties, over which the 1-in. sand cushion was spread to receive a vitrified-brick pavement surface.

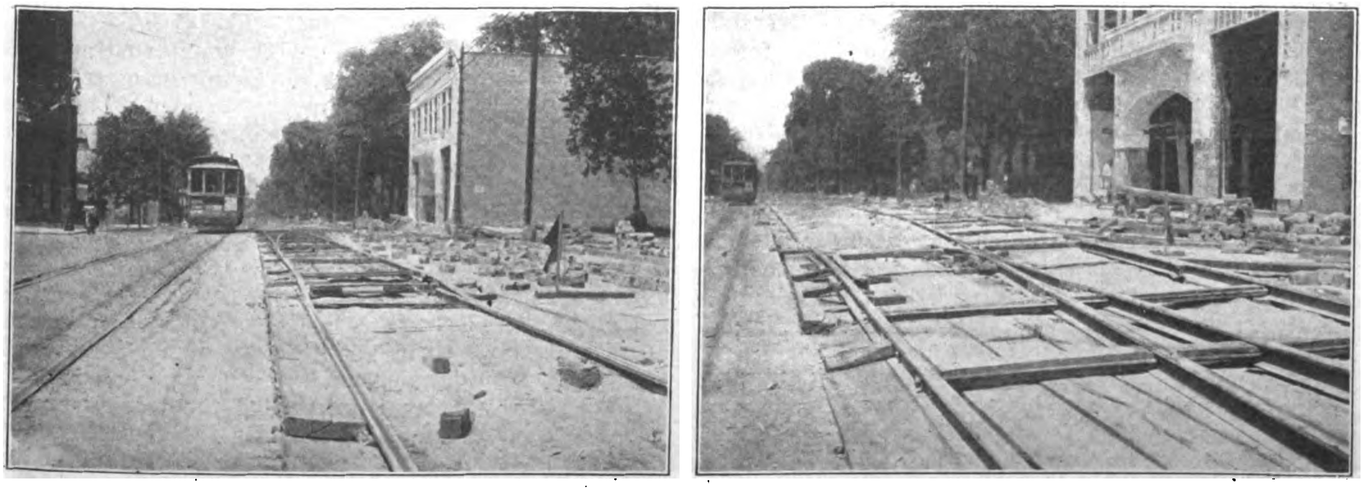
As might be expected, the first form of defect developing in this track was cupping at the joints. During the life period of the track these joints were resurfaced at three different times and ground, and at one of these times the ordinary angle-bars were exchanged for continuous bars. Finally the joints became so loose that reinforcing and grinding was considered impracticable. Moreover, it was not deemed advisable to renew the joints again, owing to the badly worn condition of the ball of the rail. At this time it was decided that it would be an economy to save the foundation, which appeared to be in excellent condition between the joints, by renewing the rail at once, rather than attempting to rehabilitate the joints, and thus obtain the additional wear life out of the old rail.

RECONSTRUCTION MATERIAL

As mentioned before, the 9-in. girder-grooved rail was replaced by a 7-in. 91-lb. T-rail, thus providing a stiffer section laterally as well as one with heavier head and consequently a longer life. In order to provide for the difference in rail heights, 2-in. white oak planks were ripped from the standard cross-ties and laid on the tops of the ties already in the track. These oak planks, as well as the rail, were securely fastened with 8-in. spikes to the ties embedded in the original track construction. The rails were laid in 60-ft. lengths, as in the original construction, but the use of the cast-welded joint instead of the mechanical joint made it necessary to break away the concrete around the old joint ties in order to respace them. Of course in many instances this concrete was badly shattered by extremely heavy impact blows at the very bad joints in the old track, thus requiring the concrete to be renewed or replaced to make a first-class finished job.

The slight variations in the plank shims necessary were first provided for by making these planks vary in thickness from 2 in. to 3¼ in. in ¼-in. variations. These were delivered on the work in sorted lots, and at the time the new rail was placed were merely laid indiscriminately on the old ties. Afterwards a gang of shimmers followed and replaced or shifted these planks to make the new rail surface uniform. Variations of less than ¼ in. were provided for by sheet-metal shims when additional height was needed, or by adzing the planks when it was desired to lower the rail surface. All planks were drilled before they were put in place, so that the spikes would not split them. The sheet-metal shim plates were of the slotted type so that they could be used with other rail-base widths. This 7-in. rail, like the 9-in., was connected at 10-ft. intervals with 3/8-in. x 1¾-in. x 5-ft. 3-in. flat tie-rods. Cast-welded joints calling for 227 lb. of cast metal extending 17 in. along the rails are standard in Detroit and were used on this rail. These welds were made just prior to laying the paving surface, but after the joint ties had been respaced and the shattered concrete at these points replaced.

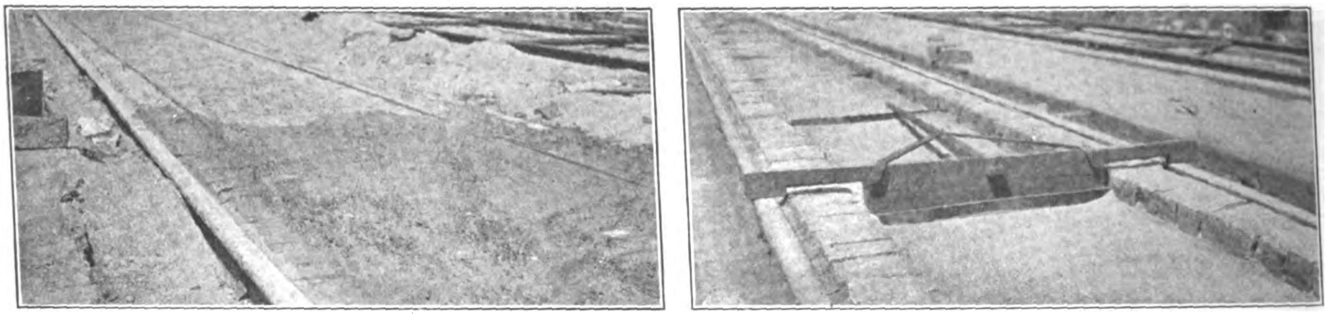
Standard track paving employed includes a single course of granite nose blocks, 11 in. x 6 in. x 5 in. in size, laid at right angles to the rail, and the space between them surfaced with standard vitrified paving block 4 in. x 4 in. x 9 in. in size. The devil strip between the two tracks was also surfaced with ordinary



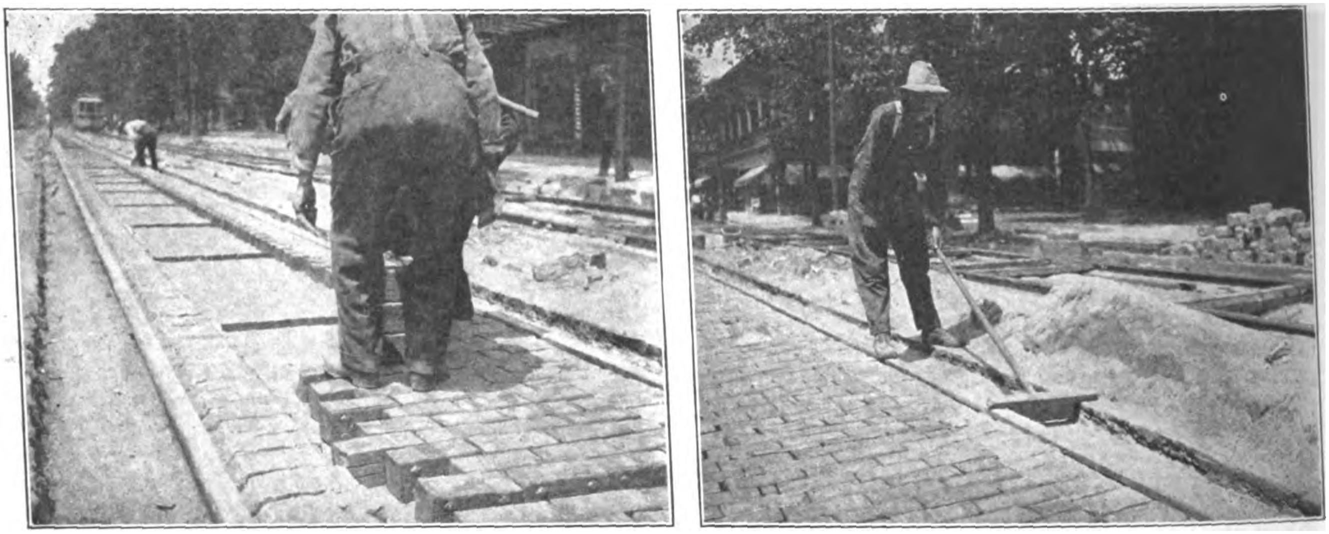
D. U. R. TRACK REHABILITATION—ANCHOR POINTS IN PORTABLE SWITCH AND PORTABLE FROG CROSSOVERS vitrified paving block, and the pavement between the outside rails and the street paving, which was asphaltum on Woodward Avenue, included stretcher courses of paving brick sufficient in number to fill the interval opened to rehabilitate the track.

Organization and Procedure

Since it was necessary to continue operating the cars over this street during the period of rehabilitation, a condition customary now in most American cities, it was necessary to have the work well organized and provide ample facilities to accomplish it in the minimum length of time. In Detroit the work is classified into two kinds, that which can be done without interrupting traffic and that which cannot. The latter, of course, may be accomplished during the interval at night when the cars are off the line, and the former includes day-work wholly. In either case, however, the work is more or less retarded, owing to cramped conditions and traffic interference.



D. U. R. TRACK REHABILITATION—FINISHED PAVEMENT GROUTED AND TEMPLET USED IN LEVELING SAND CUSHION FOR BRICK



D. U. R. TRACK REHABILITATION—METHOD OF LAYING THE BLOCKS AND TEMPLET USED IN LEVELING THE STRIP ADJOINING CITY PAVING

The first gang to arrive on the job is the one which accompanies the work train delivering the temporary track material. This gang installs the portable switches at each end of the passing tracks with a derrick car and lays the track between them. Sometimes as much as a mile of temporary track is laid in one section, and after the night gang has placed it in position the day gang bolts it together and surfaces it. This track is laid on a sand cushion when the pavement is asphaltum, and braces between the outer rail and curb prevent it from shifting toward the curb. On an ordinary brick pavement one plank laid under the outside rail is all that is necessary to surface it. After this temporary track is in position and traffic has been turned over it, active construction work is begun by the paving-excavating gang. This gang loosens and removes all paving blocks, cuts all bolts and prepares the old track as nearly as it can for the rail replacement. This gang usually consists of about thirty men, a foreman and an assistant.

The night gang, consisting of approximately twenty men, completes the work opened by the excavators during the day, loads up the excavated material, or at least load that portion of it which must be removed from the streets, and exchanges the old rail for the new. This gang is usually accompanied by a derrick car and a flat car, and sometimes also by a double-truck motor and two flats. Besides cleaning and replacing the rail this gang also delivers the new material on the job for the following day's work.

The following day the paving gang continues its work, but is followed by a surfacing gang composed of about twenty-five men and two foremen. This gang engages in transferring the shims to their proper positions to give accurate line and surface in accordance with the grade and line stakes set at 50-ft. intervals. After the track has been accurately lined and surfaced by this gang it is ready for the cast welder, which is brought on the job at intervals, preferably when there is a sufficient number of joints to make its coming economical. The cast-welder outfit is usually accompanied by a foreman and thirty-two men, who work either day or night, depending on the requirements.

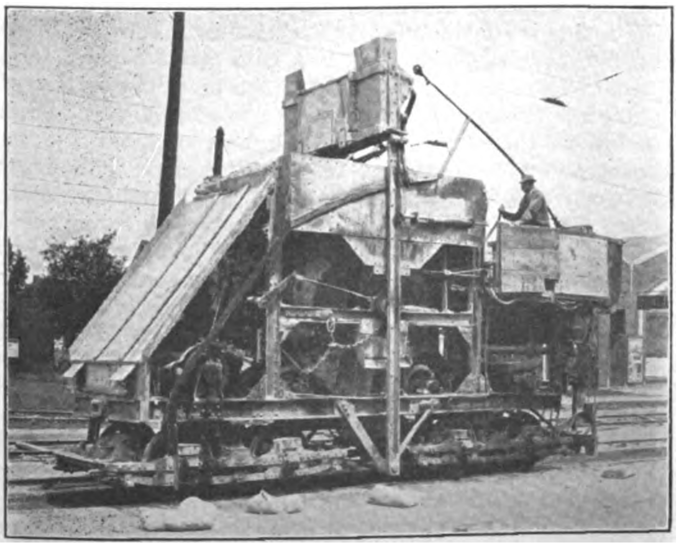
When the welding is completed the track is ready for the concreting, which includes the replacement of that removed at joint ties and that between the ties to bring it up to the paving foundation surface. The concrete mixer, which is of the batch type with three spouts, requires ten men in its operation and has a capacity of approximately 400 yd. per day, or even more when working conditions are exactly right. Views of this mixer are shown in the accompanying illustrations, with the skip in the lowered and elevated positions. It is a self-contained unit, electrically driven and self-propelled. Concrete may be deposited direct to the track or from the spout to wheelbarrows, and wheeled to any point desired.

After the concreting has been completed and allowed to set from seven to ten days, during which time the pavement excavating gang is turned back to complete the paving, the track is turned over for regular traffic. The finished pavement is grouted with a 1 to 3 mixture of sand and cement. Oftentimes it is found necessary to make up for paving-block-thickness variation at the tie-rods by the use of chipped brick. The company has a rule that this chipped-brick course shall be laid two or three courses back of the tie-rod. After the pavers have completed their work, that is to say, that portion including the course between the outer rails and city paving, the city paving gang follows and finishes the joint between its paving and the railway's, and bills the railway company for the work.

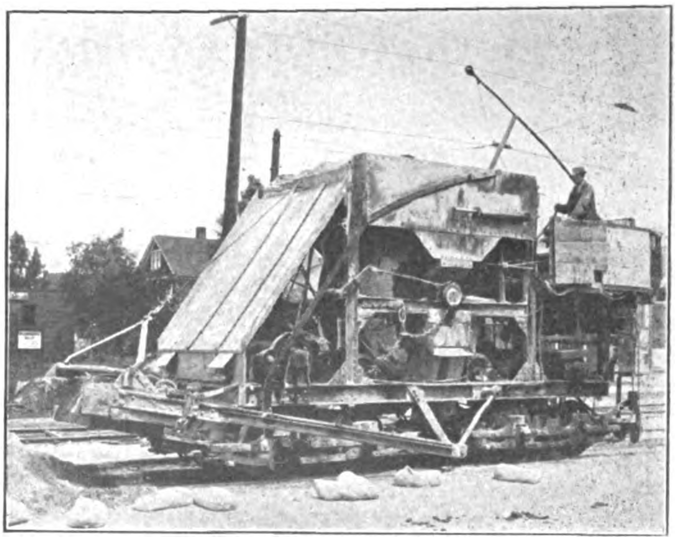
In rehabilitation work of this character the most delicate portion of it must be done by the shimming gang. As already explained, this gang works from grade stakes at 50-ft. intervals or closer, if necessary, and after the men have adjusted the wooden shims the metal shims in various thicknesses are put in place. This gang is trained just for this work and does little or nothing else, and all of its operations are conducted during the daytime. The care exercised in its portion of the job is an index of the success of the whole; consequently the road department believes that too much care cannot be taken by the foremen in charge of this work.

FACILITIES FOR REHABILITATION

Among the facilities used in track rehabilitation which make it possible to do this work and continue operation economically, the portable switch is playing a very important part. John Kerwin, superintendent of track Detroit United Railway, has been a pioneer in the use of portable turnouts and crossovers, especially where the standard A. S. C. E. rail and standard frogs are used. The Kerwin "crossover," or turnout, as it is called, includes a 60-lb. A. S. C. E. rail in 33-ft. lengths, with four-bolt continuous connection plates. The portable track to which it connects is made up in 33-ft. sections, fastened together with four tie-rods to each rail. The two outside tie-rods are 2 ft. 3 in. from the joint, and the inner rods are 8 ft. 6 in. apart. These rods have jamb nuts on each side of the rail, and they are drawn up tight against 3-in. x 6-in. oak spacers, which fit in between the rail webs. In the construction work on Woodward Avenue these rails were laid on oak plank stringers on the asphalt, which in turn rested on from 1 in. to 3 in. of sand cushion, so that the traffic would not scour the asphalt surface.



D. U. R. TRACK REHABILITATION—SELF-CONTAINED CONCRETE MIXER WITH SKIP IN ELEVATED POSITION



D. U. R. TRACK REHABILITATION—SELF-CONTAINED CONCRETE MIXER WITH SKIP LOWERED

Standard Nos. 8 and 9 A. S. C. E. built-up double-spring frogs with 6-ft. anchor points, or beveled switch-points, are used in the portable track turnout. Sections of this track, the switchpoint and frog are shown in the accompanying illustrations. As already mentioned, it is necessary to brace this portable track against the curb in order to prevent its creeping in that direction under traffic. In case the track is laid on a brick pavement a hole is excavated in the pavement at the center of the track, and braces are installed on each side between it and the webs of the rails. After the temporary track has once been delivered to a long section of track undergoing construction, it is shifted as the work progresses in sections just as long as it is possible for the utility motor car to move at one time.

As a rule the day and night work is laid out in sections from 600 to 800 ft. in length. This requires approximately two days before it is possible to change the rail, the first night being consumed in cleaning up the excavating and the second night in unloading material and changing the rails. In order to facilitate the latter, combination joints between the new and old rail are provided and transferred as the work progresses. A view of one of these temporary joints is shown in one of the illustrations.

Other parts of this standard track construction include standard manholes in each depression for surface draining. These are connected to the sewer system and are covered with an ordinary cast-iron perforated cover. Cross bonds are installed at 500-ft. intervals, connecting both rails and both tracks. These bonds are four-strand No. 00 old trolley wire, securely tied and soldered to two sections of a 36-in. strand-wire bond with channel-pin terminals. Holes for these cross bonds and also for the tie-rods are drilled on a piece-work basis by a crew consisting of two men and a boy. This crew is supplied with two electric drills and receives $3\frac{1}{2}$ cents per hole.

Corrosion of Metals in Natural Soils

The Authors Show that Electrolytic Corrosion Can and Does Occur Without Stray Railway Currents and that Two Sets of Conditions May Cause It—Experimental Data Are Given to Prove the Contentions

BY E. H. SCOFIELD, ENGINEER POWER AND EQUIPMENT, AND L. A. STENGER, CHEMIST
MINNEAPOLIS RAILWAY COMPANY

Steel, wrought iron, cast iron and lead corrode in the soils found in the streets of cities where service piping systems are installed. Such corrosion occurs both in the form of uniform rusting or oxidation at the surface, and as the more destructive pitting. The former is generally recognized as a simple chemical action and is considered to be limited in its action and not likely finally to destroy the metallic structure affected. The latter is usually attributed to so-called electrolysis, and when found in localities where electric railways operate the damage is charged to the action of electrical current originating from the return circuits of such railways.

The discovery of numerous cases of destructive corrosion, fair samples of which are shown in Figs. 1, 2 and 7, in localities where there was found to be no possibility of the presence of electric current in the earth originating from commercial electric circuits, led to a search for the causes of such corrosion. Fig. 1 shows a sample of a 4-in. cast-iron water pipe, removed from the natural earth in a city where no electric railways or leakage currents exist. The shell of the pipe was entirely corroded away at several points, while there were deep pits at others. Fig. 2 shows sample of a 1-in. mild-steel pipe, removed from the earth at a location where no leakage currents existed, but where the corrosive condition of the clay soil was very active. Fig. 7 represents a section of corroded lead pipe taken from a mixed, black soil containing cinders and other impurities. No leakage currents could be detected flowing on or from this pipe.

It is the purpose of this article to report the investigations made to determine these causes of corrosion, their nature and the damage that might be expected to arise from them. The investigations disclosed two different classes of phenomena. The first affects metals having more or less impurities in their structure, as iron, either cast or wrought, or as steel. The second affects any metal regardless of internal impurities, such as lead which, from its peculiar chemical properties, is ordinarily regarded as non-corrodible in soils. These two classes of phenomena will be discussed in turn.

CORROSION DUE TO IMPURITIES IN METALS

Reports are available from various sources showing the effects of impurities and irregularities in structure of metals on their electrical conditions. Experimental demonstrations may be made, showing that electric currents are generated when such metals are immersed in, or subjected to the action of, electrolytes. This fact has been advanced as an explanation of the damage done to metals exposed to the atmosphere, but very little attention has so far been paid to the corresponding effect on metals exposed to and in contact with soils.

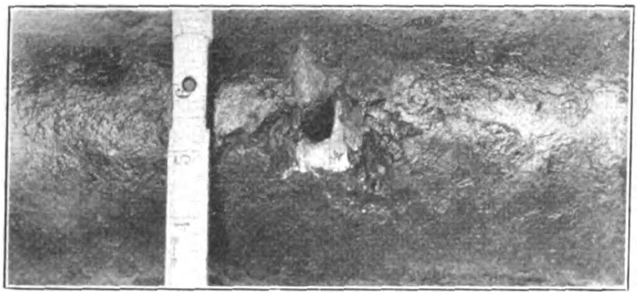
For these experiments two identical terminals were prepared, consisting of platinum plates about 1 in. square. Copper terminals might also have been used. A handle and a connecting wire were riveted in the center of each plate and the connecting wires were, in turn, joined to the terminals of a 15-volt-scale voltmeter. The plates were covered with pads of muslin or filter paper, which serve to prevent metallic contact and to hold a small amount of electrolyte. The electrolyte will be more or less chemically active, according to the kind and amount of components existing in it capable of combining with iron. For a simple, standard electrolyte for the experiments, the pads were wet with very weak sulphuric acid. Tests made with certain black, peaty soils and clays as the electrolyte have shown electric potentials of as great magnitude as have been obtained by the use of this acid. When the pads containing the same electrolyte were placed in contact, no voltage was generated, but in surveys made by placing the pads of the terminals at different points over the surface of various irons emfs were developed as follows: sheet iron, 0 to 0.5 volt; steel pipe, 0 to 0.5 volt; cast iron pipe, 0 to 0.3 volt; pitted cast iron, 0 to 0.7 volt; clean cast iron, 0 to 0.15 volt. In every case the emf's were in such a direction as to cause the current to leave the points where the iron was clean, and to return to the impurity after flowing in the outside circuit. Thus it is evident that the clean iron is electro-positive and the impurity is electro-negative.

The cause of the potential difference is found in the tendency of the pure iron ions to combine with any acid ions in the electrolyte, and to leave the metallic state. This tendency is called the solution tension of the metal and is, in the case of iron, of a comparatively high value.

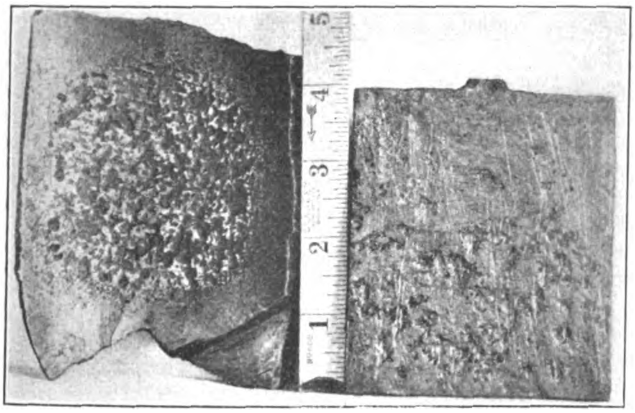
The question will at once arise as to the continuity of this battery action. Obviously the current flow will not decrease unless the conductivity of the circuit is decreased. In case of iron buried in chemically active soil, conditions will tend to increase conductivity in all features except one, that involving polarization, or the plating of a non-conducting film of hydrogen on the negative pole. Theory points out that the free oxygen in the soil and water therein will combine with the hydrogen and allow the action to continue. All experiments and the cases of corrosion examined seem to show that the action is continuous. One cell in particular was made up by using two pieces of cast iron about 4 in. square, broken from the same length of 6-in. pipe. The outside of one piece, already corroded, was placed facing the clean inside of the other, the two supported about 1½ in. apart by a section of 3-in. fiber piping. The space between was filled with moist, peaty soil and the joints were sealed with paraffin wax to prevent a too rapid escape of moisture. The two iron plates were connected through a milliammeter, and a voltmeter was connected across the terminals. The open-circuit voltage generated was 0.7, and the component of current generated, indicated on the outside instrument, was 0.004 amp. In a couple of days the current dropped to a constant value of 0.001 amp. After four months on short-circuit, some pure distilled water was added and the increased conductivity caused the current to increase to 0.004 amp. The cell was then left on short-circuit and, upon opening it after about twenty months, the soil was found to be dry and the iron plate which had the clean inside surface exposed was covered with a thick mixture of iron rust and soil. Under this pits about 1/16 in. deep were found filled with the usual carbon-like deposit.

A number of cells, made up of carbon rods and pieces of cast iron as electrodes, placed in various samples of soil gave voltages of from 0.1 to 0.9, and external current flow of from 1 to 10 milliamp, depending upon the kind of soils and their moisture content.

Fig. 3 shows at the left a sample section of pipe used to make up the cell with iron plates referred to above. The surface exposed to the action of the soil is very sharply defined in contrast to the original surface not so exposed. The pits in it are 1/16 in. deep. The sample shown on the right is a cast-iron plate used with a carbon rod to make up battery couple with soil as the electrolyte.



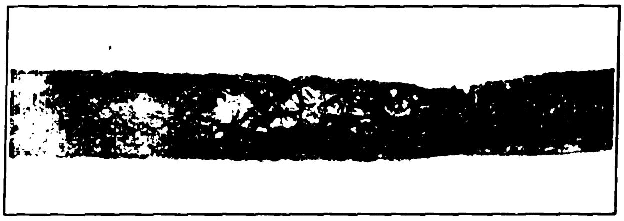
CORROSION OF METALS—FIG. 1—LARGE CAST-IRON WATER PIPE, SHOWING NATURAL CORROSION



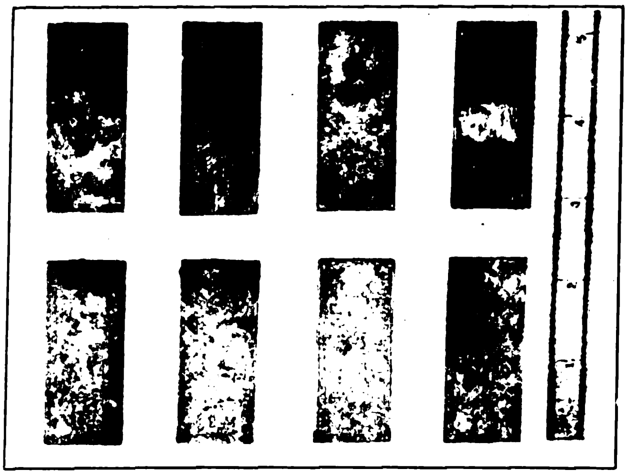
CORROSION OF METALS—FIG. 3—PIPE AND CAST-IRON PLATE CORRODED BY CONTACT WITH SOIL

Considering the practical case of iron buried in soil, there are fulfilled all conditions necessary for the destructive action of these naturally-generated currents. The water in the soil, carrying with it the soluble chemicals which it encounters by seepage through the ground, is the electrolyte. This furnishes the acid ions ready to combine with the metal. These ions act not only once but recurrently, whence a soil of small acid content having an alkaline or neutral reaction, due to natural chemical combinations with other elements may be active in producing corrosion. The electrical currents generated will flow in the shortest circuit they can find through the soil from the corroding, clean metal to the nearest impurity or negative pole on the pipe. There would be ample oxygen available to act as depolarizer. It would be difficult to produce in the laboratory experimental conditions as favorable to corrosive action as actually exist in the case of iron structures buried in the soil.

Tests were conducted on 120 samples of representative soils for the purpose of determining their comparative chemical activity in promoting iron corrosion. The moisture content of each soil as sampled from the natural location was determined. A sample of about 400 grams of each was taken and placed in a glass beaker. This beaker was set in a larger covered beaker containing water to prevent moisture loss from the soil. Mild steel plates, 1 in. x 2¼ in., were cut from the same piece of black No. 16 sheet and were numbered, weighed and placed in the soils, one only in each beaker. After remaining sixty-six days in the soils the plates were removed, cleaned and weighed. Fig. 4 shows samples of steel sheet used in making the tests on the relative corrosion of various samples of soil. It shows localized corrosion and pitting .014 in. deep. The loss in weight was considered a fair measure of the corrosive power of the soil. It was found that all of the plates lost in weight. In clean sand the loss was least, of the order of 0.04 gram. Light sandy clays, loam and drier dark soils produced losses of from 0.15 to 0.20 gram. The plates immersed in heavy clays, carrying 10 per cent to 15 per cent of water, lost by corrosion from 0.20 to 0.40 gram and those in wet, black, peaty soil lost 0.6 gram.



CORROSION OF METALS—FIG. 2—MILD-STEEL PIPE CORRODED IN CLAY SOIL

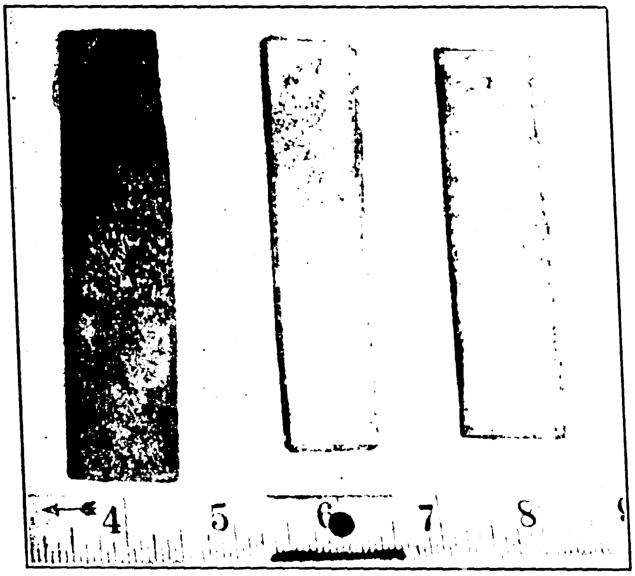


CORROSION OF METALS—FIG. 4—CORROSION OF MILD STEEL SHEETS BY VARIOUS SOILS

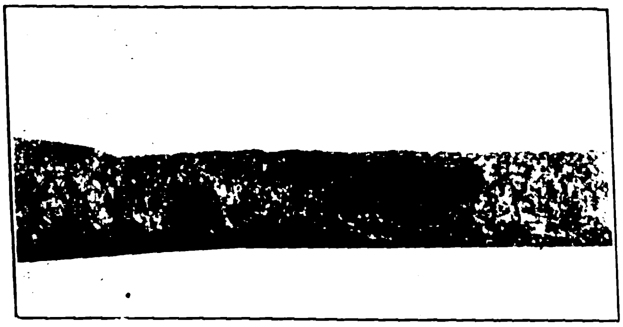
Taking, from the results of these experiments, the average value of 0.25 gram iron loss per sixty-six days, or 1.39 grams per year, as found in common yellow and blue clays, we can determine the approximate life of iron pipe in such soil. Assume that a pit would be made having a conical shape, an area on the pipe surface of 1 sq. in., and a depth of the pipe wall thickness of ¼ in. The iron from this pit would weigh 10.6 grams and, dividing this by the rate per year, we have 7.6 years as the probable life in these clays of a black iron pipe with ¼-in. wall. Cases have come under our observation where pipes which were poorly galvanized lasted but three years in clay soils before leaking, while wrought-iron and steel pipes had from four to six years' life in locations where there would have been no causes of corrosion other than chemical activity of the soil.

A sample of 3-in. cast-iron gas pipe was removed from a location where no stray current was indicated. This pipe was said to have been in service about twenty-seven years, and lay in a mixture of loam, black peat and clays. The present weight of this pipe is 27.5 lb. The probable weight of the piece of pipe as it was installed, calculated from its dimensions and assuming the specific gravity of the cast iron as 7.1, was 34.3 lb., whence the iron lost by corrosion was 6.8 lb., or the equivalent of 8.22 grams per square inch. Assuming a period of five years for disintegration of the tar coating, allowing corrosive agencies full action, this leaves twenty-two years as the time for corrosion to act.

Samples of soils were also taken from around this pipe. Cast-iron plates were placed in these soils in their natural state, in glass beakers, and the loss of iron from the specimens was determined by weighing after a period of sixty-six days. The iron plates were 2¼ in. x 1.05 in. x ⅛ in. in size, about 5.55 sq. in. in area, and were cast to this size. They were quite hard due to chill, and were mechanically cleaned only enough to remove sand and such impurities. The loss due to corrosion in the black peat was 0.8 gram. In the blue clay it was 0.6 gram, in the loam 0.5 gram, and from an average mixture taken at the pipe location 0.4 gram.



CORROSION OF METALS—FIG. 5—CORROSION DUE TO TWO DIFFERENT SOILS IN CONTACT

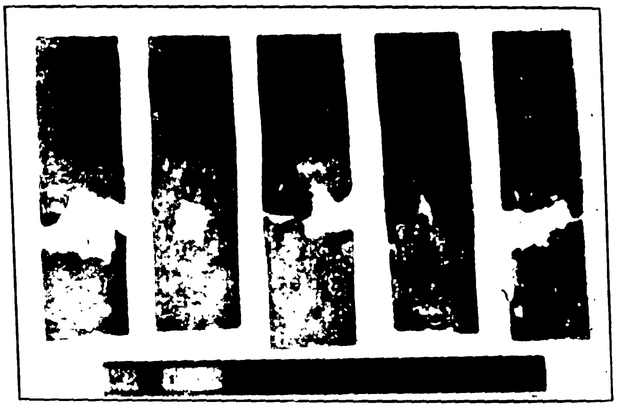


CORROSION OF METALS—FIG. 7—LEAD PIPE CORRODED BY CONTACT WITH MIXED BLACK SOIL

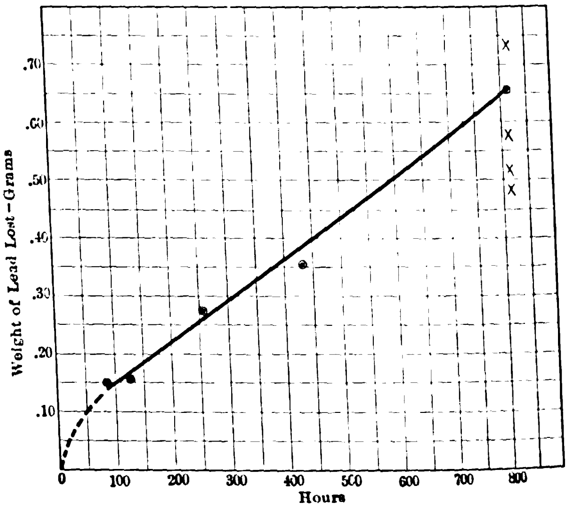
On calculation, assuming that corrosion proceeds at the same rate, these figures show, for 0.8 gram, a loss of 17.6 grams per square inch per twenty-two years, or, for 0.4 gram, 8.8 grams per square inch per twenty-two years. Whence, as an actual loss on the pipe of 8.2 grams per square inch per twenty-two years was found, it is readily seen that the damage done to this pipe may be fully accounted for on the basis of natural soil corrosion.

CORROSION DUE TO THE PRESENCE OF TWO OR MORE DIFFERENT ELECTROLYTES

The condition that causes damage from corrosion of the second class arises from a combination of a metal and two soils of different composition. The theory of this type of corrosion is based upon the easily-demonstrated experiment of physical chemistry in which an electric current can be generated by contact of two solutions of different chemicals combining power or valence. Given metal in contact with two soils, one of which contains any soluble substance subject to change, as carbon in its various combinations of gas or organic matter, nitrogenous bodies or sulphur, we may expect an electric current to flow. The current will enter and leave the metal, as a convenient conductor, in the proximity of the bi-electrolytic soil, and produce corrosion where it leaves the metal.



CORROSION OF METALS—FIG. 6—LEAD FOIL STRIPS CORRODED BY BI-ELECTROLYTIC SOILS



CORROSION OF METALS—FIG. 8—RATE OF CORROSION IN BI-ELECTROLYTIC SOIL

To demonstrate the theory and fit it to practical cases, electrodes of various metals were used. Lead proved to be the most satisfactory, as iron set up its own electromotive forces which masked the effect, and bright platinum polarized too rapidly. A cell was made up of two types of soil in contact. A lead electrode was placed in each soil and the two electrodes were connected through a voltmeter. Voltages were generated. The lead electrodes in either of the soils alone would show no traces of electric potential, if the soil were reasonably homogeneous.

A number of cells of various combinations of soils, cinders and sand were experimented with. Some gave as high as 0.1 to 0.4 volt, but not all soils would produce corrosion under these conditions. Clean sand and clay did not produce the effect, as both of these have presumably been previously reduced to their most stable chemical state.

To demonstrate corrosion under these conditions cells were made up in glass beakers with horizontal layers of two different soils as electrolyte and a single strip of lead as the corrodible metal, with the ends exposed, one to each of the soils. One cell with 1/16-in. commercial sheet lead, and with black soil and cinders as the two electrolytes, showed a corrosion loss of 0.14 gram of lead in seventy hours. Corrosion was all on the soil end as is shown by the illustrations in Fig. 5 which represents samples of lead plates in electrolyte made up of two different soils in contact. The lower half of each sample is corroded. The other end, although it appeared rough on the plate, was slightly discolored by oxidation and carbonization but it was not corroded. Four similar cells were set up, with black peaty soil and dirty clay as electrolytes, and with 1.2-in. x 4-in. strips of pure lead foil, 0.006 in. thick, as the metallic conductor. The lead strip from each cell in turn was removed at intervals, weighed and returned to the cell. This gave data to test the rate and continuity of corrosion. The results as obtained are plotted against time in hours in Fig. 8. In this figure the corrosion at the end of each interval of time for each cell is indicated by circles, and the total corrosion for each cell at the end of 800 hours is indicated by crosses. The curve shows a rapid rate of corrosion for the first 100 hours, after which the rate became constant for the remainder of the test. The total corrosion loss for each cell at the end of the full time was approximately the same as found in the others. The end of the strip in the clay was corroded, while the other end in the peat was in the original condition except for slight surface oxidation. In Fig. 6 samples of lead foil used to demonstrate the destructive corrosion of lead when exposed to action of two different soils in contact are shown. These samples were exposed for a total of 817 hours. The curve given in Fig. 8 shows the time rate of corrosion of these samples.

This latter test is of particular interest in view of the fact that the conditions are such as are found when lead pipe is laid in a trench and the trench is refilled with a mixture of earths of different character, as is usually found in a trench from 3 ft. to 6 ft. in depth. Fig. 7 shows corrosion of such a lead pipe in soil.

The corrosion results of these tests and the appearance of the specimens are such as to fully explain all observed phenomena usually attributed to electrolysis by ground leakage currents. The cast-iron samples, where corroded, were covered with a hard scale of red rust and soil. The pits in the cast iron were filled with carbon and black-iron oxide. The pitting was localized, the space between pits being but slightly corroded. The lead samples show the presence of both the gray and brown oxides. The line between corrosion and non-corrosion, where the metal was exposed to two kinds of soils, is sharply defined. Potential differences up to 1 volt were generated by placing different metals in contact with certain soils, or by placing two pieces of similar metal in contact with different soils.

An ordinance went into effect in Topeka, Kan., on Nov. 1 which provided that automobilists must not pass within 8 ft. on either side of a street car not in motion. The original ordinance provided that no automobile should pass within 8 ft. of the running board of a street car, and the change was made because some street cars have running boards on only one side.

Taxation Values in Illinois

James J. Brady, auditor of public accounts of the State of Illinois, has compiled a tabular statement of the amount of taxes charged for collection against the equalized assessed valuation of steam railroad and interurban electric railway property for 1913. The following summary is taken from Mr. Brady's analysis:

TABLE SHOWING 1913 TAX FIGURES FOR ILLINOIS INTERURBAN ELECTRIC RAILWAYS

Electric Roads	Equalized Assessed Valuation of Property in Illinois	Total Taxes Charged on Tax Books	Rate Per Cent of Tax on each $1 Assessed Valuation	Rate Per Cent of Taxes on Each $1 Gross Earnings
Alton, Jacksonville & Peoria...	$79,261	$2,509	3.17	7.93
Aurora, Elgin & Chicago......	695,511	29,598	4.26	1.62
Bloomington, Pontiac & Joliet.	52,607	1,488	2.83	6.27
Joliet & Southern Traction....	219,238	7,219	3.29	4.41
Total	$271,845	$8,707	3.20	....
Central Illinois Trac. Company	$38,349	$1,493	3.89	2.09
Chicago, Aurora & DeKalb....	91,738	2,816	3.07	3.70
Chicago & Des Plaines Valley..	222,870	11,696	5.25	2.21
Chicago, Harv'd & Geneva Lake	21,956	675	3.12	4.38
Chicago & Interurban Traction	225,791	11,164	3.14	4.31
Chicago, Lake Shore & S. Bend	10,913	580	5.32	.82
Chicago & Milwaukee Electric.	621,542	38,028	6.12	5.92
Chicago & Oak Park Elevated	978,895	60,723	6.20	7.37
Chicago & Southwestern	32,357	2,717	8.40	....
DeKalb, Sycamore & Interurban	33,315	1,587	4.76	5.29
East St. Louis & Suburban...	$451,157	$20,966	4.65	2.11
St. Louis & Belleville Electric..	123,992	6,850	5.52	6.15
Total	$575,149	$27,816	4.84	....
East St. Louis, Col. & Waterloo	$1,745	$44	2.50	.07
Elgin & Belvidere Electric....	156,903	4,342	2.77	3.01
Fox & Illinois Union.........	70,585	1,850	2.62	....
Galesburg & Kewanee........	76,712	3,547	4.62	4.19
Illinois Central Electric.......	145,907	5,135	3.52	7.36
Illinois Traction System:				
Bloom., Decatur & Champ'n.	$411,156	$13,419	3.26	2.99
Cairo & St. Louis..........	23,369	1,179	5.05	....
Chicago, Ottawa & Peoria..	406,541	17,968	4.42	4.20
Danville & Eastern Illinois..	7,500	441	5.88	8.36
Danville & Northern	6,158	329	5.34	.50
Danville & Southeastern....	6,000	264	4.40	14.93
Danville, Urbana & Champ'n.	292,369	11,236	3.84	2.35
Illinois Central Traction	292,221	11,963	4.09	4.41
Illinois Western	5,792	231	3.99	....
St. Louis Elec. Ter. Company	29,403	1,071	3.64	.94
St. Louis, Springfield & Peoria	1,194,735	48,646	4.07	3.52
Total	$2,675,244	$106,747	3.99	....
Kankakee & Urbana..........	$1,285	$51	3.96	.43
Lee County Railway	95,555	2,016	2.11	....
Met. West Side Elevated......	3,245,498	190,737	5.88	6.45
Moline, Rock Isld. & E. Trac..	5,313	278	5.23	.48
Northern Illinois Electric.....	17,947	489	2.73	8.32
North Shore & Western......	12,062	584	4.84	7.56
North Western Elevated	4,019,313	222,204	5.53	8.61
Paris Traction Company......	12,308	708	5.75	....
Rockford & Interurban	244,771	7,167	2.93	1.85
Rock Island Southern Railway	266,300	8,117	3.05	2.58
Rock Island & South. Railroad	92,268	2,850	3.09	5.50
South Side Elevated	2,735,655	145,538	5.32	5.89
South. Illinois Light & Pwr. Co.	14,715	910	6.18	....
Sterling, Dixon & Eastern....	88,172	3,362	3.81	5.06
Suburban	$126,801	$8,870	6.99	7.54
Chicago, Riverside & LaGrange	6,938	393	5.67	....
Total	$133,739	$9,264	6.93	....
Terre Haute & Western......	45,523	1,788	3.99	3.02
White Hall	11,076	378	3.41	1.45
Woodstock & Sycamore Traction	65,954	1,900	2.88	1.53
Total	$18,134,042	$920,121	5.07	5.01

Examination for Examiner of Accounts

The United States Civil Service Commission has announced an open competitive examination for examiner of accounts for Grade 2 position only, the salaries being from $1,860 to $2,100 per annum. Applicants will not be assembled for examination but will be rated upon the evidence as to education and experience. Applications must be in by Dec. 1. From the registers of eligibles resulting from this examination, which will be made up for electric railway and other single accounting branches, certification will be made to fill vacancies as they occur for accountants in the division of valuation and for examiners of accounts for the division of carriers' accounts, Interstate Commerce Commission.

National Civic Federation Draft Bill

Abstract of Main Features of Bill Drafted by Executive Council of the Department on Regulation of Interstate and Municipal Utilities of the National Civic Federation, Together with Representative Suggestions for Amendment of the Bill—Also Memorandum of Transmission by Seth Low and William R. Willcox and the Dissenting Report by E. M. Bassett, John H. Gray and Milo R. Maltbie

The National Civic Federation has just made public its draft bill for the regulation of public utilities, together with accompanying sections which trace the history of the bill and discuss some of the points of disagreement. An introductory statement and memorandum by Seth Low and William R. Willcox, the report of the department on regulation of interstate and municipal utilities, signed by Emerson McMillin, chairman of the executive council, and the dissenting report by E. M. Bassett, John H. Gray and Milo R. Maltbie, all precede the text of the bill. Appendix A, prepared by William D. Kerr, is a résumé of the suggested amendments to the bill, with arguments pro and con, while in Appendix B there is presented a schedule of existing regulatory commissions. Appendix C is a reprint of the 1907 conclusions of the commission on public ownership and operation of the federation. The drafting of the proposed bill is regarded by the federation as a logical outcome of this former report, which concluded that in this country, under the conditions of municipal politics, private ownership and operation would be preferable to public ownership and operation, provided there were adequate regulation to protect the public from extortionate rates and deficient service.

HISTORY OF BILL

According to the résumé by Messrs. Low and Willcox, who were appointed as a special committee of the executive council of the federation to consider all questions relating to the draft bill, the active work resulting in the present bill was begun in 1911, when, after a conference of those interested in utility regulation, it was determined to create a department to prepare such a bill. The department thus formed appointed an executive committee composed of the following members: Emerson McMillin, American Light & Traction Company, New York, chairman; Franklin T. Brown, Redmond & Company, New York; John H. Gray, head of the department of economics and political science, University of Minnesota; Edward M. Bassett, attorney and former member Public Service Commission for the First District of New York; Halford Erickson, member Railroad Commission of Wisconsin; William D. Kerr, attorney, Chicago; Blewett Lee, general solicitor Illinois Central Railroad; Milo R. Maltbie, member Public Service Commission for the First District of New York; Arthur Williams, chairman Association of Edison Electric Companies, and Franklin K. Lane, former member Interstate Commerce Commission (resigned on account of official duties before drafting of bill).

Inquiry revealed the fact that all states except Delaware, Wyoming and Utah had regulatory commissions of some sort. After making a complete compilation of all statutes relating to such bodies and investigating thoroughly all court decisions and general literature on the subject, tentative sections for a sample public utility bill were drawn up and sent to all commissioners and other selected and interested parties for criticism. Upon the receipt of many suggestions and criticisms and the amendment of the bill in many cases accordingly, the executive counsel of the department prepared the present draft of eleven articles and more than 300 sections. Of these sections as drafted only sixty have been criticised by anyone, from which Messrs. Low and Willcox conclude that the draft bill as a whole embodies a form of legislation which meets with wide approval, except as to such sections as deal with matters upon which differences of opinion are inevitable.

As the preparation of the draft bill proceeded it became apparent that it would be impossible to secure a unanimous approval by the department of this bill or of any other dealing with this subject. The draft bill, therefore, and the dissenting report by Messrs. Bassett, Gray and Maltbie were laid before the executive council of the National Civic Federation at a special meeting in January, 1914, without having been submitted to the department as a whole. In view of this circumstance, Messrs. Low and Willcox recommended that the names of those comprising the department on the regulation of public utilities be omitted from the document, as it was evidently unfair to hold the members in any way responsible for a measure upon which they had not had an adequate opportunity to pass. The present bill, therefore, is published upon the authority of the executive committee of the department on the regulation of public utilities, subject to the reservations embodied in the minority report.

According to Messrs. Low and Willcox, the differences in regard to the bill reflect the differences in the points of view. They say that the radicals are inclined to press regulation to the limit, even if it made it impossible to secure private capital for the construction and the conduct of public utilities. In the minds of many of them, public ownership and operation loomed up as not objectionable alternatives. Those who have to do with the procuring of private capital for public utilities, however, believe that too much regulation will easily make private capital unavailable and lean toward limiting regulation as much as possible. Yet in this conservative element, there are again great differences of opinion, for some believe in public regulation and wish to make it practicable and successful, while others accept it reluctantly and are fearful of any limitation which may interfere with established practices. In the opinion of the special committee, the National Civic Federation cannot pretend to pass judgment on the issues thus raised, and the wise course to be followed lies between the two extremes.

MEMORANDUM BY MESSRS. LOW AND WILLCOX

In the belief that the function of the federation is to make the bill as useful as possible by throwing various lights on it, Messrs. Low and Willcox subjoined to the foregoing résumé a memorandum on some of the large questions involved, for which they did not ask the federation to become responsible. In their opinion, the problem to be worked out in connection with the public regulation of such utilities, is how to give power enough to the regulating commission to enable it to prevent the abuses to which uncontrolled private management has been shown to be subject, without making exactions so severe as to render it impossible to secure the private capital necessary to maintain existing facilities in a high state of efficiency and to develop new enterprises when such are necessary. Any public service commission must have large discretionary powers and it is probably better to make this discretion large, despite the possibilities of abuse, than by making the law too rigid to make it impossible for the commission to deal equitably with exceptional conditions.

The draft bill leaves to the representatives of the public the determination of values against which stock or bonds are to be issued, upon the theory that if regulation means anything it means this, so that both investors and the public served may be protected against fraudulent practices and exaggerated values. Under the draft bill appeals may lie to the courts from the action of the commission on questions of law but not on findings of fact, such as value. Some of those who are engaged in establishing new public utilities hold the view that upon questions of value, if upon no other question of fact, there should be an appeal to the courts.

If the public assumes responsibility for the values against which stocks and bonds may be issued it is held by some that the public becomes morally responsible for the existence of such values. There is at least the possibility that in time the public will be asked to guarantee the values which it stands sponsor for. Should the time come when the public is willing to do this, it can undoubtedly secure private funds for such enterprises at much lower rates of interest than can be had at the present time. On the other hand, because the fixing of values by the public perhaps tends in this direction, there are those who maintain that public regulation should not attempt to determine values, but should call for the most complete publicity. Under such a system private investors would be given the fullest possible information and would then be expected to look out for themselves. There would be nothing in such a case to protect the public against unreasonable financial burdens as these affect good service, except the arbitrary discretion of the public service commission in fixing rates.

It has been suggested that joint use of facilities should not be permitted between competing companies. The draft bill, however, recognizes the propriety of joint use under certain conditions even in such cases, and it confers upon the commission ample authority to prevent competition where this is not in the public interest. Yet wherever the joint use of any facility is permitted, the management should always be left in full control of the owner.

The draft bill deals with the question of depreciation upon the assumption that this term is broad enough to include obsolescence and replacement. In telegraphing, "depreciation" would usually provide adequately for replacement, but in telephoning the principal cost is not in lines and poles but in service stations. For the best service, apparatus that is comparatively new must often be discarded in order to give place to the latest improvement. The same thing is true in power houses of electric railways and probably in a greater or lesser degree in connection with every public utility which depends upon so new a science as electricity. It is very difficult to lay down a general rule for depreciation applying to all cases. Probably there is no way to deal with this question in a law except to give wide discretion to the commission. Sometimes the creation of a depreciation fund board to adjust the matter from year to year in the light of actual circumstances may offer a wise solution of this very difficult problem.

As regards state versus local franchises, it is hardly conceivable that any locality will willingly abandon its right to say whether or not a franchise shall be granted for the use of any of its streets or public places. To this extent the co-operation of the locality with the state commission is probably essential. But many public utilities serve more than one locality, and for these there must be state regulation. A state commission will necessarily have a wider experience than any purely local commission can acquire except in the very largest cities, and ordinarily it can command a higher grade of expert service for its guidance. To submit questions of rates to a local commission is practically to permit the users of the service to say what should be paid for it.

The indeterminate franchise is the best form of franchise, in the interest of the public as well as of the public service corporation, which has yet been developed. It would appear to be fair to permit a locality which has assented to a fixed term franchise to pass upon the conditions of exchange when such a franchise is given up for an indeterminate one. Any attempt to bring about such an exchange by general law without the consent of the locality would be likely to evoke popular resentment because of its unfairness. By the draft bill, a new locality to be served must give its consent, which in its nature will be indeterminate. In doing so, the locality can attach conditions not inconsistent with the provisions of the bill itself.

A local holding company of a local public service corporation would seem to be of no possible advantage to the public. Yet a holding company which controls the operations of many small public service corporations in as many different localities may offer the public many advantages. In the view of some the method of financing proposed by the draft bill would be likely to force the creation of such holding companies in order to provide adequate funds for local service. Whether this be so or not, such a company under broadminded management might give better service to every locality controlled by it than any small-sized locality could command for itself. Whether or not a local company should pass under the control of a holding company and what arrangements should be made in such a case for the protection of minority stockholders, would seem to be legitimate subjects for the discretion of a public service commission.

Some standard of action must be laid down by law for the capitalization of consolidated companies. The draft bill leaves large discretion to the judgment of the commission. The dissenting report simply proposes a different standard.

The issue between public ownership and operation and private ownership and operation under public regulation is not wholly and perhaps not primarily a question of economics. The application of the state civil service law to the men employed by the private electric railway whose system was taken over by the municipality of San Francisco resulted in many members of the local union losing their positions. The effect was so serious that the American Federation of Labor sent a commission to Europe this year to study particularly this aspect of the question. The civil service system and regulation of rates of pay by law are inconsistent with the methods and objects of collective bargaining by organized labor. If anyone imagines that collective bargaining, including the right to strike, may be permanently enjoyed in connection with public service, he should recall what happened in democratic France when the railroad employees went upon a general strike. The men were ordered to the colors and the strike was broken. The attempt to carry out the methods of collective bargaining and the right of striking in connection with the public service is the pathway toward placing every public employment upon a military basis. Such questions as these far outweigh in public importance the financial questions that are involved as between public ownership and operation and private ownership and operation under public regulation.

CONCURRING AND DISSENTING REPORTS

Mr. McMillin, chairman of the executive committee of the department on regulation of interstate municipal utilities, submitted the majority report to the effect that the bill is offered in the belief that, as far as it may be adopted, it will lead to a better understanding between public utilities and the public than has heretofore been possible under less carefully drawn legislation and that the regulation thereunder will be just and fair to the investor, the owner and the user of the service.

The dissenting report by Messrs. Bassett, Gray and Maltbie criticised the bill as giving commissions no jurisdiction over holding companies. The subterranean and indirect method of buying up 51 per cent or more of the stock of a public utility could be resorted to without any check, approval or even investigation, and no protection is provided for minority stockholders. The bill should henceforth prohibit any additional shares passing into the hands of holding companies without investigation and approval by the commission. Purchases of stock in other public utilities should be subject to similar restriction, and companies not public utilities should be prevented from acquiring stock in public utilities beyond a certain small percentage. Moreover, the commission should always have power to impose conditions and enforce regulations to protect minority interests and public rights.

The three dissenters also believed that in no case should the capitalization of a merged or consolidated company exceed the capitalization of the former individual companies. No commission should be practically forced by law, if companies so desire, to make value a basis for recapitalization. All the more progressive states forbid the direct capitalization of surplus simply because it is surplus, and it should not be capitalized indirectly by means of consolidation. The present bill practically invites consolidation of companies that have a surplus with companies that have watered capital.

The sections relating to franchise grants and municipal operation should be either omitted entirely or redrafted along different lines. Particularly objectionable are the sections which undertake virtually to deprive cities of all control over franchise grants affecting their own streets. Any utility now operating might under the proposed law obtain a new franchise without the consent of the municipality, abutting property owners or the state itself. Moreover, municipal authorities would have nothing whatever to say as to the terms of any automatically renewed franchise.

FEATURES OF DRAFT BILL

The bill provides for a commission of five members appointed by the governor for five-year terms. Besides the usual powers of supervision and investigation, the commission is empowered to determine the cost or value of public utilities. Rates fixed by the commission must be observed for a period to be set not exceeding three years.

No provision in the bill is to be construed as obligating the state to pay or guarantee securities or any interest or dividends thereon. Securities are to be issued in an amount reasonably required to enable the utility "to perform its duty to the public." Stock or stock certificates may be issued only for money, or services or property at the true money value thereof as determined by the commission, equal to or in excess of the face value of the securities. Bonds and other evidences of indebtedness may not be issued below 75. The commission may require the utility to provide for the amortization of discount and expenses over a fixed period. No public utility shall declare any yearly dividends until provision has been made for this accrued amortization. The bond issues must bear a reasonable ratio to the stock issues, due consideration being given to the nature of the business, credits, earnings and prospects and the securing of an adequate relative amount of financial interest and risk on the part of the stockholders.

No contracts for consolidations, mergers, leases, or franchises (in excess of amount paid to state for granting, exclusive of taxes) may be capitalized. The capitalization of a merged or consolidated property must not exceed the value of the individual properties as determined by the commission. If the commission determines that capital has been or is being impaired or that securities have been issued for purposes properly chargeable to income, it may require the utility to set aside periodically a portion of earnings or moneys not derived from the sale of securities and prescribe rules governing such a fund.

The commission receives the power to provide joint rates and to enter into an arrangement with a utility for the automatic adjustment of charges. It may investigate all interstate rates affecting acts within the state and apply to the Interstate Commerce Commission for relief. It may enforce emergency rates for thirty days, to be renewed only after an investigation.

Every municipally owned and operated public utility must comply with the commission's orders regarding accounting procedure and reports. Each public utility shall carry a proper and adequate depreciation account under commission rules. The commission may from time to time fix proper and adequate rates of depreciation on the several classes of public utility property. Money set aside for depreciation shall be expended, until required for renewals and replacements, only for purposes chargeable to capital, for the retirement of obligations or for any other authorized purpose. The commission may direct a utility to make provision from income other than from capital sources for an impairment of capital due to depreciation and other causes, which impairment was not provided for through charges against revenue or otherwise at the time of its occurrence or subsequently.

Every utility when required by the commission must file a certification by a public accountant that it is complying with the prescribed accounting system. The commission may require this accountant to be not a shareholder, officer or permanent employee of the utility.

Franchises hereafter granted are to be indeterminate in form. Existing limited franchises may be exchanged for indeterminate ones on filing a consent to future municipal purchase, the new franchise to be subject to alterations, amendments or repeal by the legislature. No municipality can hereafter enter into the original construction of a municipal plant for public utility service in competition to a similar existing plant without obtaining a certificate of public convenience and necessity. When a municipality desires to take over a utility, the commission must set the compensation in one year from the date of the first hearing. In the case of a utility extending outside the municipality, the commission must determine how much shall be purchased. The municipality owning a utility may contract with a privately owned utility for the operation of all or part of the municipal plant.

Complaints for reparation must be filed within two years. The penalty for rebates is three times all sums received or accepted for six years prior to action. In connection with the enforcement of the act rigid penalties are provided, extending from misdemeanors with $5,000 fine for violations of orders or divulging commission information to felonies with five years' imprisonment for acts involving moral turpitude, such as falsification or destruction of records.

RÉSUMÉ OF SUGGESTED AMENDMENTS

Mr. Kerr's résumé of points in favor of and opposed to various features of the bill, as brought out in conferences and correspondence, covers such subjects as the following: Commission supervision over the operation of municipally owned and operated plants, publicity of records, effective period for rates fixed, issuance of securities, capital of consolidated companies, indeterminate franchise, rates, depreciation and municipal purchase. The character of the résumé is shown by the following abstracts of material concerning the last three points:

To the minds of some the bill should make clear that inadequacy is an element in judging rates just as much as justness and reasonableness. In reply, it was asserted that the rule of justness and reasonableness includes adequacy and every other element of rate reasonableness. On the other hand, it was stated that were the rule changed to specify adequacy as one of the elements of reasonableness, the courts would be likely to assume jurisdiction on the determination of what constitutes adequacy in a particular case, which would be undesirable. It was also said that no change should be made in any rates before authority therefor had been obtained from the commission, but the public utility should not be relieved of its duty of fixing rates in the first instance, subject only to supervision and exercise of mandatory powers in case of necessity. In answer to statements that an investigation of interstate rates by the state commission would result in a double investigation, it was asserted that it is a proper function of the state commission to report to the Interstate Commerce Commission matters which it thinks require remedying but which it has not the power to take up.

The sections regarding depreciation roused considerable difference of opinion. It was suggested that each utility should be required to make such reasonable provisions for the replacement and renewal of its property as was necessary to enable it to maintain the adequacy, efficiency and quality of its service, but not to attempt to provide a fund to offset theoretical depreciation. It is pointed out, however, that whether depreciation means so-called theoretical depreciation or merely provision for replacements and renewals, the draft bill does not attempt to say. The fundamental purpose of a depreciation account seems to be to keep a continuing and accurate balance between property values and the amounts at which they are entered in the books of accounts. In the case of a going concern, it would be absurd to apply the depreciation sections of the draft bill so as to accomplish over a period of years by regular deductions from earnings the creation of a fund held intact equalling the original cost of the property. To the drafters of the bill the term "depreciation" is used generically to denote loss of value, whether due to wear and tear, natural causes, improvements in the art, or what not.

It was thought that a municipally owned utility under the bill must secure a certificate of public convenience and necessity even when using service for municipal purposes only. It was suggested that an election regarding municipal ownership should be held not less than four months after the vote by the municipal council on the question, but no such provision was made in the draft bill on account of the radical differences in the policies of the several states upon this question. The point of providing against the cost of severance when only part of an existing utility property was taken over by a municipality was raised. It was considered important, but its determination was said to depend largely on the local law.

COMMUNICATIONS

The Code of Principles

STONE & WEBSTER
BOSTON, MASS., Nov. 12, 1914.

To the Editors:

I thank you for the copies of the "Code of Principles" of the American Electric Railway Association. Each of the ten articles is so concise and expressive that the code cannot fail to make a deep impression on everyone who reads it. I hope that the code will reach the same prominence that the "safety first" movement has already attained in this country.

I should be glad to see a copy of these ten principles posted in every power station, every electric car and every voting booth in the United States. If the people of this country can be brought to realize clearly that their own prosperity and that of their cities and towns depend largely upon their public utilities then that spirit of antagonism which is now so common will no longer exist. The prosperity of any community and the corporations that serve it are inseparably linked. A full understanding of this by the people and the companies will result in co-operation and avoid dissensions.

When the electric railroad was first developed and introduced, every city and town was ready to offer inducements to capital to invest in their city, and the advantages to the community were clearly recognized. It was a wise policy and made it possible for the United States to quickly build up for the people the best systems of local transportation facilities in the world.

These systems are still needed, and further development of them is imperative if our country is to grow. The present hostile attitude of many communities has been bred plainly by a misunderstanding of the true conditions. The more prominence that is given to this "Code of Principles" the more clearly the public will come to understand what the true conditions really are.

CHARLES A. STONE.

BOSTON ELEVATED RAILWAY
BOSTON, MASS., Nov. 10, 1914.

To the Editors:

The "Code of Principles" adopted by the American Electric Railway Association at its recent convention represents a well-considered attempt to set before the industry and the public in condensed form ten fundamental points of view designed to be useful in public relations. Every effort to bring about a better understanding of the mutual obligations of the companies and of the public is commendable, and such an expression of rights and responsibilities will tend to clear the air in many localities. The code in general seems applicable to both small and large companies, and its usefulness should thereby be enhanced.

Without criticising the intent of the separate items, it would seem that greater emphasis should be laid in the future upon reasonable wages and upon the payment of a reasonable return on the investment as the foremost essential of successful public utility management. The whole scheme of private ownership hinges upon the latter. Efficient service is unquestionably desirable from every point of view, but it should not be forgotten that the best modern facilities are closely related to a reasonable return on capital. The provision of the most advanced standards of service depends directly upon the prospect of a fair return, which is only another way of saying that prosperous electric railway companies are a fundamental necessity to sound transportation development under a régime of publicly regulated private enterprise.

The code covers a broad range of subjects which cannot be discussed adequately in a few words. Its emphasis upon the detrimental effect of short-term franchises upon civic welfare and growth and the desirability of divers methods of valuation in appraisals is well taken. The more angles from which the latter subject can be viewed the less likelihood there is of a one-sided conclusion. The clause pointing out that electric railways, being public servants regulated by public authorities, should be protected against excessive demands of labor and strikes will be generally conceded within the Association. Just how this can be brought about is the problem, and this portion of the code will have served a good purpose if it leads to practical results. The code wisely does not attempt to settle the problems of the industry in detail, but it furnishes a starting point for much valuable discussion, such as Mr. McCarter has contributed to the Nov. 7 issue of the ELECTRIC RAILWAY JOURNAL, pages 1047-1049.

Some of the principles laid down have been practised in Massachusetts from the early days of commission regulation, notably the issuing of securities on the basis of a fair capitalization; the safeguarding of the public interests by the authority given to the regulative body; State as differentiated from municipal supervision; and the full publicity of sources and amounts of receipts and expenditures. In the recent Middlesex & Boston rate decision of the Massachusetts Public Service Commission the right of capital to a living wage is also set forth in terms generally harmonious with the spirit of the code. It is to be hoped that the truths there embodied will find widespread popular acceptance.

WILLIAM A. BANCROFT, President.

WEST PENN RAILWAYS
CONNELLSVILLE, PA., Nov. 4, 1914.

To the Editors:

I wish that you would send me eight extra copies of the "Code of Principles," published as a supplement in your issue of Oct. 31. I want to have them framed and hung in several of our most important waiting rooms. I believe that the principles in this code will be appreciated and thoroughly understood by a large percentage of the traveling public and will assist in improving the relations between the electric railway companies and the public.

M. A. COFFEY,
Superintendent of Transportation.

[EDITORS' NOTE: We have on hand a number of extra copies of the supplement to our issue of Oct. 31, containing the "Code of Principles," and will supply these gratis as long as they last to electric railway companies desiring to post them in public places.]

The Revival of the Flagging Rule

ILLINOIS TRACTION SYSTEM
SPRINGFIELD, ILL., Nov. 2, 1914.

To the Editors:

Referring to your editorial headed "Revival of the Flagging Rule" and previous articles concerning the same question, all of which have been carefully considered by the writer, we have come to the conclusion that almost everybody who has had to do with this particular question seems to be somewhat mixed. The argument is, as we see it, what will a train crew do when finding a block signal set at danger, with all means of communication with the dispatcher cut off and with a right to proceed so far as time-card rights are concerned. Our answer to this proposition is that they should wait the number of minutes necessary for a train under reasonable conditions to arrive, or come from the next siding ahead, after which they should proceed carefully under the protection of a flag where the same should be necessary—that is, around curves, up grades, or over any part of the track where the vision is obscured. This should, however, apply only to roads that are equipped with block signals. An occurrence of this kind in the present day is very rare. I know of no such happening on this line since the signals have been installed.

With reference to the flagging rule in the 1909 book of rules, which was intended for non-signalled roads, I will say that, when the 1911 revision of interurban rules was being discussed, this particular rule brought out considerable argument both for and against it. It was finally decided that a rule which permitted a train crew to flag itself beyond a positive meeting point (such as that appearing in the 1909 code) was not only bad practice, but unreasonable. Also, unless it was carried out with the best of judgment, the rule was unsafe, and hence it was eliminated in the revision of rules in 1911.

Unless the telephone lines are out of use or destroyed for some considerable distance, or in other words, for a number of sidings, there is hardly an emergency which can arise that will delay the operation of trains very seriously. The ordinary telephone trouble does not delay trains to any extent, as it is seldom that trains on the average interurban railroad are off time. When they are off time to any extent there is generally some unusual reason for it and provisions are easily made to straighten it out one way or another. Considering this, we feel that it would be much better to delay a train a reasonable length of time than to take a chance of having trains meet on the main line (even though no damage was done), as this would at least create considerable comment from passengers and would naturally advertise the road and its methods of operation.

With proper supervision we can see no argument for the flagging rule as it was in the 1909 book of rules. From this you can readily see our position in reference to the flagging rule as we understand it in the operation of signals. We know of no rule in the A. R. A. code of rules which permits a train crew to flag itself out of a meeting point given by train order or time card, although the train may move under the protection of another train which has train-order or time-card rights, and consequently, we do not believe that the interurban code of rules should contain a flagging rule.

C. F. HANDSHY, Assistant General Manager.

Indexing Technical Information

MACON, GA., Oct. 30, 1914.

To the Editors:

Since the publication in the ELECTRIC RAILWAY JOURNAL for Oct. 3 of Mr. Alvord's article on "How to Use the Technical Journal," a number of short items have appeared in technical papers describing various filing systems. All of these have merit and prove that engineers and other technical readers have given much thought to preserving or recording the material that interests them, the principal object being to render such matter serviceable and accessible. Where a man is permanently located, and has the facilities to keep them up almost any filing system may be made as serviceable and expansive as desired, but the work must be conscientiously carried out in all of its detail for otherwise such systems frequently become a hopeless muddle.

But the reader who keeps his files up through his own individual effort, and who is confronted with the necessity or inclination to keep them in a compact and even portable form, soon finds the various card indexes and filing systems a burden to be discarded because of their bulk or of the labor necessary for their upkeep. Nevertheless, he feels the need of some form of taking care of certain data in an economical and quickly accessible manner. This one feature, accessibility, is perhaps the keynote to the whole problem. The purpose of this article is to describe a system that not only is accessible but is also compact and simple to maintain.

The illustration shows a file that has been in constant use for nearly ten years, holding many hundreds of valuable clippings, photographs, small drawings, cuts, typewritten sheets, etc., put up in a shape sufficiently portable to be carried in an ordinary suit case, yet admitting expansion or contraction to any desired degree. Scarcely any of the original matter remains in this particular case, as it is constantly being discarded for fresher or more desirable data, the prime object being to retain a compact working library of such material. Yet the matter discarded has not been lost track of and may readily be located in any of the larger libraries located about the country.

The elements of the system are simple and inexpensive, consisting of (1) a 600-page book in limp leather binding, the first fifty pages being alphabetically indexed from "A" to "Z" and the rest numbered consecutively, and (2) a dozen or more grip files or pasteboard covers having flexible backs with two pins or spiles with a covering clamp to bind the filed sheets together, a device more satisfactory for its purpose than any of the loose-leaf ring binders. These files are made to accommodate ordinary correspondence paper, but will readily take the large pages of the technical journals such as ELECTRICAL RAILWAY JOURNAL and the *Enginering News.* These pages usually have sufficient margin to admit trimming three sides to a template, leaving the inside margin for binding. Larger material may be folded, leaving one edge projection for binding, while small clippings may be pasted either singly or in groups on ordinary typewriter paper and then inserted. No special punch is necessary, although one adds to the neatness of the binding, as each cover contains a small flap that may be turned down over the edge of the sheet to be bound, and holes may be punched by pushing the sharp point of a hard lead pencil through the two eyelet holes provided for that purpose. These files cost 15 cents each, less in quantities, and may be obtained from almost any stationer.

LEATHER-BOUND PERMANENT RECORD BOOK AND SPECIAL FILES FOR HOLDING DATA

In this file each cover represents an individual subject or group of subjects, and each cover carries in the space provided an index letter and the title of its volume as

Volume A—Personal Clippings.
Volume B—Steel Construction (all kinds).
Volume C—Electric Railway Data.
Volume D—Concrete Construction.
Volume E—Architecture.

This lettering is continued for as many volumes and general or special topics as desired. It has the advantage of holding all material relating to that particular topic tightly bound in that volume, but no attempt toward further classification is made in these covers. Each sheet as entered is given the next higher number, page 1 being in the back of the book and the highest number always on top. To facilitate indexing, a small red margined Dennison sticker is attached in the upper right-hand corner and on it is placed the index number, volume and page, as 54 C 201, the first figure referring to the page the article is indexed on in the index volume.

In reading the technical papers three classes of material are found: (1) That which you have no desire to keep or refer to; (2) that which you have no desire to keep but which you do not care to lose track of altogether; (3) that which, at the time of filing, you think is worth keeping for future reference. The first is, of course, discarded, the second is recorded under the proper heading of the index before discarding or being placed in the library, the name of the article, the publication and date being entered as described further along, while the third class is clipped and filed in the volume assigned to that group of material. For instance, an article describing the Dallas street railway shops will be placed in volume "C," which in this case contains electric railway data, and is also recorded in the index with the addition of the volume letter and page number.

Now suppose it is desired to locate any or all of the material filed or recorded on car shops, we turn to "E" in the index where we find,

Electric Railway—Track ....page 51
Power Plants ....page 52
Carhouses ....page 53
Car Shops ....page 54

or under "C" we find,

Car Shops—Steam Roads ....page 44
Electric Roads ....page 54

This is a portion of the general index to the whole system, and once established requires no further attention except to add an occasional new sub-title.

Turning to page 54 we find the heading "Electric Railway Car Shops" and under it,

Bedford Shops, *Chicago Tribune,* Jan. 3, 1910.
A. C. C. L. Shops, *Eng. News,* June 6, 1912.
Macon Ry. & Lt. Co. Shops, *Eng. & Contg.,* May 13, 1914, Vol. A, 106.
Dallas Street Railway Shops, ELECTRIC RY. JR., Sept. 19, 1914, Vol. A, 201.

Each page of the index volume is devoted to some sub-title and on it we find recorded articles which have not been retained but which can be readily located if we care to go to the trouble. We can also locate in our own file the article or articles that have been retained. In every case the volume letter and page number are recorded in pencil to permit erasure should the article in question be removed from the file, but in any case the title and location of the original recorded in ink are retained. A 5½-in. x 9-in. 600-page book will be sufficient for a glossary of all the material the average man will care to index himself in a lifetime, while his filed material can be expanded or contracted as suits his fancy.

The description of this method may appear formidable, but in reality hardly anything simpler can be devised. The preliminary index or skeleton is permanent and the only entry made, whether the article is filed or simply recorded, is the one line entry under the proper sub-heading, no further cross-indexing being necessary as that has already been taken care of. A decimal system of numbering may be used but the advantages are hardly worth the extra effort. As the volume letter and page number readily locate it, material does not even need to be grouped in the files, except as such grouping adds to the convenience of having one volume devoted to one subject. Nor does a temporary suspension of interest in filing and indexing serve to disarrange the file which requires a surprisingly small amount of time to keep up. Also any single unit of the file may readily be split up or rearranged, as the page numbers are in pencil and these constitute the only part of the record to be changed.

CARL H. FULLER,
Formerly Engineer of Maintenance of Way,
Macon Railway & Light Company.

British See Opening for Railway Materials

According to *The Electric Railway and Tramway Journal* of recent date, the principal German markets for railway material in 1912 and the aggregate amount sent to each were as follows: Dutch East Indies, £518,900; Turkey, £473,200; Argentina, £319,100; Sweden, £303,700; Switzerland, £288,000; Netherlands, £297,600; Chile, £193,900; Brazil, £181,100; United Kingdom, £180,100; Japan, £166,900, and Denmark, £150,400. Divided according to kind of material, the German exports for rails in 1912 to all markets amounted to £2,900,600; steel railway ties, £763,800; angle plates and base plates, £329,000; fish plates, screws and wedges, bolts, gage bars, clamp plates and spikes, £250,000; metal fittings and buffers, £75,400; railway switches and signal parts, £119,200; carriage and buffer springs, £92,900. The most important item exported was rails, accounting for fully one-half of the total.

In comparing the British and German exports in rails, it is stated that in India and Australia the British hold an overwhelmingly strong position, but in South Africa their position is not so strong, although they already hold four-fifths of the trade. In Egypt, Portuguese East Africa and Argentina, the British share is larger than the German. In the European markets and in the Dutch East Indies the British have hitherto hardly been represented. In the case of chairs and ties, the position is practically the same as with rails—a strong position in British colonial markets and Portuguese East Africa and a weak position elsewhere. It is estimated that the aggregate value of the trade in railway materials which may be diverted from Germany and Austria-Hungary consists of £179,400 in the United Kingdom markets and £3,849,000 in colonial and neutral markets, or a total of £4,028,400.

Second Issue of "The Americas"

The National City Bank has just published the second, or November, issue of its magazine entitled "The Americas." Some of the most interesting articles are as follows: "A New Application of Trade Diplomacy," by William C. Redfield, Secretary of Commerce; "Financial Conditions in Argentina" and "The First Effects of the European War," by R. O. Bailey; "The Present Best Policy of South American Trade," by John Barrett, director general of the Pan American Union; "Organizing to Reach the Merchant"; "The South American Commission House" "Using the Individual Salesman"; "The Advantage of Co-operation in Latin-American Credits," by James Matthews, credit manager National City Bank, and "Banking Acceptances and Dollar Credits."

One article describes the efforts of England to secure the commerce of Germany through such means as the formation on Oct. 8 in London of the Institute of Commerce. The French also hope to secure new markets in South America. Mr. Bailey says that influential Americans already established in Argentina are reported to be opposed to an increase of American trading. An effort six months ago to establish an American Chamber of Commerce in Argentina is said to have failed on account of a fancied infringement of established rights.

The National City Bank's branch at Buenos Aires was formally opened at 321 Calle Rivadavia on Nov. 10 under the management of John H. Allen.

General Outlook in America

In his presidential address on Nov. 12 before the convention of the Investment Bankers' Association of America at Philadelphia, President George B. Caldwell, vice-president Continental & Commercial Trust & Savings Bank, Chicago, Ill., said that Americans should hold steadfastly to a belief in our banks, our securities and our government, as well as in American ability to overcome conditions that three months ago seemed insurmountable.

In enumerating seven things about which Americans should be hopeful, Mr. Caldwell mentioned American neutrality and peace, the annual surplus of about $10,000,000,000 of agricultural products to sell and the stimulus being received by American manufacturers on account of demands from abroad. In regard to the repurchase of a large amount of securities from Europe Mr. Caldwell said that it would be done at a very low price, and moreover, would have to be accomplished but once.

Moreover, speculation in this country was at a low ebb when the war started, and business was being done on a 6 per cent money market, so that it was impossible to drop from a very high level and greatly to demoralize business. Mr. Caldwell also believed that after ten years of agitation the United States is apparently approaching the time when people will not continue to listen to attacks upon big business and constructive wealth. They are beginning to realize that their welfare depends upon the welfare of those companies in which their savings are invested. As a last reason for optimism Mr. Caldwell observed that the new banking and currency act will soon release a large amount of money now in reserve, more than enough to make the early retirement of clearing house certificates and emergency currency possible, thus putting the banking houses of the country in a position they held July 30, 1914.

In Mr. Caldwell's opinion, every possible precaution is being taken in America to minimize the evil effects of the European war, and it now seems possible that the loss to American enterprise will be confined to a shrinkage of income with little or no encroachment upon capital. Some see in the present situation a long siege of calamity, but with new tools in the form of new laws to work with, the man with power of analysis and foresight born of experience knows that it is always possible to turn every advantage into a favorable condition for trading. Events are rapidly transpiring to bring about conditions more nearly normal.

The investment banker, according to Mr. Caldwell, has been for all time the medium through which secured credits were purchased and distributed, and on account of his organization, his ability to mobilize capital and his optimistic efforts and usefulness, he must continue to be recognized as most useful to society. Temporarily restrained, he will resume his activities and usefulness as quickly as the machinery can be put in order and the banks of the country give the word. In behalf of the Investment Bankers' Association, Mr. Caldwell says it does not lack in individual energy or initiative with which to meet the future.

American Association News

Opening of the New Association Year is Marked by Many Committee Meetings—Engineering and Transportation & Traffic Associations Have Selected Subjects Which Will Be Announced Soon—Index Bureau Subscription Is In Danger

The present week has been a busy one at association headquarters as the following committee meeting schedule was adhered to:

Monday, Nov. 9; committee on compensation for carrying United States mail, American Association; committee on subjects, Engineering Association.

Tuesday, Nov. 10; executive committee, Engineering Association; committee on annual dinner, committee on subjects and special membership committee, American Association.

Wednesday, Nov. 11; committee on subjects, Transportation & Traffic Association.

Thursday, Nov. 12; executive committee, Transportation & Traffic Association.

A meeting of the national joint committee on electrolysis was also held on Friday, Nov. 13, at the headquarters of the American Institute of Electrical Engineers. The association has adequate representation on this committee.

A meeting of the joint committee on overhead and underground crossings is scheduled for Tuesday, Nov. 17.

The association is also interested in the meeting of the A. I. E. E. committee on standards which is being held in New York to-day.

AMERICAN ASSOCIATION COMMITTEES

At the meeting of the committee on compensation for carrying United States mail, held on Monday, there were present the following: Capt. A. R. Piper, Brooklyn Rapid Transit Company, chairman; W. H. Collins, Fonda, Johnstown & Gloversville Railroad; T. C. Cherry, Maryland Electric Railways Company; P. N. Jones, Pittsburgh Railways, and J. H. Neal, Boston Elevated Railway Company, representing H. P. Lyons.

The committee prepared information for the use of the joint committee of the House of Representatives and the Senate of the United States on postage on second-class mail matter and compensation for the transportation of mail, as requested by Senator Bourne, chairman of the committee. The report contains statistical information relating to the transportation of mail matter by electric lines and it was immediately forwarded to Senator Bourne.

The special committee on membership appointed by the executive committee of the American Association at Atlantic City held a preliminary meeting on Tuesday. Those in attendance were L. S. Storrs, Connecticut Company, chairman; C. L. Henry, Indianapolis & Cincinnati Traction Company; James H. McGraw, McGraw Publishing Company, Inc.; S. K. Colby, Allen & Peck, Inc., and J. H. Hanna, Capital Traction Company, representing L. P. Crecelius. The committee is formulating a report to be presented later to the executive committee of the American Association.

JOINT MEETING OF AMERICAN AND MANUFACTURERS' ASSOCIATIONS COMMITTEES

A joint meeting of the subjects committee of the American Association and the committee on annual dinner of the American and Manufacturers' Associations was held on Tuesday to consider the details of the mid-year meeting and the annual dinner. As the decision had already been reached that the mid-winter meeting should be held in Washington on Jan. 29, and that it should consist of but one session for the presentation of addresses, the work of the committee was considerably simplified. The committee decided to hold the dinner on the evening of Jan. 29 and considered at length the program for the annual meeting and the dinner. A tentative program was prepared and speakers will be invited at once to participate. Due announcement of the names of these will be made. The committee decided that there should be no reduction in the number of addresses from that usual at mid-winter meetings and that the discussion should continue until all of the speakers had been heard. The committee plans to utilize the opportunity for securing prominent speakers afforded by the fact that the meeting will be held in Washington.

The following committee on arrangements for the dinner was appointed to look after details of this feature: J. H. Hanna, Capital Traction Company, chairman; W. F. Ham, Washington Railway & Electric Company; S. K. Colby, Allen & Peck, Inc.; C. C. Pierce, General Electric Company, H. G. McConnaughy, Dearborn Chemical Company, and E. B. Burritt, secretary. This committee will have general charge of the arrangements for the banquet, but the details will be in charge of a sub-committee to be known as the committee on arrangements, comprising Messrs. Burritt and McConnaughy.

A committee on transportation was also appointed consisting of Bertram Berry, Heywood Brothers & Wakefield Company, chairman; J. A. Kucera, ELECTRIC RAILWAY JOURNAL, and Harlow C. Clark, *Aera.*

Those in attendance at this meeting were C. L. Henry, Indianapolis & Cincinnati Traction Company; J. H. Hanna, Capital Traction Company, representing L. P. Crecelius, president of the Engineering Association; William Tichenor, Terre Haute, Indianapolis & Eastern Traction Company; Harlow C. Clark, *Aera;* C. C. Pierce, General Electric Company; S. K. Colby, Allen & Peck, Inc.; Bertram Berry, Heywood Brothers & Wakefield Company, and E. B. Burritt, secretary A. E. R. A.

ENGINEERING ASSOCIATION COMMITTEES

At the meeting of the committee on subjects held on Monday there were present: John Lindall, Boston Elevated Railway, chairman; J. H. Hanna, Capital Traction Company; Martin Schreiber, Public Service Railway; L. P. Crecelius, Cleveland Railway, and F. R. Phillips, Pittsburgh Railways.

The committee drafted a report assigning subjects for investigation by different committees for the coming year for consideration of the executive committee, which met on the following day.

The executive committee met on Wednesday with the following in attendance: L. P. Crecelius, Cleveland Railway, chairman; John Lindall, Boston Elevated Railway; F. R. Phillips, Pittsburgh Railways; H. F. Merker, East St. Louis & Suburban Railway; G. W. Palmer, Bay State Street Railway; W. G. Gove, Brooklyn Rapid Transit Company; J. H. Hanna, Capital Traction Company, and Martin Schreiber, Public Service Railway.

The committee approved the recommendations of the committee on subjects, and these will be announced as soon as the appointment of committees has been completed. All of the committees of last year were continued and a new special committee on lightning protection was appointed. The committee voted to request from the American Electric Railway Association the sum of $4,000 to carry on the work for the coming year. A set of rules was also drafted as a guide in the consideration of matters jointly with other associations.

TRANSPORTATION AND TRAFFIC ASSOCIATION

The committee on subjects of this association met on Wednesday and formulated plans for the year for submission to the executive committee, which met the following day. There were present: E. F. Schneider, Cleveland, Southwestern & Columbus Railway, chairman; H. C. Donecker, Public Service Railway, and L. H. Palmer, Harrison Williams Company.

The executive committee of the same association met on Thursday to consider the report of the committee on subjects. There were present: M. C. Brush, Boston Elevated Railway, chairman; R. E. Danforth, Public Service Railway; T. C. Cherry, Maryland Electric Railways; H. A. Nicholl, Indiana Union Traction Company; C. D. Emmons, Chicago, South Bend & Northern Indiana Traction Company; L. H. Palmer, Harrison Williams Company; E. F. Schneider, Cleveland, Southwestern & Columbus Railway; H. C. Donecker, Public Service Railway, and E. B. Burritt, secretary A. E. R. A.

The committee approved the report of the committee on subjects, the details of which will be made public shortly, and considered carefully the personnel of the several committees to insure the continuation of the excellent work of former committees. It was decided that reports of committees should be received on May 1 to insure proper consideration before the convention. The appointment of a committee on standards, to comprise eleven members, was authorized. This will consist of the chairmen of the committees on rules, passenger traffic, express and freight traffic, construction of schedules and time-tables, and training of transportation employees, and of one member at large from each of these divisions of transportation work, and of the chairman who shall also be chosen at large. It was further recommended that a joint committee with the Claims Association be appointed to consider the training of transportation employees, particularly with a view to utilizing the experience of the claims departments with accidents, without interfering with discipline.

ULTIMATUM ON THE INDEX BUREAU SERVICE

At the Atlantic City convention the executive committee of the American Association voted to discontinue the subscription to the Hooper-Holmes Bureau service on Dec. 31 unless much greater use is made of it than at present by the member companies. Circular letters are now going out from H. V. Drown, chairman of the Claims Association committee on index bureau, and from the central office, calling attention to the situation and to the facts underlying it. From these letters it appears that the small companies in particular are not using the bureau as they profitably could, and that those who are using it are receiving great benefit. Under the arrangement with the bureau members of the association have the privilege of filing reports of accidents and receiving in return, for a nominal consideration, reports upon such cases as involve individuals known to the bureau. There are now on file with the bureau more than 3,000,000 records, and the number is increasing by 500,000 each year.

Meetings of Anthony N. Brady Medal Award Committee

Meetings of the committee of men not identified with railway operation appointed by the American Museum of Safety to award the safety medals founded by the relatives of the late Anthony N. Brady were held in New York on Nov. 12 and 13. Those present were: Bion J. Arnold, Chicago, chairman; Frank J. Sprague, New York; James H. McGraw, New York, and W. H. Tolman, secretary-director of the American Museum of Safety. The committee met to award the medals under conditions prescribed by the committee of the American Electric Railway Association comprising A. W. Brady, Indiana Union Traction Company; C. S. Sergeant, Boston Elevated Railway, and Frank Hedley, Interborough Rapid Transit Company. The data furnished by a number of electric railways, which had complied with the request of the committee for information regarding accidents and the means taken to prevent them, were considered by the committee and will have further study. The competition has naturally awakened great interest and the committee was pleased to note how widespread and substantial is the safety movement.

Eleven Fundamental Principles

P. W. Brooks & Company, New York, have recently issued an interesting pamphlet dealing with eleven fundamental economic principles that should be followed by an investor in buying securities. The value of public utility bonds is tested from the eleven standpoints. These are demand; relation of supply and demand; efficient management; supervision by commissions; financial analyses of condition; attitude of national banks; successful operation; test by time, panic and war; freedom from competition; small denomination of bonds and certificates; and a yield, proportionate to the cost of living. In the light of each point, all public utility bonds are said to qualify as a safe and substantial investment.

The point of successful operation is discussed in connection with net earnings and the risk of receivership in per cent of capital invested. For the last thirty years public utilities have earned 8.45 per cent, as compared to 4.25 per cent for steam railroads and 7.79 per cent for industrials. The risk of receivership for the same period has been 1.84 per cent for steam railroads, 2.07 per cent for industrials and 0.37 per cent for public utilities. During the period of panic and its effects from 1907 to 1911, the net earnings of public utilities showed an increase of 60 per cent for gas and electric companies, 20 per cent for electric railways, and only 5 per cent for steam railroads. It is stated that in no other class of securities is there such a large proportion of bonds of $100 and $500 denominations. This gives public utility bonds two important advantages, in that they offer 5 and 6 per cent to the investor on savings which have not yet reached the amount necessary for investment in other bonds, and they have a very broad direct distribution. This return of 5 and 6 per cent, moreover, is accompanied by a high degree of safety.

The business of public utilities is said to be growing more than twice as fast as the railroad business, and to meet the increased demands of the public for public utility services it is estimated that $1,200,000,000 of new capital per year will be required.

The work of D. W. Merritt, chief despatcher of the San Antonio (Tex.) Traction Company, was described and illustrated in the San Antonio *Light* recently.

Equipment and Its Maintenance

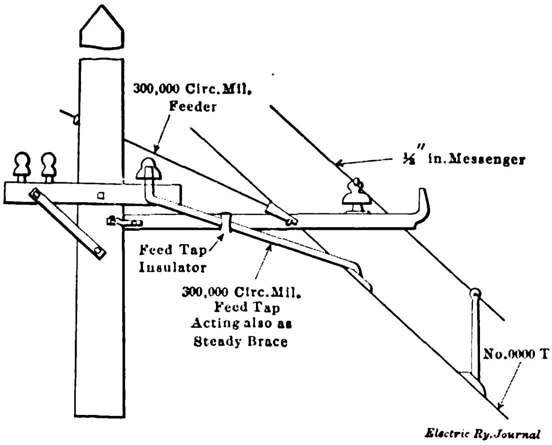
**Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading**

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

A Combined Steady Brace and Feed Tap

BY E. S. ELLIS, SUPERINTENDENT OF CONSTRUCTION CLEVELAND, ALLIANCE & MAHONING VALLEY RAILROAD, ALLIANCE, OHIO

The Cleveland, Alliance & Mahoning Valley Railroad for a year and a half has been operating a 19-mile line between Alliance and Ravenna. Last year it began the construction of its Ravenna-Warren division, a distance of 17 miles, and it is now constructing between Newtown Falls and Warren an 11-mile section. The company also proposes to extend its lines northward from Ravenna to and through Hudson, Twinsburg, Falls Junction and Randall to Cleveland, a distance of about 31 miles. Even the city trackage is on right-of-way.



COMBINED STEADY BRACE AND FEED TAP

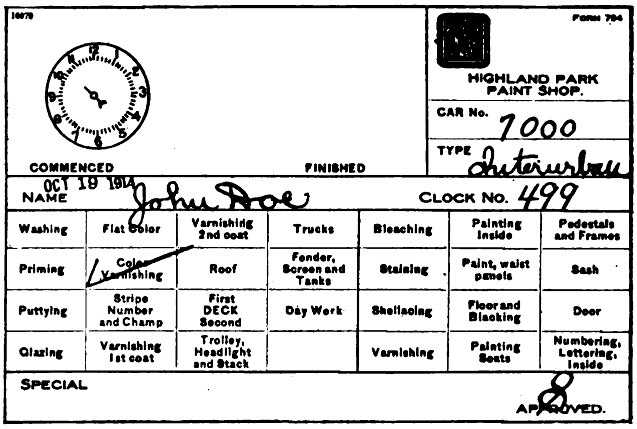
We had much trouble with the steady braces and feed taps on our catenary line until the writer hit upon the following scheme for combining the feed tap and steady brace in one. As shown in the accompanying sketch, the same feed tap insulator as used for ordinary feed taps is clamped to the mast arm. With this insulator we use a piece of feeder to make the tap, the same piece also acting as a steady strain. A standard ear is screwed on the wire and clamped to the No. 0000 trolley to complete the connection.

Detroit Paint Shop Work-Card System

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

A change from the flat-rate-per-day plan of payment to the piece-work system necessitates a corresponding change in timekeeping methods, which may result in the error of "too much system" if not carefully studied and safeguarded. A piecework timekeeping system in which both accuracy and simplicity are embodied is now in force in the Highland Park shops of the Detroit United Railway. Two printed forms are in use, and, in the course of the eight or nine months that the paint shop has been working on the piece-work basis, we have had no operations that could not be accounted for on them. An additional advantage is that timekeeping for day work or piece work can be recorded on the same time card.

The operation or work card is 4 in. x 6 in. in size, and is printed only on one side of a light cardboard, which is just heavy enough to withstand a little rough handling. As illustrated, the upper left hand corner is left blank for the imprint of the time stamp at the commencement or completion of a job, and the opposite corner contains blanks for entering the car number and type. For convenience the cars are designated as single or double-truck city cars and interurban cars. These are further subdivided into a number of different types, payment for the work done being regulated by the type to which the particular car is assigned.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FORM 794

HIGHLAND PARK
PAINT SHOP.

CAR No. 7000

TYPE Interurban

COMMENCED FINISHED

OCT 19 1914

NAME John Doe CLOCK NO. 499

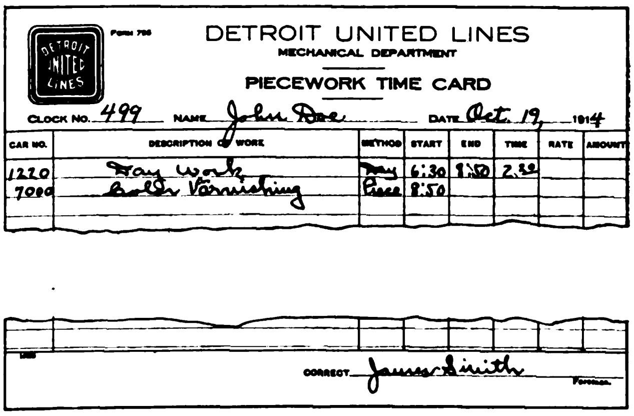
Washing	Flat Color	Varnishing 2nd coat	Trucks	Bleaching	Painting Inside	Pedestals and Frames
Priming	✓ Color Varnishing	Roof	Fender, Screen and Tanks	Staining	Paint, waist panels	Sash
Puttying	Stripe Number and Champ	First DECK Second	Day Work	Shellacing	Floor and Blacking	Door
Glazing	Varnishing 1st coat	Trolley, Headlight and Stack		Varnishing	Painting Seats	Numbering, Lettering, Inside

SPECIAL

APPROVED. S

DETAIL OF PAINTING PIECEWORK AND WORK CARD

Spaces contained in the body of the card are for the workman's name and for the clock number. The card also is ruled into twenty-eight small rectangles, each of which bears the name of a car-painting operation. Sixteen of these rectangles, at the left of the card, indicate the several operations performed on the outside of the car, with one blank reserve space. The remaining twelve spaces are a list of the inside finishing operations. The price paid for sash, seat pedestals or any other car fitting has been based not on an entire car but on one of the individual pieces. The number per


FORM 796

DETROIT UNITED LINES
MECHANICAL DEPARTMENT

PIECEWORK TIME CARD

CLOCK NO. 499 NAME John Doe DATE Oct. 19, 1914

CAR NO.	DESCRIPTION OF WORK	METHOD	START	END	TIME	RATE	AMOUNT
1220	Day work	Day	6:30	8:50	2.20		
7000	Body Varnishing	Piece	8:50				

CORRECT James Smith Foreman.

PIECEWORK TIME CARD, DETROIT UNITED RAILWAY car or the number finished by a workman is indicated opposite the word "special" at the bottom of the card, as is any other notation that may be desired.

The piece-work time card, which is the other form shown, is merely a blank for assembling the time of one man for one day. When filled out, this form contains all the necessary information for wage or cost purposes. The card is printed on light-weight paper, since it is only handled by the time clerks and not by the shop workmen.

METHOD OF USING FORMS

Workmen, upon arrival at the shop, ring in at the time clock, and then proceed to the foreman, where they receive a work card on which the time of beginning is stamped and the car number on which they are to work is indicated. One of the operations listed in the small rectangles is also checked with a pencil to indicate the particular work to be performed. Upon the completion of the work assigned it is inspected by the foreman and if found satisfactory he affixes his initials at the bottom of the work card above the word "approved," after which he turns the card over and writes the car number and operation for the next job. The workman then proceeds with the card to the time clerk, who stamps the finishing time upon it and issues a new card from the data on the back of the old one.

From the information contained on the completed card the clerk can compute the time occupied in performing the operation. This is entered upon the workman's daily time sheet with the car number, class of work and on what plan of payment the work was done. At the close of each day these time slips are delivered to the timekeeper, who inserts the rates and calculates the amounts due, and distributes them to their proper accounts. From the foregoing, as can readily be seen, the work card is virtually a written order to the employee. From it, he is enabled to keep an accurate account of his work, and if any question arises there is really no reason for an argument, since the entire record may be produced and verified.

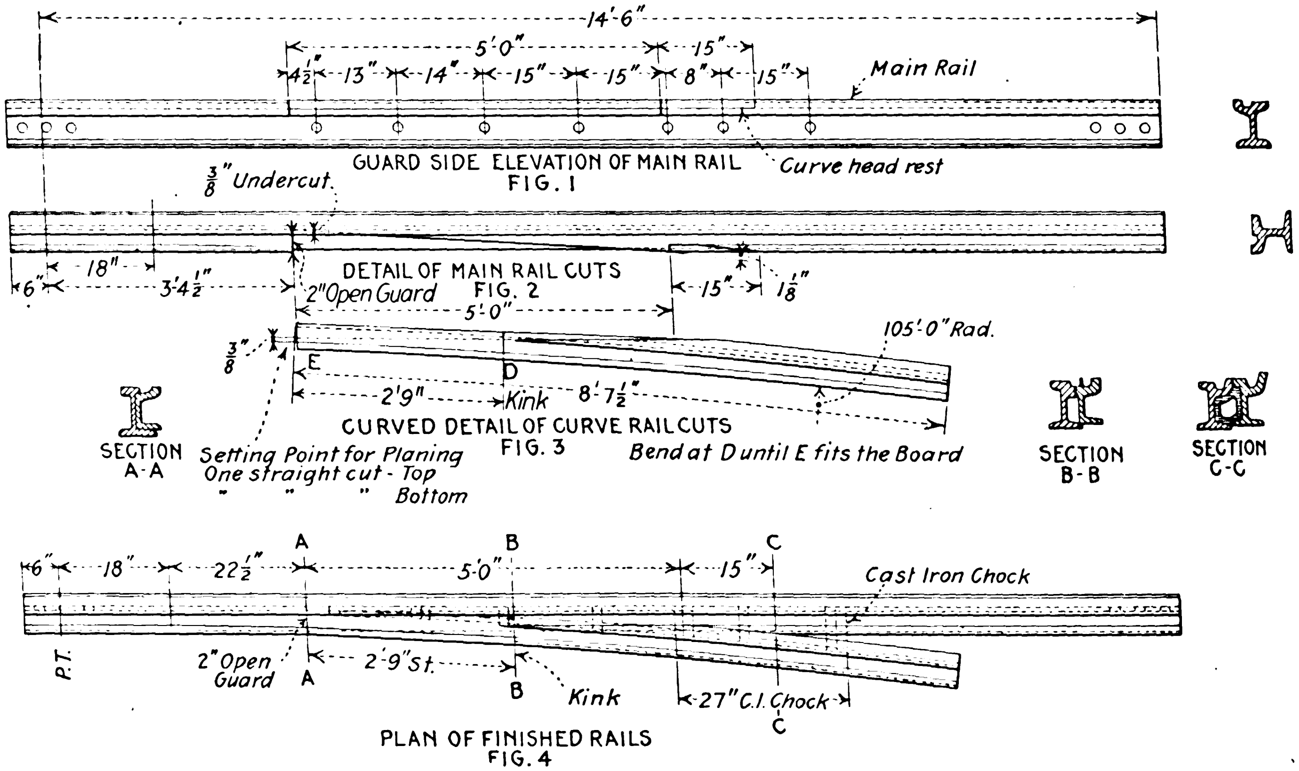
Manufacture and Cost of a Built-Up Mate

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

The mate shown is our standard for emergency crossovers and branch-offs. It is built up of the Pennsylvania Section 291, 132-lb., or Section 294, 117-lb. rail.

An important feature is the strength of the main rail, the head web and the base being left intact. The raising of the head of the curve rail to the level of the guard of straight rail provides a floor for the wheel flange while passing from the main to the curve rail. The splice bar fit, shown at section *A-A*, and the heavy chock, shown at section *C-C*, make for stability.

In the ordinary built-up mate the base of the main rail is cut away into the web, and as a consequence the rail breaks at this point under heavy travel, or lacking the splice bar fit a shearing action between the main and curve rail loosens the mate and destroys the foundation.


14'-6"
5'-0"
15"
4½"
13"
14"
15"
15"
8"
15"
Main Rail
GUARD SIDE ELEVATION OF MAIN RAIL
FIG. 1
⅜" Undercut
Curve head rest
18"
6"
3'-4½"
DETAIL OF MAIN RAIL CUTS
FIG. 2
2" Open Guard
5'-0"
15"
⅛"
105'-0" Rad.
⅜"
E
D
2'9"
Kink
8'-7½"
CURVED DETAIL OF CURVE RAIL CUTS
FIG. 3
SECTION A-A
Setting Point for Planing
One straight cut - Top
" " " Bottom
Bend at D until E fits the Board
SECTION B-B
SECTION C-C
A
B
C
6"
18"
22½"
5'-0"
15"
Cast Iron Chock
P.T.
2" Open Guard
A
2'-9" St.
B
Kink
27" C.I. Chock
C
PLAN OF FINISHED RAILS
FIG. 4

CONSTRUCTION DETAILS OF BUILT-UP MATE USED BY THE BROOKLYN RAPID TRANSIT SYSTEM

Fig. 1 shows drilling and clearance cut for planing; Fig. 2 shows the detail of cuts for the main rail; Fig. 3 shows the cut for the curve rail, the ⅜ in. measured from the inside of the guard being a straight line to the 5-ft. point at the back of the head, and Fig. 4 shows the rails and chock assembled for bolting.

We have had mates of this make in service for more than two years, some of them under our heavIest traffic, without loosening. The cost of construction follows:

Labor	
Cutting rail	$1.47
Shaping clearance	1.05
Bending	1.15
Drilling	1.95
Planing	4.65
Fitting and bolting	1.35
Fitting chock	.35
Grinding	1.70
Supervision	1.50
Total labor	$15.17
Material	
Rail	$25.92
Chock	2.00
Bolts	.75
Total material	$28.67
Grand total—labor and material	$43.84

Equipment Defects—Control Apparatus and Connections—I

BY C. W. SQUIER, E. E.

The starting of motors from rest and their acceleration to a speed where they can be operated at line voltage form the nucleus of the control problem. To this must be added suitable methods for securing several efficient operating speeds and necessary connections for reversing the direction of rotation, as well as suitable connections for those cases where the motors are to be used as prime movers or for electric or magnetic braking. The motors should be started with the least expenditure of energy and with such uniform acceleration that no excessive loads or undue strains will be thrown on them or other parts of the equipment, and with the maximum current peaks well within the commutating capacity.

In the present articles I shall deal simply with those control problems which arise in the operation of electric cars or trains, as a desirable introduction to the study of troubles that arise in operation. Since the d.c. series motor is the most widely used, only this type will be considered. I propose, further, to confine the discussion to the problems in which the motion of the rotating part of the motor maintains a constant relation to the motion of the driving wheels. The motor then must start from rest and increase its speed as the car or train increases in speed.

MOTOR ACCELERATION

First let us consider the control problem apart from the apparatus or its manipulation by considering several circuit combinations that are essential to the proper control of the motors. The problem of accelerating a motor from rest to full speed consists in starting the motor with a certain amount of external resistance in circuit with it, and then by reducing this resistance or by a series of combinations of the resistance, increase the impressed emf at a uniform rate. The greater the number of steps in the regulating rheostat the less will be the current peaks and the more uniform will be the acceleration.

In deciding on the number of steps, the first point that should be considered is the maximum allowable variation in the torque of the motors during acceleration. The average torque is obtained by considering the average acceleration that it is desired to maintain, and this must be a certain amount in order to fulfil the operating conditions laid down. Therefore, the accelerating force will be a certain constant amount upon which will be superimposed another amount composed of a succession of impulses in the nature of blows of greater or lesser intensity, depending on the number of impulses or the number of steps in the regulating resistance. This is indicated in Fig. 1, which shows a current-time curve and a tractive effort-time curve obtained in starting a car with two motors, and accelerating it to a speed where the motors can be operated with full line potential. The average tractive effort per motor required in this case was 1335 lb., and the maximum of 1800 lb. was obtained on the second point. Each succeeding notch of the controller was taken when the current had dropped to 63 amp.

Since the impulses just referred to cannot be eliminated entirely they should be made small enough to give the desired smoothness of operation. For ordinary service the difference between the greatest and least torques of the motors during acceleration should not be more than 40 per cent of the average torque required. For passenger service the comfort of the riders must be considered, and any excessive or sudden jerking is very annoying. The life of the apparatus and of the car itself is affected by the severity of these impulses. Hence control resistances must be so designed that the impulses will be small enough to be within the strength of the apparatus. In freight locomotives any excessive peaks in the torque supplied by the motors will cause the wheels to slip, and such slippage is a very important consideration in starting heavy loads.

RESISTANCE CONNECTIONS

The calculation of the resistance stepping and the number of steps required will be taken up when we consider resistance details. Resistance connections and combinations to increase the impressed emf at the motors affect the controller design, however, and several different methods will be considered.

Series Resistance—A series method of connecting the resistance is shown in Fig. 2. This consists of arranging the total resistance in several groups as *A, B, C* and *D,* with all groups connected in series at the start. This resistance is decreased by short-circuiting sections of it progressively, as indicated by the numbers applied to the contacts or switches which close in the order they are numbered and remain closed until the succeeding ones short-circuit their respective sections of resistance. Fig. 3 shows another method of connecting series resistance. In this case each succeeding switch or contact not only short-circuits its section of resistance, but also the resistance switches or contacts already closed. The arrangement shown in Fig. 2 has the disadvantage of requiring larger and heavier switches or contacts than that of Fig. 3, as each contact when closed must carry the whole current passing through the motors from the instant it is closed until the circuit is opened again. Contrariwise, with the arrangement shown in Fig. 3 each contact carries the whole current only until the next succeeding switch or contact closes. The Fig. 3 arrangement, however, has this disadvantage: if the last switch remains closed for any reason, say when the contacts are welded by excessive heating, all the resistance is short-circuited, while in the Fig. 2 method but one section is short-circuited.

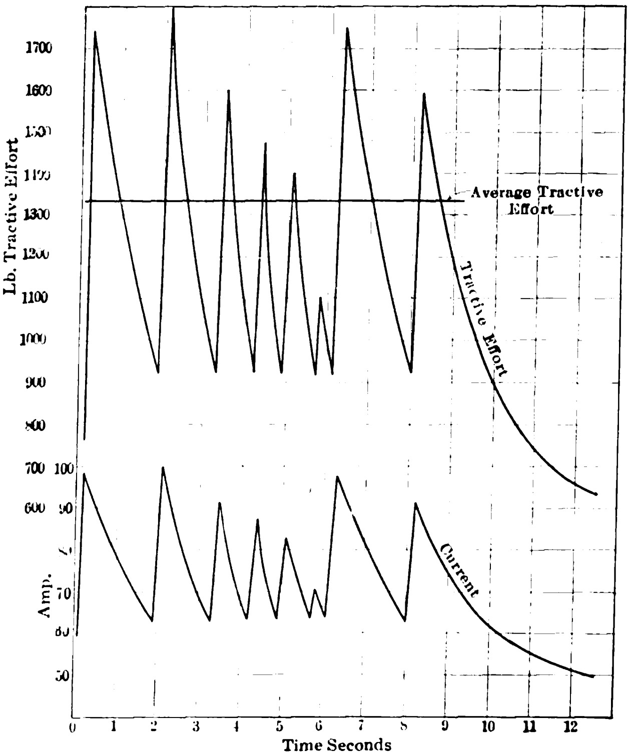


FIG. 1—CURRENT AND TRACTIVE EFFORT CURVES

Parallel Resistance—Fig. 4 shows a parallel method of arranging resistance. This consists of connecting the different sections *A*, *B*, *C* and *D* of the resistance in parallel. The total value of the resistance in circuit is thus decreased, as each section is connected in until finally the last switch or contact short-circuits the whole resistance.

The series methods have the advantage of having all resistance available for heat radiation when operating on the first point of the control, but they have the disadvantage of requiring larger and heavier switches and contacts because each when closed short-circuits its section and must carry the total current passing to the motors. This means that each contact must be of the same capacity as the final short-circuiting contacts No. 5 in the parallel method.

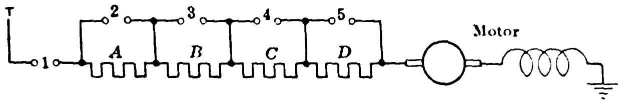


FIG. 2—SERIES METHOD OF CONNECTING RESISTANCE WITH SHORT-CIRCUITING SWITCHES IN SERIES

Series-Parallel Resistance—In an effort to reduce the total number of the contacts or switches and also the number of resistance connections, a combination of both series and parallel is sometimes used with the same control. Fig. 5 illustrates such an arrangement, and the resistance combinations for a five-point controller are as follows:

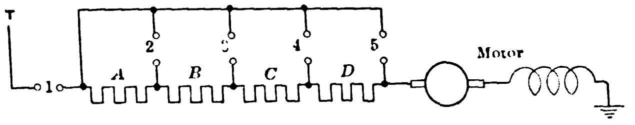


FIG. 3—SERIES METHOD OF CONNECTING RESISTANCE WITH SHORT-CIRCUITING SWITCHES IN PARALLEL

First point—With No. 1 switch closed resistance groups *A*, *B* and *C* are connected in series. Second point—with switches Nos. 1 and 2 closed the resistance is reduced by short-circuiting group *C*. Third point—with switches Nos. 1, 2 and 3 closed, resistance groups *B* and *C* are short-circuited and we have group *A* alone in the circuit. (Before passing to the fourth point No. 2 switch is opened. This does not change the value of the current to the motors as this switch has already been short-circuited by the closing of No. 3 switch.) Fourth point—switches Nos. 1, 3 and 4 are closed, No. 2 remaining open and resistance groups *A*, *B* and *C* are placed in parallel. Fifth point—switches Nos. 1, 2, 3 and 4 are all closed and all resistance is short-circuited.

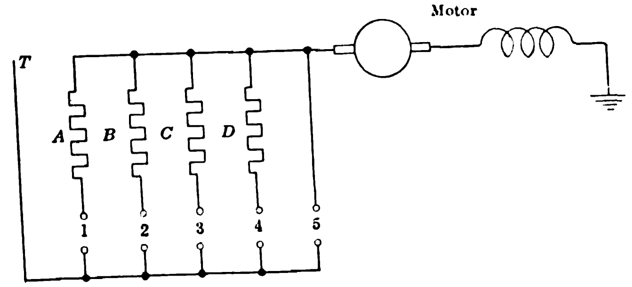


FIG. 4—PARALLEL METHOD OF CONNECTING RESISTANCE

With this series-parallel arrangement of resistance five points of control are secured with but four switches and three groups of resistance, while with the series and parallel arrangements shown in Figs. 2, 3 and 4, five points of control require five switches and four groups of resistance.

Still another resistance combination can be obtained with switches Nos. 1 and 4 closed, leaving the resistance group *C* in circuit. This can be used to advantage when motors are operated in series and parallel combinations, for to obtain the best acceleration it is necessary that the amount of resistance and the stepping should be different with the motors in parallel from what is necessary with the motors in series.

In the diagrams referred to so far I have shown only one motor, but the same connections will apply equally well to combinations of two or more motors by connecting them in series and parallel with the regulating resistance. A resistance common to all motors may be used, or each motor may have its own regulating resistance.

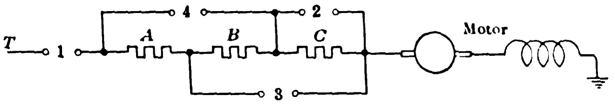


FIG. 5—SERIES PARALLEL METHOD OF CONNECTING RESISTANCE

Chicago Elevated Economy Posters

In order to impress upon the minds of its employees the cost of materials in every-day use, and what it means to the railroad company if they are wasted, the different departments of the Chicago Elevated Railroads have compiled a complete cost record of the various materials in common use. These have been printed in the form of posters which are displayed in conspicuous locations throughout the system. Under a heavy type heading entitled "Material Means Money" the following text matter is contained: "Would you allow a quarter, dime or even a penny to lie around on the structure or to be kicked around on the ground? You are intrusted with material that is just as valuable as the coin and should be as carefully protected. Look at the following prices and be as economical and as careful with all material, whether new or old, as you would be with your own." The following list of materials and their costs are furnished because it was believed that it would be helpful to other companies in compiling economy posters of this kind. The posters are printed in two forms, one for the electrical and track department, and another for the transportation and shop department. Each is displayed where it will receive the most attention from the departments effected. The following is a list of materials and their costs contained on these posters:

TRACK DEPARTMENT

Track spike, 9/16 in. x 5½ in.	$0.01	Signal oil, per gallon	$0.34
Screw spike	.04	Wood alcohol, per gallon	.41
Nut lock, ⅞ in.	.01	Muriatic acid, per gallon	.45
Beveled washer	.02	Turpentine, per gallon	.53
Hacksaw blades	.04	Malleable rail brace	.30
Hook bolts	.05	Malleable rail plate	.47
Lag screws	.05	Angle bars, 26 in. long, per pair	.90
Buttonhead bolt	.06	Plank, 2 in. x 6 in. x 16 ft., each	.46
Track bolts, 4¾ in. long	.05	Tie, yellow pine, 8 ft	1.00
Track bolts, 9 in. long	.09	Tie, yellow pine, 9 ft	1.12
Curve grease, per pound	.06	Guard rail, 6 in. x 6 in. x 24 ft. 8 in.	2.15
Tie plates, short	.11	Guard rail, 6 in. x 8 in. x 24 ft. 8 in.	2.88
Standard joint plate	.14		
Tie plates, long	.16		
Compressor oil, per gallon	.24		

ELECTRICAL DEPARTMENT

No. 4½ porcelain knobs	$0.01	Rubber tape, per pound	$0.60
½-in. x 2½-in. lag screws	.01	3-in. iron battery bell	.25
¾-in. x 3¼-in. track bolts	.02	G. E. No. 50702 lamp sockets	.27
½-in. x 12-in. arc light carbons	.02	No. 0000 clinch ears	.34
Conduit, ½ in., per foot	.04	18-in. splicing ears	1.04
Dry batteries	.15	No. 0000 foot bonds	.35
Weatherproof cable, No. 0000, per foot	.15	No. 0000 16-in. cable bonds	.54
½-in. twist drills	.09	No. 0000 48-in. cable bonds	1.05
Solder, per pound	.20	48-lb. third-rail insulators	.52
23-watt Mazda lamps	.20	Submarine cable, 500,000 circ. mil, per foot	.64
150-watt Mazda lamps	.79	P. & B. paint, per gallon	.55
Inner arc lamp globes	.16	10-amp snap switches	.77
Outer arc lamp globes	.75	Brooklyn strain insulators	.88
Friction tape, per pound	.21		
P. & B. tape, per pound	.30		

Shop Department

Air-hose gaskets	$0.01½
1-ft. No. 12 R. C. flexible copper wire	.02
1-ft. No. 00 R. C. flexible copper wire	.19
One piece mahogany—½ in. x 6 in. x 12 in.	.10
⅞-in. nut	.01½
¾-in. x 4½-in. bolt, without nut	.02½
Soap, per pound .03 to	.05
Colored waste, per pound	.06
Mop stick	.13
Mop	.17
Mazda light globe	.20
Galvanized iron pail	.24
Long - handled sleet scraper	$0.30
Carbon motor brush, .02 to	.35
Broom	.25
Safety spring	.32
Hand lantern, complete	.57
Brakeshoe .55 to	.70
Coach journal brass	2.00
Motor journal brass	2.60
Tail-light lenses .40 to	1.45
Coupling link	3.00
Tail lights and markers	3.15
Light hose jumper, $2.50 to	3.50
Pyrene fire extinguisher	5.60
Train line jumpers	20.00

Station Service

Pencils	$0.02
Erasers	.03
Soap, per bar	.04
Mazda light globes	.20
Maps of system	.20
Galvanized iron pail	$0.24
Broom	.25
Coal hods	.36
Hand ice scrapers	.30
6-ft. step ladders	1.60

Train Service

Pencils	$0.02
Erasers	.03
Metal train markers	.10
Mazda light globes	.20
Hand ice scrapers	.30
Safety springs	.32
Lantern globes, white	.13
Lantern globes, red	.42
Hand lantern	$0.57
Enameled destination sign	1.00
Coupling links	3.00
Tail lights and markers	3.15
Light hose jumper $2.50 to	3.50
Pyrene fire extinguisher	5.60
Train line jumpers	20.00

Painting Steel Cars

At the November meeting of the Central Railway Club Milton L. Sims, of the Sherwin-Williams Company, stated that the preparation of a steel coach for painting was of vital importance, as the absolute removal of all scale, grease and corrosion was necessary before any protective coatings should be applied. Any idea that paint coatings would stop corrosion when it had once started was incorrect. The safest and most economical method for removing rust was the sand blast for the outside of the cars. For the interior the use of raw linseed oil and benzine or gasoline was recommended in the proportion of one part of the oil to two parts of the benzine, applied with a brush and rubbed down with emery cloth or paper. After the rubbing down was completed, the surface should be washed with gasoline and rubbed dry with rags or waste and was then ready for the priming coat, which in all cases should be applied as soon as possible after the surface has been cleaned. The priming coat was more important than any one that was to follow, except the coats of finishing varnish, and too much care could not be exercised to see that it was done thoroughly, brushed out evenly and every bolt head and joint coated perfectly. The priming coat must spread smoothly under the brush, dry hard, but be elastic enough safely to withstand the contraction and expansion of the steel surface, which varied greatly in different sections of the country.

When the priming coat had dried safely, the next step was to hard-putty and glaze-coat over all rough places. The second coat, or brush surface, which is designed to fit with the priming coat must dry hard but elastic, and should be made from well-known and selected materials. A much heavier bodied surfacing material should then be applied and knifed off, leaving a very smooth surface, which required very much less rubbing to bring the surface up ready to receive the color coats. A more modern and safer method than using block pumice stone and water was to rub the surface down smooth by using emery cloth in connection with equal parts of raw linseed oil and benzine, and then to wash or wipe off with rags or waste and clear benzine or gasoline.

Mr. Sims said this method of surfacing did away with all danger from moisture and prevented the starting up of corrosion where any sharp edges or bolt heads may cut through to the steel. The oil formed a good sealer for the more or less porous surfacing material and provided a safe foundation for the succeeding color and varnish coats.

One coat of specially prepared car-body color should be applied and then a second coat of specially prepared car-body color. The latter should be of an elastic enamel quality, should dry hard with a semi-gloss, but should make an elastic surface suitable for striping and lettering. After this two coats of durable outside finishing varnish should be applied, and the outside of the car would be ready for service. The same priming material should be used on the interior surface, and should then be followed up with the second coat of brush surfacer. The heavy coat of knifing material could be dispensed with, and after the rubbing with emery cloth, oil and benzine had been finished, a suitable ground for graining in imitation of natural woods should be used, and then two coats of elastic rubbing varnish. The latter could be rubbed to a dead finish with rubbing oil and pulverized pumice stone, or polished as desired. This schedule was stated to require thirteen days.

With regard to canvas roofs, Mr. Sims stated that they required a specially prepared roof primer which dried very elastic and did not penetrate clear through the cotton fabric. This prevented the rotting of the fabric, which was sure to occur where too much vegetable oil was used. After the special primer has been applied, special long-life roof paints of any desired shade could be applied. He further stated that the method of painting steel coal cars had changed very materially in the last few years. Formerly all coatings were made very elastic, and very little attention was given to make the first or priming coat dry any differently from the last or finishing coat. Research work on this matter had proved that the method was wrong and that the first or priming coat should, by all means, be constructed so as to dry hard and elastic, using specially treated vehicles for the purpose and such pigments as would be neutral and last the longest. The finishing coats were made more elastic and had more gloss and moisture-resisting qualities.

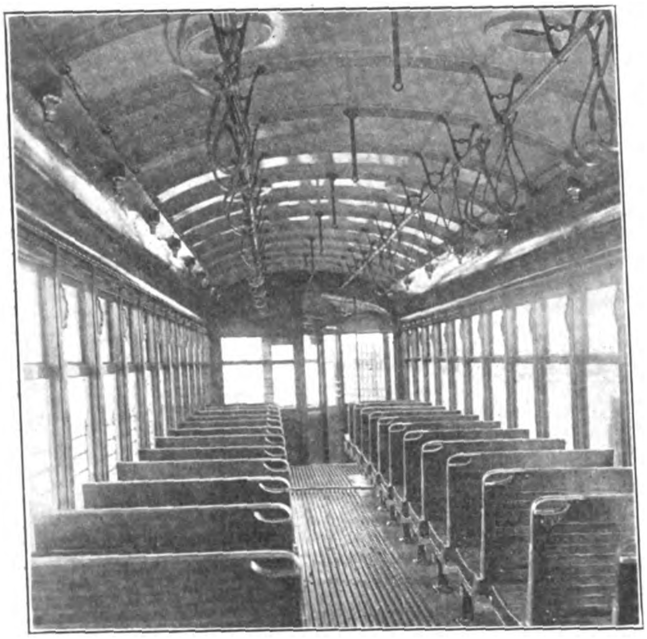
Electrolysis Survey at Providence

A detailed electrolysis survey was recently completed at Providence, R. I., by Robert L. Brunet, public service engineer of the city, assisted by James A. McKenna, of the city engineering department, with the co-operation of the Rhode Island Company. The greater part of the observations were made with a test car furnished by the company. At various points in the city test stations were also established at which were determined the flow of current in pipes and the voltage drop between pipes and rails. The maximum current found at any of the eleven testing stations employed was 13 amp. At seven stations no current in pipes was observed, the favorable conditions being attributed to the installation of insulating joints, thirty-five of which are now in use. The tests showed that the water mains in the city are on the whole substantially free from stray currents. On recommendation of Mr. Brunet, the company is to install negative cables from the Douglas Avenue terminus to the tracks on Admiral Street and from the Admiral Street terminus to the tracks on Branch Avenue. In his report, Mr. Brunet suggests that the company be formally requested to test its track and bonds yearly, the city conducting a similar yearly investigation on the piping systems. Other recommendations to be carried out from time to time include the installation of pilot wires to determine the over-all potential drop in the track, the determination of potential gradients, use of the negative returns, and yearly excavations and inspections at certain points to determine the integrity of the bonding system.

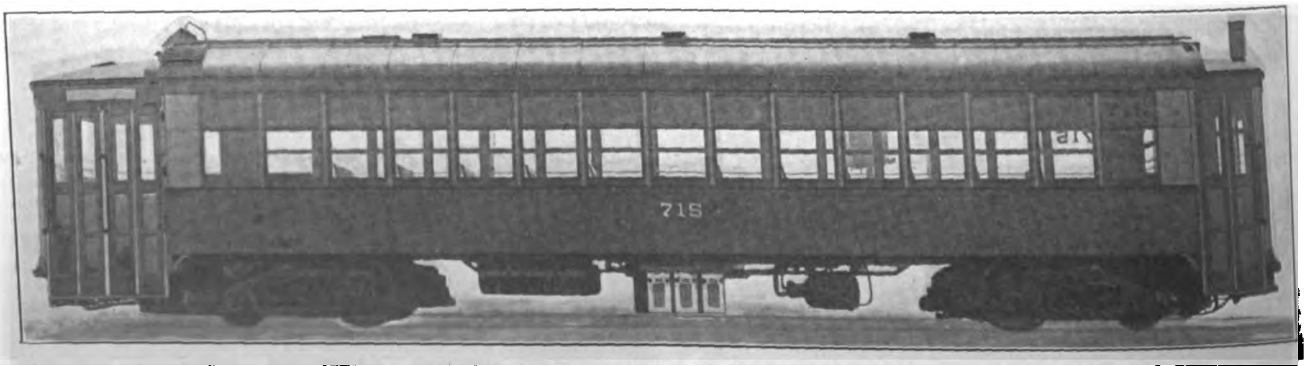
Light-Weight Cars for Puget Sound

The St. Louis Car Company recently shipped the Puget Sound Traction, Light & Power Company ten double-truck prepayment city cars, which are notable for combining lightness in weight with maximum capacity in transverse slat-type seating. The body measures 38 ft. 4 in. between the corner posts and 49 ft. 2 in. over the buffers, while the width over the sheathing is 8 ft. 4 in. These cars are of the Stone & Webster standard design for city service, but are considerably longer than cars of this design previously built. In fact, in the Puget Sound cars the designer carries out the same underframe and side construction as used on the cars of 26 ft. to 30 ft. length. The side sill angles are 5 in. x 3 in. x 5/16 in., with cross-sills of 3 in. 5½-lb. I-beams. The posts are the company's standard 1½-in. x 2-in. x ¼-in. "T" Carnegie section No. 519, and extend in one piece from side sill to side sill, forming the post and carlin. The outside panel is a girder of 5 32-in. x 29-in. plate extending from center to center of the end sills. A reinforcing plate 5 16 in. x 6 in. x 12 ft. is placed over the bolsters. Cross-sill truss rods are riveted to the side sill angles and have malleable iron struts riveted to the I-beam cross-sills. The layout is for single-end operation with a front platform 4 ft. long and a rear platform 6 ft. long over the dasher, both vestibuled. The seating capacity is sixty. The complete equipment weighs 39,000 lb., the car body alone weighing 18,000 lb.

An interesting feature is the absence of headlining, the roof being formed of ¼-in. canvas-covered Agasote. The two end ventilators are of the Stone & Webster vacuum type, while that in the rear hood and the six on the roof are of the car builders' type. The view of the interior also shows the motorman's cab which is entered by way of a 22-in. sliding door. The cab is finished in mahogany to harmonize with the general interior finish.



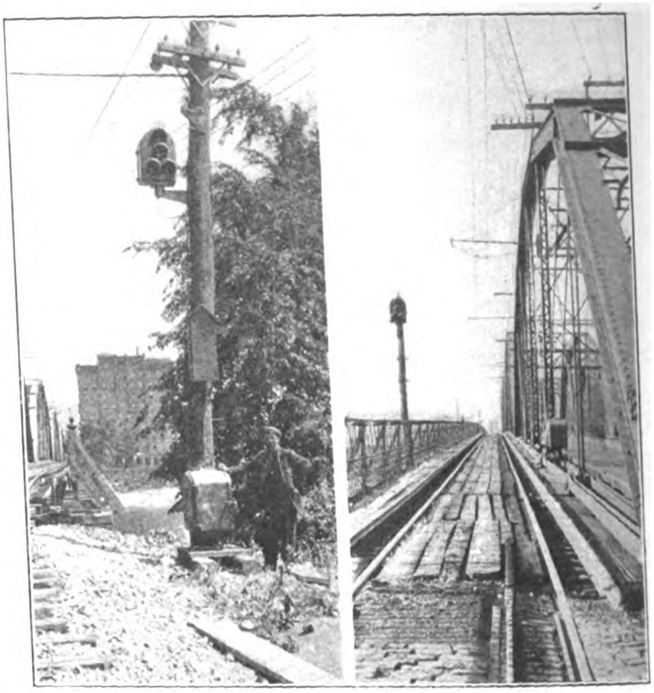
INTERIOR OF PUGET SOUND CAR, SHOWING ABSENCE OF HEADLINING AND POSITION OF MOTORMAN'S CAB



ONE OF TEN SINGLE-END STEEL CARS FOR CITY SERVICE OF THE PUGET SOUND TRACTION, LIGHT & POWER COMPANY

Protecting Traffic on a Single-Track Bridge

The Wilkes-Barre Railways Company is protecting traffic over the Market Street Bridge in Wilkes-Barre, Pa., a distance of 708 ft., with a set of the Type-E signals of the Street Railway Signal Company, Philadelphia, Pa. As the service at this point is almost constant the signals do strenuous duty, cars passing over the bridge at this season of the year at a rate of about 1000 per day of twenty hours. The percentage of failures in six weeks was 0.032, a most remarkable record in consideration of the fact that, under normal conditions, six cars leave the Public Square every ten minutes and pass under the signals in rotation, cars entering the block at the east end at the same time that cars are leaving at the west end. This makes the counting-in and counting-out operations simultaneous,



SIGNALS PROTECTING BOTH ENDS OF BRIDGE, WILKES-BARRE, PA.

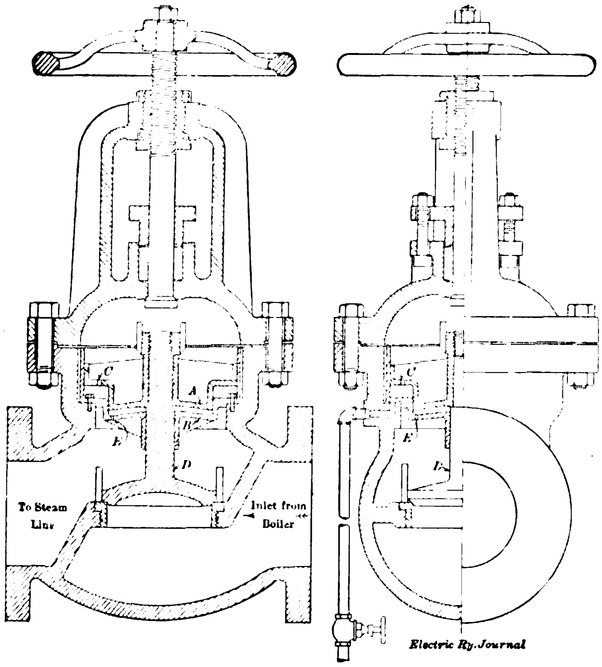
a feature which the Street Railway Signal Company claims to be original with its apparatus.

As the cars come across the bridge into Wilkes-Barre they enter a turnout that will accommodate only three cars. In order to facilitate traffic and avoid possibilities of a tie-up at this point an arrangement has been introduced whereby the closing of a switch will cause the signal at the west end of the bridge to go from permissive to stop after the passage of the three cars into the block, this indication holding until all cars pass out of the block. The illustrations on page 1110 show how the signals are mounted. At one end of the bridge the aspect case is on the existing pole, with the relay case at the bottom of the same pole. At the other end the aspect case is on a special pole with the relay located at the opposite side of the track.

Valves for Boiler and Steam Line Protection

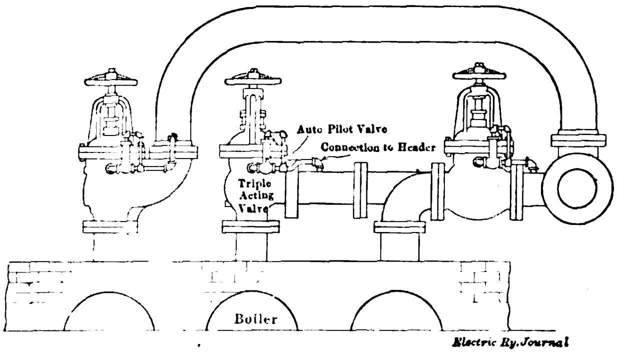
Of the valves made by the Golden-Anderson Company, Pittsburgh, Pa., the two hereinafter described are of special interest. One is a single-acting non-return valve for protecting the boilers only, the other is a triple-action valve for both steam line and boilers.

The single-acting valve is said to be the only non-return or automatic stop and check valve that can be tested in service. This valve is used in the connection from each boiler to the main steam line to prevent back flow from this line when the pressure in a boiler is lower or when it is cold. The valve embodies the Corliss dashpot method of cushioning, the full area of the upper portion of the body being occupied. Perfect alignment with the seat is also secured at all times regardless of position. The sectional views show the inside dashpot *A* attached to the valve spindle *D*, while the outside dashpot *B* acts as a bronze cylinder which is held firmly in place by the tap bolts. When the steam pressure raises the valve the resulting space between the inner and outer dashpots is instantly filled with steam, cushioning the valve in closing. The steam also circulates around and above the inside dashpot through the ports *C* and *E* to cushion the valve in opening. The small branch shown in the lower right-hand corner can be run to the floor or any other convenient point for testing the valve in service. Simply by opening the small valve the non-return valve will instantly close. By closing the small valve the non-return valve will immediately return to its automatic position. This feature enables the operators to determine at once whether the valve is operative, and avoids going on top of the boilers to close and open the non-return valve with the hand wheel. A solenoid and piping are also provided to permit remote control.

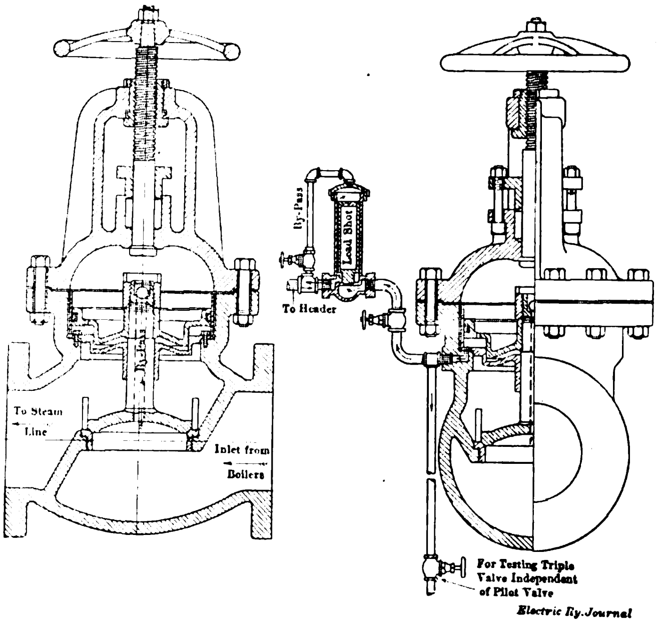


SECTIONS AND ELEVATIONS OF SINGLE-ACTING NON-RETURN VALVE

The triple-acting non-return valve requires only one connection to the header. As in the single-acting valve, the double Corliss dashpot is used to prevent sticking or hammering. Adjustment for any variation of pressure is made merely by removing the cap of the pilot valve and adding or removing lead shot or other weights from a hollow piston, as shown, for a greater or lesser variation between the boiler and header pressure. Valves of this type equalize the pressure between the different boilers, for they remain closed as long as the boiler pressure is lower than that of the header. When the pressure is equal they open automatically. The branch connection shown in the lower right-hand corner permits tests to be made from some convenient point as with the single-acting valve.



INSTALLATION OF TRIPLE-ACTING NON-RETURN VALVES



SECTIONS AND ELEVATIONS OF TRIPLE-ACTING NON-RETURN VALVE

The Leavenworth Light, Heat & Power Co., Leavenworth, Kan., on the occasion of a recent booster trip of the merchants of Leavenworth used in its display advertising the following words: "All Together—All the Time—For Anything Good—For Leavenworth."

News of Electric Railways

DECISION OF PITTSBURGH ARBITRATORS

An Abstract Is Presented of the Findings of the Majority, Adverse to the Men

The decision of the majority of the arbitrators in the wage dispute between the Pittsburgh (Pa.) Railways and its motormen and conductors, referred to briefly in the ELECTRIC RAILWAY JOURNAL of Nov. 7, page 1072, follows in part:

"We have reached the conclusion that the contention of the men for an increase over the present scale, or a change therefrom, should not be granted for Pittsburgh or for Washington, Pa.

"We will consider first certain claims for extra compensation not allowed by the present or former scales. At present no extra pay is allowed for night or holiday runs, for snow plow work, or for the five minutes a man is required to report before his platform work starts. Taking these up in order, it is contended by the employees that men operating night cars should be paid ten hours' pay for eight hours' work.

"Night work is an uncontrollable requirement of the public. As a general principle, the same reason which justifies extra pay for night work in time-controllable day ocupations, does not apply to street railway work. The absence of extra pay for night service, with the exception of one city, is the invariable practice of street railway companies.

"What has been said of night work applies to Sunday service. Conditions are unchangeable. On Sundays and holidays street traffic is not as heavy as on other days, there are fewer pedestrians on the streets and passengers are distributed more evenly over the entire day.

"The proofs in the case show that the men entitled to preference choose the Sunday runs and that in many instances where they take a rest day they take a week day in preference to Sunday. The general practice of American street railways is to allow no extra pay for Sunday work. In Pittsburgh the practice has been to allow in some instances ten hours' pay for eight hours' work on Sundays. The contention of the company is that this extra Sunday pay should be abolished; the contention of the men is that it should be further increased.

"The Pittsburgh Railways, however, has in the last schedule, and for some years, made some extra allowance for some Sunday runs. The reasons it now advocates for a change have always existed, and with them before it the company has chosen for some years to make this extra allowance. As we have said before, where any change in an existing scale is sought the burden of proof rests upon him who asks such change. We therefore adhere to the present scale.

"The conclusion has been reached that the agreement shall stand for two years from the date of this report and that the time blank in the agreement should be filled so as to read 'until Sept. 30, 1916.'"

The board made the following recommendations to the motormen, conductors and the company:

"First—That a board of co-operation be formed as follows: One man to be elected at each carhouse by secret ballot by the motormen and conductors in service more than six months. These twenty men, together with the general manager or superintendent of transportation and such other representatives as the company may select, not to exceed five persons, to constitute a board of co-operation. This board to meet at least once every month, to suggest and discuss methods of improving the service, of rendering it safer to the company, and in general to suggest ways and means of avoiding misunderstandings between the men and the company, and promoting good feeling on both sides. This board also to hear grievances and complaints that may be made by the men or the company and to suggest methods of reasonably meeting them. The election for the following period to be held at each carhouse once each year under the direction of the local committee of motormen and conductors and a local superintendent. The trainmen to be paid by the company at their regular rates of wages for all time employed by the men in attending the meetings.

"Second—That the subject of profit-sharing by the men in a percentage of the gross earnings of the company be jointly taken up by the motormen and conductors and the company, with a view to working out such plans."

EMPLOYERS LIABILITY INSURANCE IN CALIFORNIA

Financial Report Issued Indicating Success of the New State Department

The Industrial Accident Commission of California last December addressed the employers of the State, outlining the employer's liability under the workmen's compensation, insurance and safety act, and announcing that in establishing the State compensation insurance fund, the State had entered the insurance field to protect employers against their compensation liability. On Oct. 24, 1914, the manager of the compensation fund issued a financial report which is declared to be an indication of the success of the new State department. It is pointed out that as the State is not engaged in the insurance business for profit, the new department is the employer's own company, operated at a very low cost under State supervision, and providing service and protection of the highest class.

With the report appears a statement that, barring any unexpected calamity, those who hold State compensation insurance policies will be allowed a return premium of 5 to 25 per cent of premiums earned, the amount of return depending upon the experience in the various hazard groups. This return, however, will not affect minimum premiums. The California insurance laws require the setting aside of claim reserves equalling 72 per cent of all earned premiums, less losses and loss expenses paid, and this reserve must be maintained for five years. It is thought that there is no possibility of losses and loss expenses equalling that percentage, and that the difference between the reserve and the actual value of claims can ultimately be taken down. This would indicate a further return premium to 1914 policyholders, after a fair catastrophe surplus is set aside.

The initial insurance rates to be adopted for the coming year are the same as charged by the standard corporate companies, with the exception of the excess premium returns mentioned. All plants are inspected and the merit classification is applied to many. Where allowed, special merit inspections result in rate reductions of 1 to 40 per cent, the average reduction being 10.08 per cent.

The financial statement just issued covers the period from Jan. 1, 1914, to Oct. 1, 1914, during which time 5360 applications for insurance were received, and 2478 accident cases were handled. The expenses amount to 8.49 per cent of the premiums. The statement shows a total surplus of $224,020, of which $100,000 is the appropriation made last year and $124,020 represents accumulated surplus. The items that make up the totals are as follows:

Appropriation (1913 statute)	$100,000
Premiums written, less premiums returned	462,014
Interest received, due and accrued	4,502
Total	$567,017
Expenses and salaries	$41,328
Compensation and statutory medical payments	52,529
Outstanding cost, foregoing item	110,456
Unearned premiums	138,684
Total	$342,997
Surplus	$224,020

BOSTON TRANSPORTATION HEARING

Mr. Snow, for Boston Elevated Railway, Outlines Attitude of That Company Toward Proposed Unification

The Massachusetts Public Service Commission continued the hearing on Nov. 5 on the legislative resolve (Chap. 149, Acts of 1914) requiring the board to investigate transportation conditions in the Boston Metropolitan district. The proposed consolidation of the Bay State Street Railway and the Boston Elevated Railway was discussed by James F. Jackson, counsel for the former. The enabling act presented at the last Legislature was reviewed with special reference to its bearing on fare revision. It is expected that if the consolidation is approved by the Legislature a zone system of fares somewhat resembling that in use at Milwaukee will be submitted to the commission for approval. Frank B. Walker, civil engineer of the Bay State Street Railway, Boston, described various proposed track connections between the Boston & Maine, Boston & Albany and New York, New Haven & Hartford railroads and the Boston Elevated rapid transit lines, by which suburban trains may be run between the heart of the city of Boston and the outlying districts in establishing a comprehensive service in the metropolitan area. It was pointed out that this arrangement would relieve congestion at the existing railroad terminals, obviate the necessity of further costly extensions of elevated and subway structures and greatly improve the distribution of traffic. Chairman McLeod questioned the practicability of this part of the plan and pointed out that the rapid transit lines in Boston should be conserved to meet future demands upon them along existing channels of traffic instead of turned over to the accommodation of rolling stock diverted from the railroad lines of the metropolitan district.

For the Boston Elevated Railway, Frederic E. Snow pointed out the readiness of the company to enter into any comprehensive plan of consolidation or lease which will not add to existing unprofitable fare conditions. The company could not accept less than a 5-cent fare, but would be willing to extend this to Malden and Chelsea, which lie in general within the 4¼-mile radius of the Boston City Hall, which the joint commission on transportation estimated as the maximum profitable local ride for 5 cents. Residents of distant outlying suburbs cannot be carried to and from the heart of Boston at a 5-cent rate. The Revere Beach line of the Bay State Street Railway might be taken over under special excess fare arrangement. Mr. Snow said that in the event of a consolidation with the Bay State company a zone system of fares would be necessary and that the consent of the city of Boston would have to be secured to an alteration of the East Boston tunnel lease and to the transfer of the present subway leases to the new company. The Boston Elevated Railway did not desire to take on any new lines which would not be self-supporting and provide a return on the investment. Higher fares to and from the outlying districts are essential to a comprehensive development.

INJUNCTION GRANTED IN INDIANAPOLIS LABOR CASE

An injunction, *pendente lite*, enjoining officials of the Amalgamated Association and local labor union leaders from confederating to bring about a strike of the street railway employees at Indianapolis, and enjoining the car service men from striking, was issued on Nov. 7 by Judge A. B. Anderson of the United States District Court for Indiana. The injunction supersedes the temporary restraining order issued in September and continues effective until the decision on the final hearing for a permanent injunction. No date for the final hearing has been set by the court.

The individual service contract of the Indianapolis Traction & Terminal Company is found by the court to be valid, binding and effectual and in full force on its signers. The court finds that the defendants, William D. Mahon, Edward McMorrow, Joseph Colgan and R. L. Reeves, international officers of the Amalgamated Association, and the officers and attorneys for labor unions in Indianapolis, sustain no relations to the Indianapolis Traction & Terminal Company, but have confederated together to induce railway men who have not signed the individual contract and still work under the arbitration award contract to violate the provisions of the award contract by striking. The names of about 200 union men who are working under the award contract and more than 500 other men, practically all non-union, who are working under the company's individual service contract are included in the order of the court, and each is enjoined from striking or attempting to bring about a strike. The union officers previously mentioned are enjoined from combining and confederating or inducing or procuring any of the car men named in the order to violate the award contract or service contract by striking to compel the Indianapolis Traction & Terminal Company to operate upon the closed shop principle. The defendants are one and all enjoined from trespassing upon the property of the company or collecting in or upon the streets of Indianapolis or about the cars in such a manner as to interfere with the operation of cars or the employees. The order also enjoins all the defendants from interfering with any employee of the company in the discharge of his duties or by attempting to compel him to become a member of a labor organization by threats or intimidation.

MUNICIPAL RAILWAY CONSTRUCTION COST

According to a financial statement issued by the bookkeeping department of the Board of Public Works, the total cash available for construction work of the San Francisco (Cal.) Municipal Railways, when all of the sold bonds of the $3,500,000 issue voted on Aug. 26, 1913, are taken up, will be $2,666,159. The bonds to be sold total $857,500, giving a total estimated available amount from all sources of $3,523,659. Up to Sept. 26 there has been extended $1,915,567. There will be needed to complete work under way $718,227, and the engineers' estimate for new work amounts to $1,020,240, or a total of $3,654,034. The result is an estimated deficit to completion of $130,375. Some of the principal items included in the $1,915,567 of expenditures up to Sept. 26 are the following: Rails, $149,175; track specials, $118,653; car bodies, $144,650; car trucks, $36,250; motor equipment, $188,987; trolley poles, $61,237; Van Ness Avenue and Chestnut Street construction, $230,768; Potrero Avenue lines, $143,768; preliminary expenses—elections, $26,679, and Presidio & Ferries property, $312,535. The engineers' estimate for new work includes, among other items, the following: Track specials, $22,486; motor equipment, $15,348; plans and inspection, $54,000; California Street line, $127,500; Potrero carhouse, $211,345, and Church Street line (latest plans), $433,000.

During the year ended June 30, 1914, a total of 10.38 miles of track was added to the municipal railway system. The Van Ness Avenue line, 3.26 miles, was built primarily to serve exposition needs and was completed on Aug. 15. The Potrero Avenue line, 1.99 miles, running south of Market Street, was completed on Sept. 7. The Union Street line, 3.9 miles, was purchased from the Presidio & Ferries Railroad and put in service on Dec. 11. The Stockton Street line, 0.99 mile, completed this month, was built to connect Market Street with the Union Street line via the Stockton Street tunnel. The Masonic Avenue line, 0.26 mile, was built as a spur to the baseball grounds. Plans are now in course of preparation for three extensions; one on Columbus Avenue, one on California Street and a third on Church Street, the latter to cost about $330,000. The extension of the Geary Street carhouse is practically complete and the grading contract has been awarded for the 200-car shed on York Street.

MODIFIED CLEVELAND SUBWAY ORDINANCE INTRODUCED

At the regular meeting of the City Council of Cleveland, Ohio, on the evening of Nov. 9 Robert Koch, chairman of the committee on street railways, introduced an amended ordinance extending the time for starting the construction of the proposed subway, permitting larger tubes and increasing the price from $350,000 to $550,000 a mile of single track in the purchase clause. The measure was not discussed, but was referred to the Council committee of the whole. This ordinance permits stairways to stations to be 5 ft. wide, with entrances 6 ft. wide and 20 ft. long. Under it subway tracks may be brought to the surface to connect with surface tracks at locations approved by the director of public service. The ordinance further provides that the subways shall have a clear height of not less than 12 ft. and a clear width of not less than 10 ft. for each track. The construction of the first line is to be begun within twelve months from the time the ordinance goes into effect and be completed within thirty months thereafter. W. R. Hopkins, president of the Cleveland Rapid Transit Railway, stated that work may be begun sooner than stipulated, but that this depends on financial conditions.

Commissioner Hobbs reported on the cost of constructing a suspended railway of the German type. He thinks that such a road could be built at about $470,000 per mile of double track. His report showed the cost of elevated roads in New York and other cities.

The platform employees of the Cleveland Railway have decided to take their grievances to the City Council and ask that the company be authorized to make the expenditure necessary to grant a minimum work day of eight hours. Arbitration of the differences between the employees and company failed recently because certain points in the contract prevented action on the matters suggested by the men. George R. Davies, president of the local branch of the street railway men's union in Cleveland, stated on Nov. 9 that a committee will be appointed to work before the next session of the Legislature for a law fixing the number of hours that shall constitute a day's work.

NEW YORK TRANSIT MATTERS

Advertising Contract Disapproved and Relocation of Brooklyn Elevated Suggested

The Public Service Commission for the First District of New York has disapproved a contract, submitted on Feb. 2, 1914, which the Interborough Rapid Transit Company, lessee of the city subway, proposed to make with Artemus Ward for advertising, newsstand and vending machine privileges on that part of the dual system of rapid transit to be operated by the Interborough Company. The company had a contract covering such privileges in the old subway with Ward & Gow, which expired on Jan. 1, 1914, but contained a provision for a renewal for five years at a 10 per cent. increase. Before the expiration of the contract, however, the firm of Ward & Gow was dissolved and there was some question between the company and Artemus Ward as to his right as the successor of Ward & Gow to claim the right to a renewal. Therefore, the new contract was drafted and submitted to the commission. This contract was to cover a period of fifteen years from Jan. 1, 1914, and the contractor agreed to pay the Interborough Company $600,000 for that year, $700,000 each for the years 1915 to 1918, inclusive, and $800,000 for the year 1919 and each year thereafter, plus an additional sum equal to 10 per cent of the contractor's gross receipts. In disapproving the proposed contract, the commission adopted an opinion by Commissioner George V. S. Williams, in which he pointed out that the Interborough Company, as the lessee of the old subway, has the right to dispose of the advertising privileges therein without objection by the city until Jan. 1, 1917, when operation will be begun under the dual system contracts. These contracts cover the new subways as well as the old one, and provide for a division of profits between the company and the city. The city, therefore, is interested in any advertising contracts which may be made covering the period of dual system operation. The commissioner holds that the value of the advertising privileges will increase as time goes on and that better terms can be secured shortly prior to the beginning of dual system operation than can be obtained now. The dispute between the company and Artemus Ward as to the latter's right of renewal of the old contract for five years makes it impossible for the company to guarantee possession to a new contractor during such five-year period, and the commission was advised that because of this uncertainty it is impossible, at this time, to obtain effective competition for the privileges. Therefore, the contract was disapproved.

The New York Municipal Railway Corporation has applied to the Public Service Commission for a relocation of part of its Fulton Street elevated railroad in Brooklyn, in accordance with the plan favored by the committee on city plan and other citizens. This plan provides for the removal of the elevated structure from Fulton Street between Borough Hall and the Brooklyn Bridge and its transfer to Adams Street and private property. By an amendment to the rapid transit act, passed in 1913, the Public Service Commission is authorized, upon application from a company holding such a franchise, to relocate a line or part of a line in another street. Under the dual system contracts the company has the right to build a third track on the present elevated structure, and it is willing to apply to the cost of the new structure in Adams Street an amount equivalent to the money it would spend in erecting the third track. The company points out, however, that it is about ready to proceed with the third-tracking and urges immediate action if its application for a relocation in Adams Street is to be favorably considered by the commission and the Board of Estimate and Apportionment.

At the request of the financial officers of the city, the Public Service Commission for the First District has adopted a resolution asking that its engineering expenses since March 19, 1913, when the dual system contracts were signed, amounting to $3,533,000, be funded by the issuance of corporate stock instead of revenue bonds already issued in payment thereof and to be discharged by inclusion in the tax levy for 1915. The effect of this action will be to permit the city authorities to lower the tax levy for 1915 by the amount mentioned. The action is made possible by provisions of the dual system contracts, which authorize the charging of the commission's engineering expenses to the cost of construction of the new rapid transit lines.

DETROIT APPRAISAL FIGURES EXPECTED IN DECEMBER

It is unlikely that Prof. E. W. Bemis will present his appraisal of the property of the Detroit (Mich.) United Railway within the one-fare zone before Dec. 15, according to statements issued by the municipal street railway commission. The report was to have been received early in November, but various delays encountered indicate that no announcement of figures will be made until after the first week of next month.

Mayor Marx and a number of his heads of departments are making a tour to gather information as to surface railway service in several cities. Boston, New York, Philadelphia and other cities will be visited. It has been intimated by the anti-Detroit United Railway press rather than by the administration that upon the Mayor's return there will be some discussion with the company as to the service being furnished.

MONTREAL SUBURBAN LINE RECORD REVIEWED

The Montreal *Evening News* of Nov. 2 contained the following review of the activity of the Montreal & Southern Counties Railway, the property of which was described in the ELECTRIC RAILWAY JOURNAL of March 28, 1914:

"Sunday, Nov. 1, was the fifth anniversary of the opening of the Montreal & Southern Counties Railway. On Nov. 1, 1909, the first service between McGill Street and the South Shore was put in operation. The company then owned two passenger cars, and these made twenty-eight trips to and from St. Lambert only. To-day the company is operating more than 40 miles of track and is serving St. Lambert, Montreal South, Longueuil, Greenfield Park, Country Club, Chambly, Richelieu, Marieville, Rougemont and St. Cesaire, making in all ninety trips daily over the Victoria Bridge. In addition it has another 16 miles of track under construction to link up Abbotsford and Granby. In January next work will be begun on the extension of the tracks on the Montreal side as far as Youville Square.

"In place of the two cars which comprised the railway's rolling stock five years ago, there are now thirty-two passenger cars, two baggage cars, two flat cars, two rotary plows, one double track sweeper and one single track sweeper. During the first year 319,778 passengers were carried, while during the fiscal year ending June 30 last, W. B. Powell, the general manager, reports that the company carried 1,915,379 passengers.

"The effect which this line has had on the towns through which it passes is shown by the increased population figures:

	1909	1914
St. Lambert	1800	5300
Longueuil	3900	5800
Greenfield Park	500	1300
Montreal South	664	802

"In addition the company has been the means of opening up many new centers of population, including Alexandria Park, Rivera Park, St. Lambert Heights, St. Lambert Annex, Springfield Park, Sunlight City, East Greenfield Park, Pinehurst, Brooklin, Brentwood, South Kensington, Woodbine, Beverly, Albani, Belleville, Tunnel Terminals and Elswick Townsite."

ST. PAUL ELECTRIFICATION PLANS UNALTERED

C. A. Goodnow, vice-president of the Chicago, Milwaukee & Puget Sound Railway, has officially denied the rumor which has been prevalent during the past week to the effect that the voltage for the proposed electrification of a division of the railway would be raised to 6000. Mr. Goodnow stated that no change whatever from the originally planned voltage of 3000 is contemplated and that the work on the overhead construction which has been interrupted on account of a labor dispute will be continued in accordance with the scheme that was originally adopted, the design being exactly similar to the wooden pole and mast-arm, catenary arrangement that was installed on the Butte, Anaconda & Pacific Railway. Mr. Goodnow stated also that the order for the electric locomotives and substation equipment for the electrified division would be placed in the immediate future.

Progress on Philadelphia Electrification.—Steady progress is being made on the installation of tower footings for the overhead construction of the electrification on the Pennsylvania Railroad between Philadelphia and Paoli. The footings are completed nearly to the West Philadelphia station.

Bay State Arbitrators.—Henry E. Reynolds, assistant general manager of the Bay State Street Railway, Boston, Mass., has been selected to represent the company in the forthcoming wage arbitration proceedings. James H. Vahey, Watertown, Mass., has been named as representative of the employees. The third arbitrator will be selected by Messrs. Reynolds and Vahey.

Massachusetts Street Railway Association.—At the regular monthly meeting of the Massachusetts Street Railway Association, held at Young's Hotel, Boston, on Nov. 11, John A. O'Keefe, metropolitan fire commissioner, discussed the general problem of fire prevention in the Boston district, with particular reference to the organization of the State department of which he is the head.

Furthering Public Relations in San Francisco.—Jesse W. Lilienthal, president of the United Railroads, San Francisco, Cal., has recently sent out a letter to all the improvement clubs in San Francisco, announcing his consideration of the plan of a monthly letter which will deal with the future development work of the United Railroads and inviting suggestions for the improvement of conditions.

Mayor Marx, Detroit, Re-elected.—Mayor Marx was reelected in Detroit by a plurality approximating 20,000 over F. F. Ingram, who campaigned on a platform that charged the Mayor with the betrayal of the city's interest through the seven-for-a-quarter agreement with the Detroit United Railway in August, 1913. The supporters of the Mayor used as the principal slogan for his re-election "The man who took the street railway question out of politics."

Transportation Reviewed Before the Los Angeles A. S. M. E.—At a dinner given by the Los Angeles section of the American Society of Mechanical Engineers at Los Angeles, Cal., recently, Prof. George A. Damon, dean of engineering, Throop College of Technology, Pasadena, reviewed transportation development from the earliest times, illustrating his remarks with the stereopticon. He suggested for Los Angeles as the ideal a system of subways in the very densely settled section, with elevated lines in the less densely settled section and surface lines for the outlying sections.

Philadelphia Loan Bill Passed.—The bill releasing $11,300,000 for improvement work in Philadelphia, Pa., after Jan. 1 was passed at the recent election. Included in the items in the bill is an appropriation of $500,000 asked for by Director Taylor, of the Department of City Transit, and regarded by him as sufficient to complete the work of reconstructing and relocating sewers in the central portion of the city, where the subway loop will be located. The plans for this work were drawn by the department of surveys and are part of a comprehensive plan for a general reconstruction of the sewer system of Philadelphia.

Loyal Railway Purchase Negotiations.—Negotiations between the city of Seattle, Wash., and Harry Whitney Treat for the purchase of the Loyal Heights Electric Railway, which extends between the business district of Ballard and the Golden Gardens, have been tabled until after Jan. 1 1915. The city has decided that there is nothing to gain by proceeding with the negotiations until the bridge crossing the Lake Washington Canal at Ballard is completed, thereby insuring Division "A," of the Seattle Municipal Railway, entrance into Ballard. The Council contemplates purchasing the line as an adjunct to the other municipal lines.

Pacific Claim Agents' Index Bureau.—Although the extending of the services of the Pacific Claim Agents' Index Bureau to non-members was authorized last year, no steps were taken until recently to advertise this service. Now letters are being sent out to all lawyers and others who might have a use for the service, but who could not be expected to become members of the association. The minimum rate for service to non-members is $10. The bureau has discovered and exposed more than 200 accident repeaters in the last two years. The card-index cabinets of the bureau now contain more than 25,000 names of personal injury claimants assembled since the beginning of 1912, and it is estimated that the bureau has saved its members $500,000.

Agreement on Wages in Albany.—Employees of the United Traction Company, Albany, N. Y., have accepted an increase of 1 cent an hour in wages. The wage scale and other parts of the new agreement will be binding upon both parties until July 1, 1916. The men now are getting 27 cents an hour and under the settlement will receive 28 cents an hour from July 1 last. The company favored a sliding scale of from 24 cents to 29 cents an hour, depending upon the length of service. The officers of the company and the representatives of the men were at odds also regarding the length of the contract, the company's officials wanting the agreement to run for three years and the men for one year. Two years was finally agreed upon as a compromise.

Details of Cleveland Rapid Transit Mortgage.—The mortgage for $50,000,000 recently filed to the Central Trust Company, New York, N. Y., as trustee, by the Cleveland Rapid Transit Railway, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 7, is dated Oct. 9, 1914, and covers first mortgage bonds not exceeding the above amount and bearing interest at the rate not exceeding 6 per cent, issuable at $700,000 per single-track mile. The principal is due on Dec. 31, 1964, but subject to call on and after Jan. 1, 1916, at 103 and interest. The denomination of the bonds is $1,000. The proceeds are to be used for the construction and equipment, purchase or acquisition of subways, subway terminals, street railways and elevated railways for the conveyance of passengers and freight.

Financial Aid for San Francisco Employees.—Jesse W. Lilienthal, president of the United Railroads, San Francisco, Cal., has outlined the plans of the remedial loan association formed by the company to make loans to the employees. Employees who are in need of financial assistance are invited to write Mr. Lilienthal personally, stating the amount of money needed and the circumstances that caused them to run behind. It is planned to make up an estimate as to the amount of money that the company will have to maintain as a revolving fund to prevent the employees from doing business with the loan sharks. Such a fund will be available to employees at about 5 per cent, the idea being to fix the interest rate at a figure that will meet the expenses incident to administering the fund.

Clear Platform Rule Held Unlawful in Chicago.—Because of complaints of passengers and the liability of accident, the management of the Chicago (Ill.) Surface Lines endeavored recently to enforce strictly its rule prohibiting passengers from standing on the platforms when there was room in the car body. Some obstinate passengers refused to obey the conductors, and a conductor had three passengers arrested for not complying with his request to proceed into the car. Since there was no ordinance to support the rule and no law forbidding a passenger to ride on the back platform, the case was dismissed. L. A. Busby, president of the company, has explained that the rule was made to enable passengers to enter the cars with a minimum of discomfort to themselves and others and that the provision is in the interest of good service.

Electrolysis Hearing in Los Angeles.—At a hearing before members of the California State Railroad Commission, held in Los Angeles on Oct. 29 and 30, the Union Hollywood Water Company requested that the Pacific Electric Railway be required to make certain changes in its return system. The changes desired are: the installation of a system of return feeders or an equally efficient system; the placing of cross feeders to connect the return system with that of the Los Angeles Railway; the disconnection of negative substation busbars from all underground metallic structures excepting cable sheaths, and the installation of a set of wires for the purpose of connecting recording voltmeters to indicate the rail potentials. Experts for the water company and the railway presented data based upon tests including some made by the United States Bureau of Standards.

Meeting of National Civic Federation.—The national problems arising out of the war will be considered at the fifteenth annual meeting of the National Civic Federation to be held in New York City, Dec. 3, 4 and 5, 1914. The first day will be devoted to the woman's department, which will hold its sessions at the Colony Club, 120 Madison Avenue. The federation will convene at the Hotel Astor on Dec. 4 and 5. Among the subjects other than those arising out of the war which will be considered are governmental versus private enterprise, social welfare, workmen's compensation and unemployment. The federation has announced the establishment in the Metropolitan Tower, New York, of the permanent exhibit of typical welfare efforts for the enlightenment of employers about to install new features or to extend those already in force.

International Engineering Congress, 1915.—In view of the conditions now prevailing in Europe, the governing bodies of the five national societies under whose auspices the International Engineering Congress is to be held at San Francisco, Cal., Sept. 20 to 25, 1915, have recently given careful consideration to the feasibility of holding the congress and to the probability of its success, with the result that each body has unanimously confirmed its original pledge to support the congress. The committee of management is actively proceeding with arrangements for meetings on the scheduled dates and for the publications of the transactions. A detailed circular of information regarding the publications of the congress has been prepared by the committee and will be sent upon application to W. A. Cattell, secretary, in the Foxcroft Building, San Francisco, Cal.

Motor Carriages Wanted.—An American consular officer in East Africa reports that he has an inquiry for two or three railway motor carriages, which the government proposes purchasing through an agent in his district. The requirements are one closed carriage with a capacity of about fifty passengers, one open carriage with a capacity of from twenty-five to thirty passengers, and a closed inspection car. It is suggested that interested firms should send photographs or drawings and specifications giving export prices f. o. b. New York and c. i. f. destination. Time of delivery and terms of payment should be stated. Sufficient definite information to enable an order to be placed without further correspondence should be sent at once. The consular officer states that he would appreciate a duplicate set of pamphlets or catalogs on motor railway carriages. Further particulars may be obtained by addressing the bureau of foreign and domestic commerce, Department of Commerce, and referring to Inquiry No. 14,345.

Studying Difficult Extension of San Francisco Municipal Railway.—On Nov. 2 the Board of Supervisors of San Francisco passed a resolution calling for a progress report on the preparation of plans for the proposed Church Street extension of the municipal railway. The city engineer's office was ordered by the Supervisors on Sept. 14 to draw up these plans, the extension to cost about $200,000 and to include a means for handling the cars over the Church Street hill by a cable line. Replying to the request for a progress report, the city engineer stated that the auxiliary cable railway presents a number of problems which are new. The load that will be placed on the grip cars will be more than twice as great as the load at present on any grip car in San Francisco, and no grip design has yet been presented that the engineering department would approve. The sudden changes of grade render the design of satisfactory couplings difficult, and other problems have further complicated the work. The city engineer stated that plans and specifications will probably be ready about Dec. 1.

Extensions and Improvements in Los Angeles.—The total cost of street improvement work now on hand and proposed by the Pacific Electric Railway and Los Angeles Railway in Los Angeles, Cal., aggregates at least $1,110,000. Work in hand to be completed by the Pacific Electric Railway by June 1, 1915, amounts to $400,000, and in addition to this ordinances are running for the improvement of streets on which this company has lines aggregating 3 miles in length. This adds work that will cost about $250,000, according to the report. The Los Angeles Railway Corporation has under way or is about to start new construction on paved streets aggregating some $460,000. The Pacific Electric Railway recently called the attention of the civic authorities to the amount of work it has under way in the city, and asked permission to delay until next spring the paving to be done on certain streets. In his report, however, the city engineer pointed out that it would not be good policy to grant this extension of time because of the "piling up" of work and the resultant complaints that property owners would be sure to make.

Public Relations in Hot Springs.—The *New Era* of Hot Springs, Ark., recently contained an editorial in part as follows: "The Federal Light & Traction Company, owners of the public utilities companies in Hot Springs, is a corporation with a soul, and E. N. Sanderson, its president, is the heart of the soul. A corporation is an artificial being, invisible, intangible and existing only in contemplation of law. Therefore it cannot have a soul of itself. The soul must be furnished by the officials of the corporation. This is what has been done in the case of the Federal Light & Traction Company. Mr. Sanderson came here to see what the public utilities could do for the people. He has patiently listened to every suggestion and promised to do much for Hot Springs. We believe he is a man of his word and the company will do these things as soon as it can. Mr. Sanderson and W. A. Haller, general superintendent of the Federal Company, who is also here, should be extended every courtesy. Their company and S. E. Dillon, general manager of the public utilities, have the good-will of the people of Hot Springs and we believe they will voluntarily look after the best interests of its citizens."

Praise for the B. R. T.—The Brooklyn (N. Y.) Rapid Transit Company received a letter on Nov. 6 from Dr. Henry Ling Taylor, professor of orthopedic surgery of the Post-Graduate Hospital and secretary of the American Posture League, expressing the official approval of the league for the seat designed for the new subway car of the New York Municipal Railway Corporation through cooperation of the league's experts with the engineers of the railroad company. The official inspection by the members of the league, upon which this approval was based, was made on Nov. 5 at the Thirty-ninth Street shops of the railroad. Dr. Taylor in his letter said in part: "We wish to congratulate your company on its unusual consideration for the health and comfort of the traveling public, and especially on being the first railway that, to our knowledge, has sought scientific co-operation on this important question of providing a seat that shall support the body in correct posture. In particular we wish to express our appreciation of the skilful and courteous co-operation of your staff through a long period of mutual work that has put patience and effort to a severe test. The result is well worth the effort."

PROGRAM OF ASSOCIATION MEETING

New England Street Railway Club

The regular monthly meeting of the New England Street Railway Club will be held at the American House, Boston, Mass., on Nov. 19. Dinner will be served at 6 p. m. The speaker of the evening will be W. H. Tolman, Ph.D., director of the American Museum of Safety, New York. Dr. Tolman will speak on the subject, "Safety as Applied to Street Railway Work," and expects to embellish his talk with remarks on safety work in general. He will use the stereopticon to illustrate points which he desires to emphasize.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The New York curb market was freed on Nov. 11 of all price restrictions by the committee which has been supervising dealings. On the same day the first open auction of securities was held since the Stock Exchange closed on July 30. The lifting of the ban on the curb market is expected to widen the market and have a general favorable effect on the whole security situation. In fact, the reopening of the exchange may be hastened by the developments in the unlisted share market. The dealings through the clearing house are said to be increasing, and the publication of the transactions is being urged as it is felt that such a course would be likely to stimulate the demand for stocks. Arrangements are reported to be proceeding smoothly for turning over to the Federal Reserve Bank on Nov. 16 the reserves which the member banks are called upon to set up with the central institution.

On Nov. 12 it was reported in Wall Street that a plan was under consideration to finance sound but technically insolvent houses by protecting their loans. It was also reported that the Clearing House bankers and the governors of the Stock Exchange were co-operating, with the idea of establishing a working basis for reopening at the earliest possible date, and that they were more hopeful than at any time in the past three months. On the same day there was a sharp decline in foreign exchange rates to the lowest level that has obtained since the war began. The fall in rates was on a very small volume of business. The low level of the day was 4.87, as against 4.89¼ at the close on Nov. 11. This compared with a quotation of 4.90¼ a week ago, and 4.96½ a month ago. Time money rates were lower and call loans were again made at 5½ per cent. The action of the committee of five on Nov. 11 in rescinding the rule which prevented transactions except as approved by it was followed on Nov. 13 by heavy buying of bonds and short-term notes and by activity and strength in unlisted securities.

OUTLOOK IN BIRMINGHAM

G. S. Orler & Company, Inc., Boston, in a recent circular letter recommended the deposit of the bonds of the Birmingham, Ensley & Bessemer Railroad with the bondholders' committee, headed by Charles H. Zehnder. The bankers also quoted from the report of Setchell & Luther, certified public accountants, Boston, who recently made an examination of the affairs and general working conditions of the railway.

The accountants made a special examination of the books and vouchers for the period ended Aug. 31, as well as a physical examination of the properties and a study of the franchises. They expressed their belief that the money expended in completing the road, for the purchase of equipment, etc., aggregating $1,801,891, had been judiciously handled and represents the valuation of the properties. The corporation is said to own valuable franchises and rights-of-way in Birmingham, and also a valuable charter which it acquired on taking over the Tidewater Railway, all of which cost $500,000 in bonds with a stock bonus. The revenue accounts indicate that with the completion of the Bessemer line and other contemplated extensions in Birmingham, a material increase will be evidenced in the gross receipts without a corresponding increase in operating expenses. This, it is believed, should result in a decided increase in net earnings and place the road on a paying basis.

According to the report presented to the U. S. District Court by I. W. Ross, receiver of the company, the revenues of the company for the twelve months ended Aug. 31 were $220,655. The operating expenses totaled $151,542, giving net earnings of $69,112. Against this amount there was charged $109,000 for interest on bonds, $5,499 for city license and $1,899 for the franchise tax, resulting in a deficit of $48,249. The directors of the company in a recent letter to security holders stated that the heavy cost of construction, much larger than the estimates, long hauls at low rates of fare, an interest charge of $196,000 during construction and unamortized bond discount of $376,000 had proved a burden which was too heavy for the company to carry.

ANNUAL REPORT

Third Avenue Railway

The consolidated statement of income, profit and loss of the Third Avenue Railway, New York, for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Operating revenue:		
Revenue from transportation	$10,456,705	$9,742,345
Revenue from other operations	401,511	375,502
Total operating revenue	$10,858,216	$10,117,847
Operating expenses:		
Maintenance of way and structures	$1,012,646	$838,621
Maintenance of equipment	713,003	614,792
Depreciation	511,250	461,500
Power supply	779,131	794,484
Operation of cars	2,849,929	2,580,920
Injuries to persons and property	614,609	533,809
General and miscellaneous expenses	525,467	526,012
Total operating expenses	$7,006,035	$6,350,139
Net operating revenue	$3,852,181	$3,767,708
Taxes	730,784	725,693
Operating income	$3,121,397	$3,042,015
Interest revenue	75,215	70,170
Gross income	$3,196,612	$3,112,185
Deductions from gross income:		
*†Interest on funded debt	$2,368,072	$2,027,463
Interest on notes	134,174	107,236
Rent deductions, etc	38,060	30,528
Reserve for sinking fund	30,000	30,000
Total deductions	$2,570,306	$2,195,227
Net income	$626,306	$916,958

*Includes interest on adjustment income bonds at 5 per cent for the year 1914 and 3¾ per cent for the year 1913.

†Does not include interest on certificates of indebtedness of the Dry Dock, East Broadway & Battery Railroad.

NOTE—Operations of Belt Line Railway Corporation are included for the full year of 1914 and from March 22 to June 30, 1913.

During the year the revenue from transportation increased $714,360, or 7.3 per cent, and the total operating revenue increased $740,369, or 7.3 per cent. The increase of $655,896, or 10.3 per cent, in operating expenses was chiefly made up of an increase of $174,025, or 20.7 per cent, for maintenance of way and structure; $98,211, or 15 per cent, for maintenance of equipment; $49,750, or 10.6 per cent, for depreciation; $269,009, or 10.4 per cent, for operation of cars, and $80,881, or 15 per cent, for injuries to persons and property, with a deficit of $15,354, or 1.09 per cent, in power supply expenses. The net operating revenue increased $84,472, or 2.2 per cent, and owing to the fact that the slight increase in taxes was offset by an approximately equal increase in interest revenue, the gross income showed about the same increase in dollars as the net operating revenue. The interest on funded debt increased $340,609, or 16 per cent, which, with other slight increases in note interest and rent deductions, gave a total increase in deductions of $375,079, or 17 per cent. The net income decreased $290,652, or 31.6 per cent.

President Whitridge in his annual report states that the insurance rates on the buildings are less than one-half of what they formerly were. Cars are cleaned and carefully inspected each day, washed once a week with a carbolic solution and overhauled at the end of every 10,000 miles. The fund for depreciation, renewal and contingencies remained intact during the year. The payments into this fund amount to $500,000 per annum. The decrease in net income is accounted for by the fact that the company paid $281,000 for additional interest on adjustment bonds, and there were large expenditures for paving and other expenses caused by the heavy storms in February and March, to say nothing of the loss of receipts. Cash on hand amounts to $1,603,830, of which $746,883, together with 500 Third Avenue Railway first refunding mortgage 4 per cent bonds, is in the depreciation fund, $531,118 in the fund for the payment of interest and taxes and $325,829 in the current cash account.

President Whitridge says that it may be expected that a very large amount of money, more than enough to absorb all the net income, must be expended on the property during the year ending June 30, 1915, especially for pavements required by the city. He feels that it is a fair question whether under present conditions the railways should not be relieved from at least a part of the paving burden imposed upon them when their charters were obtained. He adds that the city does not protect railway tracks as it should from reckless use by trucks, automobiles and all sorts of heavy traffic.

Since the last annual report the Third Avenue Railway system has been increased by the acquisition of the Mid-Crosstown Railway, the Belt Line Railway and additional holdings in the New York City Interborough Railway, so that its total mileage is now 357.623. In February the Public Service Commission authorized the Third Avenue Railway to acquire $150,000 par value of the Mid-Crosstown Railway stock, and in April the company issued in payment with the consent of the commission $180,000 par value of its first refunding 4 per cent bonds and gave its promissory note for $250,000 and cancelled claims amounting to $34,442 against the Mid-Crosstown Railway. All the stocks and bonds of the Belt Line Railway Corporation were acquired by the Third Avenue Railway at a total cost of $2,723,044. The net earnings of the Belt Line company, after a payment of 5 per cent interest on the bonds, amounted to $23,885 for the year ended June 30. The Third Avenue Railway now owns $4,417,000 par value of the New York City Interborough Railway stock and $2,132,000 par value of its bonds. The aggregate cost of these securities and of certain unsecured debts to the Third Avenue Railway was $1,625,829. During the year the Third Avenue Railway cancelled $2,450,000 par value of the New York, Westchester & Connecticut Traction Company bonds and reduced this company's capital stock from $600,000 to $200,000.

During the six years of operation of the Third Avenue Railway Employees' Association the members and the company have each contributed $71,190. Sick benefits amounting to $39,187 have been paid to 3000 members and thirty-two death benefits of $250 were distributed. During the past year 725 cases received benefits amounting to $11,432, and $250 was granted to the beneficiaries in each one of ten deaths.

The engineers of the company have designed a new type of car with a seating capacity of forty-five as compared with fifty-one in the standard car, weighing 28,000 lb. as compared to the standard 38,000 lb. and using one-third less power than the standard. Fifty of these cars have been ordered and will be put in service during the coming year. It is hoped that they will be entirely paid for from the proceeds of the sales of old cars.

COLUMBUS REORGANIZATION PLAN CONTINUED

The boards of directors of the Columbus Railway, Power & Light Company and the Columbus Light, Heat & Power Company, both of Columbus, Ohio, have approved a plan outlined in a circular letter dated Oct. 24 to the stockholders of the latter company. It is stated that on June 17 there was presented a plan of reorganization and combination of interests of the Columbus Railway, the Columbus Railway, Power & Light Company and the Columbus Light, Heat & Power Company. The directors of the last-named company, believing that the plan would not give its stockholders the desired representation, opposed the plan.

The plan was subsequently modified, omitting the Columbus Light, Heat & Power Company, but the properties of the other companies were combined as contemplated, as described in the ELECTRIC RAILWAY JOURNAL of June 6, July 4, July 25 and Aug. 8. The Columbus Light, Heat & Power Company remained under lease to the Columbus Railway & Light Company, which had disposed of its contracts and assets to the Columbus Railway, Power & Light Company on Jan. 5, 1914.

Since the above developments negotiations were resumed, with the result that subject to the order of the Public Service Commission and the action of the stockholders of the two companies concerned, it has been agreed that under the new plan the holders of the $516,300 of preferred stock of the Columbus Light, Heat & Power Company are to receive preferred stock, series A, of the Columbus Railway, Power & Light Company, share for share, and the holders of the $210,500 of common stock are to receive preferred stock, series B, share for share, instead of the representation previously offered. It is recommended that this plan be accepted, and stockholders have been asked to deposit their stocks on or before Nov. 15 for exchange and authority to vote the same in favor of the carrying out of the suggested plan.

UNITED LIGHT & RAILWAYS CHART

The United Light & Railways Company, Grand Rapids, Mich., has compiled a chart showing the inter-corporate relations existing between the holding company and its subsidiaries as of June 30, 1914. On this date the United Light & Railways Company had outstanding in the hands of the public $7,713,600 of first preferred stock, $2,108,700 of 3 per cent second preferred stock, $6,898,700 of common stock, $7,214,000 of first and refunding 5 per cent bonds, $220,000 of 6 per cent notes due Jan. 1, 1915, and $500,000 of 6 per cent notes due Jan. 1, 1915, or a total capitalization of $24,655,000.

The company owns securities of subsidiary companies, exclusive of those of the Tri-City Railway & Light Company, to the amount of $958,400 of preferred stock, $7,855,751 of common stock and $1,286,000 of underlying bonds, a total of $10,100,151. The major part of this is deposited under the lien of the first and refunding bonds of the United Light & Railways Company. The Tri-City Railway & Light Company has outstanding $3,000,000 of preferred stock, $9,000,000 of common stock and $5,282,000 of first and refunding bonds, of which the United Light & Railway Company owns $173,800 of preferred stock, $8,823,500 of common stock and $2,076,000 of first and refunding bonds, or a total of $11,073,300. All of this is deposited under the lien of the United Light & Railways refunding bonds. The Tri-City Railway & Light Company has in addition to the above capital issued $7,889,000 of collateral trust bonds and $342,500 of assumed bonds of underlying companies, or a total capitalization of $25,513,500.

Excepting the Tri-City Railway & Light Company, the United Light & Railways Company owns all the outstanding securities of the subsidiary companies with the exception of $3,361,000 of bonds and $326,049 of stock. The Tri-City Railway & Light Company owns all the stock of its underlying companies, and all their outstanding bonds with the exception of $342,000. This ownership or control of substantially all stocks, both common and preferred, and a large part of the bonds puts the United Light & Railways Company in a strong position as regards the control over underlying companies.

American Railways, Philadelphia, Pa.—The American Railways has declared a quarterly dividend of 1¼ per cent out of earnings on the common stock, which is a reduction of one-quarter of 1 per cent from the usual quarterly dividend. The dividend is payable on Dec. 15 to stock of record Nov. 3. The following statement was issued by J. J. Sullivan, president of the company: "The reduced earnings for the past three months due to the general business depression made us feel that the wisest course to pursue under the circumstances was to curtail the dividend disbursement."

Boston (Mass.) Suburban Electric Companies.—A quarterly dividend of 50 cents a share has been declared on the 50,296 of preferred shares of the Boston Suburban Electric Companies, payable on Nov. 12 to holders of record on Nov. 5. This dividend compares with $1 per share paid quarterly from January, 1913, to July, 1914. It is stated that this reduction is expected to be only temporary, as the additional income of the Middlesex & Boston Street Railway, a subsidiary company, under the new schedule of rates just put into effect in accordance with the decision of the Massachusetts Public Service Commission as abstracted in the ELECTRIC RAILWAY JOURNAL of Nov. 7, page 1055, will probably be sufficient to enable the operating company to meet its interest and pay dividends. This in turn will enable the holding companies to meet the regular 4 per cent dividend requirements as in the past. The failure of the operating company to secure any additional revenues for the four months from July 1 to Nov. 1, during which time the need for additional revenue was acutely felt, made it seem advisable to pay but half the regular dividend at this time.

Chicago (Ill.) City Railway.—An old suit against the Chicago City Railway, originally brought up by Charles B. Venner in the State courts of Illinois, has been finally dismissed from the United States Supreme Court. The case was brought up to prevent the carrying out of the traction ordinance of Feb. 2, 1907, and the plaintiff suffered defeat in one state and federal court after another, the case finally going to the highest tribunal.

Columbus Railway & Light Company, Columbus, Ohio.—A dividend of 75 cents per share has been declared on the capital stock of the Columbus Railway & Light Company, payable on Nov. 20. No dividend will be paid to stockholders who are in default of payment on the assessment due on Dec. 30, 1913, or on June 30, 1914, but the dividend will be applied to the account of the assessment as of Nov. 20, 1914. This is the second disbursement to stockholders since the reorganization under the Columbus Railway, Power & Light Company, referred to more in detail in connection with this company elsewhere in this issue. As soon as all payments of assessments on the stock have been made, it is understood that the Columbus Railway & Light Company will be dissolved.

Detroit (Mich.) United Railway.—The first mortgage 5 per cent gold bonds, No. 101 to No. 150 inclusive, of the Detroit United Railway due on Dec. 1 are to be paid at par and interest at the Peoples State Bank at maturity. These bonds are part of an issue of $1,750,000 dated 1895, the first $600,000 of which matures $50,000 each year from Dec. 1, 1912. After the $600,000 of bonds is retired, a sinking fund will care for the payments of the remaining bonds in 1924. The payment of the bonds now called will make $150,000 of the issue retired.

Gary & Interurban Railway, Gary, Ind.—Application for an order dissolving the merger of four electric railways with the Gary & Interurban Railway, under that name, was denied by Judge Harry Tuthill in the Superior Court at Valparaiso, Ind., on Nov. 10, after he had had the evidence under consideration for seventy-five days. The application was made by minority stockholders, headed by Fred Raff, South Bend, representing 12,141 shares, par value of $25 each. The suit to dissolve the merger alleged fraud, but Judge Tuthill decided the merger was legal and that there was no attempt at fraud. The filing of the suit was referred to in the ELECTRIC RAILWAY JOURNAL of May 9, 1914.

Kansas City Railway & Light Company, Kansas City, Mo.—The committee representing the holders of the first lien refunding 5 per cent bonds of the Kansas City Railway & Light Company has arranged for payment at the New York Trust Company of the interest due on Nov. 15 on certificates of deposit as well as on the bonds.

London & Lake Erie Railway & Transportation Company, London, Ont.—A new mortgage to the Fidelity Trust Company, Ontario, dated Oct. 1, 1914, has been deposited in the office of the Secretary of State of Canada. This mortgage is the result of a recent vote by the stockholders authorizing an issue of mortgage bonds at $30,000 per mile upon the railway constructed and to be constructed.

Mahoning & Shenango Railway & Light Company, Youngstown, Ohio.—The application of the Mahoning & Shenango Railway & Light Company, the Wheatland Street Railway, the Valley Street Railway and the Sharon & Wheatland Street Railway for the approval of an agreement by which these companies are merged with the Mahoning & Shenango Railway & Light Company has been approved by the Public Service Commission of Pennsylvania. The merger is in accordance with the plan approved by the directors of the Mahoning & Shenango Railway & Light Company for unifying the corporate organization of the company, as referred to in detail in the ELECTRIC RAILWAY JOURNAL of Aug. 8, page 274.

New York (N. Y.) Railways.—Alexander J. Hemphill, Edwin S. Marston, Harry Bronner and Guy E. Tripp have issued a statement to the holders of the income bonds of the New York Railways defending the position of the directors of the company in its management of the property. The statement ends with the declaration that "if the bondholders prefer a less conservative course these directors will complacently leave it to others to assume the responsibility."

Northern Electric Railway, Chico, Cal.—Several meetings have been held by rival committees appointed by holders of underlying bonds of the Northern Electric Company and the junior bonds of the Northern Electric Railway. The indications are that the plan advanced by the Sloss interests for placing an issue of prior lien bonds ahead of the present outstanding first mortgage bonds will be rejected. Rudolph Spreckles, who represents $415,000 of the bonds, served formal notice on the Sloss trustees recently that foreclosure proceedings would be instituted if they did not guarantee the interest and the sinking fund of the bonds and maintain the priority of lien as provided in the trust deed.

Pacific Electric Railway, Los Angeles, Cal.—The Railroad Commission of California has issued an order extending to June 30, 1915, the effective date of a decision rendered April 8, 1913, in which the Pacific Electric Railway was authorized to issue $6,839,000 of refunding mortgage fifty-year gold bonds.

Philadelphia Company, Pittsburgh, Pa.—The Philadelphia Company has sent out the following notice to stockholders, signed by C. J. Braun, Jr., secretary: "In order to avoid inconvenience and expense, both to yourself and to the company, we have arranged to obtain funds from an outside source, with which to purchase its common stock dividend scrip issued on Nov. 2, 1914, to the holders of ten shares and under, provided the said scrip is rendered immediately."

Porto Rico Railways, Ltd., Toronto, Ont.—Concerning the recent passing of the quarterly dividend due on Oct. 1 by the Porto Rico Railways, as noted in the ELECTRIC RAILWAY JOURNAL of Oct 10, the directors in a recent circular said that they had found it necessary for the present to devote surplus earnings toward the liquidation of expenditures on capital accounts. During the spring and early summer Porto Rico passed through a severe business depression, caused partly by the abnormally low price of sugar and partly by the world-wide financial stringency, aggravated locally by protracted strikes in the tobacco industry. Conditions at the present, however, are steadily improving.

San Francisco (Cal.) Municipal Railway.—The Board of Supervisors of San Francisco on Oct. 26 ordered that $315,000 of municipal railway bonds be placed on sale in the office of the city treasurer. This amount was made up of bonds of $500 denomination, amounting to $210,000, and bonds of $100 denomination, totaling $105,000. The price fixed was par and accrued interest.

DIVIDENDS DECLARED

Boston (Mass.) Suburban Electric Companies, quarterly, 50 cents, preferred.

Central Arkansas Railway & Light Corporation, Hot Springs, Ark., quarterly, 1¾ per cent, preferred.

Columbus Railway & Light Company, Columbus, Ohio, 75 cents.

Pacific Gas & Electric Company, San Francisco, Cal., quarterly, 1½ per cent, original preferred; quarterly, 1½ per cent, first preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

ATLANTIC SHORE RAILWAY, SANFORD, MAINE

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Sept.,	'14	$36,181	$25,031	$11,150	$631	$10,519
1 " "	'13	33,077	24,992	8,085	654	7,431

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.

1m., Sept.,	'14	$113,019	$64,739	$48,280	$32,545	$15,735
1 " "	'13	114,659	66,363	48,296	32,329	15,967
9 " "	'14	950,590	567,634	382,955	291,311	91,644
9 " "	'13	939,427	561,884	377,542	284,463	93,079

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO.

1m., Sept.,	'14	$289,023	$169,220	$119,802	$60,312	$59,490
1 " "	'13	311,657	195,367	116,290	66,532	49,758
9 " "	'14	2,444,698	1,471,036	973,662	524,078	449,584
9 " "	'13	2,728,559	1,663,018	1,065,542	590,678	474,864

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Sept.,	'14	$245,879	*$148,779	$97,099	$83,749	$13,350
1 " "	'13	250,962	*152,349	98,613	86,394	12,219
12 " "	'14	3,078,289	*1,857,742	1,220,547	1,006,024	214,523
12 " "	'13	2,937,714	*1,819,282	1,118,432	983,118	135,314

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Sept.,	'14	$805,454	$393,153	$412,302	$224,031	$188,271
1 " "	'13	787,891	387,351	400,539	230,765	169,774
9 " "	'14	6,946,630	3,603,232	3,343,398	2,047,071	1,296,327
9 " "	'13	6,568,762	3,336,218	3,232,544	2,111,396	1,121,148

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*Includes taxes.

Traffic and Transportation

CIVIL SERVICE EXAMINATION IN SAN FRANCISCO

Questions Used in the San Francisco Examination for Promotion from Motormen and Conductors to Inspector, Municipal Railways

As previously mentioned in the ELECTRIC RAILWAY JOURNAL an examination for promotion in the Municipal Railway Service, Department of Public Works, from the ranks of motormen and conductors to the rank of inspector, Municipal Railways, San Francisco, Cal., was held by the Civil Service Commission of that city on Oct. 31. The subjects of the examination and the relative weights of the subjects on a scale of 100 were: general knowledge of duties, 50; writing of reports, 25; arithmetic, 10; experience, 5; ascertained merit, 10. The subject "General Knowledge of Duties" included questions on the rules and regulations of the Municipal Railway Service, the location of the principal streets, parks, buildings and places of amusements in the city, the knowledge of transfer systems and time-tables, and questions relating to the general duties of motormen, conductors and inspectors, Municipal Railway Service. "Writing of Reports" was a test of the applicant's ability to write correct reports upon subjects to be named by the Civil Service Commission. "Arithmetic" embraced addition, subtraction, multiplication and division of whole numbers, and common and decimal fractions. Under the heading "Experience" applicants were awarded credits for experience had in street railway service in San Francisco as motormen, conductors or inspectors as follows: five years, 100 credits; four years, 75; three years, 50. Experience of less than three years and fractions of years between three and five years was not rated. Under the heading "Ascertained Merit" applicants with a clean record for the period they have been in the employ of the city as motormen or conductors were awarded the maximum credit, 100. Applicants guilty of neglect of duty, breach of discipline or other offenses were penalized as, in the judgment of the Civil Service Commission, was warranted. Only persons in the employ of the city as motormen or conductors on Sept. 28, 1914, were eligible as competitors. The questions which were asked and the credits allowed were as follows:

FIRST SUBJECT—"GENERAL KNOWLEDGE OF DUTIES."

Q. 1. Name four important duties of an inspector. 8 credits.

Q. 2. Name four important duties of a car dispatcher. 4 credits.

Q. 3. What are the rules regarding the issuance of transfers on the Geary Street line? 5 credits.

Q. 4. What are the rules regarding rights-of-way at the various crossings on the municipal lines on Van Ness Avenue and Potrero Avenue? 5 credits.

Q. 5. Name the streets in order as follows: (a) On the Geary Street line from Fillmore Street to Arguello Boulevard; (b) Presidio and Ferries line from Van Ness Avenue to the Presidio. 20 credits.

Q. 6. You are an inspector at Van Ness Avenue and a motorman of a car complains that his car acts badly and he does not know what is the matter. Name three points where you should first look for trouble. 6 credits.

Q. 7. While you are acting as inspector at Fillmore and Geary Streets, a trolley wire breaks at Geary and Steiner Streets. State what you did. 5 credits.

Q. 8. You are an inspector of the municipal railways detailed at the ferry. Travelers ask you for directions for reaching the places named below. Give best directions for reaching them by the street cars, preferring the municipal lines when they do not require the traveler to walk more than two blocks: Scottish Rite Auditorium; main entrance to exposition; Hamilton Square; temporary city hall; hall of justice; United States mint; United States custom house; Lane hospital; Southern Pacific Railway station; New city auditorium. State place at which you directed traveler to leave the car. 20 credits.

Q. 9. An inspector is required to turn in a daily report. Name seven subject titles under which the rules of the Municipal Railway require the matters covered by such reports to be classified. 7 credits.

Q. 10. Assume that the running time, with lay-overs, for round trip from the beach to the ferry is 99 minutes, equal time each way, and there are 22 cars to be operated on an even headway, the cars to be started at the beach, the first car leaving at 5:35 a. m. Make a schedule showing leaving time at beach and at ferry for first five runs up to about 10:50 a. m. 20 credits.

SECOND SUBJECT—"WRITING OF REPORT"*

You were detailed as an inspector on the Geary Street line at Van Ness Avenue. A fire occurs at Van Ness Avenue and Geary Street and several lines of hose are run across the tracks. In your judgment the blockade will last more than one hour. Cars are operating on a three-minute headway on Geary Street and on a six-minute headway on Van Ness Avenue. Fifteen minutes after this fire occurs you are notified that a car has been derailed in the crossover at Van Ness Avenue and Bay Street.

Write a report in not less than 100 words, addressed to the superintendent of the Municipal Railways, explaining the circumstances and telling what you did as an inspector. 100 credits.

THIRD SUBJECT—"ARITHMETIC"

Show all your work in full. No credit will be allowed for an answer without the work.

Q. 1. You are an inspector detailed for one hour at the receiving desk at the carhouse. Five cars turn in their cash with record of full fares received as follows: car No. 1, 625 fares; car No. 2, 783 fares; car No. 3, 596 fares; car No. 4, 759 fares; car No. 5, 847 fares. On counting the cash you find car No. 3 15 cents short. How much cash was received? 15 credits.

Q. 2. The cash receipts of one day's operation of the Geary Street line are $868.45. In addition transfers are received to the number of 6835. What is the total number of passengers of both classes carried during the day? 15 credits.

Q. 3. The municipal railway carried the following passengers in its first year:

Full fare passengers	8,882,996
Half fare passengers	49,035
Revenue transfer passengers	49,543
Non-revenue transfer passengers	631,363
Non-revenue passengers	110,240

What was the total number of passengers carried? 10 credits.

Q. 4. The total passenger car mileage for the first year of operation of the municipal road was 1,300,868.65 miles. What was the average number of miles traveled daily? (Carry out only to two decimal places.) 20 credits.

Q. 5. The city lines received transfer and cash fares as follows: 5280 transfers from the Kearny Street line; 3890 transfers from the Larkin Street line; 8520 transfers from the Divisadero Street line; 10,850 cash fares. The city received from the United Railroads 2 cents for each Kearny or Larkin Street transfer and 2½ cents for each Divisadero Street transfer. What was the total amount in cash received by the city for the cash fares and said transfers. 20 credits.

Q. 6. What is the total amount of a payroll consisting of the following items? 178 motormen, each 212 hours at 37½ cents an hour; 172 conductors, each 219 hours at 37½ cents an hour; 23 car repairers, each 244 hours at 42½ cents an hour; 11 trackmen, each 198 hours at 37½ cents an hour; 5 machinists, each 242 hours at 52 cents an hour. 20 credits.

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*In this report make no personal references, and use only the address given you. Do not sign this report with your name, initials or address, or with any assumed name, initials or address. Any identification marks will exclude your entire examination papers.

REHEARING ASKED IN SOUTHERN PACIFIC RATE CASE

The Southern Pacific Company has applied to the Railroad Commission of California for a rehearing of the transbay rate case in which the commission refused to allow the company to raise its commutation rates between San Francisco and Oakland, Berkeley and Alameda, as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 24, page 984. The application for rehearing is based upon the claim that the commission's refusal to allow the company to raise its rates is in violation of the constitution, in that it deprives the company of property without due process of law.

The company, in its application for rehearing, maintains that the commission has made no finding to show that the fair value of the railroad company's properties devoted to suburban service is less than $26,553,667; that while the commission held that the company's apportionment of its investment and expenses between main line and suburban service was erroneous, it failed to show wherein this apportionment was in error; that while the commission held that an increase in rates would confiscate or take away from the value of residence property in Alameda County, this was not a proper question for determination by the commission.

The commission has not yet taken any action in regard to the company's application, but has issued an order extending the effective date of its decision until the matter is finally determined.

Lexington Arbitration Board Complete.—Charles G. Bagby, an attorney of Danville, Ky., has consented to act as arbitrator between the union trainmen and the Kentucky Traction & Terminal Company over the alleged unwarranted discharge of a motorman recently.

Fare Increase Hearing Continued.—The Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., has been authorized to file an amended petition in connection with its application to the Railroad Commission of South Carolina for permission to increase its fares and the hearings in the case will be continued.

Hearing on Rochester Fares.—At Rochester on Nov. 13 Commissioner Decker of the Public Service Commission of the Second District of New York was to hear the complaint of the city of Rochester against the New York State Railways as to fares during rush hours, routing of certain cars and the State Street carhouse.

Appeal in Middlesex & Boston Fare Case Probable.—It is expected that the municipal authorities of Waltham, Mass., will appeal from the Public Service Commission's decision granting 6-cent fares to the Middlesex & Boston Street Railway, by petitioning the Supreme Court of Massachusetts to set aside the finding of the board.

Experimental Cross Seat Car in Toronto.—The Toronto (Ont.) Railway is equipping one of its widest cars with a center aisle 21 in. wide and cross seats for the inspection of the members of the Ontario Railway & Municipal Board, which has before it an application from the union of street railway men in Toronto for an order to abolish the steps along the side of the open cars.

Incubus for Cleanliness on Passengers.—The Wichita Railroad & Light Company, Wichita, Kan., is seeking to arouse the public to recognition of the fact that their right to ride in clean cars is being violated by persons who expectorate on car floors or in window pockets. It is hoped by the company that under the pressure of adverse public sentiment these filthy practices will be discontinued.

Winnipeg Rerouting.—The routing of the cars on the Winnipeg (Man.) Electric Railway, which was rearranged by the City Council's traffic officer recently, is not generally approved and the matter has been taken up by the public utilities commissioner of Manitoba, who states that he will endeavor to arrange for the rerouting of the cars on the basis of the report presented early in the year by R. N. Feustel.

Prepayment Service at Providence.—Prepayment car service will shortly be inaugurated on the Elmwood Avenue lines of the Rhode Island Company at Providence. According to the company's franchise these cars cannot be operated on the prepayment plan until enough have been received from the manufacturers to equip the line on which they will be used. Upon the arrival of seven prepayment cars service will be begun on the Elmgrove-Reservoir line.

Date Set for Fare Hearing.—Dec. 2 has been fixed by the Railroad Commission of South Carolina as the date for the hearing on the application of the Charleston-Isle of Palms Traction Company, Charleston, S. C., for permission to increase the fare between Charleston and the Isle of Palms from 30 cents to 40 cents. It was erroneously stated in the ELECTRIC RAILWAY JOURNAL of Oct. 24, page 985, that the increase sought was from 25 cents to 40 cents.

Milwaukee Fare Zones Extended.—On Oct. 28 the Railroad Commission of Wisconsin handed down a decision extending the fare limits in two cases on the suburban lines of The Milwaukee Light, Heat & Traction Company. This change by the commission is generally regarded as in the nature of a concession in favor of the places affected by the increase in fares ordered on Jan. 2, 1914, and it involves no change by that body in the zone fare principle. The order was signed by two of the three commissioners. The company does not believe that the order coming six days before the election had any political significance.

Court Decision in Vermont Fair Case.—The Supreme Court of Vermont has handed down a decision in favor of the cities of Barre and Montpelier in their suits against the Barre & Montpelier Traction & Power Company in the matter of the proposed increase in street railway fares. The decision of the court, in short, holds that the franchise is a legal contract and that the railroad is obliged to maintain a fare not to exceed 5 cents within the respective limits of the cities in question and give transfers, so long as the franchise is in force. The *pro forma* degree is reversed and the cause is remanded with a mandate restraining an increase in fares.

Favorable Report on Springfield Service.—In a special report to the Board of Aldermen of Springfield, Mass., the committee on street railway service discusses the recent shortage of cars on the Springfield Street Railway, pointing out that the company will shortly place in service fifteen new pay-as-you-enter cars of Wason make, and stating that the unprecedented severe weather of the late winter disabled many cars in the early spring and handicapped the company's repair work. The report states that this caused congestion during the rush hours and made it difficult for the company to clean its rolling stock according to schedule. Up to Nov. 1, 1914, 171 cars had been overhauled, painted and varnished and 163 motors repaired and overhauled. Schedules have been revised, following consultations with R. W. Reynolds, general manager, and extra service provided in the rush hours.

Boston Transfers Approved.—The Massachusetts Public Service Commission has approved the establishment by the Boston Elevated Railway of free transfer privileges at Commonwealth Avenue and Essex Street in the Brighton district between Commonwealth Avenue and Cambridge surface cars. The board has approved the establishment of additional free transfer facilities at the Boylston Street subway stations, permitting passengers boarding cars on the surface at or west of the Church Street subway entrance to enter Copley Station and continue their trips westward in the subway, to leave the subway east-bound at Copley Station and continue their trips upon Boylston Street inbound surface cars, and to receive transfers to the Massachusetts subway station upon boarding west-bound surface cars after leaving Dartmouth Street. This extension of the transfer system will facilitate travel to and from the Back Bay shopping district, and minimize the effect of the new subway in the withdrawal of patronage from business houses on the surface.

Service Hearing in Toronto.—The Ontario Railway Board on Nov. 4 listened to the arguments of counsel for the city and the Toronto Railway in connection with the city's application for increased service. Corporation Counsel Geary reviewed the evidence of overcrowding and placed considerable emphasis upon the report of Charles R. Barnes, the board's expert, who recommended that a number of new cars be added; that cars be rerouted, and that crosstown lines be established. Mr. Geary insisted that the company could find capital for the extensions in spite of the war. H. S. Osler, counsel for the company, declared that it was unreasonable to expect the company to put 200 new cars in service and provide a seat for every passenger. He drew attention to the fact that Mr. Barnes had stated that had conditions at the time he made his investigation and report been the same as they are now he would not have recommended as he did. Mr. Osler felt that the board should recognize the fact that the company had succeeded in bringing the service to a point where little further need existed for improvement. At the conclusion of the hearing D. M. McIntyre, the chairman, intimated that the board would not delay its decision.

Personal Mention

Mr. R. R. Chestney has been appointed engineer of maintenance of way of the Macon Railway & Light Company, Macon, Ga., to succeed Mr. C. H. Fuller.

Mr. J. C. Boyd has been appointed engineer of the power station on the Galesburg & Kewannee Electric Railway, Kewannee, Ill., to succeed Mr. F. D. Marvin.

Mr. C. C. West has been appointed superintendent of traffic of the Galesburg Railway, Lighting & Power Company, Galesburg, Ill., to succeed Mr. Edward H. Nelson.

Mr. Ralph W. Purrington has been appointed superintendent of the Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass., to succeed Mr. Frank L. Reed.

Mr. Martin A. Brown, who has been auditor of the Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass., has been elected treasurer of the company to succeed Mr. Frank L. Reed.

Mr. L. A. Magraw, who has been chief engineer and electrical engineer of the Macon Railway & Light Company, Macon, Ga., has in addition been appointed general manager of the company, to succeed Mr. L. S. Boggs, resigned.

Mr. C. J. Davidson has been elected second vice-president of the Southern Illinois Railway & Power Company, Harrisburg, Ill., to succeed Mr. F. R. McMullin. Mr. Davidson also acts as chief engineer and electrical engineer of the company.

Mr. B. T. Longino, formerly superintendent of transportation of the Tacoma Railway & Power Company, Tacoma. Wash., is now assisting in the transportation department and "safety first" campaign of the Jacksonville (Fla.) Traction Company.

Mr. W. E. Boileau, formerly general manager of the Chattanooga Railway & Light Company and the Lookout Mountain Railway, Chattanooga, Tenn., has been appointed general manager of the Scranton (Pa.) Railway, to succeed the late Frank Caum.

Mr. G. W. Welsh has been appointed superintendent of power of the East St. Louis & Suburban Railway, with headquarters at East St. Louis, Ill. Mr. Welsh was formerly assistant electrical engineer of the Southern Pacific Company, San Francisco, Cal.

Mr. A. L. Kempster, manager of the Seattle division of the Puget Sound Traction, Light & Power Company, has been elected a life member of the Seattle Press Club. Nov. 19 has been fixed as the date on which Mr. Kempster will be presented with a silver life membership card.

Mr. J. Vipond Davies, vice-president of Jacobs & Davies, Inc., consulting engineers, New York, on Nov. 3 was awarded the Telford gold medal by the Institution of Civil Engineers, London, England, for his paper, "Extensions of the Hudson River Tunnels of the Hudson & Manhattan Railroad."

Mr. Elmer E. Bernard, assistant city engineer of Lynchburg, Va., has resigned and accepted a position with the Lynchburg Traction & Light Company and the Roanoke Railway & Electric Company, Roanoke, Va., as engineer of roadways. Mr. Bernard will make his headquarters in Lynchburg.

Mr. C. L. Daugherty, who has been electrical engineer of the Great Northern Railway, with offices in St. Paul, Minn., has been appointed assistant general manager of the St. Petersburg & Gulf Railway and the St. Petersburg Light & Power Company, St. Petersburg, Fla., a newly created position with the companies.

Mr. William B. McKinley, president of the Illinois Traction System, Peoria, Ill., who was elected congressman on Nov. 3 from the eighteenth Illinois district, expects to leave Jan. 1 for an extended trip around Cape Horn, going by way of the Panama Canal and down the west coast of South America and returning by way of Argentine Republic and Brazil.

Mr. Frank L. Reed has resigned as secretary, treasurer and superintendent of the Shelburne Falls & Colerain Street Railway, Shelburne Falls, Mass., but continues with the company as auditor and as a director. Mr. Reed will hereafter devote himself largely to the interests of the Monroe Bridge Paper Company, of which he has been elected treasurer and general manager.

Mr. Foster Hannaford, who has been assistant superintendent and operating engineer for the Galesburg Railway, Lighting & Power Company, Galesburg, Ill., has been appointed acting general superintendent to succeed Mr. D. McAffee. Mr. Hannaford has also been appointed acting general superintendent of the Peoples' Traction Company, Galesburg, to succeed Mr. McAffee.

Lieut.-Col. Chester Harding, corps of engineers, U. S. Army, has severed his connections with the District of Columbia to accept the detail as engineer of maintenance of the Panama Canal. He has been succeeded as a member of the Public Utilities Commission of the District of Columbia by Maj. Charles W. Kutz, corps of engineers, U. S. Army, who has been elected chairman of the commission to fill the unexpired term of Colonel Harding.

Mr. W. C. Myers has been appointed assistant general superintendent of the East St. Louis & Suburban Railway, with headquarters in East St. Louis, Ill. In 1910 Mr. Myers was appointed superintendent of electric shops and equipment with jurisdiction over electric car inspections and maintenance during construction and operating periods on the Oakland, Alameda and Berkely line of the Southern Pacific Company, which was then being equipped with electricity. Before that Mr. Myers was with the General Electric Company.

Mr. Charles F. Hewitt, who was recently appointed general manager of the United Traction Company, Albany, N. Y., was tendered a complimentary dinner at the Claridge Hotel, New York, on the evening of Nov. 6. The committee in charge of the dinner consisted of Mr. H. N. Ransom, Mr. E. S. Fassett, Mr. C. C. Castle and Mr. H. C. Evans. Fifteen or more of the two score present, including Mr. C. Loomis Allen, president of the American Electric Railway Association, and Mr. C. S. Sims, vice-president of the Delaware & Hudson Company, expressed briefly their appreciation of Mr. Hewitt's past work and referred to the problems which he will be called upon to face in Albany. They extended a hearty welcome to him and offered him the results of the experience of the electric railway men of the State of New York. In response, Mr. Hewitt outlined briefly his early experience in electric railway work in Elmira, Syracuse and elsewhere and stated that with the co-operation which was assured he felt that he was starting his new work under auspicious conditions.

Mr. Peter E. Hurley has been appointed general manager of the Trenton & Mercer County Traction Corporation, Trenton, N. J., to succeed Mr. William H. Hitchcock, resigned. Mr. Hurley resigned as general manager of the corporation on Jan. 1, 1911, and since then has been engaged principally in the contracting business. He had previously served the Trenton Street Railway. Mr. Hurley is fifty years old. He was born in Monmouth County, N. J., where he worked on his father's farm until he decided to locate in Trenton. His first job in that city was as driver of a stage, on what was known as Wayman's Line, carrying passengers between the city hall in Trenton and Riverview Cemetery. He next got a position as driver on the horse car line operating between the Clinton Street Station and Prospect Street, Trenton, at that time the only line of its kind in the city. When the Center Street division was built Mr. Hurley, after having received several promotions, became superintendent and later was advanced to general manager. After serving several months with the new company he resigned to enter other business.

Mr. W. H. Glenn, who has been vice-president and manager of railways of the Georgia Railway & Power Company, Atlanta, Ga., has surrendered that title for vice-president and operating manager, with widely increased duties which include not only the management of the railways but supervision over generating stations, transmission lines and the distribution system. Mr. Glenn was manager of railways for the Georgia Railway & Electric Company when the property of that company was leased to the Georgia Railway & Power Company. He became connected with the engineering department of one of the constituent companies of the Georgia Railway & Electric Company after he was graduated from the Georgia School of Technology. Subsequently he served for several years in the shops. He next served as purchasing agent of the company. Later he was appointed superintendent of track and roadway, and in that capacity he had charge of most of the reconstruction work which followed the formation of the Georgia Railway & Electric Company and worked out many of the problems incident to the changes in the physical property which followed the consolidation. Mr. Glenn was appointed general manager of the railway department of the Georgia Railway & Electric Company in January, 1908.

Mr. W. H. McGrath, who succeeded Mr. A. W. Leonard on Nov. 1 as manager of the Puget Sound Traction, Light & Power Company, Seattle, Wash., and subsidiary companies on the election of the latter to the position of president, has been connected with public service properties for the last fourteen years. After graduating from Harvard in 1901 with an engineering degree, Mr. McGrath went with Stone & Webster and gained experience in every department of the Boston office work. In 1902 he was appointed electrical engineer for the company at Houghton, Mich., and became superintendent of the Houghton County Electric Light Company about 1903. In 1905 Mr. McGrath was made manager of Houghton County Traction Company and Houghton County Electric Light Company, both Stone & Webster properties. He served in this position until 1909, when he was transferred to Minneapolis as assistant to Mr. A. W. Leonard, at that time vice-president and manager of the Minneapolis General Electric Company. During some of the trying times of this company and until 1912, when Stone & Webster sold the property, which then was very successful, he held the position of assistant general manager at Minneapolis. In June, 1912, Mr. McGrath returned to Boston and took up expert work for Stone & Webster in connection with the examination, analysis and organization of new properties and for other interests, bankers, etc. In November, 1913, he was appointed assistant to the vice-president of the Puget Sound Traction, Light & Power Company, Seattle, which position he held until Mr. Leonard's election to the office of president.

OBITUARY

John Kean, formerly Senator from New Jersey, is dead. Mr. Kean was born on Dec. 4, 1852. He was educated at Yale and at the Columbia Law School, and was admitted to the New Jersey bar in 1877. Mr. Kean never practiced law, but turned his attention to banking and manufacturing. He was at different times a director of the Manhattan Trust Company, Chicago Junction Railways, Union Stock Yards Company, Twin City Rapid Transit Company and the North Hudson County Railway, which is now included in the system of the Public Service Corporation of New Jersey.

J. N. Akarman, of the Akarman Company, engineers and contractors, Atlantic City, N. J., is dead. Mr. Akarman was born on March 4, 1854. He began his railroad career in 1873 with the South Boston Railroad. In 1887 he became one of the subordinate officials of the Middlesex Railroad running between Boston and Charlestown, Mass. Six years later he became superintendent of the Charles River Street Railway. When the Charles River Street Railway was consolidated with the Cambridge Railroad, Mr. Akarman resigned to become general superintendent of the railways in Worcester, Mass., owned by the Seeleys. He next assisted in building the Biddeford & Saco Railroad between Biddeford and Old Orchard Beach, Maine. After the completion of this road he accepted the position of general superintendent of the railways in Newark and Elizabeth, now included in the system of the Public Service Corporation of New Jersey. In 1892 he returned to Worcester as general manager of the Worcester Consolidated Street Railway, in which capacity he continued until 1901, when he was appointed general manager of the Elizabeth, Plainfield & Central Jersey Railway. When the last mentioned property was absorbed by the Public Service Corporation he entered the service of that company, filling while with it the positions of traffic superintendent, general passenger agent and general superintendent of the South Jersey division.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Edmonton Northwestern Radial Railway, Edmonton, Alta.**—Application for a charter has been made by this company to the Alberta Legislature in Alberta to build an interurban railway, to be operated by any other power than steam, from Edmonton northwesterly to the Pembina River. Short, Woods, Biggar & Collison, Edmonton, Alta., are the solicitors for the applicants.

FRANCHISES

Los Angeles, Cal.—The Pacific Electric Railway has asked the Council for a three months' extension of time on its franchise in which to build a second track on New Magnolia Avenue. It is expected that this company will soon ask for a franchise on Market Street. Bids will soon be awarded by the company for the construction of the extension to Corona.

Los Angeles, Cal.—The Southern Pacific Company has received a franchise from the Council to extend its tracks over certain streets in Los Angeles.

Los Angeles, Cal.—In response to the appeal of the Glen Alto Improvement Association the public utilities committee of the Council of Los Angeles has recommended the granting of a franchise for an electric railway extension from North Broadway and Prichard Street through Schuetzen Park and the Hermon districts to the boundary limits of South Pasadena. The committee recommends that the Council offer the franchise for sale at once. [E. R. J., Oct. 24, '14.]

Sausalito, Cal.—Allen H. Vance has been authorized by the Railroad Commission to transfer to the Sausalito Incline Street Railway a franchise authorizing the construction of an incline railway over certain streets and private rights-of-way in Sausalito, and the latter company granted a certificate of public convenience and necessity to exercise rights thereunder. The company has been authorized to issue its preferred stock of the par value of $2,500 to Allen H. Vance and preferred or common stock of the par value of $15,500 to be sold at par for cash only, $500 of the proceeds thereof to be used in preparing plans of the proposed incline railway, the balance for securing rights-of-way and terminal grounds. [E. R. J., Oct. 17, '14.]

Atlanta, Ga.—No further extension of time will be granted the Atlanta & Carolina Railroad to begin work on its proposed electric railway between Atlanta and Augusta. The electric railway committee of Council recently refused the request of the company that additional time be granted. The line was projected in 1907. Little actual construction work has been done.

Carbondale, Ill.—Plans are being made to soon ask the Council for a franchise to build an electric line in Carbondale. This is part of a plan to build a 12-mile interurban line between Carbondale and Murphysboro, Ill.

New Bedford, Mass.—The Union Street Railway has received a franchise from the Council to extend its lines over certain streets in New Bedford.

Pittsfield, Mass.—The Berkshire Street Railway has asked the Massachusetts Public Service Commission for an extension of time in which to finish the construction and alterations of its lines in North Street and Wahconah Street in Pittsfield.

Brantford, Ont.—The Brantford & Hamilton Electric Railway has asked the Canadian Parliament to extend the time within which the company may begin and complete the line authorized to be built from Langford to Galt.

Montreal, Ont.—Mayor Martin proposes that the Council of Montreal shall give the Montreal Tramways Company an extension of franchise for twenty-two years, on condition that the new franchise shall cover all the existing franchises with the various sections of the city which have been annexed since the original franchise was granted. These are numerous, and some of them are for fifty years or more, while one is in perpetuity. The main franchise has eight years to run, so the extension advised by the Mayor is practically for thirty years. The company asked for a forty-year extension. The question will be considered by the Board of Control at an early date.

Toronto, Ont.—A motion of Comptroller Church that the Works Commission report on the extension of the civic lines in Toronto to North Toronto, Beaches, Ward Seven and Rosedale was carried by the comptrollers on Oct. 27.

Three Rivers, Que.—The Three Rivers Traction Company has asked the Council for a franchise in Three Rivers.

Knoxville, Tenn.—The Knoxville Railway & Light Company has accepted a franchise from the Council for an extension of its lines in Knoxville. The ties for the extension are already on hand and special steel work has been ordered.

Nashville, Tenn.—The Nashville Traction Company has asked the Council for a franchise to extend its lines out Fifth Avenue to the north. The measure supplements an ordinance which gives the company privilege to extend its lines in North Nashville.

Richmond, Va.—The Virginia Railway & Power Company has asked the Council for a thirty-year franchise to extend its lines in Richmond.

TRACK AND ROADWAY

Burlingame (Cal.) Railroad.—Work has been begun by this company surveying for the extension along the present route of storage-battery road from the station in Easton to Burlingame Hills.

San Francisco (Cal.) Municipal Railway.—A branch to begin at Van Ness Avenue and Market Street and extend to Duboce Street, Castro Street, Fourteenth Street and Alpine Street to be constructed out of the $3,500,000 bond issue, and its future extension across Buena Vista Hill into the Pope tract, is advocated by the Fifteenth Street and Park Hill Improvement Association in San Francisco.

Jacksonville (Fla.) Traction Company.—Plans are being made by this company to extend its lines in Jacksonville.

Miami (Fla.) Traction Company.—Work has been begun by this company laying track on its line in Miami. Excavation at the bridge will be begun at once and the work carried westward. B. B. Tatum, Miami, president. [E. R. J., Oct. 31, '14.]

Jacksonville & St. Augustine Public Service Corporation, St. Augustine, Fla.—This company has completed 6 miles of the interurban railway between Jacksonville and St. Augustine and will soon place it in operation. This 40-mile line will connect Jacksonville, South Jacksonville and St. Augustine. J. L. Crary, St. Augustine, is interested. [E. R. J., June 20, '14.]

East St. Louis & Suburban Railway, East St. Louis, Ill.—New tracks will be laid by this company on Main Street in East St. Louis in the spring, when its new office building, which fronts on Main Street and Collinsville Avenue, will be completed. The offices of the company will be removed from Third Street and Broadway to the new building.

Freeport Railway & Light Company, Freeport, Ill.—This company is ready to submit to the Council committee on electric railways the choice of three routes for the proposed extension of this railway in the southwest section of Freeport.

Illinois Traction System, Peoria, Ill.—The extension of the company's line from Twelfth Street station south through St. Louis over the free bridge, to Belleville by way of the Southern Traction Company's line and then to Edwardsville will follow the completion of the east approach of the bridge. The plan also contemplates an elevated structure from the Illinois end of the McKinley Bridge above Main Street in Venice and then along a privately owned right-of-way above Granville Street above the Terminal tracks at the north end of the Madison yard. This company has completed a new bridge at Mackinaw. The structure is built with concrete abutments and ballast decks and has an 80-ft. span. The cost of the new bridge was $25,000.

Springfield & Central Illinois Traction Company, Springfield, Ill.—It is said that plans are being made to secure the renewals of all the franchises and other rights of this company which expire on Jan. 1, 1915, the originals having been granted for a period of two years. At a meeting of the stockholders held recently at East St. Louis the following officers were elected: Isaac Smith, president; George W. White, vice-president, and A. C. Skilman, secretary. The same directors were re-elected. [E. R. J., July 19, '13.]

Aurora, Elgin & Chicago Railway, Wheaton, Ill.—This company is asked to consider plans to build a loop line through the southeastern section of Elgin.

Wabash & Rochester Electric Railway, Wabash, Ind.—No definite plans have been decided upon by this company as to when construction will be resumed on this proposed line to connect Columbia Park, Rochester and Lake Manato.

Louisville (Ky.) Railway.—This company is asked to consider plans to extend its Walnut Street line, which ends in Parkland, out Catalpa Street and to Southern Avenue, thence to the State Fair Grounds.

***Paris, Ky.**—Business men in this section of the State are discussing a proposition to organize a company to promote an electric interurban railway to extend from Paris to Carlisle and thence to Maysville. The Louisville & Nashville Railroad recently discontinued a number of passenger trains on its Maysville branch.

***Mattawamkeag & Northern Railway, Bangor, Maine.**—Interest has been revived in the plans to build a 4-mile line from the junction of the Medway and Houlton roads in Mattawamkeag and extending along the Medway road toward Medway and Molunkas as far as Mattaceunk Rips in the Penobscot River, where an extensive power development is proposed. The railway as originally planned was to extend from Mattawamkeag through Molunkas, Medway, East Millinocket to Millinocket, 22 miles. Charles W. Mullen, Bangor, is interested.

Quebec Extension Railway, Presque Isle, Maine.—Preliminary arrangements are being made by this company to begin work in the spring on this proposed electric and steam railway to connect Quebec, Charlesbourg, Lorette, Ste. Foye, Valcartier Military Camp, Cap Rouge and Beauport. The electric power can be secured from the Shawinigan Company, the Dorchester Electric Company or the Quebec Railway, Light, Heat & Power Company. Plans are being made to secure a subsidy of $6,000 per mile for the construction of the railway, from the federal government of Canada. The company is open for tenders for the construction of this line. Alleyn Taschereau, Quebec, solicitor. [E. R. J., Oct. 12, '14.]

Detroit (Mich.) United Railway.—This company has placed in operation its new Grand Belt division between Fort Street and Clark Avenue and Thirty-fourth Street and Warren Avenue in Detroit.

St. Paul (Minn.) Street Railway.—This company has placed in operation its new Western and South Robert Street line in St. Paul.

St. Paul Southern Electric Railway, St. Paul, Minn.—This company has completed and will soon place in operation the first section of its line between Hastings, Neb., and St. Paul, Minn. The line will enter the city of St. Paul over the tracks of the St. Paul City Railway. This line will eventually be extended to connect Cannon Falls, Red Wing, Frontenac, Lake City, Mankato, Inver Grove and Faribault.

Battle Creek, Coldwater & Southern Railway, Battle Creek, Mich.—As soon as financial backing can be secured work will be begun by this company on the line between Battle Creek, Coldwater and Girard. The following officers have been elected: T. A. Hilton, president; J. F. Thompkins, Girard, vice-president; E. F. Pangburne, secretary, and A. J. Dorrance, Coldwater, treasurer.

Missoula (Mont.) Street Railway.—This company has been asked to extend its East Side line to the upper end of Parkside Addition, in Missoula, on the Rattlesnake Creek, a distance of about 1 mile. The company has intimated that the line will be built in the immediate future.

Brooklyn, N. Y.—Bids are desired until Dec. 1 by Public Service Commission, First District, 154 Nassau Street, New

York, N. Y., for reconstruction of part of Section No. 9-C-1 of Route No. 9, a part of the Fourth Avenue subway in Brooklyn, which includes the installation of cross-overs and the partial reconstruction of the DeKalb Avenue station in Flatbush Avenue extension.

New York State Railways, Rochester, N. Y.—Work has been begun by this company relaying its tracks and placing new ties on certain sections of Park Avenue in Rochester. This is done in connection with resurfacing the street by the city. The company will also pave its part of the street.

Cleveland (Ohio) Railway.—This company is asked to consider plans for an extension through West Madison Avenue in Cleveland.

Cleveland, Alliance & Mahoning Valley Railroad, Cleveland, Ohio.—Surveys have been made, grading completed, poles set and plans are being made to soon begin the overhead work on this 7-mile line from Newton Falls to Leavittsburg. All material has been bought. C. R. Morley, 756 Hippodrome Avenue, Cleveland, president.

Bartlesville (Okla.) Interurban Railway.—A contract has been awarded by this company for the laying of concrete on the right-of-way of this railway on Wyandotte Avenue between Seventh Street and Fourth Street in Bartlesville. This is in anticipation of the paving which is to be begun at once.

Ontario West Shore Railway, Goodrich, Ont.—Negotiations have been opened by Contractor Campbell, of Strathroy, Ont., with the municipal authorities interested in this incompleted railway, with a view of something being done towards its completion. The contractor has agreed to submit a proposition to the municipalities to complete the grading and to do the tracklaying. [E. R. J., May 16, '14.]

Dunnville, Wellandport & Beamsville Electric Railway, Wellandport, Ont.—This company has secured deeds for a considerable stretch of private right-of-way. About 12 miles of grading has been done. The Hydro-Electric Power Commission of Ontario has been going over the route from Dunnville to St. Catherines, in order to prepare a report, there being a proposition that the line be taken over and completed as part of the commission's proposed system of interurban lines. J. A. Ross, Wellandport, president.

Toronto, Ont.—On Oct. 24 the Ontario Railway Board, acting upon an application made by the city, gave formal approval to the construction of a civic car line along Bloor Street from Dundas to Quebec Avenue in Toronto. All that remains to be done is to secure from W. H. Hearst a formal assurance that when the House meets next session legislation will be put through validating the by-law the city proposes to pass to raise the money (some $150,000) to build the line. It is said that Works Commissioner Harris is already getting ready for construction. If delays are avoided it is expected the line will be ready for service next Spring.

Metolius, Prineville & Eastern Railway, Prineville, Ore.—This company states that surveys have been completed, right-of-way secured, but no definite plans have yet been decided upon in regard to the construction of the 30-mile line to connect Metolius and Prineville. H. B. Scheel, Prineville, president. [E. R. J., April 25, '14.]

Seaside, Ore.—Preliminary steps have been taken to build an electric interurban line from Seaside to Astoria as the first link in a comprehensive coast system of electric lines. The City Council was asked to extend the time limit on a franchise through Seaside that is held now by O. W. Taylor. Prior to the presenting of the request to the Council, considerable work had been done by interested residents of Seaside and Astoria in securing data, and it is believed that practically all the necessary right-of-way can be had gratis and that at least part of the cost of the line can be secured in the immediate vicinity.

Philadelphia (Pa.) Rapid Transit Company.—Plans are being made by this company to begin work in the spring on a new double-track crosstown line on Fifty-sixth Street in West Philadelphia.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—Plans are being considered by this company for a line between Rochester and Beaver Falls.

Pittsburgh, Pa.—The Chamber of Commerce will propose to the City Council at the next meeting that it solve the subway question by the construction of a downtown loop and lease it to the Pittsburgh Railways Company. The plans have been worked out by the board of directors and will come before the Chamber of Commerce for final approval at a meeting to be held within the next few days.

***El Paso, Tex.**—A company is being organized to build an electric railway from the center of El Paso through the suburbs to Woodlawn addition, east of El Paso. A right-of-way on Tenth Street will soon be asked for. Thomas P. Ruddy, Kansas City, and other Kansas City capitalists are interested.

Houston (Tex.) Electric Railway.—This company will soon double-track its lines on Fannin Street and on Travis Street in Houston.

***Beaumont, Liberty & Houston Traction Company, Houston, Tex.**—Surveys have been begun by this company for a line to connect Houston, Waco, Beaumont and Liberty. Offers of right-of-way and subsidies for the construction of the lines are being made by the land owners along the route. Edward Kennedy, president.

Mexia, Tex.—Preliminary arrangements are being made to build an electric railway in Mexia. The Commercial Club, Mexia, is interested. [E. R. J., Nov. 7, '14.]

San Antonio (Tex.) Traction Company.—This company has placed in operation its new line on Commerce Street from Soledad Street to Alamo Street in San Antonio.

Texas City (Tex.) Street Railway.—Work has been begun by this company on the 1-mile extension in Texas City to connect with the ferry lines between Texas City and Galveston.

Tacoma (Wash.) Municipal Railway.—Bonds for this railway have been bought by the Tacoma banks and construction work has been begun.

West Virginia Traction & Electric Company, Wheeling, W. Va.—Plans are being made by this company for improvements on the out-the-pike division of its line before the first of the year.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company on the construction of a new freight depot on F Street near Second Street in Los Angeles.

Holyoke (Mass.) Street Railway.—This company has moved into its new carhouse on Canal Street and Bridge Street in Holyoke. The old carhouse will be used for storage purposes and for car painting.

Minneapolis (Minn.) Street Railway.—This company has opened its new passenger station on Washington Avenue between Twenty-fourth Street and Twenty-sixth Street in Minneapolis.

Ohio Electric Railway, Cincinnati, Ohio.—This company has transferred all business from its old station in North Park Place to the new station in East Main Street, between First Street and Second Street in Newark.

POWER HOUSES AND SUBSTATIONS

Laurel Light & Railway Company, Laurel, Miss.—New machinery is being installed by this company at its power house in Laurel. The new equipment consists of an additional turbine of 1000-kw capacity, a new 300-kw railway machine and other equipment. The cost is estimated to be about $20,000.

Quebec Railway, Light & Power Company, Quebec, Que.—Plans are under consideration by this company for the development of additional power. The company has recently closed, or is now working on power contracts, aggregating 8000 hp. These include a contract for 2000 hp. with the St. Malo workshops of the National Transcontinental Railway, and a contract for 3000 hp for the government drydock at Levis. It was recently announced that a contract had been closed with the Ross rifle factory for an additional 600 hp.

Cleburne (Tex.) Street Railway.—Plans are being considered by this company to build a new power plant in Cleburne.

Manufactures and Supplies

ROLLING STOCK

Pacific Electric Railway, Los Angeles, Cal., noted in the ELECTRIC RAILWAY JOURNAL of Oct. 31, 1914, as expecting to purchase twenty-four all-steel cars, has ordered this equipment from the Pressed Steel Car Company.

Boston (Mass.) Elevated Railway has issued specifications for 100 center-entrance trail cars for use in the new Boylston Street subway. It is reported that the order for the cars will be placed early next week.

Hocking-Sunday Creek Traction Company, Nelsonville, Ohio, noted in the ELECTRIC RAILWAY JOURNAL of Oct. 31 as expecting to purchase three new cars, has ordered three all-steel cars, 44 ft. 6 in. over all in length, for double-end operation and seating capacity of 48, from the Cincinnati Car Company.

Charleston (S. C.) Consolidated Railway & Lighting Company, noted in the ELECTRIC RAILWAY JOURNAL of Oct. 10 as having ordered twelve all-steel city prepayment cars from the Cincinnati Car Company, has specified the following details for this equipment:

Seating capacity	41
Weight (car body only)	14,000 lb.
Length of body	28 ft. 6 in.
Length over vestibule	41 ft.
Interior trim	cherry
Roof	arch
Underframe	composite
Air brakes	G.E.
Axles	Midvale Steel Co.
Bumpers	Hedley
Cables	West.
Control	Type K
Couplers	Brill
Curtain material	Pantasote
Destination signs	Hunter
Fenders	H. B.
Gongs	Dedenda
Hand brakes	Brill, vertical wheel
Headlights	Golden Glow
Journal boxes	Symington
Motors	2 West. 323-V-2, outside hung
Paint	Flood & Conklin Simplex system
Registers	International
Sash fixtures	National L. W.
Seats	Brill Winner
Seating material	rattan
Step treads	Stanwood
Trolley catchers	O. B.
Trolley base	O. B.
Trucks	Brill 39-E
Varnish	Flood & Conklin
Wheels	Southern Wheel Co.

TRADE NOTES

Eclectic Film Company has appointed Edward Auger as manager of its branches in place of Arthur S. Kane, resigned.

Power Specialty Company, New York, N. Y., has removed its Chicago office from the Peoples Gas Building to the Harris Trust Building.

Edward C. Geither, formerly with the Ingersoll-Rand Company, has become affiliated with the Ellcon Company, 50 Church Street, New York. Mr. Geither will have charge of the sale of the E. M. B. unbreakable resistance, on which this company has recently secured American rights.

Graphite Lubricating Company, Bound Brook, N. J., has made a change in its "Bound Brook" bushing to give its customers positive proof that they are buying the genuine article. All they will have to do to convince themselves is to saw one bushing in two and the words "Bound Brook" will appear on the inside of the bushing.

Garrett B. James, of the engineering staff of the Underwriters' Laboratories, has been appointed by Secretary Lane of the Department of the Interior as consulting engineer in the bureau of mines, to carry on an investigation on the subject of oil fires. Mr. James has been granted a three-months leave of absence from the laboratories.

Walter A. Zelnicker Supply Company, St. Louis, Mo., has appointed Ralph H. Wilson as advertising manager. Mr. Wilson has been with this company about two years, first as assistant to A. R. Topping and later representing the company in the Southeast. Mr. Wilson's position as southwestern representative will be filled by E. F. Prichard, formerly auditor of the St. Louis Car Company.

Waddell & Harrington, Kansas City, Mo., consulting engineers, announce the dissolution of their firm. The firm's business will be conducted as usual until the conclusion of its affairs in July, 1915, except that it is accepting no new commissions. Dr. Waddell will give his attention to special engineering and financial matters and to important advisory work. Mr. Harrington will be joined by the firm's associate engineers, E. E. Howard and Louis R. Ash, in the establishment of the firm of Harrington, Howard & Ash. This new firm will conduct a general consulting practice similar to their past work, including hydroelectric developments, advisory municipal engineering, appraisals, examinations and reports upon engineering projects, giving special attention to foundations, bridges, particularly movable spans, and other structures in steel and reinforced concrete.

ADVERTISING LITERATURE

Dielectric Manufacturing Company, St. Louis, Mo., has issued a folder which describes standard specifications for using its "Steeltred" concrete floor hardener.

George T. Ladd Company, Pittsburgh, Pa., has issued Bulletin No. 16 which contains colored sectional illustrations of the Milne water-tube boiler.

Western Electric Company, New York, N. Y., has issued a new bulletin describing its switchboards. The bulletin is written in Spanish and is intended for use in Central and South American trade.

Wright Manufacturing Company, Lisbon, Ohio, has issued a catalog describing and illustrating its high-speed steel hoists, screw hoists, differential chain blocks, steel trolleys and hand traveling cranes.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a folder entitled "The Best Way to Prevent Boarding and Alighting Accidents," which describes and illustrates its motorman's safety mirrors for open and closed cars.

General Devices & Fittings Company, Chicago, Ill., has issued a folder illustrating its various high and low tension station devices, such as busbar supports, malleable iron fittings, insulator pins, clamp type supports, contact fittings and low tension switches, disconnecting switches and miscellaneous fittings.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 44,300, which illustrates and describes some of the gas-electric motor cars and locomotives built by this company. These cars and locomotives are adapted for branch line service on steam roads and also for interurban service. The prime mover is a gas engine direct connected to an electric generator which supplies current to the motor mounted on the axles of the front truck. The controller contains the necessary handles for regulating the generator voltage, controlling the motors and for throttling the engine and reversing the motors. The power equipment is described in considerable detail in the bulletin, and average cost of operation of the standard car is given in addition to other data relative to weights, dimensions, etc. A very attractive and profusely illustrated bulletin which contains a discussion of modern electric railway apparatus has also been issued by this company. The bulletin is contained in a colored cover of artistic design, and describes briefly the Curtis steam turbine for railway service, railway generators, transformers, switchboards, synchronous converters, motor-generator sets, ventilated railway motors, electric locomotives, and contains illustrations of the GE locomotives in use at the locks of the Panama Canal. The number of the bulletin is 44,003. Bulletins Nos. 44,403 and 44,405, also just issued, describe this company's ventilated commutating-pole railway motors for 600 and 600-1200-volt service. Bulletin No. 44403 is devoted to the GE-222-G railway motor, which has a rated output of 140 hp at 600 volts, and, having modified windings, can be supplied for operation with two in series on 1200 volts, at which voltage the rating is 130 hp. Bulletin No. 44405 describes the GE-233-A motor for operating two in series on 1200 volts. This has an hourly rating of 75 hp. Both motors are described in considerable detail, and each bulletin contains characteristic curves of the motors. Bulletin No. 46,018 describes the Type P-8 portable voltmeter. This is an unusually small instrument inclosed in a mahogany case and suitable for use on both alternating and direct current.

Electric Railway Journal

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Consolidation of Street Railway Journal and Electric Railway Review

Vol. XLIV NEW YORK, SATURDAY NOVEMBER 21, 1914 No. 21

CENTRAL STATES PASSENGER RATE INCREASE The announcement of an advance in interstate passenger rates by the steam railroads in the central passenger district, effective Dec. 1, 1914, suggests a parallel increase in the passenger rates of electric interurban lines doing an interstate business in the central states. The rates on most interurban lines are less than those on competitive steam roads, so that if the latter's are increased the electric line can make a similar increase and still retain its share of the business. Perhaps a policy of "watchful waiting" at this time should be recommended, since the advance in steam railroad rates depends upon the approval of the Interstate Commerce Commission, but if this approval is granted the traffic managers of the interstate electric lines in the central states should be prepared to file jointly a new passenger tariff containing the advanced rates. Since these will not conform with the new rates of the steam roads an independent hearing will be necessary. A glance at a map showing the electric lines in the territory affected indicates that there are at least twenty that may be classed as interstate carriers. Most of these are members of the Central Electric Traffic Association which could serve as a nucleus for concerted action. Those who are not members should at once consider the feasibility of such an advance, and, if advisable, prepare to take advantage of this opportunity.

CONVENTIONS OF THE PAST TWO WEEKS Electric railway men are apt to think of October as the month of conventions, but during the past two weeks there has been a number, and papers or reports from five are reported at considerable length in this issue. It would have been impossible for any one person to have attended all of these meetings, because some of them occurred simultaneously. Nevertheless many of the papers and reports have an intimate relation with electric railway work and each represents weeks or months of study by experts on the subject treated, with often the collaboration of others equally well fitted to consider the subject. For this reason such a paper or report is of more value than an individual contribution on the subject treated. Finally, while many of these papers will be published in the official reports of the proceedings they will not be available for some time to the public, and the technical periodical supplies the only available means for most persons of obtaining information thus presented. We consider it one of the duties of a technical paper to report all matters of this kind in its field and that this is one of the best services which it can render to its readers.

FUNDAMENTAL PRINCIPLES IN MECHANICS The readers of technical journals such as this one cannot but note how essential is a knowledge of the laws of mechanics to an intelligent understanding of many of the articles. For example, in this issue are abstracts of two recent papers, one by J. F. Layng on "Selection of Electrical Equipment," the other by E. C. Woodruff on a "Graphic Method for Time-Speed and Time-Distance Curves." In Mr. Layng's paper the most interesting feature, from the present standpoint, is the application of the law of moments. In its lowest terms this law states that to have equilibrium a tendency to twist in one direction must be balanced by an equal tendency in the other. This tendency is, of course, expressed quantitatively as the sum of a number of moments or products of forces by the lengths of the respective lever arms through which they act.

LINEAR ACCELERATION OF A MASS Both of the discussions referred to above involve the relations of force, mass and acceleration. The qualitative relations of these are well understood in a practical way. For example, if an emergency brake application is made when we are standing in a car aisle we are apt to slide toward the front door unless we brace ourselves firmly. Similarly we long to leave by the rear door when the car starts suddenly. That is, we tend to continue moving when the car stops and to remain stationary when it starts. When a quantitative relation is desired all that is necessary is to apply the fundamental law: force equals mass times acceleration. By definition of the units of these quantities a pound of force is a certain force recently prescribed by law like the pound of mass. A correctly calibrated spring balance reads in pounds of force. The unit of mass is also the pound and it is the same pound. Now a pound of force uniformly exerted on a pound of mass produces a rate of acceleration experimentally determined at about 32.2 ft. per second per second, or 21.95 miles per hour per second. A ton of force applied to a ton of mass produces, of course, exactly the same result. Similar braking forces produce the same results in the opposite direction; that is, the acceleration is negative. This negative acceleration is sometimes termed "deceleration," although the expression preferred by most engineers is "retardation." This is the whole mater of linear acceleration in a nutshell. The electric railway man who is at all concerned with design or operation should have the laws of mechanics at his fingers' ends. Sound theory, reinforced with experience, is the only safe foundation for practice.

THE CONFERENCE OF MAYORS

An account of the meeting in Philadelphia last week of the mayors of American cities to consider public utility questions is published elsewhere in this issue, and the principal result accomplished was the decision to exchange information through a central bureau, or clearing house, as it was termed by Mayor Mitchel. This is a commendable step and should result in benefit not only to the citizens of the different communities but to the utilities which serve them. Ignorance of the real conditions has been found by the utilities in the past to be the chief obstacle to satisfactory contractual relations and good public feeling. If the utilities bureau is conducted by experts, as proposed, capable not only of collecting and distributing the information desired but also of analyzing and correctly interpreting it, and if it is carried on with the same sincere efforts to obtain all the facts which have characterized our best state commissions, the public utilities have nothing to fear. Otherwise the data will do more harm than good.

In view of the fact that the meeting was devoted largely to the question of utility regulation, it was but natural that the relative claims of municipal and state regulation should have occupied a prominent place on the program. It was also natural, in view of the composition of the meeting, that a great many of the speakers should have advocated regulation by the municipalities rather than by the states. The desire for power is present in every one, and most people, especially those who already hold an executive office, believe that they can administer other governmental functions better than those in charge of them. Nevertheless, no new arguments were presented in favor of municipal regulation instead of state regulation of public utilities, and the defence of the present plan of state regulation, especially by Messrs. Erickson and Guernsey, was logical and should be convincing.

It was perhaps not surprising also that the final recommendations advocate that in all instances municipalities should have the power to municipalize public utilities, the exercise of this power being a matter for local determination, and that all such municipal utilities should be subject to local control only. While both of these matters are to a very large extent concerns of the future, they are mischievous in the extreme. It is hard to imagine any argument in favor of the regulation of private utilities which does not apply with equal and greater force to those cases where the owner and operator is the city. In a municipally owned enterprise the public must be protected not only from unreasonable and discriminatory rates and from inadequate and unsafe service but also from inefficient operation resulting in a waste of the public funds. It is hard to conceive of any more serious condition into which a municipality can come than to have its utilities, with their immense opportunities for political strength, in the hands of an unscrupulous political organization, or even of an honest but weak and inefficient one, which can laugh with impunity at the efforts of the taxpayers to dislodge it from power. Both our state and national governments are based on the principle of legislative checks and of limited power to any one department of government, and any unregulated direction of its utilities by a municipality will present the same evils as a single chamber of government or the combination in one person or group of men of the functions of judge and jury.

PROTECTION BY FLAG IN ADVANCE

Our recent objections to the so-called revival of the flagging rule, which at one time indorsed the propriety of moving a train when it was protected by a man walking in advance, are based quite as much upon the general character of any such rule as upon its detailed form or method of application. This point is discussed in a communication by John Leisenring which appears elsewhere in this issue. Mr. Leisenring emphasizes the fact that the flagging rules recently adopted by several signaled roads differ in form from the old one and do not permit the advancement of meeting points. The correctness of this statement is manifest. Yet, no matter what the construction of such a rule may be, it is subject to inherent weaknesses which it seems to be impossible to avoid if the principle is retained.

One of the latest of the roads to reintroduce the rule has adopted the following wording: "When a train is stopped by a block signal . . . and is unable to communicate with the dispatcher, the conductor . . . will proceed to the next signal and be in advance of the train at least 1500 ft., at which distance the train may proceed to the next signal, expecting to find the block occupied, etc." This is, of course, decidedly preferable to the old wording that left the distance by which the conductor preceded the train largely to his own judgment. On the other hand, the new wording provides no means for the motorman to tell when he is 1500 ft. behind the conductor if the latter is out of sight around a curve or in a mist, and it calls upon him to exercise superhuman restraint in moving his car at the unaccustomed pace of 3 m.p.h. Even the conductor is called upon to walk the ties, when hanging onto the front end of the car would be far easier.

As a matter of fact, it is well established that such a rule is not going to be followed properly any more than is the present rear-end protection rule on double-tracked steam roads—an alleged precaution, that might just as well be abolished on signaled lines as to remain, as it does now, a constant incentive to infractions of discipline. If it was followed conscientiously and with good judgment, even the old flagging rule would serve as a means to make the operation of a train as safe as that of the rocking chair in the family parlor. The difficulty is that the rule won't be followed—neither conscientiously nor with good judgment; and, as we pointed out in our first editorial on this subject on Aug. 1, a comparatively small reduction in delay does not offset the possibility of accident (both direct and indirect) when perfect safety can be obtained by having the train wait until someone has gone to the next siding or the nearest telephone. This is emphasized by the fact that the combination can hardly occur at frequent intervals. One delay of thirty minutes or an hour every year or two is not much of an excuse for the existence of a flagging rule in any form.

However, we are heartily in accord with Mr. Leisenring's statement regarding the desirability of having this newly-arisen complication settled by the Transportation & Traffic Association, and as the ensuing committee on rules has been requested to investigate it there is no doubt but that a decision will be reached at the next convention. As we have said previously, the failure of the telephone at a defective signal leaves the motorman upon the horns of a dilemma from which he ought to be rescued by definite instructions in his book of rules. That these instructions should involve the procedure of movement under the questionable protection of a flag in advance is, however, entirely unnecessary, and, in our opinion, most undesirable as well.

LABOR CONDITIONS UNDER MUNICIPAL OWNERSHIP ABROAD

Among the reports submitted to the thirty-fourth annual convention of the American Federation of Labor in Philadelphia last week was one on labor conditions on European municipally-owned railroads. It would be a good thing if every employee of American electric railways could read this report. By comparing his own lot with that of the employees of both privately and municipally-owned railways abroad the platform men of the United States would be forced to the conclusion that their pay and conditions of employment are exceptionally favorable.

If the two representatives of the American electric railway employees who wrote this report, after a somewhat extended trip abroad, have heretofore harbored the belief that municipal ownership as practiced abroad makes any real difference in the condition of the trainmen, they have now changed their minds. They say that in spite of all the claims that have been made for foreign legislation helpful to workers and the blessings of municipal enterprise, they "found the living standards of the workers of Europe, tram as well as others, so far below the average of the workers of America that no comparison is possible." They also found that there was no comparison in the sense that there was only a remote parity between the wages of European tram employees and those of the United States. They estimate that the cost of living in the United States is from 25 per cent to 65 per cent higher than it is in Europe, but that the difference in the wages of the electric railway men of the two continents is much greater, the maximum and minimum wages here being at least twice as much as are paid abroad either on private or municipal systems.

In Germany it was found that the average minimum wage in 192 cities was $17.64 a month, and the average maximum wage for the same period $35.28. In a number of cities the maximum is not reached until after twenty years of service. This is the rule in Berlin, while in Munich the maximum of 210 marks ($52.40) a month is not attained until after thirty-one years of service. The minimum wage in Paris is $33 and the maximum $40 per month. In Rome the minimum is 64 cents a day and the maximum wage after eighteen years of service 94 cents a day. London pays its motormen and conductors from $1.20 to $1.56 a day. Glasgow has a sliding scale ranging from $6.48 a week for the first year to $8.16 for the seventh year; thereafter $8.40 a week.

Aside from the question of wages the contracts that tram employees are obliged to sign in Germany would be considered intolerable here. Among other requirements is one for a bond to cover any damage caused by the employee and to secure the turning in of apparatus, tickets, etc. The employee must also agree to a system of forfeits or fines for every case of contravention of orders, and must explicitly renounce all right of appeal from decisions of the management as to punishments that may be inflicted under this or other provisions of the contract.

In general the signers of this report say that the conditions of the European tramway workers are similar to those that existed among street railway men in the United States twenty years ago. In their conclusions they remark that the same "spirit of commercialism" dominates electric railway systems in Europe, both private and municipal; that if there is anything to chose in the matter of treatment of employees, preference must be accorded to the roads on this side of the water. Besides this, the investigators found that electric railway transportation here is not only cheaper but better and there is a great deal more of it. They explode the idea that European fares are cheaper than our own by saying that the zone system means dear fares to the worker if he has to ride any considerable distance or take intersecting lines. "Zone fares and inadequate wages force the workers of Europe to live close to the workshop, mill or factory. It is rare to find a European worker who can afford to live in the suburbs or country, miles away from his work, as is frequently the case here. The rate of fares for long distances make it prohibitive, and the wages will not warrant the expenditure. Thus the zone system contributes to congestion and compels the workers to live in the most uninviting districts."

Whether they intended to do so or not, Mr. Mahon, as president of the Amalgamated Association of Street and Electric Railway Employees, and Mr. Bland, the Chicago leader of the same organization and editor of its official newspaper organ, have in their report written one of the strongest of testimonials to the effect not only that American electric railway operation is so far in advance of that of Europe that there is no basis for comparison, but that in respect to the treatment of employees American roads with regard to wages, and in other directions, have established standards which should make the American railway man glad that his lot is cast here rather than in Europe. The next time that an attempt is made to prove that American electric railway employees are down-trodden and abused it may be convenient to have as testimony of European railroad labor conditions this report, which has been spread upon the records of the American Federation of Labor.

Rebuilding Cars in Los Angeles Railway Shops

The Standard Pacific-Type Cars of This Company Are Being Remodeled Into Center-Entrance Cars with a Low Step at a Very Moderate Cost—A Detailed Account of the Work Is Given

About 330 narrow-gage cars of the Los Angeles Railway Company are being remodeled at the company's Los Angeles shops to provide longer bodies, lower steps and center entrances. Interest attaches to the work because of the small amount of new material required and the resultant low cost of changes that develop an entirely different car. In spite of the radical departure from the lines of the old model and the reduction of 13 in. in the total height of steps, the same motors, trucks and brakes are being used again, and the rule of the company which requires the mechanical equipment for all cars to be interchangeable throughout is being strictly followed.

FEATURES OF THE NEW DESIGN

As long ago as 1908 a center-entrance car was suggested for the lines of this company. However, the plan did not meet with general approval at that time, and it was not until two years ago that the first car of this type was put in service for trial under local conditions. After experimenting with various features, a design was finally developed in May, 1913, which suited climatic conditions and embodied the ideas of the company officials. An order was then placed with the St. Louis Car Company for seventy-five cars of this design, and these have now been operating in Los Angeles to the apparent satisfaction of the public and the company for several months.

In addition to the new center-entrance cars which were purchased, forty-five of the old type cars have been converted into the new type, as illustrated, and all of these were in service by April 18 of this year. About 285 more will be rebuilt in the same manner. The remodeled car is 46 ft. 7 in. long, 8 ft. 5 in. wide over all, and has a seating capacity of fifty-four, although in the old cars there were seats for only forty-four passengers. The 30-in. wheels taken from the old-style cars are used, but the spacing between truck centers was increased from 23 ft. to 30 ft. 6 in. The total weight of the rebuilt car is 37,000 lb., or 500 lb. less than its weight before remodeling. The new car is divided into two duplicate halves by the central entrance, each half having both an open and a closed section. Longitudinal seats are installed in the closed sections, thus affording wide passageways in the car near the entrance, and seven "walkovers" and one stationary seat are provided in each open section.

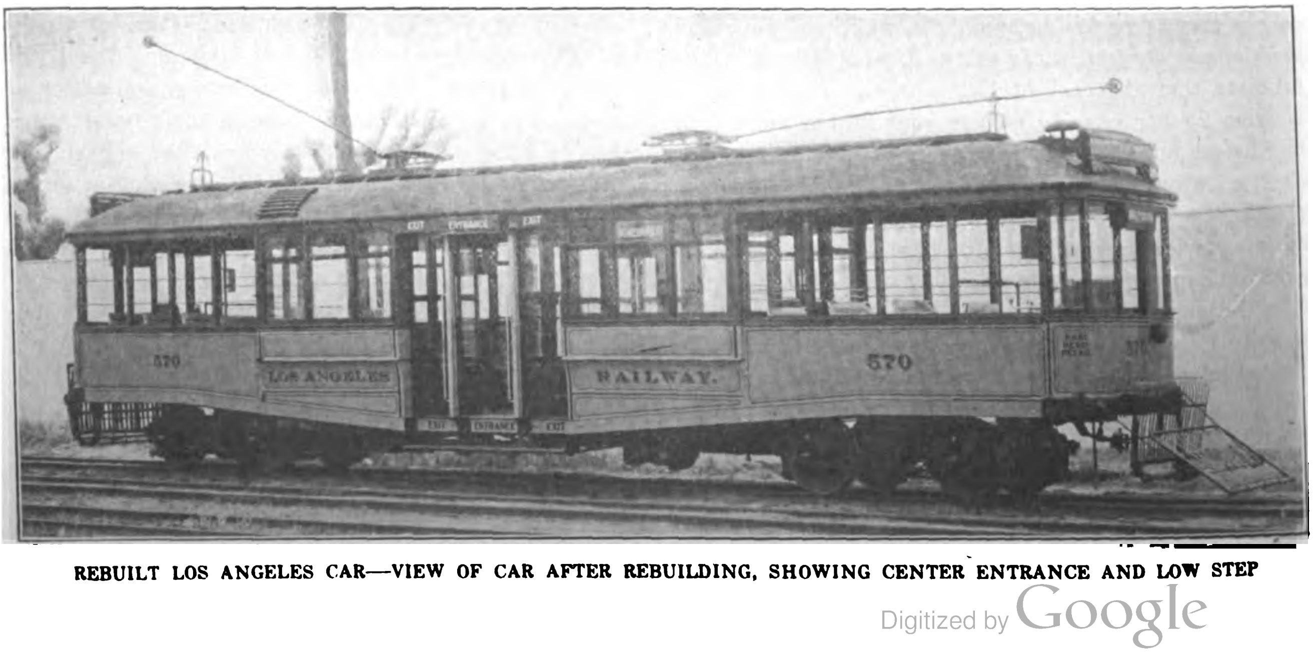
In the new cars a floor level 13 in. lower than in the old type at the steps is secured by sloping the floor upward toward each end so as to rise 8 in. in a length of 11 ft. 6 in. on both sides of the entrance. Another 2 in. is gained by a lateral slope in the entrance section, where the floor inclines from the doors toward a level 2 in. higher on the center line of the car, and the remaining 3 in. were gained by shortening the springs and making other minor changes in the trucks.

There is no step inside the car, and the only one outside has a 10-in. tread. This is set back into the frame so that its edge is flush with the side of the car. The double-leaf entrance door is normally kept open, and the exits are normally closed. All swing on ball-bearing sockets, and a single 5-in. lever at the conductor's station is sufficient to operate both exit doors with ease. The connecting levers operating the exits are below the floor, and those for the entrance are overhead. In both cases the doors are locked by throwing the hand lever past the center.

Remodeling the cars afforded an excellent opportunity to carry out new ideas in the arrangement of routing signs, and the system that was adopted is shown in one of the illustrations. These signs were built up entirely in the company's shops. The lettering on the large signs at the head end is painted on hollands similar to a strong, highly transparent tracing cloth. This material is 58 in. wide, and each sign is 40 ft. long, this being sufficient for the entire fifty-four routings under which the cars of the system operate. The edges of the cloth are bound with a flexible copper ribbon which prevents stretching, creasing or tearing. These head-end signs are illumined by three 64-watt lamps.

In the new equipment an illuminated reflector is located over the exit and entrance doors which not only furnishes light for the steps but is so located that it lights up the whole side of the car. This enables the motorman to have a full view of the side of the car and the steps with the aid of an adjustable mirror attached to the vestibule post.

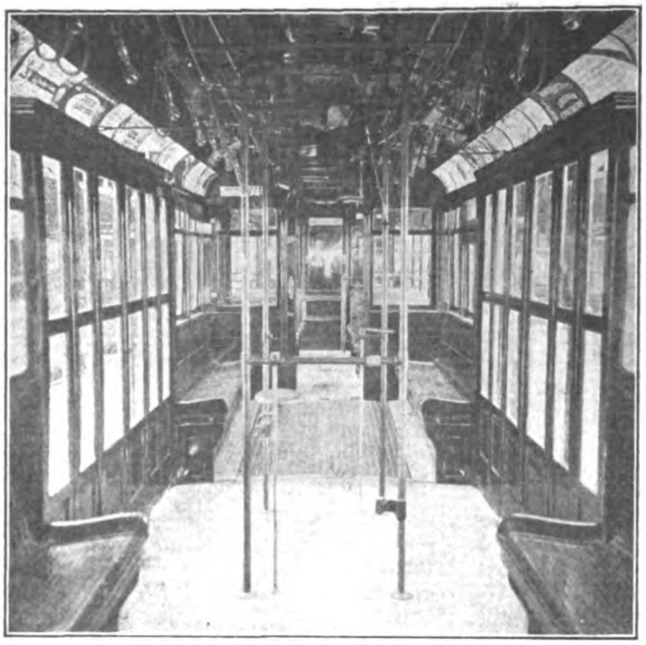
The motors on the old cars are 55-hp, 600-volt West-



REBUILT LOS ANGELES CAR—VIEW OF CAR AFTER REBUILDING, SHOWING CENTER ENTRANCE AND LOW STEP inghouse No. 38-B, and these are being used again in the rebuilt cars. The cars of the center-entrance type which were purchased new, however, are equipped with 60-hp, 600-volt, No. 306-L Westinghouse motors, and the latter are now specified when purchasing motors.

The old Westinghouse 38-B motor was originally constructed for a 4-in. axle, while the 306-L motor is constructed for a 4½-in. or 5-in. axle. As the 4½-in. axle was adopted to make an interchangeable standard axle, gear and wheel combination, it became necessary to rebore the old 38-B motors, and this was done by the use of a jig which was developed for this purpose. As many of the old motors were becoming worn at the armature-shaft bearings it was decided to rebore the shells at the same time as the axle bearings, and by the use of this jig it was possible to rebore all four bearings in a single operation, giving perfect alignment. One man has been able to rebore six motors per day with the machine, and more than 800 motors have been rebored in this manner.

It has been found that although the No. 38-B motors have given satisfactory service on all lines of the company, the hill districts can be better served with the No. 306-L motors, and so far as possible the cars with these larger motors are now being assigned to the more hilly routes.

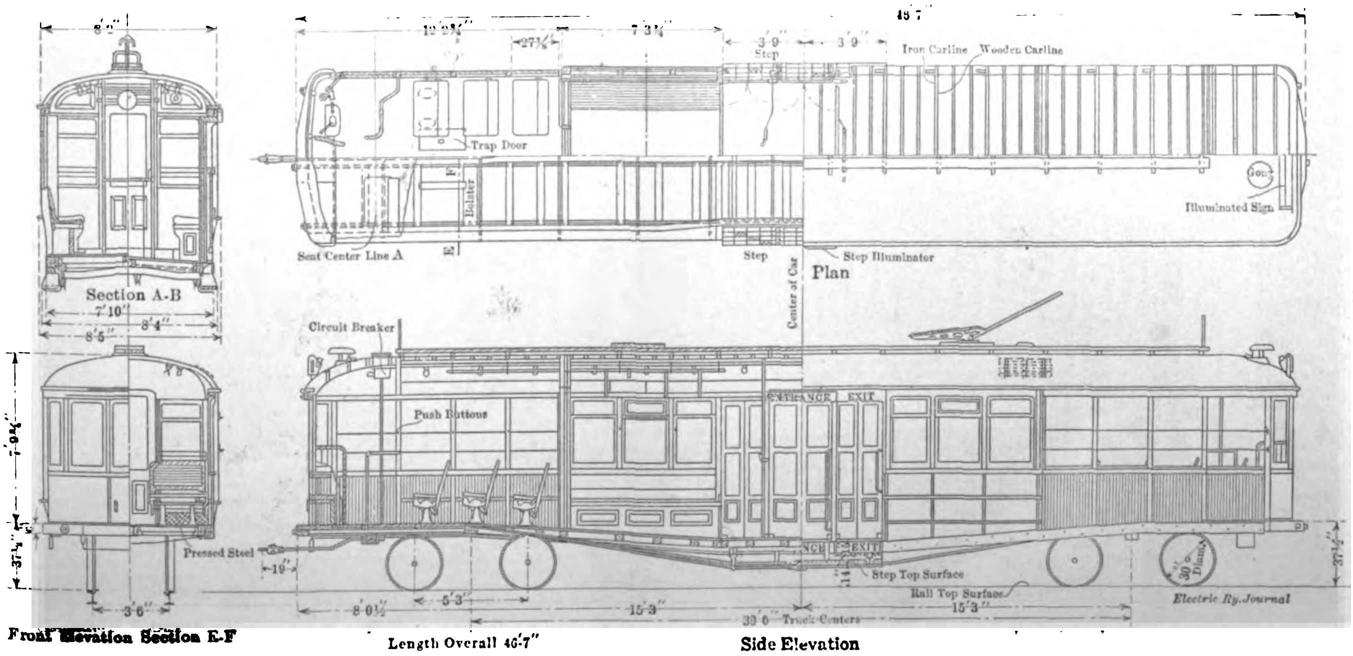

REBUILT LOS ANGELES CAR—INTERIOR VIEW

DETAILS OF RECONSTRUCTION

It was found most advisable in the rebuilding work to gain the desired 7 ft. 6 in. of length by cutting the cars in two in the middle and splicing in a new section. Incidentally this new section was designed so that it embodied the radical changes desired in the new cars, and thus many alterations that would otherwise have been necessary were avoided. In this work the upper deck of the roof is taken off and the ventilator sashes are removed. Then, by using false rafters from the top plate to the deck sills and putting in the extra length at the center an arched roof is built with practically all the old material, even the headlining being replaced.

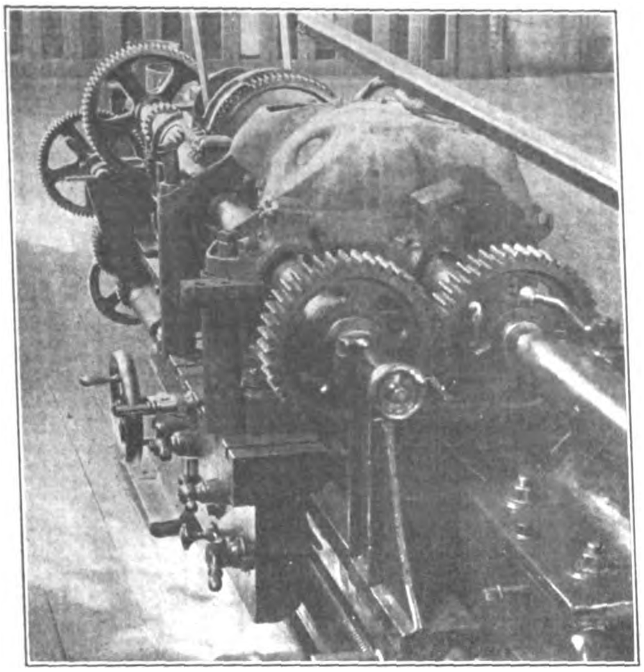
In rebuilding the floor framing, two new longitudinal sills are used. These are 4-in. 10¾-lb. I-beams, and they are bolted together on the center line of the car, while the two 5-in. 14¾-lb. I-beams used in the old car replace the old side sills. These beams are bent cold to conform to the depressed center floor level, and the two old beams are lengthened at opposite ends of the car by extra pieces, each firmly riveted to the old beams by two ½-in. splicing plates. The ½-in. x 7-in. sill plates of the old car, which are also a part of the floor framing, were neither the right width nor shape for the new design, but they were made to serve the purpose as well as new material at a considerable saving. These plates were first straightened and then put in the planer to be cut down to the ½-in. x 6-in. size desired. They were then cut in two at the middle, bent to the new shape and taken to the electric-welding shop. Here the 7 ft. 6 in. additional length was welded in at the center, the shape of the inserted length being suited to the feature of having the step recessed within the car body. The old bolt holes were welded up with new material, and the remodeled plates are said to be satisfactory in every way. The progress with the electric welding outfit is said to be such that a single operator easily turns out three times as much work as was formerly done by two blacksmiths.

In the remodeled cars the window frames and sashes are replaced, and the body posts are lengthened to conform to the sloping floor. The bench seats of the in-



Front Elevation Section E-F Length Overall 46'7" Side Elevation

REBUILT LOS ANGELES CAR—PLAN, SIDE ELEVATION AND SECTIONS, SHOWING SEAT ARRANGEMENT



REBUILT LOS ANGELES CAR—LATHE EQUIPPED WITH JIG FOR REPAIRING BEARINGS OF OLD MOTOR

closed sections are sloped 1¼ in. in 6 ft. to relieve the variation caused by the incline of the floor. Maple flooring is used in the entrance section, and pine, covered in some places with a steel mat, is used in all other parts of the car. In the entrance section four stanchions extend from floor to roof, and a removable bar, which can be used in either pair of these, serves as a barrier to limit the passageway and permits the conductor to stand behind the fare box and entirely out of the way of passengers.

Although the same control equipments are used again in the remodeled car, these are not placed on the center line as before but are located at the right-hand corners of each end of the car where the motorman's space is closed off by stanchions and crossbars. Both conductor and motorman are provided with removable seats which can be adjusted to any desired height on the stanchions.

The repair shops of the company are so equipped that they can handle all parts of the work involved in transforming the cars. The cars to be rebuilt are moved from place to place in the shops by means of transfer tables, and by distributing the various parts among the proper departments the rebuilding is carried on expeditiously. This is greatly facilitated by the company standard, which requires all parts to be interchangeable. The regular force of the company handles the work, and when not interrupted by special orders or rush repairs on disabled rolling stock it can turn out the rebuilt cars at the rate of three per week. It is interesting to note that when the rebuilding was first undertaken the progress was less than half this rate.

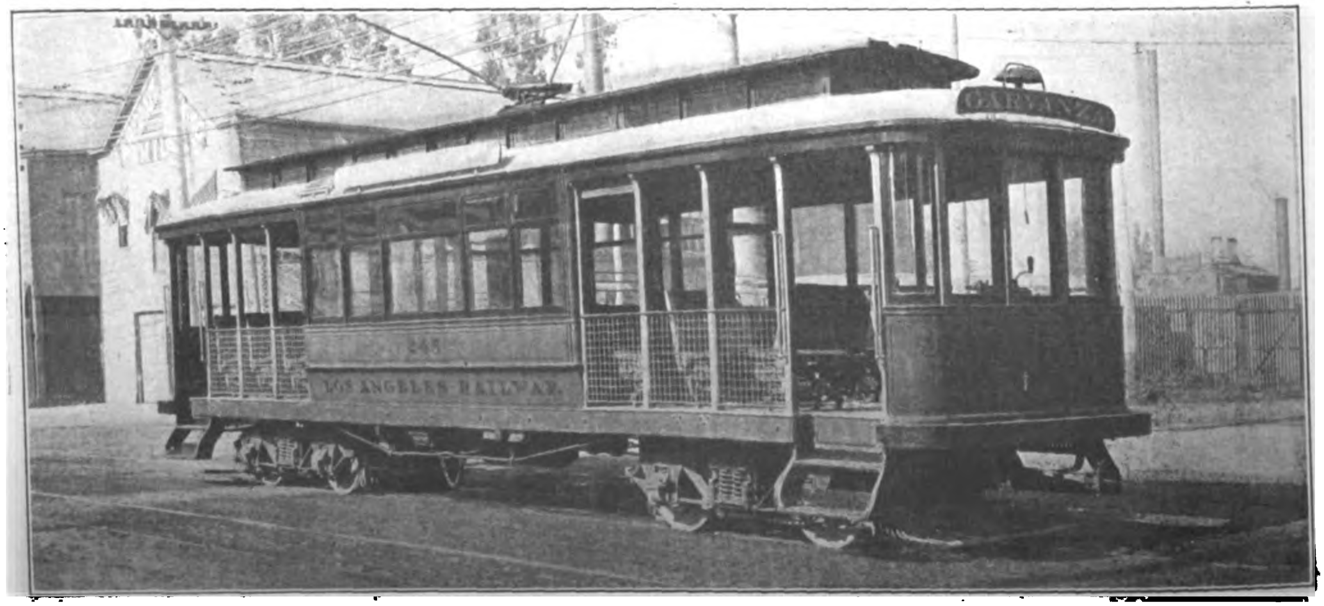
A careful system of accounting is in vogue in every department, so that a close check is kept on the cost of each branch of the work. Typical of this is the paint storeroom, where three experienced men mix all the paints used in the shops. When beginning work the car painters go to this room and receive paint and brush over a counter. The paint is weighed and charged up to the job as it goes out, and whatever comes back is deducted from the original charge. Brushes are cared for every night by the three regular paint-room men.

The work of remodeling the cars will probably not be completed until some time early in 1916, and at the present time exact cost figures are not available. It may be said, however, that judging from the cars already turned out the cost of materials and labor is estimated to be $678 per car, distributed as follows:

Labor	$165
Signs	118
Wiring	80
Painting	160
Materials	155
Total	$678

Comparing this with the $3,000, which is approximately the cost of a new car body of the same type, the economy of the plan is obvious. It is to be noted that the cost of remodeling is considerably increased by the signs, which are an entirely new feature, as well as by the necessity of entirely repainting and refinishing all parts.

The design of this center-entrance type of car, as well as the general scheme of the remodeling, was worked out by E. L. Stephens, master mechanic Los Angeles Railway, under whose personal supervision all work at the repair shops is carried out.



REBUILT LOS ANGELES CAR—VIEW OF OLD STANDARD CAR BEFORE REBUILDING

Investment Bankers' Association Convention

A Brief Account of the Proceedings at the Third Annual Convention of the Investment Bankers' Association of America in Philadelphia on Nov. 12-13—List of New Officers—Abstracts of Papers and Committee Reports of Interest to Electric Railway Officials

The third annual convention of the Investment Bankers' Association of America was held on Nov. 12-13 in the Bellevue-Stratford Hotel in Philadelphia. The president's address, which was abstracted in the ELECTRIC RAILWAY JOURNAL of Nov. 14, was delivered by George B. Caldwell, Chicago, on Thursday morning. This was followed, among other things, by a committee report by John E. Oldham, of Merrill, Oldham & Company, Boston, on railroad rates from the investor's point of view, and a report on railroad bonds and equipment notes by Samuel L. Fuller, New York. At the afternoon session on Thursday, an address was delivered by Rudolph Diamand, A. B. Leach & Company, New York, on the subject of "Investment Bankers and the Federal Reserve Law."

At the Friday morning session Andrew J. Frame, president Waukesha (Wis.) National Bank, presented an address on "An Equitable Solution of the Public Utility and Conservation Problems." On Friday afternoon two addresses were delivered as follows: "The Existing Steam Railroad Situation," by William H. Coverdale, president William H. Coverdale & Company, Inc., New York, and "The Modern Gas Company as a Security for Bonds," by Rufus C. Dawes, president Metropolitan Gas & Electric Company, Chicago. The papers and committee reports mentioned are abstracted below.

The following officers and governors were chosen for the ensuing year: President, A. B. Leach, A. B. Leach & Company, New York; vice-presidents: Frank W. Rollins, E. H. Rollins & Sons, Boston; Allen G. Hoyt, N. W. Halsey & Company, New York; John E. Blunt, Jr., Merchants Loan & Trust Company, Chicago; J. W. Edminson, William R. Staats & Company, San Francisco; Charles A. Otis, Otis & Company, Cleveland; secretary, Frederick R. Fenton, Devitt, Tremble & Company, Chicago; treasurer, J. Herndon Smith, Smith, Moore & Company, St. Louis; governors: Lewis B. Franklin, Guaranty Trust Company, New York; Charles W. McNear, C. W. McNear & Company, Chicago; Warren S. Hayden, Hayden, Miller & Company, Cleveland; George W. Kendrick, III, E. W. Clark & Company, Philadelphia; Lawrence Chamberlain, Kountze Brothers, New York; William R. Compton, William R. Compton & Company, St. Louis; William G. Baker, Jr., Baker, Watts & Company, Baltimore; John E. Oldham, Merrill, Oldham & Company, Boston, and Charles H. Gilman, Charles H. Gilman & Company, Portland, Maine.

SECURITY FOR BONDS

The address by Mr. Dawes, while dealing particularly with the subject of the "Modern Gas Company as Security for Bonds," brought out some ideas regarding general bond security that may be of interest to electric railway officials. According to Mr. Dawes, the interests of bondholders are generally best protected by preserving as much freedom as possible to those operating the property, the ownership of the equity and the operation of the property being in the hands of honest and capable men, whose leading motive must always be the protection of the bondholders. Under other conditions, in spite of skilful trustees and favorable business opportunities, the interests of the bondholders may be jeopardized.

Continuing along this line, Mr. Dawes remarked that in order to serve a growing community or to supply new demands, new funds must be provided through the increase of some form of liabilities, floating indebtedness, mortgage indebtedness or stock issues. Under proper restrictions this ought to be cared for by the issuance of additional bonds on a parity with those originally issued. A closed issue or an authorized issue too small is an injury to the bondholders. Similarly, a burdensome sinking fund may hamper a company in its ability to serve the public. The ability of the company to retire its bonds at maturity is not determined by the amount of the bonds outstanding at that time but by the ratio between the amount of its stable net income and the amount of the bonds outstanding. Preservation of the stable net income is the best protection for the bondholders, and withdrawals for sinking funds should never be so large as to interfere with this. Corporation bonds that are good are never retired but are refunded, for the financial utility of bonds to the community at large, both as promoting enterprise and as providing investment, is such that to retire well-secured bonds would be a double calamity.

In Mr. Dawes' opinion, bonds should offer stable net income upon the capital invested and the sure return of the capital at maturity, with reasonable facility for conversion into cash at any time. The best assurance of steady income is that obtained from a business supported by the public at large and supplying the public with a public necessity. Such a business operates under conditions that invite the interference and protection of the government for the continuation and regulation of the supply, and the fundamental principle of such regulation is the recognition of the right of the investment in the property to a reasonable rate of return.

INVESTMENT BANKERS AND THE FEDERAL RESERVE LAW

According to Mr. Diamond, there will be less reason for metropolitan bankers to hold bonds for permanent investment under the new federal reserve law, because the Aldrich-Vreeland act expires and bonds cannot be used to take out emergency circulation and because these banks will have a broader opportunity to use their funds for acceptances and other paper. As far as the carrying of bonds in loans or the offering of facilities to banking houses to handle their business is concerned, however, these will not be substantially restricted. Mr. Diamand considers in this connection that our national banks have previously invested a much larger amount in bonds than the banking institutions of any other country. He also said that 37.6 per cent of all the loans were based on stocks and bonds and feels that this represents too large a part of the resources to be invested in fields in close direct or indirect contact with the stock exchange.

Mr. Diamand believes that bankers in the small cities will find conditions under the federal reserve law approximately the same as in the past and that such banks will be disposed to invest 50 per cent of their surplus moneys in bonds and 50 per cent in commercial enterprises. The proportionate investment in stocks as compared to bonds will undoubtedly follow the same course as in the past.

With business in its present depressed condition, it is not believed that banks will be disposed to push back into the market very large amounts of bonds, certainly not until prices more nearly approach the purchase price. In the long run there may be a change in the character of the investment of the banks in a large city, but this change will come slowly. In discussing the dumping of European-held American securities on our markets as a result of the war, Mr. Diamand says that he does not believe that there will be any great influx of American securities from foreign countries, and even if there were any the sales would not come rapidly.

In concluding, Mr. Diamand said that the federal reserve system would tend to stabilize interest rates, would result in a broader and better banking system, would help to eliminate serious credit disturbances and would enable investment bankers to recommend with more confidence the securities of different corporations.

EXISTING STEAM RAILROAD CONDITIONS

Mr. Coverdale in his address on the above subject said that the ability to comprehend present railroad conditions and the courage to act upon them cannot be secured by working back to pioneer days of railroading and endeavoring to reconstruct the development with all its milestones of success and skeletons of failure, by trying to measure the record of the past with a personal yardstick of present financial morality or by stirring up factional disputes regarding rates, dividends, service and the like. As first aid to the injured income account and crippled credit of to-day, Mr. Coverdale offers a panacea of nonpartisanship which permits and encourages an impartial investigation. He would then apply the panacea by acquiring first-hand knowledge on the points involved and endeavor to secure a bird's-eye view of the relative merits of the different claims determined. Only in this way can the broad question of railroad economics be analyzed and its various practices properly correlated.

In discussing the various factors involved in the present situation, Mr. Coverdale assumed that certain railroad maturities are impending and that certain defaults exist which must be cured through some process of reorganization. In his opinion, the first point to be remembered is that the economic soundness of a proposed expenditure should receive consideration. The final costs of the proposition should be determined by the bankers as well as by engineers. Mr. Coverdale quoted a remark made by Samuel Insull last year before the convention to this effect: "It is not the price of coal or labor but of money that governs." With the economic soundness of the proposed expenditure determined, it then devolves upon the officers, owners and bankers to work out a practical plan or some practical modification of that existing. All securities issued under any new plan should be bounded on the north and the south by the value of the property and on the east and west by its income. When the whole of the capital liabilities is kept within these bounds their distribution into several classes in appropriate amounts is easily accomplished.

Mr. Coverdale next described the average investor's knowledge of the value of the property back of his investment, which may be summed in the paraphrase: "His not to reason why, his but to blindly buy." Mr. Coverdale urged investment bankers to conduct a thorough investigation of the relation which the amount of the lien bears to the value of the property, avoiding liens beyond whose bulky outline no sign of equity can be discerned with the naked eye and also that ingenious combination of equipment note and refunding mortgage which carefully insures a perpetual liability against a fast dwindling asset.

In regard to the inability of the average investor to make an adequate study of the property and accounts of the company, Mr. Coverdale said that investors should depend on investment bankers. The latter should be prepared to fulfil their duty to the investors. Better conditions can be brought about by investment bankers and their associates whose effective co-operation at the time of marketing securities is evidenced by underwriting syndicates and by combined selling organizations. They should make the general design and write the general specification of every security authorized and the detailed design and the detailed specification of every security issued.

As the investment banker is the temporary link between the company and the investor during the marketing period, so the trustee is the permanent link between them during the life of the indenture, and as the function of the banker should be enlarged to govern the making of the security, so the function of the trustee should be enlarged to govern the control of it after it is made. Indentures should cease to specify the duties of the trustees at great length and then relieve them of responsibility by allowing them to decide between parties by merely accepting a statement from one of them. As long as some trust deeds provide that bonds may be issued to cover maintenance expenditures, renewals and even interest charges, the trustees will be powerless to protect either the property or the bondholders.

Mr. Coverdale said that within five years 90 per cent of the present railroad mileage can be made sound. He criticised the usual process of reorganization through a receiver as adding an additional load to an already burdened property. One of the receivers is often the officer responsible for the bankruptcy, in so far as it may have been caused by operating conditions. As such he has immediate opportunity to accomplish under sanction of the court and through the issuance of receivership certificates what he was no longer able to do on the credit of the solvent company. If railroads rise under such a treatment, it is in spite of the low vitality which such a course entails. A saving element is the work of representative committees which have a way of ascertaining facts accurately and assimilating them quickly. Instead of working in terms of securities only, they work in terms of values, income, securities and property requirements.

Mr. Coverdale stated that the proportion of efficiency among officers and directors is often greater than the proportion of mileage whose record as to values, credit and income is unassailed and unassailable. In nearly all cases in his experience where railroads had required reorganization, the underlying causes have been far beyond the reach or control of the officers and directors.

In closing, Mr. Coverdale mentioned the necessity for higher rates and said that as close supervision and regulation at the hands of investment bankers will benefit future issues of securities, so the proper regulation of rates may improve and maintain their stability. It was his conviction that the needs of the railroads in this country are far greater than the operating results to be obtained from the maximum of human efficiency under existing rate conditions.

REPORT ON EQUIPMENT TRUSTS

The report of the committee on railroad bonds and equipment trusts was devoted almost entirely to an analysis of the present situation regarding equipment bonds and notes and the suggested improvements to be incorporated in indentures backing up such securities. As a result of its investigations since 1912, the committee concludes that the whole question of equipment trusts and the sufficiency of equipment as security for the equipment trust is one which goes into the very heart of the theory and practice of railroad accounting. While conditions affecting the management, auditing and financing of corporations have undergone many changes tending to safeguard and protect the investor's interest, it is the opinion of the committee that the indenture securing equipment trusts and railroad bonds has developed more and more to enable the borrowing corporation best to serve its own ends rather than to protect the investor. Under such conditions the principal matters which should be considered in the drawing of equipment trust indentures are grouped under the following heads:

1. PROPER VESTING OF TITLE OF TRUSTEE:

The trustee has to be protected against (a) attachment and judgment creditors of the railroad; (b) purchasers for value and subsequent mortgages of the railroad company; (c) prior mortgages which contain the usual after-acquired property clause covering rolling stock. The existing special rolling-stock recording acts which have been passed in practically every state and in Canada protect the trust against the first two classes of claimants if the trust agreement is properly recorded. With regard to prior mortgages, it is extremely important always to provide that no part of the equipment covered by the trust shall be delivered to the railroad prior to the execution and filing for record of the agreement, and the agreements for the construction of the cars should be made directly between the car manufacturers and the bankers or the trustee of the equipment trust.

The committee says that railroads have been lax in respect to such details in recent years. Moreover, various schemes have been prepared by which individuals or car companies have acquired cars from time to time for the uses of a particular railroad, arranged for leases of the equipment to the railroad and thereafter sold equipment-leased certificates to bankers. Such arrangements are open to question on the ground that these individuals are usually either the railroad itself in a different form or individuals who are agents of the railroad. The committee in this connection does not refer to the form of equipment trust issued under the so-called Philadelphia plan.

2. MAINTENANCE OF EQUIPMENT:

While almost all equipment trusts have provisions in the indentures requiring that the equipment shall be maintained or replaced, it has not been the practice of many trustees or of the banking firms handling equipment trusts to require that such provisions be carried out. Often new equipment has been purchased when repairs to existing equipment would have made the new purchase unnecessary. The committee feels that regular reports should be made to the trustee by the railroad covering the condition of the equipment pledged. The committee has submitted forms to be used in rendering such reports.

3. FUNDING THE PAYMENT OF PRINCIPAL AND INTEREST:

The committee found in looking over a number of indentures that no provision had been incorporated to prevent the extension of such maturing obligations. In order to safeguard against this practice, it recommends that the necessary funds sufficient to pay the principal and accrued interest of notes as they become due be deposited with the trustee and that when such notes are paid they be cancelled and no notes in substitution of them issued. No purchase or sale of notes or advances upon the same should operate to keep equipment notes alive after maturity.

4. ENFORCING CLAUSE:

An enforcing clause should be included in the indenture to enable the trustee to declare a default if the provisions of the indenture are not lived up to by the railroad. The trustee should be furnished with complete drawings describing the equipment so that in case of default it may have a full record to enable it to effect the sale of the equipment for the protection of the trust.

In the opinion of the committee the responsibility of the investment banker does not cease with the sale of the equipment trust certificates to his clients. The greatest evil to-day in connection with these securities is the neglect of investigation and regular oversight. The investment banker should make himself familiar with what provisions should be included in a properly drawn indenture securing equipment trusts. He should refuse to handle equipment trusts unless the indentures are properly drawn, and he should guard his clients' interests regularly and systematically by seeing to it that both the trustee and the railroad live up to the terms of the agreement.

EQUITABLE SOLUTION OF PUBLIC UTILITY PROBLEMS

According to Mr. Frame, the best authorities agree that the difference between private and public ownership and management of any utility approximates 20 per cent in favor of individualism. This 20 per cent spells human progress as compared to human decay. Mr. Frame believes that the greatest progress lies in individual ownership and management of public utilities subject to government supervision, but such supervision must permit of reasonable profits.

For solving public utility problems Mr. Frame suggests that all public utilities should be under the control of the United States Corporation Bureau or the Interstate Commerce Commission for interstate enterprises and under state commissions for state enterprises. Stock issues should be limited to the actual values turned in to the corporation, the cost of incorporation and interest on money advanced during construction, as well as a percentage of stock to cover a reasonable risk, not to exceed 10 per cent. Bonds should be limited to not more than 75 per cent of the total cost. Non-competitive charters should be granted for not less than twenty years at rates sufficient to pay annually a net profit of from 6 to 8 per cent, according to the risk involved. In arriving at the net profit deductions should be made for salaries and labor bills, adequate depreciation charges, reserve for accidents and extraordinary risks, interest on funded debt and cumulative dividends of from 6 to 8 per cent. The net profit above these amounts should be divided equally between the municipality or state or nation and the stockholders.

Additional stocks should be issued only for permanent improvements on the approval of the commissioners. Present outstanding stocks should remain, to be equitably adjusted whenever the corporation asks for an increase of stock. Charter extensions should be granted for twenty years and rates readjusted for service according to the average annual profits for the last twenty-year period. Mr. Frame believes this twenty-year average is equitable on account of the economic maxim that "waves of prosperity follow those of adversity."

Mr. Frame would apply the above plan not only to public utilities but with equal force to undeveloped water powers, coal mines, etc. In the case of public utilities non-competitive time charters seem necessary, but in the case of conservation of natural resources only absolute ownership with a share of net profits to the state will insure quick development.

Mr. Frame cites the city of Chicago as an example of how this plan of dividing the net profits may be worked out. He says that this city has received more than $10,000,000 in the last ten years as its share of profits on a straight 5-cent fare. This, he admits, is not a criterion of what to expect from all public utilities because large profits come only in great cities. To his mind, excessive corporation profits, except in rare cases of superior management, are a popular fallacy.

RAILROAD RATES FROM THE INVESTOR'S POINT OF VIEW

The paper by Mr. Oldham pointed out that the cost of capital cannot be neglected in adjusting railroad rates and showed that the adjustment of rates on the basis of any assumed rate of return will not provide a settlement of the question which will stand without alteration under changing conditions over any long period of years. On the present basis of railroad capitalization represented by the most conservative roads, an increase of 1 per cent in return on capital involves an increase of 5 per cent in income.

The author analyzed the financial condition of nineteen of the best railroad systems as averaged from 1900 to 1909, when railroad investments were in general favor, with operations in 1913, admittedly a year in which the securing of new capital was difficult on reasonable terms. In 1913, for every $100,000 of gross earnings, there was a capitalization of $505,000, and on this there was available for interest and dividends $32,300, or 6.4 per cent, compared with 6.8 per cent on a capitalization of $540,000 in the earlier period. There was actually paid in interest and dividends $26,200, or 5.2 per cent, as against 5 per cent in 1900-1909. There was left a surplus of 1.2 per cent on capital in 1913 compared with 1.8 per cent in the ten-year period. It is a mistake, however, to deduce from these figures that the railroads are in a prosperous condition. Owing to reductions in fixed charges due to the refunding in the ten-year period of more than $300,000,000 of bonds bearing interest at from 5 to 8 per cent, to increased efficiency of management and to the ability of the railroads to draw upon previously accumulated surplus earnings for property improvements, the railroads have been able to make the 1913 showing. The expense of financing the railroad business in order to gain $100,000 gross earnings is not stationary, any more than the cost of operation, and in view of the higher prices in recent years of labor and materials and the increasing demands for improved service, the conclusion should not be hastily drawn that because the face value of the capitalization was less in 1913, it required less actual investment to obtain $100,000 in revenue. The importance of the surplus in relation to railroad and any other form of public utility financing is very great.

After explaining fully the favorable circumstances which have kept the railroads from making a showing which is a true index of the present conditions, Mr. Oldham pointed out that the final test of the situation in public utility financing is the willingness of the investor to purchase permanent securities. The forced reliance of the railroads upon short-term borrowings indicates that present earnings do not yield a sufficient return to attract capital. The rate required by investors advanced in the period under consideration from ½ per cent to ¾ per cent on bonds and 1 per cent to 1½ per cent on stocks. The advance in payment by the railroads on their capitalization, however, rose only from 5 per cent to 5.2 per cent, and it was necessary to cut down the surplus which existed as protection from 1.8 per cent to 1.2 per cent. The cost of capital must necessarily include sufficient surplus to protect the actual return on capital.

Whether the rates for capital are low or high is a matter of comparative indifference if the cost of money and the necessary protection are recognized as forming a necessary part of the rate. The free entrance of capital into the market for railroad securities will mark the point at which the investors consider the readjustment to be effective. The events of 1914, and their effect upon the market for capital, indicate that a sufficient readjustment to meet the conditions of 1913 would still fall short of meeting the present conditions. The readjustment necessary to re-establish credit for the best railroads would still fail to give credit to the average roads. The minimum readjustment would probably be such as to insure a return on capital of from 30 per cent to 35 per cent of gross earnings, with a cost of service of from 65 per cent to 70 per cent, as compared with an actual service cost of 74.3 per cent for 1913.

Joint National Committee on Electrolysis

A meeting of the joint national committee on electrolysis was held in New York on Nov. 13. The personnel of this committee and of its sub-committees was given in the issue of the ELECTRIC RAILWAY JOURNAL for April 4, 1914, page 763, and its plans were commented upon editorially in the issue for June 27, page 1428. The purpose of the meeting was to receive and discuss the reports of the four sub-committees appointed last spring. These sub-committees with their respective chairmen were as follows: On principles and definitions, E. B. Rosa; on methods and analysis of surveys, J. D. von Maur; on foreign practice, Philip Torchio, and on domestic practice, F. N. Waterman. The sub-committees presented full reports which, after discussion, were referred to a committee of eight members for revision and editing, preparatory to publication. The report is, however, to be submitted to the full committee for approval before it is finally released. There were present at the New York meeting the following, representing the interests indicated: R. P. Stevens—American Electric Railway Association; E. B. Katté—American Railway Engineering Association; Philip Torchio, L. L. Elden and D. W. Roper—National Electric Light Association; H. S. Warren, F. L. Rhodes and A. P. Boeri—American Telephone & Telegraph Company; B. J. Arnold, chairman, and Paul Winsor—American Institute of Electrical Engineers; E. B. Rosa, secretary—National Bureau of Standards; F. Towle and S. S. Wyer—Natural Gas Association; and A. F. Ganz, J. A. Gould and J. D. von Maur—American Gas Institute.

Interborough Rapid Transit Signals

In the Oct. 31 issue of the ELECTRIC RAILWAY JOURNAL on page 1010 it was stated that the signals on the subway division of the Interborough Rapid Transit Company were "controlled by a single-rail-return track-circuit system which was installed in 1903 by the Union Switch & Signal Company." This statement should be elaborated to express the fact that, while the original installation was furnished and erected by the signal manufacturers, all subsequent modifications, extensions and improvements for the system, or approximately 50 per cent of the whole, were erected by the forces of the signal engineer's department of the Interborough Rapid Transit Company. All material for these additions to the original installation was furnished by the original manufacturer, but since the year 1905 the railway company has been doing all of its own erecting work.

Labor Conditions in Europe

Report Presented at Meeting of American Federation of Labor at Philadelphia Last Week—Wages Lower and Transportation Conditions Poorer in Europe than in America

At the annual convention of the American Federation of Labor in Philadelphia last week there was a special report entitled "Labor Conditions on European Municipally Owned Railroads." It was presented by W. D. Mahon and L. D. Bland, who visited Europe last summer in accordance with the following resolution adopted last year at the Seattle convention of the federation.

"Whereas, the question of municipal ownership and operation of street and electric railways is being considered by a number of the municipalities throughout the United States; and

"Whereas, this is an important question to the thousands of organized workers in the various trades and callings that follow this line of employment; therefore, be it

"Resolved, That the president and executive council of this American Federation of Labor are hereby instructed to make a thorough investigation as to the wages and hours of labor and the conditions of employment, including the rights of the employees to collective bargaining and the protecting of their labor through organization in such countries as have already adopted and are now operating their street and electric railways under municipal ownership, the results of this investigation to be submitted to the next convention of this federation with recommendation thereon."

An abstract of the report is printed below:

GERMANY

Of the 209 tramway systems in Germany, 134 are in the hands of private companies while the other seventy-five are owned and operated by local administrative bodies, districts or municipal councils. In some cases there is joint ownership by the municipalities and private parties, and there is a tendency to place the operation of these jointly owned properties in the hands of private parties to avoid the responsibility of operation and of dealing with the labor question.

Organizing the street railway workers of Germany has proceeded with great difficulty and under trying circumstances. It is claimed by some that the tramway employees have no legal right to organization. Old age, sickness and accident insurance are compulsory by law. According to Mr. Rathmann, the tramway representative of the Transportation Workers in Berlin, "A sudden rush to join the organization as soon as it is worth while, that is, to secure an increase in wage, and quite as sudden a rush to leave it as soon as the movement is over, seems to be a peculiarity of the tramway men, which in spite of all educative efforts of our union we have not been able to exterminate up to the present."

The report adds that although the German union, during the past three years, has fought on behalf of no less than 36,631 employees for an increase of wages, the records for 1912 show that among all these numbers there were but 8528 in good standing in the organization. The strikes of German tramway employees have been of short duration, the longest on record being three weeks. This occurred in Königsberg in 1912.

Under the head of "working conditions" the report says that the organized workers of Germany have no general labor contracts as in the United States. All contracts are made by the individual worker with his employer. He makes a contract to cover his probation period, then after he is accepted as a regular man, he makes another contract. Except as the organization has been successful in modifying them, the contracts are severe in their demands, restrictions and penalties.

The following are some of the working conditions of German tramway employees, according to the report, except that the money is translated into American currency:

"A man going to work on the trams must practice for eight weeks to learn the business. This is a government regulation. For that work he gets 60 cents a week. He must also put up an indemnity in the way of a forfeiture, averaging about $18, and this stands against him, indemnifying the company in cases of breakage or any violation of the company's rules and regulations, for all concerns have a system of fines ranging anywhere from 24 cents to as high as $3.60 or $3.84, which are imposed for the violation of rules and regulations. So if a man should fail to report in the morning and lose his run he would be fined from 24 cents to 48 cents for such offense.

"The medical test in the tramway service throughout Germany is very rigid. In addition to answering satisfactory specific questions pertaining to military service, an applicant must undergo a thorough examination by the officiating doctor and be pronounced physically sound.

"The company reserves the right to discharge without notice, while the employee who desires to quit is required to give notice in some instances as long as three months in advance. Failure to comply with this regulation invariably results in forfeiture of bond, and, as one of our German brothers put it, 'every strike is a breach of contract and if the men lose they forfeit their bond money.'

"An example of this is shown in the report on the strike of the tramway men of Saarbrucken, which occurred in 1911. It was conducted by a union not affiliated with the regular movement. The strike failed, and every striker reinstated had to pay the company 50 marks ($12) from his deposit money. The security was then increased 50 marks, so that each had to put up another 50 marks to make the deposit 100 marks ($24). The men who refused to return to work were fined by the company 92.50 marks, which practically confiscated the amount they had on deposit.

"All concerns furnish uniforms for the men, but these uniforms are furnished just as a shovel or any other tool is furnished. They are not the property of the men at all. They are simply worn while in the service, are kept in repair, and when the men leave the service they must be turned back to the company, or else they must be paid for out of the indemnity which the employee deposits on entering the service."

The report, in comparing the wages in 192 German cities, on both municipally and privately owned systems, says that the average wage for motormen during the first ten years of service varies from 73.5 marks ($17.64) to 147 marks ($35.28) per month. During the first five years of employment there are fifty-six concerns that pay from 73 to 90 marks ($17.52 to $21.60) and 124 that pay from 90 to 105 marks ($21.60 to $25.20). Some of the wage scales call for fifteen, twenty and thirty years of service and even more before the maximum pay is reached. The conductors usually get about $3 a month less than the motormen.

This difference they are supposed to make up in tips they receive from the riding public.

FRANCE

There is no municipal tramway development in France. In Paris there are some 24,000 men employed in the tramway, underground and omnibus systems; 10,000 on the trams or surface railways, 5000 on the underground, and 9000 on the omnibus service. Of these the tramway and underground men have responded least to organization.

The systems of wage on the transportation lines of Paris differ. Some employees are paid by the month, some by the day, and others by the hour. In the train service there are five grades of pay. In the fifth class men receive 165 francs ($33) a month; fourth class, 175 francs ($35) a month; third class, 185 francs ($37) a month; second class, 195 francs ($39) a month, and first class, 200 francs ($40) a month. The entrance to these various classes is not fixed by time service, but depends upon vacancies in each, so that promotion from a lower to a higher class, with resultant increased pay, can come only when a vacancy occurs. The workday on the Paris trams is ten hours, and most of the runs are completed within twelve hours. The law provides one day off in seven.

SWITZERLAND

There are forty-one tramway systems in Switzerland, eight of which are operated by municipalities and thirty-three by private concerns. The total number of all tram employees in Switzerland is 3553, including all classes. The right of the workers to organize is guaranteed by law. The laws of Switzerland also provide for insurance against sickness and accident. The managements are compelled to insure all employees and pay all premiums.

The wage at Berne for conductors starts at 150 francs a month, or $30, and reaches 220 francs a month, or $44, in ten years. The beginning wage for motormen is 155 francs a month, or $31, and after ten years the maximum is 230 francs, or $46 a month. The workday is nine to ten hours, completed in fourteen to fifteen hours. Berne has a municipal line. On the privately operated trams in Switzerland, the wage paid employees is a trifle less than on the municipal roads.

ITALY

The investigation of the conditions in Italy was interrupted by the outbreak of the war. Some figures, however, were obtained in Rome and Milan. In Rome there are one steam and four electric tram lines. One of these is owned by the municipality, which will take them all over in 1920. The wages on the private lines begins at 64 cents a day, and the maximum wage after ten years' service is 94 cents a day. The workday is nine hours, completed in about thirteen hours.

The wage on the municipal road is 10 cents a day more than on the privately owned roads, but other conditions are about the same. On the municipal system the employees are paid every two weeks, and on the private systems they are paid every week. Trainmen on all roads have one free day in every fifteen.

GREAT BRITAIN

Two cities only in Great Britain were investigated, London and Glasgow. The wages for the motormen and conductors on the lines of the London County Council Tramways is from $1.20 to $1.56 per day. These wages are higher than on the privately owned lines in or about London, but the latter are all outside the County area and in less congested districts. The workday is nine to ten hours, completed in fifteen, and the six-day week prevails.

In Glasgow the employees in the various mechanical departments of the municipal tramways to the number of about 400 are organized, but the motormen and conductors, who number 3012, have no union. One was organized in 1911, but disbanded after a strike. The men work a six-day week of fifty-one hours. The wages per week for motormen and conductors vary from $6.48 for the first year to $8.16 for the seventh year and $8.40 thereafter. The physical tests required are very rigid and more exacting than for military service.

CONCLUSIONS

The conclusions in full follow:

"We began our investigation of conditions surrounding the tramway workers of Europe with an open mind. We were ready for impressions and determined to report facts as we found them. The war prevented us from going into the investigation as thoroughly as we had planned, yet the field that we covered and the access we had to information gave us a good understanding of conditions.

"The tram systems of Europe are not to be compared to the street railway systems of the United States. Throughout continental Europe and the United Kingdom, in the most thickly populated centers, the street railway service is inferior to ours in many respects. In the continental cities the track mileage is small compared with the United States. This contributes to density of traffic and profitable operation. The same is true of the United Kingdom, whose total street railway trackage is about 3600 miles as against 40,470 miles operated in the United States.

"We found the same spirit of commercialism dominating the electric railway systems of Europe, private and municipal, as exists in this country. If any credit is to be given either, it belongs, in our opinion, on this side of the water, for the American system, to our minds, is not only cheaper to the public, all things considered, but the service is better with a great deal more of it. Cheap fares on the zone system prove dear fares to the worker if he has to ride any considerable distance or take intersecting lines, for each zone entered means an additional fare, and there are no transfers on European systems. Zone fares and inadequate wages force the workers of Europe to live close to the workshop, mill or factory. It is rare to find a European worker who can afford to live in suburb or country, miles away from his work, as is frequently the case here. The rate of fare for long distance makes it prohibitive, and the wage will not warrant the expenditure.

"Thus the zone fare system contributes to congestion and compels the workers to live in the most uninviting districts. It retards suburban development and adds to the rents of the workers, who not only have to suffer the inconvenience of small living quarters but are denied sunlight and sanitary surroundings as well.

"And right here we desire to comment that with all the claim for legislative enactments helpful to the workers, municipal utility enterprise and co-operative development, we found the living standards of the workers of Europe, tram as well as others, so far below the average of the workers of America that no comparison is possible. The rapidity with which the workers of Europe are grasping the truth that their efforts must be concentrated in the economic field, through their trade unions, was the most hopeful sign that this condition would be altered.

"None of the European systems has a night car service, such as we have in our big cities. Nor have they an interurban electric service, that has contributed so much to the development of our rural districts and brought the consumer and producer into close relationship.

"Nor can there be any comparison between the wage of the European tram employee and his brother in the United States. From the viewpoint of the purchasing power of a dollar it has been estimated by careful observers that the cost of living in various parts of the United States is 25 per cent to 65 per cent higher than it is in various parts of western Europe. The difference in the money wage of the street railway men of these countries is much greater. The highest wage paid any body of tramway workers in Europe is safely 100 per cent less than the rate paid in this country in the same occupation, and we found this to be the fact both on private and municipal systems.

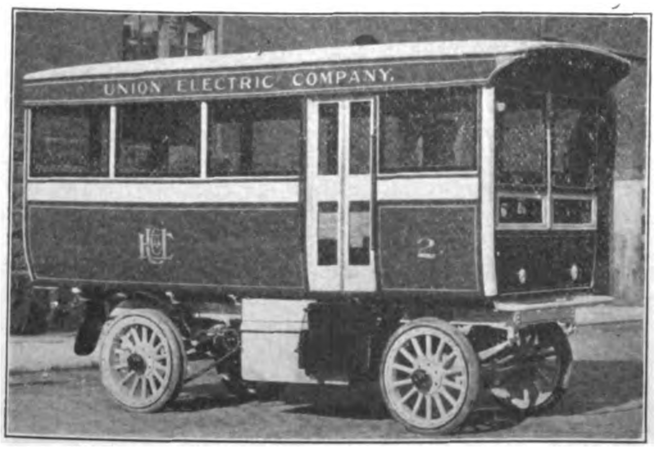
"Our investigation showed that wherever the tram workers of Europe enjoyed advanced wage and labor conditions their trade unions were responsible for them. Where the trade unions are active there the best results obtain, and whether dealing with a municipality or a private company the employees have found it necessary to maintain their unions to establish and protect their conditions."

After the above report had been presented and accepted it was returned to the writers for further consideration.

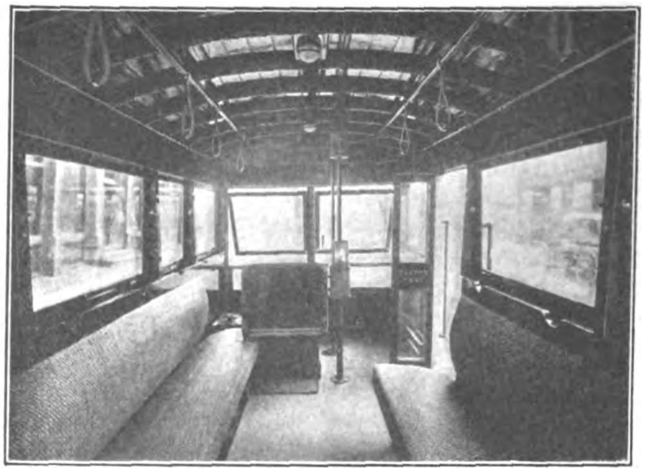
Electric Bus Service at Dubuque, Ia.

This Bus Line Connects with Four Divisions of the Union Electric Company's Car System

The Union Electric Company, Dubuque, Ia., placed in service during September, 1914, two electric buses of the type illustrated for regular service between Dubuque, Ia., and East Dubuque, Ill. This service was instituted in response to a demand of long standing from the residents of East Dubuque for a regular and dependable means of transportation between the two cities, East Dubuque being practically a suburb of Dubuque and having a population of 1500. A highway bridge owned by a private corporation and operated as a toll bridge connects the two cities. The city of East Dubuque granted the company a ten-year franchise for the operation of these buses and this was in due course approved by the Public Utilities Commission. Coincident with the granting of the franchise the Dubuque Bridge Company made a contract giving the railway company the exclusive right to operate a bus line over the bridge.



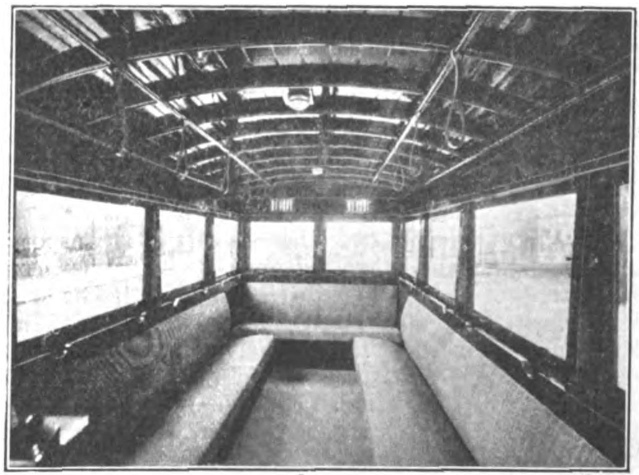
DUBUQUE ELECTRIC BUS SERVICE—VIEW OF BUS, SHOWING STEPS FOLDED AND DOORS CLOSED



DUBUQUE ELECTRIC BUS SERVICE—INTERIOR OF PASSAGEWAY, SHOWING ALSO LARGE SASH

A 5-cent fare which includes a bridge toll is charged each way, except that children under six years of age are carried free. The distance traveled in a round trip is slightly more than 3 miles. The Dubuque terminus of the buses connects with the Union Electric Company's street car system at a convenient point, making direct connections with four of its five divisions.

The bus bodies were built by H. McFarlane & Company, Chicago, and are mounted on 2-ton underframes built by General Vehicle Company. They seat twenty passengers. The buses are very sightly and their painting conforms to the standard used by the Union Electric Company in painting all of its cars, namely, special traction orange, lemon, with Tuscan red trimming and silver striping. The buses are equipped with Edison batteries. While one bus is in operation the other is receiving a fresh charge.



DUBUQUE ELECTRIC BUS SERVICE—INTERIOR OF BUS AT THE REAR

E. M. Walker, general manager, advises that so far the service has been carried on without mishap and has given the very best satisfaction to the people, besides having received the enthusiastic support of the press. No transfers are given from the buses to the street cars, the fare being 5 cents straight.

The council of the Society for the Promotion of Engineering Education has decided to hold the 1915 meeting of the society at the Iowa State College, Ames, Ia., on June 22 to 25. Dean Marston, of the Iowa State College, is president of the society.

Meeting of Railway Commissioners

Among the Subjects Discussed Were the Statistics and Accounts of Electric Railway Companies, the Present Status of the Valuation of Common Carriers, Rails and Equipment, and Service

The twenty-sixth annual convention of the National Association of Railway Commissioners was held in the rooms of the Interstate Commerce Commission, Washington, D. C., this week. The sessions began on Tuesday morning.

The address of welcome was delivered by Commissioner Clements, of the Interstate Commerce Commission, who called attention among other things to the confusion and embarrassment produced where different states adopt divergent and conflicting policies which become the basis of transportation rates.

In his annual address Commissioner Finn of Kentucky, president of the association, referred to the development of the principle of government regulation of common carriers which, he said, came into existence seventy-five years ago in Rhode Island to protect citizens against discrimination practiced by steamboat companies. Subsequently the policy was applied by other states to transportation by rail. Twenty-five years ago the federal government enacted legislation to compel common carriers to give adequate service at reasonable rates without discrimination.

Continuing Mr. Finn said that the accomplishments of governmental regulation justify the time, money and labor expended, and it is accurate to say that the discrimination between individuals has been almost abolished. The task of eliminating discrimination between localities is more difficult, and in this connection Mr. Finn discussed the long and short-haul provisions of the law. He then advocated regulation and control by the authority of the state and federal government and embracing every detail of the activities of common carriers, including investments, expenditures, equipment, material, construction, operation and charges.

On account of entangled alliances between transportation companies and other big business industries, common carriers, he said, have never had a fair chance to demonstrate their maximum benefit to the public. While Mr. Finn did not specifically advocate government ownership, he made several statements which indicated a leaning in that direction. He held that an employee does not lose his efficiency when employed by the government, and that employees of private corporations are not more proficient than those engaged in government service. He said that economy demanded the elimination of competition between public service enterprises, and if private monopoly is indefensible and intolerable, he asked why a necessary monopoly should not be publicly owned.

The report of greatest interest to electric railway companies presented at the meeting was that of the committee on statistics and accounts of electric railways. An abstract of this report is published on page 1142. Abstracts of some of the other reports of interest to electric railway companies appear below.

RAILROAD TAXES AND PLANS FOR ASCERTAINING FAIR VALUATION OF RAILROAD PROPERTY

This report was submitted by Messrs. Eshleman, California; Maltbie, New York; Erickson, Wisconsin; Hemans, Michigan; Lewis, Washington; Henshaw, Oklahoma, and MacLeod, Massachusetts, and was devoted to a discussion of the methods and status of the valuation of railroads being undertaken by the Interstate Commerce Commission. In the matters discussed, the committee does not make any positive recommendations because it does not believe that these lie within its province, but said that the Interstate Commerce Commission has indicated a desire to consult with the Railway Commissioners' Association in this work, and the committee believes that the association program and work should keep in close touch with the valuation as it progresses.

The report urges, first, clear-cut definitions by the commission on such terms as "original cost to date," "cost of reproduction new" and "cost of reproduction less depreciation," as the commission and perhaps the courts will be called upon to fix the proper definition of these terms. This should not interfere, however, with the assembling of physical data.

After describing the present organization of the board of valuation engineers, the report discusses the different valuation orders and believes that "abandoned property" should not include property which is nonoperative unless it is necessarily held for operative purposes in the immediate future. It also says that while addition and betterment reports are not required for any railroad for which the government has not started the valuation work, all companies should keep their records of additions and betterments in such shape as to permit the ascertainment of such information desired as to unit cost.

In discussing depreciation, the report refers to the contention of many railroads that there is no such thing as depreciated value and that the present value of the physical property equals 100 per cent of the reproduction cost new. On this point it says that while the final determination as to the depreciated value of the carrier's property will not be left for the decision of the field parties, they should obtain the necessary information for its determination. The report also says that depreciation can be defined as the lessening of the value of the property from physical causes and that it has no relationship to the lessening of the value of property from economic causes which are not related and are unaffected by physical depreciation. The engineering and accounting aspects of depreciation are often confused. The former considers it as a condition at a given time of a piece of property as compared to new. The latter has to do with the setting up of a bookkeeping method for accumulating a certain fund. Rates should be imposed which as a system will return to the carrier the expenses for performing its service, give an earning upon the value of the property and return a sufficient amount so that when the property is worn out in the service of the public the carrier's capital shall have been returned to him.

The report suggests further instructions to the field parties in regard to certain matters, including the necessity of differentiating between seasoned and new roadbed, of obtaining data as to any expense of building contractors' roads during construction and of making notes on the condition of the property complete enough to make it possible to differentiate between functional depreciation, deferred natural depreciation and the depreciation which is normally taken care of by seasonal repairs and renewals. In regard to donated property the report recommends the inclusion in the "cost" figure of the cash equivalent of such property at the time of its receipt.

In conclusion, the report says that the accomplishment of the work proposed in the valuation statute is impossible in its entirety, but the difficulties in the plan will be developed as the work proceeds. The commission is not pessimistic as to the value of the proposed valuation, but believes that it will not meet the expectations of those who framed the statute.

STATISTICS AND ACCOUNTS

This report was submitted by Messrs. Meyer, Interstate Commerce Commission; Prentis, Virginia; Meyers, Interstate Commerce Commission, and Sturgis, Association of American Accounting Officers, and described briefly the important changes made by the interstate and state commissions during the past year in their accounting systems. Among other points mentioned, the report said that the Nebraska Commission had given considerable study to the subject of depreciation of telephone plant equipment and of street and interurban railway plant and electric railway equipment, that the Oregon commission had adopted a uniform classification of accounts for electric, gas and water utilities, and that the New Hampshire commission had adopted a uniform classification of accounts for electric utilities. It also explained and defended the order of the Interstate Commerce Commission requiring the steam railroads having operating revenues in excess of $1,000,000 per annum to separate their operating expenses between freight and passenger service. It also urged the state commissions to adopt the various accounting orders and system of accounts of the Interstate Commerce Commission, with necessary provision so that additional matters could be incorporated by the carriers in a supplement or appendix.

REPORT OF RAILWAY SERVICE AND RAILWAY ACCOUNTS

This report was submitted by Messrs. Hughes, Ohio; Mitchel, Louisiana, and Ott, West Virginia. Although devoted principally to steam railroads, it said that "The incidental handling of package freight with dispatch by electric railways and delays in handling l.c.l freight by steam lines opened the eyes of the public and electric line promoters to the wider field of general freight service, and such carriers have, as a rule, entered this field." The report urged better ventilation of passenger cars by the statement that "it is in reason to say more deaths are occasioned by improper ventilation of train coaches and waiting rooms than by train accidents." It also referred to the importance of good light and water supply on cars, neat maintenance of waiting stations, readiness to serve, courteous demeanor of agents, etc.

VALUATION OF COMMON CARRIERS

This report was signed by Messrs. Maltbie, New York; Atkinson, Missouri; Chandler, Georgia; Doty, Ohio; Erickson, Wisconsin; Eshleman, California, and Thorne, Iowa. It referred to conferences during the past year with representatives of the railroads in regard to different points which had come up in the matter of valuation and pointed out several ambiguities in the wording of the forms used in valuation work. One of these was the phrase "condition per cent" in many of the forms, and the phrase "depreciation per cent" in others. Both of these terms, the report said, are liable to differences in construction. The committee also made suggestions as to the method of handling inventories, abandoned property, land, etc., and defended the plan to ascertain the various sources of funds used in payment of existing property; namely (1) by the issue of securities, (2) from surplus income, and (3) from operating expenses. These data should be obtained irrespective of whether the differences will be considered in the final valuation.

RAILS AND EQUIPMENT

The report of the committee on rails and equipment was presented by Messrs. McChord, Interstate Commerce Commission; Paine, Indiana; Brecht, Pennsylvania; Woerner, Missouri; Spofford, Maine; Douglass, New York, and Boyle, Montana. After giving data on accidents, their relation to defective rails, character of defects, influence of loads, etc., the report made the following references to the "frictionless rail":

"A rail of modified shape of head, 'the Frictionless Rail,' so-called, has recently been put into service. The rail is intended for use on curves, the inside rail, for the purpose as explained of preventing the usual excessive thrust against the outside rail when a train passes around the curve. Rails of this type are in use in track of different degrees of curvature, ranging from 4½ deg. to 16½ deg., where they have been in service periods from one to three years. As described by F. A. Barbey, Boston, Mass.:

" 'Its proportions are designed from the standard rail with which it is used as companion. The head is narrower and deeper than that of the standard rail; the web and base are preferably the same as those of the standard rail. Frictionless rail is laid to the customary gage for curves in accordance with standard practice. The specifications of composition and quality are the same as those of ordinary rails of the railroad company.

" 'By decreasing the impinging action of the outer wheel flanges of a locomotive or car against the high rail of a curve, the truck receives far less strains and accommodates itself to the curves more easily, and rail and track wear is reduced.

" 'The action from the frictionless rail we believe to be due to the shorter line contact of inside wheels and frictionless rail as compared with the outside wheels and standard rail. This shorter line contact allows the necessary slip to occur at the inside rail rather than the outside one, and allows the trucks to right themselves more readily. Such slip must occur somewhere on the curve because of the greater distance the outer wheel travels as compared with the inner wheel with both attached to the axle. Allowing slip on the inner rail permits lateral movement across the rail, and thereby releases the pressure against the outer rail by the outer wheel flanges.'

"Cross sections of frictionless rails as companion rails for standard sections of 85 lb., 90 lb. and 100 lb. weight are uniformly made with 7/16-in. radii of corners of head, width of head at top 1¾ in., and slope of sides 16 to 1. It is asserted that less tractive power is required to take trains around curves with this type of rail as the inside rail of the track than with standard sections, and also that less flange wear occurs on the outer rail.

"Features in the designs of rails first to attract attention are naturally those which give promise of strengthening the rails against their most common types of failure. This would lead, among other details, to a consideration of the depth of the metal of the base and to the radius of the fillet connecting the web and base. To strengthen the rail against split bases is one of the first modifications to consider. In the proposed 125-lb. section for the Pennsylvania Railroad, the radius at the base has been established at ¾ in. Dr. P. H. Dudley is recommending a fillet of about 15/16 in. radius in a new 105-lb. section for the New York Central & Hudson River Railroad. The use of a large fillet puts metal in a place advantageous to resist crosswise bending stresses in the flanges. Such a change in design appears to be beneficial, without being attended with disadvantages in other directions."

Following a discussion of car wheel and axle troubles, the report concluded with a strong recommendation for the steel car. Quoting Bulletin No. 60 of the special committee on relations of railway operation to legislation, it states that there were but fifteen wooden cars under construction on Jan. 1, 1914, only two of which were intended for the use of passengers. Of the 3144 cars under construction on the date named, 86.9 per cent were of steel, 12.6 per cent of steel underframe type and 0.5 per cent of wood. The percentage for cars with steel underframe included wooden cars under reconstruction. On the same date there were 9492 steel, 4608 steel underframe and 44,560 wooden cars in service.

STATISTICS AND ACCOUNTS OF ELECTRIC RAILWAYS

The committee on statistics and accounts of electric railways was composed of A. F. Weber, chairman; C. S. Cunningham, John H. Hale, M. F. Sheppard, John E. Benton, U. G. Powell and W. F. Ham. In its report this committee states that the developments of the last year as regards new regulatory laws in Pennsylvania, Ohio, Indiana, Illinois and Missouri have made more apparent than ever before the need for uniform and comparable statistics of electric railways. In order that the committee might be able to render to new commissions the assistance that many have sought, it seemed best to obtain first hand information concerning the powers of commissions over accounting procedure with particular reference to depreciation. On July 12 a circular letter was sent to all existing commissions, with the result that more precise information has been obtained than heretofore available.

SUMMARY OF INVESTIGATION

The committee's summary of its investigation is shown in tabular form and is made to include the three states (Delaware, Utah and Wyoming) that have not yet provided for public utility regulation, and also two territorial districts (Alaska and the District of Columbia) that possess public utility commissions. New York State, with its two commissions, is treated as a single unit. Of the forty-seven commissions, thirty-seven furnished information to the committee, and sufficient information was at hand to permit the classification of the remaining ten with the exception of Mississippi, North Carolina, South Carolina and Alaska. Most of these commissions seem without jurisdiction over the accounts of electric railways, which is definitely reported to be the situation in the following eight states: Arkansas, Florida, Kentucky, Louisiana, North Dakota, South Dakota, Tennessee and Texas.

The remaining thirty-five commissions have power to require reports if not to prescribe the accounting procedure of electric railways. In nine states the commission's power seems to be limited to determining the form of report, but in twenty-six states the commission may also prescribe rules of accounting. To this last group ten states were added during the year as follows: Colorado, Idaho, Illinois, Indiana, Missouri, Montana, Nevada, Oklahoma, Pennsylvania and Virginia. Texas was eliminated from the list because the Railroad Commission states that its jurisdiction does not extend to street and electric railways and no branch of the Texas state government is charged with the regulation of such utilities.

Nearly one-half of the thirty-five states use forms of reports provided by the Interstate Commerce Commission, presumably based on the 1908 classifications. Several of the New England states still use the earlier classifications endorsed by the National Association of Railway Commissioners in 1903, while Massachusetts and Illinois have adopted the new uniform system of accounts of the Interstate Commerce Commission effective July 1, 1914. The committee states that the form used by Nebraska contains certain variations in the classification of operating expenses that have much to commend them.

Comparatively few of the state commissions have prescribed complete systems of accounting procedure for electric railways. Many adopted the classifications of the Interstate Commerce Commission or took no action when satisfied that the companies were using these classifications. The following five states have their own systems: Maryland, New Jersey, New York, Montana and Wisconsin. The three Eastern systems on the one hand and two Western systems on the other show a general similarity.

DIFFERENCES IN EXISTING CLASSIFICATIONS

While many differences existed in present classifications, the committee feels that these are not so fundamental as to prevent ultimate uniformity of proper efforts are made in the right direction. It feels that a notable opportunity to promote uniformity was lost this year when the Interstate Commerce Commission prescribed its uniform system without co-operating with the National Association of Railway Commissioners as in 1908. This association has followed the former classifications and annually pointed out inconsistencies, certain of which criticisms have borne fruit in the new classifications. For example, the committee mentions the new Interstate Commerce Commission segregation of power costs, which was favored by a vote in the association last year.

The committee believes that maintenance charges are still incomparable as between companies that own and those that hire cars and other facilities. Rent or compensation paid for the use of cars and other equipment consists of a maintenance element and an interest element which should be separated as is done in the steam railroad classification. The experience of the New York Commissions in classifying rents paid as income deductions instead of operating expenses demonstrates that such a separation is practicable. Payments for trackage rights over other carriers' lines are more difficult to deal with. In so far, however, as the tracks used in common by several companies belong to the same system, a separation of the maintenance element from the interest element may reasonably be insisted upon. But where the interest element is minute, as is said to be the case with the majority of trackage rents paid by interurban companies for rights over city tracks, the entire amount might perhaps be included in the maintenance of way accounts. The committee quotes a letter from the Interstate Commerce Commission to the effect that the proportion of rental representing interest on investment charged to operating expenses does not exceed one-half of 1 per cent of the total operating expenses, and that this amount does not appear to justify the refinement of accounting attending the distribution of rents into the maintenance, operation, power, taxes and interest sections usually included in electric railway rentals.

DEPRECIATION ACCOUNT

The committee characterizes the Interstate Commerce Commission revision of the renewal and depreciation accounts as an important advance, but the rules adopted are now six years old and do not embody the results of recent progress. Nearly all state laws of the last three years have contained specific grants of authority to the regulatory body to require the reservation of sufficient income to provide for depreciation and many have often defined the uses to which the depreciation fund may be put. References are made to the Wisconsin public utility law, which is similar to the laws in Indiana, New Hampshire, New Jersey, the District of Columbia, Ohio, Oregon, etc., and to the California law, which is the basis for the Colorado, Idaho, Illinois and other state laws. The committee concludes that the people have learned that they cannot expect to obtain adequate service from a utility that pays out its entire surplus in dividends and reserves nothing for ultimate replacements, and also that there is an evident determination to make sure that moneys collected for depreciation, if used temporarily for new construction, shall not be deemed to constitute a part of the investment upon which consumers must pay a return.

The committee reports that comparatively little progress has been made in the determining of proper rates for depreciation. More accurate records of the term of service of physical units are needed, and an effort should be made to define more clearly the minor renewals and replacements that are properly treated as repairs and the larger replacements that are cleared through the property accounts and paid off out of the depreciation fund. The first step to be taken, however, is the expansion or multiplication of the two or three depreciation accounts now provided, as has been done by the Interstate Commerce Commission in its last steam railroad classification.

SEGREGATION OF EXPENSES BETWEEN CITY AND INTERURBAN OPERATION

The committee finds that in several commonwealths the state commissions control only interurban electric railways, while urban lines are subject to municipal control. Yet many of such interurban companies perform city service and commissions find it necessary to make some segregation of the two classes of service, which raises a problem more difficult than that of separating intrastate and interstate traffic of steam railroads. To emphasize the need of increased study of such points, the committee submits a brief by George Eberle, electric railway statistician of the Wisconsin Railroad Commission. Mr. Eberle says that there is no complete classification of accounts for electric railways in the country to-day and makes a plea for such a classification to cover all accounting divisions. He mentions investment enterprises in land, joint utility operation and joint services as points that are much in need of accounting unification, and decries the common practice of throwing urban, suburban and interurban accounts together on one system without any attempt at segregation. The necessity of separating such accounts is particularly mentioned because of the question of increased city fares or increased urban fares, which depend for their proper solution upon unimpeachable financial statements instead of spasmodic allocations. Mr. Eberle adds, however, that complete accuracy cannot be obtained unless a thorough system of segregation has been carried on over a period of years with improvements added annually as a result of consistent detailed study. Similar questions requiring segregation of accounts confront regulative bodies, and the time is now ripe for adoption of thorough cost accounting methods in the electric railway business.

The Clark interests in Tennessee, which include the utilities in Chattanooga and Nashville and the power plants on the Ocoee and Tennessee Rivers, will show at the Panama-Pacific Exposition 2000 ft. of motion picture films, for which the pictures have just been taken.

Meeting of American Railway Association

The fall session of the American Railway Association was held at the Blackstone Hotel, Chicago, on Nov. 18. There were 210 company-members present, represented by 180 delegates.

The report of principal interest to electric railway companies was that of the committee on electrical working which recommended clearances for third-rail and overhead working conductors with specifications for electric light and power transmission lines and overhead crossings for telegraph and telephone lines. The specifications for light and power transmission lines were similar to those adopted by the American Electric Railway Engineering Association in 1913. In regard to the telegraph and telephone lines, the committee reports that it recommends the adoption of the specifications prepared by the Association of Railway Telegraph Superintendents with the exception of one paragraph relating to the minimum clearance of poles over railway tracks. It points out that the specifications contained in its report has not been definitely acted upon by the engineering associations interested but is included so as to place the essentials of the matter on record.

At the meeting the Illinois Central Railroad and the Long Island Railroad were added as members to the committee on electrical working. The sub-committees appointed by the committee for further investigation of continued subjects are as follows: On third-rail working conductors and on overhead working conductor clearances—A. S. Baldwin, chief engineer Illinois Central Railroad; J. H. Davis, electrical engineer Baltimore & Ohio Railroad; E. B. Katté, chief engineer electric traction New York Central & Hudson River Railroad. As representatives of the committee on the national joint committee on specifications for wire and cable crossings—E. B. Katté and J. H. Davis.

The association decided to hold its next session in Atlantic City on May 19, 1915.

Interurban Electric Railways of Austria in 1912

The official statistics of the Austrian Railways Ministry for the calendar year 1912 contain the following data on the so-called "Kleinbahnen" or cross-country lines, about one-third of which are narrow gage. These figures do not include the Kingdom of Hungary.

The total operating route length of these lines was 406 miles (1180 miles of single track) or 87.3 per cent of all cross-country mileage, and represented an increase of 28.1 miles over the year 1911. Of this mileage, 48 per cent was double track. A total of 41 miles was devoted to freight business exclusively.

The rolling stock comprised ten locomotives, 204 snow plows, 2321 motor cars, 2013 trailers and seventy-six freight cars. The combined capacity of the passenger cars was 167,229 seats and 76,094 standing places. The lines carried 484,295,628 passengers and 232,164 metric tons of freight. The gross earnings from the passenger service were approximately $15,889,323 and from the freight business $82,193. The operating expenses averaged 61 per cent of the gross earnings, but despite this the average surplus of $5,806,090 was equal to 9.55 per cent of the capitalization. The total number of employees was 17,724 and the total annual wage $5,977,366, or about $320 per person. The railways insure the employees in sick benefits, accident and pension funds. Only sixteen persons were killed and for all traffic the splendid record of 1.03 accidents per 1,000,000 passengers was attained.

The Mayors' Conference

The Meetings in Philadelphia Last Week Were Devoted to Papers and Discussions Upon Public Utilities and Their Regulation—Resolutions Were Adopted Indorsing the Establishment of a Public Utilities Bureau for the Exchange of Information

The conference of mayors held in Philadelphia last week was attended by the mayors of forty-nine cities. There were also present a number of other officials of cities, representatives of civic clubs and associations, representatives of several of the state public service commissions and members of the Uniform Electric Rate Association. According to the list given out, mayors of the following cities were registered: New York, Philadelphia, Chicago, Boston, Mass.; Cleveland, Ohio; Detroit, Mich.; Cincinnati, Ohio; Newark, N. J.; Minneapolis, Minn.; Providence, R. I.; Rochester, N. Y.; Denver, Col.; Toledo, Ohio; Scranton, Pa.; Fall River, Mass.; Grand Rapids, Mich.; Cambridge, Mass.; Trenton, N. J.; Reading, Pa.; Wilmington, Del.; Chattanooga, Tenn.; Yonkers, N. Y.; Elizabeth, N. J.; Fort Worth, Tex.; Fort Wayne, Ind.; Holyoke, Mass.; Hoboken, N. J.; Evansville, Ind.; Akron, Ohio; Norfolk, Va.; Erie, Pa.; Harrisburg, Pa.; Passaic, N. J.; Allentown, Pa.; Canton, Ohio; South Bend, Ind.; Middletown, N. Y.; Sea Isle City, N. J.; Kalamazoo, Mich.; Camden, N. J.; Mount Vernon, N. Y.; Perth Amboy, N. J.; Montclair, N. J.; Ocean City, N. J.; Toronto, Ont.; Lebanon, Pa.; Easton, Pa.; Chester, Pa., and Poughkeepsie, N. Y.

Starting with a reception at the Bellevue-Stratford Hotel on the evening of Nov. 12, the time of the delegates was kept fully occupied until the end of the concluding session on Nov. 14. On the general reception committee were the names of many prominent Philadelphians, including officials of the local public utility companies. The reception at which the mayors were welcomed by Ex-Governor Stuart of Pennsylvania and Mayor Blankenburg of Philadelphia, was attended by many men prominent in the banking, civic and industrial life of the city.

In the business sessions, which began on the morning of Nov. 13 and were concluded on the evening of the following day, the formal papers presented were grouped in accordance with subjects prearranged in the program and there was little departure from the arrangement announced in advance. Time was allotted arbitrarily to the different speakers, and there was little opportunity for general discussion. Mayor Blankenburg was the first presiding officer, and when he was called away Dr. Ernest S. Nichols, president of Dartmouth College, presided during the remainder of the first business session. It was at this session that the chairman was directed to appoint a committee on recommendations which did the definite work of the convention. It was at this session also that Louis D. Brandeis appeared instead of taking part in the discussion of "Holding Companies and the Public Welfare" which was arranged for the evening of Nov. 14. The real subject of the discussion of Mr. Brandeis was the new Utilities Bureau, of which he is one of the trustees. This session did not bring out any strong, dominant note to characterize the drift of the entire proceedings.

It was at the afternoon session on Nov. 13, devoted to "The Regulation of Utilities," that the discussion began to get warmer in the direction of closer regulation, home rule and public ownership and operation. The tendency in this direction was strengthened by the remarks of Mayor Harrison of Chicago, who presided. Outside of the city and state officials, regulators and public ownership advocates who talked at the discussion, a distinct point of view was presented by Charles Day, of Day & Zimmermann, whose constructive policy for public service corporations rests largely on the adoption of the principles of scientific management in internal organization, operation and rate-making.

At this session the members of the committee on recommendations was announced by Mayor Blankenburg, as follows: Newton D. Baker, Mayor of Cleveland, chairman; Richard D. O'Brien, Director of Utilities, Seattle; Theodore Theime, Citizens' League of Indiana, Fort Wayne, Ind.; Frederic W. Donnelly, Mayor of Trenton, N. J.; John P. Mitchel, Mayor of New York; Charles E. Merriam, alderman, Chicago; Milo R. Maltbie, Public Service Commission, First District, New York; John M. Eshleman, Railroad Commission of California; H. S. Hocken, Mayor of Toronto; F. C. Thomson, Mayor of Chattanooga.

During the latter part of this session there was a short discussion on rates for electric light and power in which Mr. Day and the mayors of Toledo, Toronto and Poughkeepsie participated.

The evening session on Nov. 13 was held at the Central High School under the auspices of the American Academy of Political and Social Science and was devoted to "Local and State Regulation of Municipal Utilities." The presiding officer was Mayor Mitchel, of New York, and of the four speakers, Mr. Erickson, of the Wisconsin Commission, stood most strongly for state regulation in preference to local regulation.

The discussion on the morning of Nov. 14, was on "Municipal Ownership and Operation." Clarke M. Rosecrantz, of general counsel of the Milwaukee Electric Railway & Light Company, made the principal talk against public ownership and operation. Mayor Baker of Cleveland, and afterward Mayor Curley of Boston, presided at this session.

After the lunch tendered by business men of Philadelphia at the Wanamaker store, brief talks were made at a somewhat informal meeting, over which Charles A. Prouty, director of the division of valuation of the Interstate Commerce Commission, presided. Among those who spoke briefly were M. N. Baker, of the *Engineering News;* Felix Frankfurter, professor of law of Harvard University; F. C. Henderschott, of the New York Edison Company; Mayor Seger of Passaic, N. J., and Mayor Nevin of Easton, Pa. The last-named speaker said that it should not be forgotten that public service corporations made cities what they are to-day. During this meeting Mayor Baker of Cleveland, chairman of the committee on recommendations, presented the report which is published elsewhere in this issue. It was adopted without discussion.

The final session, devoted to "Holding Companies and the Public Welfare," was held at Witherspoon Hall under the auspices of the American Academy of Political Science. It lost some of its impressiveness, so far as the mayors were concerned, by reason of its unfortunate position in the program on Saturday evening at the conclusion of all the proceedings. Secretary of the Interior Lane, who was expected to preside, was not present, and Dr. Carl Kelsey, acting president of the

American Academy of Political and Social Science, opened the meeting. A strong presentation of the case of the public utility holding company was made. Brief abstracts of the different papers and addresses in the order of their presentation follow:

PRACTICAL UTILITY PROBLEMS

"FUNDAMENTAL PLANKS," BY DR. D. F. WILCOX

Speaking on "Fundamental Planks in a Public Utility Program," Dr. Delos F. Wilcox, of New York, declared that public utility investments should be placed upon a non-speculative basis and their security should approximate that of municipal bonds. In the establishment of the non-speculative character of these investments cities should not undertake to make good past losses. So far as future investments in standard utilities are concerned, the cities should assume the risk of loss due to unforeseen causes and should substantially guarantee the integrity of all investments made at the request or with the approval of public authority. The elimination of the speculator and the stockjobber from the utility field and the establishment of utility investments upon a safe, conservative, non-speculative basis is the fundamental condition precedent to good service, permanently low rates and adequate public control. If capital is made secure and is guaranteed a steady return, it demands nothing more than the ordinary interest rate. Cities ought not to make good past losses on investments that were frankly on a speculative basis when they were made. If the cities are to assume the risks of the future in order to give stability to capital and thereby to secure low rates and dependable service, the control of the investment by public authority must be much more minute and far-reaching than in the past.

Dr. Wilcox said that public utilities should not be regarded as a legitimate source of profit to be used for the relief of general taxation. Public utility services should be rendered as nearly at cost as practicable, except that the rates should include a sufficient contribution to retire the investment within a definite period of time. Public utilities should receive credit for all the service rendered by them to the city and its various departments, but only under unusual conditions should the city assume to subsidize a public utility service out of the proceeds of taxation or otherwise. Dr. Wilcox would be willing to exempt from ordinary as well as special taxation all property actually devoted to public use in the rendering of utility service under adequate control, but he hesitates to advocate at the present time so radical a proposal.

Rates and charges should include enough to maintain a sinking fund for the retirement of the investment. Under public ownership, or under private ownership as a means of ultimate public ownership, consumers should be required to pay for the plant and give it to the city. While a number of utilities at the present time seem very well established, all of them have been largely transformed within a generation, and there is no absolute assurance that the investment in any of them will not become obsolete within a single generation. If the public is to assume the risk of obsolescence, obsolescence should be met in advance.

Dr. Wilcox said that cities should assume that all the well-established utilities will be publicly owned sooner or later, private capital being entirely excluded from the public streets, except that it is loaned to the city. While the development of interurban utilities, the extension of utility service to rural regions and the grouping of a number of cities in relation to a single source of supply often present serious obstacles in the way of separate operation by or for each distinct political unit, Dr. Wilcox assumes that the most appropriate governmental agencies for the operation of these utilities will be developed as the need arises. The problem that the cities must meet ultimately, and that they should begin to meet definitely now, is that of paying for the public utilities so that the actual transfer of the properties from private ownership to public ownership may be made ultimately. It is a mistake to assume that the reduction of rates will bring public ownership any nearer except as it may squeeze the illegitimate values out of franchises and render the public utility field uncongenial for speculators.

"REGULATION," BY N. T. GUERNSEY

N. T. Guernsey, general counsel of the American Telephone & Telegraph Company, New York, in talking of "Regulation of Municipal Utilities," said that what the public wants and demands is, first, good service; second, the widest possible extension of this service, and, finally, a fair price. If the utility is to fulfil these public requirements two things are necessary. The first is that there be a return from its operation sufficient to attract constantly the new capital which is continually necessary. To-day and in the near future, public utilities, for the money which they require, must compete not only with all normal demands, but with the enormous abnormal requirements due to the war. The second essential is that freedom in the transaction of business which is necessary to progress and to efficient, economical operation, and that this freedom be not unduly restricted by attempts at so-called regulation, which are not in fact regulation, but are efforts to control the details of management and operation.

Regulation, Mr. Guernsey added, costs money. It is not an overstatement to say that millions of dollars are being spent every year for this purpose in the United States. In the ultimate analysis this burden inevitably falls upon the public. To make regulation a benefit to the community and to justify the enormous expense which it imposes upon the public several things are necessary: (1) The regulatory body must be composed of men of unquestioned integrity and force of character. (2) The men composing the regulatory body must have not only the capacity but also the business and special training necessary to the proper determination of the important and intricate questions which are presented to it. (3) The regulatory body should be composed of men who are free from other interests and engagements which would tend to prevent their giving the requisite time to the performance of their duties.

If these considerations are sound, the regulation of municipal utilities should be not local but in the hands of the state commissions. No man should sit as a judge in his own case. Members of city councils cannot in the very nature of things acquire the special knowledge and experience necessary to the correct determination of the many varied, intricate and important questions which arise out of the regulation of public utilities. The public interest does not require the local authorities to do things which may be better done by others.

The idea seems to be more or less prevalent, Mr. Guernsey added, that the function of regulation is to decrease prices and impose burdens upon the public utilities. Every burden upon a public utility is a burden upon the public, which in the final analysis must pay the bills. If the burden brings with it a benefit that is worth to the public what it pays for it, the public can afford it. Otherwise it cannot. Rates cannot be indefinitely reduced by regulation. The downward tendency in rates that has been constant in recent years has been partially met by economies that have been brought about through efficiency in management and operation; but there is a limit to what may be accomplished by such economies, and if this limit has not already been reached it will be soon. Neither by regulation nor by anything else can the public buy service for less than it is worth. To attempt to do this is to invite bankruptcy. The matter of the regulation of municipal utilities is still in the development stage in this country. If this development is to result in successful regulation, something that will contribute substantially to the welfare of the public as a whole, this must be accomplished through the co-operation of the public and the public utilities with a frank recognition of the principles which have been discussed.

"TRANSIT PROBLEMS IN PHILADELPHIA," BY A. M. TAYLOR

Under this title A. Merritt Taylor, director of the department of city transit of Philadelphia, described the program providing for the construction of subway and elevated railway lines by the city at a cost of $46,000,000, and the equipment and operation thereof by the Philadelphia Rapid Transit Company in common with its existing systems.

"We recognize," said Mr. Taylor, "the importance of co-operation between the city and the company in establishing these new facilities in a manner calculated to best serve the public. We also recognize the importance of protecting against destructive competition capital which has been invested in the existing system. Philadelphians stand for a 'square deal' between the city and vested interests. We recognize the vital importance of honestly protecting capital invested in Philadelphia to the extent that it shall produce an attractive return for reasonable service rendered to the public. In the case of our local railway system a contract was entered into in 1907 between the city and the company. With the terms of this contract in force as a basis, it is the policy of the department of city transit in establishing the high-speed lines under the terms of the co-operative program to protect the company to the extent of its annual net earnings gained prior to the operation of the municipally owned lines regardless of the amount of capital which is actually invested in the property.

"We want Philadelphia to stand out as a safe place for the investment of capital for public service. We recognize the great part which the railroad and other public service corporations can take in the development of this city and its industries, but to so take this part they must have credit upon which to raise large sums of money and they must be assured of an adequate and attractive return thereon and immunity from unwarranted competition or political and public attacks. The capitalists of this country are going to invest their money in communities where capital is justly treated and permitted to earn attractive returns and are not going to invest capital in communities where its security is impaired and its productiveness is unduly curtailed by unreasonable legislation, regulation or competition."

Mr. Taylor said that he believes that the time is past when corporations, through political, financial or other influence, can retard the development of the resources of our great cities, make unfair bargains for franchises or refuse to co-operate upon just terms in carrying out great municipal developments and undertakings which are dependent upon their co-operation. On the other hand, he believes that the time is at hand when cowardly public officials will not be permitted by the thinking public to be led by blackmailers and demagogues into imposing unreasonable and onerous terms and conditions upon corporations and invested interests. They will no longer be able to make political capital by pursuing any such course in an enlightened community.

"MUNICIPAL LIGHTING RATES," BY RAY PALMER

In his paper Ray Palmer, commissioner of gas and electricity, Chicago, Ill., said that the two principal factors discouraging municipal ownership of public utilities in our cities to-day are bad politics and the relatively high union scales paid municipal labor compared with that of the low scale paid utility corporation labor for the same class of work. When the results of bad politics are eliminated by non-partisanship elections and a fair living scale of wages is established and regulated in all classes of labor the municipality will be placed on the same operating cost basis of utility service as the corporations with the advantage of low interest charges on the investment. Until such time as this is accomplished municipal ownership will seldom be economical or practical for the public taxpayer. He then quoted some figures on cost in Chicago of 450-watt municipal arc lamps and 300-watt nitrogen tungsten lamps.

"NATIONAL UTILITIES BUREAU," BY L. D. BRANDEIS

Louis D. Brandeis, of Boston, in an address, said that for a long time there has been co-operation among the public utility interests through associations which have advanced in great degree the efficiency of operation. The cities, on the other hand, had no plan of co-operation and the proposed Utilities Bureau is not only a plan but an instrument of co-operation. The mayors must see that it has not only the machinery of operation but also an opportunity of operation.

The objection to stock watering, Mr. Brandeis said, is not at all that men who engage in these enterprises get a large return. Those who in public utility risks hold that a proper return is a fair return compared with other lines of business are right. The objection is that stock watering hides the facts as to the investment. Men have resorted to it many times because they have believed that the public would not regard the actual investment and risk. Mistrust rather than a desire to mislead underlies stock watering. When there is machinery to give the facts the occasion for stock-watering utilities is largely removed.

Mr. Brandeis also said that interlocking directorates tend to obscure facts. Where a man deals with himself as railway manager, banker and manufacturer, the public has not the ordinary assurance that the best trade is made. Mr. Brandeis also thought that no man had the time or the necessary varied knowledge of facts to be a real director in many enterprises.

REGULATION OF UTILITIES

The meeting on Friday afternoon was devoted to the "Regulation of Utilities." Mayor C. H. Harrison, of Chicago, presided. In opening the meeting he said that state control was better than no control, but not so good as local control. The latter brings results. In the early days when the infant utility was taking a chance of possible failure the investor was entitled to extra return for the hazard. To-day these utilities are entitled to a fair profit and no more. Mayor Harrison spoke of early days when the method of control of cities by public utilities could be traced through their expense accounts and doubted whether these practices had been entirely abandoned.

Personal responsibility, he thought, will weigh more heavily on a mayor than upon a governor, who is responsible to a larger constituency, all of whom are not interested in each decision. Mayor Harrison declared that the personnel of the Public Utilities Commission of Illinois is satisfactory and that all regulation must be reasonable. The most valuable commodity the utility possesses is the right to use the streets. Great good would come from public ownership. Let a municipality operate all its utilities and self-interest will induce each citizen to take a more active part in the affairs of local government. The first requisite of public ownership is a rigid civil service that appoints, holds and promotes absolutely on merit. Without it public ownership would be a public disaster; with it public ownership would be made a tremendous blessing to every community.

"COMMISSION REGULATION," BY E. W. BEMIS

Prof. Edward W. Bemis, member of the Board of Supervising Engineers, Chicago Traction, and the valuation bureau of the Public Utilities Commission of the District of Columbia, spoke on "Some Present Issues in Regulation." He told of the increase in the number of state commissions and said that efforts are being made everywhere by utilities to secure regulative acts. Home rule seems to have been checked. On the other hand, the California commission has been organized and manned so magnificently that cities are surrendering all their power to it. State commissions are existent in most states, and, said Professor Bemis, "we accept it even though seeking, as in Chicago, to secure separate regulation. We accept it as something that the country will try out for some years to come." Cities must learn that in order to win cases before state commissions they must prepare their evidence as well as the companies. It is difficult, Professor Bemis said, to get or keep strong commissioners. Criticism was expressed of the action of many of the new commissions in giving perfunctory approval to securities aggregating hundreds of millions of dollars. It is necessary to have trained experts of unimpeachable character on commissions.

"CITIES WITHOUT STATE REGULATION," BY S. P. JONES

S. P. Jones, secretary of the Voters' League, Minneapolis, Minn., made an address on "What Certain Cities Have Accomplished Without State Regulation." While admitting that state regulating commissions have been of substantial service to communities struggling with public utility problems, he said that the bald fact yet persists that it is in cities that have worked out their own salvation that the largest degree of success in rates and service has been achieved. Success in this field, however, cannot be wholly expressed in terms of rates and service. These are emphasized first, for they are the things in utility regulation that appeal most strongly to the public. The greater results are seen in the educational effect upon the community and the preparation it furnishes for the time when public utilities must and will be taken over for community operation. Disinterested students of the public utility problem should see by this time that there is but one logical and one correct solution of this problem, that public utilities must become public utilities, publicly owned and operated. Municipal ownership will not come to cities through the route of state regulation, no matter how efficient in the public interest that regulation may be. In fact, the greater the efficiency the more distant the final day of public ownership.

"A CONSTRUCTIVE POLICY," BY CHARLES DAY

"A Constructive Policy for Public Service Corporations" was the title of the next paper, which was presented by Charles Day, of Messrs. Day & Zimmerman, Philadelphia. Mr. Day advocated the application of scientific principles to rate making and management while continuing governmental regulation. The soundness of the principle of regulation must not be questioned on account of the existence of faults in its application, although, of course, we shall lose the benefits which it should afford if a constructive policy is not established which will eliminate these serious effects.

While there has been a tendency to look to the public for a remedy through the correction of faulty laws and to the commissioners through a modification of their points of view, Mr. Day believes that the responsibility rests squarely upon the corporations themselves. They alone can furnish those facts and statistics without which all argument is futile. The contributions of the engineer-manager are second in importance only to those of the engineer. These men must harvest the full benefits of which the modern steam power plant is capable.

Mr. Day said that the establishment of regulation in many states is so recent that the corporations have not yet been able to adopt new rate schedules based on cost. Rapid strides have been recently made toward the solution of this pressing need, particularly in those states where regulation has been established for some time. The work of the Wisconsin commission has been notable in this regard, Mr. Erickson's contributions especially having paved the way for a system of rate-making that promises to meet almost every requirement. A thorough knowledge of cost and operating conditions is imperative. If correct principles are applied to rate-making, the subject of rates should eventually pass from the jurisdiction of what is now largely individual opinion and debate to that of unvarying scientific law.

"REGULATION," BY J. M. ESHLEMAN

John M. Eshleman, president, Railroad Commission of California, in his paper on "What Regulation Must Accomplish if It Is to Be Permanent," said that a public utility is essentially a monopoly, but as an individual is powerless to protect himself against the abuses to which a monopoly might subject him, there must be state regulation for his protection. Otherwise the utility would be both judge and jury in every case which came before it and so would usurp the right of sovereignty. The only alternative to a monopoly in the operation of public utilities is competition, but competition involves the economic waste of duplication. Properly regulated monopolies mean better service and cheaper rates than competitive public utilities, but competition between utilities will produce better results than monopolies without regulation.

The natural tendency of everyone is to be selfish. Hence the natural inclination of the utility is to give as poor service as possible and to charge the highest price for it. On the other hand, the natural tendency of the public is to demand the best service possible and the lowest price. The wise public utility will not impose conditions on the public more burdensome than the municipality would impose if it tried to perform the same service. On the other hand, the public should realize that it cannot permanently secure any service at less than cost. The maximum service at the least cost is the desideratum. The object of public service regulation should be to produce the same frame of mind in the owner of the private utility property as he would have if he were supplying a competitive service. Those in charge of regulation should bear in mind that there is one form of competition from which a public service monopoly is not free, and that is the competition for money. The utility must always compete for funds to extend and improve its service with the unregulated industries.

Mr. Eshleman said that there were two conditions which inspired action on the part of a utility; one was the fear of loss, the other the hope of gain. If possible the public utility owner should be encouraged by the latter sentiment, but sight should not be lost of the effect of the first. If a utility feels that it is absolutely secure from competition, it may take its ease, but the only justification of monopoly is service rendered. In California no public utility can commence business until it has received from the Railroad Commission a certificate of public convenience and necessity, and the policy of the commission has been not to grant such a certificate where the existing public utility was doing its duty. Nevertheless, certificates have been granted by the board permitting competition where there seemed to be justification in doing so, and in one case as a result the existing utility not only reduced its rates in the competitive territory, but made a reduction as large as 30 per cent in non-competitive districts. Now the company realizes that it must reduce its rates where it can.

In looking toward the future, Mr. Eshleman believed that the government would go into the public utility field when the advantages of so doing were not overbalanced by the disadvantages. He was not convinced that the private owner had clearly proved that private ownership was always better than public ownership. Mr. Eshleman believed that regulation should cover the supervision of capitalization and that unless rates were made on the basis of investment, the theory of private ownership would fall because with public ownership the investment would be the basis upon which the rates would be established. Whether public ownership was desirable when private ownership was doing its best is entirely another thing. Mr. Eshleman said that he believed that if the railroads should be valued on the terms of the La Follette bill railroad rates would have to be raised. This was because of the increase in the value of the lands owned by them, especially terminals. Mr. Eshleman said that if the public utilities will not stand behind intelligent regulation they will lose.

The final question, according to Mr. Eshleman, is whether a private plant can go as far as a public plant can go. Private ownership is always under the handicap that private owners have to pay more for their money. Unless private ownership can overcome this handicap by greater efficiency in operation and in other ways it will lose.

LOCAL AND STATE REGULATION OF PUBLIC UTILITIES

This was the general subject of the meeting Friday evening. The presiding officer was Mayor John Purroy Mitchel, of New York, who spoke of the new Utilities Bureau as a clearing house of information. He said that New York had felt the necessity for some agency through which information of the kind that will be furnished by the bureau could be obtained. In dealing with electric-lighting companies the city lacked the essential facts. Regulation has been established in the United States much more quickly than seemed to be possible a few years ago. Besides the state commissions in forty-five of the forty-eight states, there are local commissions. Non-regulated public utilities are almost as foreign to the thought of managers of public utility companies as to the public.

The old hostility toward the companies has very largely waned, and this has been helped by the decided change in the managerial policy of the corporations. The companies have sought to give good service rather than otherwise. People are no longer willing to accept poor service. In every great city public opinion expects very high-grade service and clean, efficient and straightforward management. In case such service is not forthcoming the public is prepared to provide it through public ownership. Public ownership is a reserve power of which the companies are conscious.

What the cities want, Mayor Mitchel continued, is a high quality of service at just rates providing a fair return and providing for the upkeep of the property. The public cannot mulct the public service corporation of just profits and expect efficient management. It cannot demand low rates at the expense of funds for depreciation and obsolescence and of fair wages. There must be fair wages, good service and wholesome management. After that rate reductions and revenues for the benefit of the city treasury can be considered. Mayor Mitchel said that New York is not advocating a change from private to public ownership, but is advocating the policy of rigorous control of management which it has had for the last seven years. New York has benefited from the work of the Public Service Commission, as much indirectly as directly. The presence of the commission and the temper of the public that it represents have brought about a great change in the attitude of public service corporations. The city now looks forward confidently to the time when the subway and new elevated lines will revert to it.

"Some of us," said Mayor Mitchel, "have thought that the Public Service Commission has lacked aggressiveness. We do not feel that it is a part of us, that it is in close enough touch with what we are doing. I felt this so much that I organized a department of public utilities in the city's law department which is intended to represent the people of New York City in their regulative cases and hearings before the commission." Mayor Mitchel said that he also had thought of a plan to establish a local commission which should voice the interests of the people in the locality.

"STATE AND LOCAL CONTROL," BY HALFORD ERICKSON

Halford Erickson, member of the Railroad Commission of Wisconsin, said that if he should seem to favor state regulation it is because the facts as he has found them point in this direction.

It is the fact that adequate regulation of public utilities requires so much work of a technical and administrative nature that has caused so many states to abandon all efforts so to regulate directly through legislation alone and to adopt in place thereof a public utility law with a state commission. The problems with which regulation has to deal are, in fact, so persistent in their tendencies, so far-reaching in their effect and so complex in their nature that in order to cope with them properly a separate regulating body is required that is intrusted with wide powers, backed by a strong government, has the broadest and best sources of information, and is fully equipped in every other way to deal promptly with the enormous amount of work that is constantly coming before it.

While state regulation, as it is known to-day, has its shortcomings, it has on the whole been fairly successful. It has led to general improvements in the service and to more equitable and on the whole lower rates. Investigations which have resulted from it have also thrown much needed light upon the many important problems that are involved in the operation and regulation of public utilities. In the rates there have been both decreases and increases, but the former are by far the most important. State regulation has afforded an easy, inexpensive and fair means for an informal settlement of any disputes. If economic history teaches anything, it is that institutions like state regulation are simply the outcome of existing economic conditions and that they, as a rule, do not long survive these conditions. The conditions and tendencies in the public utility field, however, which have brought about state regulation are still present and bid fair to remain for some time. The public utility field, for instance, is still a legitimate field for private initiative and investments. There is also a marked tendency therein toward centralization in ownership and operation. Electrical and other utilities, while in a sense firmly established, are still subject to upheavals which flow from inventions and from the competition of new sources of supply and the risks involved therein are considerable. The forces are state-wide and they greatly affect the conditions of regulation. As long as they exist it would seem important that the regulating power also should be state-wide or as broad as the forces with which it has to deal.

There are, no doubt, instances of successful local regulation, Mr. Erickson said. It is also probable that those instances will increase in number as time goes on. At the same time local regulation is beset with many obstacles that are inherent in the situation and are difficult to overcome. To many who have given close attention to the matter it is far from clear that local regulation alone is adequate and in line with the best policy. Of the franchises which were in effect in the State of Wisconsin at the time the public utility law was enacted hardly one has been found which contained adequate provision for the regulation of service and rates. That the necessity for regulation is not obviated when the utilities are owned and operated by the municipalities is quite clear from such experience as the Wisconsin commission has had in the matter. Such utilities furnish no better service than privately-owned or operated utilities. In fact, it is often a great deal worse. Municipalities are, as a rule, slow in responding to new discoveries and improved methods, and they often fail to list and supervise their meters and other equipment properly. While some municipalities furnish good service, the service in the great proportion of them is, on the whole, on a lower level than is the case for privately operated plants.

When it comes to rates the situation from municipally operated utilities is no better. When the commission first entered upon its duties, it found the State literally streaked with unjust discriminations of all kinds, and these discriminations were as flagrant in municipally operated as in privately operated plants. While the rates charged by the municipally operated plants are often relatively low, this is not often due to low cost production of the service, but largely because in one way or another upkeep and other costs are shifted from the consumer as such to the taxpayer as such. In 1912 about 161 out of the 177 municipally owned waterworks and electric plants in the State failed to keep their accounts in such a way that they could be made to disclose the results of their operations. In passing upon public utility controversies a city administration would often have to be both prosecutor and judge. Such relations do not always lead to equitable conclusions and should be avoided as far as possible.

Replies received to a circular letter sent to all utilities in the State operating electric, gas or water departments indicate that a great many operate beyond the boundaries of a single city, and many cover many cities and towns. Thus the Central Illinois Public Service Company has properties in more than 100 cities and villages. Suppose that each of these cities and villages started out to regulate this company or so much of it as was within its limit. Local control would be running riot. The Milwaukee Electric Railway & Light Company embraces the Milwaukee city railways, eleven suburban lines, four interurban lines with 175 miles of track, four city lines in Racine, two lighting systems and one heating system. Seven of the eighteen city lines extend beyond the city limits; nine of the suburban lines have in addition to their regular city run a second fare zone beyond the city. No system of local control could have jurisdiction to link the urban and suburban lines to secure good transpartation facilities.

"STATE OR LOCAL CONTROL," BY MILO R. MALTBIE

In his address, Dr. Milo R. Maltbie, member of the New York Public Service Commission, First District, began with the following postulates: (1) Every generation is apt to have its own ideas of the scope and distribution of governmental powers. (2) Economic and social conditions are shifting constantly. (3) There has been a steady expansion in the field of operation of a single utility. (4) Effective regulation of such large utilities is difficult and expensive. Continuing, he said that, overestimating the importance of these facts, there are those who urge that all control should be transferred from local authorities to the state board; that our great cities, which have a larger population than some states, should be ousted from all supervision over their utilities, and that even the franchise-granting function be taken from them. Between this extreme and complete local regulation there is a middle ground, for certain functions can be exercised more effectively by a state board and others by local authorities. Would it not be as unjust and improper for a state board to fix the terms and conditions upon which a private corporation should use city property without municipal consent as it would be for a municipality to use private property without the consent of the owner? If municipal authorities have been corrupt and if the power to grant or withhold franchises has been abused, the remedy is not state centralization but reform of local conditions, and we have progressed too far in this direction to take a backward step.

Control over the issuance of securities by public service corporations, Dr. Maltbie said, should be lodged in the state. Supervision of accounts and the filing of reports are also matters which should be under state supervision. He also thought that if it is not now it soon will be necessary in most instances for the state authorities to control rate regulation, although, while state commissions are perfecting their methods and organization, it is not advisable to deprive every local authority, and particularly the large cities, of all control over rates. On the other hand, the granting of franchises should be reserved for the cities. Dr. Maltbie criticised the theory that state commissions should determine the rates charged by municipalities operating their own utilities. This, he thought, was another radical infringement of the home-rule principle and would virtually prevent a municipality from dealing with its utilities upon a public-health or common-good basis and require it to raise funds as prescribed by a state board. Dr. Maltbie said that the most practical plan which has occurred to him relative to service matters is for local authorities to continue to exercise the control now vested in them by statutes and city charters but to provide that in case of conflict between different local regulations or between local and state regulations the action of the state body should be controlling.

"LOCAL REGULATION," BY PROFESSOR MERRIAM

Prof. Charles E. Merriam, professor of political science of the University of Chicago, in speaking of the passage of the Illinois Public Utility Commission act by the Legislature of 1913, said that through that act the city of Chicago became the victim of as daring a raid as was ever made by a pirate crew. The bill was passed, he declared, in the interest of the public service corporations. Cities should possess the power to regulate public service corporations which are largely local. They should have the option of whether they shall retain the control over all utilities operating within their borders. There is nothing to prevent cities from securing the best advice to guide them in their regulation of local utilities. The city of Chicago has ample funds for the proper regulation of public service corporations, and it would be entirely feasible for it to have a staff of experts. The contention that city regulation will be more political than state regulation is entirely misleading. The real reason why the corporations prefer state regulation is that the indirect protest of the state electorate is less powerful than the direct protest of the local electorate. The public service corporations of Chicago will never be as effectively regulated by the State as they would be by Chicago. In conclusion, Professor Merriam said that cities deprived of the power to regulate may be forced to own and operate public utilities.

"LOCAL REGULATION," BY THE MAYOR OF READING

Mayor Ira W. Stratton, of Reading, Pa., said that while the aim of commission government is to centralize and to concentrate power and authority, the pendulum can be made to swing too far in that direction and the matter be overdone. That has been the case in Pennsylvania. Mayor Stratton said that he had no grievance against the individual members of the commission, their character, integrity and honesty of purpose. He does not believe that the commission would intentionally use the vast power at its command to the detriment of the municipalities of the State, but no necessity exists for conferring it upon them, and the act should be modified very materially. The most striking feature resulting from state regulation of public utilities, outside of its inefficiency, is its frightful cost. Mayor Stratton said that he was informed that there had been spent by the public service commissions of the several states during the last year the amazing sum of $40,000,000. "Do you marvel," he asked, "that the public is awakened and demanding that laws of regulation that do not regulate but only result in great cost, inefficiency, delay and inconvenience be corrected?"

MUNICIPAL OWNERSHIP AND OPERATION

Mayor Newton D. Baker, of Cleveland, was the presiding officer of the meeting on Saturday morning. Speaking on "Municipal Ownership and Operation," he said that the movement for municipal ownership is the direct effect of the misconduct of public service corporations. Some years ago, he said, practically every state legislature and practically every city council had been either corrupted or was under very grave suspicion, but in large part these conditions have disappeared.

Municipal ownership, Mayor Baker said, is a question of social organization and economic policy. The question of whether there shall be public ownership must be determined by consideration of all the elements that enter into the problem at any one place. To make public ownership successful the people must be willing to understand and maintain the conflict. Public utility corporations are now banded together to maintain the status quo. They have abandoned the idea of obtaining exorbitant franchises, and in the main are trying now to hold what they have secured.

"MUNICIPAL OWNERSHIP ABROAD," BY F. C. HOWE

Frederick C. Howe, Commissioner of Immigration, New York, said that the zone system of fares in English municipalities does not seem to arouse any protest and that it stimulates short-haul business. There is a constant pressure on the municipally owned lines from laboring classes to secure reduction in fares, but councils in most cases prefer to retire debts and keep up the plants. Electrical plants are municipalized to a greater extent than gas plants in England. This, he believes, is because very few electrical franchises were granted by England until electrical central stations had been established firmly in America and Germany and then, when the tramways were taken over, the English people wanted to co-ordinate the services.

ADDRESSES BY MANAGERS OF MUNICIPAL PLANTS

Mr. Howe's address was followed by a talk by Albert E. Winchester, manager and superintendent of the municipal electric lighting plant at South Norwalk, Conn., and he was followed by C. W. Koiner, manager of the municipal electric lighting plant of Pasadena, Cal. Mr. Winchester said that the South Norwalk plant had been kept out of politics by agreement between the political parties. Mr. Koiner quoted some rates charged in Pasadena and said that if the municipality had the entire field to itself it could reduce rates still further.

"MUNICIPAL OWNERSHIP," BY CLARKE M. ROSECRANTZ

Clarke M. Rosecrantz, a member of the firm of Sullivan & Cromwell, New York, general counsel for the Milwaukee Electric Railway & Light Company, was the next and last speaker of the morning. He said that he had yet to find any instance where an examination of the accounts of municipal utilities will show that their rates have been less than those of privately operated utilities without showing a deficit when proper charges incident to the cost of service were made. If insufficient rates are charged, Mr. Rosecrantz declared, "the non-users must make up the deficit, and their proportion of that deficit will be included in their tax bills. If the public operation of utility companies is likely to be successful, we ought to be able to find without any difficulty that those which have for many years been owned and operated by municipalities have been economically and efficiently operated. The history of our city management shows that the contrary is the fact."

"Many cities have been investigated by bureaus of public efficiency," he said, and "we do not find that in those matters which are properly within the province of municipal operation there has been efficient and economical management." He cited criticisms of municipal affairs in New York, Cleveland, Chicago, Milwaukee, Pittsburgh and Cincinnati. As to the claim that municipalities can raise money for public utilities at a less rate than private corporations, Mr. Rosecrantz declared: "That this cannot be done where the plant alone is pledged, is clear. It can only be done, if at all, where the city has a wide margin between the existing indebtedness and its bond limit, and it will guarantee the bonds so that it will be obliged to make any deficit occasioned by any losses in operation by resorting to taxation." Among the reasons against municipal ownership given by Mr. Rosecrantz may be stated the following:

"Public officials in charge will not have had the necessary experience and training. Extensions of service will be made for political reasons often into territory where the business would not afford a return upon even a fair proportion of the cost of the extension.

"Corruption will not be decreased, but will be increased. Public service will be less even. The policy and plan of operation and extension of the utility will be changed with change of administration. Politics will enter into every branch of the service and to the detriment of the service.

"Taxes will have to be increased to make up the deficit caused by operation and to pay for costly mistakes. The individual employee will not have a reason for giving the best there is in him. He can gain nothing by increased effort or showing ingenuity. The public will gain nothing in service or rates and will lose as to both. If a municipality once assumes such an undertaking it must assume others. The history of other countries shows that it cannot stop."

CONSTRUCTIVE UTILITY PROGRAM

At the afternoon session the resolutions of the special committee were presented by Mayor Baker as follows:

"We congratulate the cities and people of America upon the candor and fearlessness with which their representatives have in this conference faced the problem of the relation of the public to public utilities. The conference has been helpful in its interchange of opinion and experience, and especially in its development of the idea of the community of interest among the cities. With that made plain, we can now proceed to a program of inter-city helpfulness which must be the permanent outcome for good from the conference.

"We recommend: That no general conclusion be formulated upon the abstract question of municipal ownership, but, rather, we express our judgment to be that municipalities should be given in all instances the power to municipalize public utilities, the expediency of its exercise being at any time and place, and with regard to any particular utility, a matter for local determination.

"That we make no general determination as between state board and local or home-rule regulation of public service corporations. That we do, however, declare that the franchise-making power should in all cases be local, that municipally owned utilities should be subject to local control only, that in large cities local regulation is plainly to be preferred, and that in all cases the principles of home rule should be preserved by at least leaving it to the people of a city of whatever size to determine whether they desire to act for themselves or to call in a state board, if one exists, either to regulate or to aid the local authorities in regulating privately owned local utilities.

"That we indorse the idea of the establishment of the Utilities Bureau, as a nation-wide inter-city agency for bringing the combined ability and experience of all our cities to the service of each city which may face a public utility problem. Through it we meet the combination of private interests with a combination of public interests, and to the specialized experts which private interests thus mass in defence of one another we oppose the skill, experience and resources of the united cities of the country.

"We recommend that the trustees of the Utilities Bureau proceed to its further organization, outlining a plan by which its support may be assured and its services made available. In this connection we suggest for the consideration of the trustees that an office be provided, records kept, experts be employed, and that cities which can legally do so contribute on some equitable basis to the expense of the bureau, in excess of its earning, when in the service of cities actually using its facilities in the solutions of particular problems.

"We vote our hearty recognition of the high public service performed by Mayor Blankenburg in calling this conference; to Mayors Mitchel, Harrison, Shroyer and Baker, for their sympathetic assistance to him; our appreciation of the gracious hospitality of the city of Philadelphia, and our thanks to the American Academy of Political and Social Science."

During the afternoon also brief addresses were made by Messrs. Crosser and Frankfurter. Abstracts follow:

"MUNICIPAL OWNERSHIP," BY CONGRESSMAN CROSSER

Congressman Robert Crosser of Ohio said that in every other kind of business than public utilities there is competition. No matter how good or how bad managers of private companies are, they are human, and if they have the right to control service they will regulate it in the interest of profits. The policy of regulation is not new, although the form of regulation now common may be new. Instead of having regulation by a city council or a board of aldermen, there is now regulation by a commission. Congressman Crosser declared that employees of public utilities privately owned are in politics now, and that it would be desirable to have one set of officials in control of general city operations and public utilities, so that the people could hold them responsible. Public ownership will purify politics by freeing the public from control by corporations. The speaker said he wants cheaper and better service, but above all he wants to have the cities purified.

"CONCERTED ACTION," BY PROFESSOR FRANKFURTER

Prof. Felix Frankfurter, professor of law of Harvard University, said that in the decision of public utility questions there should be a balanced representation. Up to date, the opposing interests have not been well balanced. Concerted ability on the part of the corporations must be met by concerted ability on the part of the public. In the telephone rate case now pending in New York the company has the facts as to the value of its property, but the city lacks them and cannot get them without an expenditure out of all proportion to the importance of the matter. The same condition exists in the controversy over street lighting rates in Boston. The fact should be demonstrable without difficulty.

HOLDING COMPANIES AND THE PUBLIC WELFARE

Abstracts of the addresses made at the Saturday evening session follow:

"HOLDING COMPANIES," BY F. T. HOMER

Francis T. Homer, of Bertron, Griscom & Company, New York, said that the most serious charge brought against holding companies generally, and therefore public utility holding companies, is that they afford a most convenient means for overcapitalization. That all holding companies are susceptible to this abuse cannot be denied. But public utility holding companies do not offer the same opportunity for overcapitalization as those in the industrial field because the history of public utility investment has been one of almost uniform growth in the volume and security of earnings and not one of large fluctuations. Overcapitalization of the operating company in itself is not facilitated in any manner by the instrumentality of the holding company. Public utility holding companies do not result in the centralization of large power for their officers and directors, for the reason that they are usually so financed as to provide only such an amount of working capital as can be profitably employed in temporarily financing the subsidiaries, so that in adverse times the bonds and preferred stock of the subsidiaries need not be sacrificed, and so that even in good times the disposition of the securities of the subsidiaries can be postponed until the investment made therein is demonstrative of the increasing earning power of the subsidiaries and the higher grade of credits which its underlying securities should command.

Operating companies included in a holding company are under the stimulus of competition in their different departments with similar departments in other companies, and the average of operating economy and efficiency is materially greater in the public utilities which are subsidiaries of large holding companies than in the isolated, unaffiliated companies locally owned and controlled. The advantages arising from uniformity of accounting from the purchase of material and supplies in volume and the lower prices from the use of the greater credit of the holding company are self-evident.

The conference of mayors, Mr. Homer added, is welcomed by the public utility people. There is nothing so harmful to the public service corporations as a lack of public understanding and comprehension of their functions, their duties and their rights. In the face of an increase in the costs of materials, supplies and labor used for the public service corporations proportionate to the increased cost of such commodities and labor in other business channels, public service corporations have nevertheless steadily and uniformly reduced the actual costs of the service which they furnish the public.

Of approximately $4,000,000,000 of securities invested in street railways, 81.4 per cent are organized into or affiliated with holding companies. Of the $2,100,000,000 of securities outstanding in the electric light and power business, 82.5 per cent are organized into or affiliated with holding companies. Of the $1,300,000,000 of securities outstanding of gas companies, over 66 per cent are organized into or affiliated with holding companies, so that out of approximately $7,500,000,000 of gas, electric and traction capital 78.5 per cent is now organized into or affiliated with about 140 independent holding companies whose securities are known and bought throughout this country and Europe. The last annual report of the comptroller shows that for the year 1913 the investment holdings of the national banks in public utility issues had increased nearly 20 per cent over their previous holdings, while their investments in railroad securities decreased over 6 per cent.

"HOLDING COMPANIES," BY C. F. MATHEWSON

Charles F. Mathewson, of Krauthoff, Harmon & Mathewson, counsel for the Consolidated Gas Company of New York, said that the great majority of public utility holding companies exist to meet a real need. They add immensely to the development and the efficiency of the service of public utilities and inure enormously to the benefit, not only of their immediate customers, but also of the entire communities in which such utilities are established. If, through the medium of a company holding scattered plants, the hazard of the investor is rendered less than it would be if his eggs were all placed in a single basket, he would be willing and could be compelled to accept a lower rate of return upon his capital.

Mr. Mathewson expressed the belief that the centralization of financing and management which is made possible by the holding company, or which is made possible by a centralized holding by any other method, is of vast and growing importance to the development of the company in the line of public utilities and the activities of the community which are dependent thereon or connected therewith. The element of destruction of competition which is said to lead to monopoly is not present; for scattered public utilities at different points never, or only in rare instances, could be competitors with each other. Moreover, being subject to state regulation, their charges to and treatment of consumers may be controlled for the public good, and in certain public utilities, at least, a regulated monopoly is more conducive to the convenience and good service of the public than any amount of competition.

The holding company, Mr. Mathewson concluded, has come to stay because it ought to stay, because it is an instrument of progress and efficiency and development and its elimination would be a misfortune whose consequences would be difficult to calculate, but certainly immense.

"HOLDING COMPANIES," BY J. P. GOODRICH

James P. Goodrich, director of the National City Bank, of Indianapolis, Ind., said that so far as the existence of public utility holding companies is concerned, no possible objection can be urged. Competition in public utilities is never desirable from the standpoint of either the investor or the public. Public utility holding companies enjoy wider banking facilities, and it will be conceded that in operating, managing and legal directions such companies possess certain advantages. By the policy of checking one plant against another the properties are keyed to the highest point of efficiency.

No holding company, Mr. Goodrich declared, ought to be permitted to acquire only a controlling interest in operating property and manage the whole company in the interest of that controlling share. Holding companies should be required to acquire the entire stock interest in the property. The speaker had no sympathy with the cry against big business. Public opinion, however, must require the regulation of holding companies as well as operating companies.

Changes in Railway Section of A. I. E. E. Standardization Rules

The standards committee of the American Institute of Electrical Engineers held two sessions on Nov. 14 and approved the revision of the standardization rules which has been in process for a year past. The revised code will be effective on Dec. 1. The board of directors on July 10 approved the rules in preliminary form subject to revision by the committee so that no further action by the board is necessary. The revision of the electric railway standards was in charge of a sub-committee consisting of W. A. Del Mar, New York Central Railroad, chairman; F. W. Carter, British Thomson-Houston Company; Hugh Hazleton, consulting engineer, New York; E. R. Hill, Gibbs & Hill; H. M. Hobart, General Electric Company; William McClellan, consulting engineer, New York; Harold Pender, professor University of Pennsylvania; Martin Schreiber, Public Service Railway, and N. W. Storer, Westinghouse Electric & Manufacturing Company.

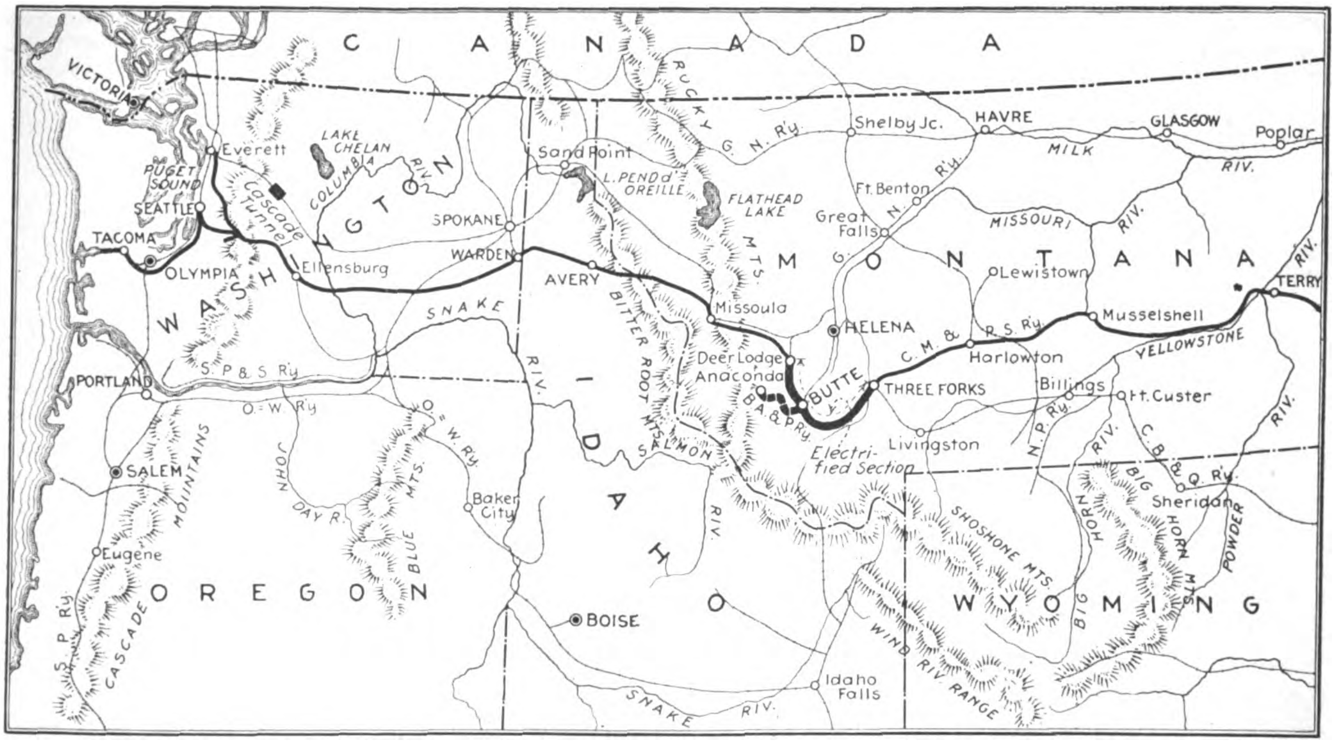
The important revisions in this section include the following: The rating of substation machinery was changed to differentiate between overload capacity of machines for ordinary and for extreme fluctuations of load and for specification of input power-factor other than 100 per cent. The section (No. 418) on maximum motor output was stricken out and a statement made to the effect that the subject of overloads is under investigation. The table of permissible operating temperatures was altered so as to clarify the intent of the phrase "short period." The revised rule states that 'for infrequent occasions, due to extreme ambient temperatures, it is permissable to operate at 15 deg. higher temperature" (see Section 419). An inconsistency in the sections on efficiency tests was eliminated by inserting a new table of core losses based upon a larger number of experimental results than had been originally available. The appendix, Section 437, was changed insofar as it relates to core losses to correspond with Sections 427 and 428. Allowances for axle-bearing and gearing losses (Section 430) were considerably decreased on the basis of extensive data and the range of the table was extended to double load. The statement was appended that further investigation may indicate the desirability of giving separate values of the losses for full and tapped fields, or slow and high-speed motors.

The Chicago, Milwaukee & St. Paul Electrification

The Final Plans Have Been Made and the Contracts Placed for the Electrification of 113 Miles of Trunk Line —Locomotives Weighing 260 Tons and Using Regenerative Control Will Be Used—Four Substations Will Supply 3000-Volt Direct Current to a Double Overhead Trolley Wire

With the placing, last week, of the contract for the electrical equipment for the Chicago, Milwaukee & St. Paul electrification there has been taken one of the most important steps in the history of the supersession of steam by electricity. In this instance electrical operation has been adopted, not because of the smoke nuisance, the high cost of terminals, the congestion of traffic, or any of the dozen other impelling but peculiarly local causes that have necessitated past installations, but rather because of the accumulated evidence as to the normal operating economies that may be expected from the use of the more modern form of motive power with low-priced hydroelectric energy. labor and material necessary to complete the first 113-mile division will cost approximately $3,000,000. It is also estimated that the complete electrification, comprising 440 miles, will cost approximately $12,000,000, but the change in motive power is expected to result in a saving of 25 per cent over the costs involved by the present system of operation.

With regard to route mileage, this electrification is the first step in a scheme which, when completed, will very greatly exceed anything that has heretofore been attempted. The immediate program calls for the electrification of 113 miles of line between Three Forks and Deer Lodge, Mont., as shown in the accompanying map.


C A N A D A
VICTORIA
PUGET SOUND
Everett
SEATTLE
TACOMA
OLYMPIA
Ellensburg
LAKE CHELAN
COLUMBIA RIV.
Cascade Tunnel
WASHINGTON
SPOKANE
WARDEN
Sand Point
L. PEND d' OREILLE
AVERY
SNAKE
BITTER ROOT MTS.
FLATHEAD LAKE
ROCKY MTS.
Missoula
Deer Lodge
Anaconda
B. A. & P. Ry.
BUTTE
THREE FORKS
Electrified Section
HELENA
Great Falls
Ft. Benton
Shelby Jc.
HAVRE
G. N. Ry.
MILK
GLASGOW
Poplar
RIV.
MISSOURI RIV.
M O N T A N A
Lewistown
Harlowton
C. M. & P. S. Ry.
Musselshell
YELLOWSTONE
TERRY
RIV.
Billings
Ft. Custer
Livingston
N. P. Ry.
C. B. & Q. Ry.
Sheridan
BIG HORN MTS.
BIG HORN RIV.
POWDER RIV.
SHOSHONE MTS.
WIND RIV. RANGE
W Y O M I N G
Idaho Falls
SNAKE RIV.
BOISE
I D A H O
SALMON RIV.
O. W. Ry.
Baker City
BLUE MTS.
JOHN DAY R.
O R E G O N
S. P. & S. Ry.
PORTLAND
O. W. Ry.
SALEM
CASCADE MOUNTAINS
Eugene
S. P. Ry.

C., M. & ST. P. ELECTRIFICATION—MAP NORTHWESTERN SECTION OF THE UNITED STATES SHOWING ELECTRIFIED DIVISION

In authorizing the statement that the final contract for the work had been closed, C. A. Goodnow, assistant to the president in charge of construction, Chicago, Milwaukee & St. Paul Railway, said that field work on the overhead line would be started as soon as forces could be organized. Practically all of the poles are on the ground at the present time, and the overhead line material will be available as rapidly as it is required. The contract calls for the delivery of the first substation equipment on May 1, 1915, and the first locomotive on Oct. 1, 1915. Upon receipt of the first locomotive it is planned to run an operating test, and, if this is satisfactory, the electrified division will be in full operation by Jan. 1, 1916.

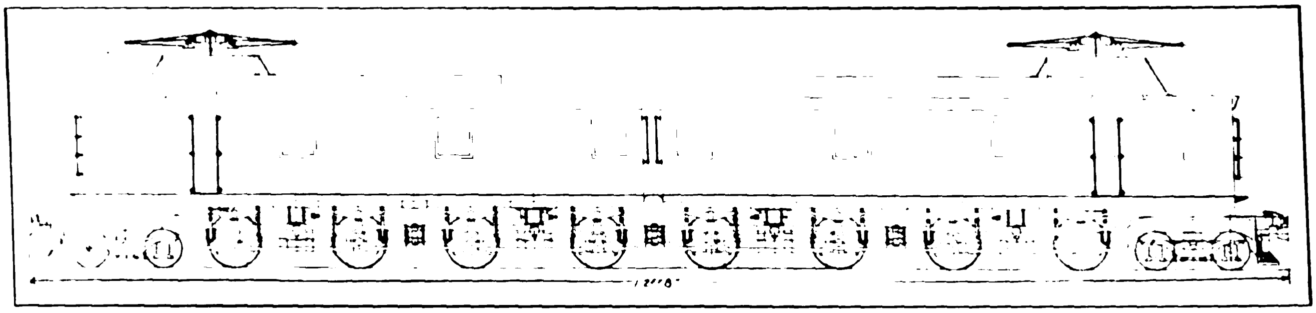
The contract for electrical apparatus, which was placed with the General Electric Company, covers the equipment for four substations, the overhead line materials and twelve locomotives. It is estimated that the This, with sidings, makes a total single-track mileage of 168. The plans for the near future, however, include the extension of the electrified zone to cover 440 route-miles between Harlowtown, Mont., on the east, and Avery, Idaho, on the west, the whole foreshadowing the ultimate electrification of the main line to the Pacific Coast, a distance of 865 miles.

OVERHEAD CONSTRUCTION

Power for propulsion will be furnished at 3000 volts, d.c., and it is obvious that the remarkable success of the 2400-volt electrification of the Butte, Anaconda & Pacific Railroad, which, as shown by the map, is in the same general locality as the proposed electrified division, contributed largely to this choice of system. In fact, the overhead construction is to be exactly similar to that used on the Butte, Anaconda & Pacific Railroad, except that a double trolley wire of No. 0000 copper will be used in order to provide greater collection area for the pantograph shoes. The contact wires will be supported by a flexible catenary construction that will be hung from mast arms on wooden poles, the single-pole bracket construction having been adopted because it affords a minimum obstruction to the view and also is less expensive than the use of span wires. Double poles with span wire, however, will be employed where there are two or more tracks as well as at the sharper curves.

A limited amount of feeder copper will be placed on the poles at the present time to minimize the voltage drop between substations. A high-tension transmission line will also be installed along the right-of-way, tying the substations together. This line will be erected and maintained by the railroad company, independently of the transmission lines from the hydroelectric company which is to supply the power, and it will form a ring system to protect against shut-downs through line failures.

The prime power will be purchased from various hydroelectric plants of the Montana Power Company, and it will be transmitted to the railway company's substations at 110,000 volts, three phase, sixty cycles. The price at which it will be furnished approximates ½ cent per kilowatt-hour, the power factor being limited to a variation of 20 per cent from unity and the monthly load factor being the equivalent of 60 per cent when based on the contract load. As planned at present, the load factor will easily be maintained by requiring the dispatcher to adjust train movements so as not to exceed the maximum amount of power covered by the power contract.



C., M. & ST. P. ELECTRIFICATION—LOCOMOTIVE DIAGRAM SHOWING ARRANGEMENT OF DRIVING WHEELS AND MOTORS

SUBSTATIONS

Contrary to previous reports the high-tension alternating current will be transformed to 3000 volts d.c. in four permanent substations. These will be built of brick and will have concrete roofs that will provide a support for overhead high-tension busbars. Indoor transformers, of the self oil-cooled type, will step down the high-tension current to 2300 volts a.c. for use in motor-generator sets, each of the latter being composed of a synchronous motor mounted on the same shaft with two 1500-volt d.c. generators that are connected in series to supply 3000 volts to the line. Each unit will have two separate exciters for the synchronous motor and for the generator fields, and, with the control switchboard and transformers, will make a complete, independent set.

Two of the four substations that will be installed for the 113-mile division will contain equipments consisting of three 1500-kw motor-generator sets, and each of the other two substations will be equipped with two 2000-kw motor-generator sets. The total substation capacity will thus be 17,000 kw, or about 50 per cent of the input of all of the locomotives, the reason for this relatively high percentage being the high requirements for starting trains which reach momentary peaks of more than 5000 kw. These momentary loads will be easily carried, however, by the five-minute overload capacity of the motor-generator sets, which will be of the order of 200 per cent. The substations will be erected and placed in operation by the railway company, the General Electric Company furnishing all of the electrical machinery.

LOCOMOTIVES

The locomotives, of which twelve are to be included in the initial installation, are truly remarkable for their size and power. Each will consist of two half-units permanently coupled together to make an engine 112 ft. 8 in. long that weighs 260 tons and that has 200 tons on drivers. The prominent feature of the design is the use of a separate motor twin-geared to each of the eight pairs of driving wheels. In the design may be seen the principle of "stretching out" the locomotive and thus minimizing the localization of vertical and horizontal blows on the track. The same principle was followed, although on a much smaller scale, in the case of the latest type of high-speed electric locomotive built by the General Electric Company for the New York Central Railroad, these engines having made a remarkably successful record for the past year in hauling the extremely heavy through passenger trains on that road.

The eight pairs of drivers for each complete locomotive are equally spaced at about 10-ft. intervals. Each half-unit has two articulated trucks with frames outside of the driving wheels, and this arrangement, together with the connection between the half-units themselves provides a chassis composed of four trucks linked together by three permanent couplings. The driving-wheel trucks at the extreme ends of the complete unit have their frames extended to provide center-pin castings for four-wheeled bogie trucks, the extended framing carrying also the bumper beams and coupler at each end of the locomotive.

A summary follows of the general dimensions and weights of the locomotive:

Length face to face of couplers	112 ft. 8 in.
Total wheelbase	103 ft. 4 in.
Wheelbase each half unit	46 ft. 7 in.
Minimum driving wheelbase	5 ft. 0 in
Total weight	260 tons
Weight on drivers	200 tons
Weight on each pair of driving wheels	25 tons
Weight on each bogie truck	30 tons
Diameter of driving wheels	52 in.
Capacity of locomotive—continuous rating	3000 hp
Capacity of locomotive—one-hour rating	3440 hp

The drivers are 52 in. in diameter and they are equalized in pairs on each side, so that each one of the four driving-wheel trucks is independent. The drivers on the end trucks are not excepted so that there is no cross equalization anywhere in the structure. Naturally each driving-wheel truck also has its own brake-rigging system. The bogie trucks at the ends of the complete unit are of the standard locomotive type with 36-in.

wheels on 6-ft. centers. Each one will transmit a 30-ton load to the truck wheels for guiding purposes, the truck center pin being 13 ft. 5 in. ahead of the nearest driving axle.

The cab extends practically the full length of the locomotive, the space between the two half-units being minimized to provide easy passageway from one end of the locomotive to the other. The height of the cab roof is only 13 ft. 10 in. above the rail exclusive of the housings for the ventilators, but the pantograph bases extend about 5 ft. above this owing to the great height of the trolley wire, which will be maintained at an elevation of about 24 ft. above the rail. The cab for each half-unit will be supported at two points, one permitting rotation and the other a sliding movement so that the chassis can weave about in accordance with the requirements of the track but without affecting the cab.

MOTORS AND CONTROL

The eight motors for the complete locomotive will be of the General Electric No. 253-A type, and each will have a continuous rating of 375 hp and a one-hour rating of 430 hp. This will give the locomotive a continuous rating of 3000 hp and an hourly rating of 3440 hp. The drawbar pull effective for starting trains will approximate 80,000 lb. As previously mentioned the motors will be twin-geared to the driving axles, that is to say, each armature shaft will carry a pinion on each end, and it is only in the matter of gear ratio that the passenger locomotives will differ from those used for hauling freight.

The motors will be insulated for 3000 volts, but they will be permanently connected in pairs in series so that the voltage across each one will be 1500 when the locomotive is operating in full parallel on the 3000-volt trolley. The control will provide three running positions with the four pairs of motors connected in series, series-parallel or full-parallel, but the control system will include the novelty (for this country) of using regenerative braking control for holding trains on down grades. This will provide also for regenerative return of energy to the trolley wire on long down grades so that the presence of a train going down a mountain grade will be of assistance to another train coming up. This obviously will improve the load factor of the electrified division to a marked degree.

The motor equipment will enable locomotives in freight service to pull 2500-ton trains up 1 per cent grades at a speed of 16 m.p.h., or, when two locomotives are used on a train, will provide power enough to pull 2500 tons up a 2-per cent grade. However, the plan of operation includes the general use of a locomotive at each end of trains on ascending grades, there being one 2 per cent grade 20 miles long and two 1 per cent grades approximately 35 miles long on the electrified section. On descending grades only the locomotive at the head end will do the regenerative braking. The locomotives in passenger service will be called upon to haul trailing loads of 800 tons at a speed of 60 m.p.h. on the level.

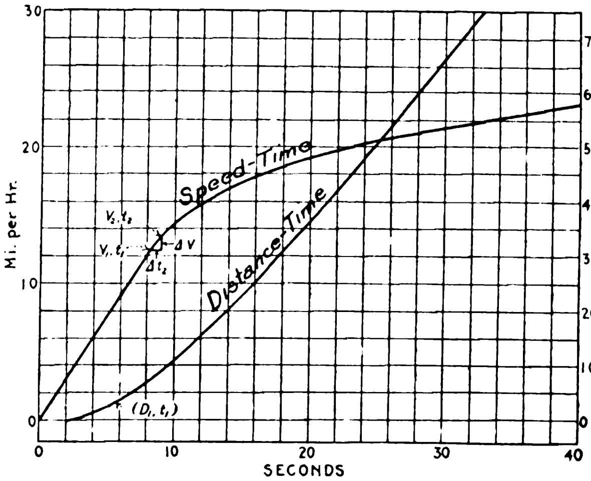
Collection of the large drafts of current (ranging from 1500 amp to 2000 amp at 3000 volts) that will be required for the service at times will be effected through the use of two pantographs of the "pan" type on each complete locomotive. As a provision against the possibility of injurious arcing, however, and to supply an ample factor of surplus capacity the previously mentioned use of a double trolley wire was considered desirable. This secures flexibility and gives a greater area of collection, the maximum draft of current per pantograph contact being thus reduced to the order of 500 amp.

All of the plans for the electrification project have been in charge of C. A. Goodnow, assistant to the president, Chicago, Milwaukee & St. Paul Railroad, and R. Beeuwkes, electrical engineer, and the work of construction that is soon to commence will be under their direction. In general, all of the erection will be done by the railroad company including the installation of the overhead lines, the construction of the substations, and the preliminary operation during the future period of transition from the use of steam to that of electricity.

Electric Railway Graphics at A. I. E. E. Meeting

Graphical Methods of Plotting Velocity-Time and Distance-Time Curves Were Considered at Last Week's Meeting

At the regular monthly meeting of the American Institute of Electrical Engineers, held in New York on Nov. 13, part of the time was devoted to the presentation and discussion of a brief paper on "A Graphic Method for Speed-Time and Distance-Time Curves," by E. C. Woodruff, of the electrical engineering faculty, Pennsylvania State College. This paper appears in the November issue of the A. I. E. E. *Proceedings*. The paper was discussed by C. O. Mailloux, N. W. Storer, Max von Recklinghausen, F. Castiglioni, and others. The general trend of the discussion indicated that the method outlined by the author was ingenious but that it had been used before substantially in the same form. The speakers emphasized the importance of graphical methods when many calculations are to be made. Mr. Mailloux described the methods which he had developed for applying the integraph, a special form of planimeter which traces an integral curve, to electric railway problem solution. The limitations of graphical methods in regard to accuracy were referred to in the discussion, especially in methods involving an accumulation of errors as the one just presented does.



RAILWAY GRAPHICS—FIG. 1

Professor Woodruff's method of plotting time-speed, or as Mr. Mailloux prefers "velocity-time," curves is explained and illustrated briefly below:

In Fig. 1 are shown the curves which are desired; that is velocity-time and distance-time curves.

The velocity-time curve consists of two parts; a straight line from $V = o$, $t = o$ to $V_1 t_1$ where starting resistance has all been cut out, and a curved line from $V_1 t_1$ onward as current is cut down by increasing counter-emf.

The straight-line part of the curve is calculated by assuming starting current per motor and reading from the traction-current curve furnished by the motor manufacturer or experimentally determined, the traction corresponding to the gear ratio and wheel diameter used. The acceleration is calculated by means of the formula,

$$\text{acceleration} = \frac{\text{force}}{\text{mass}}.$$

where acceleration is in feet per second per second, mass is weight in pounds divided by acceleration due to gravity, 32.2 ft. per second per second, and force is in pounds. Extra allowance must be made for the mass of rotating parts, roughly about 10 per cent of the total.

For example, assume that the starting current in the case illustrated in Figs. 1 and 2 is to be 70 amp per motor. The car weight is assumed at 7½ tons per motor and the speed-current and traction-current curves in Fig. 2 are plotted for a certain motor geared 69:17 with wheels 33 in. in diameter.

At 70 amp the traction is 1190 lb. per motor and the resistance, as determined from Armstrong's formula, and plotted in Fig. 2 (see speed-resistance curve) is about 85 lb. per motor.

Armstrong's formula is

$$f = W'\left(\frac{50}{\sqrt{W}} + 0.03V + 0.002V^2a(1 + 0.1[N - 1])\right)$$

Where

f = resistance in pounds (2000 lb.),
W' = weight of train in tons,
W = weight of load in tons per motor,
V = speed in miles per hour,
a = cross-sectional area of train in square feet, and
N = number of cars in train.

The net traction on level tangent track is then 1190 — 85 = 1105 lb. per motor.

The corresponding acceleration is, in miles per hour per second,

$$a = \frac{1105}{7.5} \times \frac{3600 \times 32.2}{5280 \times 2000} \times 0.9, \text{ or approximately}$$

$$a = \frac{1105}{7.5} \times \frac{1}{100} = 1.53 \text{ m.p.h.p.s.}$$

The speed, by Fig. 2, for 70 amp is 12.5 m.p.h. To reach this speed at a = 1.53, requires 8.15 seconds. Thus V = 12.5, and t_1 = 8.15, Fig. 1, and this is connected with the origin by a straight line, as the current per motor, and therefore the acceleration, is assumed constant up to this point.

From V_1t_1 up it is necessary to assume intervals of time or speed and to calculate the corresponding speed or time. These increments are represented by ΔV and Δt in Fig. 1. It proves to be easier to assume increments of speed. Then the average speed while the speed is increasing from V_1 to V_2 is $(V_1 + V_2) \div 2 = (2V_1 + \Delta V) \div 2$.

From this average speed and the curves in Fig. 2 the traction, current and time can be calculated by the method already outlined.

Professor Woodruff simplifies the calculations by means of certain "service curves" plotted between net traction and time, of which one is shown as a hyperbola in the upper right-hand corner of Fig. 2. These simply show the times in which a certain increase in speed will be produced by different applied net traction forces. The one shown is for $\Delta V = 1$. The data for these curves are calculated by means of the fundamental law already mentioned. One will need as many of these curves as he proposes to use values of ΔV, the use of smaller values of ΔV being necessary on the upper flat part of the velocity-time curve to insure accuracy.

To show the application of the curves assume ΔV = 1 in Fig. 1. The average V between V_1 and V_2 is 13 m.p.h. In Fig. 2 a horizontal line is drawn at 13 m.p.h. intersecting the current curve at 65 amp. A vertical line through this point intersects the traction line at A and the gross traction is AD. The net traction available for acceleration is AB, which is laid off with dividers on the service curve, which is intersected at 0.58 seconds. This is Δt and it determines the point V_2t_2. This procedure is followed until the desired length of curve is obtained. (Fig. 2 is reproduced here simply for illustrative purposes. It was reproduced from the advance copy of the paper, but appears to the abstracter to have been inaccurately reproduced from the author's original chart.)

The distance-time curve is obtained thus. Up to time t_1 the distance is most readily calculated point by point from

$$D = Vt$$

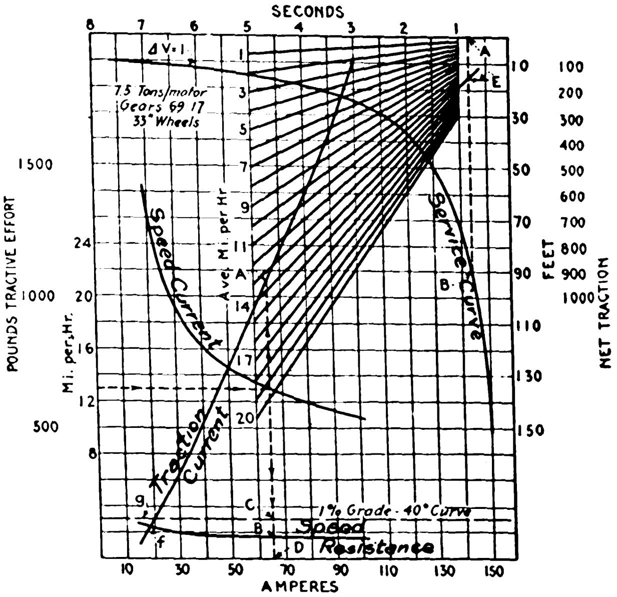
$$D \text{ (in feet)} = \frac{\text{m.p.h.} \times 5280}{3600} \times \text{sec.}$$

when V is the average velocity up to the time t.

From t_1 on the distance can be obtained from the area under the velocity curve by counting the squares or using a planimeter, the value of each white square being

D' = 2 (m.p.h.) × 2 (sec.) = 4 m.p.h. — sec. = 5.87 ft.

This calculation is greatly simplified by means of a series of radial distance-time lines drawn from the upper right-hand corner of the diagram for different speeds. The point in which the service curve intercept intersects the distance-time line corresponding to the appropriate speed is the increment of distance corresponding to the assumed speed increment. (See point E, Fig. 2.)



RAILWAY GRAPHICS—FIG. 2

It remains only to explain the correction for grade and curve resistances. Horizontal lines are drawn in Fig. 2 corresponding to these resistances. Grade resistance is 20 lb. per ton per per cent and curve resistance is assumed at 1 lb. per ton per 2 deg. curvature. In stepping off the net traction the intercept is simply reduced by the curve resistance and reduced or increased (on down grade) by the grade resistance.

The British Columbia Electric Railway, Vancouver, B. C., has arranged to look after the families of all of its employees who have volunteered for active service during the war. A special officer has been appointed to take charge of the work, and the employees are contributing 1 per cent of their monthly wages to the fund. The company has made a contribution of $1,000 to the general relief fund in Vancouver.

Central Electric Railway Association Meeting

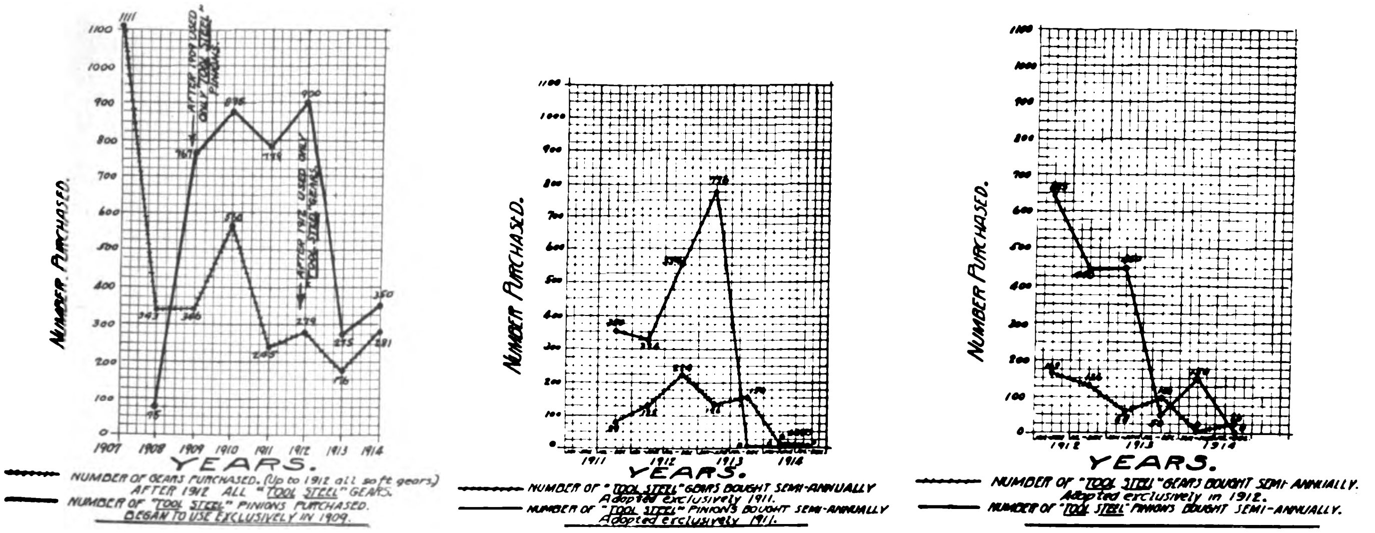
Among the Subjects Discussed at This Meeting, Which Was Held in Fort Wayne on Nov. 19-20, Were Those of Intermating Hard Pinions with Soft Gears, Timber Preservation, Selection of Railway Equipment, and a New Standard Flange Contour—Abstracts of the Papers Are Published, Together with a Telegraphic Report of the First Day's Proceedings

The autumn meeting of the Central Electric Railway Association was held in Fort Wayne, Ind., on Nov. 19-20. At this meeting five papers were presented and three of these are published in abstract below. An important report of the C. E. R. A. committee on standards was also presented at the meeting in which a new standard wheel-flange contour, differing from the A. E. R. A. standard, was recommended for adoption by the association, and an outline of this committee's recommendations follows, together with a report of the proceedings on Thursday, Nov. 19.

RUNNING TOOL-STEEL PINIONS WITH SOFT GEARS

BY E. S. SAWTELLE, ASSISTANT GENERAL MANAGER TOOL STEEL GEAR & PINION COMPANY

With regard to the results that have been secured by running tool-steel pinions with low-carbon untreated gears we have found that the three following general laws may be formulated: (1) Where an untreated gear has a carbon content of less than 0.30 per cent a tool-steel pinion will be injurious to it. (2) Where the untreated gear has a carbon content of 0.30 per cent or over, the tool-steel pinion will not decrease its life, and if the carbon content runs reasonably high, the tool-steel pinion will prolong its life. (3) In either case where the tool-steel pinion is mated with an untreated gear the life of the pinion will usually be lessened and frequently will be reduced from one-half to one-third as much as would be obtained if it were mated with a tool-steel gear.



FIGS. 1, 2 AND 3—GEARS AND PINIONS—DIAGRAMS SHOWING EFFECT OF USE OF HARD PINIONS

The startling significance of the importance of carbon content has been demonstrated by a test on a machine which absorbed a continuous input of 10 hp. On this a new tool-steel gear was installed and was first operated with a tool-steel pinion long enough to polish up the teeth on the gear. An untreated pinion made from 0.17 per cent carbon steel was next installed, and this pinion was completely worn out in fifty-six hours. An untreated pinion of 0.31 per cent carbon was next installed and it was worn out in 354 hours. Finally a tool-steel pinion was installed and it continued in service for more than 3000 hours, and the pinion was not then completely worn out. This test demonstrated that by increasing its carbon content from 0.17 per cent to 0.31 per cent, five times as long a life could be obtained from an untreated pinion that was mated with a tool-steel gear.

Substantiating this conclusion we have had check analyses taken in four cases where customers reported that they were obtaining low life from soft gears on account of mating them with tool-steel pinions. In all four cases the analyses of drillings from the soft gears showed that their carbon content was between 0.18 per cent and 0.25 per cent.

I have very carefully watched several test cars that were equipped to demonstrate the effect of inter-mating hard and soft gearing. With untreated material that showed a carbon content of 0.42 per cent the net result would indicate that the inter-mating with tool steel was a trifle beneficial to soft gearing and a trifle detrimental to the tool-steel gearing. In another case it was found that a soft gear wore 25 per cent faster where mated with a tool-steel pinion than where mated with a soft pinion, also that the tool-steel pinion wore very much faster than normal. In this case the soft gear was made of a comparatively low carbon steel. In fact, in every case that I have been able thoroughly to investigate, where the soft gears have given unsatisfactory results when mated with hard pinions, it has appeared that the condition came primarily from the fact that some manufacturer was using a case-hardening grade of steel for an untreated gear.

To go at the matter from another viewpoint, if the mating of the hard pinion with the soft gear is detrimental to the soft gear, it would be apparent that, after the installation of a considerable number of hard pinions in excess of hard gears, it would be necessary for a railway company to purchase, during the next few years, a greater number of gears per annum than had been bought previously, these gears being needed to replace gears which were wearing abnormally fast on account of the injurious effect of mating them with hard pinions. Conversely, if the hard pinions were beneficial to the soft gears, the buying of gears would be decreased numerically after the installation of a quantity of hard pinions.

In Fig. 1 is shown the number of gears purchased by a large city railway line. These were all untreated gears up until 1912, after which nearly all were tool-steel. On the same chart is shown the total number of tool-steel pinions purchased, and it is evident that there were installed approximately 2000 tool-steel pinions which had been in use for a year or two before the use of the hard gears had begun. It is noticeable that, despite this fact, the purchases of gears were numerically less in 1911, 1912, 1913 and 1914 than in the four years preceding. The extremely heavy purchases in 1907 were occasioned by an attractive proposition, and the company bought a number of soft gears for general stock, but these were used up within the next couple of years.

Fig. 2 shows results on a line which began to equip with the hard gears and pinions in the latter part of 1911 and whose purchases of pinions ran exceedingly high as compared with gears. During 1911 and 1912 the road installed about 800 tool-steel pinions to run with soft gears, yet for 1914 the gear purchases have been virtually nil.

Fig. 3 shows results on a large city line which began, early in 1912, to use tool-steel gears and pinions exclusively. It will be noted that during 1912 and 1913 more than 1000 tool-steel pinions were installed in excess of the tool-steel gears. In addition to this there were undoubtedly many cases where the hard gears and pinions were not mated together. The replacements for 1913 and 1914 were considerably less than in the preceding years.

A fourth calculation may be based on the total purchases of four smaller city and interurban roads. During the first two years they bought 283 more tool-steel pinions than gears, while during this period their total annual purchase averaged eighty-nine gears. During the third year and the fourth year their annual gear purchases dropped to fifty-four and forty respectively.

All of these companies have been purchasing under exclusive contracts, and we have positive assurance that they have not purchased any gears from other sources so as to interfere with the accuracy of the calculations we are making. It might be pointed out that many of these companies had installed a considerable number of tool-steel gears and that this might affect the purchases in the latter part of our calculations. I believe that all of these companies, however, have been able to get at least two or three years' life from the soft gears, and, this being the case, they would not feel the benefits of the use of the hard gear directly until a period later than that which we have used in compiling the charts.

It would seem to me from the data which we have been able to collect from the experience under special tests and under actual service conditions in test cars, and from the general effect that the use of the tool-steel pinion has on the diminution in the numerical purchases of gears in subsequent years, that with the exception of certain isolated cases it is good practice from the standpoint of the gear to mate it with a hard pinion, though we believe it is not good practice from the standpoint of the pinion.

However, it would be my recommendation that wherever for any reason untreated gears or pinions are purchased, a minimum carbon content of 35 per cent should be specified and the manufacturer held strictly to this as a minimum allowance. It would also be my recommendation that, as far as possible, railway companies keep their hard gears and hard pinions intermated, rather than allow their hard gears to be mated with soft pinions, and vice versa.

TIMBER PRESERVATION

BY WILLIAM F. GOLTRA, PRESIDENT THE W. F. GOLTRA TIE COMPANY, CLEVELAND, OHIO

There are two general methods of impregnating woods with antiseptic, namely: (1) Impregnation by immersion in open tanks or boilers, involving an absorption rather than an injection of the preservative fluid, so that the depth of penetration obtained is very shallow except with particularly open or porous woods such as sap pine. (2) Impregnation by pneumatic pressure in air-tight cylinders. In this method, which is the one in general use, the timber is placed in closed cylinders, and the preservative is injected into the wood under pressure from force pumps. There are some variations in the details of operation, and these may be classed into five groups and described as follows:

Process A—The wood that is to be treated is first "air seasoned," or piled in open air for a period of from three months to twenty months, to dry out. When sufficiently seasoned, it is loaded on small tram cars and run into cylinders 6 ft. or 7 ft. in diameter and from 100 ft. to 150 ft. long. The wood is then submerged in the preserving fluid, which has been heated to a temperature between 170 deg. and 190 deg. Fahr. A pressure pump then forces more fluid into the cylinder until the desired degree of absorption is obtained. The pressure is then released, the surplus fluid drained from the cylinder and a vacuum applied. This last operation is for the purpose of hastening the drying of the material and to prevent subsequent dripping when taken out of the cylinders.

Process B—In this the green or partially seasoned wood is run into the cylinders. Live steam is admitted at such rate as to secure 20-lb. steam pressure in from thirty minutes to fifty minutes. The pressure is maintained for a period varying from one hour to five hours, depending upon the character of the timber and its condition. A vacuum is then applied and maintained for at least thirty minutes, at the expiration of which time the hot preservative is admitted into the cylinder without otherwise breaking the vacuum. The remainder of the operation is similar to Process "A."

Process C—The material, in a green or partially seasoned condition, is run into a cylinder and the wood is submerged in a preservative, usually creosote oil, the temperature being raised to 215 deg. or 225 deg. Fahr. Boiling is maintained for periods ranging from four hours to eight hours, depending upon the character of the timber and its condition. A vacuum is sometimes applied to assist liberation of saps in the wood. Pressure pumps are then put into action, the remainder of the operation being substantially the same as Process "A."

Process D—Under this process the material must first be "air seasoned" as in Process "A." It is then run into a cylinder and an initial air pressure of varying intensity is applied. Without lowering this air pressure the cylinder is then filled with a preservative, usually creosote oil, having a temperature of from 170 deg. to 190 deg. Fahr. The pressure is then raised still higher, the remainder of the operation being substantially the same as in Process "A." The patentees call this an "empty-cell" process.

Process E—As creosote oil and water solutions of zinc chloride have different specific gravities and tend to separate from each other it is necessary to keep such preservatives in agitation in the treating cylinder, and a device for this purpose has been patented. This consists of a centrifugal pump that keeps churning the emulsion in the impregnating cylinder while under pressure.

Practically all plants in America are equipped to treat by Process "A," the earliest and simplest method of treating timber by the application of pressure. Thirty-one plants are completely equipped to treat also by Process "B," while thirteen plants are equipped to treat with Process "C," that is, boiling in creosote oil. Of the other fifty treating plants about two-thirds are equipped in some fashion for steaming material whenever occasion requires. Seventeen plants are equipped for treating by Process "D" and nine by Process "E."

The selection of the preservative that is used for the treatment, although important, is secondary to other factors which influence the durability or life of treated material. The chief impregnating fluids in use in this country to-day are chloride of zinc, creosote oil and heavy crude oil. Up to 1900 approximately 15,000,000 ties had been treated in the United States, of which about 14,500,000 were treated with chloride of zinc and 500,000 with creosote oil. However, for various reasons (some legitimate and some otherwise) the consumption of creosote oil has greatly increased of late and has surpassed that of zinc chloride.

Chloride of zinc is an efficient and cheap preservative. It has been used longer than any other preservative, and the service records both in Europe and America attest to its merits as an excellent wood preservative. Ordinarily ties and timbers, when treated with chloride of zinc, are treated to "refusal," that is to say, the chemical solution is forced into the wood until it refuses to imbibe any more. The solution is usually made 2 per cent strong. The average absorption is 1½ lb. of salt per tie, which at 3½ cents per pound costs between 5 cents and 6 cents per tie.

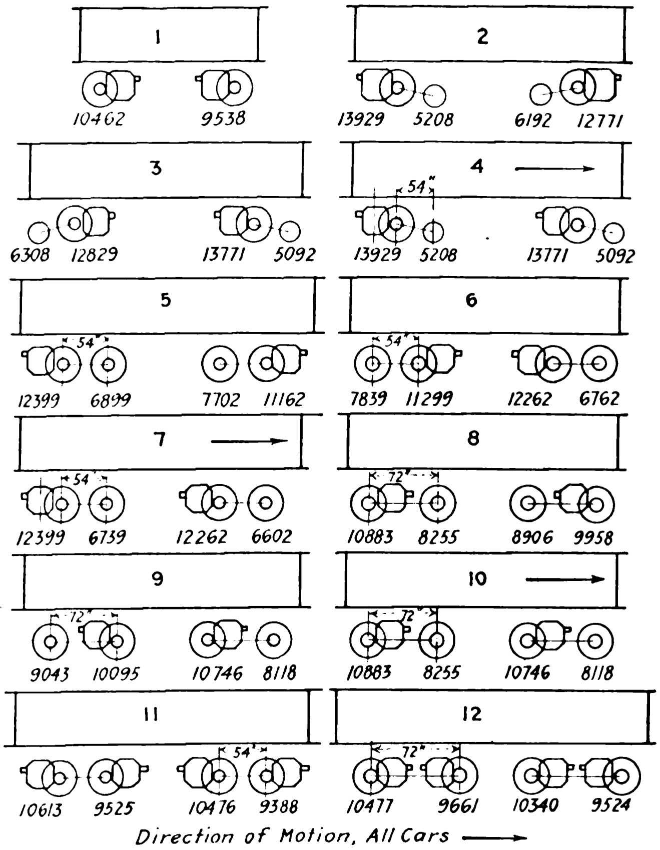
Creosote oil is much more expensive, and the price is constantly advancing. Ten years ago it was selling at 6 cents a gallon, while to-day the price is around 10 cents a gallon. Thoroughly seasoned ties, treated to refusal, will absorb an average of 4½ gal. of oil per tie, or from 40 cents to 50 cents worth of oil, at current prices. This makes it almost prohibitive to treat ties to refusal so we find it is a common practice to inject only a partial dose, say 2½ gal. of oil, or less, per tie. Where such practice prevails, it is frequently observed that the ties are only superficially covered with black tar oil, and as good a penetration as this could have been obtained by open tank process at much less cost. It would be far better to use a combination of creosote oil and chloride of zinc and treat the material to refusal. The combination of creosote oil and chloride of zinc meets with much favor, both here and in European countries. The mixture consists of 12½ per cent creosote and 87½ per cent zinc chloride solution. The cost, based on the above prices, would be about 11 cents per tie.

In my opinion, the two most important factors in the treating of material are: (1) The proper seasoning or drying of the material before the injection of the preservative, and (2) a thorough and full impregnation of the wood with whatever preservative is selected. To obtain thorough treatment it is very essential that all saps and water be removed from the wood, so far as possible, before the injection of the fluid. This, however, can be effected quickly and economically by means of steaming the timber immediately upon arrival at the treating plant, then piling in open air for a period of a few months to season it, and then completing the drying in ovens or kilns. The condition of timber as regards moisture content at the time of treating is by far the most important of the many factors influencing the absorption of the preservative, and unless this feature has the utmost attention the results from treatment will hardly ever be satisfactory.

SELECTION OF RAILWAY EQUIPMENT

BY JOHN F. LAYNG, RAILWAY ENGINEERING DEPARTMENT
GENERAL ELECTRIC COMPANY

In this paper the author discusses some of the factors entering into the selection and arrangement of motors and controllers for city and interurban cars. For the purpose of analysis he divided these cars into two general classes, namely, those provided with two-motor equipments and those provided with four-motor equipments. Three types of trucks were also considered, namely, single, maximum traction and double trucks. With these elements a number of different combinations can be made, of which twelve, shown in the accompanying diagram, were analyzed to determine the distribution of weight on the axles, particularly during the period of acceleration. This distribution of weight largely determines the schedule possibilities and grade-climbing qualities of a car. In this analysis Mr. Layng called attention to the following considerations.



SELECTION OF ELECTRICAL EQUIPMENT—DISTRIBUTION OF LOAD DRIVING ACCELERATION

The single-truck car is ideal from the standpoint of weight distribution, but seating capacity and riding qualities limit its field of application. In the double-truck car the ideal distribution of power equipment is such as to give uniform weight on the axles to minimize wheel slippage. This ideal cannot be realized. During the accelerating period there is a shifting of the car-body weight, that on the front center plate being reduced and that on the rear increased. If a body weighing 10 tons is accelerated at the rate of 1½ m.p.h.p.s., and the center of mass is 24 in. above the center plate and the king pins are 20 ft. between centers, the weight on the front center plate during acceleration is 9863 lb. and that on the rear plate is 10,137 lb. A similar shifting of weights takes place on each truck.

The choice between two-motor equipment and four-motor equipment is decided largely on the basis of wheel slippage. Double-truck, two-motor equipments are not satisfactory on grades greater than 5 per cent or on bad rail made such by snow, sleet, mud or leaves. Trailer operation must also be considered in making this choice. The figures given on the chart show that from the standpoint of weight distribution the four-motor equipment is superior and that with inside-hung motors is best of all.

ANALYSIS OF WEIGHT DISTRIBUTION

The weight distributions given in the chart were determined in the following manner. The assumptions made were: (1) Acceleration $1\frac{1}{2}$ m.p.h.p.s. on tangent, level track; (2) single-truck car, weight 10 tons, wheelbase 10 ft., center of gravity 24 in. above center line of axles; (3) all double-truck car bodies, weight complete with car-body equipment, 10 tons, no live load; (4) trucks of double-truck cars, weight 6000 lb., wheelbase 72 in. for outside-hung motors or 54 in. for inside-hung motors, distance from surface of center plate to axle center line 12 in., wheel diameter 33 in., distance of center of gravity of body above center plate 24 in., distance between truck centers 20 ft., and weights and lengths of two ends of car equal; (5) slight tilting of body and rotating effect of dead axles neglected.

Referring to the second diagram the symbols are seen to signify as follows:

W = weight of car body (in pounds),
T = retarding pressure of car body during acceleration (in pounds),
P = pressure transferred from front to back truck at king pin (in pounds),
t = retarding pressure of truck during acceleration (in pounds),
L = distance between truck centers (in feet),
X = center of moments of car body,
Y = center of gravity of car body,
H = vertical distance X to Y (in feet),
K = vertical distance center plate to rail (in feet),
l = distance between axle centers (in feet),
Z = center of gravity of truck,
$l_1 l_2$ = horizontal distance, truck center of gravity to trailing and leading wheel treads respectively (in feet),
h = vertical distance rail to truck center of gravity (in feet).

The moment formulas then give the desired weights.

$$T = \text{mass} \times \text{acceleration} = \frac{W}{32.2} \times \frac{1.5 \times 5280}{3600} = 0.0684\,W$$

(1) Transfer of car body weight from front to rear truck:

Balancing moments

$$0.0684\,WH = 2P\frac{L}{2} = PL$$

$$P = 0.0684WH/L$$

$$W_1 = \frac{1}{2}W - P \qquad W_2 = \frac{1}{2}W + P$$

Where W_1 = car-body weight on front truck (in pounds),
and W_2 = car-body weight on rear truck (in pounds).

(2) Transfer of car-body weight from front to rear axle:

$$\frac{1}{2}TK = p_1 l_1 + p_1 l_2 = p_1(l_1 + l_2) = p_1 l.$$
$$p_1 = TK/2l.$$

Where p_1 = center-plate load transferred from front to rear axle (in pounds),

(2) Transfer of truck weight from front to rear axle:

$$t = 0.0684b \qquad 0.0684bh = p_2 l$$
$$p_2 = 0.0684bh/l$$

Where b = weight of truck (in pounds).
p_2 = truck load transferred from front to rear axle (in pounds).

$$p = (TK/2l) + (0.0684bh/l).$$

Where p is the total load transferred from the front to rear axle.

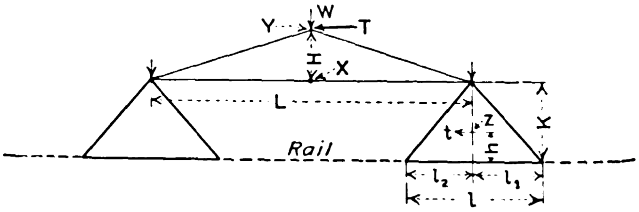
The distribution of wheel pressure is then:

FRONT TRUCK	REAR TRUCK
$W' = (W_1 l_2/l) - p$	$W' = (W_2 l_2/l) - p$
$W'' = (W_1 l_1/l) + p$	$W'' = (W_2 l_1/l) + p.$

CHOICE OF TYPE OF MOTOR AND CONTROL SYSTEM

In selecting a type of motor the problem is to secure the maximum power per pound of weight, the maximum efficiency and reasonable price.

The ventilated motor is now generally specified and the value of field control in increasing motor capacity is recognized. In considering field control the service must be studied to determine whether or not the increased cost and complication are warranted. These are not great in the motor but come in the controller and wiring. The extra connections also increase the difficulty of locating trouble. As all of the saving from the use of field control occurs during acceleration the saving is proportionately small when stops are infrequent. Comparatively few four-motor field control equipments have been purchased, but two-motor equipments have been extensively applied for city service.



SELECTION OF ELECTRICAL EQUIPMENT—FORCE DIAGRAM DOUBLE-TRUCK CAR

During three years past the interest in 24-in. wheel equipments has been increasing and efficient and well-constructed motors have been developed. This interest is due to the tendency to reduce weight. An innovation in control with these equipments has also been introduced in which three running points are provided. Its use should produce from 7 per cent to 8 per cent. saving over the two-running-speed control. It is necessary to analyze the service carefully in applying this control, as the heating is not equally divided among four motors. The small-wheel trucks can be purchased to weigh but 8000 lb. per pair, whereas standard trucks weigh approximately 12,000 lb. The comparative motor weights are 1750 and 2000 lb. The use of the small-wheel truck thus results in a saving of 5000 lb.

In interurban service are found most of the four-motor equipments which are used and field control has not been generally adopted here for the reasons stated. The use of voltages above 600 are attractive due to the resulting savings, but as many interurban roads supply city service the use of high voltage would require the replacing of much city car equipment. Interurban roads are considering the business of handling carload freight and the custom has been to start with 40-ton locomotives with four 125-hp motors. On some properties business has grown so that 60-ton locomotives with four 225-hp motors are necessary.

CONCLUSIONS

The selection of a proper equipment is not difficult, but it requires information based on actual observation and careful records. There is great likelihood that an equipment larger than necessary will be installed if a manufacturer is asked to make recommendations based on number of stops per mile and duration of stops. In this case both manufacturer and customer will allow safe margins.

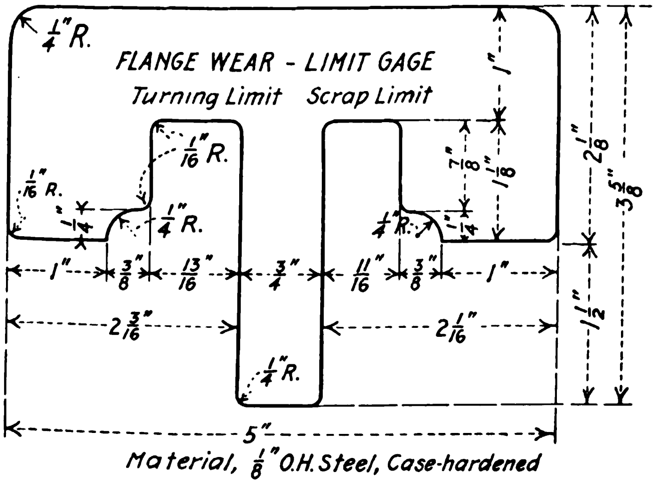
The effect of attempting to run faster than normal schedules is greatly increased expense. For example, with a 9.6 m.p.h. schedule speed for a 20-ton car making 7.75 stops per mile the energy consumption is, in a certain case, 145 watt-hours per car-mile. By slowing this schedule to 9.45 m.p.h. 122 watt-hours only are required, a saving of 19 per cent. The present tendency to increase schedule speeds results from the increase in platform wages.

REPORT OF COMMITTEE ON STANDARDS

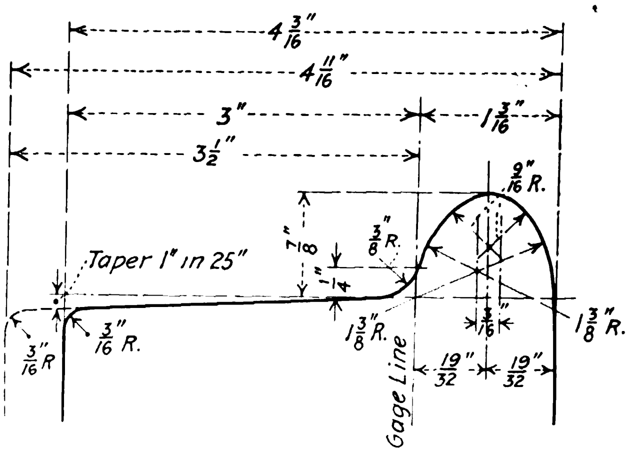
This committee presented for the consideration of the Association drawings for a proposed standard wheel flange and tread contour and for a proposed standard limit gage for wheel-flange wear. The data for the former design had been obtained from the twenty-three replies that were received from sixty-two question blanks sent out last September. Of the companies replying two gave preferred dimensions for special grooved rail and twenty-one answered negatively in regard to the proposal to use the A. E. R. A. grooved rail as standard. Eight of the companies reported that the type of rail on their lines was governed by city ordinance, and thirteen replied to the contrary. There follows a summary of the data showing the number of companies using various types of rail and flange contour and the average results obtained from the data contained replies.

Interurban rails, 70 lb. A.S.C.E	Fifteen companies
Interurban rails, other kinds	Eight companies
City rails, T-section	Twelve companies
City rails, grooved section	Two companies
Wheel-flange contour, A.E.R.A. dimensions	Sixteen companies
Wheel-flange contour, other dimensions	Five companies
Average maximum wheel mileage, first turning	98,000 miles
Average guard-rail opening	1.71 in.
Average minimum curvature	42.4 ft.
Average number of minimum curves	3.45
Average flange wear-limit thickness	11/16 in.

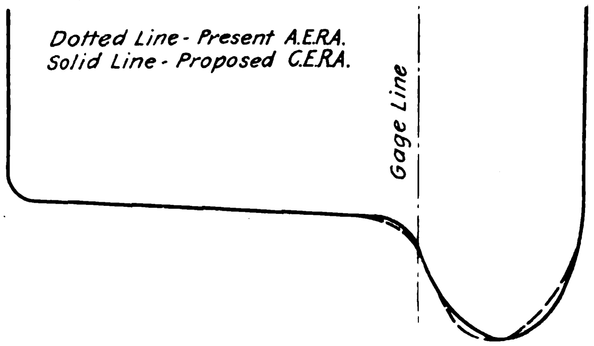
This data was used by the committee for the design of a flange wear-limit gage for determining the minimum thickness of flanges commensurate with safety in operation and economy in turning. This design is shown in the accompanying illustration. The committee stated that at the present time, while a majority of the member companies were employing a uniform flange contour corresponding with the A. E. R. A. standard, nevertheless there was a considerable variation in the practice governing minimum flange thickness, and there appeared to be no reason why definite limitations could not be adopted and adhered to. The committee therefore recommended that the flange wear-limit gage should be adopted as standard by the association.



C. E. R. A. STANDARDS—FLANGE-WEAR LIMIT GAGE



C. E. R. A. STANDARDS—PROPOSED FLANGE AND TREAD CONTOUR


Dotted Line - Present A.E.R.A.
Solid Line - Proposed C.E.R.A.
Gage Line

C. E. R. A. STANDARDS—COMPARISON OF A. E. R. A. STANDARD FLANGE CONTOUR WITH THAT PROPOSED BY C. E. R. A.

With regard to modifying the present standard flange and tread contour, with a view toward improving the efficiency of the design, the committee recommended that the flange and tread contour as shown in the accompanying illustration be adopted as standard by the association. The report was made by the following committee members: R. N. Hemming, chairman; L. M. Clark, H. H. Buckman, Charles Sigler and Edward Heydon.

PROCEEDINGS ON THURSDAY

The Fort Wayne meeting of the Central Electric Railway Association was opened by President Schneider on Thursday, Nov. 19, at the Hotel Anthony, with a large number of delegates in attendance. After calling the meeting to order the president announced that the report of the standardization committee would not include the question of charges for interline equipment repairs and that consideration of this subject would be deferred. The report of the standardization committee was then read by Chairman R. N. Hemming, Union Traction Company of Indiana. H. H. Buckman, Louisville & Northern Railway, spoke of mileage results that his company had obtained with A. E. R. A. standard wheel-flange contour and with the proposed C. E. R. A. wheel-flange contour. These tests had been made on both steel tired and rolled steel wheels. G. K. Jeffries, Terre Haute, Indianapolis & Eastern Railway, stated that the proposed C. E. R. A. contour was approximately the same as that used on his road.

L. A. Mitchell, Union Traction Company of Indiana, called attention to influence of track special work on wheel wear. He stated that rail wear was too small to be measured accurately even after several years of service. That due to wheel-flange wear, however, governed the life of rail in track special work, especially in curves. He approved of the proposed new contour because he thought it would reduce nosing. Mr. Mitchell also spoke of the tendency to use blunt flanges so as to provide for flange-bearing special work.

Regarding the recommended wheel-flange wear-limit gage C. L. Henry stated that no action had been taken on this subject by the American Electric Railway Engineering Association. The association then voted to adopt as recommended practice the wheel-flange wear-limit gage designed by the committee. This design will be submitted to the American Electric Railway Association for adoption as standard at the next convention.

W. F. Goltra was then requested to read his paper on "Treatment of Ties or Wood Preservation," of which an abstract appears on another page. This was discussed by R. N. Hemming and L. A. Mitchell. Mr. Mitchell called attention to the zinc-chloride treatment and its effect on spikes and rail. While the steam roads had not been affected, electric roads had experienced a rapid corrosion of spikes when used with zinc-treated ties. He mentioned that he had removed spikes, after about five years' service, which showed from 20 per cent to 50 per cent reduction by corrosion. This experience had led him to believe that the zinc-chloride treatment for electric roads was unsatisfactory. W. A. Carson, Evansville Railways, stated that he had had similar experience with zinc-treated ties. In reply to an inquiry, Mr. Mitchell stated that he was using a combination zinc-chloride and creosote treatment for ties and, so far as he could determine at this time, the combination had eliminated the objections to zinc treatment so far as electric roads were concerned.

E. S. Sawtelle then read his paper entitled "What Results Have Been Secured by Running Tool-Steel Pinions With Low-Carbon Untreated Gears," which appears elsewhere in abstract form. Mr. Buckman, in discussing this subject, approved the recommendation that better results would be obtained with mated than with unmated gears and pinions. He also stated that he had found quite a marked difference in the wearing qualities of different types of case-hardened gears and pinions. W. E. Rolston, Chicago, Lake Shore & South Bend Railway; F. A. Bundy, Ohio Electric Railway, and R. N. Hemming, Union Traction Company of Indiana, reported similar experiencees in intermating gears and pinions. Rather than use mis-mated gears and pinions Mr. Bundy stated that his company had scrapped about $1,000 worth of untreated material.

The recommendation of the standards committee that a way committee be appointed to study the problems affecting this department of electric railways was then approved by the association. The following were appointed as members of the new committee: T. R. H. Daniels, Terre Haute, Indianapolis & Eastern Traction Company; W. A. Carson, Evansville Railways; J. H. Sundmaker, Ohio Electric Railway; L. A. Mitchell, Union Traction Company of Indiana, and E. Smith, Toledo, Fostoria & Findlay Railway. The meeting then adjourned until the next day, Friday, Nov. 20.

In connection with the meeting, the Cleveland, Southwestern & Columbus Railway and the Union Traction Company of Indiana ran special cars to Fort Wayne, from Cleveland and Indianapolis respectively. The Cleveland car, in charge of President Schneider, carried a party of forty, and stopped en route at the Fostoria shops of the Toledo, Fostoria & Findlay Railway. The shops at this point were inspected as well as the company's new, 56-ft., all-steel cars that had been recently received from the Niles Car Company.

Pennsylvania Railroad Tries Out Storage-Battery Car

A successful demonstration of Edison storage battery car operation was conducted on Nov. 16 over the main line of the Pennsylvania Railroad from Newark to Holmesburg Junction, near Philadelphia. The trial trip was taken by a number of representatives of the Pennsylvania Railroad and several other railroads. The car used for the demonstration had been ordered by the Lorain, Ashland & Southern Railway, Ashland, Ohio, from the Railway Storage Battery Car Company, New York, and on the occasion of the test was on its way to be delivered to the railway company as a second storage battery car equipment for that line.

The demonstration car measured 48 ft. 9½ in. in over all length and was composed of a passenger compartment, a 14-ft. 6¾-in. baggage compartment and a 5-ft. 5¼-in. smoking compartment. Power was supplied by 240 Edison A-12-H storage battery cells. The car was operated by double-end control. The total weight of the car was 31 tons.

The schedule of the run was as follows:

	Miles
Leave Newark 11.45 a.m.	0
Arrive Trenton 1.24 p.m.	48.1
Leave Trenton 1.31 p.m.	—
Arrive Bristol 1.54 p.m.	58.1
Leave Bristol 1.55 p.m.	—
Arrive Holmesburg Junction 2.21 p.m.	68.3

The 68-mile run was made by smooth operation in 2 hours 31 minutes actual running time, excluding stops at Trenton and Bristol to let off passengers. The average running speed of the car, 27 m.p.h., and maximum speed of 36 m.p.h. was very creditable in view of the fact that forty-four passengers were on board, and, especially owing to the short-circuiting of one of the motors while charging in the Newark yard, so that the run was made with only three 20-hp motors in service.

This car will be operated temporarily for about thirty days on the 4-mile Holmesburg Junction-Bustleton branch of the Pennsylvania Railroad, and thereafter two new storage battery cars, operated separately, will probably be introduced for the regular passenger service of the branch line. These two cars will be either suburban passenger cars of the Pennsylvania Railroad re-equipped with storage batteries, motors and control or standard 50-ft. double-truck Edison storage battery cars of the Railway Storage Battery Car Company with 32-ft. passenger and 12-ft. 10-in. baggage compartments. They will operate for about 130 miles each day on one battery charge and will be designed for maximum speeds of 30 to 35 m.p.h. At the end of about six months, if the operation of this equipment proves satisfactory in reliability and saving of car-mile costs, from fifty to seventy-five storage battery cars may be adopted for general branch line service on this steam railroad.

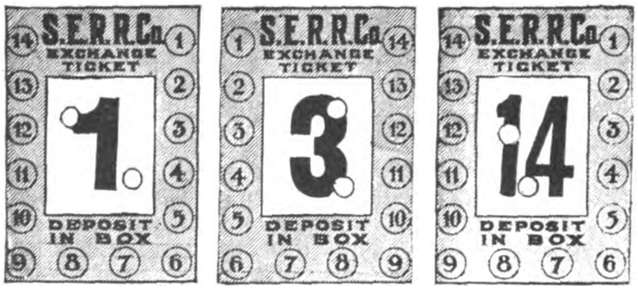
Arrangements have been made with the officials of the public library whereby the United Railroads, San Francisco, Cal., can take books out in bulk to the divisions where there is a demand for them. A bookcase was installed at the Sutro carhouse and about fifty books placed upon the shelves. Most of the books were immediately taken out. The selection was made by Superintendent Nougues and the editor of the *United Railroads Magazine*, but the men will be permitted to apply for any book desired, and it will be procured.

Interurban Prepayment Operation with Zone Tickets by the Stark Electric Railroad

BY A. J. SAMPSON, ASSISTANT GENERAL MANAGER AND AUDITOR

A decided departure from the usual method of fare collection and receipting, which also includes an important change in door location, was inaugurated on Oct. 19 by the Stark Electric Railroad on its 32-mile line between Canton and Salem, Ohio. In all respects but one the two cars used are of interurban, arch-roof type with standard side-door baggage compartment. The exceptional feature is the replacement of the standard vestibule side doors by quadruple doors hinged to the sides and opening in the middle, and by wide fixed steps which give direct access to the conductor's position in the body of the car. The successive rails from ground to car floor are as follows: 14¾ in., 12¼ in., 12⅛ in. and 12⅛ in. The usual stanchions and dividing rails are provided. When the car is under way the steps are completely inclosed. The fact that the conductor is always stationed at the rear should be a big factor in the elimination of platform accidents. At wayside stops the ground between the rails has been filled in and planked to afford passengers a safe and dry footing.

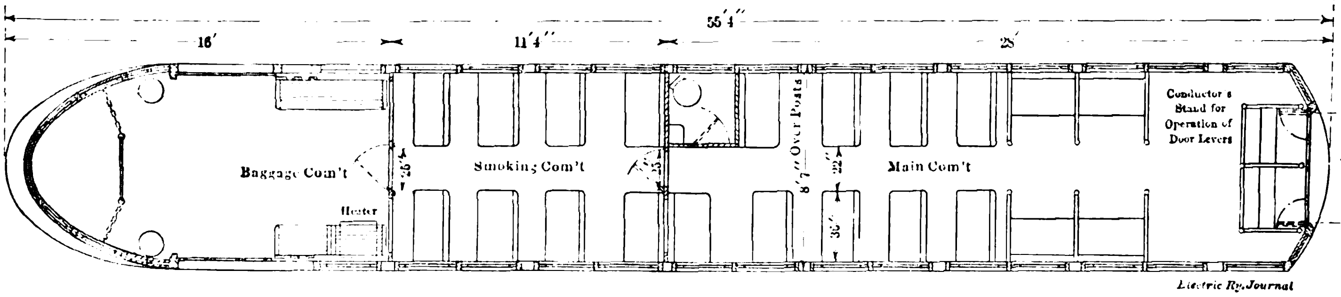
When passengers board the car they must deposit in a Cleveland fare box, a fare of some class—namely, ticket, cash or mileage. As the fare is deposited the conductor issues an exchange ticket showing in large type the number of the fare zone into which the passenger is entitled to ride. This exchange ticket must be deposited in the fare box as the passenger leaves the car at his destination.



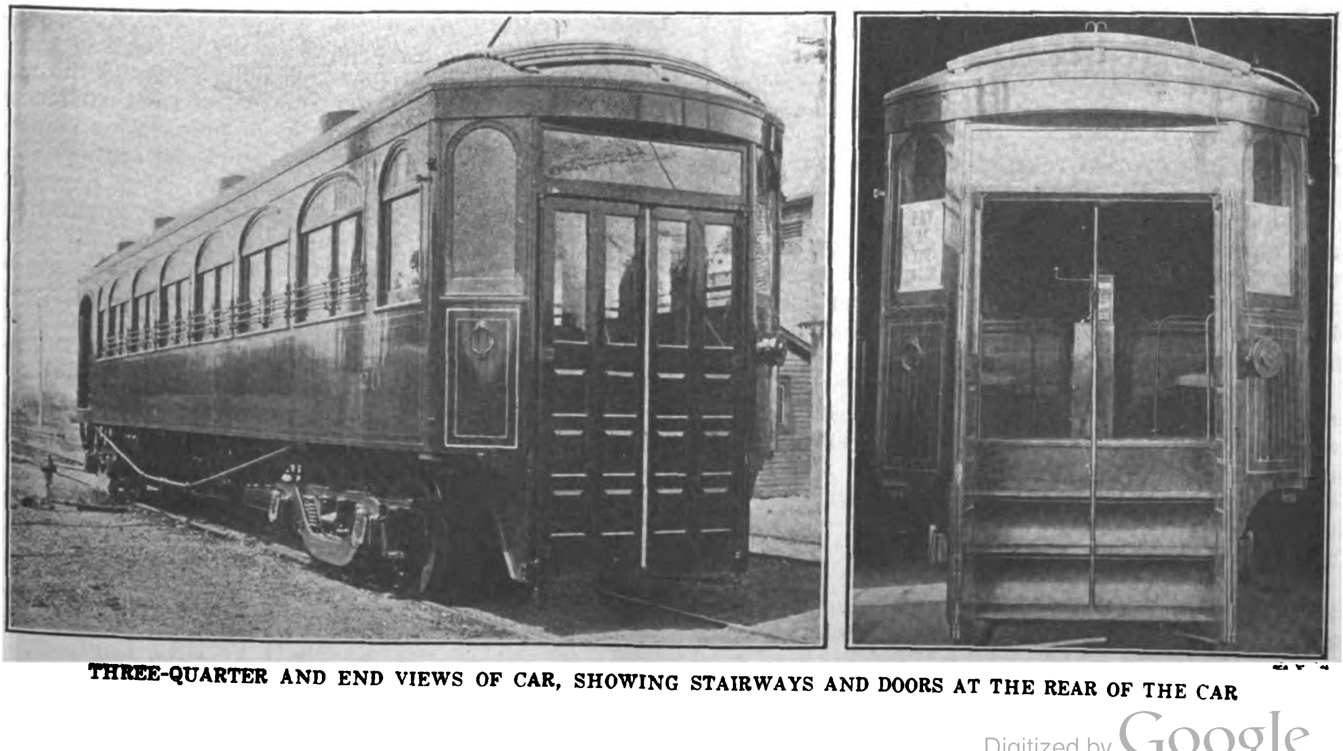
FARE RECEIPTS NUMBERED ACCORDING TO ZONES OF PASSENGERS' DESTINATION

If a passenger should attempt to ride into a different fare zone than the one to which the fare was paid the conductor would then collect an additional fare. Our road has been divided into fourteen fare zones, and each of the large corresponding numbers are plainly seen as the ticket is dropped into the box so that it is easy for the conductor to detect anyone who is trying to over-ride. The small numbers on the edges of the exchange ticket are punched out only when the passenger pays a cash fare. The actual fare paid is five times the difference between the small number punched out and the big number on the ticket, 70 cents (14 × 5) being the largest cash fare collected.

We use a small box made like a ticket case with tubes holding 100 each of the fourteen fare zone tickets.



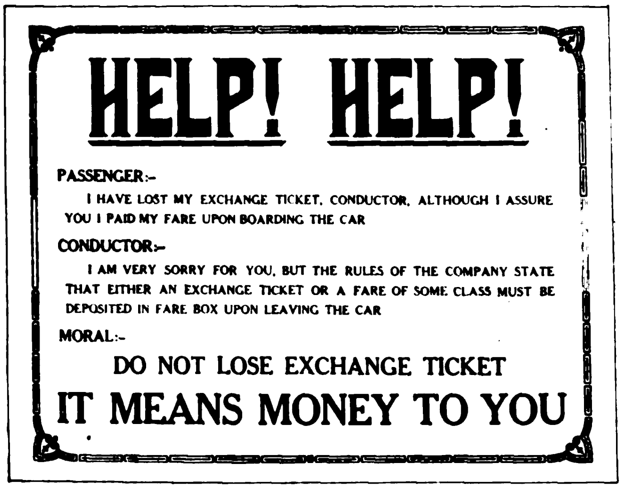
PLAN OF STARK ELECTRIC RAILROAD'S INTERURBAN PREPAYMENT CAR WITH ALL ENTRANCE AND EXIT VIA END DOORS AT THE REAR



THREE-QUARTER AND END VIEWS OF CAR, SHOWING STAIRWAYS AND DOORS AT THE REAR OF THE CAR

This case rests upon an upright piece of pipe and is taken off by the conductor at the end of the run. Each conductor is held responsible for maintaining at all times his supply of exchange tickets.

The cash box is sent to the auditing department each morning for the checking of the contents. Each fare collected must have an exchange ticket to balance same, and the cash in the box must check against the amounts indicated by the punches made in the exchange ticket by the conductors. This may seem a rather long method of checking the conductor, but we have found it saves time when compared with all the steps necessary under the old system of checking cash fare receipts issued and tickets collected. In addition, when the daily report is put on the auditor's desk for the day's business, he knows that all work in regard to checking conductors' reports in his department has been completed and that nothing has been carried forward to do the next day.



HELP! HELP!

PASSENGER:-

I HAVE LOST MY EXCHANGE TICKET, CONDUCTOR, ALTHOUGH I ASSURE YOU I PAID MY FARE UPON BOARDING THE CAR

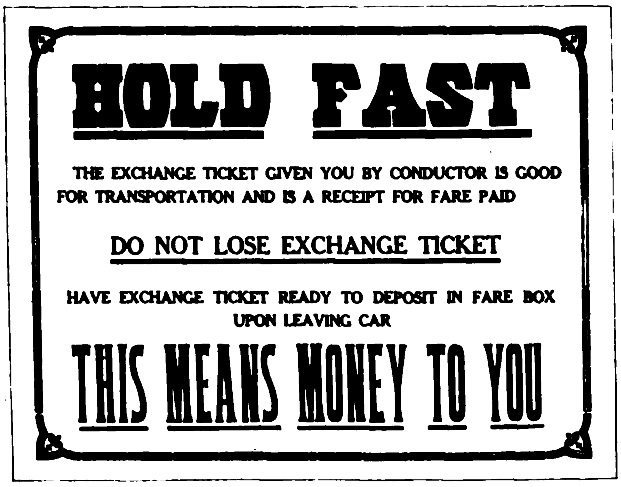
CONDUCTOR:-

I AM VERY SORRY FOR YOU, BUT THE RULES OF THE COMPANY STATE THAT EITHER AN EXCHANGE TICKET OR A FARE OF SOME CLASS MUST BE DEPOSITED IN FARE BOX UPON LEAVING THE CAR

MORAL:-

DO NOT LOSE EXCHANGE TICKET

IT MEANS MONEY TO YOU



HOLD FAST

THE EXCHANGE TICKET GIVEN YOU BY CONDUCTOR IS GOOD FOR TRANSPORTATION AND IS A RECEIPT FOR FARE PAID

DO NOT LOSE EXCHANGE TICKET

HAVE EXCHANGE TICKET READY TO DEPOSIT IN FARE BOX UPON LEAVING CAR

THIS MEANS MONEY TO YOU

REPRODUCTIONS OF TWO POSTERS GIVING NOTICE OF PRE-PAYMENT OPERATION

We are very well satisfied with the experiment so far and the public seems also to be well pleased. I spent two days riding the cars and heard far more compliments than kicks in regard to the system. I might add that several educational cards, two of which are reproduced, were posted in the cars to prepare our patrons for the change.

The cars, which were furnished by the Jewett Car Company, Newark, Ohio, are 55 ft. 4 in. long over all, 54 ft. over the body, 8 ft. 7 in. wide and seat fifty passengers. The body, which weighs 35,000 lb., is of wood with composite underframe, mahogany trim and Agasote headlining. The arch roof is used. The plan on page 1163 shows the division of this single-end type into three compartments and the layout of the prepayment section.

COMMUNICATIONS

Calculating Depreciation

Barclay Parsons & Klapp, Consulting Engineers
New York, Nov. 19, 1914.

To the Editors:

Replying to the communication from John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, appearing in your issue of Nov. 7, 1914, page 1059, wherein Mr. Britton takes exception to the methods of calculating depreciation as brought out in my article, I feel that Mr. Britton's views on this matter cannot be lightly passed over because of his forty years of experience in the handling of public utility properties and his ripe judgment and the success of the corporation with which he has been so long connected.

In a statement defending the adaptability of the per cent of gross earnings method of accruing depreciation, admission must be made that at best the method is a rule of thumb and, as described by others, "unscientific." However, as brought out by the article, the question of depreciation is exceedingly complex and the application of the more refined methods seems on study to be unwarranted on account of the variations and exceptions which are found to upset the plans as outlined by any one refined method. Among bankers whose experience covers a variety of public utility properties widely scattered, the conclusion has been drawn that adequately to protect the investor in funded securities, and at the same time create no hardship to the stockholders in the accruing of unnecessary reserves, simple, hard and fast rules are sometimes necessary, and in order to obtain simplicity of application rule-of-thumb methods are advisable, and that the per cent of gross earnings method for the determination of depreciation and maintenance has proved to be of merit.

An instance occurs to the writer in a large generating and operating company where objection was raised to the proposal of using the per cent of gross-earnings method for the determination of the reserves, and a suggested method was tried based on the per cent of additions to physical property, bearing in mind the experience of the rates of depreciation of each particular kind of property. After months of preparation requiring extended conferences of engineers and accountants, a schedule was prepared and applied. This has now been in use for a sufficient period to test its application and it is surprising to note the negligible error with which the per cent of gross earnings method reaches the same result, the one requiring considerable eliminations and judgment on the part of the accountants to obtain the monthly total, the other a simple multiplication that can be checked by anyone seeing the report.

Sifting down the various arguments that have been advanced, and agreeing that depreciation is necessary, the answer which comes to mind is that simplicity of method and application is eminently desirable. In view of the success of the per cent of gross earnings method for calculating depreciation and its extended use, the answer to Mr. Britton's criticism can be summed up by the users of the method with the statement that it obtains a satisfactory result by a simple and direct process.

Ralph U. Fitting, Engineer.

The Revival of the Flagging Rule

Illinois Traction System
Springfield, Ill., Nov. 12, 1914.

To the Editors:

The writer has previously commented on your criticism of the so-called revival, by several roads, of a rule permitting a train to proceed under flag protection such as that which once appeared in the standard interurban code. It is undoubtedly a fact that several roads have, in connection with their automatic signals, adopted a form of flagging rule, but this, in every case with which the writer is at all familiar, differs very materially from the rule which was eliminated in 1911. It is apparent that the opinions expressed in my letter of Sept. 4 have been understood as an argument for the revival of the old rule. Nothing was farther from my intentions, as I firmly believe that such a rule is unsafe.

Under the conditions existing in 1911 the occasions on which a train would have reason to flag itself ahead were when it had arrived at some carded or ordered meeting point and could not obtain other orders, or at a junction or end of double track where a train was permitted to flag ahead in case the dispatcher could not be communicated with, this latter condition being as unsafe as the first. Under these circumstances it would be better to have the train delayed several hours, if necessary, than to have it proceed past the meeting point or junction, meet the opposing train somewhere between the two sidings and then have to back up to the siding to allow the other train to pass. This is surely what would happen, if not in the first section of track, at least in the second or third. In addition to the fact that such a procedure is most desirable from an operating standpoint, the danger is too apparent to need mentioning.

Under the conditions existing on signaled roads to-day, however, it is not the right to proceed past meeting points or junctions that is being given to the trainmen, but rather the right to adhere to the time-carded or ordered meets, after properly protecting themselves, under conditions where it is perfectly safe for them to do so. It appears to the writer that if the Transportation & Traffic Association desires to include a rule covering this condition, which is a new one on electric roads, it can with proper differentiation, very safely do so. The entire question seems to be whether the signals are to take precedence over the regular train-operating rules or are to be adjuncts to them.

John Leisenring, Signal Engineer.

ASSOCIATION NEWS

PUBLIC SERVICE RAILWAY SECTION MEETING

A most enthusiastic meeting of the Public Service Railway section was held in Newark on Nov. 19 with an attendance of about 350. The speakers were Thomas N. McCarter, president of the company; R. E. Danforth, general manager, and C. Loomis Allen, president American Electric Railway Association. Mr. McCarter's address was a forceful statement of how the men can assist the officers of the company in fostering cordial relations with the thinking public by doing their work in a thorough manner and thus helping the company to earn a fair return on the investment in the property.

Mr. Allen spoke on "Public Relations" and outlined the development of the association during the past ten years. He traced the work of the public relations committee year by year and especially commended, and urged the study of, the 1914 report. Mr. Danforth's talk was announced as a report upon the plans for the coming year. He outlined an instructive program in which the section is to be systematically informed upon the problems connected with the operation of a great corporation. He expanded his talk, however, to give concrete suggestions as to ways in which the employees can carry out Mr. McCarter's advice.

The experience of the section officers has demonstrated that the section is an important agency for the promotion of a spirit of co-operation and good-fellowship. The hearty reception given to the plan outlined by Mr. Danforth shows that the members desire to utilize the meetings for the good of the company as well as themselves.

The next meeting on Dec. 17 will be the occasion of the annual dinner, for which an attractive menu has been prepared.

WASHINGTON RAILWAY & ELECTRIC COMPANY SECTION

At the meeting held on Oct. 26 the following were re-elected, the only changes being that the terms of the two directors were interchanged. President, G. C. Whitney, accident department; vice-president, C. S. Kimball, bookkeeper; two-year director, William L. Clarke, secretary to the president; one-year director, J. T. Moffett, superintendent of transportation, and secretary, B. F. Hunter. C. P. King and W. F. Ham, president and vice-president of the company, respectively, are directors ex-officio by the terms of the constitution. The meeting was devoted to reports from delegates to conventions recently held, namely, those of the National Electric Light Association, the Association of Edison Sales Managers and, of course, the A. E. R. A. The formal part of the proceedings was relieved by music from the PEPCO (Potomac Electric Power Company) glee club.

In reporting on the Atlantic City convention President Whitney commended the work of the Accountants' Association and especially of the committee on standard classification of accounts and the educational committee. He valued highly also the papers on valuation and depreciation. W. N. Deneale appreciated particularly the paper by N. W. Bolen and the exhibits, which he described briefly. J. E. R. Shaw described some of the exhibits of particular interest to transportation men. W. F. Dement reported on other transportation matters, particularly the training of employees. J. T. Moffett, who did not attend the convention, read a letter which he had received from the delegates as follows:

"Dear Sir:—We attended the 1914 meeting of the American Electric Railway Convention, held at Atlantic City, N. J., attending each meeting of the Transportation & Traffic Association and several meetings of the American and other associations. The papers read and the discussions were both interesting and instructive, especially those at the meeting of the Transportation & Traffic Association.

"We had a splendid time, enjoying every minute that was spent at the convention, and we feel very much indebted to you and the officers of the company who made it possible for us to attend. We shall endeavor to repay the company with renewed interest.

"Again thanking you for the splendid time we had, we beg to be

"Respectfully yours,
———— ————"

The regular October meeting of the Denver Tramway Company section was held in the Tramway Auditorium on Thursday, Oct. 15. The feature of the evening was a paper by R. H. Ingersoll, chief dispatcher, Denver Tramway Company, entitled "Telephone Dispatching."

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Hot-Banding Armatures at Decatur Shops

BY O. P. CHUBBUCK, SUPERINTENDENT OF SHOPS, ILLINOIS TRACTION SYSTEM

At the Decatur shops of the Illinois Traction System, where all of the interurban equipment is maintained, the practice of hot-banding armatures is followed. After an armature is stripped, all slots are cleaned and the armature receives a coat of insulating varnish. Then in each of the coil grooves is placed a trough made of fish paper about 0.007 in. thick. In the bottom of this trough there is placed a piece of fiber 1/32 in. thick, upon which the bottom coil rests. Another piece of fiber, 1/32 in. thick, is placed between the bottom and top coils. This raises the coils about 1/16 in. above the laminations.

The armature is then wrapped with a temporary banding and placed in an oven having a temperature of from 65 deg. to 75 deg. Cent., for a period of from eight to ten hours, or until the winding is thoroughly warmed through. Next, the temporary banding is removed and the armature is placed in the banding lathe so that a temporary wire band can be run on, using a soft brass strip over each slot. These strips are of sufficient thickness to draw the coils down flush with the bottom of the banding recesses, when a tension of about 200 lb. is put on the wire. The coils, being thoroughly warmed, soften and draw down into all corners, so that they fit the slots very snugly. The armature is now laid aside to cool, after which the temporary banding is removed and a permanent banding put on.

In making this permanent banding a strip of tin is put all the way around the armature underneath the banding wire. In this way we are able to draw down the coils very tightly. Also, this tin acts as a reinforcement, holds the solder and makes a very firm job when complete. This system of hot-banding armatures was recommended by the General Electric Company. We have been using it for about eighteen months and do not know that we have ever had a case where coils became loose in an armature so banded.

Warning and Stop Signs—Durability of Markings

BY R. C. CRAM, ASSISTANT ENGINEER WAY AND STRUCTURE DEPARTMENT, BROOKLYN RAPID TRANSIT SYSTEM

In the ELECTRIC RAILWAY JOURNAL for July 25 there appeared an article describing the use of white bands on poles along the roadway to serve as a warning sign at approaches to grade crossings with other lines.

There are other uses to which this scheme may be applied. In particular, it will be found valuable if applied to poles on approaches to sharp or hidden curves and at control points for sidings and turnouts. The usual custom is to indicate the distance from the control point by the number of bands upon the pole, as indicated in the article mentioned, it being assumed that poles are approximately 100 ft. apart.

On city properties where it is desirable to have cars stop at definite points constantly, to facilitate loading and proper spacing, the scheme of painting a white strip about 12 in. wide upon the pavement between gage lines has been found very valuable, particularly at transfer points and congested places where several cars are likely to be loaded at the same time.

Experiments have been tried with colored paving materials differing from the general pavement, but the painting method seems to work out best. Whiting has been found quite satisfactory as a painting medium if a little salt is added to the solution to aid in making it adhere to the pavements. Such strips last about a week under ordinary vehicular traffic before requiring repainting, which is done usually by the transportation inspector or by curve cleaners.

Comparative Costs of Building the Rivoli Suburban Line

BY CARL H. FULLER, FORMERLY ENGINEER MAINTENANCE OF WAY, MACON (GA.) RAILWAY & LIGHT COMPANY

The Rivoli line is a 3.19-mile extension added to the Macon Railway & Light Company's Vineville Avenue line and intended to assist in the development of new suburban territory adjacent to Macon. For the first 1¼ miles the track occupies the streets of a subdivision that was being platted and developed at the time of its construction. The following 1½ miles was constructed along an excellently graded county highway, when it leaves the road for private right-of way through rolling farm and woodland and to its terminal at the Country Club.

The contract for the grading and track laying was awarded to the contractor, who graded the streets of the new subdivision, for $1,780 per mile. All cuts and fills exceeding 16 in. were to be figured as an extra, and the railway company was to furnish all ties, rail and fittings within 200 ft. of the end of the track. In the subdivision the streets were supposed to be cut to the established grade before the railway company's contract became effective.

The contractor handled the track construction in connection with his street grading. As he was well equipped with men and teams, he had everything in his favor for doing economical work. Yet on the completion of the first 1.45 miles of track he asked to be released on the ground that he was losing money. The contract was cancelled, the railway company paying the contractor the price agreed on plus some extras, making a total of $1,850 per mile.

This first section of 1.45 miles was laid at an average of 68 ft. a day, or 77 days per mile, requiring a total of 112 days. The railway company then entered on the work. It used its own track gang with the addition of rented teams and men for the grading and completed the remaining 1.74 miles of track in 56 days, averaging 164 ft. of finished track a day, or 32 days per mile.

The work corresponded with that previously performed by contract, with the addition of removing some twenty pines, building a 48 in. metal culvert with riprap bulkheads, some blasting and the installation of one diamond turnout. The cost amounted to the following:

Team foreman, 28 days at $2	
Per foot of track at $0.0061	
Per mile of track at $32.50	$56.00
Rented teams, 128 days at $5	
Per foot of track at $0.0695	
Per mile at $366	640.00
Extra labor on grade, 227 days at $1.25	
Per foot of track at $0.0309	
Per mile at $163	283.62
Company track gang, foreman at $75 per month	
Labor at $1.25 and $1.35 a day	
Per lineal foot at $0.225	
Per mile at $1,080	1,880.33
Hauling men to and from work on special car	
Average haul 10 miles a day	
53 days at $2.26	
Per foot of track at $0.0135	
Per mile at $69	119.91
Company work per mile........$1,710.20 Total	$2,979.86
Contract work per mile........$1,850.00 Total	$2,862.50

Both sections had the same engineering supervision and the company work was better done as evidenced by the necessity for resurfacing the contract work within a year. The following additional labor of hauling was common to both sections of the work:

Hauling rail—6 miles or 12 miles for the round trip—1020 bars at $0.24 each, per ton of rail at $0.73, per foot of track at $0.0144, per mile of track at $140.69	$244.80
Hauling ties, average haul same as above, 8415 ties at $0.0395 each per foot of track at $0.0198, or per mile of track at $104.50	336.60
Hauling miscellaneous material at $10 per mile	17.29
Hauling dirt for two fills	81.46
Hauling per mile at $238, total	$680.15

The following material was required to construct 3.19 miles of track:

8415 ship pine ties at $0.60 each, per foot of track at $0.30, or per mile at $3,696	$5,049.00
1020 bars 60-lb. rail, A. S. C. E. section, per foot of track at $0.70, per mile of track at $105.60 or per ton at $35, or $3,696 per mile	11,790.24
1029 splice bars at $0.75 per pair, per ft. of track at $0.196, or per mile at $560	1,785.04
93 kegs of spikes at $3.63, per ft. at $0.02, or per mile at $105.60	337.59
21 kegs of bolts at $7.50, per ft. at $0.0095, or per mile at $49.40	157.50
One standard long radius diamond turnout	886.00
One single left-hand branch-off	415.00
Metal culvert 48-in. diameter, 24 ft. long	99.00
Miscellaneous material	107.50
3.19 miles at $6,484.90 per mile, or	$20,686.83

After the track had been surfaced and in use for several weeks, 1020 concealed No. 0000 compressed terminal bonds 9 in. long were installed, necessitating the removal of splice plates, drilling two holes with a Duntley electric track drill, applying the bonds with screw press and replacing the plates.

1020 concealed bonds at $0.375 each, or $123.75 per mile of track	$382.50
Bond labor at $0.2405 each, or $77.00 per mile	246.21

We used 1560 lin. ft. of 4 in. x $^3\!/_4$ in. flat-iron guard rail on curves which were fastened to the running rail with bolts and cast-iron filler blocks spaced 30 in. on centers, costing as follows:

1560 lin. ft. bar iron at $0.169 per foot	$263.64
Shop drilling of holes in guard at $0.0291	45.40
Bolts, cast fillers and washers at $0.065	101.57
Labor, 46 days at $1.35 or $0.04 per ft	61.22
Total 1560 ft. guard rail in place at $0.303 per foot	$471.83

SUMMARY

Labor grading and track laying at $1,831.46 per mile	$5,842.36
Hauling all material at $238 per mile	680.15
Track material at $6,484.90 per mile	20,686.83
Bonds at $197.08 per mile	628.71
Guard rail	471.83
Engineering and supervision at $263.32 per mile	840.00
Total, 3.19 miles at $9,137.89 per mile, or	$29,149.88

The foregoing figures may be taken as a fairly average cost for constructing unballasted track in dirt roads, using 60-lb. rail and negro labor under white foremen. Such construction will require an annual maintenance charge of $195 a year to keep it up until it is necessary to begin tie renewal when, of course, the expense will be materially increased.

One point is brought out quite forcibly in the comparison between the contract versus company method of construction and laying track, namely, that no particular advantage in cost is obtained by subletting the work. The railway can buy all material as cheaply as the contractor and use ordinary track labor under competent supervision with the addition of rented teams. The railway suffers little or no disadvantage on account of equipment, and it has no incentive to slight work in the surfacing.

Equipment Defects—Control Connections —II—Grouping Motors

BY C. W. SQUIER, E.E.

The series-parallel grouping of motors is the one most commonly used for car operation, and it can be employed whenever the number of motors is a multiple of two. With this method the motors may be arranged in any combination so that there will be at least two motors in series at the start, the final arrangement being all in parallel. This provides two economical operating speeds, that of two motors in series, or approximately half speed, and that with all motors in parallel or full speed. By economical operating speeds are meant the speeds at which the motors are operated without external resistance in circuit. It is also possible to use this method with three motors by connecting all three in series and then in parallel. However, this combination is seldom used in railway service.

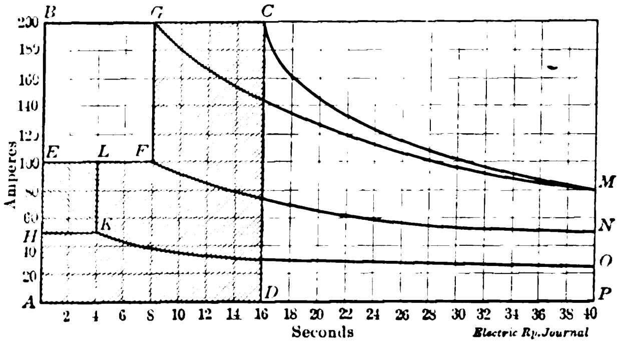


FIG. 6—CURRENT-TIME CURVES FOR STARTING A CAR WITH FOUR MOTORS

Series, Series-Parallel and Parallel.—This method is often used with four-motor equipments and can be employed only when the number of motors is four or some multiple of four. With this method the motors are started with four in series, then changed to two in series and two in parallel, and then all in parallel. This arrangement gives three economical operating speeds, namely, one-fourth, one-half and full speed.

ENERGY CONSUMPTION

The amount of energy required to start and operate the motors varies considerably with the different combinations just referred to. This is best illustrated by referring to the current-time curves of Fig. 6, which show the current taken in starting a four-motor car equipment with the different combinations. By referring to the characteristic curves of the motors it was found that a current of 50 amp per motor was necessary to start the car from rest and accelerate it at a rate of $1\frac{1}{4}$ m.p.h.p.s. With this rate of acceleration sixteen seconds would be required to attain a speed of 20 m.p.h., which is the speed corresponding to 50 amp in the motor with full voltage impressed upon its terminals. With all four motors connected in parallel the energy consumed in starting and accelerating the car will be represented by the area *A-B-C-D*. After the point *C* is reached in the current curve the current will fall off along the curve *C-M*. If we assume an average line voltage of 600, then the energy consumed will be 1,920,000 watt-seconds. Now consider the motors connected first two in series, two in parallel up to half speed, then all in parallel, and the energy consumed will be represented by the area *A-E-F-G-C-D* or 1,440,000 watt-seconds, which saving is represented by the area *E-B-G-F* or 480,000 watt-seconds, equivalent to a decrease of 25 per cent in energy input. Next if the motors be started all four in series, then changed to two in series, two in parallel and then four in parallel, the energy will be represented by the area *A-H-K-L-F-G-C-D*, which is a further saving of the area *H-E-L-K* or 120,000 watt-seconds, equivalent to 6.25 per cent additional of the first input.

This discussion illustrates the saving that can be obtained by starting and accelerating the car to a speed of 20 m.p.h., but if the running speed is to be less than this then the saving will be still more pronounced. For the sake of comparison let us assume that it is desired to operate at half this speed, then with all four motors in parallel this speed will be attained in eight seconds and it will be necessary to stop cutting out resistance. The current will then fall off along the curve *G-M* and at the end of forty seconds the energy input will be represented by the area *A-B-G-M-P*. If, however, the motors are operated according to the second combination of two in series, two in parallel, then all external resistance can be cut out at the end of eight seconds and the current will fall off along the curve *F-N*, which is but half the amount represented by the curve *G-M* with the speed of the motors remaining the same.

The area *A-H-K-O-P* represents the energy input with all four motors operating in series and accelerating up to a speed of one-fourth full speed.

Yoke for Handling Armatures

BY R. H. PARSONS, ELECTRICAL FOREMAN

The old-style rope slings used for hoisting armatures were dangerous. If discarded as soon as the strands were beginning to break the danger was decreased, but the possibility that the rope would be cut on striking a sharp edge during some lift was always present. Further, the armature might slip out of the sling almost any time.

The accompanying sketches illustrate safe, convenient and durable yokes for hoisting armatures, either with or without a carriage. The armature cannot slip out because it always hangs level. On account of its compact design, this form of suspension can be used where headroom may be limited, as in raising an armature on a high platform or rack where the distance from the chain hoist to the platform is scant. Fig. 1 shows a yoke for raising the armature alone. The dimensions, of course, must be varied according to the sizes of armatures. The spacing between the ends can be arranged to permit suspension from either the armature shaft or oil collars. If only one type of armature is to be carried the yoke may be designed to close measurements; but more liberal measurements must be used if the same yoke is to be used for different armatures. The suspension hole must be offset a little from the center to secure proper balance, for an armature is heavier on one end than on the other. Fig. 1 shows the proper offset in proportion.

Fig. 2 illustrates a yoke for hoisting an armature and carriage. In transporting an armature from the armature room to the motor shop or the car the armature often is carried part of the way by a crane and then is dropped either on the floor or on another carriage. The yoke of Fig. 2 makes it easy and safe to carry both armature and carriage anywhere. It avoids any handling of the armature, thus preventing damage to coils, etc.

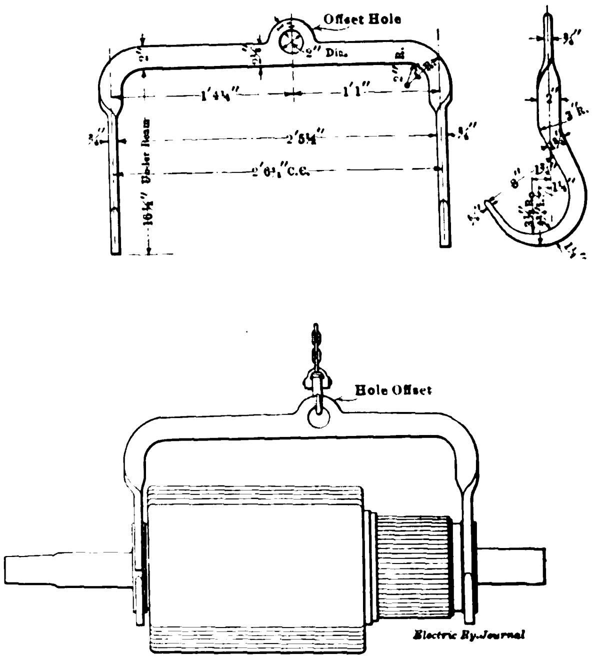


FIG. 1—YOKE FOR SUSPENDING ARMATURE ALONE

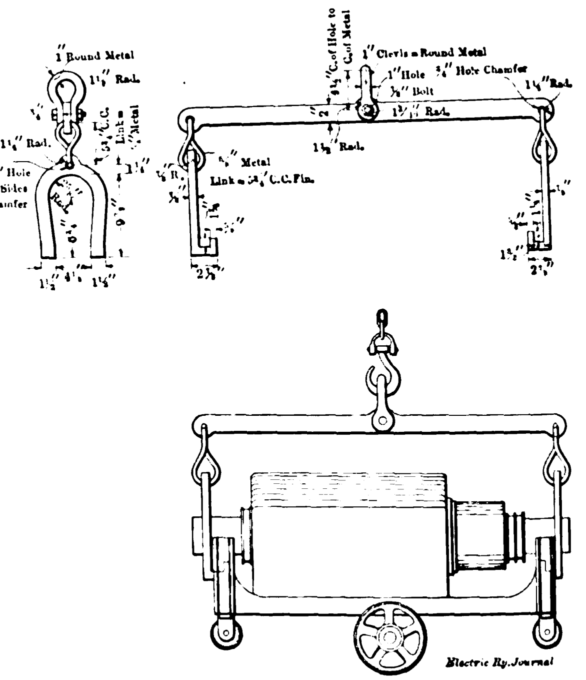


FIG. 2—YOKE FOR SUSPENDING ARMATURE AND CARRIAGE

At the same time it makes it possible to have the armature trucks where they are needed, since for every armature transported one way there is one to go back.

The confirmation of the report that England has embargoed ferro-manganese steel to the United States has caused a rapid rise in the market price of this alloy and no doubt will work a serious hardship on manufacturers making a specialty of manganese steel products. While at the beginning of the European war several manufacturers announced that they had quite a stock of ferro-manganese steel on hand, they had hoped that the opening of the seas would release the great stores of this product said to be held in England.

Combination Step Lamp and Marker

While it has not become general practice to provide markers and tail-lights on street railway cars, the ease with which these may be combined with step lamps which are in general use should increase their popularity. These have been provided on the new cars recently purchased by the Evanston (Ill.) Railway. By connecting the step lamps on each side of the car in one of the headlight circuits, the headlight and the step lamps at the rear entrance and the front exit are turned on simultaneously. Essentially this step-lamp fixture consists of a flared rectangular metal reflector, 6 in. wide x 10 in. long x 6 in. deep, set in the usual position under the vestibule bonnet and over the entrance and exit steps. A 4-in. green roundel is provided in the front end of the reflector at the exit door at the motorman's end of the car, and a 4-in. red roundel in the rear end of the metal reflector over the rear entrance. When the step lamp is lighted with the headlight, a green marker shows ahead and the red tail-light behind. These reflectors are fitted with 23-watt tungsten lamps.

COMBINATION STEP LAMP AND MARKER

Commutator Slotting

According to B. G. Lamme, the slotting of commutators, or the undercutting of the mica between bars, for the purpose of reducing rapid wear, burning, grooving or undue heating of the commutator or the deposit of copper on the brushes will not remove the primary cause of the trouble, namely, the large local currents or high current density on the brush contact. However, it lessens the harmful effect by allowing the brush to maintain better contact with the commutator. In this way the burning action can be diminished, in most cases to such an extent that the commutator face will polish, and this in turn will enable the brush to make better contact with the copper. Undercutting in general is advantageous where the mica takes up a relatively large portion of the total surface, such as 20 per cent or more. The general practice at present with non-undercut commutators is about 1/32 in. thickness between bars. Where the commutators are undercut there is a liability that carbon dust will collect in the slots and short-circuit between bars, unless the peripheral speed is sufficient to keep the slots clear. Therefore, in slow-speed commutators which are undercut it may be necessary at times to brush out the slots. In high-speed commutators, or in variable-speed machines which intermittently reach high speeds, there is usually but little difficulty from the collection of carbon in the slots.

Slotted commutators, while advantageous in some ways, present certain operating objections in others. Except where the brushes cover several bars, the slotted commutators of generators are likely to produce chattering of the brushes, unless frequently lubricated. Therefore, with such commutators, self-lubricating brushes are recommended. These brushes usually contain, or consists of, graphite, and generally are of lower resistance than ordinary carbon brushes; therefore, they are not as useful in assisting commutation. In commutating-pole generators where the resistance of the brushes is of relatively little importance, graphite brushes are often satisfactory. As such brushes are usually soft, they are not well adapted for wearing away the mica in commutators which are not undercut.

Car Maintenance in Manila

A brief outline of the experience of The J. G. White Management Corporation in operating traction lines in the Philippines, as regards the principal causes which led to the use of steel cars on the Manila city lines, may be of interest.

Wooden cars exported to Manila from the United States were found to be very expensive in the long run, due to the destructive activities of the Philippine white ant. The habits of these ants are more or less similar to those of the teredo except that the latter generally attacks wood under water only. The white ant bores readily through both paint and varnish and destroys the inner portions of the wooden members of the cars.

Various methods for protecting the car equipment were tried in an endeavor to avoid the necessity of continually replacing portions destroyed by the ants. In accordance with recommendations of the bureau of forestry all open edges of wood were coated with carbolineum, and gasoline was sprayed over all portions open to attack. However, these methods proved unsatisfactory as well as costly, and the company was forced to resist the depredations of the native insect by a change in type of car construction.

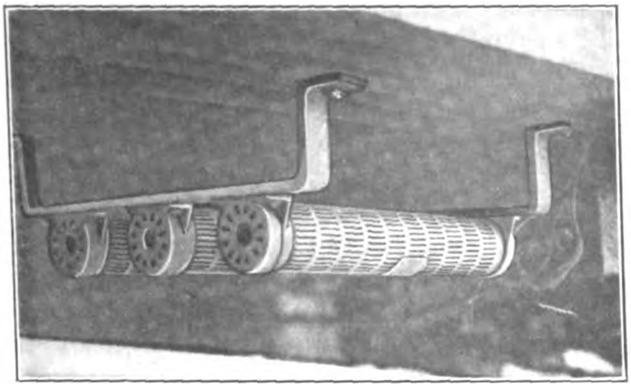
Six center-entrance cars, similar to those in service on the Brooklyn Rapid Transit System, were constructed with steel sills and superstructure; the various wooden parts, including post fillers, etc., were made of a native wood known as pagatpat which grows in Philippine swamps. This wood is very heavy, of dense grain and is not attacked by the white ant. It also seemed to offer great possibilities as a material for car construction in view of its low cost and good appearance when finished.

The results, however, were not so pleasing as was expected, for a new difficulty arose. The native wood was found to cause indirectly a corrosion of all brass, iron and steel parts which came in contact with it. The wood contains about 1 per cent, by weight, of salts which are acidified in the presence of water, the acids thus produced eating the metal parts reached by them. The same was found to be true of insulation on motor control cables as well as ordinary lighting wires.

Six new center-entrance cars are now being constructed in the company's shops at Manila and are more or less of the same design as the first six. However, the wooden post fillers, etc., are being made of ash shipped from the United States and thoroughly treated with carbolineum. It is expected that this new semi-steel car will solve the problems of excessive car maintenance in Manila.

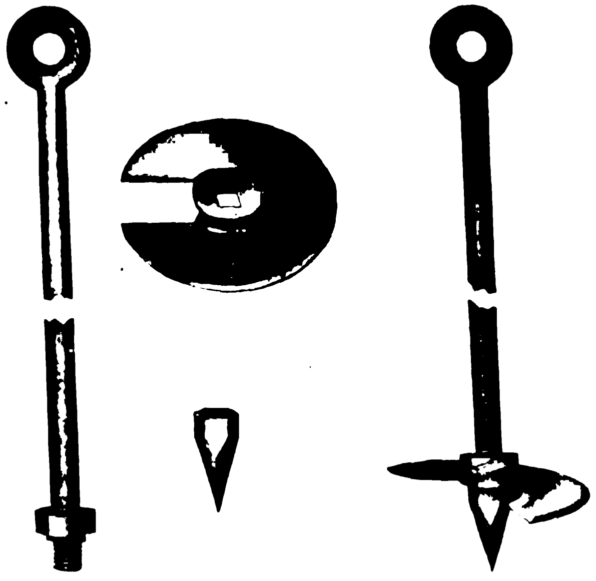
Resistances for Operating 220-Volt Fan on Trolley Circuit

On the office car of H. E. Chubbuck, vice-president executive of the Illinois Traction System, are three 220-volt fans. It was desired to arrange each fan for independent operation from the trolley, and so three special resistances were obtained and mounted underneath the car, as illustrated. Nichrome wire, obtained from the Driver-Harris Wire Company, was used because of its constant temperature coefficient. The wire was wound on standard electric car-heater cores and held in the regular electric heater casings.


FAN RESISTANCES UNDER CAR

Guy Anchors with Interchangeable Wings

An all-steel screw anchor with interchangeable wings to provide for different soil and load conditions is being manufactured by Hubbard & Company, Pittsburgh, Pa., and is known as the "Steelwing" guy anchor. This anchor has a much larger bearing surface than other all-steel anchors, and as it is made of open-hearth steel throughout and galvanized by the hot-dip process, it is far more reliable than the various cast-iron combinations, to say nothing of the old-style wooden deadman. The wings are made in three sizes, 6 in., 8 in. and 10 in. diameter, with rods of ¾ in., 1 in., 1¼ in. diameter, 5 ft. 6 in. long. Wings and rods are made of high-carbon open-hearth steel, securing great strength and stiffness without excessive weight. A drop-forged cap screws on the end of the rod and holds the plate absolutely rigid.

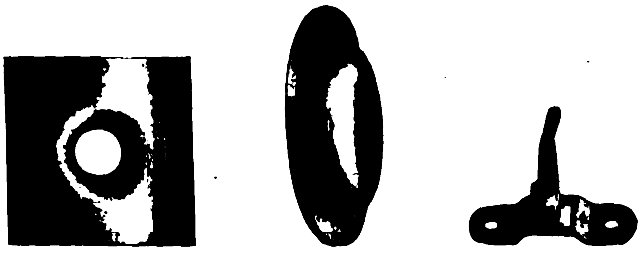

GUY ANCHOR DISASSEMBLED AND ASSEMBLED

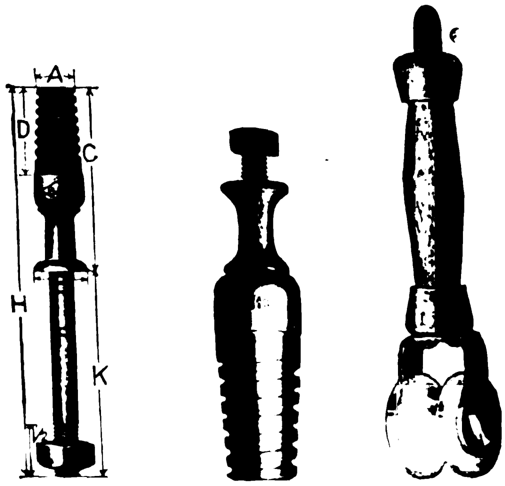
To install this anchor a shovelful of earth is removed to give it a start, and with a bar thrust through the eye of the rod the anchor may be screwed to place in a minute or two. No special tools, such as wrenches, post-hole augers, etc., are needed, and since the wings are thinner than the old cast-iron type and specially sharpened, and since the cap is designed to offer little resistance to the earth, installation is greatly simplified.

The interchangeability of the wings is a valuable feature, as this permits the use of a larger wing in soft loam or sand without the added expense of a heavier rod. Of greater importance, however, is the absolute dependability of the anchor, which does not contain a single welded joint, even the eye on the end of the anchor rod being drop-forged.

Recent Improvements in Line Hardware

The accompanying illustrations show a few of the latest line specialties of the Barnes & Kobert Manufacturing Company, Milldale, Conn., specialist in pole line hardware. One view shows a form of wood strain insulator, with porcelain or composition spool for use where extra insulation is required. The wood is of impregnated, second-growth hickory with heavy drawn-steel caps. The detachable pole step shown is made to hold 400 lb. with safety. This step when detached weighs less than 5 oz. and several can easily be carried in a lineman's tool kit. The cupped washers illustrated alongside are made to hold either 1½-in. or ⅝-in. steel pins in the center of 1¼-in. or 1½-in. wood pinholes. The square one goes on top of the cross-arm and conforms in shape to the crown of the latter. The round one fits underneath the cross-arm. Of the two types of pins presented the short one is for use on cross-arms made of angle-iron, while the long one is the company's new Western Union type made either ½ in. or ⅝ in. in diameter. When used with cup washers these pins will fit either 1¼-in. or 1½-in. wood pinholes. Several types of brackets, guy clamps and break arms are also announced by this manufacturer.


CUPPED WASHERS AND POLE STEP



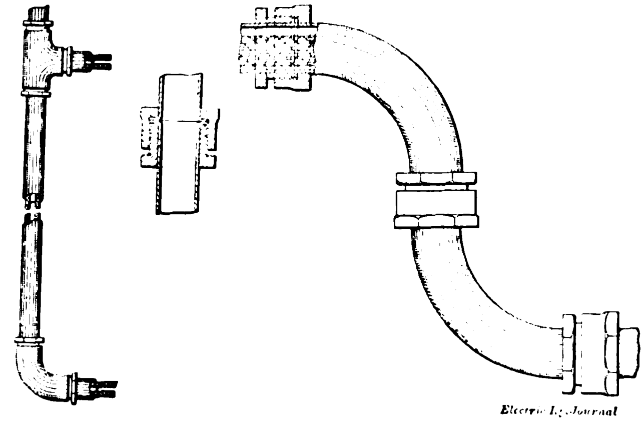
TWO TYPES OF PINS AND WOODEN STRAIN INSULATOR

A Threadless Flanged Conduit

Convinced of the need for better conduit, the National Formed Metal Products Company, Chicago, Ill., has developed after experimenting three years a flanging machine which will produce a light-weight, threadless conduit on a commercial basis. The collapsing of pipes was the one feature that prevented pipe manufacturers from marketing a light-weight conduit. It is believed that a conduit of this kind will be of particular interest to the electric railroads from several standpoints.

The conduit and the fittings shown in the illustrations have been especially designed for car work. It has been the aim of the manufacturer to eliminate practically all present car-conduit difficulties, and at the same time add some advantages over the present threaded conduit. In weight alone, the new conduit saves approximately 60 per cent. Any desired thickness of wall may be secured at a very slightly increased cost.

Owing to the design of the coupling it is possible to feed rigid conduit onto the cable in much the same way as is done with flexible conduit, thereby freeing the insulation from all mechanical strain. The joints can then be coupled and made absolutely watertight after the cables are in place. The coupling also has been especially designed to withstand, without loosening, the severe vibration inevitable in car service. To this end it has been provided with an automatic lock that forms an integral part of the fitting.



Electric Ry. Journal

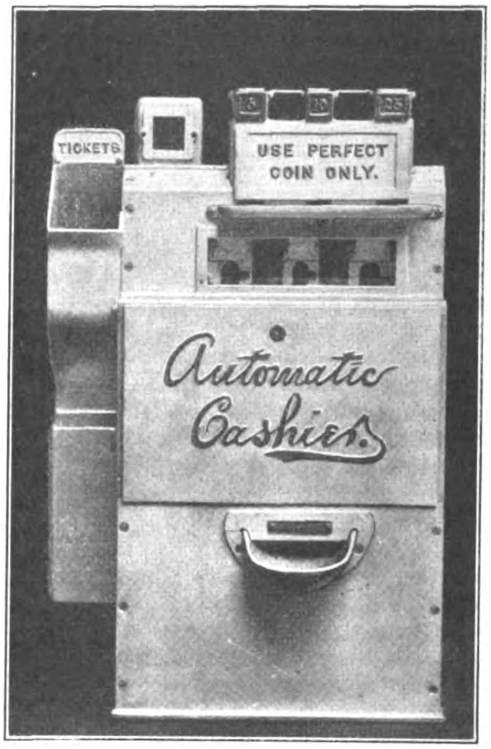
THREADLESS CAR CONDUIT

It is also asserted that the conduit is absolutely foolproof against the oversight or carelessness of pipemen in neglecting to ream cut pipe ends, since the sections cannot be coupled unless they are properly flanged and filleted. As the conduit is threadless, no difficulty is experienced from the entrance of oil and thread turnings into the pipe, nor has difficulty arisen from eccentric pipes as the coupling forces the abutting sections into alignment. In the matter of maintenance and repairs this conduit possesses an advantage over the threaded type since it is possible to remove any section without disturbing the adjacent sections, and at the same time the conduit is free from the weakness of running thread joints.

To resist corrosion this conduit is protected by a lead-like, rustproof coating. The pipe is also absolutely free from scale and this, together with the coating process, makes it possible thoroughly to impregnate both the interior and exterior surfaces and ends. All surfaces are perfectly smooth, and the lead-like coating presents a surface that very materially assists in fishing cables. In coupling up abutting sections it is unnecessary to use a wrench, a pipe vise with smooth-faced jaws being furnished. The combination of these two features makes remote the injury of the rustproof coating by the workmen. The conduit flanging machine is a small portable device, and the time required for producing a finished flange is far less than that required for cutting a standard thread on the same size of pipe.

Automatic Cashiers for Car Service

One of the new exhibits at the last convention of the American Electric Railway Association was the "Automatic Cashier" of the Automatic Cashier Corporation, Norfolk, Va. This machine was devised to permit quick and accurate change-making on prepayment cars and at terminals, stations, etc. Ordinarily it is made to give change for dimes, quarters and half dollars. The machine retains the desired number of fares from any of these coins as inserted, and instantaneously delivers the required change to the patron. The conductor or other attendant does not take any money from the passenger. The machine simultaneously records the transaction and automatically locks after every transaction. It unlocks only when a coin has been inserted and only to the extent of that particular coin. No vexatious calculation or delay on the part of the operator is required. Should a passenger inadvertently place his coin in the wrong slot it is automatically returned for correct insertion.



AUTOMATIC CASHIER FOR CAR PLATFORM AND STATION

All transactions are between the passenger and the machine, access to which can be had only by an authorized person having the key. Records and registers can be made visible or invisible. A verification of the number of fares paid is indicated and the coin inserted is held suspended to the full view of the passenger and operator. Spurious coins are ejected and confiscated. All coins inserted immediately become available for change from the tills. Provision for extraordinary runs of business is made by overflow packets. An attachment for registering and canceling tickets is also one of the many features of the machine. The weight of the machine is approximately 50 lb. Its dimensions at the base are 12 in. x 13 in. and its height 22 in.

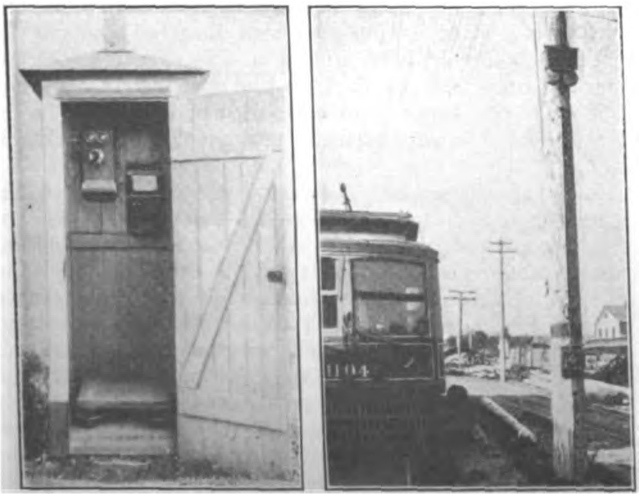
Telephone Dispatching on the Milwaukee Railway System

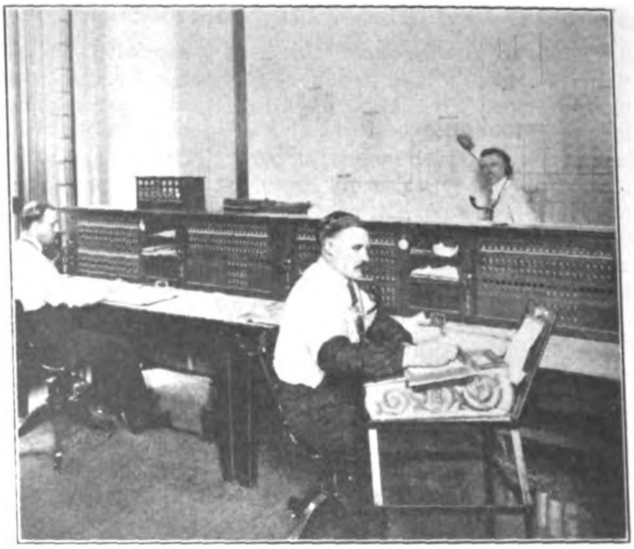
The efficiency of the telephone as a means for dispatching on railway lines is being demonstrated almost daily by the increasing number of railroads that have adopted it for controlling train movements. Until a few years ago electric street railway lines had no uniform method of dispatching cars. Their usual practice was to start cars at certain intervals and check the maintenance of schedules by having inspectors stationed at various points along the road. The telegraph was not considered as this would have entailed the establishment of way stations with experienced operators. The need of a satisfactory dispatching system was felt particularly on interurban lines, where it often became necessary in an emergency for a car crew to communicate with the dispatcher and for the dispatcher to communicate with the car crews and inspectors.

An equipment that is one of the most extensive of its kind has been operated for several months by The Milwaukee Electric Railway & Light Company. Three switchboards are in service—one for the use of the train dispatchers, another for handling all calls within the company's Public Service Building, and a third for handling public telephone messages, operated by the Wisconsin Telephone Company.

The train dispatchers' switchboard is a Western Electric six-panel, three-position board with two of the positions in service at present. The equipment of the four panels now in use is sufficient to talk to the 240 telephones located at various points along the car lines. These telephones, which are usually found at transfer points and track intersections, are mounted on poles that may be readily distinguished by broad yellow bands painted on them a short distance above the telephones.

The telephone instruments are of two kinds—the metal box type operated on central battery within the city, and the familiar Western Electric No. 1317 magneto wood telephone for the outlying districts. The latter are inclosed in shelter booths. There are also twenty-five loud-ringing call bells located at track intersections, parks, etc. These are mounted on poles with the telephone instruments and are used to signal the supervisors. They are operated from the train dispatcher's switchboard. On the top of the switchboard in the first position is placed a small lamp signal box which indicates open bridges or closed steam railroad gates, thus enabling the dispatcher to note the location and length of all delays to traffic. Harmonic ringing is used.


BOOTH FOR TELEPHONE: POLE TELEPHONE WITH LOUD-RINGING BELLS ABOVE


TELEPHONE EQUIPMENT AT DISPATCHING HEADQUARTERS

The dispatchers handle 490 trains and receive approximately 3900 calls daily. In all 1600 miles of telephone circuits are operated, a part of the lines being in lead-covered cable, of which there is a total of 80 miles.

A commercial switchboard for handling calls within the Public Service Building is made up of a single section arranged for three operators and equipped for 270 commercial lines, which connect 425 telephones, some of which are on party lines in the suburban districts. This switchboard, also manufactured by the Western Electric Company, is connected through to the dispatcher's switchboard to take care of transferred calls. Three private branch exchange switchboards are operated in conjunction with the main switchboard, one at Cold Springs operating thirty-eight lines, one at Racine operating fifteen lines and another in the way department operating ten lines. In conjunction with the commercial and dispatcher's switchboards, there is a complete power plant, terminal and wire chief equipment.

The public switchboard operated by the Wisconsin Telephone Company has sixty-five extension telephones connected to it. There are ten trunk lines, four of which are for incoming calls exclusively. One private line connects directly with the trouble department and has a "silent" number known only to the outside trouble men and heads of departments.

London and North-Western Rolling Stock

Some further particulars were recently made public as to the rolling stock to be used on the London & North-Western Railway's electrified lines. All the vehicles are 56 ft. 11 in. long over all. The motor cars are carried on two four-wheeled pressed-steel trucks of 8 ft. 9 in. wheelbase, with centers 37 ft. 6 in. apart; the trucks for the trailer and control-trailer vehicles have a wheelbase of 9 ft. and are 38 ft. apart. The vehicles are 9 ft. wide, 7 ft. 5¾ in. high from floor to center of roof inside, and 12 ft. from the rail level to the highest point outside. In the case of the motor cars, the motorman's compartment is built entirely of steel. The motor car includes the motorman's and apparatus compartment and baggage compartment, and an open saloon for smokers. The control trailer is open throughout, except for a motorman's compartment and a vestibule at each end, and seats sixty passengers—non-smoking. In all accommodation is provided for 128 third-class and thirty-eight first-class passengers. Each motor car carries four 250-hp motors.

News of Electric Railways

B. R. T. CO-OPERATES WITH POLICE AND FIREMEN

Lecture to Ranking Police Officials on Safety by the Brooklyn Rapid Transit Safety Bureau

On Nov. 18 inspectors, captains, lieutenants and other ranking officers of the New York police department to the number of about 350 attended a lecture on safety given jointly at police headquarters by the Brooklyn Rapid Transit System and the New York fire department. The railway was represented by E. C. Clarke, supervisor of instruction, and Jessica P. McCall, supervisor of the bureau of public safety, and the fire department by W. B. Northrop, special investigator.

Mrs. McCall gave an extended account of the safety work of the Brooklyn Rapid Transit System in connection with the children of the public schools and their mothers. She showed by means of numerous colored slides how the work has been extended beyond safety features relative to electric railroading. For example, children are shown the consequences of lighting a gas stove improperly, the wisdom of removing protruding nails, of passing from one side of the street to the other only at regular crossings, etc. Sanitation and fire prevention were also considered. At the talks to mothers the necessity is emphasized of labelling all drugs properly and of placing them on shelves high enough to be out of the reach of children. The enduring effect of the lectures to the children has been proved by references to safety in compositions written long after the talks had been presented. Mrs. McCall concluded with a presentation of the film "The Price of Thoughtlessness." This film was originated by Mr. Clarke and the staff of the Vitagraph Company of America. It has been very widely circulated.

Following Mrs. McCall, Mr. Northrop presented his new story, "The Locked Door." This picture, also prepared with the co-operation of the Vitagraph Company of America, most appropriately is made on a slow-burning film which permits it to be shown in any kind of a building. The story contrasts two clothing shops in the same building, one of which has the most approved fire protection devices and open doors to the stairways and fire escapes, while the other shop has no protection, the employees are permitted to throw findings on the floor at random and the doors are locked. In the protected shop an incendiary fire makes very little headway because of the operation of the automatic sprinklers and other devices, while in the unprotected shop a carelessly thrown cigarette results in a terrible catastrophe. This story of fire protection is entwined with a romance concerning the daughter and the son of the two shop owners. The film is most realistic.

Both films were received with much applause, and many notes were made by the various officers present, presumably for their guidance in furthering among their men the campaign for the saving of life and property.

CONNECTICUT AND RHODE ISLAND TRUSTEES

The trustees appointed to take over the securities of the Connecticut Company, New Haven, Conn., in accordance with the recent New Haven Railroad dissolution decree, the terms of which were noted in the Electric Railway Journal for Oct. 24, have organized. The trustees are Walter C. Noyes, Old Lyme; Lyman B. Brainard, Hartford; Charles Cheney, South Manchester; George E. Hill, Bridgeport, and William W. Hyde, Hartford. Judge Noyes has been elected chairman of the trustees and chairman of the board of directors, which will be composed of the other trustees and President L. S. Storrs of the Connecticut Company. Mr. Brainard has been elected treasurer of the board of trustees. While the trustees are to take over the direction of the affairs of the company as officers of the United States Court they have announced that it will be their purpose to continue the present personnel in the operation of the property.

The trustees for the Rhode Island Company, Providence, R. I., are Rathbone Gardner, John O. Ames, John P. Farnsworth, Theodore Francis Green and Charles C. Mumford, all of Providence. It was announced from Providence that the trustees of the Rhode Island Company had not yet decided anything about the future of the Rhode Island Company, but that they would meet soon to organize formally. The new directorate consists of Theodore Francis Green, Rathbone Gardner, Charles C. Mumford, John O. Ames and John P. Farnsworth, the trustees, and A. E. Potter and A. T. Potter, president and vice-president, respectively. Robert W. Taft, Howard Elliott, D. Newton Barney, Henry H. McHarg, Frederick A. Brewster, A. Heaton Robertson, L. S. Storrs, N. W. Smith, Duff F. Sherman and A. E. Clark of the old board resigned before the reorganization and it was voted to reduce the number of directors from twelve to seven.

GOVERNORS DISCUSS WATER-POWER

Led by Governor William Spry of Utah, who read a paper on "State Control of Natural Resources," the Governors' Conference in session at Madison, Wis., on Nov. 11 discussed topics of federal ownership of large tracts of public lands in Western states and the exemption of these lands from furnishing tax revenues to the state governments, the federal leasing of water-powers with right of withdrawal, and the state control of natural resources under conditions of commission regulation similar to those now imposed by utility commissions.

Governor Spry and other speakers declared that the conservation agitation originated in selfishness by self-appointed guardians of the nation's resources, and that the effect of this policy has been to retard seriously the development of the West. Although the first "conservation congress" of a few years ago was called ostensibly to prevent waste of natural resources, said Governor Spry, it actually developed into a spectacular and wordy exploitation of calamitous and misleading figures and information predicting the early bankruptcy of the nation's natural wealth. As a result valuable rights were withdrawn by the government after insufficient field investigation and this has interrupted the development of the West. The matter of who shall control and dispose of natural resources was a minor matter compared with the need for at once placing these resources in the hands of those who will develop their usefulness and to the best advantage.

In discussing Governor Spry's address, Governor S. V. Stewart of Montana pointed out that public utilities were now regulated by commissions in most of the states, and such a system of regulation applied to natural resources would prevent abuse of monopoly.

Governor A. O. Eberhart of Minnesota said the state should undertake no business which can be transacted efficiently by private interests, and the federal government should exercise no function which can be properly discharged by the state governments.

Governor E. M. Ammons of Colorado protested against the difficulties which have been thrown in the way of those who seek to construct storage reservoirs and waterpower plants on the upper headwaters of Colorado streams. With the aid of state commissions having supervision of water-power subjects, the Governor declared that the greatest use might be made of state waterpowers, instead of the least, as at present.

NEW YORK CITY RAPID TRANSIT MATTERS

The Public Service Commission for the First District of New York has failed to legalize the Flushing route, known as Route No. 52, by the filing of the necessary number of property owners' consents. Because the new rapid transit route parallels its Port Washington branch for a distance, the Long Island Railroad refused to sign the necessary consent. The commission may go to the Appellate Division, which is empowered to give its consent to the building of the line in lieu of the property owners' consents; or it may adopt two new routes, which, taken together, would be identical with the present route.

Mayor John Purroy Mitchel and Chairman Edward E. McCall, of the Public Service Commission for the First District, have executed on behalf of the city of New York, the deed from the United States government to the city for easements under the United States post-office property for the construction of the new subway line. William G. McAdoo, Secretary of the Treasury, had already executed the instrument in behalf of the United States government. This clears the way for the construction of Section No. 1 of Route No. 48, the Park Place, William and Clark Street subway.

A communication has been sent by the commission to the Board of Estimate and Apportionment asking whether the city will have funds available to defray its part of the expense in the removal of the existing elevated tracks and structure from Fulton Street, Brooklyn, to Adams Street. The New York Municipal Railway Corporation recently applied to the commission for such relocation, and stated that it would be willing to devote an amount equivalent to the sum it would otherwise spend for the third-tracking of the line from Brooklyn Bridge to the Borough Hall. The change, if made, will be in line with other improvements that are being made in the vicinity of Borough Hall, and was recommended by the city plan committee.

The commission will hold a public hearing on Nov. 30 to inquire whether the Interborough Rapid Transit Company should be ordered to retire the 477 composite cars operated in the subway, use them on the elevated lines in Manhattan and The Bronx and replace them in the subway with all-steel cars.

The commission is advertising for bids, to be opened on Dec. 1, for the reconstruction of the DeKalb Avenue station on the Fourth Avenue subway in Brooklyn.

LABOR ON NEW YORK SUBWAY

Work has been stopped on one section of New York's subway system as the result of the activity of the labor unions in resurrecting a provision of the State labor law which requires that only citizens of the United States shall be employed on public works contracts. On Nov. 16 all of the subway contractors received a letter from labor representatives charging them with "openly and wantonly violating the labor law of this State with regard to employing men who are not citizens of the United States." To decide upon a plan of action a closed meeting of all subway contractors concerned in the case was held on the night of Nov. 18. After the session had adjourned C. A. Crane, secretary of the General Contractors' Association, gave out the following statement:

"The General Contractors' Association at its meeting declared that it was the intention of its members to comply with the law of the State in every particular. At the same time it desires to call to public attention the extreme difficulty of constructing the vast public works now under way and at the same time exclude alien labor. It is believed that the alien labor law is not constitutional and is in violation of treaties with other countries. Steps will be taken as speedily as possible to submit the question to the courts."

WESTERN MASSACHUSETTS TRANSPORTATION

The western counties transportation commission, which is to report on the desirability of electric railway construction in the Berkshire district at the next session of the Massachusetts Legislature, opened final hearings at Springfield on Nov. 16. The session was occupied by addresses on behalf of electric railway extensions into the so-called hill towns. About 240 miles of new lines are desired by residents of the territory lying between the Connecticut River and the New York State line. The estimated cost of development is $5,000,000. Among the new lines desired are the following: Agawam-Feeding Hills extension to Southwick; opening of service on the Lee-Huntington line; East Longmeadow to Hampden; Goshen to Williamsburg; a through line from Pittsfield to Northampton; a line from Plainfield through the Cummington Valley; a line from Worthington to Williamsburg; a line through the Farmington Valley; Granby to Holyoke; Wales to the Connecticut State line; and Hampton Ponds through Southampton to the Westfield-Holyoke line. The speakers urged the construction of these lines through private or State aid.

ILLINOIS TRACTION EXTENSION

The Illinois Traction System plans an extension of its present system south from the Twelfth Street station in St. Louis through the city, over the free bridge to East St. Louis and to Belleville by way of the tracks of the Southern Traction Company. A line from Edwardsville to Belleville, swinging east of East St. Louis, is a part of the plan. An elevated structure is also proposed to be built from the Illinois end of the McKinley bridge, above Main Street in Venice, and the tracks of the Wabash, Alton and other railroads, and along a private right-of-way above Granville Street and the tracks of the St. Louis Terminal Railway at the north end of the Madison yard. The lines of the Southern Traction Company approach within a short distance of the Illinois end of the free bridge. This proposal when carried out will permit the operation of one of the largest interurban belt lines in the Central West, and it is believed to be a part of the plan of the Illinois Traction System to enter the southern Illinois district, which is one of the most valuable coal mining regions in the United States.

SUBWAY AND LABOR MATTERS IN CLEVELAND

The proposed amended franchise ordinance of the Cleveland Underground Rapid Transit Company was considered at a meeting of the Council on the evening of Nov. 11. Councilman Gahn objected to the amendments, especially the one relating to the price fixed in case the city should decide to purchase the property. He suggested that members of the Cleveland Engineering Society be called in to give some information on the matter. W. R. Hopkins, president of the company, told the Council that, barring unforeseen obstacles, the work proposed would be completed within two years. He expressed the belief that construction work could be begun in the spring if the city made the desired changes in the franchise.

It is said that Mayor Baker favors a working arrangement between the Cleveland Underground Rapid Transit Company and the Cleveland Railway whereby the former may use the surface tracks after it reaches the outskirts of the city. For instance, it is proposed to bring the subway cars to the surface at University Circle on the Euclid route, but to give East Cleveland and the eastern part of the city proper service the cars must run on to the end of the surface line or the passengers must transfer. Mayor Baker and Mr. Hopkins are said to hold that the people within a distance of 5 miles from the center of the city can be guaranteed a 3-cent fare indefinitely by such an arrangement. The subway will reduce the number of long hauls and the congestion in the business district, both of which at the present time operate to increase the expenses of operation of the Cleveland Railway.

The motormen and conductors of the Cleveland (Ohio) Railway have voted to appeal the question of an eight-hour day to the City Council, and a committee of seven men will be appointed to appear before that body and urge action. About 700 men were present at the meeting and they responded to a recommendation by President Mahon of the Amalgamated Association to stand united on this one point, although they had already become seriously divided over the nominations for officials of the local branch. Chairman Koch of the street railway committee of the Council said the men would be heard, but that Council has no jurisdiction in the matter. The opinion of the company officials seems to be that the appeal to the Council is part of a campaign to secure the re-election of the present officials of the local branch of the union.

Dr. Charles S. Howe, president of Case School of Applied Science, is not favorable to the announced plan of building a subway in the city. He believes the Boston plan best adapted to present needs. The first work should be on Euclid Avenue between the Public Square and East Ninth street and on Ontario Street between the Public Square and Broadway. Traffic is exceptionally heavy on both these streets, and Dr. Howe says the first step should be to relieve this congestion. Then the subways could be extended as the traffic demands on other streets. Dr. Howe has suggested that the city should own the subways and lease them to the Cleveland Railway for operation. In any event he believes that the city should retain the right to say where the stations shall be located and that transfers should be issued between the lines of the subway operating company and the Cleveland Railway.

BLANKET FRANCHISE APPLICATION IN RICHMOND

Proposals have been made to the city of Richmond, Va., by the Virginia Railway & Power Company to surrender its various franchise grants and accept in place thereof a blanket franchise. The franchises that the company desires to have extended have thirteen to fifteen years to run and cover 36.5 miles of streets. An extension of fifteen years is being asked on these grants, the company offering to relinquish its perpetual franchise rights on this plan on 10 miles of streets that have recently been annexed to the city. A committee has been appointed to investigate the subject.

Boston Elevated Asks Extension of Time.—The Boston (Mass.) Elevated Railway has asked the Massachusetts Public Service Commission for an extension of time for building the rapid transit line from Sullivan Square terminal to Everett and Malden, on account of unforeseen delay in dredging the Mystic River.

Arbitration in Lexington.—Much latitude has been permitted in the arguments and evidence to be presented in the arbitration of the controversy between the Kentucky Traction & Terminal Company and its union carmen over the discharge of a union motorman. Charles C. Bagby, Danville, Ky., has been named by the Governor as umpire.

Calvert Townley in South America.—Calvert Townley, assistant to the president of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., is at present in South America making a detailed study of the business situation there in the interest of his company. Mr. Townley will spend several months in Brazil, Argentina, Chile, Peru and other countries.

Pittsburgh Chamber of Commerce on Subway.—The Chamber of Commerce of Pittsburgh, Pa., has adopted a report presented by its city transit committee recommending the construction by the city of a downtown subway loop to be leased and operated by the Pittsburgh Railways. The report commits the chamber to the policy of forcing the matter upon the attention of the Council until something is done to relieve the present surface railway situation.

New Pacific Electric Cut-off in Operation.—The new Lordsburg-North Pomona cut-off on the San Bernardino line of the Pacific Electric Railway, Los Angeles, Cal., was opened to through service on Nov. 4. The running time between Los Angeles and San Bernardino is two hours, the fastest service on the entire electric system. The cut-off is 1½ miles long, and shortens the route 7 miles, with the result that a saving of twenty minutes in running time is affected. The cost of the cut-off is said to have been $60,000.

Seattle Fare Injunction Hearing.—Judge Jeremiah Neterer and Judge William B. Gilbert, of the United States Circuit Court, and Judge E. E. Cushman will hold a hearing in Seattle on Nov. 23 on the application of the Seattle, Renton & Southern Railway, for an injunction to restrain the Public Service Commission of Washington from enforcing its order denying the company the right to increase its passenger rates. The order of the commission vacating and suspending the schedule of fares of the company was referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 31, page 1031.

Ontario's Hydroelectric Railways.—Newmarket and Uxbridge, the two municipalities in the hydroelectric radial area in Ontario that turned down the radial railway project recently, will be asked to take another vote on the proposition. The municipalities which voted in favor of the radial proposals have complied with the by-law formalities. According to Sir Adam Beck all that remained to insure an early start on the line is the approval of the other two municipalities. Arrangements have been made to urge the Canadian government to secure the $6,400 a mile grant that was figured upon in the estimates of the commissioner's engineers.

Conditions of Montreal Franchise Extension.—Mayor Martin, of Montreal, Que., on Nov. 9 presented a report to the Board of Control with the application of the Montreal Tramway for an extension of its franchise, which has several years yet to run. The Mayor recommends an extension of thirty years. He would demand the extension of the company's system and a fare not to exceed 5 cents between morning and midnight. He also urges the establishment of a bus service within five years, and refers to subways which may be constructed by the city. In addition, he would require the company to pay for certain street repairs, $12,000 yearly for street watering, and be made liable for taxes in certain districts where it is now exempt.

Appeals From Pennsylvania Commission Decisions.—Three appeals were filed in the Dauphin County Court at Harrisburg, Pa., on Nov. 10 in cases involving orders of the Public Service Commission of Pennsylvania, and it is said that a case may be started to test the constitutionality of the public service company act. Several other similar appeals were taken recently. The appeals now filed are in the cases of the Pennsylvania Utilities Company and the Bangor Steam Heat Company from orders referring to furnishing heat for Bangor; in the Phoenixville, Valley Forge & Strafford Railway case, in which the approval of a contract with Phoenixville is appealed from, and by several small railroads which were ordered by the commission to pay a portion of the cost for a viaduct in Butler.

Toronto Railway Matters.—Non-concurrence was expressed by the Board of Control of Toronto, Ont., on Nov. 12 in the recommendation of the works committee of the City Council, that the city enter into an agreement with the Toronto Railway for the operation of the new line on Bloor Street, between Dundas Street and Quebec Avenue, on a basis of 20 cents per car-mile. It was decided to ask permission to introduce a by-law empowering the commissioner to construct, equip and operate the line. Comptroller Church moved that application be made to the Legislature for an act giving the city power to make direct application to the Legislature for such amendments to the railway act as might be required from time to time. This matter was referred to the legal department for report.

Petition for Additional Cambridge Subway Station.—Residents of the Dana Hill district of Cambridge, Mass., have filed a petition with the Public Service Commission asking that an additional station be constructed at Putnam Square in the Cambridge subway. The petitioners claim that the surface car service between Putnam and Central Squares is inadequate and that traffic congestion at the latter point, which is an important transfer station, justifies the building of a new station between Harvard and Central Squares. A hearing will be given by the board, but it is considered unlikely that the additional station will be required in view of the recognition by the Railroad Commission prior to the building of the subway of the importance of limiting stops on rapid transit lines articulated with surface car service.

PROGRAMS OF ASSOCIATION MEETINGS

Railway Business Association

Fairfax Harrison, president of the Southern Railway, and Warren G. Harding, United States Senator-elect of Ohio, are announced as the speakers for the sixth annual dinner of the Railway Business Association, which will be held at the Waldorf-Astoria Hotel, New York, N. Y., on Dec. 10, 1914.

NATIONAL FIRE PROTECTION ASSOCIATION

The biennial meeting of the electrical committee of the National Fire Protection Association will be held in March, 1915, in New York City, the day and place of the meeting to be announced later. As usual, the provisions of the national electrical code as they now exist will be considered, together with reports of all sub-committees. Suggestions for amendments to the code, in order to be included in the bulletin, must be specific, and where a change is desired in a rule or section of a rule definite wording for such change must be given, together with the reasons why the change is recommended, and these suggestions, together with all committee reports, must be in the hands of Ralph Sweetland, 141 Milk Street, Boston, Mass., secretary of the electrical committee, not later than Jan. 15, 1915. The meeting will be open to all persons interested, and such persons will not only be welcome but are urged to be present and give the committee the advantage of their experience and advice.

Financial and Corporate

RECENT FINANCIAL TENDENCY

Analysis of Improved Conditions Brought About During the Last Week—Abstracts of Interviews Concerning Utility Earnings

The last week has been the most encouraging of any period since business was closed in the financial district. On Nov. 14 the committee of five announced that supervision over the prices of listed municipal bonds would no longer be required, and shortly afterward the committee of seven gave notice that dealings in unlisted municipal bonds for domestic accounts might be conducted without restriction. Not only was trading on the curb begun and maintained but the quotation of prices was resumed. Wire houses enjoyed a substantial volume of business for the first time in many weeks.

The opening of the twelve Federal reserve banks on Nov. 16 is believed to have brought about a relief in commercial circles and to have had a stimulating effect on all branches of business. Paul M. Warburg, of the Federal reserve board, declared that Nov. 16 might be considered the Fourth of July in the economic life of the United States, marking the foundation of its financial emancipation. October trade figures show an excess on exports over imports of $57,300,000. A general feeling of betterment is reported in trading and manufacturing centers. The cotton exchanges in New York and New Orleans resumed business on Nov. 16 at about the level of prices expected. This move should ease some phases of the problem which the sudden restriction of markets imposed upon the South and the country at large. In London the publication of the treasury scheme for relieving the stock exchange loan position, the issuance of new emergency rules and finally the announcement of the government's plan for financing trade, have ended the heroic measures, and it is believed that a gradual return to normal should ensue.

The New York Stock Exchange has considered plans for reopening its business in listed bonds, which would involve as one feature the establishment of minimum prices for trading. According to latest reports the exchange will not open on Nov. 23 as expected. The committee of seven has been dissolved. Tentative arrangements have been entered into between the Stock Exchange and representatives of the banks for the reopening of the Stock Exchange call money market. In Chicago the Stock Exchange will resume business on Nov. 23. Trading will be permitted in all listed and unlisted stocks at the closing prices of July 30 and the same will apply as to bonds. In handling dividend-paying stocks traders will be permitted to deduct one dividend. Walter Jackson, chairman of the special committee of five in the Boston Stock Exchange, issued a notice on Nov. 18 stating that the committee had rescinded its former order requiring members to confirm by letter all transactions made through the committee. All trades in listed securities made outside, however, must still be reported.

Transactions to the New York Stock Exchange clearing house committee on Nov. 16 were the heaviest recorded at any time since the closing of the exchange. Bond dealings passed the high record of $3,000,000 recorded on Nov. 13. There were also heavy dealings in listed stocks and unlisted bonds and notes. On Nov. 16 Commonwealth Power & Railway Light Company preferred stock showed an advance of one and one-half points over Nov. 12, while American Light & Traction Company common and American Gas & Electric Company common advanced five points and two points respectively in the bid prices. Utah Securities Company 6's were probably the strongest bonds on the list, with sales at 76, an advance of two points. By Nov. 18 American Light & Traction Company common had advanced six additional points, while Utah Security Company 6's sold for 76¾. Advices from Chicago state that the municipal bond market is showing improvement in demand and prices and the same is true of public utility issues.

In an interview published in the *Electrical World* of Nov. 14, Harrison Williams, who is on the executive committees of the Federal Light & Traction Company and the Republic Railway & Light Company, said that the gross earnings of the average public utility have been comparatively little affected by present conditions. There is little difficulty in supplying the necessary capital for the present limited requirements of companies of recognized standing. Until conditions become settled, however, short-time financing for the minimum construction requirements is likely to prevail. When the time arrives for permanent financing a broader market for public utility bonds should readily be obtained at prevailing rates of interest and at former or perhaps slightly better prices. In Mr. Williams' opinion there seems to be nothing in the present situation to compel any further action by public utilities other than to limit their immediate capital expenditures to the minimum consistent with meeting the requirements of the individual situation.

According to an interview in the same issue with F. G. Sykes, president American Power & Light Company, the earnings of the company and its subsidiaries were better in September than for a long previous period, the net from operation having increased 21 per cent over September, 1913, and for the twelve months 18 per cent over the preceding twelve months. This increase is largely caused by the fact that the company's properties are located in widely separated sections of the country and therefore reap the benefits accruing from diversification of industries. The company has found the cost of new money too high for ordinary construction purposes at this time and has curtailed its proposed construction operations. It is trying to shape its course so as to increase earnings through the acquisition of new business largely on lines already constructed.

The quotation prices of securities of a number of prominent public utility companies have been collated from sources of information available on Nov. 19 with the idea that they would probably prove of general interest as indicative of recent price tendencies. As best suited to meet the requirements of such a list it was decided to give wherever possible recent bid and asked quotations and the bid quotation on July 30, the last day that the New York exchange was opened for business. The quotations follow:

	Bid	Asked	July 30
American Lt. & Tr. Co.	300	305	320
American Lt. & Tr., pfd.	104	105	108
American Pr. & Lt., pfd.	77	82	80
American Pub. Utilities	35	45	45
American Pub. Utilities, pfd.	63	68	..
American Water Wks. & Elec., ptc. pfd.	8	13	..
American Water Wks. & Elec., ptc. 1st pfd.	48	53	..
Boston Elevated	88½	88½	96
Boston & Worcester, pfd.	38	39	37
Brooklyn Union Elevated, 1st 5's	98	99½	101½
Mass. Elec., pfd.	56½	..	58
Chicago Elev. Rys. 1916 notes	94	98	..
Cities Service Co.	40	45	60
Cities Service Co., pfd.	50	55	57
Commonwealth P. R. & Lt.	52	55	57
Commonwealth P. R. & Lt., pfd.	74	77	77
Detroit United 4½'s, 1932	64	66	70
Federal Light & Traction	14	18	18
Federal Light & Traction, pfd.	55	65	70
Interborough-Met. 4½'s, 1956	70½	71	..
Interborough-Met. ref. 5's, 1966	96½	97	..
Pacific Gas & Elec. Co.	36	..	34
Pacific Gas & Elec. Co., pfd.	75	80	71
Public Service Corpn., N. J., 1916 notes	97	98½	..
Republic Ry. & Lt. Co.	17	20	17
Republic Ry. & Lt. Co.	65	75	68
Tennessee Ry., Lt. & Pr. Co.	8	11	11
Tennessee Ry., Lt. & Pwr. Co., pfd.	40	50	55
Union Ry., 1st m. 5's	98	102	101
United Light & Railways	40	45	60
United Light & Railways, 1st pfd.	65	70	60
United Light & Railways, 2nd pfd.	60	65	72
West End St. Ry., com.	66½	..	68½
West End. St. Ry., pfd.	85	..	85

FINAL RECEIVERSHIP REPORT FILED

In filing with the United States Federal Court his final report as receiver of the Indianapolis, Crawfordsville & Western Traction Company, the predecessor of the Indianapolis, Crawfordsville & Dansville Electric Railway, Harry J. Milligan asked that he be discharged from his receivership duties. The report shows that all payments ordered by the court on April 17, 1912, have been made and that all taxes, assessments and valid claims against the company have been satisfied. There remains only for the court to enter an order for the disposal of $87,360 now held by the clerk of the United States Federal Court. It is expected that bondholders will receive part, if not all, of the money in registry. Mr. Milligan was appointed receiver on July 8, 1909, after a complaint had been filed against the company by the Chicago Installation Company.

ANNUAL REPORT

Fonda, Johnstown & Gloversville Railroad

The statement of income, profit and loss of the Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y., for the year ended June 30, 1914, is as follows:

Revenue from transportation:	
Freight revenue	$264,198
Passenger revenue, steam division	66,113
Passenger revenue, electric division	598,847
Mail revenue	3,109
Express revenue	15,741
All other revenue from transportation	7,134
Revenue from operations other than transportation	31,735
Total operating revenues	$986,877
Operating expenses:	
Maintenance of way and structures	$86,859
Maintenance of equipment	55,925
Traffic expenses	8,330
Transportation expenses	275,590
General expenses	68,068
Total operating expenses	$494,772
Net operating revenue	$492,105
Outside operations (Sacandaga, N. Y.—summer resort)—deficit	7,279
Total net revenue	$484,826
Taxes accrued	45,366
Operating income	$439,459
Other income:	
Dividends declared on stocks owned	$6,300
Interest on other securities, loans and accounts	17,957
Miscellaneous income	9,322
Total other income	$33,580
Gross corporate income	$473,040
Deductions from gross corporate income	380,333
Net income (available for dividends)	$92,707
Dividends, 6 per cent on preferred stock	30,000
Balance surplus	$62,707

The passenger revenue of the company increased $3,876 during the year and the other operating revenues $6,659, while the freight revenue decreased $11,981, giving a decrease in total operating revenue of $1,446. The total operating expenses decreased $3,314, but the net operating revenue increased $1,868 and the gross corporate income $6,091. The deductions from the gross corporate income decreased $7,484, giving a decrease in net income available for dividends of $1,393. It is stated that the decrease of $3,314 in operating expenses was a good showing in view of the extraordinary expenses, such as an increase for removal of snow and ice of $8,983 over the previous year, an increase of $4,842 in repairs of power plant steam equipment and an increase of $11,553 in the company's payroll.

The revenue of the company from transportation was divided $350,707 for the steam division and $604,434 for the electric division, these amounts being a decrease of $16,128 for the steam division and an increase of $5,345 for the electric division. The revenue from operations other than transportation for the period was made up as follows: Steam division, $2,912, or an increase of $1,611; electric division, $28,824, or an increase of $7,727. The main sections of operating expenses show the following comparative expenses: Maintenance of way and structures—steam division, $27,352, or a decrease of $922; electric division, $59,506, or a decrease of $6,518; maintenance of equipment—steam division, $16,430, or a decrease of $4,846; electric division, $39,495, or an increase of $4,406; traffic expenses—steam division, $4,954, or a decrease of $441; electric division, $3,376, or a decrease of $377; transportation expenses—steam division, $91,114, or a decrease of $485; electric division, $184,476, or an increase of $5,181; and general expenses—steam division, $19,091, or a decrease of $182; electric division, $48,977, or an increase of $870.

The road and equipment account was charged during the year with amounts aggregating $57,668 for various additions and improvements. The operations during the year showed practically the same surplus available for dividends as in the previous year, and the usual 6 per cent dividend was paid on the preferred stock but none on the common stock. In view of the general financial conditions and the amounts needed to complete construction work rendered necessary in connection with street improvements being made by the State highway department and the cities of Amsterdam and Johnstown (which will cost the company about $100,000), it was deemed advisable by the board of directors to conserve the cash resources of the company. The company still has available $500,000 of preferred stock for future improvements and additions. Advances made to subsidiary companies on account of new construction and for the Sacandaga investment amounted to $23,071.

American Water Works & Electric Company, Pittsburgh, Pa.—William T. Wallace, general manager Great Shoshone & Twin Falls Water Power Company, a subsidiary of the American Water Works & Electric Company, has been named receiver of the former company by the Federal Court at Boise, Idaho. The proceedings had the approval of the holding company and the noteholders' protective committee and is a step to facilitate reorganization. This protective committee, of which Alvin W. Krech is chairman and H. Hobart Porter a member, was formed to obtain deposits of $1,780,000 of serial notes outstanding and to perfect the reorganization plan. Already $1,299,500 of the notes, or 73 per cent, have been deposited with the Union Trust Company, Pittsburgh.

California Street Cable Railroad, San Francisco, Cal.—The Railroad Commission of California has rendered a decision authorizing the California Street Cable Railroad to issue $384,000 of 6 per cent serial bonds secured by deed of trust to the Union Trust Company, San Francisco. These bonds are to be used for the purpose of refunding $384,000 of bonds maturing Jan. 1, 1915. The new issue will be subject to call on payment of a 5 per cent premium within 5 years from the date of the bonds, and upon payment of a 3 per cent premium at any time after 5 years from the date of the bonds. A sinking fund will be provided, the annual payments on which will range from $24,000 in 1916 to $46,000 in 1927. The commission's order provides that the bonds shall be sold to net not less than 99 per cent of their face value with accrued interest. The application to the commission to issue these bonds was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 31.

Chicago & Oak Park Elevated Railroad, Chicago, Ill.—Arguments on the motion of the Continental & Commercial Trust Company for dismissal of the petition of Samuel Insull, receiver of the Chicago & Oak Park Elevated Railroad, for an order to issue receiver's certificates were continued until Nov. 21 by Judge Kohlsaat.

Cumberland County Power & Light Company, Portland, Maine.—The York County Power Company, a subsidiary of the Cumberland County Power & Light Company, recently filed with the Fidelity Trust Company, Portland, as trustee a first and refunding mortgage to secure not more than $2,500,000 of 5 per cent bonds dated Dec. 1, 1913, and due Dec. 1, 1943, subject to call on any interest date at 105. Of the new bonds, $500,000 has been certified and guaranteed principal and interest by the Cumberland County Power & Light Company. An additional $719,500 is reserved to retire a like amount of underlying bonds, and the remaining $1,280,500 is issuable only for future extensions and additions.

Georgia Railway & Electric Company, Atlanta, Ga.—A petition for authority to issue $160,000 of bonds has been filed with the State Railroad Commission by the Georgia Railway & Electric Company. The proceeds arriving from the sale of the bonds, which are to be a refunding and improvement mortgage forty-year 5 per cent sinking fund gold coupon issue, are to be used to cover expenditures made from Jan. 1 to June 30 for extensions and betterments. It is stated that more than $200,000 was expended by the company for improvements during this period.

Kentucky Utilities Company, Somerset, Ky.—The Illinois Trust & Savings Bank, Chicago, is offering for sale at 95.84 to yield 7 per cent the first mortgage five-year 6 per cent gold bonds of the Kentucky Utilities Company, dated Oct. 1, 1914, and due Oct. 15, 1919. These bonds are redeemable as a whole or in part at 100 and interest upon thirty days' published notice. They are coupon bonds, registerable as to principal, in denominations of $100, $500 and $1,000. Of an authorized amount of $2,000,000, $1,500,000 is outstanding. These bonds are followed by $1,849,000 of junior securities, all of which are under the control of the Middle West Utilities Company. The Kentucky Utilities Company was organized in 1912 and now serves eighteen cities and towns in central and southeastern Kentucky, all with electric light and power, five with ice, three with water, one with gas and one with street railway service.

Joliet & Eastern Traction Company, Joliet, Ill.—The Joliet & Eastern Traction Company has taken over the business of the old Joliet & Southern Traction Company under arrangements made at a recent meeting of the bondholders' committee in Chicago. It was voted to issue $300,000 in stock to be given in exchange for the outstanding $800,000 of bonds of the old company. The remaining $50,000 of the authorized stock will be held in the treasury to be issued in payment for improvements and betterments when they are made. All of the holders of the bonds were recognized in the reorganization of the new company. The old property was appraised at $350,000 by the Illinois Public Utilities Commission. After the old company went into bankruptcy it was known that nothing but a reorganization would result and a committee was appointed by the bondholders to look after their interests. This committee was composed of Joy Morton, Chicago, Ill.; Robert T. Kelley and Charles E. Wilson, Joliet, Ill.; F. B. Watson, Aurora, Ill., and F. J. Kohlhagen, Frankfort, Ill. This committee has watched closely the bankruptcy proceedings, and when sale of the property was made by order of the court the line from Joliet to Chicago Heights, Ill., twenty-five miles long, was bid in for the benefit of the bondholders. The sale extinguished all stock interests in the company, and now the new stock will take the place of the former bond issue. Officers of the new company have been elected as follows: Joy Morton, Chicago, Ill., president; Robert T. Kelley, Joliet, Ill., vice-president; E. H. Stearns, Chicago, Ill., secretary, Daniel Peterkin, Chicago, Ill., treasurer, and F. C. Eckman, Joliet, Ill., general manager.

London (Ont.) Street Railway.—According to the annual report of the London Street Railway for the year ended Dec. 31, 1913, the passenger earnings amounted to $327,075, and miscellaneous earnings to $4,891, a total of $331,966 for the year. The total operating expenses were $234,916, giving net earnings of $97,050. The total fixed charges were $29,114 and the net income $67,936. During the year passenger earnings increased $25,879, while miscellaneous earnings decreased $143, giving an increase in gross earnings of $25,735. Operating expenses increased as follows: Maintenance of way and structures, $2,796; maintenance of equipment, $1,790; power plant expenses, $5,978; car service expenses, $13,449, general expenses, $624, or a total increase of $24,638. The net earnings increased $1,097, which, combined with an increase in total deductions from income of $203, gave a net increase of $894. During the year $91,440 was expended for improvements, extensions and betterments. The number of passengers carried in 1913 was 9,078,489, as compared to 8,353,230 for 1912.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The Railroad Commission of California has rendered a decision authorizing the Los Angeles & San Diego Beach Railway to issue three promissory notes totaling $32,000 and bearing interest at not to exceed 7 per cent per annum.

New York (N. Y.) Railways.—Darwin P. Kingsley, president New York Life Insurance Company, on Nov. 16 wrote Alexander J. Hemphill of the bondholders' committee of the New York Railways to the effect that the real issues in the present dispute between the income bondholders and the company are the asserted right of the insurance interests having large holdings of the bonds to elect five of the eleven members of the board of directors, and the claim that specific provisions of the income bond indenture in regard to the setting up of reserves have not been followed by the company. This was in answer to a statement recently made by several of the directors, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 14.

Northern Electric Railway, Chico, Cal.—At a convention of bankers holding overlying bonds of the Northern Electric Railway, held at San Francisco on Nov. 2, a committee of eight was appointed for the purpose of suggesting a feasible plan for the protection of the properties of the company and its creditors. On Nov. 6 a second convention of bankers was held, at which forty-six banks were represented. The convention adopted the recommendation of the committee that the country banks holding overlying bonds form a syndicate to purchase at 90 the underlying bonds held as collateral against loans. This would pay off all such obligations and leave a sufficient working capital to insure the successful operation of the company. This plan is calculated to preserve the equities of the underlying bondholders and leave the country banks in control of the situation. The endorsers, who are the owners of practically all of the company's stock, are to cause this stock to be transferred to trustees named by the country bankers in consideration of their being relieved as endorsers on notes secured by first mortgage bonds. This stock is to be used by the trustees for the benefit of the overlying bondholders and unsecured creditors as determined by the country banks. The committee was instructed to prepare the necessary papers to put the plan in operation and to secure the approval of the San Francisco banks and other creditors of the company. The San Francisco bankers interested in the securities of the company have expressed to the committee a general approval of the plan.

Paducah Traction & Light Company, Paducah, Ky.—It is reported that nearly $12,000 of 5 per cent gold mortgage bonds of the Paducah Traction & Light Company will be sold by the State Street Trust Company, Boston, Mass., bids being received up to Nov. 26.

Staten Island Midland Railway, New York, N. Y.—The Staten Island Midland Railway has applied to the Public Service Commission for the First District of New York for authority to issue $135,000 of equipment trust certificates. The commission has ordered a public hearing upon the application for Nov. 23. These certificates are not to be sold for cash but are to be issued directly for the acquisition of thirty-two double-truck closed cars. The certificates are in denominations of $500 and are dated January, 1915, to mature about 5 per cent every six months.

Third Avenue Railway, New York, N. Y.—At the recent annual meeting of the stockholders of the Third Avenue Railway, A. E. Cottier presented a prepared list of questions to President Whitridge dealing principally with the acquisition of the New York City Interborough Railway, The Mid-Crosstown Railway and the Belt Line Railway Corporation. Discussing the acquisition of property by the Third Avenue Railway since the organization, Mr. Cottier said that about $1,000,000 had been taken from the treasury and not capitalized. He also questioned the wisdom of keeping the depreciation fund untouched until it reached $2,000,000. In reply Mr. Whitridge said that it was possible he had made a mistake in purchasing the Mid-Crosstown Railway, but it was too early yet to tell that. In his opinion, the setting up of an actual depreciation fund was the soundest thing he had done and he regarded his first duty as due to the bondholders, the real owners of the property, who had supplied all the money. A resolution to appoint a committee of stockholders to examine the affairs of the company was lost by a stock vote of 98,363 shares against 7,435, but Mr. Whitridge appointed the following committee to conduct such an investigation: H. Lock, L. F. Strauss and E. A. Manice.

Tidewater Southern Railway, Stockton, Cal.—The Tidewater Southern Railway has purchased from the Modesto & Empire Traction Company the railway line from Modesto to Empire, taking over with it all freight agreements with the Santa Fé Railroad.

Union Traction Company of Indiana, Anderson, Ind.—The Union Traction Company of Indiana has filed suit in the United States Court for $1,544, the suit being directed against Peter J. Kruyer, collector of internal revenue for the sixth district in Indiana, and his predecessor, Elam H. Neal. The railway says that the money was collected from it under the government excise tax law of 1911, although the amount was not due, because the company was not doing business. The street car and interurban systems and plant of the company were leased to the Indiana Union Traction Company in that year.

West End Street Railway, Boston, Mass.—The annual meeting of the stockholders of the West End Street Railway will be held on Nov. 24 to choose directors and to vote on the increase of the common stock by the issue of not exceeding 13,000 shares, par value $50, to provide

means for repaying to the Boston Elevated Railway amounts expended by it for permanent additions and improvements to the West End Street Railway property.

DIVIDENDS DECLARED

American Railways, Philadelphia, Pa., quarterly, 62½ cents, common.

Baton Rouge (La.) Electric Company, 3 per cent, preferred.

Norfolk Railway & Light Company, Norfolk, Va., 3 per cent.

Northern Texas Electric Company, Fort Worth, Tex., quarterly, 1¾ per cent, common.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE					
1m., Sept., '14	$69,099	*$29,159	$39,940	$17,323	$22,617
1 " " '13	68,457	*28,780	39,677	17,355	22,322
12 " " '14	777,721	*372,008	405,713	208,864	196,849
12 " " '13	749,593	*342,103	407,490	207,134	200,356
CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.					
1m., Sept., '14	$87,086	*$55,095	$31,991	$28,456	$3,535
1 " " '13	117,882	*64,686	53,196	25,327	27,869
12 " " '14	1,119,695	*702,784	416,911	330,335	86,576
12 " " '13	1,190,488	*704,035	486,453	289,280	197,173
COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO					
1m., Sept., '14	$256,125	*$148,485	$107,640	$42,654	$64,986
COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.					
1m., Sept., '14	$1,230,822	*$733,907	$496,915	$352,245	$144,670
1 " " '13	1,170,661	*713,461	457,461	322,556	134,644
12 " " '14	14,745,084	*8,389,731	6,355,353	4,122,755	2,232,598
12 " " '13	13,896,026	*8,041,245	5,854,781	3,756,545	2,098,236
CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE.					
1m., Sept., '14	$230,663	*$122,671	$107,992	$63,711	$44,281
1 " " '13	218,398	*126,466	91,932	63,659	28,273
12 " " '14	2,503,949	*1,429,718	1,074,231	762,788	311,443
12 " " '13	2,278,877	*1,268,738	1,010,139	692,916	317,223
DALLAS (TEX.) ELECTRIC COMPANY					
1m., Sept., '14	$173,777	*$94,673	$79,104	$33,358	$45,746
1 " " '13	180,067	*102,892	77,175	25,393	51,782
12 " " '14	2,270,801	*1,345,632	925,169	350,694	574,475
12 " " '13	2,105,076	*1,218,562	886,515	297,016	589,499
EASTERN TEXAS ELECTRIC COMPANY, BEAUMONT, TEX.					
1m., Sept., '14	$59,970	*$33,180	$26,791	$8,601	$18,190
1 " " '13	49,107	*29,548	19,559	8,242	11,317
12 " " '14	661,602	*398,404	263,208	100,388	162,810
12 " " '13	412,324	*224,144	188,179	46,488	141,691
EL PASO (TEX.) ELECTRIC COMPANY					
1m., Sept., '14	$87,041	*$48,718	$38,323	$4,203	$34,120
1 " " '13	73,747	*39,096	34,651	4,233	30,418
12 " " '14	1,015,765	*569,240	446,526	51,300	395,226
12 " " '13	880,335	*470,067	410,268	48,989	361,279
GALVESTON-HOUSTON ELECTRIC COMPANY, GALVESTON, TEX.					
1m., Sept., '14	$195,260	*$104,718	$90,542	$35,921	$54,621
1 " " '13	200,183	*110,589	89,594	34,965	54,629
12 " " '14	2,455,476	*1,351,522	1,103,954	440,563	663,391
12 " " '13	2,304,396	*1,317,426	986,970	413,775	573,195
NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.					
1m., Sept., '14	$196,155	*$109,267	$86,888	$41,858	$45,030
1 " " '13	187,252	*119,404	67,848	39,828	28,020
12 " " '14	2,258,848	*1,369,392	889,456	504,355	385,101
12 " " '13	2,166,318	*1,291,081	875,237	493,073	382,164
NEW YORK (N. Y.) RAILWAYS					
1m., Aug., '14	$1,182,628	$709,380	$473,248	$369,253	$103,995
1 " " '13	1,218,600	740,041	478,559	373,834	104,735
2 " " '14	3,353,216	1,422,058	1,931,158	738,954	192,204
2 " " '13	2,422,764	1,471,167	951,597	749,780	201,817
PHILADELPHIA (PA.) RAPID TRANSIT COMPANY					
1m., Oct., '14	$2,097,099	$1,195,274	$901,826	$807,938	$93,888
1 " " '13	2,113,530	1,210,638	902,892	796,599	106,298
4 " " '14	7,910,776	4,557,958	3,352,818	3,234,037	118,781
4 " " '13	8,079,519	4,713,194	3,336,324	3,195,247	171,077
PORTLAND RAILWAY, LIGHT & POWER COMPANY, PORTLAND, ORE.					
1m., Sept., '14	$483,313	*$262,257	$221,056	$184,666	$36,390
1 " " '13	547,451	*278,501	268,950	176,918	92,032
12 " " '14	6,511,485	*3,319,816	3,191,669	2,148,892	1,042,777
12 " " '13	6,689,055	*3,322,192	3,366,863	1,934,892	1,431,971

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*Includes taxes.

Traffic and Transportation

TORONTO SERVICE CASE

Recommendations Regarding Service Made by the Toronto Railway & Municipal Board

The appeal made in November, 1911, against the Toronto (Ont.) Railway by the city for relief from alleged defects in the street railway system resulted on Nov. 9 in judgment by D. M. McIntyre, chairman of the Ontario Railway & Municipal Board. The board takes the view that as the expenditure involved in the application of the city as practically $3,000,000 and would involve replacing much of the present equipment the company is entitled to consideration, particularly as its franchise has only seven years more to run. The board, in its judgment, leaves it to be inferred that any additional equipment put on by the company should be compensated for at the termination of the franchise. The judgment reads as follows:

The conclusions reached by the board for the improvement of the company's service and which may be incorporated in a formal order, are the following:

1. That before Jan. 1, 1915, the company reconstruct 13.45 miles of track classified as in poor condition in the report of Mr. Barnes.
2. That before June 1, 1915, the company extend its tracks, with all necessary overhead work, pursuant to plans and specifications to be approved by the board, from their northerly terminus on Ossington Avenue at Bloor Street, northerly along Ossington Avenue to and along Hallam Street to Dufferin Avenue, thence along Dufferin Avenue to Lappin Street, and thence along Lappin Street to Lansdowne Avenue, and operate cars along such extension according to a schedule approved by the board.
3. That before Dec. 1, 1914, the company extend its tracks, with the necessary overhead work, pursuant to plans and specifications to be approved by the board, along Teraulay Street from its tracks on College Street southerly to a junction with its tracks at the corner of Teraulay and Agnes Streets, and operate its cars thereon according to a schedule to be approved by the board.
4. That before Jan. 1, 1915, the company place metal troughs of an approved type on the trolley wire where it is carried over steam railway tracks.
5. That before Jan. 15, 1915, the company reconstruct the platform and steps of thirty-four of the cars as recommended in the report of Mr. Barnes and report to the board upon the feasibility of reconstructing the remainder of the 202 cars referred to in said report.
6. That not later than June 1, 1915, the company build and have in operation upon routes approved by the board fifty double-truck motor cars of a design approved by the board.
7. That on or before May 1, 1915, the company equip each of its cars with a legible route sign on the right-hand side, and a destination sign at the front end, both signs to be suitably illuminated during the hours of darkness.
8. That cars reconstructed by the company in future be equipped with push buttons.
9. That not later than Jan. 15, 1915, the company report to the board on an approved heating system for its cars and the cost of the same.
10. That during the summer months and the hours of congested travel in other months, all the College Street cars going west be run along Howard Park Avenue, and around the High Park loop, but that only each alternate car at other times be run along Howard Park Avenue and around the High Park loop.
11. That not later than Jan. 15, 1915, the company report to the board on the practicability of the rerouting proposed in the recommendation of Mr. Barnes' report.
12. That not later than Jan. 15, 1915, the company report to the board on the operation of its cars at certain points, with a view to preventing unnecessary delays.
13. That not later than Jan. 15, 1915, the company submit to the board a draft by-law dealing with the several matters referred to in Mr. Barnes' report.

The board has already disposed of the application for an order to extend the Bloor Street line from Lansdowne Avenue to the northeastern corner of High Park on the ground that by reason of the company's abandonment of its charter the board has no jurisdiction to make such an order.

The board is of the opinion that the Wilton Avenue line should be extended to Danforth Avenue as recommended in Mr. Barnes' report, but no such order will be made until the subways are constructed under the steam railways and the new streets being opened up by the city are put in condition to receive the tracks.

The board is of the opinion that the extension of the company's tracks along Ossington Avenue, Hallam and Lappin Streets should be extended westerly from Lansdowne Avenue to Dundas Street, but no order for such further extension can be made until subways are constructed under the steam railway tracks.

The board further orders that the cost of procuring and having printed the report of Mr. Barnes, amounting to $9,960, be borne equally by the parties concerned. The board further orders that each of the parties pay to the board in law stamps the sum of $100.

COMMISSION ORDERS CHARLESTOWN SERVICE RESTORED

The Massachusetts Public Service Commission has issued an order restoring direct subway service to and from Charlestown on the lines of the Boston Elevated Railway. The order was issued at the request of the Charlestown Improvement Association, which was dissatisfied with the experimental service recommended by the board in its order of June 26, 1914, and which asked the commission at a recent hearing to restore the original facilities furnished by the company. It is the opinion of the board that the belt-line service from Sullivan Square via Bunker Hill Street, Chelsea Street, City Square, Main Street and vice versa, should be operated for a further experimental period of two months. Regarding the provision of belt-line service between Sullivan Square and South Boston, via Summer Street, the board suggests that the petitioners and the company confer prior to action by the commission, which will follow if agreement is not reached. The order provides that during normal hours a 20-minute schedule in each direction be maintained on the Bunker Hill belt line; and that the company shall restore the former 10-minute line from Winter Hill, Somerville, through Charlestown and Washington Street, Boston, and return; the former 10-minute line from Sullivan Square via Main Street, through the Tremont Street subway to Pleasant Street and return; the former 10-minute line from Sullivan Square to Dorchester Street, South Boston, and return, via Main Street and the Tremont Street subway, and the former 10-minute line from Sullivan Square via the Tremont Street subway to Dudley Street terminal and return. Free transfer privileges are to be effective as at present between surface and elevated cars at City Square.

INCREASE IN PHILADELPHIA SUBURBAN FARES

The Pennsylvania Railroad, the Philadelphia & Reading Railway and other carriers have filed new tariffs containing substantial changes with the Interstate Commerce Commission. Though no changes will be made in suburban or local one-way fares, holders of monthly trip and school tickets will be required to pay from 20 to 25 cents above the present charges. A number of trip tickets will be withdrawn from sale altogether, and all excursion tickets except those to resort points will be discontinued. The changes in suburban rates have been so adjusted that no person traveling on commutation tickets will have to pay more than 1 cent a day additional fare. The change will go into effect on Dec. 15. The sixty-trip monthly ticket of the Pennsylvania Railroad will be advanced 25 cents above the present rate. The forty-six-trip school ticket will be advanced 20 cents. The 100-trip ticket will be withdrawn from sale. The 180-trip quarterly ticket will be sold at three times the monthly rate. This ticket will be kept on sale for the convenience of those who do not care to purchase a ticket every month. The fifty-trip ticket will be withdrawn from sale. Strip tickets will be withdrawn from sale. Ten-ride tickets will be sold, good for bearer. They will cost nine times the one-way fare.

Excursion tickets to Atlantic City, Cape May and other seashore points will be advanced 25 cents. All excursion tickets except those to resort points will be withdrawn from sale. Round-trip tickets will be sold at twice the one-way fare and will be good until used, with stop-over privileges. No changes will be made in any suburban or local one-way fares. Through or inter-territorial, fares have been revised on a basis of 2½ cents a mile as the maximum rate.

KANSAS CITY REROUTING

The rerouting of cars as arranged by the Board of Control and installed by the receivers of the Metropolitan Street Railway in Kansas City, Mo., has met with comparatively few complaints. An interesting feature was the arrangement to care for the traffic at the new Union station, which is located in another part of the city from the old one. Two loop cars run each way on Grand avenue and Main Street to and from the depot, gathering direct transfers from every line in Kansas City, Mo., and Kansas City, Kan., and all the interurbans. Some of the other lines were routed by the depot, being turned two blocks apparently out of their normal routes north of the station in order that they might pass the station, and emerging from the station vicinity to their previous routes by going another block, apparently, "out of their way." Main Street is being excavated south of the station, and a street made where eventually tracks will be laid, after which the street cars will find a direct route southward from the station to their present southbound tracks. The present apparently circuitous routing was put into effect at once, to avoid a later rerouting that probably would cause confusion. The radical rerouting necessary at this time naturally was expected to be later corrected in minor details and the Board of Control now has expert traffic men inspecting traffic with the object of making reports and suggesting such changes as may be deemed necessary.

Investigate Height of Car Steps.—The New Hampshire Public Service Commission will give a hearing at its offices in Concord on Dec. 1 upon the height and safety of steps on electric railway cars throughout the State, with a view toward the regulation of step heights and designs.

Massachusetts Fare Case Appealed.—George B. Willard, president of the Waltham Board of Trade has asked the Supreme Court of Massachusetts to review and modify the action of the Public Service Commission, which recently handed down a decision granting 6-cent fares to the Middlesex & Boston Street Railway.

Suburban Express Service at Memphis.—Suburban electric express business is to be begun immediately by the Memphis (Tenn.) Street Railway under the terms of an ordinance passed some time ago by the City Council. At the outset one car will be employed, running daily over each of the three suburban lines, to Lakeview, to Raleigh Springs and to Normal. The downtown station will be on Front Street. According to T. H. Tutweiler, president of the company, other cars will be added as the business grows.

To Mayors' Conference by Trolley.—Harrison R. Fehr, president of the Lehigh Valley Transit Company, Allentown, Pa., placed private car "999" at the disposal of the various municipal officials of all the cities located along the lines of the company for the trip to the conference of mayors and city officials held in Philadelphia beginning on Nov. 12. The car started from Easton and passed through Bethlehem to Allentown, from which place it followed the "Liberty Bell" Interurban Line to the Sixty-ninth Street terminal in Philadelphia.

Progress of New Kansas Road.—The Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan,, is said to be more than meeting expectations as to traffic. The first car was operated on July 20. There are now eighteen round trips a day between Bonner Springs and Kansas City, 17 miles. An express car was added to the equipment on Nov. 18, and put into operation at once. Heretofore the company has carried parcels from the city, and small packages from the country, in the baggage sections with which all the passenger cars are equipped. The company refused to carry poultry, milk and farm products on the passenger cars, but the large business of this kind that presented itself demanded the addition of the regular express car. The car will make two trips a day.

Increase in Philadelphia Service.—Effective on Nov. 15, the Philadelphia (Pa.) Rapid Transit Company increased the service on the subway-elevated line in the rush hours. During the periods of greatest congestion trains of five cars are now operated every two minutes instead of trains of six cars every two and one-half minutes. It was found that the end cars of a train were seldom used to capacity, while the center cars carried an undue proportion of the total load, and it is believed that with the cars divided into five-car trains on a two-minute interval the cars will be more equally loaded and better service will be provided. The owl car service has also been improved by operating a ten-minute service instead of a fifteen-minute service until 1 a. m. from the Sixty-ninth Street terminal and until 1.30 a. m. from the ferries terminal.

Agricultural Department Established.—T. W. Cross, Gresham, Ore., has been selected by the Portland Railway, Light & Power Company, Portland, Ore., as head of the agricultural department which the company has established with a view of developing the knowledge of ranchmen and farmers along its interurban lines. One of the first steps taken by Mr. Cross was to secure a list of the ranches in the district in which the company operates. Each owner of land was canvassed by mail as to the number of acres under cultivation, the crop raised, the amount of live stock, etc. Meetings are being held in the schoolhouses and in depots, at which Mr. Cross advises the men as to increasing their output. The company has enlisted the services of the agricultural department of the State and of the United States in furthering the movement looking toward increased output.

Employees' Publication in Louisville.—Under the direction of Samuel Riddle, superintendent of the Louisville (Ky.) Railway, the transportation department of the company has arranged to publish every two weeks a bulletin which will circulate among the trainmen and other employees of the company. It will be a medium by which new rules and regulations will be communicated from the management of the company to the men, and various members of the transportation department and official corps of the company will contribute to it. The work of editing it will fall upon Mr. Riddle, whose idea it was and who is working out the plan. The first issue of the publication will be out shortly. It will be called Trolley Topics. "Safety first" matters will be considered in the various issues, and other questions relating to operation of the cars and improvement in the company's service.

Order Requiring Exchange of Transfers.—The Public Service Commission of the First District of New York has issued an order directing the Coney Island & Brooklyn Railroad, the Brooklyn Rapid Transit Company, the Coney Island & Gravesend Railway, the Brooklyn, Queens County & Suburban Railroad, the Nassau Electric Railroad, the Brooklyn Heights Railroad and the Van Brunt Street & Erie Basin Railroad to establish through routes and joint rates, fares and charges over their lines, so that free transfers may be given from the Van Brunt Street line to the intersecting lines of other companies, and vice versa. The division of the fares between the company issuing the transfers and the company accepting the transfer, is left to the companies to agree upon. The Van Brunt Street & Erie Basin Railroad operates 3 miles of line in downtown Brooklyn. Its equipment includes fifteen motor cars.

Misuse of Seats a Misdemeanor.—A recently promulgated rule of the Louisville (Ky.) Railway which prohibits passengers from propping up their feet on the seats in front of them has just been sustained in the City Police Court. A conductor on the Shelby Street line found John Hoffman with one foot on the seat in front of him. He notified Hoffman of the rule and requested him to remove his foot. Hoffman refused repeatedly, so when the car reached the police station located on the line, the conductor stopped the car and caused Hoffman's arrest. In the police court counsel for Hoffman sought to show that the infraction of the company's rules did not constitute a misdemeanor as charged in the warrant. Judge Samuel Boldrick, however, ruled otherwise, saying the rule was a good one. He assessed a fine of $5 against Hoffman and then suspended the fine. The moral effect of the conviction, however, was not lessened.

Effect of Cattle Quarantine on Electric Railways.—The Southern Indiana lines of the Insull corporations, which cross the Ohio River at Louisville into Kentucky, have been considerably benefited since the quarantine regulations against live stock seeking to prevent the foot and mouth disease from spreading. No horse-drawn vehicles have been permitted to cross the wagon bridge between Louisville and New Albany, Ind., while the ferry boats can carry wagons but not horses. This has added to the volume of the local express business of the Louisville & Southern Indiana Traction Company and the Louisville & Northern Railway & Lighting Company, the shippers arranging for deliveries at the other end of the line outside of the companies' delivery districts. The quarantine has been so strictly enforced that the railway companies have prohibited carrying of dogs across the river. Ordinarily many dogs are carried across the river by hunters seeking fields in Indiana, but this traffic has been cut off altogether at this time.

Toledo Safety Movement.—The Toledo Railways & Light Company, Toledo, Ohio, is co-operating with the city of Toledo, through its Commerce Club, in the "safety first" campaign which has been started in that city. E. R. Kelsey, chairman of the company's committee on safety, represents the company as its member of the Toledo safety league. The company has also launched the safety movement independently so far as it and the public are concerned. The work is under the supervision of George Oliver Smith, in charge of safety for all companies operated by Henry L. Doherty & Company. The company has a general safety committee consisting of the heads of the operating departments. This is divided into two sub-committees, one committee on safety for the employees, of which D. C. Bailey, claim agent, is chairman, and the other committee on safety for the public, of which E. R. Kelsey is chairman. The company has arranged to show the well-known Vitagraph film "The Price of Thoughtlessness."

Philadelphia "Safety First" Prizes Awarded.—The award of $100 in cash prizes for the best practical suggestions as to how the public can be induced to exercise proper care in avoiding accidents has been announced by the safety bureau of the Philadelphia (Pa.) Rapid Transit Company. The contest, which closed on Oct. 31, was proposed by the safety bureau during the carnival of safety, in which the Philadelphia Rapid Transit Company participated, at Convention Hall, in September. The suggestions submitted, about 10 per cent of them from children, contain little originality, thus emphasizing the fact that the company has pretty generally covered the field in its safety campaign. Many of the contestants praised the company for the adoption of the most modern cars and safety devices; referred to the efficiency and co-operation of the car men, and to the continued campaign carried on in the public schools through the co-operation of the board of education. The safety bureau, in making the awards did not commit itself to indorsement of all of the suggestions by the successful participants. The first prize was $25, the second $15, and the third $10. Ten fourth prizes valued at $5 each were also distributed.

Preparing for Christmas in Washington.—The Washington Railway & Electric Company, Washington, D. C., will on Dec. 29 again entertain the 2500 children of its employees with a Christmas festival at the New National Theater. Gifts, comprising everything in the way of the newest novelties in toys, books, bags of assorted candies and fruits, all purchased from Washington merchants, will be distributed. Clarence P. King, president of the company, has issued instructions to make the year's event, the fourteenth annual celebration, the biggest and best ever attempted. Free transportation in special cars to the New National Theater will be provided for all the children and the parents accompanying them, and at the conclusion of the entertainment tickets will be distributed for the return trip home. Last year the feature of the entertainment was a company baby show. This year arrangements are under way for children of company employees, between the ages of nine and fourteen, to offer a diversified program, consisting of exhibition drills, fancy dances and songs and choruses. Mr.

King has appointed Assistant Secretary William L. Clark as general chairman of the Christmas committee. E. S. Marlow, manager of the lighting and power company commercial department, will serve as vice-chairman and J. F. Sullivan as secretary.

Rehearing Denied Southern Pacific in Rate Case.—The Railroad Commission of California has rendered a decision denying the application of the Southern Pacific Company for a rehearing of the transbay commutation rate case in which the company sought to raise commutation rates between San Francisco and cities on the other side of the bay. The commission denied the company's original application upon the grounds that the company's apportionment of its investment and expenses between main line and suburban service was erroneous; that many of the transbay lines were built for competitive purposes, and that where a duplication of investment had been made, the burden should not fall upon the patrons of the company, and that in electrifying and extending its lines the company had done so with a view not only to present but to future traffic. The application for rehearing was based, primarily, upon the ground that the commission's refusal to allow it to raise its rates was in violation of the federal constitution in that it deprived the company of property without due process of law. The denial of the original petition by the Railroad Commission was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 24, page 984. The application for a rehearing was noted in the issue of Nov. 14, page 1120.

The Toronto Overcrowding Case.—After the jury had twice disagreed and had been twice sent back to reconsider its verdict by Chief Justice Sir Glenholme Falconbridge, at Toronto, Ont., the members filed into the Assize Court on Nov. 14 with a verdict of guilty against the Toronto Railway. The charge was of maintaing a public nuisance in the operation of cars, particularly with regard to overcrowding. At the request of counsel for the railway the jury was polled, and it developed that the verdict was unanimous. H. H. Dewart asked for a stated case, the main reason being the charge delivered by his Lordship. Mr. Dewart said that it was practically an order to the jury to bring in a verdict of guilty. He contended that the interpretation his Lordship gave on points of law practically took the matter out of the hands of the jury. The Chief Justice said that he would assist in having the case sent to the Court of Appeal for final judgment. Mr. DuVernet, appearing for the Crown, said that he would consent to sentence being suspended until the stated case had been disposed of. In replying to Mr. Dewart, the Chief Justice said that R. J. Fleming, the manager of the railway, in his evidence had admitted that if the power were conferred on the railway to refuse passengers when the cars were overcrowded and use force he would do so.

Hearing on Allston (Mass.) Transfers.—The Massachusetts Public Service Commission gave a hearing on Nov. 6 upon the petition of residents of the Allston district of Boston for the granting of free transfer privileges at the junction of Commonwealth and Harvard Avenues on the Boston Elevated Railway. For the company, H. B. Potter, assistant to the second vice-president, pointed out that the number of free transfer points on the system has increased in the past sixteen years from seventy to 170; that the carrying power of the free transfer has been enormously increased, and that the situation is fast getting beyond control. On general principles the company opposes any further extension of such facilities at the present time. Chairman McLeod said that the board was convinced that transfers should be granted at Harvard and Commonwealth Avenues to and from Brookline Village and would so order. Mr. Potter urged that such facilities be limited to points north of the intersection of Commonwealth and Chestnut Hill Avenues, in the Aberdeen district, to prevent round-trip riding on a single fare. Mr. Potter said that almost 100,000,000 free transfers were issued yearly by the company. This is 60 per cent of the revenue-passenger traffic. Chairman McLeod said that there were many transfer abuses daily in Boston and intimated the board's appreciation of the difficulties and inconsistencies under which the company was working. The board took that part of the case bearing upon Allston station transfers under advisement.

Personal Mention

Mr. J. L. Greatsinger, formerly second vice-president of the Elmira, Corning & Waverly Railroad, Waverly, N. Y., has been elected president of the company, to succeed Mr. G. Tracy Rogers.

Mr. R. C. Hardy, who has been chief clerk of the Alton, Granite & St. Louis Traction Company, Alton, Ill., has been appointed chief clerk to the assistant general superintendent of the company.

Mr. Henry K. Greenwood, who was superintendent of the Mesaba Railway, Virginia, Minn., now has the title of assistant to the general manager and superintendent of overhead construction.

Mr. W. H. Gayton, superintendent of the transportation of the Alton, Grainte & St. Louis Traction Company at East St. Louis, Ill., has had his jurisdiction extended to cover the Alton City lines.

Mr. Thomas E. Mitten, who has been chairman of the executive committee of the Philadelphia (Pa.) Rapid Transit Company, has been elected president of the company to succeed the late Charles O. Kruger.

Mr. W. J. McGraw has been appointed auditor of the Chicago, South Bend & Northern Indiana Railway, South Bend, Ind., to succeed Mr. C. A. Smith. Mr. McGraw has also been appointed auditor of the Southern Michigan Railway succeeding Mr. Smith.

Mr. Frederick Nicholls, president of the Canadian General Electric Company, Toronto, Ont., vice-president of the Toronto Railway and director of the Canadian Northern Railway, has been appointed an honorary colonel of the Canadian militia.

Mr. R. D. Benson, who was vice-president of the Muskogee (Okla.) Electric Traction Company, has been elected president of the company to succeed Mr. Willis E. Fertig, and has in turn been succeeded as vice-president of the company by Mr. W. S. Benson.

Mr. H. Brady has been appointed chief engineer of the power station of the Lancaster & York Furnace Street Railway, Millersville, Pa., to succeed Mr. A. Hobble. Mr. Brady also succeeds Mr. Hobble as chief engineer of the power station on the Lancaster & Southern Street Railway.

Mr. J. G. Herrin, assistant superintendent and purchasing agent of the Kansas City-Western Railway, Leavenworth, Kan., is acting as general superintendent of the company pending the return of Mr. J. W. Richardson, who has relinquished his active duties with the company on account of his health.

Mr. George T. Ordway has been elected president and a director of the Federal Utilities, Inc., New York, N. Y. He succeeds Mr. DeForest Candee as president, but Mr. Candee continues as a director. Mr. Ordway was formerly connected with the banking house of Bertron, Griscom & Company, New York, N. Y.

Mr. J. B. Rowray has been appointed superintendent of the Northern Electric Railway, Chico, Cal., to succeed Mr. W. R. Lawson, resigned. Mr. Rowray was formerly superintendent of the company, but resigned following the appointment of receivers. He was previously superintendent of the north division of the Pacific Electric Railway.

Mr. T. J. Kennedy, president and general manager of the Algoma Central & Hudson Bay Railway and the Algoma Eastern Railway, Sault Ste. Marie, Ont., has also been elected vice-president and general manager of the International Transit Company and the Trans St. Marys Traction Company, in charge of street railways and ferries.

Mr. Thomas G. Orr has been appointed traffic manager of the Pittsburgh & Butler Street Railway, Pittsburgh, Pa., to succeed the late Thomas D. Parrack. Mr. Orr was formerly excursion agent of the Pittsburgh & Butler Street Railway. Previous to that he had been connected for many years with the Buffalo, Rochester & Pittsburgh Railroad and the Canadian Pacific Railroad.

Mr. E. B. Allen has been appointed purchasing agent of the Louisville (Ky.) Railway, to succeed the late William H. McClure, whose place he filled during the latter's last illness. Mr. Allen entered the treasurer's office of the company thirteen years ago, soon after his graduation from the Louisville male high school, and had been employed in various capacities until he resigned last summer. He then went East and enrolled in the Massachusetts Institute of Technology as a student of mechanical and electrical engineering. Serious illness of his father recalled him to Louisville at the same time that Mr. McClure was absent from the office, and Mr. Allen took up the work, continuing in the post after Mr. McClure's death until the formal appointment.

Mr. A. E. Green has been appointed superintendent of transportation of the Kalamazoo City lines of the Michigan United Traction Company to succeed Mr. C. H. Smith. Mr. Green was employed at the Jackson County Jail, Jackson, Mich., from January, 1901, to January, 1903. He then received a commission and acted as deputy sheriff in Jackson from 1903 to 1907. He entered electric railway work in the latter year as motorman with the Jackson City lines of the Jackson Consolidated Traction Company and continued with the company until July, 1907. He was employed by the Michigan United Railways, Jackson, Mich., as despatcher from July 1, 1909, until Nov. 22, 1909, when he was promoted to chief inspector of the Kalamazoo City lines of the Michigan United Railways, which has been succeeded by the Michigan United Traction Company.

Mr. W. E. Boileau, who as previously announced has been appointed general manager of the Scranton (Pa.) Railway, entered railway work in the early 80's with a large steam railroad system. In 1888 he became connected with electric railway work and spent a number of years constructing and operating properties in the South. In 1904 he went to Dubuque, Iowa, where he was in charge of the construction of a new power station, carhouse and shops and the rebuilding of tracks for the Union Electric Company. In 1905 Mr. Boileau became connected with the New York, Westchester & Boston Railway, New York, and remained with the company until after the property passed into the control of the New York, New Haven & Hartford Railroad. Until recently he has been general manager of the Chattanooga Railway & Light Company, the Lookout Mountain Railway and the Lookout Incline Railway, Chattanooga, Tenn. He is an individual member of the American Electric Railway Association, an associate of the American Institute of Electrical Engineers and a member of the New York Railroad Club.

Mr. R. S. Buck, who as previously noted in the ELECTRIC RAILWAY JOURNAL has been appointed engineer of maintenance of way of the New York (N. Y.) Railways, was born in Vicksburg, Miss., and was graduated from Rensselaer Polytechnic Institute in 1887 as a civil engineer. His early professional work was chiefly on United States river and harbor surveys and improvements in the Missisippi Valley. From 1893 to 1899 he was associated with Mr. L. L. Buck, civil engineer, serving for most of the time in charge of the construction of the two Niagara arch bridges and the Lewiston suspension bridge. From 1899 to 1902 he was chief engineer in charge of the Manhattan and the Queensboro bridges over the East River at New York. During this time he also acted as consulting engineer for the State of New York on the construction of the reinforced concrete briges on the Niagara State reservation between the mainland and Goat Island. From 1902 to 1904 he was chief engineer of the Dominion Bridge Company, Montreal. In 1904 he resumed his connection with the Manhattan and the Queensboro bridges as consulting engineer. In 1907 he resigned this position to become a member of the firm of Sanderson & Porter, New York, N. Y., engaged in the development of electric railways and other public utility properties. In 1913 he retired from Sanderson & Porter to return to the Dominion Bridge Company as chief engineer, and remained with that company until his apppointment to the New York Railways.

OBITUARY

Daniel V. Murphy, special counsel for the Public Service Commission of the Second District of New York, is dead. Mr. Murphy was fifty years old. He resided in Buffalo.

J. E. Lamb, treasurer of the Terre Haute & Western Railway, Paris, Ill., which is leased to the Terre Haute, Indianapolis & Eastern Traction Company, died recently. No successor to Mr. Lamb has yet been elected.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Morrisburg & Ottawa Electric Railway, Ottawa, Ont.—Incorporated under the Ontario companies act to build an electric railway and other public utilities in Ottawa. The company is apparently being formed in connection with a New York syndicate with which negotiations have been in progress for some time for building the line from Morrisburg to Ottawa, 55 miles. Capital stock, $40,000. Headquarters: Ottawa. J. G. Kilt, Citizen's Building, Ottawa, president. [E. R. J., Aug. 8, '14.]

FRANCHISES

Bisbee, Ariz.—W. A. Bradford and associates have asked the Cochise County Supervisors for a franchise through Cochise County from Bisbee to Naco. [E. R. J., Nov. 7, '14.]

Stockton, Cal.—The Stockton Terminal & Eastern Railway has asked the Council for a franchise over Miner Avenue from Union Street to American Street, and for trackage of the north side of the water front in Stockton.

Jacksonville, Fla.—The Jacksonville Traction Company has asked the Council for authority to build the following extensions of its lines: on Spearing Street from Adams Street to Beaver Street, thence along Beaver Street to Fairfield Street; an extension on Albert Street from Florida Avenue east to Fairfield Street; from Enterprise Street north to Tyler Street to Kings road, thence westerly along Kings road to the city limits. The repaving of Main Street from Hogans Creek to Eighth Street with asphaltic concrete is also being considered.

Peoria, Ill.—The Peoria, Canton & Galesburg Railway has asked the Council for an extension of time on its franchise in Peoria.

Sandwich, Ill.—The Aurora & Mendota Electric Railway has asked the Council for a franchise in Sandwich. This railway will connect Aurora and Princeton, via Yorkville, Plano and Sandwich. [E. R. J., Sept. 19, '14.]

Boston, Mass.—The Berkshire Street Railway has asked the Massachusetts Public Service Commission for an extension of time on its franchises in which to build the extensions to North Adams, known as the northern and eastern routes.

Orange, N. J.—Terms which meet the approval of the Orange City Council and the Public Service Railway Company having been settled, the ordinance giving a fifty-year franchise for the extension of the Central Avenue line is now ready for final adoption by the Council.

North Tonawanda, N. Y.—The International Railway has received a franchise from the Council to extend its line from Niagara Falls to Buffalo through North Tonawanda.

Toronto, Ont.—The City Council has authorized Works Commissioner Harris to proceed with the construction of a temporary track on Bloor Street, west from Dundas Street to Quebec Avenue, as he stated it would be impossible to lay a permanent track until Spring. The committee discussed the matter of the operation of a service after the track was completed some six weeks hence. Several of the aldermen thought it should be operated by the city as a separate unit, but on the motion of Alderman McBride the commissioner was directed to negotiate with Manager R. J. Fleming of the Toronto Railway Company, for the operation of the line.

Middletown, Pa.—The Harrisburg Railways has received a franchise from the Council to relocate its line in Middletown. The route of the line will be changed so as to continue out Main Street to Catherine Street and along Catherine Street to Water Street. In completing the loop the line will be extended up Catherine Street from Emaus Street. Plans are being considered to extend this line across Swatara Creek and into Royalton.

Richmond, Va.—The Virginia Railway & Power Company has asked the Council for a thirty-year franchise in lieu of all the various franchises now held by the company.

TRACK AND ROADWAY

Florence & Huntsville Interurban Railway, Florence, Ala.—This company, which was recently incorporated to build a 60-mile electric railway from Florence to Huntsville, has taken over 5 miles of the old Huntsville & Nashville Railroad grade, and the terminal at Huntsville. It has bought material for 10 miles of track and two gasoline cars. Thurston Allen, Florence, is secretary. [E. R. J., Sept. 26, '14.]

Tucson (Ariz.) Rapid Transit Company.—Work has been begun by this company relaying some of its tracks in Tucson with 65-lb. rails bound with steel ties and all laid in a bed of concrete. The paving between the rails and 1 ft. each side of the rails will also be of concrete.

Marin County Electric Railways, Mill Valley, Cal.—This company has filed an amended application with the Railroad Commission of California requesting authority to start construction work at Mill Valley on private funds, pending the sale of the stock and of the receipt of deferred payments on stock already subscribed. The Commission in a previous decision authorized the railway company to begin construction when $35,000 received from the sale of stock has been deposited in Marin County banks. This is part of a plan to build an electric line in Mill Valley and to the Northwestern Pacific Railroad depot and thence to the high school on the Sausalito road. W. Wesley Hicks, 320 Market Street, San Francisco, chief engineer. [E. R. J., Oct. 12, '14.]

San Rafael & San Anselmo Valley Railway, San Rafael, Cal.—An order has been issued by the Railroad Commission of California authorizing this company to return to its stockholders 80 per cent of the money which it has collected. An order authorizing the company to build a line between San Rafael and San Anselmo was made by the commission in November, 1913, together with permission to issue $55,000 par value stock and $45,000 face value of bonds with the provision that the moneys thus secured should be deposited in Marin County banks as trust funds. It was also provided that if the company should fail to deposit $50,000 in one year, the money collected should be repaid to the purchasers with certain deductions for expenses. The total amount collected by the company on the sale of its stock was $4,910. Out of this bills amounting to $1,102 were paid. E. S. Rake, San Rafael, president. [E. R. J., Dec. 20, '13.]

Stockton (Cal.) Electric Railway.—This company is asked to consider plans to extend its tracks down Fourth Street in Stockton.

Shore Line Electric Railway, Saybrook, Conn.—Plans with respect to the proposed extension of this railway from Chester to Middletown have progressed to the point where it is an assured fact that application will be made to the next General Assembly for a charter permitting the construction of this connecting link. A separate company will be incorporated to obtain the charter.

Washington Railway & Light Company, Washington, D. C.—An extension over Portland Street in Washington, from Anacostia to the Firth-Sterling steel plant at Giesboro Point, is being planned by this company.

Miami (Fla.) Traction Company.—Work has been begun by this company at the west approach to the Twelfth Street bridge from where it will be continued westward in Miami. This is part of a plan to build a 3-mile electric railway in Miami. B. B. Tatum, Miami, president. [E. R. J., Oct. 31, '14.]

People's Traction Company, Galesburg, Ill.—An extension of its tracks to the new station in Abingdon is being built by this company. It will place in operation a "Y" which will permit the turning of all cars. Freight and passenger cars will be operated on different tracks after the completion of this work. The company will also raise the track through the town and renew all of the poles.

Southern Illinois & St. Louis Railway, Harrisburg, Ill.—Financial backing has been secured and work will be begun at once by this company at Johnston City on the first section of the line between Johnston City, Frankfort and Benton. When completed the railway will connect the following towns in southern Illinois: Eldorado, Harrisburg, Carrier Mills, Pittsburg, Marion, Spillertown, Whiteash, Johnston City, West Frankfort, Benton and Herrin. W. H. Schott, president. [E. R. J., July 11, '14.]

Pekin, Ill.—Bids are being received by the Council for the construction, rehabilitation and equipment of an electric railway in Pekin. Municipal ownership of this electric line was adopted at the last election, and the city plans to sell bonds, rebuild the present line, and extend it to the city park in Pekin. It is planned to begin work in the spring.

Terre Haute, Indianapolis & Eastern Company, Indianapolis, Ind.—This company has placed in operation its new line to Beallview.

New Albany & French Lick Valley Traction Company, New Albany, Ind.—Those who subscribed about a year ago to the stock of this proposed electric line, assembled recently in Fredericksburg, Ind., and initiated a movement which seeks to revive the project to build the railway. Fredericksburg is on the route of the proposed line 25 miles north of New Albany. The line would reach from New Albany to Paoli, via Mooresville, Galena, Greenville, Palmyra, Fredericksburg, Hardinsburg, Rego and Chambersburg, 40 miles. Promotion of the project has languished since the death of Charles A. Hernley, Newcastle, but tentative plans were made at the meeting referred to to revive the project. [E. R. J., April 4, '14.]

Tri-City Railway, Davenport, Ia.—Work will soon be begun by this company on its Oregon Street extension in Muscatine.

Keokuk, Ia.—Progress on the proposed electric line between Keokuk, Ia., and Jefferson City, via Kahoka, Williamstown, Newark, Shelbyville and Mexico, has taken the form of obtaining signed subscriptions for the project. Substantial bonuses have been subscribed at St. Francisville and Wayland, Mo. H. W. Knight, the promoter, has other public meetings scheduled along the proposed route for the purpose of explaining this proposition. [E. R. J., Oct. 17, '14.]

New Orleans Railway & Light Company, New Orleans, La.—Extensive improvements for its lines in New Orleans are being planned by this company.

Bangor Railway & Electric Company, Bangor, Maine.—Plans are being made by this company to build a new loop through Post-office Square, Harlow Street and Central Street in Bangor.

United Railways & Electric Company, Baltimore, Md.—This company is asked to consider plans to extend its lines from Eastern Avenue and Eighth Street to Eastern Avenue and Fifteenth Street in Baltimore.

Kensington Railway & Sandy Spring Railway, Kensington, Md.—Within the next few weeks this company expects to complete and place in operation a ½-mile extension in Kensington.

Boston, Mass.—Bids desired until Dec. 15 by the Boston Transit Commission, B. Leighton Beal, secretary, Boston, for building Section E, Dorchester Tunnel, located under and near Ft. Point Channel, extending from a point in Summer Street about 200 ft. west of the channel to a point about 80 ft. north of the corner of West Second Street and Dorchester Avenue in South Boston, a distance of about 3200 ft. The tunnel will be of concrete and for a length of about 300 ft. it will consist of two tubes, each tube to be built inside of a circular shield and to have an outside diameter of about 24 ft., the part under the channel to be constructed in compressed air. Specifications and forms of contract can be obtained at 15 Beacon Street, ninth floor.

Minneapolis, St. Paul, Rochester & Dubuque Traction Company, Minneapolis, Minn.—This company has just ordered new steel rails for 18 miles of extensions of its lines.

***Corinth, Miss.**—Financial backing has been secured and preliminary arrangements are being made to build an 80-mile railway between Corinth and Nashville. It has not yet been decided whether the line will be electric, gas-electric or steam. Carl H. Fuller, Corinth, formerly engineer of the Macon Railway & Light Company, Macon, Ga., is investigating the possibilities of this proposed road, in which Allen W. Jones, Bradentown, Fla., and Clopton C. Thomas, Corinth, are interested.

***Plentywood, Mont.**—Plans are being considered to build a 7-mile electric railway to connect Plentywood and Raymond. No names are yet given of those interested in the project.

New York & Queens County Railway, New York, N. Y.—This company is asked to consider plans to extend its line on Flushing Avenue from Ehret Avenue to Jackson Avenue in Flushing.

New York, N. Y.—Bids are desired until Dec. 11 by the Public Service Commission, First District, 154 Nassau Street, New York, for constructing Section 4 of Routes 4 and 36, a part of the Broadway-Fourth Avenue Rapid Transit Railroad in the Borough of Manhattan, consisting of a two, four and six-track underground railroad, extending northerly under Seventh Avenue, from Fifty-first to Fifty-ninth Streets, and easterly under Fifty-ninth Street to a point about 22 ft. west of the westerly building line of Seventh Avenue extended.

Tidewater Power Company, Wilmington, N. C.—The extension on Red Cross Street to the hospital in Wilmington and thence to a point one block from the Oakdale cemetery gate has been placed in operation by this company.

Cushing (Okla.) Traction Company.—Contracts have been awarded and work has been begun by this company on the construction of the 13-mile line from Cushing in an easterly direction to the oil fields. Frank Brown, Independence, president. [E. R. J., Oct. 17, '14.]

Lake Erie & Northern Railway, Brantford, Ont.—The stockholders of this company will vote on Dec. 7 on the authorization of an issue of mortgage bonds.

Toronto, Ont.—The Ontario Railway and Municipal Board has ordered the Toronto Street Railway to put fifty new cars into commission, to complete the Teraulay line to College, and to make a number of improvements to existing rolling stock.

Willamette Valley Southern Railway, Oregon City, Ore.—Grading has been completed and tracklayers are now near the terminus of this line between Oregon City, Beaver Creek, Mulino, Molalla and Mount Angel. It is planned to have this line in operation by Dec. 1. Power will be purchased to operate this line from the new substation of the Portland Railway, Light & Power Company at Beaver Creek. [E. R. J., April 25, '14.]

Corry & Columbus Street Railway, Corry, Pa.—An extension will be built north from Columbus to Clymer, Sherman, Summerdale and Mayville, N. Y., connecting at Mayville with the Chautauqua Traction Company's line to Westfield and for Chautauqua & Jamestown, N. Y., also Chautauqua Lake boats and Pennsylvania Railroad. Surveyors are now on the route.

Slate Belt Electric Street Railway, Pen Argyl, Pa.—Westbrook & Voss, engineers, have laid plans before the directors of this company for the extension of the tracks from Wind Gap Park, through Wind Gap, to Saylorsburg and Lake Poponoming. A new line will have to be built from Saylorsburg to the lake to complete the extension proposed.

Rhode Island Company, Providence, R. I.—Work has been begun by this company relaying its tracks on Westminster Street and on Weybosset Street in Providence. A complete new equipment of rails and bonding will be laid.

Brenham, Tex.—All stock has been subscribed and surveys will be made at once for a route to build an electric line to connect Brenham, Navasota, William Penn and Independence. L. M. Hewitt, Bryan, is interested. [E. R. J., Nov. 7, '14.]

Tennessee & Kentucky Railroad, Nashville, Tenn.—Arrangements are being made by this company to begin work soon on the construction of its 45-mile line between Nashville, Tenn., and Adairville, Ky., via Goodlettsville, White House, Orlinda and Lamont. Nearly all the right-of-way has been secured. Power for operation of this line will be purchased from the Nashville Railway, Light & Power Company, so that the company will not have to build a power plant of its own. Headquarters: 312 Third Avenue, Nashville. Officers: J. P. Helms, president; A. G. Merrit, Jr., vice-president; Paul D. Denton, secretary, and H. L. Sperry, treasurer. [E. R. J., July 25, '14.]

Cleburne (Tex.) Street Railway.—Plans are being made by this company for improvements of its lines in Cleburne.

Beaumonth, Liberty & Houston Traction Company, Houston, Tex.—This company is making surveys for its proposed line between Houston and Beaumont. It is also planned to make preliminary surveys between Houston and Waco, and to begin actual construction work on the Houston-Beaumont line at once. E. Kennedy is president and Charles Fox is chief engineer of the company.

McKinney, Bonham & Paris Interurban Railway, McKinney, Tex.—Right-of-way has been secured and work will soon be begun by this company on its interurban line between McKinney, Bonham, Paris, Blue Ridge and Leonard. L. A. Scott, president. [E. R. J., Oct. 24, '14.]

Danville Traction & Power Company, Danville, Va.—The extension to Cragshead Street in Danville has been completed by this company.

Princeton (W. Va.) Power Company.—Plans are being made by this company to build five new steel bridges on its line between Bluefield and Princeton. [E. R. J., Oct. 24, '14.]

SHOPS AND BUILDINGS

Georgia Railway & Electric Company, Atlanta, Ga.—This company has opened its new frieght station at North Butler Street in Atlanta. This supplants the old freight depot at Walton Street and Fairlie Street. The Atlanta Northern Railway will also use this building for handling its freight in Atlanta.

East St. Louis & Suburban Railway, East St. Louis, Ill.—This company has moved into its new three-story office building on Collinsville Avenue and Main Street in East St. Louis. The East St. Louis Light & Power Company, a subsidiary, will also have its offices in this new structure.

Bangor Railway & Electric Company, Bangor, Maine.—Plans are being made by this company to open a new passenger station in the Graham Building in Bangor.

Columbia Electric Street Railway, Light & Power Company, Columbia, S. C.—One bay of this company's carhouses in Columbia was destroyed by fire on Nov. 10. Nineteen cars were burned.

POWER HOUSES AND SUBSTATIONS

Fresno (Cal.) Interurban Railway.—This company has placed in operation its new substation at Barton Vineyard, which will furnish power for its line between Fresno, Clovis and the Normal School.

Wilmington & Philadelphia Traction Company, Wilmington, Del.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for the following apparatus: two 150-kw, 250-volt, three-phase, sixty-cycle, 1200-r.p.m. compound-wound commutating-pole self-starting rotary converters; two 165-kva, 2400-volt high-tension to rotary volts low tension, three-phase, sixty-cycle, oil-insulated, self-cooled transformers, and one three-panel switchboard to control same.

Sioux City (Ia.) Service Company.—One motor-generator set, 300-kw, 275-volt, d.c. compound-wound commutating-pole generator with one 450-hp, 550-volt, 900-r.p.m. shunt-wound d.c. motor on common base and shaft, and one five-panel switchboard for the above will be installed by this company at its power plant in Sioux City. The order for this apparatus has been placed with the Westinghouse Electric & Manufacturing Company.

South Covington & Cincinnati Street Railway, Covington, Ky.—Contracts have been let by this company for installing two 1500-kw synchronous rotary converters, six kva transformers and other accessories, including two switchboards, in substations.

Richmond Light & Railroad Company, New York, N. Y.—This company has been ordered by the Public Service Commission to install and have ready for operation by March 15, 1915, in its electric plant at Livingston, additional boilers having a capacity of at least 1800-hp; also one auxiliary smokestack and appurtenances; also by May 1, 1915, electrical generating apparatus of at least 6000-kw capacity; and to submit plans by Dec. 15 for the reconstruction of the plant.

Manufactures and Supplies

ROLLING STOCK

Empire United Railways, Syracuse, N. Y., has recently purchased five express cars.

Springfield, Troy & Piqua Railway, Springfield, Ohio, expects to build one freight car.

Toronto (Ont.) Street Railway has been ordered by the Ontario Railway and Municipal Board to put fifty new cars into commission.

Columbia (S. C.) Railway, Gas & Electric Company lost nineteen cars in a fire on Nov. 10, 1914, which destroyed one bay of its car barns.

Florence & Huntsville Interurban Railway, Florence, Ala., a new road, is reported to have ordered two gasoline motor cars and two trailers.

Binghamton (N. Y.) Railway has issued specifications for about twenty cars, including probably ten double-truck and ten single-truck cars.

Westchester Electric Railroad, Mt. Vernon, N. Y., has purchased and placed in operation four of the new Third Avenue type stepless cars equipped with radial axle trucks. The cars are handling the service of the Chester Hill line which runs from Mt. Vernon to Tuckahoe, through Bronxville and Chester Hill.

TRADE NOTES

U. S. Metal & Manufacturing Company, New York, N. Y., has been appointed New England agent for Thayer & Company, New York, who manufacture the Chillingworth seamless gear case.

Wasson Engineering & Supply Company, Milwaukee, Wis., has appointed R. R. Holden as district sales representative for Illinois, Indiana, Ohio, Wisconsin and Michigan. Mr. Holden's headquarters are in the New York Life Building, Chicago.

Jesse Coogan Engineering Company, Salt Lake City, Utah, has received a contract to install the Evans automatic fire sprinklers in the new carhouse of the Utah Light & Railway Company, and another contract to install the Coogan system of hot water heating in the new joint terminal station for the Ogden Rapid Transit Company and the Ogden, Logan & Idaho Railway.

Hall Switch & Signal Company, New York, N. Y., has just elected as president Col. Henry G. Prout, whose resignation as president of the Union Switch & Signal Company was announced in these columns some months ago. Col. Prout was editor of the *Railroad Gazette* from 1887 to 1893. He was a graduate of the University of Minnesota with the degree of C.E. in 1871. He then entered the service of the Khedive of Egypt and was major of engineers and later colonel of general staff in 1873 to 1878 and later governor of the Provinces of the Equator. William P. Hall is now vice-president and chairman of the executive of the Hall Switch & Signal Company. Other changes in the organization which have been announced are as follows: W. J. Gillingham, hitherto Western representative of the company, with office at Chicago, has been appointed general sales manager, with headquarters at the main office in New York City. W. A. Peddle has been appointed acting chief engineer, in charge of engineering and production, and W. H. Lane, chief engineer, has been granted leave of absence until January 1, on account of ill health.

ADVERTISING LITERATURE

G. C. Reiter, Canton, Ohio, has issued a folder describing its motorman's foot gong signal.

Tool Steel Gear & Pinion Company, Cincinnati, Ohio, has issued a catalog which shows several illustrations of gears and pinions which have rendered remarkably long actual service on a number of electric railways.

T. O. Smith Company, Milwaukee, Wis., has issued a folder describing its "Mixerette," the latest addition to its line of non-tilting mixers. This mixer has a capacity of 5 cu. ft. of mixed concrete per batch and will easily produce 45 cu. yd. to 50 cu. yd. per day.

National Scale Company, Chicopee Falls, Mass., has issued folders describing its counting machines, elevating trucks and multi-call, a factory signal system. The company has also issued a testimonial letter from the New York Central lines in regard to its counting machines.

Ohmer Fare Register Company, Dayton, Ohio, has issued a booklet entitled "Know Your Men," which contains a general discussion on fare collecting and includes data on results of this company's fare registering system as practised by the Denver Tramway Company, Southern Pacific Railroad, Portland (Ore.) Railway, Light & Power Company, New York State Railways and Chicago & West Towns Railway.

Joseph Dixon Crucible Company, Jersey City, N. J., has issued a mailing card in the form of a barrel of boiler graphite. This graphite is intended for the reduction of fuel consumption, prevention of scale hardening and for the purpose of giving to the surface of boilers a smooth polish, thus preventing pitting and making the removal of scale easy by a gentle mechanical action.

Auto Utilities Manufacturing Company, Chicago, Ill., has issued a folder describing its Peerless building ventilator, for use on railway shops and power houses. This ventilator is square in design, giving it a great wind-resisting surface at any angle. This surface or face is divided in the center in the form of a V, splitting the wind and forcing it over the corner openings at a great velocity. The vacuum thus formed creates a powerful suction through the corner openings. It is dust and storm proof. It has no parts suspended on braces and no tops to blow off, but is double seamed and interlocked. Another folder issued by this company describes Peerless smoke jacks for electric car stoves. A list is included of 113 electric railways which are using this smoke-jack in connection with Peter Smith heaters.

Electric Railway Equipment Company, Cincinnati, Ohio, has issued Catalog No. 16 describing its iron and steel tubular poles for electric railway and combined lighting and railway service, assembled with its wire-block swedge joints, also its complete line of fittings for iron and steel tubular poles including feeder arms, cross-arm supports, iron pole tops, section collars, wheel guards, bands, steps, and feeder wire insulator pins. The catalog also contains valuable data showing the weights and the sizes of various three-section poles of lengths from 28 ft. to 35 ft., inclusive, as well as the moment of inertia of the iron sections of the bottom ends of the poles, the deflection of the poles under various loads and the maximum safe load that should be applied to the poles. An additional chapter has been inserted in this catalog which supersedes Catalog No. 15, entitled "Selection of Poles," selected from the 1913 report of the A. E. R. A. committee on power distribution. This report is accompanied by very convenient tables for assisting engineers to select the proper size poles to meet local conditions. The tables show the pull on span wires in pounds for various street widths, and also the sag and tension of single and double track trolley span wires.

General Electric Company, Schenectady, N. Y., has issued Bulletin No. 40500 describing a.c. generators for direct connection to reciprocating engines. The object of the bulletin is to illustrate and to describe some of the recent improvements in the alternators equipped by this company for direct connection to steam, oil and gas engines. The construction of the alternator is explained in considerable detail and the bulletin contains data relative to dimensions, capacities, weights, etc., of alternators of this description. Bulletin No. 41500 describes small d.c. and a.c. motors of the drawn-shell type. These are all of fractional horse-power motors which have been specially designed for application to the diversified forms of small machines which may be driven by electric power. These motors range in capacity from 1/30 hp to ¼ hp inclusive, and are furnished for use on circuits of standard voltages. Bulletin No. 44404 describes this company's new line of ventilated commutating-pole motors. This motor has a rated capacity of 88 hp on 600 volts, but owing to the special feature of induced ventilation has a greater service capacity than motors of the closed type having the same hourly rating. The bulletin contains a schedule of speed tables and characteristic curves of the motor.

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FUNCTIONS OF THE A. E. R. A. SECTION

As one reads the reports of the association company section meetings in the "Association News" column of this paper, and especially if he has the good fortune to be an attendant upon the meetings of a section, he cannot but be impressed with the substantial and helpful character of the section movement. When President Allen faced an enthusiastic audience of three hundred or more on a stormy night in Newark last week he stated that the largest number of attendants at a session of the Atlantic City convention was less than three hundred. Obviously an institution which will bring out an audience like this from all parts of the State of New Jersey has something worth while to give its members. The active company section yields, among others, these benefits: It furnishes a medium through which the results of the work of the parent association can be disseminated locally. It furnishes an effective channel for the exercise of individual enthusiasm and initiative. It promotes loyalty to the local company and to the industry. It provides for give-and-take discussion of local problems, and it reduces operating friction, or, to change the figure, it provides a safety valve for the critical spirit. But while section work is good, its development cannot be forced. It depends for its success in any community upon the enterprise of a few individuals, and it must be initiated to meet a real local need. Given the need, together with suitable leadership, however, it will be found everywhere that the thinking class in the railway organization will support section meetings and other co-operative activities.

HELPING THE SIGHTSEER

The sightseeing vehicle is not so common in American cities as it is abroad because of the absence of historical places, remarkable buildings of past ages, art museums and the like. For all that it is doubtful whether American railways take advantage of the sightseeing business that is available. There are not many places in America with the charms of a Quebec or New Orleans, but there are many which for one reason or another do entertain many strangers, whether from day to day or on the occasion of conventions, fairs, etc. If there is enough permanent sightseeing business it can be secured largely for special car transportation at a special rate—say 25 cents to 50 cents for a complete trip with guide. Where a sightseeing car can attract business for many days of the year it will pay the company to build an open-tier car, say like that of Montreal and Quebec, from which the riders can get real snapshot views of the city. Wichita, Kan., at first thought does not suggest a promising place for sightseeing travel. Yet on the occasion of a recent dry-farming congress the Wichita Railroad & Light Company ran a "Seeing Wichita" car twice a day at 25 cents per trip. Furthermore, every employee was decorated with an "Ask Me" badge to encourage the diffident visitor to ask for information. Thus the company not only gained extra revenue but performed a service that was a great convenience to the stranger. Furthermore, the idea of offering every platform man as a guide showed the kind of spirit that leads the local public to feel that its railway system is doing good work to make the town a by-word for enterprising hosptality.

PERMANENT TRAFFIC BUREAUS

Although the traffic bureau, or traffic squad as it has sometimes been called, has been in use in some cities for at least ten years, the general growth of the idea of keeping continuous records of traffic and subjecting the whole service to periodical inspections by specialized observers has been singularly slow. It is true that a comparatively small amount of attention has been devoted to the extent of the possible savings that can be made through the annual expenditure of the several thousand dollars necessary to support a permanent staff of men for this work. However, this does not alter the fact that enormous savings are easily available in many cases. Even at the risk of meeting the "local conditions" argument, it might well be asked why the average schedule speed in one city is satisfactorily maintained at 10 m.p.h., although the speed in another town of about the same size and general character is only 8 m.p.h. In the former case the average car and its crew are performing 25 per cent more effective work than in the second case, and the cost of this work has been estimated to constitute fully half the total cost of operation. Of course, there is a reason for such differences in schedule speed, which might easily make the difference between failure and prosperity, and this reason is just what the traffic bureau is likely to know. If in such a case it was able to point out the real sore spots and to offer a remedy for them it would pay for itself even if none of its members ever did a stroke of work during the rest of their lives. Indeed, it may be safely said that an efficient traffic bureau is about the most inexpensive economy that can be introduced by any street railway of reasonable size, because the opportunities for saving time and money by the real study of traffic are, at once, the most prolific and the most completely neglected ones that can be found today in any of the various departments.

PROBLEMS IN SPECIAL WORK STANDARDIZATION

In a recent editorial we urged the appointment by the Engineering Association of a committee on special work standardization and suggested that it begin with foundations. Following a study of the supporting structure, it appears that the question of standardizing layouts might next be considered. While the association has adopted standard dimensions for right and left-hand switches and mates for 100-ft. and 200-ft. radius curves, the scope of this good work could be enlarged to embrace standard spirals for lead curves, for which the lengths of connecting rails could be prescribed. The final step in this plan of special-work standardization could include the over-all dimensions for 90-deg. frogs, limiting dimensions for all frogs and crossings less than 90 deg. so as to permit the use of but a single joint in each rail between gage lines, and at the same time provide ample spread in the arms to facilitate the application of connections. Pioneer work of this character has been done on several large systems, and its economy is unquestioned.

The standardization of the design and materials employed in the manufacture of frogs, crossings, switches and mates also affords a vast field for constructive study. While the manufacturers have developed the art to a point where each knows the steel or cast-iron section required to meet certain loads, they no doubt would welcome a set of standards for various loadings, so that all could bid for work on the same basis. In the size of the binder casting section to carry certain loads there is a wide range of difference, owing to the diversity in methods of reinforcing or toughening the metal used by different manufacturers. The size of the rolled-rail-arm grip area and the method of preparing the rail to insure a positive bond between it and the casting may be specified by establishing certain minimum limits. These must necessarily vary with the different railway loads and should include a factor of safety to cover maintenance deficiency.

Insert fastenings and settings may also be standardized to a certain extent, including the size and number of bolts or wedges and the method of locking them in position. Regarding the size of the insert, there is not a wide difference of opinion among manufacturers, and, in fact, it is doubtful if many engineers have ever given it consideration. The thickness of the plate and the method of setting and fitting in the casting pocket are all subject to standardization to a limited degree. Gentle approaches to the narrow throatways and gradual changes from tread to flange or to equal flange and tread bearing could be specifically defined. Throatway widths and depths, however, will manifestly vary with the standard wheel flanges.

The foregoing suggestions represent in a general way what subjects could be taken up by a committee inquiring into the subject of special-work standardization. Undoubtedly the results of such a study would be of immeasurable benefit to the industry from the standpoint of economy, and the information collected would be of great intrinsic value.

ELECTRIC RAILWAYS AND PUBLIC LIBRARIES

The communication from K. E. Walker, a librarian of New Haven, Conn., printed in this issue, discloses an ally to the improvement of conditions in electric lines of whose assistance insufficient advantage has been taken in the past. By means of a systematic effort to interest electric railway employees in the reading of technical literature Mr. Walker has secured very satisfactory results. His letter is indicative of what might be called the modern idea of the function of a library—namely, to study the literary needs of its own community and then to endeavor to meet these needs even if traditions must be violated in so doing.

The old-fashioned library was a cloistral place appealing only to the scholar, who moved silently among shelves laden with dust-covered tomes. The modern library possesses a different atmosphere and one more akin to that of a business office, and most of the readers have the appearance of seeking information which will be of assistance in their daily problems rather than abstract knowledge. There is a similar change in the appearance and attitude of the librarian. Formerly he seemed to look on the library as an end in itself and as a "collection" of interesting curiosities; he was willing to let it remain a stagnant literary pool. Now he is an alert specialist, keen to keep a stream of vital, useful knowledge flowing from the library to all parts of the community.

That the local libraries should be useful to an industry as important as the electric railway industry goes without saying, but it may be worth while to restate it for the purpose of raising in the mind of electric railway managers the question whether their own companies are utilizing all of the benefit of which the public libraries in the communities which they serve are capable.

SURPLUS AND CREDIT

One of the criticisms directed against the steam railroads at a recent rate hearing in Washington by the counsel representing the shippers was that some of the companies which petitioned for an increase in rates were earning a surplus in addition to paying dividends. The thought underlying this criticism is a common one and applies as well to rate hearings of electric roads as to those of steam roads. Carried to its logical conclusion, it would mean that no company is justified in asking for an increase in rates except as a means for keeping itself out of bankruptcy. Nevertheless there is a close relation between a surplus and credit which is of vital importance in the financing of any company, even though it may occasionally be overlooked by the short-sighted investor to whom the dividend or interest rate paid on securities seems all-important. The cheapest financing is that which is done with a large margin of safety, and companies should be encouraged to maintain a fair surplus over fixed charges and dividends in order to insure sufficient credit for securities to flow freely to investors.

The price at which a security can be sold depends quite as much upon the margin between the earnings of the company above and beyond that required to pay interest or dividends on the security as upon the rate of interest or dividends actually being paid. The difference between the amount received and that paid out not only provides an opportunity for an increase in dividends later but gives a reserve for contingencies. One electric railway property which we have in mind went as far, for instance, as to spend more than $20,000,000 in twelve years to put its property in excellent physical condition before payment of dividends in 1912. While a property operated under such conditions may not be attractive to those who desire a quick return through stock dividends, it is a much more conservative investment than one dispensing its net income without any thought of future requirements. The ideal situation, of course, is where a railway can pay attractive dividends and still have sufficient surplus for the protection of its corporate interests. We believe that a reasonable margin for such a surplus should be allowed in rate making.

THE RECEPTION OF THE JOB SEEKER

The attitude that a man takes toward the corporation that employs him is determined very largely by the reception he receives when he first applies for a job. If that reception indicates distrust in his integrity and involves a degradation of his rights as a man the employer need feel no surprise later at sullen behavior and worse. Thus the first essential is that the man who guards the gates of employment should be kindly as well as keen. Yet for years one of our largest electric railways retained in its employment bureau an individual who addressed each applicant as follows: "Damn you, weren't you a conductor on the ——— Street line?" Of course, his object was to catch repeaters off their guard, but he offended ninety-nine innocent men to catch the hundredth wrongdoer. To make matters worse, most of the men had been forewarned of this method of attack, so that little good was accomplished any way. Eventually Mr. Brusque was dismissed. To-day, a different practice is followed. After a group of recruits have passed the school tests they are introduced to an assembly of dispatchers and carhouse superintendents, who generally find no trouble in singling out the men who have been in their service before. The plan as carried out involves no humiliation of innocent men and permits few guilty ones to escape. The company could save a little money, however, if the recruits were inspected before going through the course of instruction. This change would not involve much extra inspection because only a comparatively small number of men who have passed the preliminary physical and oral examinations are rejected in the course of the training on the car platform.

Another humiliating experience for the man who seeks a platform job is to be photographed for the company's rogue's gallery. How many men have been deterred from stealing by this practice? and is the number large enough to offset the outraged feelings of the innocent majority? It is doubtful even whether the demand for three or four personal references does any good, since the crook is the very person who can supply as many references as desired. It may do no harm to ask for references, but one inquiry followed up carefully is worth a dozen followed up by mail and is enough to indicate whether the others are genuine. Incidentally this practice will save time, stationery and postage. What every railway needs in its employment bureau is an experienced reader of character who can "tell the mind's construction in the face." Such men when found cost more than bulldozers, but they are worth the difference.

ADOPTING THE UNEARNED INCREMENT

From time to time we hear the moss-grown argument that the location of a carhouse or operating station in a residential district tends to depreciate property values. While this may be true of exclusive residential districts in which a railway company could not afford to locate its stations, the experience of the Cleveland Railway most emphatically controverts this argument as a general proposition. Early in its history it adopted the policy of locating the carhouses at points, first, where they were best suited from an operating standpoint, and second, in residential districts where its trainmen could afford to have their homes. While in many instances the location of the site selected was in an undeveloped district, it was but a few years until the surrounding property was cut up into building lots. Although these carhouses and their surroundings might not appeal to the very esthetic they were kept attractive in appearance and as a result did not detract from the desirability of the surrounding property for residential purposes.

Having demonstrated the fallacy of this fogy idea to its entire satisfaction, the management of the railway proceeded to purchase other sites with areas more than ample for its requirements. As the territory developed and the property enhanced in value, portions of these sites were cut off and sold as lots, and in some instances the company realized from these extra lots more than the cost of the original property. At other points property which now has been outgrown and must be thrown on the market has enhanced in value so that the profit will net 1000 per cent. Although this increase has taken from ten to twenty years, it must be borne in mind that in the meantime the property has been serving the full purpose for which it was intended.

At the present time in seeking new sites for carhouses and repair shops, the management is adhering to this policy. As an added incentive to those seeking locations for high-class homes, the new carhouses are being built of a high standard architecturally, and the surrounding grounds are being parked, paved and kept in a neat and clean condition. Already a number of these new sites have appreciated in value, and there can be no doubt but that this company's policy of adopting the "unearned increment," arising in large part from its own improvement, is an excellent one.

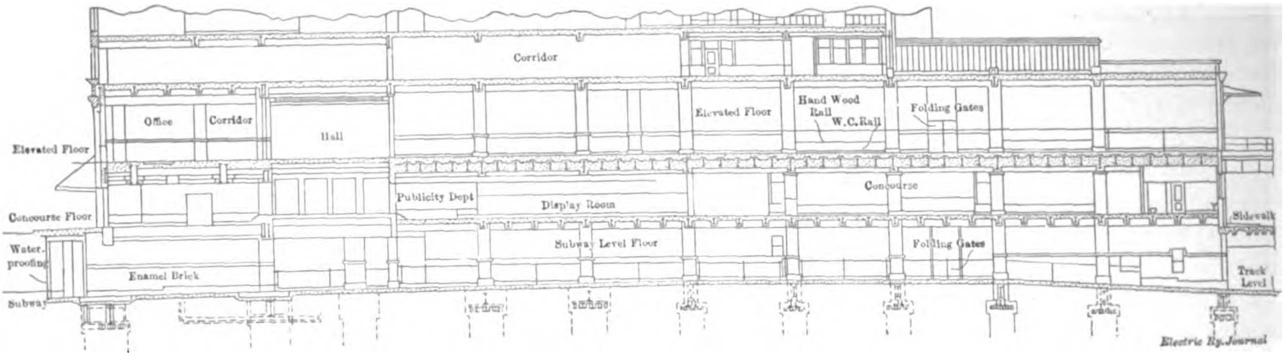
Progress on the Newark Terminal

In His A. E. R. A. Public Service Company Section Paper, Abstracted Below, Martin Schreiber Gives Interesting Facts Regarding the $5,000,000 Terminal Now Under Construction

As mentioned in the issue of the ELECTRIC RAILWAY JOURNAL for Oct. 31, page 1015, Martin Schreiber, engineer of maintenance of way Public Service Railway, gave an illustrated description of the work on the terminal now under construction in Newark at the meeting of the A. E. R. A. Public Service Company section held on Oct. 29. This project was described in a preliminary way in the issue of this paper for Feb. 8, 1913, page 246. The terminal will be a handsome building fronting on Park Place, in the business center of the city. It will be but a step from the intersection of Market and Broad Streets, said to be the second most congested intersection in the country, the maximum rate at which cars are scheduled through it being 532 per hour. As will be remembered from the previous article the new terminal building is a combined terminal for local and interurban cars, and a sales and office building for the several subsidiary companies forming the Public Service Corporation. The terminal tracks are located on a subway or basement floor and on an elevated floor, the ground floor between these being occupied by a concourse and salesrooms.

This terminal project of the Public Service Corporation is unique in the electric railway development of the country, not only on account of its magnitude and the cost involved, but because the operating problems to be solved were diversified and complicated.

Mr. Schreiber outlined the steps which led up to the present plan, which is the indirect outcome of President T. N. McCarter's association tour of 1912. On this trip Mr. McCarter was impressed by the results obtained from electric railway terminals, particularly in the West. In applying the principle to conditions in Newark he devised the two-train-floor plan with the concourse on the ground level between the two train floors. Before it was possible to carry out the plan it was necessary to secure twenty-seven franchises covering subway, overhead, coincident trackage and extensions in the city. On March 16, 1914, the final stamp of approval was placed upon the plans by the Board of Public Utility Commissioners, fourteen months after the scheme was first introduced to the city authorities. Actual construction was begun on June 14, and it will require two years for the completion of the work.



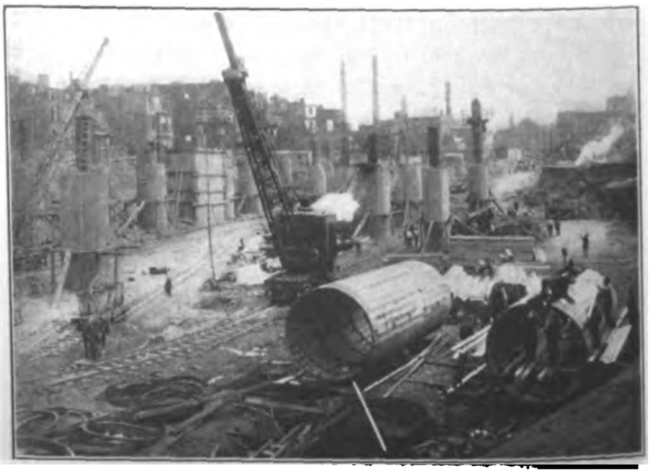
NEWARK TERMINAL—PARTIAL VERTICAL SECTION OF TERMINAL

TRAIN AND CONCOURSE FLOORS IN THE TERMINAL

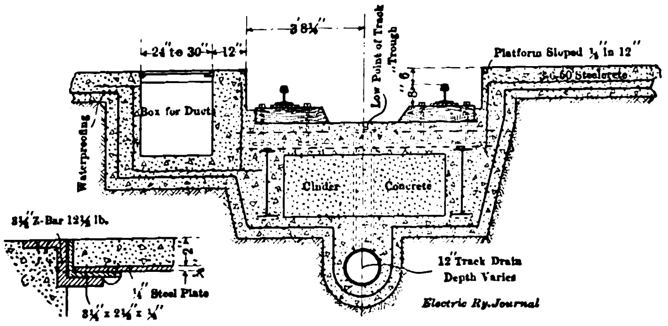
Cars enter the subway floor from a subway located under Halsey and Cedar Streets and crossing under Broad Street, the construction of which is well advanced. The tracks enter the building at an elevation 21 ft. below the curb line. The ingoing track diverges into two unloading tracks, each 280 ft. long on the southerly side. The loading tracks are three in num-

PUBLIC SERVICE

NEWARK TERMINAL—FRONT OF BUILDING ON PARK PLACE



NEWARK TERMINAL—RECENT PROGRESS PHOTOGRAPH


3' 8½"
24" to 30"
12"
Low Point of Track Trough
Platform Sloped ¼" in 12"
3-6-60 Steelcrete
8"
6"
Box for Ducts
Waterproofing
Cinder
Concrete
8¼" Z-Bar 12¼ lb.
2"
½"
¼" Steel Plate
8¼" x 2¼" x ¼"
12" Track Drain
Depth Varies
Electric Ry. Journal

NEWARK TERMINAL—TRACK SECTION AND CONDUIT COVER DETAIL, TERMINAL BASEMENT

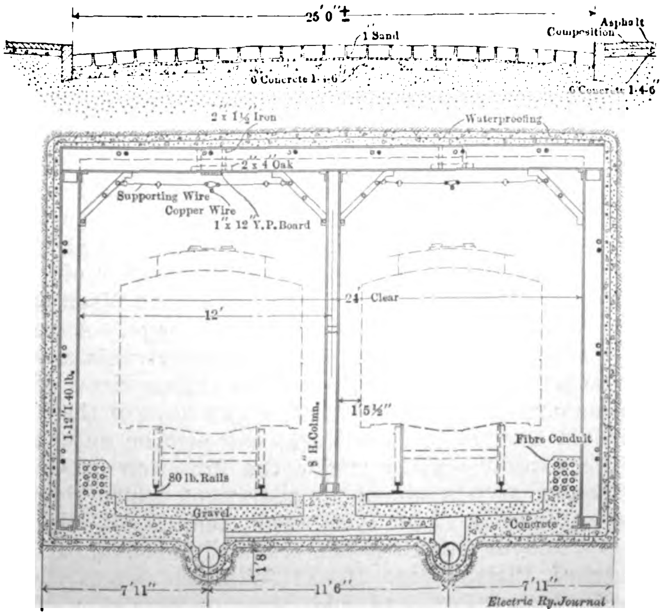
ber, are 225 ft. long, and are located on the northerly side. The total area of the sub-surface terminal is about 104,000 sq. ft. Six stairways for the loading tracks and four for the unloading tracks connect this floor with the concourse above. There is also one stairway on the center platform. On this floor are also spaces for boilers and power plant accessories, building stores, mailing room, etc.

On the elevated train floor are two unloading tracks on the north side, respectively 140 ft. and 170 ft. long, and 190-ft., 180-ft. and 140-ft. unloading tracks on the south side. From the loading platforms there are six stairways leading to the concourse and from the unloading platform there are five stairways. The East Park Street wing on this floor is taken up with coal-conveying machinery for the power plant, and the North Canal Street wing is utilized for division offices and the general employment bureau. The entire area of this train floor is about 70,000 sq. ft.

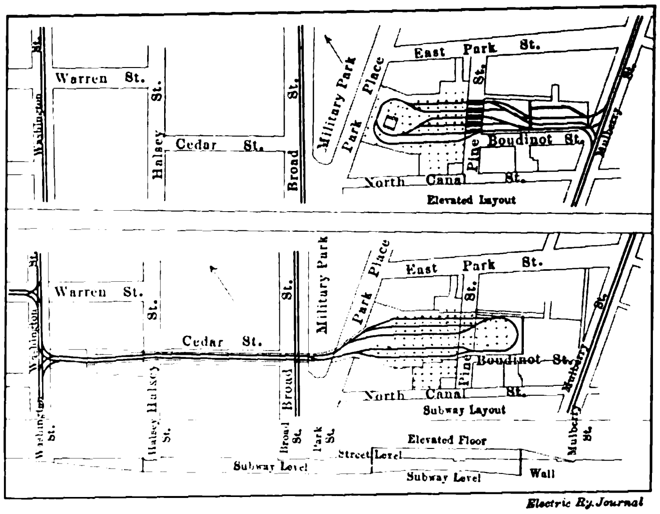
The 70,000 sq. ft. of the concourse floor provide a concourse for the interchange of passengers between the two train floors, salesrooms for the gas and electric companies, waiting rooms, lavatories, booths, etc. On this floor are also the railway school of instruction, the station master's office and the assembly hall checkroom.

THE OFFICE FLOORS

From the third floor up is the office building, each floor of which has an area of about 30,000 sq. ft. The floor is so planned that the wings are but two rooms deep and all offices have outside light and air. The offices of the railway company will be on the sixth floor; the dining rooms for officers and employees on the eighth floor, with kitchen and chef's quarters above; the general assembly room, in which the A. E. R. A. company section and other meetings will be held, on the fourth floor, and the technical library on the seventh floor.


25' 0" ±
1" Sand
Asphalt Composition
6" Concrete 1-4-6
6" Concrete 1-4-6
2 x 1½ Iron
Waterproofing
2 x 4 Oak
Supporting Wire
Copper Wire
1" x 12" Y.P. Board
24' Clear
12'
1' 5½"
1-12" I-40 lb.
8" H. Colmn.
Fibre Conduit
80 lb. Rails
Gravel
Concrete
1' 8"
7' 11"
11' 6"
7' 11"
Electric Ry. Journal

NEWARK TERMINAL—CROSS-SECTION OF SUBWAY


East Park St.
Warren St.
Washington St.
Halsey St.
Cedar St.
Broad St.
Military Park
Park Place
Pine St.
Boudinot St.
North Canal St.
Mulberry St.
Elevated Layout
Subway Layout
Elevated Floor
Street Level
Subway Level
Subway Level
Wall
Electric Ry. Journal

NEWARK TERMINAL—TRACK LAYOUT ON SUBWAY AND ELEVATED TRAIN FLOORS

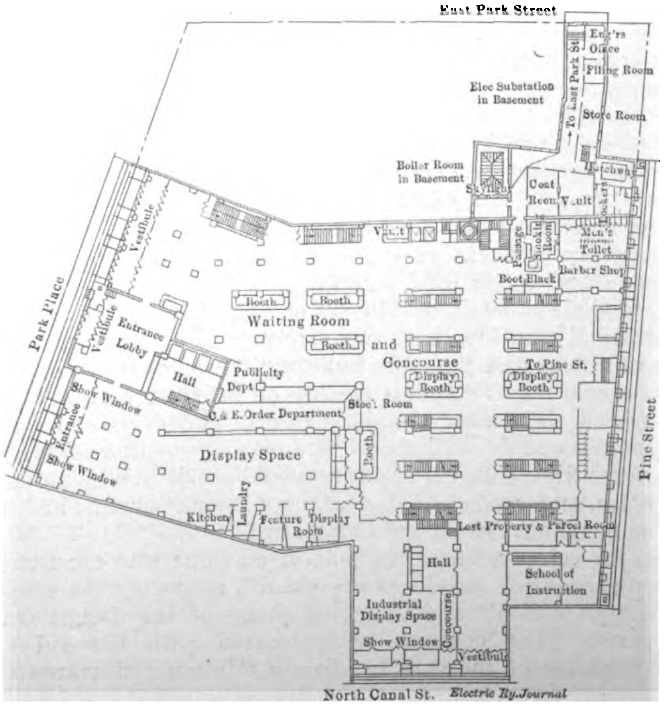
GENERAL FEATURES OF THE BUILDING AND SITE

The complete floor space will be 451,000 sq. ft. and the building will contain a total of 394 rooms, of which 235 are working rooms and the remainder are general utility rooms. The site contains about three acres, and adjoining real estate has been purchased so that if the neighboring canal is electrified in the future a connection can be made into the terminal.

The excavation necessary is about 100,000 cu. yd., and 92,000 cu. yd. of concrete, 460,000 sq. ft. of waterproofing, 44 miles of conduit and piping and 9000 tons of steel will be required.

TRACK CONSTRUCTION

The subway track construction outside of the building will consist of 80-lb. T-rail, with Bonzano joints, laid on concrete ties on 2-ft. centers, with 6 in. of ballast.

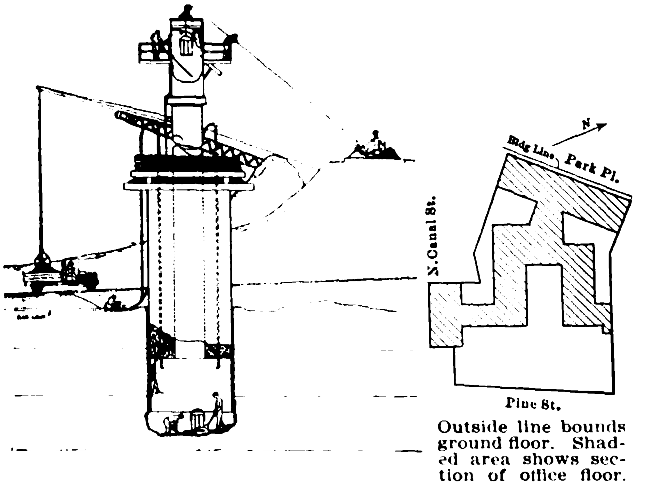

East Park Street
Eng'rs Office
Filing Room
To East Park St.
Elec Substation in Basement
Store Room
Boiler Room in Basement
Skylight
Coat Room
Vault
Hatchway
Lockers
Vault
Passage
Smoking Room
Men's Toilet
Barber Shop
Boot Black
Vestibule
Vestibule
Entrance Lobby
Booth
Booth
Waiting Room
Booth
and
Concourse
Park Place
Hall
Publicity Dept
Display Booth
Display Booth
To Pine St.
Show Window
C. & E. Order Department
Stock Room
Entrance
Show Window
Display Space
Booth
Pine Street
Kitchen
Laundry
Feature Display Room
Lost Property & Parcel Room
Hall
School of Instruction
Industrial Display Space
Concourse
Show Window
Vestibule
North Canal St.
Electric Ry. Journal

NEWARK TERMINAL—PLAN OF CONCOURSE FLOOR

On the elevated and subway floors in the terminal 90-lb., 7-in. T-rail will be used. This will be fastened to short ties with screw spikes and anchored to concrete, as shown in an accompanying illustration. The rails will rest upon special tie plates equipped with 1-in. cowhair felt. All curves and special work will be of solid manganese construction and this, as well as the other track, will be exposed for convenience in making renewals. The track will be well drained, as shown, to take care of water from cars or platforms, being located well below the latter, which is crowned to shed water into the track spaces.

DESIGN AND OPERATING PROBLEMS

Mr. Schreiber outlined many of the unusual problems involved in the terminal undertaking. These covered all branches of the engineering profession, so that a special staff had to be organized to handle them. An assistant engineer was assigned to supervise the work under the engineer of maintenance of way. A corps comprising an architect, a foundation engineer, a structural engineer, a heating and ventilating engineer and an electrical engineer was organized. Jacobs & Davis, of New York, were retained as consulting engineers, and George B. Post & Sons, of New York, as consulting architects.



Outside line bounds ground floor. Shaded area shows section of office floor.

NEWARK TERMINAL — DIAGRAMMATIC CROSS-SECTION OF CAISSON; FLOOR SECTION DIAGRAM

As the foundations were of unusual importance in a building which must carry loaded cars on an elevated floor without producing serious vibration, the character of the soil was carefully studied in advance. In the borings, sand and clay were encountered at 4 ft., sand and fine stone at 18 ft., fine sand at 21 ft., fine moist sand and water level at 26 ft., quicksand at 35 ft. and red shale in horizontal layers at 53 2/3 ft. After considering a plan involving separate sets of columns for the train floor and the office building, it was abandoned and a single set of columns resting on bedrock, with a well-braced, deep floor system for train platforms and concourse, was decided upon. The reasons for this selection were: first, that heavy floors would assist in eliminating noise, and, second, that clearances among columns had to be provided for the cars on train floors.

An eccentric arrangement of columns was necessary on account of the clearance feature, rendering the whole design difficult and dictating many of the design features. The columns were located with the aid of templates of the cars to allow a minimum clearance of 1 ft.

The arrangement of stairways was made with a view to enabling passengers to use the proper ones in reaching the cars desired so that no crossing of tracks on train floors will be necessary. The climb from the concourse floor to the elevated train floor will be 17 ft. and that from the subway floor to the concourse floor will be 18 ft., the subway floor track being crowned to minimize climbing. These heights compare favorably with 32 ft. in the Hudson River tube at Fulton Street, New York; 30 ft. at the 180th Street elevated station, New York; 58 ft. from subway train platform to bridge platform at Brooklyn Bridge, New York; 36 ft. at Ninety-ninth Street elevated station, New York; 44 ft. from the Pennsylvania Railroad train platform to the street, New York terminal; 43 ft. from the subway platform to the street, Long Island Railroad, New York terminal.

The general layout of the terminal was designed to care for 400 cars per hour, or say 50,000 persons going in both directions, doubling the capacity for handling passengers in the business district of Newark.

Safety in Street Railway Work

Dr. W. H. Tolman, director of the American Museum of Safety, discussed the topic of "Safety as Applied to Street Railway Work" at a meeting of the New England Street Railway Club on Nov. 19. A large number of lantern slides were shown.

According to Dr. Tolman, a new figure has appeared in the industrial field—the safety engineer—whose work lies in the direction of reducing accidents in industrial, manufacturing and transportation enterprises. A museum of safety has been in existence in New York for some time, and one has recently been established in Boston by the Massachusetts Industrial Accident Board. From such a museum safety men can go forth to explain safety methods to manufacturers and workers. An important feature of this campaign is in the public schools, and in New York, Brooklyn and Buffalo more than 500,000 children have been reached in this way. Excellent work has also been done by the Public Service Railway, New Jersey, which is now beginning its fourth year of educational work.

An address on safety work was also presented by Dr. Tolman at a meeting on Nov. 10 of the Hudson & Manhattan Railroad Athletic Association. President Fisk was also a speaker at this meeting.

The Pennsylvania System's Exhibit at the Panama-Pacific Exposition

The Pennsylvania System exhibit at Chicago was historical; at St. Louis scientific; at the Panama-Pacific International Exposition in 1915 the exhibit will be practical and popular and will serve to bring before the eyes of the thousands of people a true educational picture of density of population, traffic and industry served by the Pennsylvania System. The exhibit will consist of models of New York City and surroundings, with the Pennsylvania System from the Mississippi River to the Atlantic Ocean and from Duluth to Norfolk; and two railroad stations, the Union Station at Washington and the proposed Union Station at Chicago. A unique motion picture auditorium of two Pennsylvania all-steel passenger coaches, wherein will be shown views of various journeys from the Western gateways of the Pennsylvania System to New York, will also be on exhibit.

The exhibit will be under the direction of George D. Dixon, vice-president in charge of traffic Pennsylvania Lines East of Pittsburgh, and D. T. McCabe, vice-president in charge of traffic Pennsylvania Lines West of Pittsburgh. H. T. Wilkins, special agent traffic department, has had direct supervision of the preparation of the exhibit and he will also supervise its installation and display.

Meeting of Central Electric Railway Association

The Autumn Meeting Which Was Held in Fort Wayne on Nov. 19-20, Was Reported in Part in Last Week's Issue—An Account of the Proceedings at the Second Day's Session Is Published, Together with Papers on Oxy-Acetylene Welding and on Interurban Headlights

In last week's issue of the ELECTRIC RAILWAY JOURNAL an account of the first sessions of the Fort Wayne meeting of the Central Electric Railway Association was published, and the last session held on Friday, Nov. 20, is reported in the following paragraphs. The meeting on Friday opened with President Schneider in the chair and more than eighty members in attendance. At a business session which was held prior to taking up the regular program, the association was informed that several boat lines operating on the lakes out of Cleveland, Ohio, had requested joint rates with the electric lines touching lake points. Upon motion, W. S. Whitney, general freight and passenger agent, Ohio Electric Railway, John F. Keys, general passenger agent, Detroit United Railway and President Schneider were appointed a committee to investigate the desirability of granting the request.

Following the transaction of business the regular program was opened with a paper by J. F. Layng, engineer of the General Electric Company, entitled "Selection of Railway Equipment." This was published in abstract in the Nov. 21 issue. W. E. Rolston, electrical engineer Chicago, Lake Shore & South Bend Railway, opened the discussion with an inquiry regarding the economical motor load factor. In response Mr. Layng stated that there were too many variables to permit its determination. He said that one must assume the worst condition on any line or any system and select a motor of sufficient capacity to do the work. To determine the worst condition, however, actual tests should be made to obtain best results. After these data are obtained the railway company's engineer should not include a factor of safety because all manufacturers take this into consideration in selecting a design to meet the conditions presented. If the safety factor is not included the first cost is materially decreased without affecting maintenance.

In reply to another inquiry Mr. Layng stated that the motor mounting shown in Figs. 5, 6, 7 and 8 of the diagram accompanying his paper, were not recommended by the manufacturers, but represented methods of mounting in actual service. This diagram was published on page 1159 of the ELECTRIC RAILWAY JOURNAL for Nov. 21. G. H. Kelsay, superintendent of power, Union Traction Company of Indiana, inquired regarding the current consumption of the motor mountings shown in Figs. 2, 3 and 4 as compared with that shown in Fig. 12 of the same diagram. In response Mr. Layng stated that the power saving obtained by the use of maximum traction trucks for two-motor equipments as compared with standard trucks was practically negligible. The efficiency of modern motors varied from 84 per cent to 88 per cent under full load, and there was little to be gained by the slight change in size necessary when a two-motor equipment was used instead of a four-motor equipment. The factor governing the selection of motor equipment should be wheel slippage rather than motor efficiency. The combined gear efficiency of a four-motor equipment also enters and tests have indicated that it is about the same as that for a two-motor equipment. On long-haul interurban lines wheel slippage was negligible. In referring again to the question of load factor, Mr. Layng stated that better economy could be obtained with a greater range of speed points in the control equipment.

R. N. Hemming, superintendent of motive power, Union Traction Company of Indiana, raised the question of whether it was more economical in train operation to mount motors on trail cars or to increase the size of the motor-car equipments, and Mr. Layng replied that the maximum economy would be obtained with trailers operated without motors. In explanation, he stated that in either case it would be necessary to have practically the same control equipment on both cars and that the application of motors to trail cars was purely a problem to be decided by the question of weight. It was also necessary to consider the question of dead mileage in operation. He suggested that the trailer weight could be further reduced by equipping them only with air brakes connected by train line to a compressor on the motor car. He stated also that motors which were suitable for trailer operation were also good for local service, and that this was a point deserving of serious consideration, since it was almost impossible to divorce local and limited service on most interurban lines. In view of this condition electrical equipment must be so selected as to be flexible enough to meet any operating condition. Following the discussion Mr. Layng exhibited some lantern slides showing the historical development of railway motors.

J. W. Esterline, president and general manager of the Esterline Company, next read a paper entitled "Interurban Headlights." This appears elsewhere in abstract form. Following his comprehensive treatment of this subject, the speaker stated that he had collected data to determine the cost of operating arc lamps and had found in a test of 5000 samples that the average power consumption for 4-amp, 550-volt lamps had been 2.25 kw per arc for a six-hour period. Figuring the difference in the cost of this energy as compared with that consumed by 100-watt incandescent lamps, he found that it represented 6 per cent on an investment of $6,000,000. The cost of maintaining incandescent headlights amounted to little more than the cost of replacing bulbs. To obtain the maximum life, however, it was necessary to select a lamp voltage which would conform to the maximum trolley voltage condition.

In reply to an inquiry regarding the fog penetrating qualities of the "Golden Glow" headlamp, the speaker stated that it was entirely due to the rate of vibration of the rays. The blue and violet rays, representing those with a high rate of vibration, were absorbed during foggy or rainy weather, while those of a longer wave length were not turned back. The question of short and long lengths of light waves was analogous to the short and long lengths of sound waves. For example, extremely high-pitched whistles did not carry as far as low-pitched whistles.

Mr. Hemming, of the Union Traction Company of Indiana, then spoke of the relative advantages of mounting headlamps on the hood or on the dash. Among other things he stated that it was costing his road approximately $8.10 per lamp per year for maintenance. In a recent test he found that he could see slightly farther with the headlamp in the hood than he could with it mounted on the dash. He also stated that he believed it was easier on the motorman's eyes to look under the rays of a lamp mounted in the hood than through the rays of a lamp mounted on the dash.

In discussing some of these points Mr. Esterline stated that the problem was purely one of eye efficiency and that it alone should determine the location of the lamp. It was also important that tests of this kind be made by continuous observation rather than by an observer whose eyes had not accustomed themselves to the conditions under which a motorman must operate his car at night. It was also brought out that the length of vision depended both on the reflector and the tilting of the lens. By reference to a diagram it was shown that eye efficiency increased with the angle of reflection, hence this in a way might account for the better results obtained by mounting the headlamps in the hood rather than on the dash.

H. S. Smith, engineer of the Prest-O-Lite Company, next read a paper entitled "Oxy-acetylene Welding." This paper appears below in abstract form. Various points relating to the application of this method of welding were brought out by Messrs. Cochran of the Ohio Electric Railway, and Hemming, Mitchell and Kelsay of the Union Traction Company of Indiana. It was stated that bonds with 2½-in. terminals were welded to the rail in three and one-half minutes, with a total labor cost of 10 cents. It was stated that the successful accomplishment of track welding and repairs was simply a question of determining the nature of filling-in material which would give the best result. Mr. Mitchell stated that he believed there was a good field for an iron bond or welded joint which would replace the present method of bonding. Mr. Cochran emphasized the fact that the bonding question was a very important one at this time, since copper bonds were costing approximately 40 cents per pound. If scrap copper could be used for this purpose instead of new, it would afford a means of making considerable saving. Following this discussion President Schneider announced that the annual meeting of the association would be held in Indianapolis, Feb. 25 and 26, 1915, the place of meeting to be decided upon by the committee having the convention arrangements in charge.

OXY-ACETYLENE WELDING

BY H. S. SMITH, THE PREST-O-LITE COMPANY, INDIANAPOLIS, IND.

Apart from the vital question of cost it is generally conceded that fusion produced by the burning of gases is preferable, for the purpose of welding, to the electric process. This is true over a wide range of work for the following reasons: When welding with the electric arc, an intense heat is concentrated at a single point, whereas with gas welding the heat of the flame can be brought at will to bear on the work surrounding the part to be welded, making it possible gradually to attain the desired welding heat. With electric-arc welding the light produced is so intense that the use of very dark glasses by the operator is imperative. This in itself makes for uncertain results, because the operator cannot see his work clearly. Again, unsteadiness on the part of the workman may cause an arc to be struck unintentionally, resulting in fusion or addition of metal where it is not desired. The electric arc is formed at the expense of atmospheric oxygen, and this indicates the possibility of chemical changes of an oxidizing character taking place in the molten metal, whereas with the gas process the welded part is always protected from the atmospheric oxygen by a shield of the products of combustion. Electric welding is suitable for filling in or welding comparatively simple parts but it cannot be used for complicated work, as is the case with the gas process. Probably the chief objection to electric welding is the fact that it is almost impossible to perform any subsequent treatment of the welded part. This is quite simple with the gas process, where the area surrounding the weld and the weld itself can be gradually annealed, thus removing internal strains and taking from the welded portion its hard and brittle character. Please do not understand me as being severely critical of the electric process. Electric welding has a large field wherein it can be employed advantageously and with better results than can be obtained with other methods of welding.

Experience with the oxy-acetylene welding process has shown that best results are arrived at when acetylene is delivered at the burner under pressure. In order to do this it is necessary to employ pressure generators, which have some serious objections, or to employ acetylene in dissolved form. In some cases the injector type of blowpipe is used. This enables acetylene to be supplied from generators which generate under low pressure, using excess pressure on the oxygen supply to provide power to suck in the acetylene and deliver the mixture of gas to the blowpipe nozzle at a suitable pressure. One volume of acetylene (C_2H_2) requires, theoretically, 2.5 volumes of oxygen to burn it to carbon dioxide and steam, but in actual practice it is found that, when both gases are delivered to the blowpipe under pressure, only 1.1 volumes of oxygen are required for each volume of acetylene. Injector-type blowpipes require 1.3 volumes to 1.5 volumes of oxygen to one of acetylene.

Acetylene, on issuing from the nozzle of a blowpipe into the flame, immediately splits up into its two constituents, carbon and hydrogen. The carbon burns with the oxygen supplied through the blowpipe to form carbon monoxide. It is this combustion that produces the white cone of the flame. The carbon monoxide later, in the close vicinity of the white cone, burns to carbon dioxide. The hydrogen contained in the acetylene cannot combine with oxygen at or in close vicinity to the white-cone flame, as the temperature at that point is about 6300 deg. Fahr. This is far beyond the dissociation temperature of steam, which is about 4000 deg. Consequently, the hydrogen passes away and only combines with the oxygen of the air after it has passed away from the hot part of the welding flame. The result is a zone of more or less free hydrogen surrounding the welding flame, and this is highly advantageous, as it tends to confine the heat and prevent oxidation of the metal.

For commercial purposes oxygen is manufactured either by what is known as the liquid-air process or the electrolytic process and it can be obtained comparatively pure from either class of plant. Any impurity in oxygen manufactured by the liquid air process is mainly nitrogen, and, while freedom from nitrogen is desirable, a slight percentage is not fatal to good welding of iron or steel. However, should the percentage of the nitrogen impurity exceed 1½ per cent the welds are apt to be porous, because of the absorption of the nitrogen by the molten metal. The purest possible oxygen should be procured for welding aluminum, copper or brass, as at high temperatures these metals have strong affinity for nitrogen. In the case of oxygen manufactured by the electrolytic process the only impurity will be hydrogen. Excess hydrogen will tend to reduce the flame temperature, but oxygen manufactured by this process is, as a rule, in a comparatively pure state.

Acetylene as employed for welding purposes to-day can be generated by the user at or near his shops by treating calcium carbide with water, or it can be procured in cylinders in the form of dissolved acetylene. At 30-lb. pressure and over acetylene in its free state is explosive. Between 15-lb. and 30-lb. pressure its action is somewhat uncertain. Therefore where users desire to have acetylene under pressure it is probably best to use dissolved acetylene. This is washed, dried and purified acetylene gas compressed into ordinary steel bottles or cylinders that have been previously filled with some porous substance, such as asbestos or charcoal, which is then saturated with acetone. Acetone is a liquid hydrocarbon that has the peculiar property of absorbing acetylene, and an acetone cylinder of 2 cu. ft. capacity will hold 20 cu. ft. of acetylene at 1-atmosphere pressure or 300 cu. ft. at 15-atmospheres pressure.

The strength of a weld made by the oxy-acetylene process is, as a rule, less than that of the original metal. A claim of 100 per cent weld strength is unsupportable. Practice has shown that for thin sheets up to say 3/16 in. in thickness, one can get a weld strength of 95 per cent, but that this figure falls to 85 per cent for 1-in. plates. However, where welding has to be carried out, there is generally no objection to adding a fillet of metal along the joint or using high-grade filling-in metal. In such cases the welded joint can be made to equal or exceed the strength of the rest of the work.

In order to insure successful results it is necessary that the work be carefully prepared before welding. The parts to be welded must be free from rust and grease. Sections over ⅛ in. in thickness must be beveled before welding. For thick work beveling from both sides is advantageous if feasible. Whenever welding is performed, internal strains are invariably set up in the metal due to expansion and contraction, and, in the case of cast iron, the tendency to crack will be greatly increased if the cooling of the metal after fusion is rapid or irregular. In all cases care should be taken in the selection of the proper size of blowpipe tip to be used on any particular job. As large a blowpipe tip as is possible should be used so that the metal is kept in the molten state as short a time as possible.

With those unacquainted with the process, the welding of cast iron appears to be more difficult to accomplish than work on steel or wrought iron, but such is not the case. Since it is generally necessary to work a weld in cast iron, it is indispensable that the line of welding should be constituted of the soft gray iron that contains graphitic carbon. Slow cooling or reheating after the welding is completed tends to bring about the precipitation of graphitic carbon and the production of a softer material. It is found that by employing silicon in the filling rod in the form of ferro-silicon, the iron combines with the silicon in preference to the carbon, allowing the carbon to take the form of graphite and thus facilitate the formation of gray iron. The presence of manganese has exactly the opposite effect. In order to get good workable welds there must be slow cooling after the welding is completed. The filling rod must contain a percentage of silicon, and there must be no manganese present.

The welding point of ordinary cast iron is lower than that of iron or mild steel and lower than the melting point of iron oxide; therefore, if any oxides are formed during the welding process they cannot be melted and blown away by the flame, as is the case where iron or steel is fused. Therefore, when welding cast iron, it is necessary to employ some flux to break down any oxides that are formed.

For cutting metals a special blowpipe is provided consisting of any oxy-acetylene blowpipe fitted with a central or following jet for oxygen only. The work that has to be cut is first heated up by means of the oxy-acetylene jet, and, as soon as it is raised to a temperature at which oxygen will ignite it, the separate oxygen jet is turned on and the metal at once burns away very rapidly. The oxygen simply has sufficient pressure behind it to blow away the oxide as it is formed, with the result that a clean, narrow cut can be made through plates up to 12 in. in thickness and over. The speed at which this work can be done is high, varying from 100 ft. per hour for metal ¼ in. thick to 12 ft. per hour for metal 12 in. thick, the oxygen consumed in this process varying from 0.50 cu. ft. per lineal foot run in ¼-in. plates to 50 cu. ft. in 12-in. plates. As an instance of the use to which the oxygen cutting tool can be put I might mention the cutting off of the heads of bolts and rivets which hold the coupler anchorage between the steel sills of 80,000-lb. capacity freight cars. The job usually takes three men ten hours. One man with a cutting torch can do it in forty-five minutes.

There is another important application of oxy-acetylene in the electric railway field, and this is the welding of copper bonds and rails. The Twin City Rapid Transit Company employs a twin cable bond with cast terminals, and it is claimed that a gang of three men can weld seventy-five of these bonds per day. The gas consumption is 2 ft. of acetylene and approximately 2 ft. of oxygen per bond. It has been suggested that the copper of the bond is oxidized when this process of applying it is adopted, but practice has shown that this is not the case if the weld is properly and rapidly made, special attention being taken to see that the welding flame is a neutral one. The oxy-acetylene blowpipe can also be employed for reapplying the solder type of bonds which have come loose.

INTERURBAN HEADLIGHTS

BY J. W. ESTERLINE, THE ESTERLINE COMPANY, INDIANAPOLIS

We have in our experience in the headlight business found a great many men who are inclined to judge the qualities of a headlight by its intrinsic brilliancy. The more blinding, dazzling and the more powerful its appearance at night, without any reference to its effect upon visibility and the efficiency of the eye, the better the headlight is believed to be, and many of our laws have been based upon a similar conception of the question of illumination.

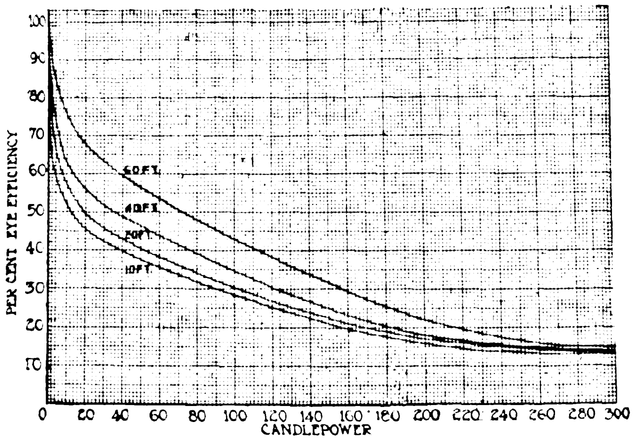
When we look at the human eye we see through the clear, transparent cornea a circular colored portion, the iris. In the center of the iris is an opening, the pupil. This opening has the property of enlarging itself or contracting, according to the amount of light striking the eye. Thus, when we pass from a dark room into a brilliantly-lighted room, the pupil almost instantly contracts. It is significant that the contraction in passing from darkness into bright light is accomplished almost instantly, whereas the enlargement in passing from bright light into darkness is accomplished comparatively slowly.

Close behind the pupil in the human eye lies the crystalline lens, whose function is, of course, similar to that of a lens in a camera. There is, however, this important difference in operation. The clearness of the image formed by the lens of a camera is maintained, whether the object is far or near, by changing the distance between the lens and the ground glass, or sensitized plate. Obviously, in the human eye such changes cannot be made. The clear focus of near or distant objects is therefore accomplished by changes in the curvature of the crystalline lens. Around the outside of the lens runs a ligament, and this ligament is attached to the ciliary muscle. By contraction or relaxation of the ciliary muscle a greater or lesser curvature of the lens is accomplished.

The crystalline lens is non-achromatic. When light having rays of all colors, as in the case of white light, is reflected from the object to the eye, the blue and violet rays are brought to a focus in front of the retina, and the red rays directed toward an imaginary focus behind the retina. The red, blue and violet rays serve, therefore, to blur the otherwise sharp image formed by the yellow rays on the retina.

Now, when the object is illuminated by monochromatic light, that is, by a light of a single color, the rays are brought to a sharp focus on the retina, and there is no blurring effect. In other words, the non-achromatic lens can adapt itself to any one color of light, but in the presence of light of all colors, combined in approximately the proportion of white light, it adapts itself to the yellow rays.

Research has conclusively established that monochromatic light enables detail to be distinctly seen at a lower intensity of illumination than when the object is viewed by white light. It has also been established that different colors of monochromatic light vary in their power to disclose detail. The power of disclosing maximum detail with minimum illumination seems to be possessed by a yellowish-green color, and we can see more distinctly with the same light, or equally distinctly with less illumination, if that light be of a greenish-yellow color.



CURVES SHOWING RELATION BETWEEN EYE EFFICIENCY AND CANDLE-POWER OF LIGHT AT VARIOUS DISTANCES

In considering the question of headlights, it must be borne in mind that the human eye when constantly subjected to an intense white light reflected from the road quickly loses its efficiency. In other words, the brilliancy of the light itself reflected back into the eye of the motorman soon lowers the efficiency of the eye to a point where the ability to see is less than it would be if the light were less brilliant. The lowering of the eye efficiency depends upon the total amount of light which enters the eye, and upon the angle with the line of vision at which each integral portion of light enters the eye.

The curves in the accompanying cut show the relation between the efficiency of the human eye and the intensity of light entering the eye along the line of vision. It will be observed that a very small intensity of light entering the eye along the line of vision materially cuts down the efficiency of the eye. When the intensity of the beam reaches 300 cp the efficiency has been tremendously reduced. These curves show clearly why, when a beam of several thousand candle-power shines directly into the eye, it is impossible for the driver of a car to see anything in his path, since an increase of from 20 cp even to 300 cp in the beam of light entering the eye lowers the efficiency from 70 per cent to 12 per cent. The curves also show that the efficiency of the eye is very little affected by the distance of the light source or light reflecting object from the eye.

Dr. C. P. Steinmetz has said: "The light which enters the eye is converted into heat, and if its power is considerable, it may be harmful or even destructive, causing inflammation or burns. This harmful effect is, assuming the same amount of visibility, greatest for those frequencies of light which have the lowest visibility or highest power equivalent. Hence, green and yellowish-green lights are the least harmful, the least irritating to the eye, as they represent the least power." The United States bureau of standards also recommends a yellow light as causing the least fatigue. The American Railway Master Mechanics' Association's committee on headlights reported that there was no apparent difference in the ability to see dummies with a given intensity of light, whether the source was oil, acetylene or incandescent lamps. However, with an arc lamp having 60,000 apparent beam candle-power, a dark dummy could be seen only 557 ft. away, but calculating from the visibility curve for oil, acetylene and incandescent lamps, the dummy should have been seen at the same distance with an apparent beam candle-power of only about 14,000. This effect could be attributed only to the predominance of short violet waves in the arc rays to which the eye did not readily respond.

In the type of headlight manufactured by the company with which the writer is associated, non-blinding effect and increased visuality is secured by altering the quality of the light given by the incandescent lamp, and by this means the coloring and irritating effects are greatly reduced without appreciably altering the illuminating qualities.

The colored glass lens that is used subtracts from the beam of light given by the incandescent bulb all of the rays above the green, i.e., the violet and the blue, and passes all of those colors below it, so that while the light given by the filament of the lamp itself is a brilliant white, the beam of light from the headlight is a greenish-yellow. Because of the fact that a beam of light from this type of lamp is soft, mellow and free from glare, it does not, at first sight, impress one as being as powerful as the striking, brilliant, dazzling rays from an arc lamp, but riding behind the lamp one is soon impressed with the detail with which objects can be observed, the entire freedom from tiring of the eyes, due to the quality and the steadiness of the light.

With a polished glass mirror reflector and a lamp of 100 watts burned at normal efficiency, these headlights enable the observer to distinguish ordinary objects at a distance of from 900 ft. to 1200 ft. without difficulty, whereas, objects of a light color, such as poles, station markers and persons in light clothing, can be seen from 1200 ft. to 1500 ft. On account of the variation of the intensity of the light with the voltage, the best results are obtained by operating the lamp with other tungsten bulbs. However, quite a number of roads maintaining a fairly uniform trolley voltage, say from 450 to 600, are using these headlights in series with resistances.

When operated in series with the tungsten lamps in the car, with the headlight bulb burning at normal intensity at normal trolley voltage, the operation of the headlight is very satisfactory even with fluctuating trolley voltages, and on numerous occasions tests have shown that it continues to give light at voltages at which arc lamps refuse to operate. On the steadiness of the light from an incandescent headlight little need be said, as the variation in illumination is limited to the fluctuation caused by the changes in trolley voltage, and there is entire absence of the constant flickering and shifting of the light, so common in an arc lamp.

In this type of headlight an incandescent lamp with a spherical bulb and a concentrated type of filament is used, since only that part of the filament at the focal center of the parabola is effective in producing the beam, the average life of this type of bulb when burned continuously at normal voltage being from 450 hours to 500 hours. The life is greatly increased with a slight reduction in voltage, and it is, therefore, important that the lamp is not burned above its normal rating.

Safety on Illinois Railways

Members of the Illinois Electric Railways Association Describe Their Methods

At the meeting of the Illinois Electric Railways Association held at the Auditorium Hotel, Chicago, Nov. 21, with President B. I. Budd in the chair, John Mallon, assistant general superintendent of transportation Chicago Elevated Railways, gave an illustrated talk on the safety and first-aid methods employed by his company. The speaker showed a number of lantern slides which are exhibited at the meetings of employees to illustrate the right and wrong ways of performing routine duties, following which a set of slides, designed to show the public how to avoid accidents, also was exhibited. He stated that Dr. H. A. Fisher, the company's surgeon, has a special squad of five trainmen who give demonstrations of first-aid work at points on the Chicago elevated system. They devote special instruction to local squads in each division so that, in turn, these squads may become proficient and themselves disseminate first-aid information. To encourage employees' interest in the "safety first" movement buttons are distributed among them, a monthly bulletin is issued giving safety hints and the men are called together at monthly meetings, when pictures are shown bearing on their work and offering suggestions for greater safety to themselves and to the public. First-aid boxes have been located about the elevated system where they may be reached readily in case of accidents.

In the discussion of "safety first" methods, which followed Mr. Mallon's talk, J. R. Blackhall, general manager Chicago & Joliet Electric Railway, Joliet, Ill., described his local campaign, in which "safety first" moving-picture films were exhibited at local theaters. With the co-operation of the superintendent various schools were closed, and the railway provided free transportation for the children to the center of the city where the picture shows are given. A number of interesting letters of appreciation have been received from members of these youthful audiences. Blotters bearing "safety first" advice also were distributed in the schools and business houses, and suggestions for the prevention of accidents were set forth in letters to local business men and to all owners of automobiles.

H. B. Adams, claim agent Aurora, Elgin & Chicago Railroad, said that about 80 per cent of all accidents were due to carelessness on the part of the employees or the public, while for the remaining 20 per cent the company was to blame. Mr. Adams described his campaign, in which he made "safety first" talks to school children, college students and members of local clubs. The net result of this was a reduction of about 50 per cent in the number of accidents. He also laid particular stress upon the value of interesting the children and in getting them to spread among their elders the maxim "Get on with the right hand; get off with the left."

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B. I. Budd, president Chicago Elevated Railways, declared that while it is easy to start "safety first" systems, the difficulty lies in following them up and getting the results which are so essential. He recommended the practice of giving credit for meritorious acts, although he cited an instance to show that unless care is taken this practice can be abused.

Marshall P. Sampsell, president Central Illinois Traction Company, Mattoon, Ill., stated that the safety department of a utility is one of the most important divisions of its work, and he urged that, if necessary to make retrenchments, other work be curtailed or dispensed with before that of the safety department. Mr. Sampsell recommended the appointment of a special safety agent to be responsible directly to the president of the corporation and urged that the latter official give due attention to the human side involved in the suggestions of his safety inspector.

E. J. Blair, electrical engineer Chicago Elevated Railways, described the attention being paid to the proper lighting of railroad yards by steam railroad companies. He suggested that this topic be considered thoroughly by the electric railways, which, better than any other utilities perhaps, are equipped to provide their yard facilities with cheap and efficient illumination.

Just before adjourning the meeting President Budd called attention to the work of scrap experts who are now engaged in campaigns among electric railways for the more advantageous disposal of scrap and refuse material. Analyses of the methods of collection and sale of scrap, said Mr. Budd, show that this material, extremely valuable in the aggregate, has been handled loosely and sold too cheaply. Owing to the incompleteness of the classification given it, the prices received fall far short of those which should be obtained. During present business conditions, President Budd urged a closer attention to the disposal of scrap material. Following the session the regular association luncheon was held in a room adjoining the convention hall. About fifty delegates were present at the meeting.

The trustees of the Rockefeller Foundation have decided to inaugurate an extensive investigation into the problem of industrial relations, and have secured the services of W. L. Mackenzie King, C. M. G., former Minister of Labor for Canada, as director of the investigation.

Meeting of American Railway Association

Proceedings and Reports of Committees at the Autumn Session in Chicago

The autumn session of the American Railway Association was held at the Blackstone Hotel, Chicago, Ill., on Wednesday, Nov. 18. There were present 210 members, represented by 180 delegates. At the opening of the meeting the executive committee reported that its attention had been called to the use of illuminated electric signs on the rear of passenger trains, and in connection therewith the committee adopted the following resolution: "The American Railway Association disapproves of the use of electric illuminated signs on the rear of passenger trains, by reason of the effect they have of concealing the essential indications of the standard marker signals and also because they absorb the light of other signals and have a tendency to divert the attention of the employees, whose duty it is to observe the signals which are essential in railway operation."

CHANGES IN STANDARD TIME OPPOSED

The committee on standard time presented a report covering its consideration of this subject, and resolutions were adopted by the association to the effect that it was the sense of the American Railway Association that the uniform standard time system, which had been in force since 1883, had proved its practicability and utility, and should be maintained in its integrity, and no essential departure should be made therefrom; and that when any proposition should be made for a change in the standard time of the whole or any part of a railway line a member of the American Railway Association the subject should be referred to the executive committee for consideration; and that the American Railway Association urged upon the roads which had recently adopted eastern time in place of central time that they return to the use of the uniform standard at the earliest practicable date.

The committee on transportation reported that it had now practically completed the revision of the standard code of train rules for single and double track, rules governing the movement of trains with the current of traffic on two or more tracks by means of block signals, rules governing the movement of trains against the current of traffic on two or more tracks by means of block signals, and additional rules for three or more tracks. Before presenting this to the association for adoption, however, it desired to give each member an opportunity to examine and formally to submit its criticism of the rules. As a result of the suggestions which it hoped to receive in reply, the committee expected to be able to present a complete report to the association at the session in May, 1915.

STANDARD FREIGHT-CAR DIMENSIONS

The committee on maintenance announced the result of the letter ballot, ordered at the previous session of the association, relative to the standard inside dimensions of box cars, as follows: (1) That the present standard inside dimensions of box cars, as adopted by the association on October 23, 1901, viz., 36 ft. in length, 8 ft. 6 in. in width and 8 ft. in height, should be adhered to, except in the construction of special equipment, such as automobile cars; (2) That special equipment should not exceed the inside dimensions of 40 ft. 6 in. in length, 8 ft. 6 in. in width and 9 ft. in height, with maximum outside dimensions of 9 ft. 2 in. in width at 13 ft. above the top of the rail; (3) That the Master Car Builders' Association be requested at the earliest practicable moment to design and adopt a standard frame for closed cars in accordance with the present standard inside dimensions of box cars.

Although a majority of the memberships of the association voted in favor of the three resolutions, the number of freight cars represented by such memberships was less than two-thirds of the freight cars owned and controlled by the members of the association. The resolutions therefore were not adopted.

The committee also presented a summary and compilation of data collected of clearances for switch stands, signal stands, platforms, platform shelters, mail cranes, water columns, coal chutes, water tanks, etc., and advised that the subject has been referred to the American Railway Engineering Association for its consideration and recommendation. The committee also included in its report a summary of the number of freight cars, passenger cars and locomotives reported equipped with safety appliances as required by the United States Safety Appliance Standards, July 1, 1914, as follows:

	Total Number in Service	Fully Equipped with Safety Appliances
Freight cars	2,510,214	1,204,454
Passenger cars	56,980	52,470
Locomotives	66,853	63,687

The joint committee on automatic train stops reported that since the adoption of the requisites of installation for automatic train control, approved by the association on May 20, 1914, no stop device that had been thoroughly and practically tested and had been demonstrated to comply therewith had come to the notice of the joint committee.

COMMITTEE ON ELECTRICAL WORKING

The committee on electrical working reported that the diagram of third-rail working-conductor clearances adopted by the association in May, 1912, had been under consideration by the sub-committee in joint session with sub-committees of the American Railway Engineering Association and American Electric Railway Engineering Association, with the view of establishing limiting rolling equipment clearances in the space close to the track rail, for permanent way structures or for other devices such as automatic train stops. These sub-committees had carefully investigated the question, and compiled information received from 183 railway companies as to existing encroachments of rolling equipment within the space under consideration. They had concluded that the third-rail clearance diagram could be extended towards the track rail without materially affecting interchange equipment. A recommendation was therefore adopted by the Association to revise the present standard, to provide for the prolongation of the line *EE-FE* of the standard diagram horizontally to within 6 in. of the gage line of the track. This provision would allow devices attached to the permanent way to project 2½ in. above the top of the track rail in the space between a point 19¾ in. distant from the gage line to a point 6 in. distant.

The committee also reported that it would now be desirable to provide for an extension of the "designing line," which in the diagram ended at a point 18¼ in. from the gage line 6½ in. above the top of the rail, to some point, say 7 in. from the gage line. However, the committee was unable at the present time to fix definitely the location of this extension. The matter had, therefore, been referred to the sub-committee for investigation and report at the next meeting of the association. Reference was made by the committee to its report of April 21, 1913, which covers four diagrams for overhead clearances and adds a fifth diagram for minimum clearances required for direct-current overhead-contact rails, where these are installed under permanent way structures. On the recommendation of the committee the association accepted these as recommended practice.

The committee reported further that in the spring of 1912 the association adopted, as recommended practice, specifications for overhead crossings of electric light and power lines. These specifications were subsequently adopted by the American Railway Engineering Association, the American Electric Railway Engineering Association, the National Electric Light Association and the American Institute of Electrical Engineers. The American Electric Railway Engineering Association in 1913 adopted a specification differing in some respects from the foregoing. This amended specification had been the subject of consideration by the sub-committee in conference with similar committees of the other associations, in order to effect the adoption of a standard specification by all bodies interested. Their joint report recommended the adoption of the American Electric Railway Engineering Association specification. As the committee indorsed this recommendation and the adoption of the new specification the association adopted the same as recommended practice.

The committee advised that the consideration of overhead crossings for telegraph and telephone lines had been referred to a sub-committee, which had been in conference with similar committees of the American Railway Engineering Association and the American Electric Railway Engineering Association. The sub-committee recommended the adoption of the telephone, telegraph and signal wire crossing specification prepared by the Association of Railway Telegraph Superintendents, with the exception of one paragraph relating to the minimum clearance of poles from railway tracks. The side clearance specified by the telegraph superintendents was not considered sufficient by the sub-committee, and it was recommended that the minimum clearance of poles be made to conform to that established for the transmission line crossing structures. The committee stated that this specification was intended to cover only cases where crossings of telegraph, telephone and other wires were over rights-of-way, and not for cases where it was desirable or necessary (especially where lines are to be electrified) to carry these crossings under tracks by insulated wire cables. It was considered of first importance to fix the conditions of safety for supporting structures and wires over rights-of-way. In the case of underground cable work, which in many cases, if not generally, was the preferred method of providing for low-tension wire crossings, the conditions presented were not of such immediate importance to the railways as in the case of overhead crossings. The specification which the committee offered had not been definitely acted upon by the engineering associations, but the committee thought it desirable to place on record at this time the essentials of a matter which was of immediate and increasing importance to the railroad companies, and the committee, therefore, offered the specifications for adoption as recommended practice of the association. The association took action accordingly.

The sub-committees appointed by the committee for further investigation of continued subjects were as follows: On third-rail working conductors and on overhead working conductor clearances—A. S. Baldwin, chief engineer Illinois Central Railroad Company; J. H. Davis, electrical engineer Baltimore & Ohio Railroad Company; E. B. Katté, chief engineer electric traction New York Central & Hudson River Railroad Company. As representatives of the committee on the national joint committee on specifications for wire and cable crossings—E. B. Katté, chief engineer electric traction New York Central & Hudson River Railroad Company, and J. H. Davis, electrical engineer Baltimore & Ohio Railroad Company.

USE OF JOINT INSPECTION BUREAUS RECOMMENDED

On the recommendation of the committee on relations between railroads a national form of weight agreement was approved. This covered in detail methods of light-weighing and marking freight cars. The committee reported that it had been advised that in official classification territory a uniform charge had been adopted of $2 for cars reconsigned en route and $5 on cars reconsigned at destination and that it understood that similar action was contemplated in other parts of the country. The committee also called attention to the joint interchange and inspection bureaus now in successful operation and recommended the extension of this plan to all important interchange points. Upon recommendation of the committee Rule 7 of the national code of car demurrage rules was amended in regard to demurrage charges on refrigerator cars.

In conclusion the association decided to hold its next meeting in Atlantic City on May 19, 1915.

Final Meetings of Railway Commissioners

Evils of Trespassing Discussed — Officers Elected — Next Meeting in San Francisco

A number of the papers and reports presented during the early sessions of the convention of the Association of Railway Commissioners were published in the issue of last week. The principal report of electric railway interest presented during the concluding sessions was that of the committee on grade crossings and trespassing of railroads. This report is signed by Commissioners Glasgow, Harlowe, Yates and Elmquist.

It states first that upon examining the reports compiled by different states on the subject the committee finds a great variation in method of tabulating these statistics, and it recommends the adoption of uniformity. It says the question of grade separation is becoming more important every year owing to the increased number of motorcycles and automobiles driven by people who have little regard for safety devices or for their own safety. The committee considers that no form of crossing protection equals the separation of grades, but recognizes that this solution is not applicable in all cases, not only on account of the expense involved but also because of the varying conditions obtaining in different cities and states. In some the topography of the country is such as to permit the separation of grades with little difficulty and at moderate expense. In others the contrary is the case. Nevertheless the committee believes that where conditions at all justify the separation of grade it should be effected. For the same reason it is impossible to suggest a uniform law on the subject, but it recommends that the different states should take up the matter and empower the commission of the state to install such protection as the conditions demand.

The committee presented some statistics in regard to trespassers killed and injured in the different states during the past three years. Owing to differences in the fiscal year it was impossible to obtain absolutely accurate figures, but those given are approximate. The totals showed that the number of passengers killed in 1911 were 3888; in 1912, 4208; in 1913, 4354. These figures show that the loss of life is increasing every year and that it equals in number that of passengers and employees combined.

The report points out that the "trespassers" were not the irresponsible people commonly referred to as tramps and hoboes, but were made up of farmers and

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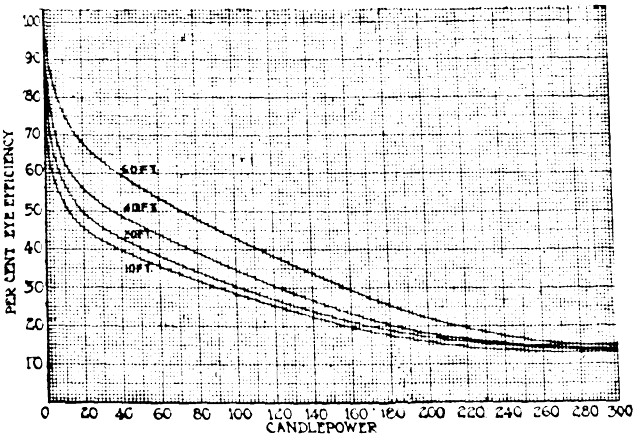

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F. E. Fisher, general superintendent Chicago, Ottawa & Peoria Railway, explained that the safety crusade must reach all branches of electric railway operations, and introduced W. F. Carr, his engineer of maintenance of way and of overhead construction, who furnished a number of safety hints. The public must be systematically educated, said Mr. Carr, and while advertising and printed text matter are effective, the most valuable instruction will be that given individually by employees; in the same way regulations contained in the book of rules are likely to be found not effective unless discussed and the points at issue emphasized. All accidents occurring on the Chicago, Ottawa & Peoria Railway are listed and described in detail for record. A merit and demerit system is also maintained, by which the meritorious acts and deeds of thoughtfulness in accident prevention are rewarded, while carelessness is correspondingly penalized. Mr. Carr advised against the policy of discharging men who have made mistakes, for, he declared, a serious accident for which a man is to blame leaves an indelible impression upon his mind and makes him a more careful and thoughtful operative in the future. If, on the other hand, the man is discharged, his place must be given to a new man, and it is possible that the lesson of safety may have to be learned all over again.

B. I. Budd, president Chicago Elevated Railways, declared that while it is easy to start "safety first" systems, the difficulty lies in following them up and getting the results which are so essential. He recommended the practice of giving credit for meritorious acts, although he cited an instance to show that unless care is taken this practice can be abused.

Marshall P. Sampsell, president Central Illinois Traction Company, Mattoon, Ill., stated that the safety department of a utility is one of the most important divisions of its work, and he urged that, if necessary to make retrenchments, other work be curtailed or dispensed with before that of the safety department. Mr. Sampsell recommended the appointment of a special safety agent to be responsible directly to the president of the corporation and urged that the latter official give due attention to the human side involved in the suggestions of his safety inspector.

E. J. Blair, electrical engineer Chicago Elevated Railways, described the attention being paid to the proper lighting of railroad yards by steam railroad companies. He suggested that this topic be considered thoroughly by the electric railways, which, better than any other utilities perhaps, are equipped to provide their yard facilities with cheap and efficient illumination.

Just before adjourning the meeting President Budd called attention to the work of scrap experts who are now engaged in campaigns among electric railways for the more advantageous disposal of scrap and refuse material. Analyses of the methods of collection and sale of scrap, said Mr. Budd, show that this material, extremely valuable in the aggregate, has been handled loosely and sold too cheaply. Owing to the incompleteness of the classification given it, the prices received fall far short of those which should be obtained. During present business conditions, President Budd urged a closer attention to the disposal of scrap material. Following the session the regular association luncheon was held in a room adjoining the convention hall. About fifty delegates were present at the meeting.

The trustees of the Rockefeller Foundation have decided to inaugurate an extensive investigation into the problem of industrial relations, and have secured the services of W. L. Mackenzie King, C. M. G., former Minister of Labor for Canada, as director of the investigation.

Meeting of American Railway Association

Proceedings and Reports of Committees at the Autumn Session in Chicago

The autumn session of the American Railway Association was held at the Blackstone Hotel, Chicago, Ill., on Wednesday, Nov. 18. There were present 210 members, represented by 180 delegates. At the opening of the meeting the executive committee reported that its attention had been called to the use of illuminated electric signs on the rear of passenger trains, and in connection therewith the committee adopted the following resolution: "The American Railway Association disapproves of the use of electric illuminated signs on the rear of passenger trains, by reason of the effect they have of concealing the essential indications of the standard marker signals and also because they absorb the light of other signals and have a tendency to divert the attention of the employees, whose duty it is to observe the signals which are essential in railway operation."

CHANGES IN STANDARD TIME OPPOSED

The committee on standard time presented a report covering its consideration of this subject, and resolutions were adopted by the association to the effect that it was the sense of the American Railway Association that the uniform standard time system, which had been in force since 1883, had proved its practicability and utility, and should be maintained in its integrity, and no essential departure should be made therefrom; and that when any proposition should be made for a change in the standard time of the whole or any part of a railway line a member of the American Railway Association the subject should be referred to the executive committee for consideration; and that the American Railway Association urged upon the roads which had recently adopted eastern time in place of central time that they return to the use of the uniform standard at the earliest practicable date.

The committee on transportation reported that it had now practically completed the revision of the standard code of train rules for single and double track, rules governing the movement of trains with the current of traffic on two or more tracks by means of block signals, rules governing the movement of trains against the current of traffic on two or more tracks by means of block signals, and additional rules for three or more tracks. Before presenting this to the association for adoption, however, it desired to give each member an opportunity to examine and formally to submit its criticism of the rules. As a result of the suggestions which it hoped to receive in reply, the committee expected to be able to present a complete report to the association at the session in May, 1915.

STANDARD FREIGHT-CAR DIMENSIONS

The committee on maintenance announced the result of the letter ballot, ordered at the previous session of the association, relative to the standard inside dimensions of box cars, as follows: (1) That the present standard inside dimensions of box cars, as adopted by the association on October 23, 1901, viz., 36 ft. in length, 8 ft. 6 in. in width and 8 ft. in height, should be adhered to, except in the construction of special equipment, such as automobile cars; (2) That special equipment should not exceed the inside dimensions of 40 ft. 6 in. in length, 8 ft. 6 in. in width and 9 ft. in height, with maximum outside dimensions of 9 ft. 2 in. in width at 13 ft. above the top of the rail; (3) That the Master Car Builders' Association be requested at the earliest practicable moment to design and adopt a standard frame for closed cars in accordance with the present standard inside dimensions of box cars.

Although a majority of the memberships of the association voted in favor of the three resolutions, the number of freight cars represented by such memberships was less than two-thirds of the freight cars owned and controlled by the members of the association. The resolutions therefore were not adopted.

The committee also presented a summary and compilation of data collected of clearances for switch stands, signal stands, platforms, platform shelters, mail cranes, water columns, coal chutes, water tanks, etc., and advised that the subject has been referred to the American Railway Engineering Association for its consideration and recommendation. The committee also included in its report a summary of the number of freight cars, passenger cars and locomotives reported equipped with safety appliances as required by the United States Safety Appliance Standards, July 1, 1914, as follows:

	Total Number in Service	Fully Equipped with Safety Appliances
Freight cars	2,510,214	1,204,454
Passenger cars	56,980	52,470
Locomotives	66,853	63,687

The joint committee on automatic train stops reported that since the adoption of the requisites of installation for automatic train control, approved by the association on May 20, 1914, no stop device that had been thoroughly and practically tested and had been demonstrated to comply therewith had come to the notice of the joint committee.

COMMITTEE ON ELECTRICAL WORKING

The committee on electrical working reported that the diagram of third-rail working-conductor clearances adopted by the association in May, 1912, had been under consideration by the sub-committee in joint session with sub-committees of the American Railway Engineering Association and American Electric Railway Engineering Association, with the view of establishing limiting rolling equipment clearances in the space close to the track rail, for permanent way structures or for other devices such as automatic train stops. These sub-committees had carefully investigated the question, and compiled information received from 183 railway companies as to existing encroachments of rolling equipment within the space under consideration. They had concluded that the third-rail clearance diagram could be extended towards the track rail without materially affecting interchange equipment. A recommendation was therefore adopted by the Association to revise the present standard, to provide for the prolongation of the line *EE-FE* of the standard diagram horizontally to within 6 in. of the gage line of the track. This provision would allow devices attached to the permanent way to project 2½ in. above the top of the track rail in the space between a point 19¾ in. distant from the gage line to a point 6 in. distant.

The committee also reported that it would now be desirable to provide for an extension of the "designing line," which in the diagram ended at a point 18¼ in. from the gage line 6½ in. above the top of the rail, to some point, say 7 in. from the gage line. However, the committee was unable at the present time to fix definitely the location of this extension. The matter had, therefore, been referred to the sub-committee for investigation and report at the next meeting of the association. Reference was made by the committee to its report of April 21, 1913, which covers four diagrams for overhead clearances and adds a fifth diagram for minimum clearances required for direct-current overhead-contact rails, where these are installed under permanent way structures. On the recommendation of the committee the association accepted these as recommended practice.

The committee reported further that in the spring of 1912 the association adopted, as recommended practice, specifications for overhead crossings of electric light and power lines. These specifications were subsequently adopted by the American Railway Engineering Association, the American Electric Railway Engineering Association, the National Electric Light Association and the American Institute of Electrical Engineers. The American Electric Railway Engineering Association in 1913 adopted a specification differing in some respects from the foregoing. This amended specification had been the subject of consideration by the sub-committee in conference with similar committees of the other associations, in order to effect the adoption of a standard specification by all bodies interested. Their joint report recommended the adoption of the American Electric Railway Engineering Association specification. As the committee indorsed this recommendation and the adoption of the new specification the association adopted the same as recommended practice.

The committee advised that the consideration of overhead crossings for telegraph and telephone lines had been referred to a sub-committee, which had been in conference with similar committees of the American Railway Engineering Association and the American Electric Railway Engineering Association. The sub-committee recommended the adoption of the telephone, telegraph and signal wire crossing specification prepared by the Association of Railway Telegraph Superintendents, with the exception of one paragraph relating to the minimum clearance of poles from railway tracks. The side clearance specified by the telegraph superintendents was not considered sufficient by the sub-committee, and it was recommended that the minimum clearance of poles be made to conform to that established for the transmission line crossing structures. The committee stated that this specification was intended to cover only cases where crossings of telegraph, telephone and other wires were over rights-of-way, and not for cases where it was desirable or necessary (especially where lines are to be electrified) to carry these crossings under tracks by insulated wire cables. It was considered of first importance to fix the conditions of safety for supporting structures and wires over rights-of-way. In the case of underground cable work, which in many cases, if not generally, was the preferred method of providing for low-tension wire crossings, the conditions presented were not of such immediate importance to the railways as in the case of overhead crossings. The specification which the committee offered had not been definitely acted upon by the engineering associations, but the committee thought it desirable to place on record at this time the essentials of a matter which was of immediate and increasing importance to the railroad companies, and the committee, therefore, offered the specifications for adoption as recommended practice of the association. The association took action accordingly.

The sub-committees appointed by the committee for further investigation of continued subjects were as follows: On third-rail working conductors and on overhead working conductor clearances—A. S. Baldwin, chief engineer Illinois Central Railroad Company; J. H. Davis, electrical engineer Baltimore & Ohio Railroad Company; E. B. Katté, chief engineer electric traction New York Central & Hudson River Railroad Company. As representatives of the committee on the national joint committee on specifications for wire and cable crossings—E. B. Katté, chief engineer electric traction New York Central & Hudson River Railroad Company, and J. H. Davis, electrical engineer Baltimore & Ohio Railroad Company.

USE OF JOINT INSPECTION BUREAUS RECOMMENDED

On the recommendation of the committee on relations between railroads a national form of weight agreement was approved. This covered in detail methods of light-weighing and marking freight cars. The committee reported that it had been advised that in official classification territory a uniform charge had been adopted of $2 for cars reconsigned en route and $5 on cars reconsigned at destination and that it understood that similar action was contemplated in other parts of the country. The committee also called attention to the joint interchange and inspection bureaus now in successful operation and recommended the extension of this plan to all important interchange points. Upon recommendation of the committee Rule 7 of the national code of car demurrage rules was amended in regard to demurrage charges on refrigerator cars.

In conclusion the association decided to hold its next meeting in Atlantic City on May 19, 1915.

Final Meetings of Railway Commissioners

Evils of Trespassing Discussed — Officers Elected — Next Meeting in San Francisco

A number of the papers and reports presented during the early sessions of the convention of the Association of Railway Commissioners were published in the issue of last week. The principal report of electric railway interest presented during the concluding sessions was that of the committee on grade crossings and trespassing of railroads. This report is signed by Commissioners Glasgow, Harlowe, Yates and Elmquist.

It states first that upon examining the reports compiled by different states on the subject the committee finds a great variation in method of tabulating these statistics, and it recommends the adoption of uniformity. It says the question of grade separation is becoming more important every year owing to the increased number of motorcycles and automobiles driven by people who have little regard for safety devices or for their own safety. The committee considers that no form of crossing protection equals the separation of grades, but recognizes that this solution is not applicable in all cases, not only on account of the expense involved but also because of the varying conditions obtaining in different cities and states. In some the topography of the country is such as to permit the separation of grades with little difficulty and at moderate expense. In others the contrary is the case. Nevertheless the committee believes that where conditions at all justify the separation of grade it should be effected. For the same reason it is impossible to suggest a uniform law on the subject, but it recommends that the different states should take up the matter and empower the commission of the state to install such protection as the conditions demand.

The committee presented some statistics in regard to trespassers killed and injured in the different states during the past three years. Owing to differences in the fiscal year it was impossible to obtain absolutely accurate figures, but those given are approximate. The totals showed that the number of passengers killed in 1911 were 3888; in 1912, 4208; in 1913, 4354. These figures show that the loss of life is increasing every year and that it equals in number that of passengers and employees combined.

The report points out that the "trespassers" were not the irresponsible people commonly referred to as tramps and hoboes, but were made up of farmers and laborers in the country and mechanics, business men and women and children in the cities. It says that in no other country are pedestrians permitted to make such common use of the railway right-of-way, and believes that this use could be greatly curtailed by demanding punishment of the violators of the law. The greatest hindrance in the past to enforcement of the law has been the unwillingness of the justices before whom the violators of the law are brought to treat the matter seriously. This can be corrected only by education and the building up of public sentiment.

The report also calls attention to the danger of diagonal crossings because of the apparent inability of the average driver of a vehicle properly to measure the distance to be traveled in making such a crossing or to gage the speed of the approaching train. It recommends that the commissioners receive authority to abolish such crossings and construct right-angle crossings, the expense to be apportioned between the railroad and the city, village or township. A proposed bill for punishment of trespassing was included in the report.

Three reports scheduled on the program were not presented, namely: "Powers, Duties and Work of Railway Commissioners"; "Railway Capitalization," and "Safety Appliances."

The following officers were elected by the commissioners for the ensuing year:

President, Clifford Thorne, of Iowa; first vice-president, Robert R. Prentiss, of Virginia; second vice-president, Max Thelan, of California; secretary, William H. Connolly, Washington, D. C., assistant secretary, James B. Walker, of New York.

San Francisco, Cal., was chosen as the meeting place for the next convention, which will open Oct. 12, 1915.

Meeting of Society of Chemical Industry

The Action of Manganese and Titanium in Rails and Other Commercial Steel Was Discussed

At a meeting of the Society of Chemical Industry, held in New York on Friday, Nov. 20, two papers were presented which dealt with the effects of different alloys on steel. One of these, entitled "Manganese Steel," was read by John H. Hall, consulting engineer, New York, who first outlined the early experiments with manganese. He explained that low-carbon manganese steel containing less than 8 per cent manganese was brittle and practically worthless. By means of graphs plotted between manganese content and carbon content he showed the results of experiments demonstrating that when the contents lay along the line drawn from 12 per cent manganese to 1.5 per cent carbon the resulting alloy steel was tough and strong. No valuable properties had been discovered in experiments which were made with very high manganese contents, or those of 30 per cent and over.

Mr. Hall states that manganese steel was characterized by a high coefficient of expansion, a lack of magnetic qualities, considerable brittleness when cast, a low fusing point and a very high tensile strength. Its hardness was peculiar, owing to a lack of response to Brinnel tests, this being due to the very low elastic limit of manganese steel in compression. It possessed, however, the ability to develop a surface hardness of extreme character under repeated blows, provided these were insufficient to wear away the hard skin as rapidly as it was formed. The resistance of all manganese steel to wear and abrasion was extraordinary and this accounted for its wide use where extreme wear and the presence of grit were encountered. With relatively high manganese contents, say 12 per cent, with 1.25 per cent carbon, the tendency to flow under pressure was increased. The steels with low manganese contents tended to flow less under pressure but were more brittle. It was this tendency to flow under loads that prevented the use of manganese steel for car wheels.

Manganese steel was produced by mixing molten ferromanganese and molten steel containing 1.25 per cent carbon, the use of any process of steel making being possible. The crucible process was, however, objectionable on account of the absorption of carbon from the graphite crucibles. With the open-hearth process the furnace had to be very small, and was not altogether desirable because it had to be run continuously, whereas foundries where manganese steel was used generally ran only in the day time. Small Bessemer converters were most convenient for manganese-steel manufacture on account of the low first cost and possibility of intermittent use.

The manufacture of manganese-steel castings invariably involved about 40 per cent of scrap. When the scrap castings were remelted by the Bessemer process the manganese was all lost, and the use of the electric furnace had been proposed for melting scrap, although it was not altogether desirable owing to its high cost. The electric furnace had also been proposed for melting the ferromanganese before it was added to the steel. This was quite a problem as the addition of cold ferromanganese would involve freezing of the steel, and the melting of the ferromanganese customarily had to be done in crucibles.

In discussing the commercial forms of manganese steel, Mr. Hall said that practically all of it was cast. Its great fluidity and low melting point helped the foundryman, but, on the other hand, its great shrinkage in cooling made it very likely that the castings would break. Annealing was generally used to prevent shrinkage strains, but the design of the casting was exceedingly important, and even with good pattern design the production of perfect castings was difficult. In the heat treatment the castings had to be brought up to the temperature of recalescence with great care and they could not be allowed to cool below this temperature to any considerable extent before quenching. As the temperature of the casting fell away from the proper temperature the treated steel would lose toughness, the heavier castings having less temperature leeway in heat treatment than the light ones. The heat-treating temperature was in the vicinity of 1000 deg. Cent. and, owing to the sudden quenching in water at this high temperature, breakage sometimes occurred. The design of casting was, therefore, important in this instance as well as at the time the molten metal was poured into the mold.

Mr. Hall stated that rolling manganese steel was a possibility and was accomplished in some instances. The major difficulty in the way of rolling was the very narrow range of temperature at which the metal could be worked. If manganese steel was rolled too cold it broke the rolls in the mill. If it was rolled too hot it tended to crumble.

In the discussion of the paper the matter of surface hardening under blows was brought up, and the effect of this quality in preventing the peening of railway crossings was commented on. It was stated that the surface hardening reached a maximum after a surface indentation of about 5 per cent. With crossings where the angle was such that the car wheel would acually jump, the wear was sometimes rapid enough to render negative the surface hardening effect, and the result was that a failure of the crossing took place from peening. It was stated that it was possible to caseharden steel with ferromanganese placed inside of the mold, but that this produced only a very thin skin of hard metal. The price of manganese-steel castings ranged between 7 cents and 18 cents per pound.

In answer to a question, Mr. Hall said that the presence of silicon, sulphur and phosphorus in the steel occurred, in general, in only small amounts and that they were of very little importance in manganese steel. With regard to results in service he spoke of rails on the Boston Elevated Railway which, when made of Bessemer steel, lasted six weeks, when made of open hearth steel lasted three months, and when made of manganese steel lasted two and one-half years. In the rolls for a stone crusher it was found that 6 per cent manganese was as good an alloy as 12 per cent manganese, but that either one wore ten times as long as rolls made of ordinary open-hearth steel.

EFFECT OF TITANIUM ON STEEL

A paper entitled "Titanium and Its Effect on Steel," by George F. Comstock, was then read. In this it was explained that the element titanium was widely distributed throughout the earth, although it was found nowhere in large quantities. It was invariably found in nature as an oxide, as it burned readily, its affinity for oxygen enabling it, when not in the form of an oxide, to rob molten steel of oxygen. In addition it had a very strong affinity for nitrogen. The compounds formed by the oxidation of titanium possessed stability to a very marked degree, the contrary being true of the pure element. The order of stability of the various forms were: oxide, nitride and carbide, the latter being the compound customarily used in manufacture. The carbide as a deoxidizer was practically as good as the pure element and was very much cheaper.

Titanium steel proper was not commercially made, the practical value of the titanium being its purifying effect. For this reason results equal to those obtained from the so-called titanium steel could be produced by the ordinary processes of manufacture provided these were sufficiently thorough. No changes in microstructure were effected by the presence of titanium. The actual titanium content found in commercial steel did not exceed 0.025 per cent. Titanium could be used in steel made by any process, but at the present time the demand for it existed mainly in the case of rails, so that it was used most frequently with the open-hearth process.

The introduction of the titanium was effected while the molten steel was being poured from the furnace to the ladle, the steel after the addition of the titanium being held in the ladle from three minutes to ten minutes. Thirteen pounds of the alloy called ferro-carbon-titanium (the equivalent of the carbide) were usually added per ton of steel, and the actual addition of the pure element approximated 0.1 per cent. The cost of the process added about 5 per cent to the price of the rail.

The process was purely one of oxidation, together with the cleansing effect of the titanium which acted as a flux for the silicates and other slags and made them rise to the top of the metal. Therefore, the advantages obtained from it were greater soundness of the metal and freedom from segregation. Blowholes, which were due to trapped bubbles of carbon monoxide in the molten metal as it "froze" or cooled, were also reduced, and though they were always present in low-carbon titanium steel they contained no slag and could be rolled out. The serious defect, segregation, was described as nothing but selective freezing, and in well-deoxidized steel the freezing took place quietly in the pasty mass of cooling metal, the carbon monoxide bubbles having been eliminated by the deoxidizing process. However, the deoxidation of steel usually involved extended pipes as an offset to the elimination of blowholes. Some failures in the prevention of segregation by titanium had been observed, but in such cases only very small amounts of titanium of the order of 0.005 per cent were found upon analysis, indicating that the steel had reached the ladle in a badly over-oxidized condition and that not enough titanium had been added to overcome it.

A number of tests were cited by the author to demonstrate the improvements effected by the use of titanium, of which the important ones were in the freedom from flaws. The tests applied largely to rails, one case being cited where a titanium rail on the Boston Elevated Railway showed 41 per cent less wear than the adjacent standard rails. It was also stated that titanium steel was used for axles to stop segregation and that its use in thin sheets was very effective, the sheets rolling exceptionally fine and smooth, and being well suited for galvanizing.

New A. I. E. E. Standardization Rules

Being a Summary of Some of the Notable Changes in the Railway Section of the 1914 Rules from the 1911 Rules

In last week's issue of the ELECTRIC RAILWAY JOURNAL, page 1152, attention was called to the fact that the finally-approved standardization rules of the American Institute of Electrical Engineers would go into effect on Dec. 1. A brief summary was there given of the principal final revisions which had been approved by the standards committee on Nov. 14. These among other changes had been made from the preliminary edition of the rules approved by the board of directors on July 10 and circulated in tentative form (green cover edition). In the following paragraphs are summarized, from the electric railway standpoint, some of the notable changes in the 1914 rules from the 1911 rules which they now supersede. This analysis is based upon the Dec. 1 edition which differs in important details from that of July 10.

In the old rules the only special attention given to electric railway apparatus was in a two-page section of the appendix, comprising a half-page on railway motor rating and the remainder on the selection of motors for specified service. At the time the old rules were adopted there was little unanimity of opinion regarding the whole subject of railway motor rating. In the new rules the sections relating to electric railway equipment, forty-eight in number, fill six pages, and a three-page appendix is devoted to supplementary matters relating to railway motors.

STANDARDS FOR ELECTRIC RAILWAYS

In the rules are given under the heading "Standards for Electric Railways" groups of sections under "Definitions," "Rating of Railway Substation Machinery" and "Conductors and Rail Systems."

Under the first heading are definitions of "transmission system" and "distribution system" practically identical with those given in the Interstate Commerce Commission standard classification of accounts for electric railways. A substation is next defined as "a group of apparatus or machinery which receives current from a transmission system, changes its kind or voltage, and delivers it to a distribution system."

In the rating of railway substation machinery particular attention has been given to intermittent loads, and the distinction between nominal and Institute continuous ratings is made. The former is the "Kva output at a stated power factor imput which, having produced a constant temperature, may be increased 50 per cent for two hours without exceeding the standard ultimate temperature rise. In the case of frequency-changers the power factor of the output shall also be stated.

"Machines in substations subjected to extreme fluctuations of load should be capable of carrying a load of twice their nominal rated load, for a period of five minutes, and should also be capable of carrying a load of three times the nominal rated load for one minute, without disqualifying them for continued service. These overloads shall be applied after a continuous run at nominal rated load." The continuous rating is that load, at 100 per cent power factor which a machine, fulfilling the general Institute specifications for strength, commuting qualities, etc., will carry continuously with a temperature rise not exceeding that specified in the following table:

TABLE OF HOTTEST-SPOT TEMPERATURES AND OF CORRESPONDING PERMISSIBLE TEMPERATURE RISES

Class	Description of Insulation	Highest Permissible Temperatures for Hottest Spot	Highest Permissible Temperature Rise of Hottest Spot Above 40 Deg. for the Purpose of Fixing the Institute Rating
A1	Cotton silk, paper and other fibrous materials, not so treated as to increase the thermal limit	95 deg. Cent.	55 deg. Cent.
A2	Similar to A1, but treated or impregnated and including enameled wire	105 deg. Cent.	65 deg. Cent.
B	Mica, asbestos or other material capable of resisting high temperatures, in which any Class A material or binder, if used, is for structural purposes only, and may be destroyed without impairing the insulating or mechanical qualities	125 deg. Cent.	85 deg. Cent.
C	Fireproof and refractory materials	No limit	

The sections on conductor and conductor systems define terms and specify essential details of contact rails, trolley and messenger wire or cable and classes of construction. The important dimensions specified are: 26 in. to 27 in. for third-rail gage; 2¾ in. to 3½ in. for third-rail elevation; 18 ft. for the height of the lowest point of a trolley wire under maximum conditions of sag unless local conditions prevent, and 21 ft. on trackage operating electric and steam railroad equipment and at crossings over steam roads. These dimensions were specified upon the advice of the American Electric Railway Engineering Association.

RATING OF RAILWAY MOTORS

As in the preceding sections the nominal and continuous ratings are distinguished. The nominal rating is as in 1911 except that it is specified in kilowatts and reference to a room temperature of 25 deg. Cent. is omitted. The continuous ratings are the inputs in amperes at which the motor may be operated for ½, ¾ and full voltages respectively without exceeding the following temperature rises when operated on stand test with motor covers and cooling system, if any, arranged as in service: Class of material A_2 (see preceding table), temperature rises of windings, by thermometer 65 deg., by resistance, 85 deg.; class of material *B*, 80 deg. and 105 deg. respectively.

OPERATING TEMPERATURE LIMITATIONS

In addition to the above stand test limitations the following permissible operating temperatures are specified: Class of Material A_2, maximum observable temperature of windings when in continuous service, by thermometer, 85 deg., by resistance, 110 deg.; class of material *B*, 100 deg. and 130 deg. respectively. For infrequent occasions, due to extreme ambient temperatures, it is permissible to operate at 15 deg. higher temperature.

Field control motor ratings are specified on the basis of performance with the operating field which gives the maximum motor rating.

MOTOR EFFICIENCY AND LOSSES

The specifications of efficiency determination are in form to permit easy checking of performance guarantees. The efficiency is determined from losses as follows.

Copper loss is calculated from resistance measurements corrected to 75 deg. Cent.

No-load core loss, brush friction, armature-bearing friction and windage are measured by operating the motor without gears and with the kind of brushes and brush pressure as in commercial service. With the field separately excited, such a voltage is applied to the armature terminals as will give the same speed for any field current as is obtained with that field current when operating at normal voltage under load. The sum of the losses mentioned is then the product of the counter-emf and the current.

Core loss in d.c. motors is separated from friction and windage losses above described by measuring the power required to drive the motor at any given speed without gears, by running it as a series motor on low voltage and deducting this loss from the sum of the no-load losses at corresponding speed. Or it may be obtained by separately exciting the field and driving the armature from a motor having known losses, and noting the difference in losses between driving the motor light at various speeds and driving it with various field excitations. Core losses in d.c. motors under load should be assumed as follows:

Per cent of input at nominal rating	200	150	100	75	50	25 and under
Loss as per cent of no-load losses	165	145	130	125	123	122

The brush-contact loss to be used in determining efficiency may be obtained by assuming that the sum of the drops at the contact surfaces of the positive and negative brushes is 3 volts.

The loss in gearing and axle bearings in single-reduction, single-geared motors varies with type, mechanical finish, age and lubrication. The following are given for comparison:

Per cent of input at nominal rating .	200	150	125	100	75	60	50	40	30	25
Losses as per cent of input .	3.5	3.0	2.7	2.5	2.5	2.7	3.2	4.4	6.7	8.5

OTHER RULES AND DATA

The last sections of the rules are devoted to definitions of terms relating to electric locomotives.

In the appendix relating to railway motors suggestions are made as to the data needed for selecting motors for specified service and for pre-determining the performance of a motor in service when it cannot be tested under service conditions.

The following average data as to mechanical losses, based on the results of many tests, are given as a basis for comparison:

Per cent of input at nominal rating . .	100 or over	75	60	50	40	30	25
Losses as per cent of input	5.0	5.0	5.3	6.5	8.8	13.3	17.0

These figures include axle bearing, gear, armature bearing, brush friction, windage and stray-load losses. They apply to single-reduction, single-geared motors.

The ordinance adopted by the City Council of Kansas City, Mo., requiring drivers of automobiles to dim their headlights was amended on Nov. 3 to include street cars. The ordinance will go into effect on Jan. 1.

COMMUNICATIONS

Effect of Car-Wheel Diameters on Motors

SCRANTON, PA., Nov. 11, 1914.

To the Editors:

I beg leave to submit for the consideration of Messrs. Parks, Nottage and Foote, and of any others who may be interested in the question, the following theoretical consideration of the effect of car-wheel diameter on motors.

For a given car equipment, the tractive effect per motor which is used in overcoming the train resistance for motor, is

$$T = \frac{K}{D} T' \text{ lb.} \qquad (1)$$

in which K is a constant depending on the gear ratio and gear efficiency; T' is the net effective torque in pound-feet; and D is the diameter of the car wheel in inches.

Considering the total train resistance for a given set of conditions (weight, head-on cross-section and speed of car, grade, curvature and acceleration if starting), to be divided equally between all the motors on the car, irrespective of variations in the car-wheel diameters, we will suppose a two-motor equipment in which the wheels of truck No. 1 are D in. in diameter and those of truck No. 2 are $(D + d)$ in. in diameter. From equation (1) we then have for the respective motor-torques,

$$T'_1 = \frac{DT}{K} \text{ lb.-ft.} \qquad (2)$$

and

$$T'_2 = \frac{(D + d)T}{K} \text{ lb.-ft.} \qquad (3)$$

From these last two equations, we obtain

$$T'_2 = \left(\frac{D + d}{D}\right) T'_1 \qquad (4)$$

which indicates that the torque required of the motors on truck No. 2 (which has the large wheels) is $\frac{D + d}{D}$ times that required of the motors on truck No. 1.

For any electric motor, the theoretical torque, developed by the passage through the motor of a current I_a, is

$$t = 0.117 \Phi Z' I_a \text{ lb.-ft.} \qquad (5)$$

where Φ = the magnetic field flux per pole;
and Z' = a constant for a given motor, depending upon the number of poles, and the kind of armature winding.

(For a complete discussion of the foregoing equation, see Vol. I, Franklin & Esty's *Elements of Electrical Engineering*, page 99.)

In a series motor designed for electric railway service, the magnetic circuit is operated very nearly at the point of saturation, except at very light loads. Consequently, we may, with little error, assume that for all operating current values the magnetic flux per pole is a constant. Also, the net effective torque available at the pinion of the motor is less than that expressed in equation (5) by the amount of the torque required to overcome friction and other stray-power losses. Assuming that under the conditions existing we may neglect these losses, and that we may call Φ a constant, we may write, from (5),

$$T' = C I_a, \qquad (6)$$

where T' is the net effective torque as used in equation (1) and C is a constant equal to $0.117 \Phi Z'$. Writing variations of equation (6) for the torques of the two motors under consideration, and substituting the same in equation (4), we obtain

$$I_{a_2} = \left(\frac{D + d}{D}\right) I_{a_1}, \qquad (7)$$

where I_{a_1} and I_{a_2} are the motor currents for motors No. 1 and No. 2, respectively. The constant C for each motor torque is considered the same since the magnetic circuits are presumed to be nearly saturated for the operating current values, I_{a_1} and I_{a_2}.

Equation (7) indicates the relative values of the currents taken by the motors on the two trucks. The current taken by the motor geared to the large wheels is, of course, greater than that consumed by the motor geared to the small wheels. Thus, if on a two-motor car, motor No. 1, geared to 32-in. wheels, takes 80 amp under a certain set of conditions, motor No. 2, if geared to 33-in. wheels, will take $\frac{33}{32}$ times 80 amp, or 82.5 amp. This, of course, is a purely theoretical value, and, at that, is only an approximation. It would seem, however, that the increase in motor currents due to small differences in wheel diameters should not be sufficiently large to cause trouble.

The foregoing is offered, not as the "practical solution" desired by Mr. Foote in the ELECTRIC RAILWAY JOURNAL for Oct. 31, nor as an entirely correct and accurate technical consideration of the many complexities of the question. Rather, it is desired that this letter be part of the discussion suggested by Mr. Foote, and an indication of the peculiar points involved in a final solution.

J. M. WALSH.

Encouraging Railway Employees to Use Technical Books

FREE PUBLIC LIBRARY

NEW HAVEN, CONN., Nov. 23, 1914.

To the Editors:

The public library at New Haven has been making an effort to interest the employees of the local electric railway company in the books relating to their line of work. With the co-operation of J. K. Punderford, general manager of the company, we distributed through the chief motorman a hundred or more lists of books which we thought would be of value. These lists were also placed in the three carhouses. A special effort was made to reach new men. As a result, at the end of two weeks of effort our circulation of electric railway books was next to the highest of all classes for this department, whereas before it was practically negligible. Books that have been popular are Gutman's "Motorman and His Duties," Aylmer-Small's "How to Become a Successful Motorman," Harding's "Electric Railway Engineering" and Ashe and Keily's "Electric Railways." The ELECTRIC RAILWAY JOURNAL also has its devotees. There is a crying demand for practical books which we have tried to meet by supplying instruction books and bulletins of the General Electric and Westinghouse companies.

We call the attention of the men to the technological room in the library and to the fact that it is for their use free. Then when they come in and make themselves known we show them the books and pick out some new subject in railroading as a basis of conversation. Then we gradually lead up to the topic of their own work and thus overcome the embarrassment that is general on the occasion of the first visit to an institution of this sort. If, in the course of the conversation, no interest is manifested we try to locate some hobby, which usually crops out eventually. If it develops that a visitor entertains just a little fear of books and book knowledge and does not seem to be able to get information from books we endeavor to show him how to overcome this lack.

We cannot say that the demand for books has been as great as the number of electric railway employees would seem to warrant, because there are many difficulties confronting the "front-end" man who wishes to advance. The very fact that a man is seen with a book in his hand gives the impression that he is after an inspector's or starter's job and he is apt, like the teacher's pet among school children, to be looked down upon by his companions.

Summing up the results of our efforts to help the men it may be said: (1) That our circulation jumped in two weeks from lowest to next to highest for this department; (2) that we have a steady group of book users; (3) that all electric railway men here, from the general manager down, know that we have their interests in mind, and (4) that the men who come to the library are worth working for and that it is a good policy to help the one man in a hundred who wants to get ahead rather than to throw up our hands in despair because ninety-nine do not care to advance.

When convincing arguments can be presented to the men a great gain will have been made and we hope to persuade them to use books steadily. We have great hopes of interesting the new men who will be broken in in January. KENNETH C. WALKER,
Head Department of Technology.

Corrosion of Metals in Natural Soils

WORCESTER POLYTECHNIC INSTITUTE
WORCESTER, MASS., Nov. 24, 1914.

To the Editors:

I am very glad that Messrs. Scofield and Stenger decided to publish their paper on "Corrosion of Metals in Natural Soils," which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 14. This paper should be read with considerable interest by electric railway engineers, as it is one of the few definite contributions which we have on this subject.

It is undoubtedly true that under the proper soil and electrode conditions a considerable amount of self-corrosion can take place, enough at times to show the same magnitude of results as though the damage had been done by stray railway currents.

When self-corrosion can be shown to have produced such results as are shown by Messrs. Scofield and Stenger, the subject becomes a very live one to electric railway operators, as in many cases it should proportionately reduce the responsibility that pipe owners might attempt to fix on the electric railway company. The subject seems to have had a very careful study in Minneapolis, and we are to be congratulated that the officials of that company have seen fit to give us the results of their investigations.

ALBERT S. RICHEY,
Professor of Electric Railway Engineering.

The report of business done by the Public Service Commission for the Second District of New York for October shows an increase in the number of new cases filed with the commission. The commission disposed of seventy-six formal cases during the month, while eighty-seven new ones were submitted. This makes a total of 549 formal cases disposed of since March 16, 1914. A total of 106 informal cases was filed with the commission during the last month, and final disposition was reached in 129 old and new informal complaints. The total number of informal complaints disposed of since March 16 is 1216.

Fare Decision in Manchester, N. H.

Six Per Cent Return Allowed on Investment in Property—Depreciation Considered at Length

The Public Service Commission of New Hampshire has rendered a decision in the fare case which has been before it for several months. An abstract of the brief of the company in this case was published on page 88 of the issue of this paper on July 11. The commission orders the Manchester Street Railway to sell tickets to school children with full transfer privileges, for use on the way to and from school, at the rate of six tickets for 25 cents and twenty-five tickets for $1, dating from Dec. 1, 1914. Under the law the board was asked to investigate whether the company reasonably could be required to sell tickets at these rates and also whether the company could be required to sell tickets to the general public at these rates good before 8 a. m., between 11:30 a. m. and 1 p. m., and from 5 p. m. to 7 p. m. As to the school tickets, it was admitted that the number of those who would use them is comparatively small and that the establishment of this rate would not largely reduce the company's revenue. The other proposed reduction was dismissed by the board on the ground that it would prevent a reasonable return on the fair value of the company's property. An abstract of the decision is printed below.

To ascertain the value of the property, the commission employed the engineering firm of Sloan, Huddle, Feustel & Freeman, of Madison, Wis., the company being represented on this work by Hollis French, of Boston, Mass., its consulting engineer. Edwin F. Jones and Frank S. Streeter appeared as counsel for the company. The commission reached the sum of $1,599,728 as the cost of reproduction new of the physical properties and $1,154,253 as the cost new less accrued depreciation. The company's engineer agreed to the foregoing estimate of cost new except that he allowed $27,500 more for track and $19,200 more for depreciation. The variation was due to the use of current prices by the company, whereas the board held that a five-years' average is preferable as in the Berlin Electric Light Company case, 3 N. H., P. S. C. Rep. 174, 196. The capitalization, including $133,500 in notes outstanding, totals $1,402,750, and the cost of road and equipment as carried on the books for the year ending June 30, 1913, was $1,399,106. The correspondence between the cost of reconstruction new, the construction account and the amount contributed by the stockholders, is extraordinarily close. Making some allowance on the one hand for possible inadequacies in the construction account, and on the other for advances in construction costs and appreciation in land values, it appears that the property has been principally built up out of funds contributed directly by the stockholders, and that very little has been put into it out of earnings. This fact is extremely important in determining the amount upon which the company should be allowed to earn a return.

The board finds that the average dividend received upon the capital stock has been 5.839 per cent since 1889, and upon the actual investment of the stockholders 5.58 per cent, the averages being obtained by ascertaining the relation between the total amount paid in dividends and the total of the principal sums upon which those dividends were paid. The commission holds that the foregoing constitute at least an approximately fair return upon the value of the property. It holds that 6 per cent upon the fair value of the property constitutes a reasonable return on such a business as the Manchester Street Railway, occupying a monopoly in the transportation field in the large and growing city in which it operates.

(Population, 1910, 70,063.) President E. C. Foster testified that in his opinion a higher rate than 6 per cent is needed to attract street railway capital, but the board holds that 6 per cent in a street railway in a thriving New England city is as attractive as a 7 per cent return in a Southern property of similar size. The commission holds that it is immaterial how the return on the value of the property is divided between stock and bonds, and points out that if the capitalization were half in bonds at 5 per cent, 7 per cent could be paid on the stock to yield a fair return. The company has no bonded indebtedness, however. Except for the appreciation in land values, there has been during the greater part of the company's history no great discrepancy between the investment and the value of the property.

DEPRECIATION

The present depreciated value of the property, excluding appreciation in land values, is $1,050,000. There has, therefore, been a total depreciation of $450,000, of which $100,000 has been made good out of earnings, while the balance of $350,000 remains a loss to the stockholders unless it is in some way made good to them. The company's counsel claimed that the depreciation should not be taken into account so long as the service is not impaired, and that the cost of reproduction new is the true measure of the present fair value for rate-making purposes. This theory the board has several times considered and rejected (Manchester Gas case 4 N. H., P. S. C. Rep., 337, 405). It held that according to the United States Supreme Court there is no constitutional right to demand a return upon more than the present depreciated value of the property, but that justice may often require that a return be allowed upon a larger sum. In the Manchester Gas case, the utility during the full period of its existence had paid not only adequate but excessive returns on its investment and had also put into the property out of earnings an amount more than sufficient to make good its accrued depreciation. To allow a return upon the full undepreciated value of its property would have been to permit it not only to get the return upon its investment to which it was unquestionably entitled but also to capitalize and make the public forever pay a return upon what was in fact a depreciation reserve provided out of rates which the public had paid. Justice clearly did not require such action.

The present case presents an entirely different situation. The railway company, instead of paying to its stockholders more than an ample return and keeping its property good, and even adding to its value, out of its earnings, has barely paid a fair return in the form of dividends on the amount actually invested, and above that has been able out of its earnings to make good only $100,000 of the $450,000 depreciation which the property has suffered. Of the remaining $350,000 a part is offset by appreciation in land values, leaving $250,000 representing a clear loss to the stockholders as a result of the public service which they have performed, if they are for the future to be allowed a return only on the depreciated value of their property. Justice does not require that they should suffer this loss. In the general outcry against inflated capitalization there is never found a suggestion that a public service corporation, well planned and efficiently managed, should not be allowed a fair return upon at least the full amount of its bona fide investment. It has been unable to do so at the rates which it has charged and has suffered a substantial loss as the result of its operations. Justice requires that it have an opportunity to make that loss good.

Technically, depreciation should be made good out of earnings. But it is out of the question for this company to make good out of its earnings a loss of $250,000. It could only be done by increasing the rates. And an increase of the 5-cent fare in the city of Manchester is not seriously to be considered. Neither the company nor the public would desire it. The board, therefore, finds that justice to the company and to the public good alike requires that the deficiency in the present depreciated value of the property below the amount actually invested by the stockholders be regarded as a cost of developing the business, and as such added to the depreciated value to determine the present fair value of the property devoted to the public service, and that the company should hereafter be allowed to earn annually a fair return upon $1,402,750, the amount of its bona fide investment, which fair return is found to be 6 per cent, together with a sum sufficient to take care of the annual depreciation of the property. This valuation takes due account of all depreciation, including functional depreciation due to changes in the art and the discarding of obsolete plant and equipment. No consideration is given to working capital, because it does not appear that the company has any beyond its stores and supplies, totalling $32,527, and included in the engineers' valuation. The board finds that the expenditures of the company are in general normal and reasonable. The amount charged to maintenance of way and equipment is perhaps somewhat higher than the average, but it would not be in the public interest to lower the high standard of maintenance by curtailing expenditure.

POWER

The question of whether the cost of power is excessive received much study. The railway purchases power from the Manchester Traction, Light & Power Company, which owns its stock, at a price of 2.25 cents per kw-hr. of alternating current furnished. In 1913 it purchased 5,229,013 kw-hr. at a total cost of $110,979. The railway company converts the energy into direct current in a substation of its own which cost $128,000, and the operating expenses of which are about $20,500 per year, including interest on the investment. It appears on analysis that the street railway paid $7,439 more for its power than it would have paid had it been entitled to take it on a five-year contract under the Traction company's Schedule D. The board recognized that the street railway company has the first call on the power system, after the street lighting service, and as it overlaps the lighting peak in many of its rush-hour demands, necessitates the maintenance of steam plant capacity. The board finds that the price is not unreasonably high, although a slight overpayment may be made to the traction company.

CONCLUSIONS

The board's conclusion is that the operating expenses cannot be expected to decrease as time passes, but must be expected to increase, with growth of business. To determine the effect of the proposed reduction in rates a traffic count was made of rush-hour and other-period passengers for an entire week in January and July, 1913, counting separately all who rode on the cars before 8 a. m., from 11:30 a. m. to 1 p. m., and between 5 and 7 p. m., on week-days. It was found that 39.03 per cent traveled in these rush hours, the segregations being 13.205 per cent, 8.364 per cent and 17.634 per cent. It is estimated that the receipts would be reduced by $25,212 on the 1913 earnings basis if the rates were reduced for rush-hour riders and would prevent the earning by the company of a reasonable return upon the fair value of its property.

ASSOCIATION NEWS

JOINT COMMITTEE ON OVERHEAD AND UNDERGROUND CROSSINGS

The second meeting of this committee, which is still in the formative period, was held at association headquarters on Nov. 17. The first meeting was held on Sept. 30, and the third is scheduled for Dec. 16 at the same place. The following attended the meeting: Farley Osgood, Public Service Electric Company, chairman; G. W. Palmer, Bay State Street Railway Company, vice-chairman; R. D. Coombs, consulting engineer, New York, secretary; B. T. Anderson, Lackawanna Railroad; C. L. Cadle, New York State Railways; E. B. Katté (represented by deputy) New York Central Railroad; W. T. Oviatt, Narragansett Electric Lighting Company; P. H. Thomas, consulting engineer, New York, and L. S. Weld, Long Island Railroad. The committee discussed plans for its work and organization. It will eventually consist of about twenty representatives of all interests involved in overhead or underground crossing matters. Eventually suggested specifications will be prepared and submitted to the engineering public for criticism. The committee hopes also to be in a position to give advice on crossing problems when requested to do so. The new committee is the outgrowth of a committee of the National Electric Light Association on overhead construction formed in 1911 and subsequently enlarged into a joint committee by the addition of the chairmen of similar committees of other associations.

MEETING OF THE DENVER TRAMWAY COMPANY SECTION

The twenty-first monthly meeting of the section was held on Nov. 19, William M. Casey presiding. The following officers were elected: President, C. B. Wells, superintendent of transportation; vice-president, George L. Rice, superintendent Southern division; secretary-treasurer, H. G. Mundhenk, stenographer transportation department, and director for two years to fill the vacancy created by the expiration of Mr. Wells' term, A. N. Evans, engineering department.

The feature of the meeting was a series of talks by delegates to the Atlantic City convention of the association. Those who spoke at length were John A. Beeler, G. W. Dolezal, W. C. Swisher, E. L. Rice and W. H. Seip. Messrs. Casey, Adams and others took part in the discussion. The attendance at the meeting was 120.

R. H. INGERSOLL ON TELEPHONE DISPATCHING

In our issue for Nov. 21, page 1165, the recent Denver Company Section paper on the above subject by R. H. Ingersoll, chief dispatcher, was mentioned. In this paper the author stated that the dispatching of streets cars on city lines by telephone is the result of an inspiration that came just twenty-five years ago to C. K. Dunham, one of the early superintendents of what is now the Denver City Tramway. He gave interesting details of the work of his department, stating that it requires fifty-four telephones on thirty circuits operated by five men. He compared the dispatching system to the human brain, the driving, directing and controlling element. In the Denver Tramway it is a veritable clearing house for detail. Almost every department touches elbows with the dispatcher at some angle of its work. For example, a track greaser may find stones in the same switch day after day. He reports this to the dispatcher, who notifies one of the company's special officers. Again, the track repair gang and line repairmen keep the dispatcher notified of their whereabouts so that an emergency track or line trouble may be brought to their attention promptly. In case of sudden load, the dispatcher notifies the power house in time to prepare for it, as when heat is to be turned on as indicated by signal from the dispatcher's office. The superintendent of rolling stock provides the dispatcher with a list of cars, plows, sweepers, etc., distributed among the carhouses. He frequently calls upon trainmen for reports as to the condition of sand boxes at the ends of the line. In Denver the conductor pays his motorman and himself every night, keeping the record of the time given the car, trip by trip, by the dispatcher, so that the dispatcher's sheet is the record of every trainman's time for the day.

All of the above matters are incidental to real dispatching. When all cars are reporting on time, the work of dispatching is not difficult, for by long practice the schedules are memorized and the time can be given and put down quickly. The test of the dispatcher comes when nothing is on time. More important than figuring time is the judgment he displays. He must be a good guesser of what the conditions are and what each crew can and will do under those conditions. A dispatcher should have good street car sense combined with an ability to understand conditions and figure the best way out of his difficulties quickly.

The telephone dispatching system affords the superintendent the greatest facility for keeping in touch with every detail of the operation of cars. The flexibility of the car service and the rapidity with which it enables the dispatcher to adjust the headway on any line, are the strongest points in favor of this telephone system. In every city the travel demands the addition of extras in the morning and late afternoon, and by the telephone system the dispatcher can put out and withdraw such trippers without confusion, equalizing the spaces between the regular cars as fast as such extras are put out or withdrawn. Any congestion caused by accident or blockade also may be adjusted without difficulty in the same manner. There is a regular method of pulling down the lines at night, as the load or travel drops off; but if the dispatcher finds that the travel on any line is such as to require increased service, he may hold the full quota of cars, and if necessary use cars which are not needed on other lines. In this way, through the agency of but one or two men, who are alive to the needs of the patrons on all lines, the service is reduced to a minimum.

The use of the telephones employed in this service should be restricted by the dispatcher to those who in their line of duty are interested in the movement of cars, and when the use of the telephone is so limited a certain respect attaches to the messages transmitted and the tendency for small talk is discouraged. This small talk not only keeps someone else from getting in touch with the dispatcher, but it breaks down the wall of respect which should surround the dispatcher's office.

Mr. Ingersoll's paper provoked a lively discussion, and the men who are in contact with the dispatching system gave illustrations of its working and enthusiastically supported the speaker's contention.

The plan of piling the snow along the curb line as is done in Montreal is to be followed by the New York railways during the coming winter, except that in New York a new type of sweeper with an out-board broom will be used instead of the out-board plow of Montreal. The difference is obviously necessitated by the practical absence of sleighs in New York, a circumstance which makes it necessary to remove all snow from the street surface rather than to leave a coating of a few inches.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Equipment Defects—Control Connections —III—Changing Motors from Series to Parallel

BY C. W. SQUIER, E. E.

With straight rheostatic regulation the control connections are comparatively simple as it is necessary only to arrange the circuits, as already described in a previous issue, and provide the means for decreasing the resistance of the circuit. When a series-parallel grouping of the motors is desired, however, it is necessary to provide contacts for making the transition from series to parallel. The control connections then become more complicated.

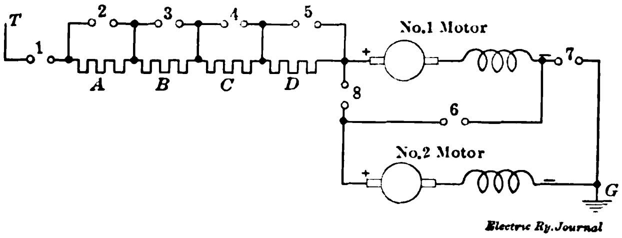


FIG. 7—CIRCUIT DIAGRAM FOR TWO MOTORS

Let us consider what steps are necessary to change the connections of two motors from series to parallel. By referring to Fig. 7, the circuit diagram for two motors, we see that two motors are connected in series by connecting the positive side of No. 1 motor to line through the regulating resistance, the negative side to the positive terminal of No. 2 motor, and the negative terminal to No. 2 motor to ground. To change this to the parallel connection it is necessary to open the circuit between the negative side of No. 1 motor and the positive side of No. 2 motor, and connect the positive side of No. 2 motor to line and the negative side of No. 1 motor to ground. The sequence by which this change or transition is carried out has led to what are called respectively the "open circuit" and the "short-circuited motor" methods.

Open Circuit Transition

If, in making the change from series to parallel, we first open the connection No. 6 between the motors, the circuit through both motors is opened so that power will be entirely shut off for a short interval. If the positive side of No. 2 motor is then connected to line by closing contact No. 8, and the negative side of No. 1 motor to ground by closing contact No. 7 at the same time, the change from series to parallel will be completed. This procedure, because the circuit is opened for a short interval, is called the "open circuit" method and is that used with the General Electric Company's Type L controllers. In order to distribute over several sets of contacts the arcing caused by opening the circuit, the circuit is opened at several points at once as at contacts No. 1 and No. 6 in the diagram mentioned. This arrangement provides several so-called series breaks and reduces the burning due to arcing at each point.

Fig. 8 shows a simplified diagram for an open-circuit controller. It is seen that in passing from the last series point to the first parallel point that the circuit is opened at the *T*, 15 and *E* contacts, and when closed again additional resistance is cut in to limit the current per motor to the accelerating value. This controller has five series and five parallel points and is designed to use five groups of parallel regulating resistance. One of this controller's disadvantages is the sudden jerking in the operation of the car when passing from series to multiple because the current is entirely shut off from the motors and the acceleration is stopped momentarily and then suddenly applied. This is uncomfortable to passengers and also throws an additional strain on the equipment. Another disadvantage is the burning of the contacts. The accelerating current is the largest that a controller has to handle under ordinary conditions, and as this type of controller has to open this maximum-current at every operation, it burns more than some other types.

Short-Circuited Motor Transition

Referring again to Fig. 7, if in making the change from series to parallel part of the regulating resistance is reinstated in the circuit by opening contacts Nos. 3, 4 and 5 after having been cut out for full series operation, and immediately following this the negative side of No. 1 motor is connected to ground by closing contact No. 7, we have No. 2 motor short-circuited. The next step in the transition is to open contact No. 6 and then close No. 8. This connects the motors in parallel with resistance groups *B*, *C* and *D* in the circuit. This way of changing the motors from the series to the parallel combination is termed the shunted motor or short-circuited motor method, and its sequence of connections is intended to overcome the stated disadvantages of the open-circuit method. Its disadvantage however, com-

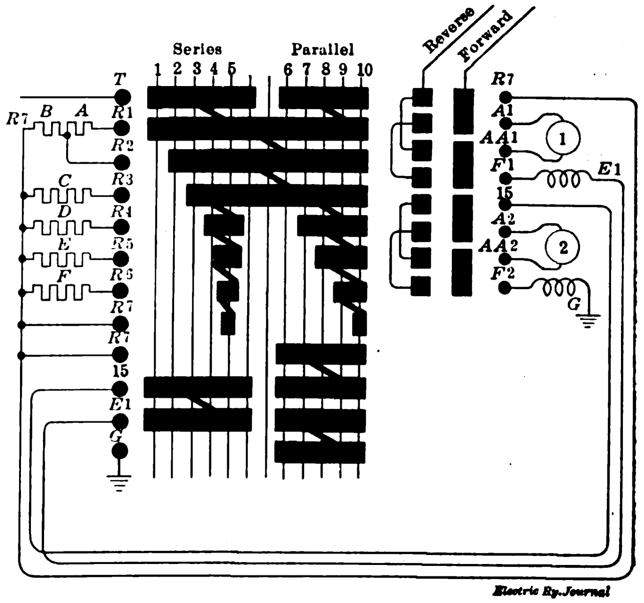
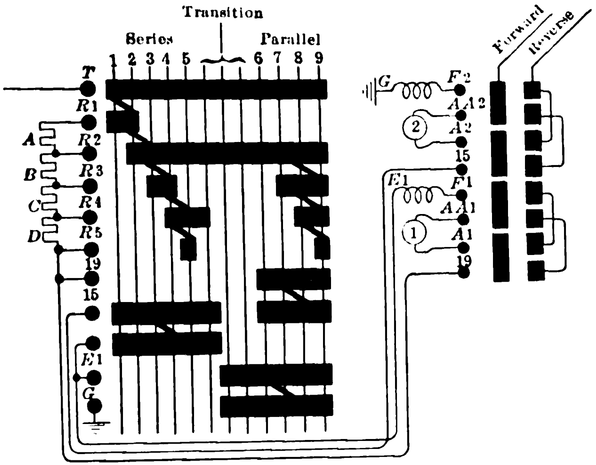


FIG. 8—CONNECTIONS FOR CONTROLLER WITH OPEN CIRCUIT TRANSITION

pared with the open-circuit method, is that a sudden rise in voltage is liable to occur on the first motor because that motor is in circuit for a short time with the resistance that is afterward used with both motors. Short-circuit transition changing from series to parallel is embodied in the design of the General Electric Company's Type K controllers. Fig. 9 shows a simplified diagram for the K-11 controller. This controller has five series and four parallel points and uses four groups of series regulating resistance.



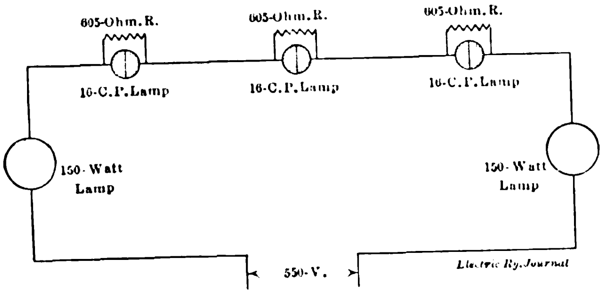
Electric Ry. Journal

FIG. 9—CONNECTIONS FOR K-11 CONTROLLER

Shunt Resistances Used to Operate Signal and Lighting Lamps on One Circuit

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES SAULT STE MARIE, MICH.

On a swing bridge used by an interurban electric railway, it was recently necessary to wire up both the navigation signals lamps and the illuminating lamps from the 600 volts d. c. traction circuit. The three signal lamps comprise one at each end and one at the center of the bridge, all of 16-cp rating. For illumination at each bridge end, however, one 150-watt lamp was chosen. The latter two lamps are so arranged that the operator may see the end rails from his cabin, which is located above the track at the center of the bridge.



Electric Ry. Journal

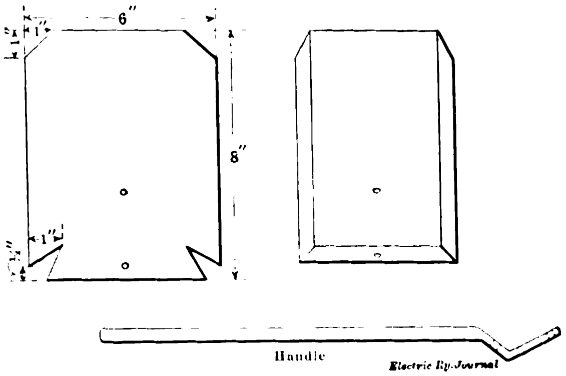
SHUNT RESISTANCES IN USE TO OPERATE SIGNAL AND LIGHTING LAMPS ON A RAILWAY CIRCUIT

To save conduit and labor in placing all lamps the two 110-volt, 150-watt lamps were wired in series with the three 110-volt, 16-cp lamps to form one circuit on the 600-volt line. However, attention was called to the point that the 150-watt lamps alone would not work in series with the 16-cp lamps. The trouble was overcome by placing a 605-ohm ½-amp resistance in shunt with each 16-cp lamp, as shown in the accompanying diagram. In operation this circuit has proved very satisfactory.

A Serviceable Coal Shovel for Car Stoves

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD (ILL.) & INTERURBAN RAILWAY

A good serviceable fire shovel for cars using stoves is very easily made from scrap to be found around any railway shop. The blade of the shovel is made from pieces of 16-gage dash iron, cut as shown in the accompanying diagram, and then bent so that the corners come together. The handle can be made of any scraps of ½-in. or ⅝-in. round iron flattened at the end to permit riveting to the blade, or it can be made of pieces of flat iron if the latter are not too heavy. These shovels will give better satisfaction than most of the shovels that can be bought and their cost is about the same. We used these shovels last winter with good results.



Electric Ry. Journal

CAR STOVE SHOVEL MADE BY THE ROCKFORD & INTERURBAN RAILWAY

Comparative Merits of Motor Bearings

BY R. H. PARSONS, ELECTRICAL FOREMAN

Varied opinions are held as to the use of bronze versus iron-shell and axle bearings, some being greatly in favor of bronze and others still clinging to iron. In this article is it intended to set forth a few points for and against each, as both have their advantages.

The iron bearings consist of a heavy shell of cast or malleable iron, and in some instances of cast steel with a heavy lining of babbitt. The cast shell is cheap, the malleable a little more expensive and more durable, and the cast steel is still more expensive and more lasting, but it has the disadvantage of warping with heat, especially when babbitting. The iron-shell bearing is found to a great extent in the older type motors for which they are perhaps more economical because the conditions for accuracy and uniformity are unfavorable.

The bronze bearing includes a composition of 84 per cent copper, 12 per cent tin, 3.5 per cent zinc and 0.5 per cent lead, with a much thinner wall, lined with a light coating of babbitt. This bearing has come into almost general use in modern motors and, as built for them with all parts machined, standardized and fitted accurately, they give excellent results.

Generally speaking, the advantages found in the bronze bearing are many. An important one is that very little babbitt is necessary; and if by heating or by neglect the bearing is worn through the babbitt, the bronze makes a good wearing surface for the shaft. No harm is done, therefore, unless the wear is sufficient to allow the armature to strike the pole pieces. An iron-shell bearing, however, requires quite a thickness of babbitt to guard against this danger, for if the babbitt wears through the shaft would be running on iron. Since the inner side of these shells is made rough purposely to grip the babbitt, the result would not be good.

But the main point in favor of a bronze bearing is in the babbitting. It is a simple matter to tin the inside of a bronze bearing. Then when the babbitt is poured it adheres to the bronze to make a perfectly tight lining. On the other hand, it is difficult if not impossible to make the babbitt tight in an iron shell.

Even when much care is used in babbitting iron shells, as by heating them before pouring the babbitt, it will often be found that the cooled babbitt is loose in the shell. Again, the babbitt sometimes appears tight following the boring and installation, yet it will be found loose after running a short time. It may not be loose enough to rattle, but not much of a crevice is needed to permit the leakage of oil, and thus make an opportunity for a hot bearing.

Some wear between the outside of the bearing and the inside of the motor shell or housing is bound to come. A bronze bearing will take the greatest wear itself, saving the motor, but if the bearing is of iron the motor housing will be worn appreciably after a time, although the bearing will receive some wear, too. This is a point to be considered, as bearings are a small item as compared to paying $18 for a new housing for a box-frame motor, $175 upward for new shells, or reboring old shells at $15 or more each to take larger bearings. The reboring of shells itself is not an expensive job, but involves so much other work that the cost is often considerably increased. Shells must be stripped, fields and armatures overhauled, new dowels or keyways fitted for bearings, and new bearings of a larger size purchased, upon which follow the reassembling of the motor and the labor of removing from and replacing in the car. The cost depends on how much and how thoroughly this work is done. A special machine costing $500 to $600 is also necessary for the work. Hence, if bronze bearings will help extend the life of the shell or housing, they are well worth consideration.

The question of space often counts to a great extent in the choice of bearings. If the space is small the use of iron bearings would be impracticable because the lining necessarily would be thin, would be difficult to make and keep tight, and would be a source of danger from wearing through. This objection would apply to new motors where space would determine the size, or where it might be decided to use larger axles or armature bearings than those for which the motors were designed. In such instances bronze bearings could be used to advantage.

The first cost of the bronze bearing is about three and one-half times the cost of iron bearings, and under the same conditions the life of the iron bearing would be about double. The iron bearings will last say 600,000 miles while the outside wear will make it necessary to scrap the bronze bearing after a service of 300,000 miles, depending on the condition of the motors in which they are used. Against this the scrap value of the bronze bearing is as much as 10 cents to 14 cents per pound, depending on individual conditions, while the scrap value of the iron bearing is practically nothing.

The cost of babbitt enters also into any comparison because the iron bearing requires much more babbitt. This condition demands that a much larger stock of babbitt be kept on hand and continually turned over, thus giving greater opportunities for losses.

OTHER BEARINGS

Some roads have adopted non-babbitt bronze bearings for all motors, the bronze being made to certain specifications while the manufacturer contracts to take back the scrap at a value per pound probably 50 per cent lower than the original cost. In this way the bearing cost after the original installation would be the difference between the first cost and the scrap allowance. However, one point clear in this proposition is that if the bearing is not rebabbitted it must be turned into scrap when the bearing surface has worn enough to give the armature shaft vertical play. The limit would probably be 1/16 in. Therefore, for this 1/16-in. wear the bearing must be paid for at a rate of about 12 cents per pound for the whole bearing. The redeeming feature of this proposition is the entire elimination of the cost of babbitt, the labor for handling same, etc. This plan of handling the bearing problem has been taken up in a few places, but its success is not yet assured enough to encourage general adoption.

One or two roads have adopted to some extent cast-iron bearings without any lining, and these have been found to give some degree of satisfaction. While running a steel shaft against a cast-iron bearing undoubtedly would be successful for light service, assuming abundant lubrication, the result in case of heating would be far worse than with either a bronze or cast-iron babbitted bearing. Such a bearing would be very apt to freeze to and cut the shaft badly, would tend to destroy the dowel pins or keys, and would lead to the skidding and flattening of the wheels.

A solid babbitt metal bearing has been used by a few companies, but the results obtained are questionable.

Ball bearings for railway motors are being tried out in many places, but they have not yet reached that stage where they will supplant the ordinary oil bearing. For standard cars their saving in friction is not great enough to be a deciding point in their favor, while the lubrication of modern plain bearings has reached a degree of efficiency that does not make it necessary to use ball bearings just for the protection of the armature. However, the use of ball bearings in the motors of automobile and storage battery cars has proved that they are practicable in other respects than energy saving as they allow a closer design of the motor, permit less clearance of pole pieces and give a superior wear which keeps the gears, pinions and brushholders in better alignment. In general, ball bearings for motors fitted for plain bearings involve special designs and installation costs of $60 to $100 for motors of say 60-hp capacity. Their excellent service in storage-battery motors warrants the extra cost for the self-propelled car, but their advantages for larger motors of standard cars are not so decisive. Motors originally designed for the use of ball bearings would not necessarily cost much more on account of special design, but the price of ball bearings themselves is four or five times the cost of bronze bearings, and their life, without repairs, would not be longer if as long as that of a bronze bearing.

Effect of Impact Resulting from Flat Wheels

A test is being conducted by the mechanical engineering department of Purdue University, Lafayette, Ind., to determine the effect of the impact resulting from flat wheels. These tests cover flat spots of various sizes on wheels carrying definite loads and running at definite speeds. It has been found that an imperfect wheel with a 3-in. flat spot strikes the track with an impact of 104,000 lb. when the car is going 16 m.p.h. and is carrying a load of 20,000 lb. It was also found that under similar conditions a flat spot only 1½ in. in length produced a blow of 20,000 lb., and the impact for spots 2 in. long was 25,000 lb. A standard freight car was mounted in the test laboratory and special apparatus, including an instrument which photographed the magnitude of the blows, was employed to collect test data.

ASSOCIATION NEWS

JOINT COMMITTEE ON OVERHEAD AND UNDERGROUND CROSSINGS

The second meeting of this committee, which is still in the formative period, was held at association headquarters on Nov. 17. The first meeting was held on Sept. 30, and the third is scheduled for Dec. 16 at the same place. The following attended the meeting: Farley Osgood, Public Service Electric Company, chairman; G. W. Palmer, Bay State Street Railway Company, vice-chairman; R. D. Coombs, consulting engineer, New York, secretary; B. T. Anderson, Lackawanna Railroad; C. L. Cadle, New York State Railways; E. B. Katté (represented by deputy) New York Central Railroad; W. T. Oviatt, Narragansett Electric Lighting Company; P. H. Thomas, consulting engineer, New York, and L. S. Weld, Long Island Railroad. The committee discussed plans for its work and organization. It will eventually consist of about twenty representatives of all interests involved in overhead or underground crossing matters. Eventually suggested specifications will be prepared and submitted to the engineering public for criticism. The committee hopes also to be in a position to give advice on crossing problems when requested to do so. The new committee is the outgrowth of a committee of the National Electric Light Association on overhead construction formed in 1911 and subsequently enlarged into a joint committee by the addition of the chairmen of similar committees of other associations.

MEETING OF THE DENVER TRAMWAY COMPANY SECTION

The twenty-first monthly meeting of the section was held on Nov. 19, William M. Casey presiding. The following officers were elected: President, C. B. Wells, superintendent of transportation; vice-president, George L. Rice, superintendent Southern division; secretary-treasurer, H. G. Mundhenk, stenographer transportation department, and director for two years to fill the vacancy created by the expiration of Mr. Wells' term, A. N. Evans, engineering department.

The feature of the meeting was a series of talks by delegates to the Atlantic City convention of the association. Those who spoke at length were John A. Beeler, G. W. Dolezal, W. C. Swisher, E. L. Rice and W. H. Seip. Messrs. Casey, Adams and others took part in the discussion. The attendance at the meeting was 120.

R. H. INGERSOLL ON TELEPHONE DISPATCHING

In our issue for Nov. 21, page 1165, the recent Denver Company Section paper on the above subject by R. H. Ingersoll, chief dispatcher, was mentioned. In this paper the author stated that the dispatching of streets cars on city lines by telephone is the result of an inspiration that came just twenty-five years ago to C. K. Dunham, one of the early superintendents of what is now the Denver City Tramway. He gave interesting details of the work of his department, stating that it requires fifty-four telephones on thirty circuits operated by five men. He compared the dispatching system to the human brain, the driving, directing and controlling element. In the Denver Tramway it is a veritable clearing house for detail. Almost every department touches elbows with the dispatcher at some angle of its work. For example, a track greaser may find stones in the same switch day after day. He reports this to the dispatcher, who notifies one of the company's special officers. Again, the track repair gang and line repairmen keep the dispatcher notified of their whereabouts so that an emergency track or line trouble may be brought to their attention promptly. In case of sudden load, the dispatcher notifies the power house in time to prepare for it, as when heat is to be turned on as indicated by signal from the dispatcher's office. The superintendent of rolling stock provides the dispatcher with a list of cars, plows, sweepers, etc., distributed among the carhouses. He frequently calls upon trainmen for reports as to the condition of sand boxes at the ends of the line. In Denver the conductor pays his motorman and himself every night, keeping the record of the time given the car, trip by trip, by the dispatcher, so that the dispatcher's sheet is the record of every trainman's time for the day.

All of the above matters are incidental to real dispatching. When all cars are reporting on time, the work of dispatching is not difficult, for by long practice the schedules are memorized and the time can be given and put down quickly. The test of the dispatcher comes when nothing is on time. More important than figuring time is the judgment he displays. He must be a good guesser of what the conditions are and what each crew can and will do under those conditions. A dispatcher should have good street car sense combined with an ability to understand conditions and figure the best way out of his difficulties quickly.

The telephone dispatching system affords the superintendent the greatest facility for keeping in touch with every detail of the operation of cars. The flexibility of the car service and the rapidity with which it enables the dispatcher to adjust the headway on any line, are the strongest points in favor of this telephone system. In every city the travel demands the addition of extras in the morning and late afternoon, and by the telephone system the dispatcher can put out and withdraw such trippers without confusion, equalizing the spaces between the regular cars as fast as such extras are put out or withdrawn. Any congestion caused by accident or blockade also may be adjusted without difficulty in the same manner. There is a regular method of pulling down the lines at night, as the load or travel drops off; but if the dispatcher finds that the travel on any line is such as to require increased service, he may hold the full quota of cars, and if necessary use cars which are not needed on other lines. In this way, through the agency of but one or two men, who are alive to the needs of the patrons on all lines, the service is reduced to a minimum.

The use of the telephones employed in this service should be restricted by the dispatcher to those who in their line of duty are interested in the movement of cars, and when the use of the telephone is so limited a certain respect attaches to the messages transmitted and the tendency for small talk is discouraged. This small talk not only keeps someone else from getting in touch with the dispatcher, but it breaks down the wall of respect which should surround the dispatcher's office.

Mr. Ingersoll's paper provoked a lively discussion, and the men who are in contact with the dispatching system gave illustrations of its working and enthusiastically supported the speaker's contention.

The plan of piling the snow along the curb line as is done in Montreal is to be followed by the New York railways during the coming winter, except that in New York a new type of sweeper with an out-board broom will be used instead of the out-board plow of Montreal. The difference is obviously necessitated by the practical absence of sleighs in New York, a circumstance which makes it necessary to remove all snow from the street surface rather than to leave a coating of a few inches.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Equipment Defects—Control Connections —III—Changing Motors from Series to Parallel

BY C. W. SQUIER, E. E.

With straight rheostatic regulation the control connections are comparatively simple as it is necessary only to arrange the circuits, as already described in a previous issue, and provide the means for decreasing the resistance of the circuit. When a series-parallel grouping of the motors is desired, however, it is necessary to provide contacts for making the transition from series to parallel. The control connections then become more complicated.

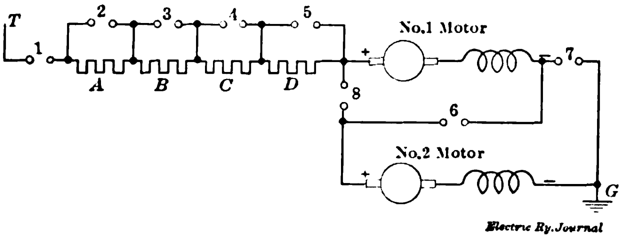


FIG. 7—CIRCUIT DIAGRAM FOR TWO MOTORS

Let us consider what steps are necessary to change the connections of two motors from series to parallel. By referring to Fig. 7, the circuit diagram for two motors, we see that two motors are connected in series by connecting the positive side of No. 1 motor to line through the regulating resistance, the negative side to the positive terminal of No. 2 motor, and the negative terminal to No. 2 motor to ground. To change this to the parallel connection it is necessary to open the circuit between the negative side of No. 1 motor and the positive side of No. 2 motor, and connect the positive side of No. 2 motor to line and the negative side of No. 1 motor to ground. The sequence by which this change or transition is carried out has led to what are called respectively the "open circuit" and the "short-circuited motor" methods.

OPEN CIRCUIT TRANSITION

If, in making the change from series to parallel, we first open the connection No. 6 between the motors, the circuit through both motors is opened so that power will be entirely shut off for a short interval. If the positive side of No. 2 motor is then connected to line by closing contact No. 8, and the negative side of No. 1 motor to ground by closing contact No. 7 at the same time, the change from series to parallel will be completed. This procedure, because the circuit is opened for a short interval, is called the "open circuit" method and is that used with the General Electric Company's Type L controllers. In order to distribute over several sets of contacts the arcing caused by opening the circuit, the circuit is opened at several points at once as at contacts No. 1 and No. 6 in the diagram mentioned. This arrangement provides several so-called series breaks and reduces the burning due to arcing at each point.

Fig. 8 shows a simplified diagram for an open-circuit controller. It is seen that in passing from the last series point to the first parallel point that the circuit is opened at the *T*, 15 and *E* contacts, and when closed again additional resistance is cut in to limit the current per motor to the accelerating value. This controller has five series and five parallel points and is designed to use five groups of parallel regulating resistance. One of this controller's disadvantages is the sudden jerking in the operation of the car when passing from series to multiple because the current is entirely shut off from the motors and the acceleration is stopped momentarily and then suddenly applied. This is uncomfortable to passengers and also throws an additional strain on the equipment. Another disadvantage is the burning of the contacts. The accelerating current is the largest that a controller has to handle under ordinary conditions, and as this type of controller has to open this maximum-current at every operation, it burns more than some other types.

SHORT-CIRCUITED MOTOR TRANSITION

Referring again to Fig. 7, if in making the change from series to parallel part of the regulating resistance is reinstated in the circuit by opening contacts Nos. 3, 4 and 5 after having been cut out for full series operation, and immediately following this the negative side of No. 1 motor is connected to ground by closing contact No. 7, we have No. 2 motor short-circuited. The next step in the transition is to open contact No. 6 and then close No. 8. This connects the motors in parallel with resistance groups *B*, *C* and *D* in the circuit. This way of changing the motors from the series to the parallel combination is termed the shunted motor or short-circuited motor method, and its sequence of connections is intended to overcome the stated disadvantages of the open-circuit method. Its disadvantage however, com-

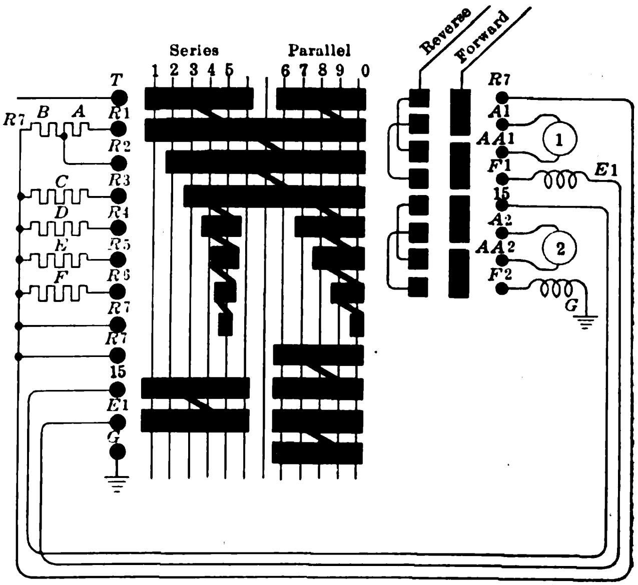


FIG. 8—CONNECTIONS FOR CONTROLLER WITH OPEN CIRCUIT TRANSITION

pared with the open-circuit method, is that a sudden rise in voltage is liable to occur on the first motor because that motor is in circuit for a short time with the resistance that is afterward used with both motors. Short-circuit transition changing from series to parallel is embodied in the design of the General Electric Company's Type K controllers. Fig. 9 shows a simplified diagram for the K-11 controller. This controller has five series and four parallel points and uses four groups of series regulating resistance.

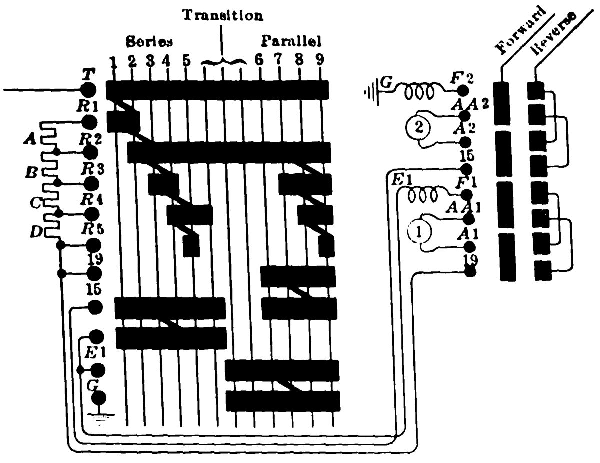
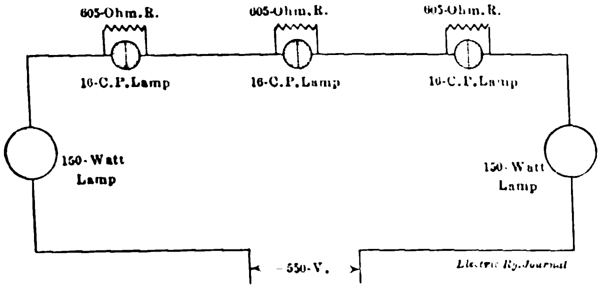


FIG. 9—CONNECTIONS FOR K-11 CONTROLLER

Shunt Resistances Used to Operate Signal and Lighting Lamps on One Circuit

BY J. G. KOPPEL, ELECTRICAL SUPERINTENDENT OF BRIDGES SAULT STE MARIE, MICH.

On a swing bridge used by an interurban electric railway, it was recently necessary to wire up both the navigation signals lamps and the illuminating lamps from the 600 volts d. c. traction circuit. The three signal lamps comprise one at each end and one at the center of the bridge, all of 16-cp rating. For illumination at each bridge end, however, one 150-watt lamp was chosen. The latter two lamps are so arranged that the operator may see the end rails from his cabin, which is located above the track at the center of the bridge.



SHUNT RESISTANCES IN USE TO OPERATE SIGNAL AND LIGHTING LAMPS ON A RAILWAY CIRCUIT

To save conduit and labor in placing all lamps the two 110-volt, 150-watt lamps were wired in series with the three 110-volt, 16-cp lamps to form one circuit on the 600-volt line. However, attention was called to the point that the 150-watt lamps alone would not work in series with the 16-cp lamps. The trouble was overcome by placing a 605-ohm ½-amp resistance in shunt with each 16-cp lamp, as shown in the accompanying diagram. In operation this circuit has proved very satisfactory.

A Serviceable Coal Shovel for Car Stoves

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD (ILL.) & INTERURBAN RAILWAY

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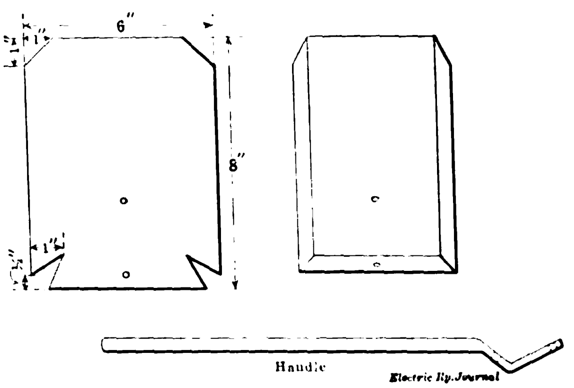

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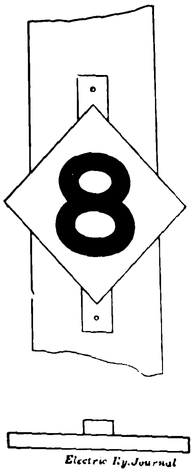
Standard Way Signs Approved by Connecticut Public Utilities Commission

In the inspection of electric street railway lines operated in the State of Connecticut, the Public Utilities Commission found that no uniform system of signs governing the operation of cars had been adopted by the various companies. The commission believes that this lack of uniformity creates confusion on the part of the general public desiring to board or alight from cars and in some cases it may be a possible element of danger. It therefore approved on Oct. 27 as of Oct. 1, 1914, a standard for station, stop, speed limit, slow, warning and whistle signs, as shown in the accompanying drawings. The commission orders and directs the use of such signs by all electric street railway companies operating in the State of Connecticut not later than April 15, 1915. The details of each sign follow:

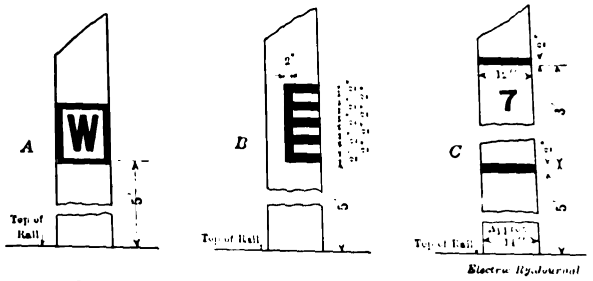
Stop—Face red, letters black, back black.

Slow—Face yellow, letters black, back black.

Whistle—White field, black band, black letter.

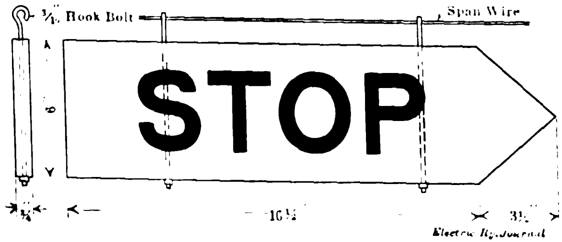


SPEED LIMIT SIGN



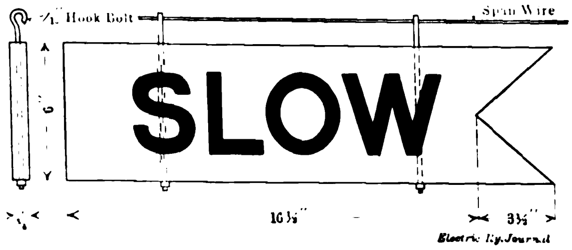
WHISTLE, WARNING AND STATION SIGNS

Speed limit—Face yellow, figures black, back black. Dimensions: Vertical diagonal of board, 13 in.; horizontal diagonal of board, 12 in.; thickness of board, 7/8 in.; height of figures, 6 7/8 in.; nailing strip, 17 in. x 2 in. x 7/8 in.; distance from top of rail to sign, 5 ft.



STOP SIGN

Warning—White bars on black field; four poles away, four bars; three poles away, three bars; two poles away, two bars; one pole away, one bar.

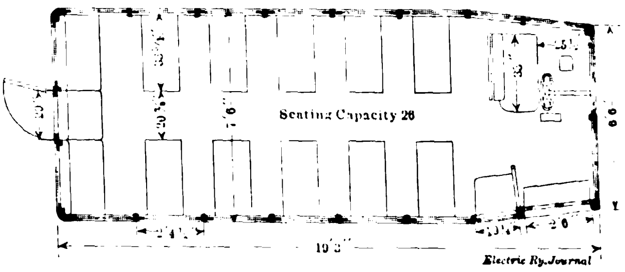


SLOW SIGN

Station—White band, black rings, black figure.

Cleveland Motor Bus for Traffic Development

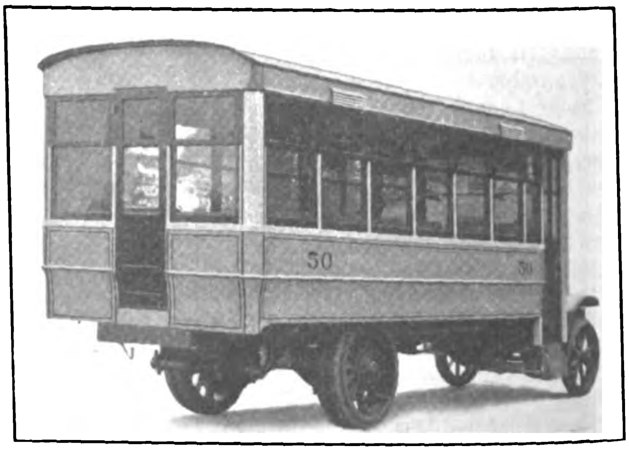
The Cleveland Railway, in acceding to a recent demand for an extension of its lines into a sparsely settled suburban district, substituted motor omnibuses for track and cars. After surveying the territory from which the demand for an extension came, the company had decided that a track extension could not be operated profitably. On the other hand, if some form of transportation service was rendered, it was quite certain that the territory would develop rapidly and soon reach a point where a street railway service could be furnished at a profit. The installation of the motor bus instead of the street car satisfied the community, and even if operation is at a slight loss, or expenses only are made for the time being, the change in policy represents a saving.



CLEVELAND MOTOR BUS—GENERAL PLAN

Three buses were put in operation on Sept. 1, two of which are used in regular service and one is kept in reserve. Since they have been in operation only a short period, complete operating data are not available. The earnings have averaged 24 cents per bus-mile; the platform expense for twenty-six seated passengers has been 30 cents per hour, or about 6 cents per bus-mile. These buses are used in two suburban districts, one in East Cleveland and the other in South Brooklyn, a suburb of Cleveland. The schedules cover an approximate half-hour service.

An exterior view and a floor plan of one of these buses are shown in the accompanying illustrations.



CLEVELAND MOTOR BUS—EXTERIOR VIEW, SHOWING NORMAL NEAR-SIDE ENTRANCE AND EXIT AND EMERGENCY REAR EXIT

A double folding door at the front right-hand corner provides entrance and exit to the body. This door is operated from the chauffeur's seat. The mechanism which opens and closes the door also raises and lowers the step. An emergency door at the center of the rear end of the bus is fitted with a mechanism to permit opening by the passengers. The general dimensions of the body are as follows:

Length over corner posts	19 ft. 3 in.
Width over sills and panels	7 ft. 3¼ in.
Width over posts	7 ft. 6 in.
Center to center of side posts	2 ft. 4½ in.
Height from top of floor over roof	7 ft.

The body is built with an oak bottom framing reinforced with structural steel channels, and the body framing is of ash. Heat is furnished by four Garrison heaters, connected to the engine exhaust and provided with valves for regulation. Four Perry ventilators are also fitted into the letterboard, two on each side of the bus. Two lamp circuits, one over the center of each row of cross-seats, have sockets for 6 cp and 8 cp lamps. These circuits are connected to a storage battery installed at the chauffeur's seat, and to a generator mounted on the chassis. The body is also equipped with hand straps and push-button buzzer system. These buses were designed and built by the G. C. Kuhlman Car Company, Cleveland, Ohio.

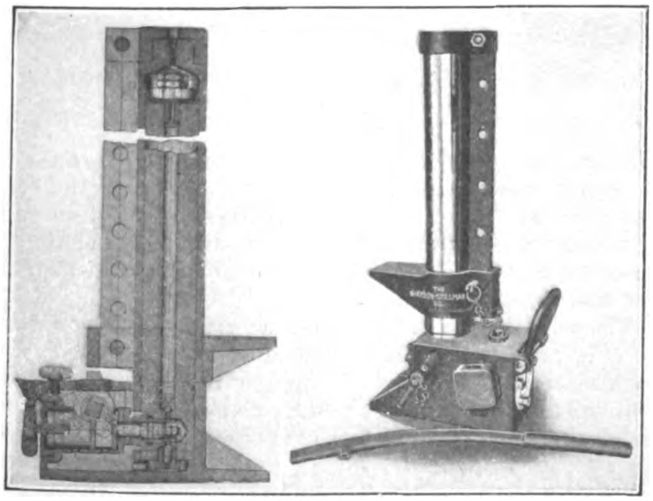
Hydraulic Emergency Jack

The Watson-Stillman Company, New York, has just brought out a new type of hydraulic jack. Primarily the design was intended as an emergency jack for electric railway use, but it will be welcomed by any shop or factory where lifting work is performed. As shown in the accompanying cuts, the following unusual features are embodied in this jack.

The claw can be moved vertically and adjusted to the most convenient height and, with the cylinder, can be swung in a complete circle without changing the position of the jack or of the pump level.

The cylinder is the moving part of the jack instead of the ram, as in the ordinary jack, thus allowing the pump mechanism to stay in a fixed vertical position and permitting the working parts of the jack to be made simpler and more compact.

The piston is packed with leather rings; the valves are of the ball type, and all passages are made so large that the construction is practically foolproof.

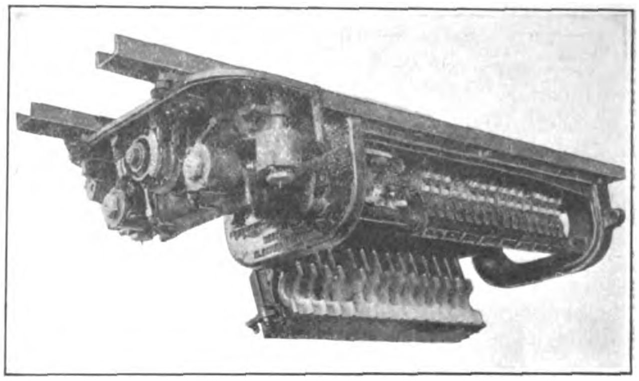


HYDRAULIC EMERGENCY JACK IN SECTION AND COMPLETE

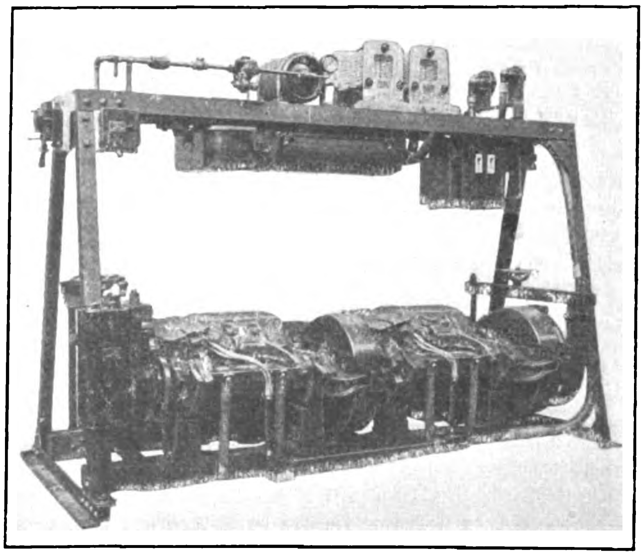
The release of the pressure is by a key operating a small needle valve. Again, while the operating lever is but 18 in. long one man weighing 125 lb. can obtain the maximum pressure with but slight effort. The lever is made curved in shape and the socket has a hole in each of its four sides to allow convenient operation from practically any position. These jacks are operated with a special oil, which, besides acting as a lubricant, prevents rust on working parts, avoids freezing and does not injure the packings. These jacks are now built in 5 and 10-ton sizes with a ram stroke of 10 in. They are guaranteed to stand a 50 per cent overload without detrimental effect to any of their parts.

Unit Switch Control for Platform Type Controllers

To get the many advantages of remote control and yet utilize the existing platform controllers, a very satisfactory pneumatically operated device known as the PK head was brought out some time ago by the Westinghouse Electric & Manufacturing Company for attachment to a standard platform or K type of controller. The head is controlled from the master controller mounted on the platform, thus making possible the mounting of the K controller horizontally under the car with the head attached. A line switch also mounted under the car acting as a circuit breaker and containing two individual unit switches opens the main circuit, thus removing all heavy current-carrying parts from the platform. In the case of double-end control one of the K controllers is removed from the car entirely.



K-TYPE CONTROLLER AS MOUNTED UNDER THE CAR



VIEW OF UNIT SWITCH CONTROL COMPLETE ON EXHIBIT RACK

The essential feature of this equipment is the PK pneumatic operating head which consists of air cylinders with pinion and rack mechanism which rotate the K control drum notch, governed entirely and accurately by the motorman who manipulates the master controller on the car platform.

The apparatus possesses the very decided advantage of introducing a time element in the drum rotation or progress of the K controller. In other words, while it may be rotated or advanced to full series or multiple as rapidly as any operating condition demands, it advances to these positions with a reasonable and desirable time element. This makes it impossible for a motorman deliberately to abuse the equipment. The K controller is employed merely as a commutating switch with a closed circuit, bringing in and cutting out the various resistance steps, but through the cycle of series-parallel operation the drum does not make or break the main circuit. In this way wear and tear on the contacts are eliminated and the danger of welded contacts is removed. This "making" and "breaking" is cared for by the auxiliary two-unit line switch previously mentioned.

The equipment is designed to operate on a maximum air pressure of 70 lb. but will operate at a minimum of 50 lb. of compressed air obtained from the brake system. The master controller is small and compact, and controls the movement of the PK head and consequent acceleration of the car. It is operated, as far as the motorman is concerned, like a type K controller, so that no special instructions are necessary. The line switch, in connection with an overload trip mounted on one of its end frames, takes the place of the usual car circuit breaker. In case of overload or short-circuit the overload trip relay opens the two switches of the line switch and thus cuts off power. Whenever the overload trip operates the line switches cannot be closed again until the trip has been "reset" by moving the control switch to the "reset" position, first placing the master controller in the "off" position, thus preventing abuse by closing the circuit breaker with the type K controller on any running position. When two or more cars are coupled in a train, the PK head on each will operate simultaneously under the direction of the selected master controller in the train.

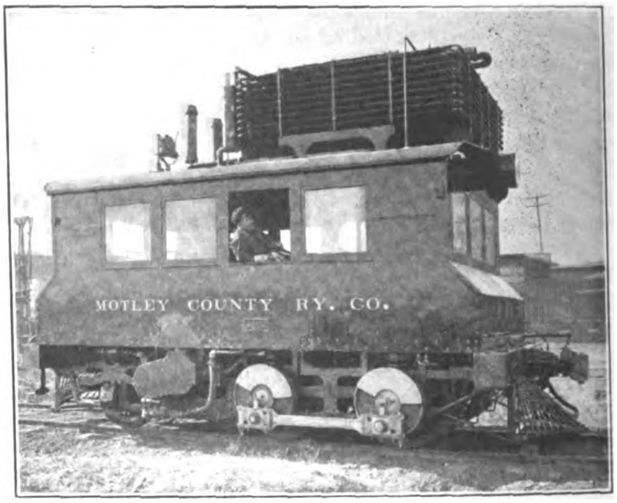
After exhaustive tests on trial equipment this type of control was selected by the Third Avenue Railway, New York, as it successfully met the demands of equipment space limitations and insured perfect safety to passengers. It is also used on 125 cars of the New York City Railway's Broadway division, which has unquestionably the hardest street railway service in the United States.

Gasoline Switching Locomotive for Motley County Railway

The Motley County (Tex.) Railway recently purchased a 300-hp gasoline switching locomotive from the McKeen Motor Car Company, Omaha, Neb. The locomotive made the trip from Omaha to Matador, Tex., under its own power. It is used in freight and switching service between Roaring Springs Junction on the Quanah, Acme & Pacific Railway and Matador, Tex. This locomotive has a tractive effort of 12,000 lb. at 6 m.p.h. The motorman's position in the center and on the right side of the locomotive with an uninterrupted view in all directions, together with the air-reverse control, is far superior to the steam locomotive for signal observation owing to the absence of boiler and tender. Of the general features only the cab resembles the 200-hp locomotives built by the McKeen Motor Car Company, the 300-hp design being in the 0-4-2 class.

The frames are of cast steel and the driving wheels 42 in. in diameter. The usual locomotive spring suspension with equalizers is used. The engine bed is a steel integral casting which forms an efficient brace and reinforcement in tying together one side frame to the other. The all-steel cab covers the entire length of the locomotive frame between the bumper beams and is so bolted to the frames and buffer beams as to add very materially to the strength of the locomotive. The headlights are operated by acetylene. The straight air brake is used on the locomotive, which has a Gregory brake valve to permit the operation of automatic brakes on the train.

The diameter and stroke of the 300-hp six-cylinder engine is 11 in. and 15 in. respectively. Its general design and details correspond to the manufacturer's latest model (foolproof) Type C engine, which is notable for increased water circulation around valves and cylinder heads; tungsten steel valves; piston triple rings; special compound hardened cams; faultless magneto; water-jacketed intake pipes; inclosed flywheel, crankcase and camshaft, water and air pumps driving mechanism; combination splash and automatic lubricating system; gears of herringbone type. Among the new characteristics is the use of two exhaust pipes, which extend through and above the roof. The engine has an air-reversing mechanism which adds materially to the convenience and ease of the motorman. Two 5-in. air compressors are attached to the engine crankshaft, in addition there is an auxiliary air compressor in the cab for emergency service.



GASOLINE SWITCHING LOCOMOTIVE USED BY MOTLEY COUNTY RAILWAY

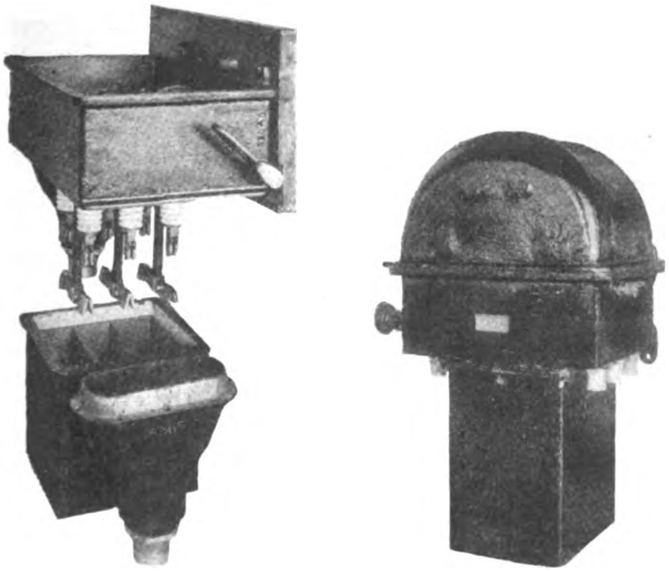
The ends of the front or main driving axle and rear driving axle have counterbalance crank disks which are connected by side rods. The power transmission, pneumatically operated, is effected by means of a sprocket on the crankshaft, through a Morse chain to a sleeve working free on the rear driving axle and is then transferred through a multiple disk friction clutch, from which it is delivered by a Morse chain to the forward driving axle where, by another clutch, the power is either magnified by a series of gears to produce heavy tractive effort and high torque for starting purposes, or is delivered direct to the driving wheels. By thus magnifying the torque of the internal combustion engine great starting effort is obtained for this style of locomotive. At the same time when the locomotive is once in motion, higher economy is obtained by cutting out the gears and operating the direct connection. The general dimensions of this locomotive follow:

Driving wheels, diameter		42 in.
Driving wheelbase	4 ft.	8 in.
Total rigid wheelbase	12 ft.	0 in.
Length over bumper beams	19 ft.	6 in.
Length between pulling faces of couplers	22 ft.	5½ in.
Length over all	22 ft.	11½ in.
Height, rail to top of exhaust pipe	13 ft.	3 in.
Height, rail to top of cab	10 ft.	8 in.
Width over cab	9 ft.	8 in.
Width over cab eaves	10 ft.	0 in.
Center to center of frames	6 ft.	9⅛ in.

Oil Switches for Manhole Service

Two new types of manhole oil switches for mounting on flat vertical surfaces have recently been developed by the General Electric Company. One of the switches is for operating by hand and the other by a solenoid, which is an integral part of the switch. They can be used in locations where there is danger of flooding.

In the hand-operated switch there are two bell chambers through which run the leads to and from the switch. This chamber is of the usual construction and, after the leads are connected to the switch terminals, is filled with an insulating compound and made air tight. The bell chambers, as well as the oil vessel and cover, are cast iron. They are bolted to the cast-iron switch frame, the joints being made watertight by gaskets. The operating handle is outside the frame and can be operated by a hook from the entrance to the manhole. The shaft handle passes through a stuffing box.



MANHOLE OIL SWITCHES FOR HAND AND SOLENOID OPERATION RESPECTIVELY

The solenoid-operated switch as a rule is operated from the central station by the usual control switch located in the station. The mechanism is especially simple, the plunger of the solenoid being connected direct to the crosshead attached to the operating rods. The switch solenoid uses current only while the switch is in the act of closing or opening by means of the tripping coil. The switch is held closed by a catch, which allows the switch to open by gravity when the catch is thrown out of position either by the trip coil plunger or by a small tripping lever located outside the switch frame.

Both hand and solenoid-operated switches have an indicator, which can be seen from the top of the manhole and shows whether the switch is open or closed.

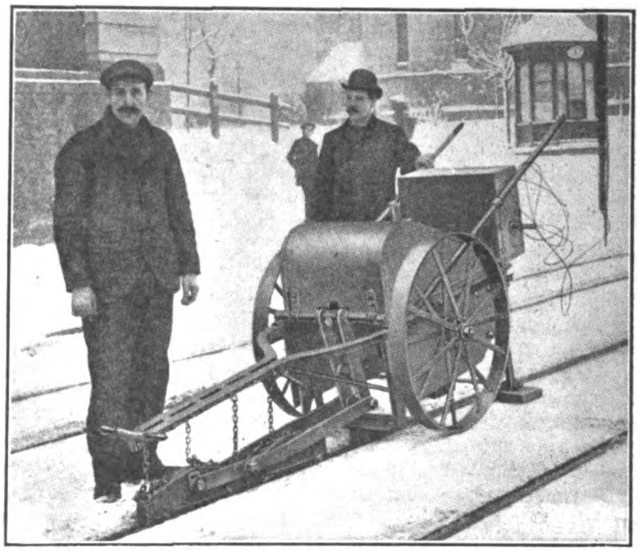
Transite backing has been found a good insulation for the supports of controllers, motors and starting boxes mounted on the steel columns or other metal structures of electric railway shops.

A Light Rail Filing Machine

A light, portable rail filing machine for filing cupped rail joints, corrugations and other rail-head defects has recently been introduced by the U. S. Metal & Manufacturing Company after extended use abroad. A view of this machine as actually used at Trondheim, Norway, is reproduced herewith.

Stress is placed by the builder on the tilting feature which permits bringing the file plane to bear upon and to be raised from the rail in such simple fashion that the work can be undertaken while the cars are running.

The frame of the machine is supported upon two iron wheels. The driving motor and gear are mounted upon the frame. The motor acts by means of a driving rod upon a two-armed swinging lever, on the lower end of which the thrust rod for the file plane is mounted. On the frame a lifting arm or boom projects toward the front, on which arm the file planes are suspended by means of chains. At the rear of the wheels are two supports which can be raised or lowered. If the supports are lowered the rear of the machine is raised and the boom tilted toward the rail in accordance with the bearing surface pressure required upon the file planes.



PORTABLE GRINDER IN USE AT TRONDHEIM, NORWAY

Extra weights can be attached to the file planes when hard rails are to be filed. The starting box and tool box are located at the rear of the machine, between the handles. Either files or carborundum may be employed in filing the rails.

The maximum stroke of the file planes is approximately 19 in.

Boston Subway Entrances and Exits

The Boston Finance Commission has recommended to Mayor Curley that the size of the Cambridge subway entrances and exits on Tremont Street, Boston, be reduced in height and length, subject to the approval of the Boston Transit Commission and the Boston Elevated Railway. The board recommends that the entrance be rebuilt to conform to the type of stairway covering in use at Central Square, Cambridge, and that the escalators be changed to a uniform design. In advices received from the Boston Transit Commission the finance board was informed that the exposure of the escalators to the weather is undesirable on account of injury to the machinery and interference with operation, but the latter board is of the opinion that the size of the coverings can be further reduced without danger to the service.

News of Electric Railways

RICHMOND FRANCHISE GRANT

Company Desires Thirty-Year Grant—Fare Readjustment Asked—Arbitration of Disputes Suggested

As previously noted in the ELECTRIC RAILWAY JOURNAL the Virginia Railway & Power Company, Richmond, Va., has submitted to the City Council a petition and draft of an ordinance under which it offers to surrender its various franchise grants and accept a thirty-year blanket franchise in their place. The present grants have thirteen to fifteen years to run. In its letter of transmissal to the Council the company says that it is to the interest of both the city and the company that the company be granted the right to occupy the streets upon clear and definite terms with one grant covering the whole territory and that the provisions of the grant be as liberal as consistent with the public interests and the retention of proper control and supervision over the streets to the end that the service may be rendered at the lowest operating cost. The company says that the varying dates of expiration of the existing franchises will be a source of embarrassment to the city and that they are already causing inconvenience to the company in perfecting financial arrangements and in the administration of its properties.

The company has prepared a form of ordinance which it is believed will accomplish the results desired. This ordinance is merely a rough draft, in which the effort has been made to conform as far as possible to the provisions of existing ordinances, the idea being to have the draft ordinance as presented constitute a basis for discussion and consideration by the proper committee and by the Council.

The only mortgage lien upon the properties of the company in Richmond is the mortgage of the Virginia Railway & Power Company, dated July 1, 1909, given to secure an issue of $15,000,000 of bonds. Under this lien the company is authorized, with the consent of the trustees, to surrender its franchises and accept in lieu a new grant. Property recited in detail in the draft which the company proposes to transfer and convey to the city is at present valued in excess of $1,000,000. Under existing conditions the company is required to grant a 5-cent straight fare, sell six tickets for 25 cents, provide tickets good between 6 a. m. and 7 a. m. at 2½ cents each and furnish tickets to pupils attending schools and colleges at 2½ cents each. As a result of these rates and the system of transfers in vogue a passenger can ride from any point in the city to practically any other in the city or its suburbs for 4 1/6 cents and at certain hours of the day for 2½ cents. The average fare for passengers carried is 3 cents.

After reciting briefly the conditions under which the rates of fare were fixed and referring to the cost of labor in the various departments of the company for 1914 as compared with 1896 and 1900, the company says:

"It follows from these figures that if the rates of fare fixed in the franchises granted in 1896 and 1900 were reasonable and just, they must be unreasonable and unjust to the company at the present time, when the average length of haul per passenger has practically doubled through growth of suburban territory, and the cost of everything entering into the transportation has increased in excess of 50 per cent, while the rate of fare per passenger carried has actually decreased."

The ordinance submitted by the company suggests no rate of fare. The statement is made that it is hoped that the fares may be fixed upon a basis which will be just not only to the company but enable it to finance its requirements upon a basis favorable to the public and to the public service. It is suggested that provision be made for the readjustment of fares from time to time as changed conditions may require. The company was required under its franchise to pay to the city in 1913 in taxes a total of $179,076, or an amount equal to interest at 4 per cent for the year on approximately $4,500,000. In addition the company sustained a loss on account of the special 2½-cent fare in the morning. In short, the company paid the city in direct taxation and in charges for the benefit of the public an amount in excess of 12 per cent on its gross railway earnings within the city. In addition to this it is required to pay the State franchise tax and the federal income tax. The total taxes and licenses paid by the company in all jurisdictions for the year ended June 30, 1914, was $308,111, which is an increase of $33,522 over the preceding year. This increase is continuing for the present year at the same ratio.

It is suggested that in addition to the payments for paving and repairing the new ordinance provide a tax upon gross receipts in lieu of all other charges. Arbitration is suggested as the method best suited to disposing of such questions as may present themselves for settlement under the grant.

THE CLEVELAND RAPID TRANSIT FRANCHISE

Lack of a quorum is believed to have prevented the Council committee of the whole at Cleveland, Ohio, from going on record in favor of the amended franchise ordinance of the Cleveland Rapid Transit Company on Nov. 20. Councilman Gahn advocated a plan of fixing the purchase price for the city by arbitration. Mayor Baker opposed this plan and said further that a bond to guarantee the beginning of work on the subway within a specified time, suggested by Dr. Charles S. Howe, the president of Case School of Applied Science, would be of little value. He suggested that the ordinance be so amended as to require the expenditure of a certain amount on construction each year. Data collected by City Engineer Hoffman showed that the cost of building the tunnel would be about $551,179 per mile of single track.

At the meeting of the committee on Nov. 18 Dr. Howe charged the company with dilatory tactics and suggested that it be compelled to give a bond of $1,000,000 to insure its commencing work on the subway within the prescribed time. W. R. Hopkins, president of the company, said:

"We not only have not asked for favors, but have rendered a great public service in working out the subway plans. The general idea that we are nursing along something valuable is tragic, it is so untrue. The moment the city indicates that it does not want a subway system, I am ready to quit."

Allen T. Burns, head of the Cleveland foundation survey, suggested that the city retain the right to allow other companies to use the subway. Mr. Hopkins agreed to have this section of the ordinance rewritten. During the debate Mr. Hopkins stated that the idea of building a subway was Tom L. Johnson's and that Mr. Johnson had asked him to go into it as a citizen. He drafted the original ordinance. Everything in relation to the matter has been open and those interested in the amended ordinance may secure any information desired. Now, however, it is his desire, if the city wants the subway, to go before financiers with as nearly a unanimous vote of Council as possible, that they may know that Cleveland really wants faster transportation.

At a meeting of a number of business men with O. C. Barber, Barberton, Ohio, in the law offices of Goulder, Day & White, a proposition to build a freight subway under East Fifty-fifth street to connect the lake front with the upper Cuyahoga Valley was discussed.

SUBWAY LABOR TROUBLES

The Public Service Commission for the First District of New York has adopted the plans and form of contract and began advertising for bids, to be received and opened on Dec. 11, for the construction of Section No. 4 of Routes Nos. 4 and 36, that part of the new Broadway subway in Manhattan extending northerly under Seventh Avenue from Fifty-first Street to a connection with the crosstown part of the line in Fifty-ninth Street.

During the week ended Nov. 21 the Oscar Daniels Company, contractors for Section No. 1 of Route No. 18, suspended work on that contract on account of an acute situation which had arisen in regard to the employment of aliens on the work. The New York labor law provides that on public works no non-citizens shall be employed. Recently the Bricklayers and Masons' Union made complaint to the Public Service Commission that various contractors on the new subways were violating the labor law in this and other particulars, and on Nov. 12 sent letters to several contractors notifying them of such violations and demanding immediate compliance with the law. As the law provides for the forfeiture of a contract in case its provisions are violated, as well as for punishment for misdemeanor, the Daniels Company felt unwilling to take the risk which a continuance of work might bring, especially as a large number of its employees were not citizens. Accordingly, it announced the suspension of work. Meanwhile the Public Service Commission and the subway contractors generally are giving serious consideration to the situation, with the hope that some means may be found to continue work on all contracts. Various contractors have informed the commission that they regard it as impossible to get a sufficient number of American citizens to carry out their contracts, especially in excavation work. A complaint by John Gill, business agent of the Bricklayers and Masons' Union, against the Dock Contractor Company, alleging violation of the labor law, is pending before the commission.

RAILWAYS UNITE AGAINST MAIL RATE LEGISLATION

The Western Association of Short Line Railroads was organized in San Francisco on Nov. 16, when thirty representatives of short-line railroads in California, Arizona, Nevada and Idaho met to consider their common interests in the proposed reduction of rate of payment for carrying United States mail, and their dealings with the Interstate Commerce Commission. It was agreed that all of the smaller railroads in California, Oregon, Washington, Idaho, Montana, Wyoming, Colorado, Utah, Nevada, Arizona and New Mexico should be asked to join the association. Officers elected at the meeting were: D. M. Swobe of the McCloud River Railroad, president; L. G. Cannon of the Nevada Northern Railroad, first vice-president; D. L. Bliss of the Lake Tahoe Railroad, second vice-president; C. M. Oddie of the Nevada Central Railroad, secretary,

The directors are: For three years—D. M. Swobe of the McCloud River Railroad, R. K. Minson of the Arizona & New Mexico Railroad, L. G. Cannon of the Nevada Northern Railroad. For two years—D. L. Bliss of the Lake Tahoe Line, E. N. Heigho of the Pacific & Idaho Northern Railroad, and C. M. Oddie of the Nevada Central Railroad. For one year—R. M. Cox of the Nevada-California-Oregon Railroad, E. O. Burns of the San Diego & Southeastern Railroad, and a representative to be chosen from the Oakland, Antioch & Eastern (Electric) Railway. The committee which is to make the contest for fair payment for carrying the mails, even to sending a representative to Washington, consists of R. M. Cox of the Nevada-California-Oregon Railroad, L. G. Cannon of the Nevada Northern Railroad, C. M. Oddie of the Nevada Central Railroad, E. N. Heigho of the Pacific & Idaho Northern Railroad, and O. W. Lehmer of the Yosemite Valley Railroad. This committee was instructed to oppose actively the Bourne bill and the Moon bill, pending in Congress, either of which will reduce the payments to the small roads by from 25 per cent to 65 per cent.

WESTERN MASSACHUSETTS TRANSPORTATION HEARINGS CLOSED

Final hearings were concluded at Boston, Mass., on Nov. 24 by the commission on transportation in western Massachusetts, which is to report to the Legislature by Jan. 15 next upon possible means of electric railway and highway development in the Berkshire district. L. S. Storrs, C. Q. Richmond and others discussed electric railway conditions in the region west of the Connecticut River and pointed out the possibilities of supplementary service between local electric railways and steam roads. The commission will confer with the Public Service Commission and with other railroad officials before drafting its report.

PLANS FOR RENEWING TOLEDO NEGOTIATIONS

It is expected that Henry L. Doherty, chairman of the board of directors of the Toledo Railways & Light Company, will be in Toledo during the week commencing Nov. 23 to review with his attorneys the tentative franchise recently submitted by the franchise committee.

The proposed franchise is said to contain many of the provisions of the draft prepared by Mr. Doherty early in the negotiations and also some of those offered by the Toledo Citizens' Franchise Association. Under it the company would operate at a straight 3-cent fare for one year, under a commissioner appointed by the city. At the end of that time the fare would be fixed for a term of five years, based upon the experience of the year and the value of the property, as fixed by appraisers named by the city. The fare would then be revised every five years thereafter, if necessary. The committee proposes to allow the company a 6 per cent return on its investment.

Copies of the new franchise will probably not be distributed widely until the various points at issue are thoroughly threshed out at conference between the committee and the company officials. The points upon which the company and city have already agreed will probably not be taken up again. The committee has announced its readiness to resume negotiations at any time.

NEW SEATTLE SALE OFFER

The receivers of the Seattle, Renton & Southern Railway, Seattle, Wash., have offered to sell to the city the portion of the line within the city limits for a consideration of $200,000 in municipal railway bonds, bearing interest at the rate of 4½ per cent, and 20 per cent of the gross earnings of the property for a period of twenty-eight years. The maximum price fixed by the receivers in excess of the $200,000 bonds is $1,300,000. The original offer of the company was to sell for $1,600,000, including the initial payment of $200,000 in bonds, and an annual payment of $1,400,000, or 25 per cent of the gross earnings, for a period of twenty-five years. The Council rejected this offer but decided to submit the proposition to the voters. Corporation Counsel Bradford advised that if the voters refused the proposition the receivers could then go into the courts in the event of a condemnation case with the city, and argued that the city has estimated the value of the line at $1,600,000. The resolution of Councilman Dale, asking the city legal department to request the King County Superior Court to order the sale of the Renton line has been referred to the corporation counsel. The new offer of the company to sell will probably be referred to the Council committee of the whole.

Cost of Electrifying Steam Roads at Cleveland.—E. P. Roberts, smoke inspector, has completed a report of his investigation of the cost of electrifying the steam roads within the city limits of Cleveland, Ohio, and places his estimate between $20,000,000 and $30,000,000. The investigation was undertaken at the request of the City Council.

Third Bay State Arbitrator Chosen.—District Attorney Joseph C. Pelletier of Boston, Mass., has been chosen as the chairman and third member of the board of arbitration which will investigate wages on the Bay State Street Railway. Hearings will begin at Boston on Dec. 17. The company will be represented by Henry E. Reynolds, assistant general manager, and the employees' union by James H. Vahey.

Boston Elevated Employees and Military Duty.—As a result of the service required by the Massachusetts militia at the Salem fire last summer, the Boston Elevated Railway is taking a military census of its employees. Each man with military affiliations is asked to file a blank giving the essential features of his connections so that the company will have definite information as to possible requirements in emergencies which demand the use of troops. A number of employees who were on duty at the Salem fire were not only not hindered in their duties by the company, but were paid in full for time away from Boston in addition to their militia compensation.

Trial Run of New York Municipal Car.—On the afternoon of Nov. 24 a most successful trial run of the first New York Municipal Railway Corporation car was made in Brooklyn for a party of guests including the following: Messrs. Wood (Commissioner), Wilder and Whiston of the Public Service Commission for the First District, New York; Messrs. Hedley and Doyle, Interborough Rapid Transit Company; Messrs. Hazelton and Brinckerhoff of L. B. Stillwell and J. V. Davies of Jacobs & Davies. These gentlemen were chaperoned by Col. Williams and Messrs. Menden, Huff, Meneely, Gove, Siebert, Van Cott, Dempsey, Bullock and other representatives of the New York Municipal Railway Corporation and Brooklyn Rapid Transit System.

Possible Change in the Ohio Public Utilities Commission.—As a result of the recent election in Ohio Edward M. Fullington, former state auditor, and E. L. Lampson, former speaker of the House of Representatives, have been announced as aspirants for the position occupied by E. W. Doty on the Public Utilities Commission of that State. His term expires on Feb. 1, while the terms of the other two members of the commission expire in February, 1917, and February, 1919, respectively. Governor-elect Willis, however, has announced that no appointments will be announced until he has taken office. Mr. Doty is a Republican, but was appointed by Governor Cox at the request of Mayor Baker of Cleveland, both Democrats.

Electrification Urged.—A movement has been inaugurated by the Caldwell Commercial Club, of Caldwell, Idaho, to secure the electrification of the Wilder branch of the Oregon Short Line, extending from Caldwell to Wilder, a distance of approximately 11 miles. It is understood that the Short Line is willing to lease the property for a long term of years to responsible parties and an effort will be made by the Caldwell, Wilder, Greenleaf and Homedale commercial organizations to interest the Caldwell Traction Company in the plant. It is estimated that the cost to electrify the branch and to complete the extensions planned, together with the purchase of additional equipment and the erection of substations, will approximate $100,000.

East Boston Tunnel Toll Situation.—At the request of Mayor Curley of Boston, Mass., John A. Sullivan, corporation counsel, has written all holders of East Boston tunnel bonds, asking them to release the city from its pledge on the face of the bonds that the whole amount of the 1-cent tunnel tolls from passengers on the cars of the Boston Elevated Railway running in the tube shall be used to pay the principal and interest of the bonds. The letter pointed out that if the pledges are waived the city can appropriate $125,000 annually for the foregoing requirements until 1922. The act under which the appropriation is permitted was adopted by a referendum vote at the last Boston city election. There has been a general desire to abolish the 1-cent tolls, which impose a 6-cent fare upon residents of East Boston using the Boston Elevated Railway system, and to transfer the liabilities met by them to the general tax levy. If the bondholders release the city no alteration in fare received by the Boston Elevated Railway will result, as the company has turned over the tolls to the city.

A. N. Brady's Holdings.—The value of the estate of the late Anthony N. Brady is placed at $77,042,443 by Charles M. Friend, personal tax appraiser of Albany County, who filed his report in the surrogate's court at Albany, N. Y., on Nov. 19. Mr. Brady's holdings are particularly interesting on account of the prominent part which he played in public utility affairs. His interest in the Brooklyn Rapid Transit Company consisted of 22,029 shares appraised at $1,935,798. In addition he held $2,385,000, par value, of Brooklyn Rapid Transit 4 per cent bonds appraised at $2,101,383, and $152,000 of Norfolk & Portsmouth Traction Company 5 per cent bonds appraised at $124,196. His holdings of Interborough-Metropolitan common stock amounted to 7392 shares appraised at $116,424. The 1150 shares of Delaware, Lackawanna & Western Railroad stock which Mr. Brady owned were appraised at $221,375. His largest holdings of industrial securities were in tobacco corporations. He held 32,344 shares of American Tobacco common, valued at $6,792,240; 12,844 shares of American Tobacco new preferred, valued at $1,155,960, and 288,335 shares of British American Tobacco, Ltd., valued at $5,190,030.

PROGRAMS OF ASSOCIATION MEETINGS

Pennsylvania Street Railway Association

The Winter meeting of the Pennsylvania Street Railway Association will be held at the Board of Trade Building, Harrisburg, Pa., on Dec. 8 and 9. The meeting will be called to order on Dec. 8 at 1:30 p. m. C. L. S. Tingley, president of the association, will read his address and an address will be made by Prof. Emory R. Johnson of the Public Service Commission of Pennsylvania. This will be followed by the presentation of the report of Henry M. Stein, secretary and treasurer of the association. The session will then be concluded with the following program of papers and reports:

Presentation of problems referred to in the "Question Box," William A. Heindle of the Southern Pennsylvania Traction Company.

Paper, "The Latest Developments in Street Railway Equipment," by W. R. Steinmetz of the Westinghouse Electric & Manufacturing Company.

Report of the committee on preparing and filing rates and tariffs to be presented by C. B. Fairchild, Jr., chairman, statistician with the Philadelphia Rapid Transit Company.

The program for the session on Dec. 9, which will convene at 9:30 a. m., follows:

Paper, by H. S. Swift, treasurer of the West Penn Traction Company. Subject to be announced.

Discussion of "Question Box" problems.

Paper, "Efficiency Through Conservation of Time in Interurban Traffic," by E. C. Spring of the Lehigh Valley Transit Company.

Report of committee on uniform crossing agreement, of which R. P. Stevens is chairman.

Report of committee on height of car steps, of which H. H. Crowley is chairman.

Address by Dr. John Price Jackson, Commissioner of Labor and Industry.

Report of nominating committee and election of officers.

There will be a dinner at the Harrisburg Club on the evening of Dec. 8 for members and their guests.

National Civic Federation

The annual meeting of the National Civic Federation will be held on Dec. 4-5 at the Hotel Astor, New York. On Friday, following the annual address of President Low, there will be fifteen-minute reports from the chairmen of the various departments, including August Belmont on provision for a model uniform workmen's compensation law, John Hays Hammond on the results of an inquiry throughout the country as to the business situation and its effects upon unemployment this winter, and William R. Willcox on the growth of employers' welfare work. On Friday afternoon Prof. J. W. Jenks will review present-day tendencies toward the substitution of governmental action for private enterprise. Ex-Governor Stubbs of Kansas, and Ex-Senator Jonathan Bourne of Oregon, will open the discussion on the question "Shall the Government Own and Operate the Railroads, Telegraph and Telephone Systems and Municipal Utilities?" Ex-Governor Stubbs will take the affirmative and Ex-Senator Bourne the negative side of the question as it relates to railroads, and Congressman David J. Lewis and Dr. Frederick C. Howe will present the affirmative sides respectively of the question as it relates to telegraph and telephone systems and municipal utilities. The negative side of the two latter subjects will be taken up by speakers yet to be named.

The session on Saturday morning, Dec. 5, will be devoted to the question of social insurance. George W. Perkins, chairman of the department, will preside. There will be a report of the commission sent to Europe by the Federation in the early summer to study sickness and unemployment insurance and old-age pensions. At the close of this session there will be a luncheon under the auspices of the workmen's compensation department at which will be discussed problems arising in connection with the operation of the workmen's compensation acts now in force in twenty-five states.

The afternoon session on Saturday will be devoted to the consideration of the questions of our preparedness for war and our duties under the Hague conference.

Financial and Corporate

ELECTRIC RAILWAY EARNINGS

Figures of Representative Railways for September Show a Slight Decrease in Earnings on Account of War and General Business Conditions

The figures for gross and net earnings of electric railways in the United States for the month of September, 1914, in comparison with the same month of the previous year, as calculated by the ELECTRIC RAILWAY JOURNAL, show that the present business situation in this country brought about by the European war and by internal conditions has caused a slight aggregate decrease in earnings. This has not been widespread, however, as the accompanying table will show. This table, compiled from returns from fifty-three representative electric railways well divided geographically and also well differentiated as regards city, city and suburban, and interurban service, indicates that all sections and classes of lines secured increased gross and net earnings during the month in question, with the exception of the city lines in the East, the city and suburban lines in the South and the city lines in the Central section. Owing to the lack of monthly reports from Western companies it is impossible to report fully for these in September, but the returns from two companies in the Northwest testify to the fact that the business depression felt there for some time was still in progress.

Of the fifty-three companies examined, twenty-nine showed decreases in gross earnings for September, 1914, as compared to September, 1913, and twenty-seven companies suffered decreased net earnings. Of the twenty-three city lines covered by the table, thirteen showed decreases; of the sixteen city and suburban lines, eight showed decreases, and of the fifteen interurban lines, eight showed decreases—in most cases in both gross and net. Two companies, a city and an interurban line in the South, reported decreased gross revenues but increased net revenues. The total decrease in gross earnings for all the companies examined was 1.40 per cent, which was divided as follows over the four sections of the country: East, 0.93 per cent; South, 0.19 per cent; Central, 0.04 per cent; West, 7.7 per cent. If the figure for the West is eliminated on account of unequal returns the total decrease in gross earnings for the remaining sections is about 0.87 per cent. The aggregate net earnings decreased 2.24 per cent, which amount was made up by a 2.46 per cent decrease in the East, a 2.2 per cent increase in the South, a 0.64 per cent decrease in the Central section and a 13.1 per cent decrease in the West. Without the two Northwestern lines, the aggregate net earning decrease was 1.24 per cent.

The 0.93 per cent decrease for the Eastern companies was largely the result of a decrease of 1.4 per cent for large metropolitan lines. Of the seven city lines examined, only three showed increases. Increases were reported for city and suburban lines, however, amounting to 3.8 per cent, while the Eastern interurban lines had an aggregate increase in gross receipts of 1.9 per cent, only one line seeming to have been affected by conditions leading to metropolitan decreases. The total decrease in net earnings for the Eastern lines was 2.46 per cent, which was brought about in spite of a 9.4 per cent increase for city and suburban lines and a 5.7 per cent increase for interurban lines by a decrease of 4.1 per cent for metropolitan lines.

The best showing in the South was made by the city lines with a reported increase in gross earnings of 2.9 per cent and in net earnings of 8.2 per cent. Although interurban lines in Texas secured an increase of 0.5 per cent in gross earnings and 5.7 per cent in net earnings, there was an aggregate decrease of 0.19 per cent in gross earnings caused by a decrease of 2.5 per cent for city and suburban lines in Kentucky, Tennessee, Florida, Georgia and Virginia. Moreover, the 2.8 per cent decrease in net earnings on this class of lines in these states was sufficient to lower the aggregate net earning increase to only 2.23 per cent.

The most satisfactory record for September in the Central section was held by interurban lines as a class, which had an increase in gross earnings of 2.7 per cent and in net earnings of 2.9 per cent. A closer examination of this figure, however, shows that of the six interurban lines covered, five showed decreases in both gross and net earnings, but this condition was remedied in the aggregate by the large increase in gross and net earnings on a large system in Illinois. The gross earnings of city and suburban lines increased 0.5 per cent and the net earnings 0.6 per cent. Four of the six city lines reporting suffered decreases, giving a total decrease in gross earnings of 1.5 per cent and in net earnings of 3.3 per cent and reducing the aggregate showing for the Central section to a 0.04 per cent decrease in gross earnings and a 0.64 per cent decrease in net earnings. The city line decrease was lowered by a substantial increase in gross and net earnings for a large company in the milling district.

The above figures of course prove nothing conclusive in regard to the entire industry on account of the comparatively small number of reports. If monthly reports were obtainable from all electric railways it might be shown that a smaller percentage of the companies had suffered decreases in both gross and net earnings during September. On the other hand, the showing might be worse. Part of the industry has undoubtedly been affected by the present business decline, mostly through the closing down of industrial plants and the subsequent cutting off of traffic by employees. Yet in view of the facts that public utilities are more immune to business depression than are industrials or steam railroads, and that the slight losses now felt should be quickly recovered in the expected business revival, the outlook is by no means discouraging.

TABLE SHOWING PERCENTAGE OF INCREASES OR DECREASES IN GROSS AND NET EARNINGS OF FIFTY-THREE REPRESENTATIVE ELECTRIC RAILWAYS FOR SEPTEMBER, 1914 AND 1913

	East	South	Central	West
City Lines:				
Gross	1.4 d	2.9	1.5 d	...
Net	4.1 d	8.2	3.3 d	...
City and Suburban Lines:				
Gross	3.8	2.5 d	0.5	7.7 d
Net	9.4	2.8 d	0.6	13.1 d
Interurban Lines:				
Gross	1.9	0.5	2.7	...
Net	5.7	5.7	2.9	...
Aggregate:				
Gross	0.93 d	0.19 d	0.04 d	...
Net	2.46 d	2.23	0.64 d	...

NOTE—The letter d denotes decrease.

COLUMBUS AND GRAND RAPIDS COMBINATIONS

The consolidation of the Columbus Light, Heat & Power Company with the Columbus Railway, Power & Light Company is assured, as more than two-thirds of the outstanding stock of the two concerns has approved the plan, which was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 14. Steps will be taken immediately to complete the merger of the properties. The stockholders of the Columbus Light, Heat & Power Company will receive what they originally demanded, one share of series "A" preferred for one share of their preferred, and one share of series "B" preferred for one share of their common. It is expected that the consolidation of the two companies will be completed before the close of the year. This action will bring all the lighting, power and heating properties in Columbus into one concern.

The Consumers' Power Company, which is controlled by the Commonwealth Power, Railway & Light Company through complete stock ownership, has applied to the Michigan Railroad Commission for authority to merge the following eleven companies, all of whose stocks and bonds are owned by it: Flint Electric Company, Pontiac Power Company, Saginaw Power Company, Bay City Power Company, Consumers' Power Company (Michigan), Economy Power Company, Au Sable Power Company, Central Power Company, Commonwealth Power Company, Grand Rapids-Muskegon Power Company and the Grand Rapids Edison Company. This merger, which is similar to the previous combination of the gas interests of the Commonwealth Power, Railway & Light Company, will result in making the Consumers' Power Company of Maine an operating instead of a holding company and will effect economies in administrative expenses and taxes, particularly the federal corporation tax. It is stated that the capitalization of the Consumers' Power Company of Maine will not be increased by the merger, the $13,930,000 of bonds of the companies being all deposited as collateral for the first lien and refunding 5 per cent bonds of the Maine company. Bonds of the latter company have been issued to a total of $12,936,000, (including $610,000 to be presently issued), $2,724,000 additional are held in escrow to take up additional bonds and a further amount is reserved for extensions.

D. E. Pomeroy, vice-president of the Bankers' Trust Company, New York, has been elected a director of the Commonwealth Power, Railway & Light Company, succeeding Benjamin Strong, Jr., resigned.

ANNUAL REPORT

Spokane & Inland Empire Railroad

The comparative statement of income, profit and loss of the Spokane & Inland Empire Railroad, Spokane, Wash., for the years ended June 30, 1913 and 1914, follows:

	1914	1913
Operating revenues:		
Freight	$310,930	$336,813
Passenger	483,192	565,703
Street railway system	541,618	550,046
Other revenue	195,910	164,219
Total	$1,531,650	$1,616,781
Operating expenses:		
Way and structures	$257,284	$226,161
Equipment	134,931	179,958
Traffic	21,759	24,935
Conducting transportation	497,006	512,139
General and miscellaneous	151,724	157,322
Total	$1,062,704	$1,100,515
Net operating revenue	$468,946	$516,266
Taxes accrued	150,000	147,000
Operating income	$318,946	$369,266
Other income—miscellaneous	3,840	4,936
Gross income	$322,786	$374,202
Deductions:		
Interest on funded debt	$238,513	$241,542
Interest on unfunded debt	214,427	210,190
Miscellaneous	425	999
Total	$453,365	$452,731
Deficit	$130,579	$78,529

The operating revenues of the company decreased as follows during the year: Interurban freight, $25,883, or 7.7 per cent; interurban passenger, $82,551, or 14.6 per cent, and street railway system in Spokane, $8,428, or 1.5 per cent. The interurban passenger decrease is attributed partly to the withdrawal of the Alan race meet on the Coeur d'Alene division, but mostly to the general business depression. Other revenue, mainly from the sale of power, increased $31,691, or 16.1 per cent, giving a total decrease of 5.3 per cent. Operating expenses for way and structures increased $31,122, or 13.8 per cent, but other expenses showed the following decreases: Equipment, $45,027, or 25 per cent; traffic, $3,175, or 12.7 per cent; conducting transportation, $15,133, or 3 per cent, and general and miscellaneous, $5,598, or 3.6 per cent. The total decrease amounted to 3.4 per cent. The net operating revenue decreased $47,320, or 10.1 per cent. Taxes accrued increased $3,000, but the gross income decreased $51,416, or 13.9 per cent, and the deficit increased $52,049, or about 70 per cent. The operating ratio increased from 68.07 to 69.38, and the ratio of taxes to operating revenue increased from 9.09 to 9.79.

During the year the total expenditures for additions and betterments amounted to $152,487. The annual report calls attention to a heavy profit and loss charge of $558,255, in which connection it recalls that, effective July 1, 1914, the Interstate Commerce Commission ordered that all electric railways accrue depreciation on equipment but granted permission to carriers who had not set up reserves for accrued depreciation during the life of the equipment to charge to profit and loss that portion of the actual loss from depreciation equitably assigned to the period prior to July 1, 1914. A charge of $483,010 was made, therefore, to bring the depreciation up to date. In the future regular monthly charges to operating expenses will be made in accordance with the uniform system of accounting for electric railways prescribed by the commission.

Regarding general conditions in the Northwest, the report states that the lumber trade remains quiet, and the growing automobile competition is affecting the company's passenger business. The tributary country, however, is steadily developing and the crops are very satisfactry. With a continued decrease in the cost of operating the property and the promise of better conditions, the outlook is favorable.

The total interurban mileage of the company is divided as of June 30 into 176.684 miles for main line, 18.225 miles for second track and 42.472 miles for yard tracks and sidings. In a similar manner the mileage of the city traction lines in Spokane is made up of 35.535 miles for main line, 12.087 miles for second track and 5.569 miles for yard tracks and sidings.

READJUSTMENT PLAN IN IDAHO

The Priest committee of holders of the first and refunding mortgage bonds of the Idaho-Oregon Light & Power Company, which is controlled by the Idaho Railway, Light & Power Company, Boise, Idaho, in a recent circular letter said that the foreclosure sale of the lighting property is set for Dec. 1 at Boise. While a considerable number of creditors' actions are still pending to have claims paid ahead of the mortgage, the status of these has been in part decided so that their relation to the plan can be dealt with. The committee's action in setting aside the validity of $718,000 of bonds has been decided in its favor, and an additional $107,000 of bonds, in a suit not yet decided, is conceded to be held by the railway only as collateral for possible claims up to $24,400. There are $2,494,000 of valid outstanding bonds entitled to participate in the proceeds of the sale, and of these more than 83 per cent are deposited with the committee.

The committee states that it is necessary to provide a substantial amount of cash to take up the receivers' certificates, to pay whatever claims may be allowed as preferred, to pay unassenting bondholders, cost of foreclosure and the like, and to make adequate provision for future development. It is planned to authorize several new security issues after the foreclosure sale. These include, first, $5,000,000 of first mortgage twenty-year gold bonds with interest at 6 per cent or such less rate as may be from time to time determined on successive issues, of which it is proposed to issue at once an estimated maximum of $800,000 to provide cash for the reorganization and for immediate needs. An additional $513,000 is reserved to retire divisional bonds at or before maturity; $637,000 is applicable to capital requirements under certain restrictions and the remaining $3,000,000 is afterward issuable for not more than 80 per cent of the cost of future additions. There will also be authorized $3,500,000 of general mortgage bonds at 3 per cent interest for the first five years and 6 per cent thereafter, of which an estimated amount of $2,100,000 is to be immediately issued to provide for all the bonds participating in the reorganization. The bonds will be held under a closed mortgage when the reorganization is complete. Cumulative 6 per cent preferred stock will have a total present estimated issue of $283,500 issuable to reimburse the holders of the present first and refunding mortgage bonds for $135 of interest unpaid. Non-cumulative 6 per cent preferred stock of a present estimated issue of $616,500 will be issued to provide $400 for each bond participating in the reorganization, and other issues will be made only for cash or property. There will be an authorized issue of $5,000,000 of common stock.

For each first and refunding mortgage bond participating in the reorganization, it is proposed to issue $1,000 of general mortgage bonds, about $135 of cumulative 6 per cent preferred stock, $400 of 6 per cent non-cumulative preferred stock and $800 of common stock, or a total of $2,335. The committee, however, reserves the right to modify the plan under certain restrictions.

The Krech committee of holders of the first and refunding mortgage bonds in a circular letter dated Nov. 16 objected to the above plan on account of the following reasons: (1) Doubt as to the accuracy of estimated net income; (2) insufficient provisions for immediate cash requirements; (3) continuance of destructive competition; (4) probable sale of property at auction at a price to give the bondholders the actual value of their bonds; (5) liens against bonds deposited with Priest committee aggregate more than 10 per cent of par value, and (6) failure of the committee to file a certificate of its cost, expenses, etc. It is stated that the estimate of the Priest committee is $2,060,000 for the value of the property, against which are underlying liens of $513,000 and proposed new issues of prior lien bonds, $800,000; general mortgage bonds, $2,100,000; preferred stock, $900,000 and common stock, $5,000,000. The Krech committee assumes that the property will not sell for more than $2,000,000. This committee states that the real cause of present conditions is too much power and too few customers, while the Priest committee asserts that the growth of business has been steady and substantial in spite of the general business depression in the Northwest, and desires to make adequate provision for future development.

Alabama Traction, Light & Power Company, Ltd., New York, N. Y.—Suits have been filed in the courts of Chilton and Shelby Counties, Ala., against the Alabama Power Company, the stock of which is owned by the Alabama Traction, Light & Power Company, for alleged damages aggregating more than $500,000 on account of the big lake created by the dam along the Coosa River.

American Public Service Company, New York, N. Y.—The gross earnings of the American Public Service Company for the twelve months ended July 31, 1914, were $397,672. The operating expenses and taxes totaled $260,224, leaving net earnings of $137,448. Bond interest paid and accrued amounted to $68,793, giving a balance for the period of $68,654. The above gross earnings and operating expenses and taxes compare with respective amounts of $369,285 and $248,341 for the twelve months ended Dec. 31, 1913. The American Public Service Company through its constituent companies operates various electric light and power, ice, water works and gas properties, mostly in Texas, as well as the Marshall (Tex.) Traction Company.

Androscoggin Electric Company, Lewiston, Maine.—The Androscoggin Electric Company, recently formed by the consolidation of the Lewiston & Auburn Electric Light Company and the Portland & Lewiston Interurban Railroad (organized as the Portland, Gray & Lewiston Railroad), as noted in the ELECTRIC RAILWAY JOURNAL of Oct. 31, has filed a mortgage to the United Safe Deposit & Trust Company, Portland, Maine, as trustee, to secure not to exceed $5,000,000 of first and refunding mortgage 5 per cent bonds, dated Oct. 26, 1914, and due on Oct. 1, 1934, without option of earlier redemption. The present issue is to be $1,800,000, of which $1,200,000 is reserved to retire at or before maturity the same amount of first mortgage 5's of the Lewiston & Auburn Electric Light Company, due on June 1, 1939, but callable at 105. The additional bonds are reserved for 80 per cent of the cost of future extensions. The officers of the new company are as follows: President, William T. Cobb, Rockland, Maine; secretary-treasurer, Julius Parkhurst, Lewiston, Maine; directors, William T. Cobb, Rockland, Maine; Maynard S. Bird and Hugh J. Chisholm, Portland, Maine; Harold Libbey and A. A. Libbey, Lewiston, Maine.

Christchurch (New Zealand) Tramway.—The revenue account of the municipally operated Christchurch Tramway for the year ended March 31, 1914, showed gross earnings from operation of £137,567 and operating expenses of £76,668. After deducting £25,683 for interest, £2,734 for sinking fund and £27,389 for reserve funds and allowing for £1,718 of rates from special areas there remained a net surplus of £6,810. The earnings increased £3,286, or less than 2½ per cent, but the operating expenses decreased £3,081. The operating ratio of 55 per cent is the record for Australasia. The saving came from keeping the service within stricter limits. the number of car-miles run being 2,162,769 (including 89,777 of extensions) as compared to 2,125,566 in the previous year. It is announced that the work of electrifying the North Beach line will soon be completed.

Georgia Railway & Electric Company, Atlanta, Ga.—The Georgia Railroad Commission has authorized the Georgia Railway & Electric Company to issue $160,000 of refunding and improvement mortgage forty-year 5 per cent sinking fund gold coupon bonds to cover expenditures made from Jan. 1 to June 30 for extensions and betterments.

Interurban Railway & Terminal Company, Cincinnati, Ohio.—At the recent annual meeting of the Interurban Railway & Terminal Company C. H. Worthington, C. J. Williams, Charles M. Leslie, M. Ackerman, A. F. Maisch and J. M. Hutton were chosen as members of the board of directors. The following officers were elected: C. H. Worthington, president; Charles M. Leslie, vice-president; C. J. Williams, secretary-treasurer, and Frank Dinsmore, general counsel.

Lehigh Traction Company, Hazelton, Pa.—The Lehigh Traction Company, which defaulted June 1 on the semi-annual interest on its first mortgage bonds, will again fail to make payment on Dec. 1, according to a letter to bondholders from N. C. Yost, treasurer of the company. Instead of paying the interest the company transmits an offer from Alvan Markle, president, to purchase the December interest coupons for his personal account if presented on or before Jan. 1. Mr. Markle made such a proposition in regard to the June coupons, which was accepted by virtually all the bondholders upon the recommendation of the protective committee. This protective committee is now advising bondholders that it will not recommend the acceptance of the purchase offer in the case of a second default. The company states that it has just resumed operations after an eight months' strike, and although the traffic is approaching its normal volume, the demands of operation require that all resources be utilized in that direction. The company under terms of the mortgage is allowed six months' grace before legal action can be taken on default.

Melbourne Tramway & Omnibus Company, Ltd., Melbourne, Australia.—The report of the Melbourne Tramway & Omnibus Company for the year ended June 30, 1914, shows tramway receipts of £766,426, an increase of £15,335, and omnibus receipts of £1,793, a decrease of £265, or total receipts of £768,219, an increase of £15,070. After paying maintenance expenses of £69,184, salaries of £29,177, wages of £264,904, interest of £74,250, dividends of £192,000, and other miscellaneous items, the company had left a balance of £152,006. From this the directors propose to pay a final bonus on the stock of £96,000, leaving £56,006 to be carried forward. The tramways carried 91,438,777 passengers during the year, and the omnibuses 430,008, a total of 91,868,785 and an increase of 2,016,022 over the previous year.

Mexico Tramways, Mexico City, Mexico.—For the calendar year 1913, the earnings of the Mexico Tramways from traffic amounted to approximately $3,266,734 in gold and miscellaneous earnings totaled $61,077, giving total earnings of $3,478,811. Operating and general expenses amounted to $1,190,175, maintenance expenses $370,806, taxes $56,016, giving gross profits from operation of $1,861,815. Rentals and fixed charges to subsidiary companies under leases, less amounts received as interest and dividends on securities held, amounted to $279,437, leaving a balance of $1,582,378 to be transferred to the profit and loss account at the head office in Toronto. After adding the balance from the previous year of $1,462,928, and deducting current expenses and fixed charges amounting to $1,473,419 and four quarterly dividends at the rate of 7 per cent, there was left a balance for the year of $1,382,967. The operating ratio for the year was 46.48 per cent compared to 47 per cent in 1912. At the end of 1913 the tramway system comprised 213.5 miles of single track, of which 204.087 miles were operated by electricity and 9.445 miles by mules. The total cash passengers carried during the year was 94,397,044.

Northern Electric Company, Chico, Cal.—A. Bonnheim, chairman of the protective committee of eight recently appointed by the convention of bankers to devise a feasible plan for the protection of the Northern Electric Railway and its creditors, denies that there is any intention of selling the company to the Atchison, Topeka & Santa Fé or any other concern. Stockholders believe that the road can be put on a sound financial basis in two years under proper management. The line has been earning $200,000 yearly above traffic expenses, but this sum did not cover the interest charges.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—All of the outstanding first mortgage ten-year 5 per cent bonds of the Portsmouth Street Railroad & Light Company have been called for payment at 102 and interest on Jan. 1 at the Bankers Trust Company, New York.

Public Service Corporation, Newark, N. J.—The Public Utilities Commission of New Jersey has authorized the Public Service Gas Company, a subsidiary of the Public Service Corporation, to increase its outstanding capital stock from $10,000,000 (all owned by the Public Service Corporation) to $10,750,000.

Southern Pacific Company, San Francisco, Cal.—The Southern Pacific Company has filed an application with the California Railroad Commission, asking authority to issue $1,170,000 of equipment trust certificates. The money is to be used for the purpose of purchasing the following equipment: twenty passenger locomotives, ten switching locomotives, fifty steel passenger coaches, twenty-two electric motor coaches and two electric motor combination coaches and express cars. The equipment trust certificates will mature in ten equal instalments.

West End Street Railway, Boston, Mass.—At the annual meeting of the stockholders of the West End Street Railway on Nov. 24 it was voted to increase the capital stock by the issuance of 13,000 shares, par value $50. The proceeds are to be used to pay the Boston Elevated Railway for the cost of additions and improvements made to the property during the year. The retiring directors were re-elected.

DIVIDENDS DECLARED

Citizens' Traction Company, Pittsburgh, Pa., $1.50.

El Paso Electric Company, El Paso, Tex., preferred (No. 25), 3 per cent; quarterly, 2¼ per cent, common.

Manhattan Bridge Three-Cent Line, Brooklyn, N. Y., quarterly 1½ per cent.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1¼ per cent, common.

Rochester Railway & Light Company, quarterly, 1¼ per cent, preferred.

Washington Railway & Electric Company, Washington, D. C., quarterly, 1¼ per cent, preferred; quarterly, 1¾ per cent, common.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis., quarterly, 1¾ per cent, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
AMERICAN RAILWAYS, PHILADELPHIA, PA.					
1m., Oct., '14	$449,551	......	......	......	......
1 " " '13	452,428	......	......	......	......
4 " " '14	1,949,104	......	......	......	......
4 " " '13	1,953,075	......	......	......	......
ATLANTIC SHORE ELECTRIC RAILWAY, SANFORD, MAINE					
1m., Oct., '14	$27,184	$26,025	$1,160	$623	$537
1 " " '13	25,420	25,003	417	654	†237
BATON ROUGE ELECTRIC COMPANY, BATON ROUGE, LA.					
1m., Sept., '14	$14,332	*$9,385	$4,948	$2,087	$2,861
1 " " '13	14,254	*9,847	4,407	2,127	2,280
12 " " '14	177,279	*115,159	62,120	25,182	36,938
12 " " '13	156,427	*96,083	60,343	23,647	36,696
BROCKTON & PLYMOUTH STREET RAILWAY, PLYMOUTH, MASS.					
1m., Sept., '14	$13,080	*$9,240	$3,840	$1,105	$2,735
1 " " '13	12,091	*8,340	3,751	1,069	2,682
12 " " '14	120,480	*100,965	19,515	12,845	6,670
12 " " '13	125,222	*96,400	28,822	13,049	15,773
CAPE BRETON ELECTRIC COMPANY, LTD., SYDNEY, N. S.					
1m., Sept., '14	$27,773	*$17,817	$9,956	$6,397	$3,559
1 " " '13	32,516	*16,956	15,560	6,082	9,478
12 " " '14	367,115	*210,435	156,681	76,218	80,463
12 " " '13	373,223	*203,762	169,461	71,449	98,013
COLUMBUS (GA.) ELECTRIC COMPANY					
1m., Sept., '14	$59,676	*$25,716	$33,961	$28,812	$5,169
1 " " '13	50,685	*22,186	28,499	24,601	3,898
12 " " '14	664,645	*280,648	383,996	313,304	70,693
12 " " '13	638,691	*293,129	345,562	255,029	90,533
EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.					
1m., Sept., '14	$216,514	*$130,542	$85,972	$63,992	$21,980
1 " " '13	232,446	*135,329	97,117	49,748	47,369
12 " " '14	2,718,761	*1,699,872	1,018,889	655,766	363,123
12 " " '13	2,646,837	*1,511,370	1,135,467	587,738	547,729
GRAND RAPIDS (MICH.) RAILWAY					
1m., Sept., '14	$108,327	*$74,706	$33,621	$13,690	$19,931
1 " " '13	112,753	*74,251	38,502	8,968	29,534
12 " " '14	1,288,300	*833,073	455,227	159,440	295,787
12 " " '13	1,283,496	*780,952	502,544	172,549	329,995
LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE.					
1m., Sept., '14	$67,326	*$40,914	$26,412	$15,550	$10,862
1 " " '13	64,139	*38,647	25,492	15,630	9,862
12 " " '14	673,618	*462,414	211,204	184,676	26,528
12 " " '13	668,841	*414,878	253,963	177,643	76,320
PORTLAND (MAINE) RAILROAD					
1m., Sept., '14	$95,122	*$53,522	$41,600	$19,555	$22,045
1 " " '13	90,286	*55,687	34,599	16,503	18,096
12 " " '14	1,038,223	*641,664	396,559	256,549	140,010
12 " " '13	1,030,896	*708,200	322,696	144,736	177,960

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*Includes taxes.
†Deficit.

Traffic and Transportation

DECISION IN CONNECTICUT FARES AND SERVICE CASE

Commission Rates Safety Ahead of Good Service and Rules on Fares

The Connecticut Public Utilities Commission has issued its finding in the case of the petition of citizens of Meriden alleging inadequate service and unreasonable rates. The finding follows in part:

"On that part of the complaint relating to service, the commission is unable to find from the testimony any grounds for belief that conditions in Meriden are materially inferior to those on other divisions of the Connecticut Company system of equal importance. A certain amount of overcrowding undoubtedly exists here as at other places during the so-called rush hours and this is, to some extent, excusable on account of the nature of street railway traffic, the demands upon the company's equipment fluctuating. Safety is paramount in street railway operation, good service follows next in line of importance and every reasonable effort should be made to handle the passenger traffic expeditiously and comfortably at all times. Occasional failure to meet exceptional demands is not a justification for a general order requiring better or more frequent service.

"The Connecticut Company has not so failed except in a few instances on the Middletown line, and assurances were given that within a short time the company intended to revise the schedule on this line. As to the other matters of service, notably the lack of double-truck cars and flat wheels on some of the cars, the company had already remedied conditions by the installation of four additional serviceable cars, had improved conditions as to flat wheels whenever complaint had been made and was disposed to make further improvements now that specific attention had been called to certain cars. Under the foregoing conditions the commission does not feel warranted in issuing a formal order to the respondent on matters of service.

"On the question of rates between the towns of Meriden and Middletown, and Meriden and Wallingford, the commission is of the opinion that the petitioners have not justified their request for a reduction of the rates by a granting of transfers in the first case, and by reduction from 15 cents to 10 cents in the other case. In neither of these instances, taking into consideration the transfer privileges on the Wallingford line, does the average rate of fare appear to vary much from 1½ cents per mile, and the commission would not feel warranted, on the showing made, in declaring that rate excessive.

"If there are any special conditions which would take these cases out of the general rule, they were not presented for our consideration. This is true also on the question of whether the company should sell twenty-five tickets for $1. Most of the petitioner's witnesses testified, as they naturally would, that such a practice would be very desirable, but no facts were presented on which we would feel justified in ordering the company to take such a step. We do not consider that the sale of tickets at this rate in one city of the State, under the conditions presented at the hearing, constitute an unfair discrimination against Meriden or any reason for a further extension of the policy in the absence of a showing that the ordinary unit of 5 cents is an unreasonable charge for the service rendered in each case where such a unit is now the basis of the company's fare.

"We find, however, that the fare from Meriden Center to Archer's Corner is unreasonable. On the line via Cook Avenue, the charge is now 10 cents for a ride of 2.16 miles and via Hanover Street 10 cents for a ride of 2.83 miles, or at the rate of approximately 4.6 cents per mile in the first case and 3.5 cents per mile in the second case. So radical a variation within the city limits from the normal average rate per mile may well be considered as discriminatory against the district served and warrant some change in zone limits to secure a better equalization of rates. The present zones on the Meriden-Wallingford line are so constituted that passengers to Archer's Corner pay two fares for a trip of 2.16 miles by the shorter route and 2.83 miles by another route. If the first zone limit were shifted to Archer's Corner or to the city line, a few hundred feet further, the company would still receive in excess of 1½ cents per mile for this distance. Without passing at this time on the question of whether or not a local rate of 1½ cents per mile is fair both to the company and public, as a general practice, it is the opinion of the commission that in this case, at least, an extension of the zone would result in a more equitable rate than the one now in effect.

"For the foregoing reasons, we hereby order and direct the Connecticut Company to alter its fare zone limits in the city of Meriden so that on and after Dec. 1, 1914, no fare in excess of 5 cents shall be charged or collected for a single ride between Archer's Corner and the railroad station in the center of the said city of Meriden by either of the present routes in either direction."

"SAFETY FIRST" IN TOLEDO

The city of Toledo, Ohio, has a safety league organized by the Commerce Club with a score of prominent Toledo business men as members. This league has already engaged a woman teacher to start the work of giving "safety first" talks in every schoolroom in Toledo, in both public and parochial schools. The talks will be augmented by the moving picture "The Price of Thoughtlessness," which will be shown in every room. The Toledo Railways & Light Company has been able to secure a small moving-picture machine that does not require a booth and yet fulfils all requirements of "safety first." At the close of the talk the teacher who has been retained to carry on the work will distribute "safety first" buttons to all the children. Some 60,000 of these buttons have been contributed by the Toledo Commerce Club. They are all numbered and some of them have duplicate numbers, so that if one boy finds another boy with the same number on his badge each will get $1 on presentation of the button to the Commercial Club. This will stimulate the wearing of the button.

The Toledo Safety League plans also to reach all the parents by giving illustrated talks in the evening to all the parents' clubs in all the schools as well as before other clubs and lodges and societies. As a member from the Toledo Railways & Light Company on the safety league E. R. Kelsey is delivering these talks with the moving-picture films already referred to and some 100 traffic slides of various kinds. Further to stimulate interest in the safety work the league secured H. L. Brownell, supervisor of safety of the Chicago Surface Lines, to talk to all the public and the parochial school teachers and show them the films and slides used by that company. The league has also arranged to have Marcus A. Dow, supervisor of safety for the New York Central Lines, present at a general safety meeting.

On Nov. 22 the Newsboys' Association had a safety meeting at which more than 1000 boys were in attendance. Commodore Gunckel, father of the newsboy movement, said it was the finest meeting the newsboys had ever had. Buttons were distributed and a safety film shown.

The safety committees within the company itself are so thoroughly organized in the different carhouses that several times the chairman of the committee at one of the carhouses has reported to the manager of railways that his carhouse had gone twelve or thirteen days without an accident. Although the work has just got a good start a marked decrease in the number of accidents has already been shown.

COPPER INSTEAD OF NICKEL FARE ZONES

The Public Service Commission of Indiana on Nov. 21 granted the petition of the Union Traction Company of Indiana, filed several months ago by Arthur W. Brady, president, to establish on its lines a 1-cent or "copper" zone instead of the present 5-cent or "nickel" zone as a basis for its passenger tariffs. The company is authorized to file with the commission a new schedule of passenger tariffs, which will put into effect on its lines in Indiana rates practically approximating 2 cents a mile for the distances actually traveled; provide a minimum fare of 5 cents; give due consideration to competitive fares, lowering its fares to correspond in such circumstances; sell commutation tickets in books of twenty round trips at the rate of 1¼ cents a mile, and discontinue the sale of round-trip tickets at amounts less than two full fares. It is believed by the Union Traction Company officials that many inequalities in the fares now existing will be eliminated by the new "copper zone" system. The order of the commission provides that fares shall be computed as follows:

"At the rate of 2 cents a mile for the distance actually traveled, as nearly as practicable, a half mile at 1 cent each to be taken as the unit. In the case of fractional miles from 0.75 (regarded as 0.8) of any mile to 0.24 (regarded as 0.2) of the next mile, both exclusive; fractions shall be disregarded, and the intervening whole mile regarded as the distance. In the case of fractional miles from 0.25 (regarded as 0.3) of any mile to 0.74 (regarded as 0.7) of the same mile, both inclusive, the fractional distance shall be regarded as ½ mile, and the total distance shall be taken as the number of whole miles and one-half. For instance, any distance from 5.3 miles to 5.7 miles, both inclusive, shall be regarded as 5.50 miles, and any distance from 5.8 miles to 6.2 miles, both inclusive, shall be regarded as 6 miles. The minimum fare shall be 5 cents, and due consideration shall be given to competitive mileage of steam or other electric railroads. The fares for children between five and twelve years of age shall be at the rate of 1 cent a mile, computed in the method above outlined."

LOUISVILLE "TROLLEY TOPICS"

Trolley Topics, the publication for distribution among employees of the Louisville (Ky.) Railway, has made its appearance. It is a small bulletin of eight pages and is devoted to the interests of the company's employees. In the foreword the purpose of the publication is set out as follows:

"With this issue *Trolley Topics* makes its first appearance and extends greetings to each employee in all departments.

"It is essentially a paper of and for the employees of the Louisville Railway and the Louisville & Interurban Railroad, and has been conceived in the interest of those having at heart the welfare, prosperity and advancement of our company and our fellow employees, and in the effort to attain for our patrons the best and safest street car service in the country.

"Through the medium of *Trolley Topics* it is hoped to promote efficiency, to bring all departments into closer harmony, to suggest improvements and betterments to the service, to engender co-operation, to become better acquainted, to please all and offend none."

One of the departments in future will be a questions and answers section.

COURT DECISION IN REROUTING CASE

The Supreme Court of Nebraska has overruled the motion of the Lincoln Traction Company for a rehearing in the Herpolsheimer case. This action of the court makes effective the decision of the District Court which prevents the company from further abandoning any lines of the old Citizens Street Railway without permission of the Railroad Commission. The District Court decision, now effective, requires the company to put the College View high line cars back on Twelfth Street and to run the high line cars every twenty minutes. These cars now run every thirty minutes. The court says:

"We have not decided in this particular case that the defendant company cannot establish new lines of service upon such streets as the city may permit, nor that it cannot initiate necessary changes in the management of its business. It is not essential that every minor change in the conduct of the traffic, or in the service rendered, or in other matters of detail concerned with the operation of the line should be preceded by an application to the Railroad Commission for permission to make the change. The opinion does not so hold. The point decided is that the company cannot make such changes in the routing of its cars as the evidence in this case shows were made or contemplated, without first obtaining the approval of the commission."

The company has since applied to the State Railway Commission for a temporary order permitting the continuation of the present routing until a hearing can be had by the commission. The application sets forth that the company will require ninety days to secure special tracks required by the change; that an additional operating expense of $6,500 will be entailed, and that it has in hand petitions from patrons affected favoring the present service. It requests permission to control the routing of its cars. Two of the commissioners were out of town when the application was filed, and the request for a temporary order cannot be considered until all three are present.

AUTO BUS COMPETITION IN LOS ANGELES

There has recently been an enormous increase in the number of privately-owned automobiles that solicit "fares" at 5 cents each on the streets of Los Angeles. The automobiles are operated chiefly during the rush hours and have so considerably affected the earnings of the street railways that there has been much discussion on the question of passing some ordinance to regulate their operation. The first definite step in this direction was taken on Oct. 11 when the Board of Public Utilities of Los Angeles submitted a statement to the City Council calling attention to the fact that, obviously, the motor bus business should be regulated in some manner. The city's legal department has stated unofficially that the city can regulate the motor buses by requiring them to run on regularly stated routes and on a definite time schedule, but the city's right to require the filing of indemnity bonds, it was stated, would have to be established. Early in November the city had issued a total of 842 permits to chauffeurs for operating cars in passenger service. Of this total about 650 were operating on regular runs and taking 5-cent fares. A great many privately-owned automobiles are, however, being used by the public during the rush hours and at other times, for which no licenses have been issued, and the number of these is increasing daily. Some automobiles even make regular runs to near-by suburban points and charge 5 cents for the ride that costs 10 cents on the electric line.

The public utilities committee of the city of Los Angeles announced that it would hold a public hearing on Nov. 27 at which the question of regulating the auto bus business of that city would be discussed.

Fare Increase Under Advisement.—The South Carolina Railroad Commission has taken under advisement the application of the Augusta-Aiken Railway & Electric Corporation, Augusta, Ga., to increase its rates on its line in that State from 1 cent to 2 cents a mile.

Steam Passengers Transferred to Electric Line.—The Quincy, Omaha & Kansas City Railroad (steam) has put into execution its plan of transferring its Kansas City passengers and their baggage to the Kansas City, Clay County & St. Joseph Railway (electric) at Avondale in Clay County. This action is taken to avoid the expense of bringing passengers into the new Union Station in Kansas City.

Increase in Fare Asked in Kansas.—Alleging that the cost of operation has increased to such an extent since the 2-cent fare went into effect that railroads cannot maintain first-class passenger service at a profit, all the railroads doing business in Kansas have filed with the Public Utilities Commission applications for the restoration of 3-cent fares. A hearing probably will not be had until the new commission assumes office after Jan. 1, 1915.

Chicago Surface Lines Aid Red Cross.—Acting on the permission granted by Mayor Harrison and the Chicago City Council, the Chicago Surface Lines gave to the Red Cross for use in the European War Relief work a check for $2,000. Since the city was entitled to a part of the income from the lines it was necessary to get its sanction. Leonard A. Busby, president of the company, states that the contribution was made and charged to the Chicago Surface Lines individually and was made upon the unanimous request and approval of the executive committee.

"Tricky" Patrons.—A letter was addressed to the editor of the Topeka *Capital* recently in which the writer expressed the opinion that it would be interesting to know how many people are "victimized" a week by the Topeka Railway paying out in change Canadian dimes in place of American dimes. To the letter as published in the *Capital* the editor appended this note in the usual parentheses: "Patrons should examine their 'change.' We do not imagine the street railway company imports Canadian money. If it pays such coins out they are coins that tricky patrons have already passed to the company."

New Interurban Fares.—The New York State Railways, Syracuse, N. Y., has filed with the Public Service Commission of the Second District of New York, effective on Dec. 15, 1914, new joint one-way fares from Canastota, Chittenango, Clark Mills, Hecla, Kirkville, Manlius Center, Syracuse, Utica, Vernon and Wampsville to destinations on the New York, Ontario & Western Railroad. All fares are advanced 2 cents to Durhamville and Kenwood, 3 cents to State Bridge and Valley Mills, 4 cents to Stockbridge, 5 cents to Fish Creek and Munns, 6 cents to North Bay, 7 cents to Pratts and White's Corners, 8 cents to Jewell and Morrisville, 9 cents to Eaton, 10 cents to Cleveland, 11 cents to Randallsville, 13 cents to Earlville, 15 cents to Smyrna, 17 cents to Sherburne Four Corners, 18 cents to Galena, and 21 cents to Norwich.

Increase in Freight Rates.—The Indianapolis, Columbus & Southern Traction Company, which operates between Louisville and Indianapolis over the connecting Insull lines, is preparing to put into effect the 5 per cent increase in freight rates which have been allowed by the Interstate Commerce Commission. On May 28 the commission, acting at the instance of Louisville shippers, instructed the railway to establish through and joint freight rates between Louisville and points in Indiana, including Indianapolis. The present order is a sequel and will apply to merchandise in less than carload lots, taking the first, second, third and fourth-class rates. Existing class rates are 18 cents, 16 cents, 14.5 cents and 11 cents a hundred to Indianapolis, and under the order the rates will be 18.9 cents, 16.8 cents, 15.2 cents and 11.5 cents, while rates to intermediate points will be advanced proportionately.

Hocking Valley Railroad Case.—Arguments of counsel for the Hocking Valley Railroad and the Public Utilities Commission of Ohio were heard by the Supreme Court on Nov. 18 in the appeal from an order of the commission requiring the company to maintain electric railway service between Wellston and Hamden. The company claims that the line is no longer profitable and that an outlay of $25,000 will be required to put the road in shape to continue service. The commission contended that because a unit of a system is not profitable that fact does not furnish a reason for the abandonment of the unit so long as the whole system is profitable. It further stated that the company cannot at will withdraw a service which it had educated the people to use and depend upon in their daily activities and business. The company offered to maintain steam train service in place of the electric service, but the commission refused to accept this change.

I. T. S. Prizes Awarded.—The Illinois Traction System, Peoria, Ill., has announced the winners in the annual contest among the various substations for the best kept station. The substations are divided into two classes, those with agencies and those without agencies. First prize for the best kept substation with an agency was awarded to Union, a station about 15 miles north of Lincoln. Second prize was awarded to Fithian, which is between Champaign and Danville. The first prize for the best kept substation without an agency was awarded to Verden, which is located south of Springfield. Second prize was awarded to Anderson, which is north of Carlinville. System card passes for the agents and substation attendants constituted the first prize in both instances. Division card passes for the agents and the substation attendants were awarded as the second prize in both cases. About forty substations on the line participated in the contest.

Heavy Municipal Railway Traffic.—On Oct. 8 there was an aviation exhibition at the exposition grounds in San Francisco and the attendance was about 40,000. The municipal railway has two lines running direct to the grounds. Only seventy-nine cars were in commission on the municipal system to maintain service on all five lines, but the crowds were handled satisfactorily and without delay. The receipts on the several lines on Oct. 8 were as follows: "A" line (Geary Street, Market Street and Tenth Avenue) $1,004; "B" line (Ferries to Ocean, via Market and Geary Streets) $1,223; "D" line (Ferries to exposition grounds, via Van Ness Avenue) $914; "E" line (Union Street line, Ferries to Presidio) $1,242; "H" line (Potrero Avenue and Van Ness Avenue) $481. By the time the exposition opens the municipal railway will have 197 cars in service and will have added to the system the California Street and the Stockton Street and Columbus Avenue lines.

Ruling Regarding Free Transportation.—The Railroad Commission of Pennsylvania having been requested to express its opinion upon the question whether a railroad, street railway or other transportation company may lawfully grant free passes to charitable organizations, has ruled as follows: "As we have heretofore had occasion to point out, in connection with similar questions relative to the subject of free transportation, the constitution of the commonwealth, in Article XVII, Section 8, expressly provides, that: 'No railroad, railway or other transportation company, shall grant free passes, or passes at a discount, to any person except officers or employees of the company.' So long as this prohibition remains as it now stands in the constitution, the commission is powerless to hold that free transportation may be issued to a charitable organization for charitable purposes, however much we might otherwise be in accord with a public policy which would permit of such free transportation in this class of cases."

Passengers to Determine Rerouting.—The rerouting due to the opening of the new union station at Kansas City, Mo., has met with sufficient objection in only one instance to cause any possibility of a change to arise. This case is that of the Independence line, which was rerouted to enter the business district three blocks south of its former course. The board of control is planning a unique system of disclosing the facts as to the logical routing. Cards will be printed with blanks on which passengers from Independence and vicinity will indicate their destination in Kansas City. These cards will be handled by Metropolitan Street Railway or board of control employees, who will ascertain the facts from the passengers, the inspectors noting also the point at which the persons board the cars. The suggestion that the passengers on the Independence cars vote as to their preferences in routing was rejected because business interests or associations might influence the vote and the result would not indicate the logical route for the traffic.

Pacific Electric Railway Offers Prize.—The Pacific Electric Railway, Los Angeles, Cal., has announced a contest for the selection of a name and symbol for the new personally conducted trolley trip which it proposes to launch Jan. 3, 1915. The trip will be different from anything the company has ever operated, taking the tourist through the fruit districts of Pomona, Upland, Alta Loma, Etiwanda, Fontana, Rialto, San Bernardino, Riverside and Redlands. The company will pay $50 in cash to the first person sending in a name and symbol selected by the judges as the most appropriate for this trip. A prize of $25 will be awarded for the second best selection of name and symbol. Like the Old Mission, Triangle and Balloon route trolley trips, the new trip will afford to the tourist access to many points of interest through the southern part of the State, but still is different from them in many respects. The trip will start from the Pacific Electric station, Los Angeles, at 9 a. m. The return from Redlands will be made at 4:30 p. m., arrival at Los Angeles being scheduled for 7:30 p. m.

Safety Movement on Evansville Railways.—The first six months of operation of the "safety first" movement on the Evansille (Ind.) Railways has just been completed. In celebration of this occasion the outgoing members of committees banqueted the incoming members. Two local safety committees, one for each division of this company's lines, are appointed every six months. Regular meetings are held each month, when action is taken on all suggestions sent in by employees. These suggestions are then forwarded to the general safety board, comprised of department heads and the chairmen of the local committees, who finally approve or reject them. The membership of each committee is such that it will furnish an avenue through which any employee can make suggestions. Each employee is requested to make these suggestions to the committee member with whom he is most closely in touch, and he need not confine the suggestions to matters pertaining only to his department. In connection with the suggestions offered and their value, it is interesting to note that during the first six months' period eighty-seven suggestions were offered. From this number the local committees and the general board approved seventy-four.

Personal Mention

Mr. **V. M. Combes** has resigned as claim agent of the Kansas City-Western Railway, Leavenworth, Kan.

Mr. **Louis P. Howe** has been elected president of the Keene (N. H.) Electric Railway, to succeed Mr. Charles Warren.

Mr. **Gideon Adams** has been appointed roadmaster on the Atlantic & Suburban Railway, Pleasantville, N. J., to succeed Mr. George Dixon.

Mr. **E. Lewis** has been appointed roadmaster on the Exeter, Hampton & Amesbury Street Railway, Exeter, N. H., to succeed Mr. J. Raney.

Mr. **A. Carroll** has been appointed roadmaster of the Southwestern Traction & Power Company, New Iberia, La., to succeed Mr. A. Heflin.

Mr. **H. Aldrich** has been appointed superintendent on the Claremont Railway & Light Company, Claremont, N. H., to succeed Mr. T. A. Clark.

Mr. **Glenn M. Averill** has been elected president of the Cedar Rapids & Marion City Railway, Cedar Rapids, Iowa, to succeed Mr. J. F. Porter.

Mr. **A. M. Baldwin** has been elected treasurer of the Central California Traction Company, San Francisco, Cal., to succeed Mr. Walter Arnstein.

Mr. **A. L. McAllister** has been appointed auditor of the Southern Illinois Railway & Power Company, Harrisburg, Ill., to succeed Mr. C. R. Scott.

Mr. **W. O. Demoss** has been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., to succeed Mr. J. W. Gerke.

Mr. **A. S. Henry** has been appointed superintendent of the Lockport division of the International Railway, Buffalo, N. Y., to succeed Mr. J. W. Andrews.

Mr. **H. U. Wallace**, vice-president and general maanger Western Light & Power Company, Boulder, Col., is now in charge of purchases, succeeding Mr. J. W. Ryall.

Mr. **P. L. Saltonstall** has been elected treasurer of the Manchester Traction, Light & Power Company, Manchester, N. H., to succeed the late S. Reed Anthony.

Mr. **Shelton E. Martin** has been elected secretary of the Third Avenue Railway, New York, N. Y., and affiliated companies, to succeed Mr. Frederick J. Fuller.

Mr. **H. J. Parks**, master mechanic of the Alton, Granite & St. Louis Traction Company at East St. Louis, Ill., has had his jurisdiction extended to cover the Alton City lines.

Mr. **Charles Witzel**, purchasing agent of the Third Avenue Railroad, New York, N. Y., has succeeded Mr. H. I. Sutherland as purchasing agent on the Yonkers (N. Y.) Railroad.

Mr. **Frank Martin** has been appointed chief engineer of the power station of the Trenton & Mercer County Traction Corporation, Trenton, N. J., to succeed Mr. De Witt Smith.

Mr. **M. Heffner** has been appointed superintendent, purchasing agent and master mechanic of the Allentown & Reading Traction Company, Allentown, Pa., to succeed Mr. W. J. Bear.

Mr. **P. E. Seddon** has been appointed secretary, treasurer and purchasing agent of the Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa., to succeed Mr. S. H. Waddell.

Mr. **C. M. Leslie**, formerly claim agent of the Interurban Railway & Terminal Company, Cincinnati, Ohio, has been elected vice-president of the company to succeed Mr. Warren Bicknell.

Mr. **T. D. Dugan**, formerly chief dispatcher of the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, has been appointed assistant superintendent, to succeed Mr. A. C. Kelsey, resigned.

Mr. **Matthew C. Brush**, vice-president of the Boston (Mass.) Elevated Railway, has been nominated a member of the executive committee of the Alumni Association of the Massachusetts Institute of Technology.

Mr. **C. J. Williams**, formerly assistant secretary and auditor of the Interurban Railway & Terminal Company, Cincinnati, Ohio, has been elected secretary-treasurer of the company to succeed Mr. James M. Hutton.

Mr. Mortimer G. Gould has been elected president of the Lima-Honeoye Light & Railroad Company, Lima, N. Y., to succeed Mr. D. M. Lewis, who continues with the company as secretary, general manager and purchasing agent. Mr. Gould also acts as chief engineer of the company.

Mr. Michael Connor, who has been superintendent over all of the line of the Illinois Traction System between Danville and Decatur, has been made superintendent from Danville to Urbana, with headquarters in Danville. Mr. Bert Snyder will be superintendent from Champaign to Decatur with headquarters in the latter city.

Mr. Delos F. Wilcox, for six years head of the franchise bureau of the Public Service Commission of the First District of New York, has been appointed first deputy commissioner of water supply, gas and electricity of New York to succeed Mr. F. T. Parsons, resigned. Since last summer Mr. Wilcox has been working on an appraisal of the private water supply plants in Queens which the city expects to buy or condemn.

Mr. Charles W. Mullen, Bangor, has been nominated as the third member of the new Public Utilities Commission of Maine by Gov. William T. Haines, the nomination of ex-Congressman S. W. Gould, Skowhegan, having failed of confirmation by the Governor's Council. Mr. Mullen and Mr. Gould are both Democrats. Mr. Mullen was graduated from the University of Maine in 1882 and was largely responsible for developing the important water power at Millinocket and took the lead in the development of the Great Northern Paper Company. He has also been identified with other large business projects in Maine. He was twice Mayor of Bangor, and has served one term in the Maine House and one in the Senate. He has twice been a Democratic candidate for Congress.

Mr. W. S. Henning, who has been appointed general manager of the Southwestern Traction & Power Company, New Iberia, La., began his railway career in 1898 as resident engineer in charge of track, railway, bridges and buildings on the Houston & Texas Central Railroad at Ennis, Tex. He continued in this capacity until 1902. He then accepted a position as construction engineer on the Southern Pacific Company's branch lines in Matagorda County, Tex. From 1903 to 1906 he was engineer of maintenance of way of the Galveston (Tex.) City Railway, covering the period during which the grade of the city was raised. From 1906 to 1912 he was engaged in construction work for the Southern Pacific Company in Louisiana. In 1912 he was appointed chief engineer of the Southwestern Traction & Power Company.

Mr. W. H. Davidson has been appointed auditor for the receivers of the Columbus, Delaware & Marion Railway, Columbus, Ohio, to succeed Mr. A. F. Elkins, who, as previously noted in the ELECTRIC RAILWAY JOURNAL, resigned some time ago to accept an appointment as accountant in the division of valuation in the Interstate Commerce Commission, with headquarters in Chicago. Mr. Davidson is thirty-three years of age. Before accepting the appointment to the Columbus, Delaware & Marion Railway he was connected with steam railroads. He resigned from the United States weather bureau service in March, 1906, to accept a position in the accounting department of the Gulf, Colorado & Santa Fé Railway at Galveston, Tex. In September, 1907, he resigned from that company to become connected with the office of the auditor of the Hocking Valley Railway at Columbus, Ohio, and continued with that company in the auditing department until he was appointed to succeed Mr. Elkins with the Columbus, Delaware & Marion Railway.

Mr. Oscar T. Crosby, who resigned as president of the Wilmington & Philadelphia Traction Company, Wilmington, Del., two years ago, has just returned to this country from a trip abroad, during which he traveled in Spain, Algeria, Tunisia, Egypt, Turkey, India, Borneo, Ceylon, the Federated Malay States, Java, Borneo and Japan. Mr. Crosby returned to the United States through China and Russia by the Trans-Siberian Railway. He was in Pekin when war was declared, but did not find it difficult to pass through Russia, Finland, Denmark, Germany and Holland. His trip in Turkey and Borneo was off the usual lines. In Turkey he drove about 600 miles, following the Euphrates River from Aleppo to Bagdad and Babylon, and then crossed the Persian Gulf to India. In Borneo he took a trip through unexplored country, visiting Dyaks who had never before seen a white man. He was able to do this through the courtesy of the Dutch officials, who loaned him a small steamer by which he ascended one of the unfrequented rivers, and later used small boats rowed by native Malays.

Mr. Harry B. Weatherwax has been elected vice-president of the various electric railways controlled by the Delaware & Hudson Company. The properties with which Mr. Weatherwax will be connected in addition to his present duties with the Delaware & Hudson Company are the United Traction Company, Albany, N. Y., Hudson Valley Railway, Troy & New England Railway and Plattsburg Traction Company. There will be no change in the organization of the various companies. Messrs. Reynolds, Hewitt and Barber retain all their authority. Mr. Weatherwax will represent Mr. C. S. Sims, vice-president of the Delaware & Hudson Company, in connection with all electric railway matters, thereby relieving Mr. Sims of many details which he has handled in the past. Mr. Weatherwax was formerly chief clerk to Mr. W. J. Mullin, general traffic manager of the Delaware & Hudson Company, and later was appointed industrial agent of the company. Last year he was elected vice-president of five subsidiary corporations of the Delaware & Hudson Company.

Mr. Ray W. Reynolds has resigned as manager of the Springfield (Mass.) Street Railway, to become general manager of the Mesaba (Minn.) Railway. Mr. Reynolds took the position of manager in Springfield when he succeeded the late George F. Reed, who died suddenly on Jan. 10, 1914. At the time of his appointment he was secretary and general manager of the Hartford & Springfield Street Railway, with headquarters at Warehouse Point, Conn., having been appointed to that position on Aug. 1, 1912. Mr. Reynolds was born in Mattoon, Ill., in 1882 and was graduated from the Armour Institute of Chicago in 1900. He then spent two years in the electrical engineering department of Purdue University at Lafayette, Ind. His first work in the electric traction field was with the old Indianapolis & Northern Railway, which is now a part of the system of the Terre Haute, Indianapolis & Eastern Traction Company. He worked through all of the departments and was appointed superintendent in 1905. In 1907 he became connected with the Chicago, South Bend & Northern Indiana Railway at South Bend. At one time he was also in charge of the Southern Michigan Railway. In 1910 Mr. Reynolds was elected vice-president of the American Light & Water Company, Chicago, and placed in charge of the construction work. He supervised the building of electric lighting stations and hydroelectric developments which this work called for until August, 1912. From this position he came East to accept the place made vacant by the resignation of Mr. H. S. Newton, then manager of the Hartford & Springfield Railway.

Mr. L. A. Magraw, who, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 14, was appointed general manager of the Macon Railway & Light Company, Macon, Ga., was born in Springfield, Mass., on May 7, 1883. He attended the public schools at Waterbury, Conn., and was graduated from the Worcester Polytechnic Institute in 1905. He then entered the test department of the Crocker-Wheeler Company, with which he remained two years. During part of this time Mr. Magraw was instructor at Sibley College, Cornell University. In 1907 he entered the employ of the Westinghouse Electric & Manufacturing Company as erecting engineer at Philadelphia, and during his connection with the company at that place he supervised the installation of many steam turbine plants throughout Pennsylvania. In 1909 Mr. Magraw was transferred to the engineering department of the Westinghouse Electric & Manufacturing Company, and as resident engineer at Charlotte, N. C., he was active in the development of high-tension apparatus and supervised the installation of one of the first outdoor substations carrying 110,000 volts. In 1911 Mr. Magraw was appointed chief engineer of the Central Georgia Power Company and in January, 1912, he became chief engineer of the Central Georgia Transmission Company and had charge of the construction of a number of substations, distributing and high-tension lines in north-central Georgia. In March, 1912, he was appointed chief engineer of the Macon Railway & Light Company and began the reconstruction of the distribution lines, feeders and overhead trolley in the city of Macon and also supervised the construction of a number of cars. In January, 1913, he was appointed general manager of the Central Georgia Power Company and Central Georgia Transmission Company, and in October, 1914, he was appointed general manager of the Macon Railway & Light Company.

Mr. Herbert M. Flanders, engineer of maintenance of way of the Springfield (Mass.) Street Railway and other lines controlled by the New England Investment & Security Company, has been appointed general manager of the Springfield system, to succeed Mr. Ray W. Reynolds, who has resigned to accept the position of general manager of the Mesaba (Minn.) Railway. Mr. Flanders will become manager on Dec. 1, when the resignation of Mr. Reynolds becomes effective. Ever since his graduation from the Massachusetts Institute of Technology in 1900 Mr. Flanders has been constantly in railroad work. He was born in Haverhill, Mass., in 1876, and received his education in that city and in Malden, Mass. After his course at the Massachusetts Institute of Technology Mr. Flanders was employed by the Boston & Maine Railroad, but soon left this position to engage in the construction of the electric railway in Portsmouth, N. H. When the road was finished, two years later, he remained to take charge of the work of eliminating grade crossings. Later he took up the work of surveying new routes for electric railways and assisted in laying out the Boston & Haverhill and the Boston & Worcester electric lines. He was appointed engineer of maintenance of way for the Houston (Tex.) Electric Railway in 1906 and a year later he went to Fort Worth, Tex., as chief engineer of the Northern Texas Electric Railway. After eighteen months with this company he returned to Massachusetts as roadmaster of the Newton Street Railway. He went to Springfield in 1909 as roadmaster for the Springfield and Berkshire systems when the latter system was under the direction of the New England Investment & Security Company. On Dec. 1, 1913, he was appointed engineer of maintenance of way of the Springfield Street Railway and on Nov. 21 he was selected as manager of the system.

H. M. Flanders

OBITUARY

Douglas S. Martin, who relinquished his position on the editorial staff of the *Electrical World* in August to enroll in the forces of Great Britain, has succumbed to shrapnel wounds received at the battle of Messines on the Belgium border. Mr. Martin was graduated as an electrical engineer from the Central Technical College, London, England, and was formerly editor of the *General Electric Review*. After resigning from that paper he engaged in electrical work in the Far West and on returning East joined the editorial staff of the *Electrical World*. Mr. Martin was twenty-seven years of age. He was a brother of Mr. T. C. Martin, secretary of the National Electric Light Association.

John Murphy, formerly general superintendent of the Pittsburgh (Pa.) Railways, died on Nov. 24 at Orlando, Fla., after a long illness. Mr. Murphy settled in Pittsburgh about thirty years ago. He entered electric railway work under the late William J. Burns with the Second Avenue Traction Company, Pittsburgh. Later he became superintendent of that company. When the West End Traction Company was merged with the Second Avenue company he was placed in charge of both systems and when the Pittsburgh, Allegheny, Manchester and Pleasant Valley lines were absorbed he was appointed general superintendent of all of them. He was subsequently appointed general superintendent of the Pittsburgh Railways and retained that position until Feb. 1, 1909, when he retired on account of ill health. Mr. Murphy is survived by a widow, three sons and three daughters.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

FRANCHISES

Tucson, Ariz.—The Tucson Rapid Transit Company has received a twenty-five-year franchise from the Council in Tucson.

***Searcy, Ark.**—The Searcy & Kensett Transportation Company, represented by H. E. Hill, has received a franchise from the Council to build an electric railway in Searcy and extend it to Kensett, 4 miles. Application for a charter will soon be made by this company.

***Jacksonville, Fla.**—The Port Commissioners with a formal request received the approval of the County Commissioners recently to cross all highways, streets and byways in Duval County with the proposed railway line from the new dock site to the connecting lines of the railways in Jacksonville.

Boston, Mass.—The subway extension to Everett and to Malden is supposed to be completed next February, but the work has not been begun. An extension of time is asked for by the Boston Elevated Railway on the ground that there has been unforeseen delay in the dredging of Mystic River.

***St. Louis, Mo.**—The introduction of an ordinance to permit the city of St. Louis to construct the loop at the western approach in conjunction with the work of completing the free bridge is being seriously considered by city officials. With the repeal of the Southern Traction franchise for such a loop there is no immediate prospect of one being constructed otherwise. Andrew Scully, a member of the House of Delegates, said recently he is contemplating introducing such an ordinance. He said he had consulted railroad experts and they advised him that the cost would be about $30,000 a mile. The loop, he said, would include about 3 miles of track, and he estimated it could be built with an appropriation of about $100,000.

Newark, N. J.—The Public Service Railway has received nine franchises from the Board of Public Works to be utilized in connection with the proposed terminal in Newark.

La Salle, N. Y.—The International Railway has received a franchise from the Council in La Salle over the right-of-way of the old Buffalo, Thousand Islands & Portland Railroad in La Salle.

Milwaukie, Ore.—The Portland & Oregon City Railway has again asked the Council for a franchise in Milwaukie. Some time ago Steven Carver, the promoter of the line, withdrew the franchise for some changes, and it was recently submitted at a meeting of the Council, the route having been agreed on. Considerable grading on the line south of Milwaukie to Oregon City has been done, and also on the branch projected toward Clackamas and Logan. It is announced that work will be begun on the section in Milwaukie as soon as the franchise has been granted.

Seaside, Ore.—The Council has granted an extension of time on the franchise received by O. W. Taylor two years ago. The extension was granted with the agreement affixed that the rights of the franchise are to be transferred to the new electric line now proposed between Astoria and Seaside. The possession of this franchise has been sought by those promoting the new line. [E. R. J., Nov. 14, '14.]

Harrisburg, Pa.—The Harrisburg Railways has received a franchise from the Council to extend its lines to the plant of the Middle Car Company in Harrisburg.

Montreal, Que.—The Montreal Council has passed a by-law allowing the Montreal & Southern Counties Railway to extend its tracks across McGill Street to Youville Square in Montreal, with the object of extending its terminals. The city stipulates that it will take no legal responsibility, this clause being inserted in view of the contract of the city with the Montreal Tramways Company, whose lines run along McGill Street. The work is to be commenced before Jan. 1 and completed in six months.

Corpus Christi, Tex.—The Texas Southern Electric Company has received a franchise from the Commissioners' Court of Nueces County to build an electric railway from Corpus Christi to Bishop, 35 miles.

Dallas, Tex.—The Metropolitan Street Railway has asked the Council for a franchise to use the Dallas Consolidated Electric Street Railway tracks on Main Street in Dallas.

TRACK AND ROADWAY

Birmingham-Tuscaloosa Railroad & Utilities Corporation, Birmingham, Ala.—As a result of an agreement with the City Council this company will begin work at once on the electrification of the Tuscaloosa Street Railway.

Tucson (Ariz.) Rapid Transit Company.—Plans have been made to build an extension north on Stone Avenue to the city limits and beyond the city line to Pastime Park. Another line will be built from the present terminus of the line at Third Street and Park Avenue, north on Park Avenue to the Speedway and east on the Speedway about 1 mile. The south side loop in Tucson will also be constructed at once.

Fresno (Cal.) Interurban Railway.—Work has been begun by this company on the 2-mile section of its line from Fresno Avenue, Fresno, via the Normal School to Gould Colony. It is reported that a 12-mile line of the company from Barton's vineyard to Centerville will be constructed on the main line to Clovis. John McCaffery, manager.

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company on its 8-mile line between Arlington and Corona. Shearer & Company, Los Angeles, were awarded the contract for the construction of the line.

San Francisco (Cal.) Municipal Railway.—Extensions of this railway in San Francisco on Columbus Avenue and through the new Fort Mason tunnel are now ready to be placed in operation. Bids for the construction of the California Street line, 2.07 miles in length, have been called for by the Board of Works for Dec. 2. In addition to the Church Street line, for which several alternate plans are now being compared, other extensions under consideration are as follows: Out Market Street from Kearny to Tenth Avenue; from the present park terminus through the park to the Sunset district; from the Stockton Street line across Market Street and south to the Southern Pacific depot.

Iowa Railway & Light Company, Cedar Rapids, Ia.—Right-of-way has been acquired by this company on both sides of river trackage in Cedar Rapids and plans are being made to connect this company's lines with the lines of the Waterloo, Cedar Rapids & Northern Railway. This is part of a plan to spend $500,000 on improvements of its lines in Cedar Rapids.

***Caldwell, Idaho.**—The Caldwell Commercial Club and several other organizations are considering plans to secure the electrification of the Wilder branch of the Oregon Short Line extending from Caldwell to Wilder, 11 miles. J. H. Lowell, Caldwell, is interested.

Fox & Illinois Union Railway, Aurora, Ill.—Plans are being considered by this company to extend its line, now being constructed from Yorkville to Morris, on to Dwight. H. H. Evans, president. [E. R. J., Nov. 1, '13.]

Decatur, Sullivan & Mattoon Traction Company, Mattoon, Ill.—This company has increased its capital stock from $4,000,000 to $5,000,000. This action was taken at the annual meeting of the stockholders held in Mattoon. The directorate was increased from nine to twelve. John G. Throde, Mattoon, and M. L. Deck and G. A. Stadler, Decatur, were elected directors for the long term and H. H. Temple and A. Spitler, of Mattoon, for the short term. Officers were elected as follows: J. A. McFall, Mattoon, president; George B. Fidler, Mt. Zion, vice-president, and John G. Throde, Mattoon, secretary and treasurer. The company plans to build an electric railway from Decatur through Sullivan to Mattoon, a distance of about 50 miles. [E. R. J., Nov. 29, 13.]

City Railway, Mount Vernon, Ill.—Work has been begun by this company on its 4-mile line in Mount Vernon. Its repair shops will be located in Mount Vernon and it will operate three cars. Capital stock, authorized, $40,000. Capital stock, issued, $40,000. Officers: Louis G. Pavey, Mount Vernon, president and general manager; Earl Green, vice-president; C. C. Baldwin, Mount Vernon, secretary and chief engineer, and J. B. Emerson, Mount Vernon, purchasing agent. [E. R. J., April 4, '14.]

Evansville & New Harmony Traction Company, Evansville, Ind.—Surveys have been completed between Evansville and New Harmony and bond sales in the communities along the right-of-way are meeting with more success than had been anticipated, and it is announced that construction will be begun by this company in the spring. The line will eventually be extended to Mount Carmel, Ill. [E. R. J., Sept. 19, '14.]

Arkansas Valley Interurban Railway, Wichita, Kan.—This company has been authorized to use the Hutchinson Interurban Railway tracks in Hutchinson and will soon build an extension from Halstead to Hutchinson.

South Covington & Cincinnati Street Railway, Covington, Ky.—Preliminary arrangements are being made by this company for the extension of the Ft. Mitchell line to Erlanger.

Kentucky Southwestern Electric Railway, Light & Power Company, Paducah, Ky.—It is reported that this company expects soon to begin construction of its projected line from Paducah to Murray, Ky., 58 miles. A power house, three substations, carhouses, 1800-ft. trestle and several smaller ones, etc., will be required. The grade will run to about 2 per cent on the maximum with 8-deg. maximum curvature, with about 1,000,000 cu. yd. of material to be handled.

Bay State Street Railway, Boston, Mass.—This company is asked to consider the feasibility of the construction of a new line from Montello to South Weymouth, via Cary Hill and West Abington.

St. Paul Southern Electric Railway, St. Paul, Minn.—This company has placed its line between Hastings, Neb., and St. Paul, Minn., in operation.

St. Paul (Minn.) Street Railway.—This company is asked to consider plans for an extension of its Dale Street and Forest Street line to Ocean Street in St. Paul.

Metropolitan Street Railway, Kansas City, Mo.—Engineers have plans for this company by which it will be possible to rebuild the Central Avenue Bridge, as per the plans of the Kaw Valley Drainage Board, without interfering with wagon service over the structure or street cars on the second deck, thus avoiding the necessity for rerouting cars' during the construction period.

United Railways Company of St. Louis, St. Louis, Mo.—Plans are being considered by this company to build a new system of loops in the downtown district of St. Louis. Several other lines will be extended 3 miles or more. Broadway in North St. Louis will be tapped by two crosstown lines, the Jefferson and Taylor lines.

***Corona, N. Y.**—Plans are being considered to build an electric line from the terminus of the dual subway line at Corona to the Vanderbilt property at Lake Success. It will be double track and will cross the meadows and Flushing Creek by a viaduct and bridge, thence it will extend east parallel with the North Hempstead Road and north of the Black Stump Road and the proposed Grand Central Boulevard. W. K. Vanderbilt, Jr., is said to be interested.

Buffalo & Lake Erie Traction Company, Buffalo, N. Y.—During the next few months this company plans to reconstruct about 2 miles of track in Erie.

Jamestown, Westfield & Northwestern Traction Company, Jamestown, N. Y.—Surveys are being made by this company for a line south of the present tracks in Westfield from below the canning factory up to the Lake Shore station. It will also build a switch at the station.

Manhattan & Queens Traction Corporations, New York, N. Y.—An extension down Sutphin Road to the corner of Pacific Street and Rockaway Road in Brooklyn is being contemplated by this company.

Yonkers (N. Y.) Railroad.—Work has been begun on the substitution of a double track for a single one in New Main Street, one of the principal business streets of Yonkers. The improvement will greatly facilitate the operation of the three lines serving the eastern portions of the city.

Oklahoma (Okla.) Railway.—As soon as financial backing has been obtained this company will begin work at once on a 15½-mile extension from Oklahoma City to Guthrie.

Stark Electric Railroad, Alliance, Ohio.—Within the next few months this company plans to make improvements at the eastern terminus of its interurban line into Salem.

Cleveland (Ohio) Railway.—The new Warner Avenue extension from Broadway and Miles Avenue, 1 mile south, has been completed and will probably be placed in operation on Dec. 1.

Ohio Valley Traction Company, Portsmouth, Ohio.—The officials of this company, after a meeting in Portsmouth on Nov. 19, announced that the greater part of their bonds, amounting to $500,000, has been sold and that work on the traction line between Portsmouth and Ironton, Ohio, will be begun early in the spring.

Toronto (Ont.) Civic Car Lines.—Work has been begun on the construction of the Bloor Street West civic car lines in Toronto.

Toronto, Ont.—Messrs. E. A. Walberg and John F. Hansen have asked the Board of Control for permission to lay a civic car line on Manor Street or some other cross street in North Toronto, to provide a service for the employees of the Canada Wire & Cable Company in Leaside. The line would connect with the proposed civic car line on Mount Pleasant Avenue. The deputation said that the city could take over the line when it was required in connection with the civic system. The applicants were asked to put their proposal in writing and it will be considered along with the other proposed car lines, for which Comptroller Church wants to submit a $1,000,000 by-law.

Berks & Lancaster Railway, Lancaster, Pa.—The contract for the construction of 6½ miles from Kleinfeltersville to Womelsdorf has been awarded to J. A. Vandergrift Company, New York. This line will connect with the lines of the Ephrata & Lebanon Railway. This new line is the connecting link between the lines of the Ephrata & Lebanon Railway and the Reading and Lancaster lines.

Oxford, Cochranville & Parkersburg Electric Railway, Oxford, Pa.—This railway project has been abandoned.

Pittsburgh, Harmony, Butler & New Castle Railway, Pittsburgh, Pa.—This company has opened its new bridge over the Beaver River, near Ellwood City. The structure is 1250 ft. long, 82 ft. high and 29 ft. wide, and cost $160,000. It spans the tracks of the Pennsylvania Railroad lines, the Beaver River and the tracks of the Pittsburgh & Lake Erie Railroad.

Pottstown & Phoenixville Railway, Pottsville, Pa.—Work still continues on the extension of this company's line from Sanatoga to Linfield. The section of the line from Miller's Bridge, ½ mile below Sanatoga, to Linfield, a distance of 2½ miles, will be placed in operation in December. Within the next ten days the contract for the extension from Linfield to Spring City will be awarded.

Titusville (Pa.) Electric Traction Company.—This company contemplates some important extensions in the near future. Address W. J. Smith, manager, for definite information.

Tennessee & Kentucky Interurban Electric Railway, Nashville, Tenn.—Surveys are being made by this company from Jellico, for a distance of 16 miles, through the coal and timber fields located in northern Tennessee. [E. R. J., July 25, '14.]

Beaumont (Tex.) Traction Company.—This company is asked to consider plans to extend its line south from Beaumont to the refinery of the Magnolia Petroleum Company.

Dallas, Tex.—Work has been begun on the extension of the Southern Methodist University line from the terminus, near Mockingbird Lane, to the campus. The contract for the line has been awarded and the route will be via the Highland Park line, transferring at Abbott Avenue and Euclid Avenue in Dallas. This is part of a plan to build an electric line from the Southern Methodist University to the terminus of the Dallas Consolidated Electric Railway by the Southern Methodist University. [E. R. J., Aug. 8, '14.]

*__San Angelo, Tex.__—Plans are being considered to build an electric railway to connect San Angelo, Bronte and Robert Lee.

Texas City (Tex.) Street Railway.—An extension to the passenger pier at the foot of Eighth Street in Texas City will soon be built by this company.

Milwaukee Electric Railway & Light Company, Milwaukee, Wis.—This company is asked to consider plans to double track its line on Downer Avenue between Hartford Avenue and Edgewood Avenue in Milwaukee.

SHOPS AND BUILDINGS

Iowa Railway & Light Company, Cedar Rapids, Ia.—At a cost of approximately $80,000 this company has acquired property at and in the vicinity of the northeast corner of Fourth Avenue and Second Street in Cedar Rapids on which it plans to build a new passenger station. The company also plans to build a large freight terminal on the west side of the river at Ninth Avenue.

Kentucky Southwestern Electric Railway, Light & Power Company, Paducah, Ky.—During the next few months this company plans to build its new carhouses in Evansville.

Worcester (Mass.) Consolidated Street Railway.—Plans are being made by this company to build a new freight depot upon the site of the Geary carhouse in Adams Street, which was burned a few years ago.

Kansas City (Mo.) Railways.—The board of control has been granted an extension of time on its report on the selection of a site for an interurban railway station. The board's report would be a recommendation, the selection resting with the City Council. The recommendation probably will be made early in December.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn.—This company's paint and repair shops at Nicollet Avenue and Sixtieth Street, Minneapolis, were destroyed by fire on Nov. 19. Three of the company's gasoline cars were destroyed. The roundhouse and office building near by were saved. The loss is estimated to be about $50,000.

Mesaba Electric Railway, Virginia, Minn.—This company has opened its new carhouses and offices just east of Mountain Iron. The company is moving into the new quarters from the temporary frame building that was erected after the fire a year ago. In that fire the carhouses and plant of the company were destroyed. The new buildings which have been erected cost $28,000.

Ohio Electric Railway, Cincinnati, Ohio.—Work has been begun by this company on the new freight and passenger station at Fort McKinley, stop No. 7.

Lehigh Valley Transit Company, Allentown, Pa.—Plans are being considered by this company to build a new freight station at Marshall and Markley Streets in Norristown.

POWER HOUSES AND SUBSTATIONS

Danbury & Bethel Street Railway, Danbury, Conn.—This company has installed a new 600-kw, 2300-volt turbo-generator, two 200-kw rotary converters and one 300-kw converter in its power house in Danbury.

Kentucky Southwestern Electric Railway, Light & Power Company, Paducah, Ky.—Plans are being considered by this company to soon build a new power plant and three substations.

Ithaca (N. Y.) Traction Corporation.—Two 300-kw, three-phase, sixty-cycle, 1200-r.p.m., compound-wound, self-starting rotary converters; two 300-kva, three-phase, sixty-cycle, 2200-volt, high tension to rotary volts low tension O. I. S. C. transformers, and one six-panel switchboard will soon be installed by this company at its power house in Ithaca. The apparatus was ordered from the Westinghouse Electric & Manufacturing Company.

Empire United Railways, Inc., Syracuse, N. Y.—This company has recently purchased two 400-kva transformers for installation in the substation of the company which is located at Port Byron.

Cleveland, Youngstown & Eastern Railroad, Cleveland, Ohio.—Two 300-kw, 600-volt, direct-current, three-phase, sixty-cycle, 1200-r.p.m., compound-wound alternating-current self-starting rotary converters and one five-panel switchboard for the above will soon be installed by this company at its power plant in Cleveland. The apparatus has been ordered from the Westinghouse Electric & Manufacturing Company.

Nashville Railway & Light Company, Nashville, Tenn.—This company has awarded a contract for installing a 500-kw motor generator set in a new substation which has been built in Nashville.

Manufactures and Supplies

ROLLING STOCK

Buffalo & Depew Railway, Buffalo, N. Y., is completing two snow plows in its own shops.

Northwestern Pacific Railroad, San Francisco, Cal., has converted seven of its 57-ft. 3-in. interurban trail coaches into double-end motor coaches.

Minneapolis, St. Paul, Rochester & Dubuque Electric Traction Company, Minneapolis, Minn., lost three of its gasoline cars in a fire which destroyed the repair shop and paint plant of the company at Nicollet Avenue and Sixtieth Street on Nov. 19.

Yuma Valley Railway, Arizona, through the United States government department of reclamation service, has purchased one 55-ft. all-steel, 200-hp seventy-five passenger gasoline motor car from the McKeen Motor Car Company, Omaha, Neb.

TRADE NOTE

Mathias Klein & Sons, Chicago, Ill., tool manufacturers, have perfected and are now marketing an improved Klein Haven's clamp adapted for handling plain or stranded wire or cables up to ¾ in. in diameter. The particular feature of construction is the addition of a swing latch which engages with a stud on the lower jaw, thus centralizing the pressure on the cross-bolt, which is strongly made of turned machined steel. The body and handle of this clamp are made of steel forging and the eccentric of hardened tool steel.

ADVERTISING LITERATURE

National Tube Company, Pittsburgh, Pa., has issued a folder describing male and female "Kewanee" union.

Ohio Brass Company, Mansfield, Ohio, has issued a folder illustrating the features of its Type C section insulator.

Prepayment Car Sales Company, New York, N. Y., has issued a folder entitled "The Melting Pot" in regard to prepayment platforms.

W. W. Lindsay & Company, Philadelphia, Pa., contracting engineers, have issued a booklet containing illustrations of new construction work built by the company, which include, among others, a view of the handsome power house of the Charleston (S. C.) Consolidated Railway & Lighting Company, and the carhouses of the Springfield Railway and the People's Railway, Dayton, Ohio.

Hess-Bright Manufacturing Company, Philadelphia, Pa., has issued a series of sheets on its ball bearings for various uses. Sheet 101 describes vertical mountings on shafts without shelters; Sheet 102, standard mountings for horizontal and vertical ball bearing electric motors; Sheet 103, ball bearings as applied to turbine pumps; Sheet 106, ball-bearing live-tail centers, and Sheet 107, ball-bearing lathe heads.

Continental Fibre Company, Newark, Del., has issued a catalog describing its insulating products, vulcanized fiber, "Bakelite-Dilecto" and "Continental Bakelite" for insulation of armatures, brakeshoes, dynamos, motors, magnetos, transformers, railway signals, high-tension cable conduits and track insulation, in connection with electric track circuit signals. The peculiar characteristics of each of these materials is explained in detail, together with their fields of usefulness. Although manufactured primarily as insulating materials, their physical qualities render them adaptable to a wide range of mechanical applications.

Dayton Fare Recorder Company, Dayton, Ohio, has issued a folder describing its computing fare recorders for city and interurban railways, which are designed to dispense with figure drudgery in fare collecting and accounting and also to avoid the inevitable mistakes and losses that go with it and to provide, instead, printed records of the fare receipts fully itemized, computed and summarized ready to be delivered at the receiver's window when the conductors make settlement. No clerical work either by conductors or receiving clerks is required to determine the amount of fare collected. The folder contains a reproduction of a printed record produced from a twelve-fare interurban recorder, which illustrates the principle of double registration and recording used on all recorders of the different sizes.

H. Edsil Barr, Erie, Pa., engineer and manufacturer, has issued a folder describing and illustrating his pneumatic light forging hammer for machine shops. As illustrations in the catalog show, this hammer is similar in appearance to a steam hammer and operates on the same plan—by the use of pressure in a suitable cylinder to lift and throw the ram. The hammer consists of a heavy anvil or die block, cast solid and with provisions for bolting down. Cast with the anvil is a heavy box frame or housing strongly reinforced inside and supporting the cylinder. In the cylinder operates the piston which drives the ram or hammer head, and the movement of the ram is controlled entirely by the operator who presses the foot lever, thus operating the valve, which admits air under pressure to the cylinder.

Drew Electric & Manufacturing Company, Indianapolis, Ind., has issued a 107-page catalog, No. 3, describing its complete line of electric railway, light and power materials. These materials include clinch gears, splicing gears, line suspensions, trolley frogs, trolley switches, tunnel approaches, trolley crossings, section insulators, motorman's safety mirrors, pole sleeves, telephone jack boxes, night car stop signals, pipe insulators, hangers, strain insulators, turnbuckles, flexible brackets, high-voltage insulators, cross-arm supports, Garton-Daniels lightning arresters and choke coils, anchor rods, machine bolts, galvanized iron and steel wire, lamp sockets and other miscellaneous tools. At the end of the catalog are useful tables and data governing the selection of wire according to weight, diameter, resistance and other physical properties, and also tables for selecting iron pipes as poles. An illustration shows one of the largest and most intricate pieces of overhead construction on the lines of the Indianapolis Traction & Terminal Company at Illinois and Washington Streets in the city of Indianapolis, supplied by this company. The intersecting streets at this point are 90 ft. wide. The width of the streets requires the supporting wires to be very long, thus making the maintenance and proper alignment very difficult. As this point is the central transfer junction in the city and in the heart of the conjested downtown district, uninterrupted movement of cars is important to both the company and the public. A total of 3724 regular, and about fifty to seventy-five special, cars pass under this equipment every twenty-four hours. The average renewal of material in this particular case has been two and three-quarters years, during which time nearly 4,000,000 car passings occurred. The back of the catalog contains a convenient index for referring to the materials described.

LABOR QUESTIONS IN CLEVELAND

Having been informed by the director of public service that the City Council of Cleveland, Ohio, cannot dictate working hours and conditions on the Cleveland Railway, George R. Davies, president of the branch of the Amalgamated Association in that city, has intimated that the officers of the company will be prosecuted under section 9007 of the general code, which is intended to insure eight hours' rest out of the twenty-four for all railroad men on interurban and street railroads. This section provides that on a railroad more than 30 miles long or interurban or street railway more than 4 miles long, men who have worked fifteen consecutive hours shall not be permitted to go on again until they have had at least eight hours' rest, except in case of accident. Very few, if any, men are called upon to work fifteen consecutive hours. Mr. Davies blames the schedules more than he does the officials of the company for what he terms poor conditions.

The Cleveland Railway will pay $600 of the expenses of the recent arbitration proceedings between it and the men. Attorney Charles Higley, representative of the company, will receive $500 and A. B. Thompson, the third arbitrator, $200. Judge Willis Vickery, selected by the men, will not present a bill. The union organization will pay the remainder of the amount.

The City Council yielded to the plan of collecting funds in the fare boxes of the cars on Nov. 25 for the benefit of the Associated Charities, which has a deficit of some $30,000. The average of the receipts for Sunday, Monday and Tuesday of the week will be taken as the portion for the company on Wednesday. Whatever sum above this amount is found in the boxes will be donated to the charitable organization.

Electric Railway Journal

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IMAGINARY "SAFETY FIRST"

A recent examination of a certain new shop which has been heralded as the safest of its kind in the state, disclosed a most contradictory condition of affairs. The shop has an employees' safety committee which meets regularly to discuss the cause and cure of every accident, and the company apparently is willing to follow any suggestions that will reduce hazard to its workmen. When the mill room was shown to a visitor, a great deal of pride was taken in exhibiting the sheet-iron housings and screens that had been put up to inclose the belting of some tools, yet, strange to say, other belts and chain-driven tools near by carried no such protective devices at all. The floor was littered with boards and blocks in every possible direction, a ladder had been left in a decidedly dangerous position against the wall, and across a passageway, overhead, a loose board was bridging the space between a window sill and a roof truss ready to Zeppelin the innocent visitor. Aside from these major dangers were such minor ones as brushing off a circular saw which hung from a post with a looseness akin to nonchalance, or April-fool kicking into a pile of shavings that might cover a piece of metal with more inertia than is good for toe comfort. We say nothing of the fire danger. If this is the best that the company and the committee can accomplish for "safety first" it would be well for the members to stick to their regular jobs and hire a German Hausfrau of the good old kind to do some real house-cleaning.

KEEPING THE SUBSTATION ATTENDANT BUSY

On an interurban road the substation attendant has a lonesome job at best, and if he is energetic he is constantly seeking something to keep him busy. Generally his sole duty is to attend to the substation equipment if it is away from a station stop, but even at the way station his duties as ticket agent are not arduous. In any event, the attendant's salary forms a large proportion of the substation's operating cost. For this reason many roads have made it a practice to hire as cheap a man for this position as is consistent with the duties he has to perform. There is considerable difference of opinion regarding this practice, however, and in an effort to keep down the station operating cost some roads have given the attendant other duties to perform. On the Chicago, South Bend & Northern Indiana Railway each substation attendant is supplied with forms for a certain type of field and armature coils and a stock of wire with which he is expected to keep the storeroom supplied with a sufficient stock of coils for all repairs. These coils are merely wound and pressed into shape at the substations, and when a sufficient number have accumulated they are sent to the shop where they are dipped, baked and turned into stock. This practice has enabled the company to employ a higher priced and, consequently, a better qualified substation attendant, without increasing the cost of operation. The idea of keeping the substation attendant engaged is an excellent one, particularly when a portion of his time may be charged to other work. On the larger systems, where the number of coils for repairs would be insufficient to keep all attendants constantly employed, the installation of a machine lathe or other equipment for finishing various kinds of small castings or manufactured repair parts would attain the same end.

PUBLICITY AND PUBLIC SERVICE COMMISSIONS

In the special convention issue of the Electric Railway Journal devoted to public relations a chapter treated of publicity methods of public utilities, a topic closely related to the main subject. In the present issue is a view of publicity from another angle, that of the public service commission. A commission, we believe, has a duty to perform in enlightening the public and assisting in a correct understanding of the problems of the public utility companies. Owing to its intimate relations with the companies within its jurisdiction it has the knowledge, and owing to its impartial position its statements will be accepted by the public more readily than those from an interested party. It is thus possible for a commission to serve the utility and the public at the same time. The editorial study which led to the preparation of the article referred to impressed us with the fact that the commissions desire to perform this function to the satisfaction of both interested parties. "Commission News" is coming to be a more and more conspicuous feature in the public press. As an example of this and without wishing to detract in any way from the credit due the other commissions, we may properly direct special attention to the successful efforts being made by the New York State Commission for the First District to keep the public informed and interested in the subway work in progress in New York City. In addition to the methods mentioned in the article, numerous others are in use. Near each of the numerous surface structures in New York, such as loading cranes, engine houses, etc., necessary in connection with the underground work, are neatly-lettered signboards, placed by the commission, containing information intended to satisfy the natural curiosity of the populace. Exhibits of an instructive character have been set up on property condemned for subway purposes but not needed for immediate use. As a result of these and other measures the people of the city are following the work with interest and appreciation.

"POISONING THE WELLS"

A curious, and we are sure to the committee on public relations very unexpected, objection has been made to a part of its program by "a journal of opinion," publication of which has just begun under the title of the *New Republic*. As to the Code of Principles, it is admitted that "it is an able, and, on the whole, a moderate document." But the *New Republic* condemns the recommendation that public education be attempted by means of the "formation of a committee of prominent technical educators to promote the formulation and teaching of correct principles on public service questions in technical and economical departments of American colleges, through courses of lectures and otherwise."

The objecting editor assumes that by "correct principles" are meant the Code of Principles, and that it is proposed to secure the teaching of this code very much as the first-grade pupil is taught the multiplication table or as the law student is compelled to memorize the seven exceptions to the rule in Shelly's case. We hasten to reassure the alarmed critic, whose fears for the purity of the well-springs of knowledge would perhaps be justified if he had correctly understood the American Electric Railway Association proposals as to educational propaganda. The Code of Principles does not attempt to lay down the lines upon which technical and economic education shall be conducted, although its declarations might well be brought before and be debated by students who may some day have to deal with the actual economic problems affecting a great industry in whose status the public is deeply concerned. Furthermore, it must be assumed that the "committee of prominent technical educators" would be able to preserve their students from contamination in case railway emissaries should attempt to mislead them in the way suggested.

A criticism such as the one to which we have referred, based upon complete misunderstanding, would not be deserving of comment if it did not represent what may be a general misconception. For this reason it is well, perhaps, that the objection should have been made definitely and specifically. It should be answered just as definitely and specifically so that the purpose of the American Electric Railway Association and of its committee on public relations shall be clearly understood by all.

Without regard to the wording of the recommendation to which criticism is made—and when examined with any care it is evident that it is not a proposal that railways shall invade the schoolroom with advocacy of special interests—there was an aim embodied in this recommendation which is not only wholly defensible but extremely desirable from every point of view. It is this: that the teacher and student of economics shall have practical as well as theoretical experience. No student in a technical course in any of our universities expects to be able to acquire the knowledge to fit him for his chosen profession by the study of books only. The civil engineer must have practice in the field, preferably in actual construction; the electrical engineer must study the application on a large scale in central power stations of the forces whose laws he is studying; the medical student must have access to the hospitals and to the clinics of the best practicing surgeons, and so through all of the other courses. More and more, effort in technical education is being directed toward bringing the student into contact with existing conditions and to enable him to combine his teaching in theory with that gained in the laboratory of actual experience. The same principle applies, of course, to the instructors. The most successful teachers in engineering, as well as in medicine and surgery, are those who give part of their time or have given a large part of their time to practical work in their chosen fields, who are in intimate touch with and participate in the work of the technical associations engaged in this kind of research and who conduct their study of the science in which they are engaged outside as well as inside the college walls.

We believe that the same rules should apply to a thorough prosecution of the study of railway economics. The best laboratory of economics, so far as the railways are concerned, for both the student and the instructors, is the railways themselves. In fact, it would seem as if the need for this contact with actual conditions was even more important in the field of economics and sociology than in that of engineering or medicine, because the principles in the former studies are less capable of expression by laws or mathematical formulas and are more dependent on the human element. No professor of economics, however jealous of his prerogatives or however devoted to his text-books, ought to object to the invitation to use this laboratory, to make original investigation and to listen to the men who are running the railroads.

That is all that has been proposed or contemplated by the public relations committee. It is a sound proposal; it will result in better education, and we hope to see it carried out. Criticism based upon misconception or hostility will not hurt if no other end is being sought than a fair opportunity for discussion and exposition and for the broadening of education by the addition of practical to theoretical teaching.

When a railroad commission bill was before the Pennsylvania Legislature some years ago, an amendment was offered to the effect that no one should be eligible for appointment on the commission who had ever been connected with or employed by a railroad company. Too narrow a prohibition, declared a sarcastic legislator, who suggested that the bill be made to read that no one who knew anything about railroads should be on the commission. If anyone wishes to argue that this is a good rule to apply to education in economics, let him make the most of it. Such an argument will soon fall with the weight of its own absurdity.

DECREASE OF FARE DENIED

The decision of the Public Service Commission of New Hampshire in the Manchester fare case, a report of which was published in our last issue, is one of the encouraging symptoms of reasonable treatment of utilities and as such deserves comment. The issue nominally was the sale of cut-rate tickets during the rush hours and practically involved the fair return which an electric railway company ought to be allowed upon its investment. To the unthinking man on the street a concession of six tickets for a quarter or twenty-five tickets for a dollar during the hours of heavy traffic does not seem very much, especially when, to his mind, the profits ought to be greater at those times because of the crowded cars. When, however, it is shown by experience that the cost of operation is greater at those hours, that during that time 40 per cent of the passengers travel, and that a cut of substantially 25 per cent was proposed, the severity of the measure becomes apparent. In very few lines of business could a 25 per cent cut in prices be endured without imminent peril of bankruptcy, even if such reduction affected only 40 per cent of the goods. Of course, a number of city railway companies do actually sell six tickets for a quarter and occasionally twenty-five for a dollar, and come out whole, but such instances are nearly always under exceptionally favorable traffic conditions, where the earnings per car-mile reach a highly satisfactory figure.

The final ruling of the commission was that the road was entitled to earn 6 per cent on a sum which was practically the full book value of the property, that is upon the actual sum total of its investment. The depreciated value of the property was recognized as considerably less than this, but the commission took the very rational view of the case that, inasmuch as no excessive dividends had been paid, the difference between the depreciated value and the investment might properly be considered as a legitimate cost incurred in developing the business. In other words, in getting the company on its feet and performing public service during the years since it started, at the present rate of fare the concern has not been able fully to make good the depreciation as it has occurred from the multifarious causes which affect such properties. The company was therefore allowed a 6 per cent return on the full amount of its real investment, to which sum was added sufficient allowance for taking care of future depreciation. This puts it up to the company to provide for depreciation, as has been the custom in one form or another under many commission rulings.

We believe that all who have had anything to do with the raising of money for public utility properties or the investment of capital in them will agree that the allowance made by the commission is not large, especially when one considers the uncertainties of going into the business twenty-five years ago. Indeed, the commission admits this when it points out that this percentage would amount to 7 per cent on the stock and 5 per cent on the bonds if the capitalization was equally divided between these two classes of securities. The commission also pleads in extenuation of its low rate that the company has a monopoly in a thriving New England city of 70,000 inhabitants, where capital for good local investments is presumably as cheap as in any other part of the country, and that in the South, for example, the same rate would not hold.

On the whole, the decision is most encouraging, especially when taken into consideration with the decision of the Massachusetts Board in the Middlesex & Boston case, because it exhibits a trend of opinion among commissions that public utility rates must be such as to put the business on a stable investment basis, even if the rates have to be raised. This is the principal point for which public utility operators are striving. With this principle established, the percentage of return which will enlist new capital to extend existing systems and develop new enterprises is a minor question and one which can be determined only by comparison with the rates of return which are offered by other commercial enterprises in the same locality. Commissions, in general, are coming year by year to a much more reasonable view of utilities than was had at first, and to-day any company which comes in to a question of fare rates with clean hands as regards its capitalization and expenses of operation may be reasonably certain in most states of getting fair play. Sometimes commissions may seem to bear somewhat severely upon the company, but their decisions are much less to be feared than the operation of local politics.

STEEL CAR CONSTRUCTION PROBLEMS

If steel cars could be so simplified or standardized as to make the absorption of the expense for jigs, templets and dies a minor consideration rather than one of prime importance, the construction cost would be so reduced as to make the general use of steel a foregone conclusion. The prominence of this problem is forcefully emphasized elsewhere in this issue in an article describing the new pressed steel cars for the Chicago Elevated Railroad. In the illustrations a few of the jigs and templets are shown, and when it is considered that these are merely examples of more than a thousand similar ones it becomes easy to realize the importance of standardization. While it is possible to adapt to other cars the ideas developed in preparing these jigs, all but a few of the special devices must be cast aside when the order is completed. This is not only an economic waste which the car manufacturer must anticipate, but one for which the purchaser must pay. How much simpler, yet more economical and practical, would be the purchase of car bodies in the same manner as automobiles! If this could be done, the expense for the costly but necessary construction facilities could be spread over the manufacturers' annual output, and under the existing competitive conditions the purchaser would reap the benefit in decreased cost.

To the same end attention may well be called to the practical considerations that are involved in car design, so-called because the choice of certain members is based largely on experience rather than upon any theoretical calculations. Such considerations include the impact loads involved by unusual buffing or collisions, and the extent to which the maximum bending moment should be assumed to be increased to provide against the effect of shocks caused by sudden depressions in the track. A great variety of opinions may be obtained from car designers regarding either of these questions, yet there is no doubt that the adoption of some simple standards in this regard is practicable. Certainly such a move would be a long step toward the ultimate solution of the important problem of reducing the cost of steel car construction.

THE NEW A. I. E. E. STANDARDIZATION RULES

After many months of effort the standards committee of the American Institute of Electrical Engineers has put the finishing touches upon the revised set of standardization rules, and they are now practically ready for distribution in pamphlet form. The new rules became effective on Dec. 1. The completion of this work is a cause for congratulation to the Institute and to the electric railway industry, for it provides a codification of existing electrical practice. It is now up to the industry to study, digest and apply the information. Institute sections and branches, railway association sections and other agencies for the dissemination of information could well devote attention to the subject in early meetings.

The preparation of rules intended to exert influence in the direction of standardization of electrical apparatus was the result of a topical discussion on the standardization of generators, motors and transformers which took place at Institute meetings held in 1898. A committee then appointed prepared rules which were adopted at the 1899 convention. These rules were revised in 1902, 1907 and 1911 to accommodate them to the rapidly-developing electrical art, and the present revision is the work of a large and representative committee appointed in 1913. These rules aim to define the nomenclature of electrical engineering, to specify reasonable performance for electrical apparatus and to suggest methods of testing or calculation by which actual performance can be checked against specifications. One of the principal effects of the rules will be to enable purchasers of equipment to write definite specifications which will put all manufacturers upon the same basis in bidding.

Their scope is limited to electrical qualities or to those directly or indirectly affecting such qualities. While the accuracy of this statement may be questioned upon casual examination of some of the rules, a deeper study will show their relevancy. For example, third-rail positions are specified and this, at first sight, appears to be a trespass upon the railway field. They were included, however, because the position of the rail affects the design of the insulator. The scope of the rules is further limited by commercial and economic conditions. They would fail of their purpose if they were made academic and theoretical. While they are designed to appropriate the best from existing practice and to point out the lines of progress, they must depend for their usefulness upon the strength of their appeal to the manufacturer and the user of electrical equipment. That they have made such an appeal is evidenced by the extent to which the "Institute rating" of this or that device has come to be recognized as a standard of reference at least, if not a standard of perfection. The manner in which the standards committee is endeavoring to feel the pulse of the industry is indicated by the letter from W. A. Del Mar, chairman of the sub-committee on railway standards, published elsewhere in this issue. Mr. Del Mar's committee had prepared a tentative section on the maximum input of railway motors, but both the sub-committee and the full committee felt that further information on the subject is necessary before the adoption of a definite rule is warranted. It is the great carefulness thus typified which gives to the rules such a high standing in the profession.

The new edition of the rules is larger than the last one, requiring more than twice as many pages. This is partly due to improved typographical arrangement and partly to amplification of text. The division into main sections is as follows: Definitions of a general nature, and standards for electrical machinery, for wires and cables, switches and other circuit control apparatus and for electric railways. Appendices are devoted to railway motors, illumination and photometry, standards for telephony and telegraphy, bibliography of electrical standardization literature, and horse-power and kilowatt. An ample index is provided. In each main division the important terms are defined and the limitations of operating conditions are specified with the intention of making clear what is wanted rather than how it is to be obtained. In other words, the rules do not go into design details nor do they take up definitions which do not affect the user of electrical apparatus. The railway section abstracted in the last issue of this paper is typical of the general plan.

While the standardization rules can only be suggestive it is obviously to the interest of every maker and user of electrical apparatus to know and use them. This applies particularly to the individual engineer who wishes to express his knowledge in exact terms. One who says or writes "resistance" when he means "rheostat" or "resistor," or who forgets himself so far as to connect a "reactance" in a circuit instead of a "reactor" is no student of the rules. We can possibly excuse the man who synchronizes a "rotary converter" instead of a "synchronous converter" for he has not confused a thing with the property which it possesses as has the other fellow. He has, however, used a term not very logical because there are at least four kinds of rotary converters in addition to the one to which he referred. The use of specific terms rather than general ones makes for clarity and mutual understanding, and this paper, for one, will use its influence, as far as practicable, in carrying out the suggestions of the new standardization rules.

PROTECTION OF EQUIPMENT TRUSTS

The recommendations of the committee on equipment trusts of the Investment Bankers' Association of America, whose report was abstracted in the issue of this paper for Nov. 21, should be interesting to electric railway officials. Equipment trusts securities were, it is true, first issued by steam railroads and have been more extensively used by them than by other carriers, but the facts that since 1904 the Hudson & Manhattan Railroad, the International Traction Company, the Philadelphia Rapid Transit Company, the United Railways & Electric Company, the United Railroads of San Francisco and the Fort Wayne & Northern Indiana Traction Company have issued equipment trusts and that within the last three weeks the Staten Island Midland Railway and the Southern Pacific Company have made applications for authority to make such issues for electric rolling stock, indicate that electric railways to some extent favor this form of borrowing.

Obviously, the prime reason why more electric railways at present do not have equipment trusts is that such issues are based upon cars and other operating necessities that are usually purchased from earnings or from the proceeds of bond sales under general mortgage liens. There are instances, however, when such methods are impracticable or inadvisable. For example, while the purchase of a few cars each year or so may be easily handled from the current cash resources, the acquisition of twenty-five, fifty or one hundred cars might prove too serious a drain upon working capital and necessitates the spreading of the expenditure over the earnings for a series of years. Then again, even if the company were free through the possession of a limited open-end mortgage to float additional bonds covering new car purchases, or if, restricted by closed mortgages, it should desire to open new issues for such purposes, existing market conditions or diminished credit accompanying comprehensive rehabilitation proceedings might make such a step inadvisable. Under such conditions the equipment trust is a most useful and economical device.

It may be almost axiomatic to say that equipment trust certificates, of all obligations, should be surrounded by the most perfect safeguards. The Investment Bankers' committee complains, however, that lately the railroads have been showing a growing looseness in the responsibilities that are the backbone of such securities. Under the equipment trust plan a railway is obligated not only to provide for the safety of the equipment trust investor by properly instituting and preserving his first lien on the rolling stock but also to maintain the property in proper operating condition. Yet it seems that many steam railroads have been receiving equipment before recording the agreement, thus giving the equipment trusts under the after-acquired-property clause of general mortgages only a junior lien on the rolling stock. The indentures, too, have lacked the specific agreements that would enable the trustee to keep informed regarding the condition of the equipment and to declare a default for lack of proper maintenance and replacement. These points can be cleared up by the adoption of the indenture clauses and forms of periodic reports to the trustee suggested by the committee. Railways should welcome any attempted legitimate oversight on the part of trustees and not show any reluctance to submit maintenance reports or to restore lost or damaged rolling stock, for only in this way can there be permanently secured to equipment trusts the attractive investment character heretofore held. Their excellent record thus far as regards defaults has perhaps led to an exaggerated sense of security, but with changing conditions in the railway field it is vitally important that all interests concerned unite to remedy any existing neglect of regular oversight over such issues.

THE ELECTRIC RAILWAY AS A CITIZEN

The participation of electric railways in the civic life of towns in their territory is something very different in nature and effect from that form of pernicious political activity known as "lobbying." As an undertaking which has invested large amounts of money for fixed and movable property and which pays correspondingly large sums for taxes, the electric railway has a legitimate interest in all that will further the prosperity of its habitat. That interest, of course, is best displayed through the personality of a local manager who has ample authority to be the embodiment of the company's citizenship rights and duties. A study of what electric railway companies are doing in the smaller cities discloses that many managers do take a commendable part in civic work. To illustrate: Several companies on one or two occasions have permitted women to serve an afternoon and morning as fare collectors, under the guidance of the regular conductors, with the understanding that all collections in excess of the regular fares were to be applied to the children's or other charities; another set the example of encouraging home manufactures by organizing a "buy at home" club among its own men; a third has built up a mid-week shopping travel from the outlying towns by working out a fare-rebate scheme with the local merchants; and any number of properties have freely given display to the work of "clean-up day," anti-tuberculosis and other organizations concerned with social problems. Activities of this kind meet with much praise from various influential elements in turn and will not be forgotten when the railways ask something for themselves.

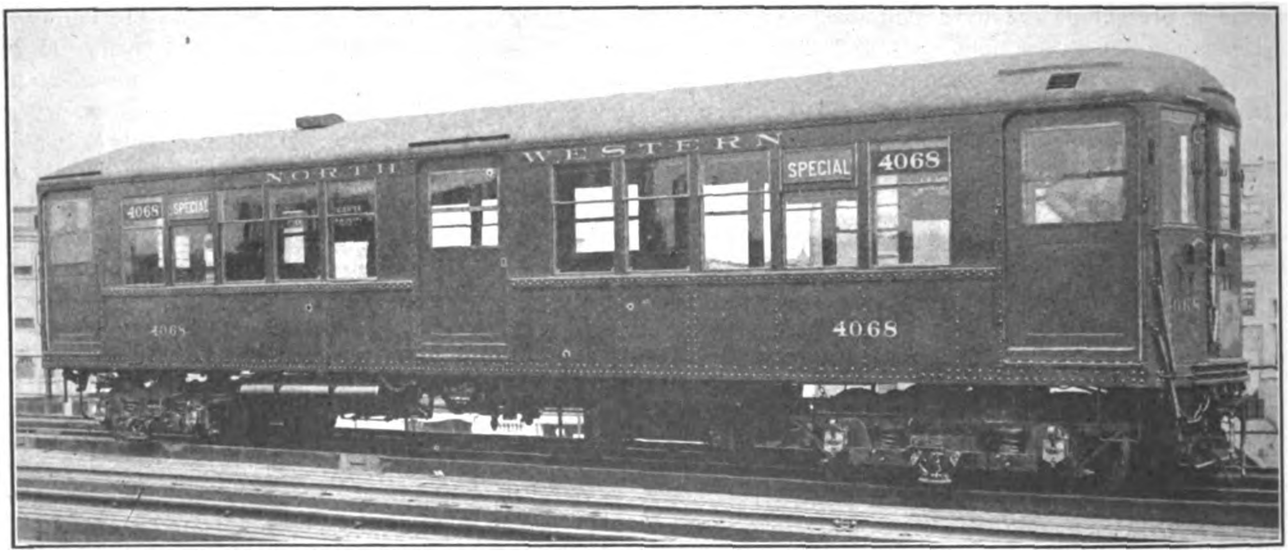
It is characteristic that the railways which do the things described are organized to allow the manager a large degree of initiative. On the small isolated property the manager is the master in any event. However, those companies which operate in whole groups of towns must be careful so to organize their departments that centralization of engineering and purchasing functions will go hand in hand with ample freedom for the local traffic managers. The latter should be far more competent to judge the merits of certain forms of co-operation with the public than a distant and often unsympathetic central bureau.

Pressed-Steel Cars for the Chicago Elevated

A Summary of the Reasons for Choice of Materials and Dimensions, Also the Considerations Which Governed the Size and Arrangement of the Members in the Body Framing

In December, 1913, the Chicago Elevated Railroads placed an order for 128 pressed-steel trailer and motor cars, and took an option for twelve months for an equal number of cars of the same design. The principal features of these cars were described in the ELECTRIC RAILWAY JOURNAL for Jan. 10, 1914. In the following paragraphs the reasons which governed the design and dimensions of these cars and materials used in their construction will be discussed.

As mentioned in the earlier article, the necessity for additional rolling stock was brought about by the increased capacity of the Chicago Union Loop. A slight remodeling of the structure accompanied by through routing of all north and south-bound cars over the Northwestern and the South Side Elevated lines, made it possible to add 500 cars per hour to the existing schedules which had been limited to 700 cars per hour. While the through routing of cars enabled the elevated lines to take advantage of a portion of this increased capacity with the rolling stock on hand, thereby partially offsetting the loss incident to the inauguration of universal transfers throughout the elevated system, additional rolling stock was necessary to obtain full advantage of the increased capacity.



CHICAGO STEEL CAR—VIEW SHOWING EXTERIOR OF COMPLETED CAR

Primarily, the size of the order justified the purchase of pressed-steel cars as the most economical from an operating standpoint. Moreover, it was desirable to obtain a fireproof car weighing no more than the existing rolling stock, which was of composite construction. By the use of steel pressings, properly designed, it was believed that the maximum strength per pound of weight would be attained, while the finished car would weigh no more than those of composite construction. Steel pressings also offered a car structure having fewer joints and fewer rivets than would be possible to obtain with commercial shapes. The side sill and cross-bearer connections are typical of this. If commercial sections had been used, cutting and fitting for each cross-bearer would have been necessary, after which a connection angle would have been required. The connection of the pressed-steel cross-bearer to the side sill requires only the rivets necessary to fasten the flange of the bearer to the side sill. Thus approximately one-half the number of rivets needed with commercial shapes accomplish the same result. It necessarily follows that a reduction in the number of pieces and joints, as well as in the number of rivets, should decrease the cost of fabrication and should also reduce the cost of maintenance. Also in this case there was a sufficient number of cars to make the use of pressings economical, since so large an order could easily absorb the cost of jigs, templets and dies.

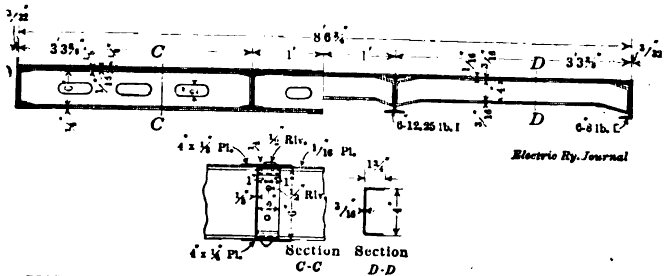
In order to give an idea of the relative cost of the Chicago Elevated Railroads' pressed-steel cars as compared with a number of steel passenger cars now in use on other roads, Table I is shown. This was taken from the article describing the 1914 New York Municipal car. The basis used for the unit figures for the Chicago car is a total capacity of 150 passengers, of whom fifty are seated.

TABLE I.—COMPARATIVE COSTS
Various Steel Passenger Cars

Type of Car	Total Cost Completely Equipped	Cost per Passenger Seat	Cost per Passenger Capacity Seated and Standing	Cost per Lineal Foot
A	$12,236.97	$169.95	$46.00	$175.98
B	18,500.00	260.56	99.46	287.09
C	13,000.00	250.00	84.41	253.25
D	14,500.00	329.54	93.54	300.00
E	12,500.00	284.09	80.64	258.62
F	14,000.00	318.18	76.92	268.91
New York Municipal Car	15,000.00	166.68	55.55	223.88
Chicago Elevated Car	11,000.00	220.00	73.33	229.17

CONSIDERATIONS GOVERNING DIMENSIONS

In the preliminary investigations clearance studies made on the various divisions of the Chicago elevated system soon developed the fact that but very slight changes could be made in the dimensions of the new car over those already standard in existing rolling stock. The following principal over-all dimensions of the new cars were therefore adopted:


C
D
C
D
6-12.25 lb. I
6-8 lb. E
Section C-C
Section D-D
Electric Ry. Journal

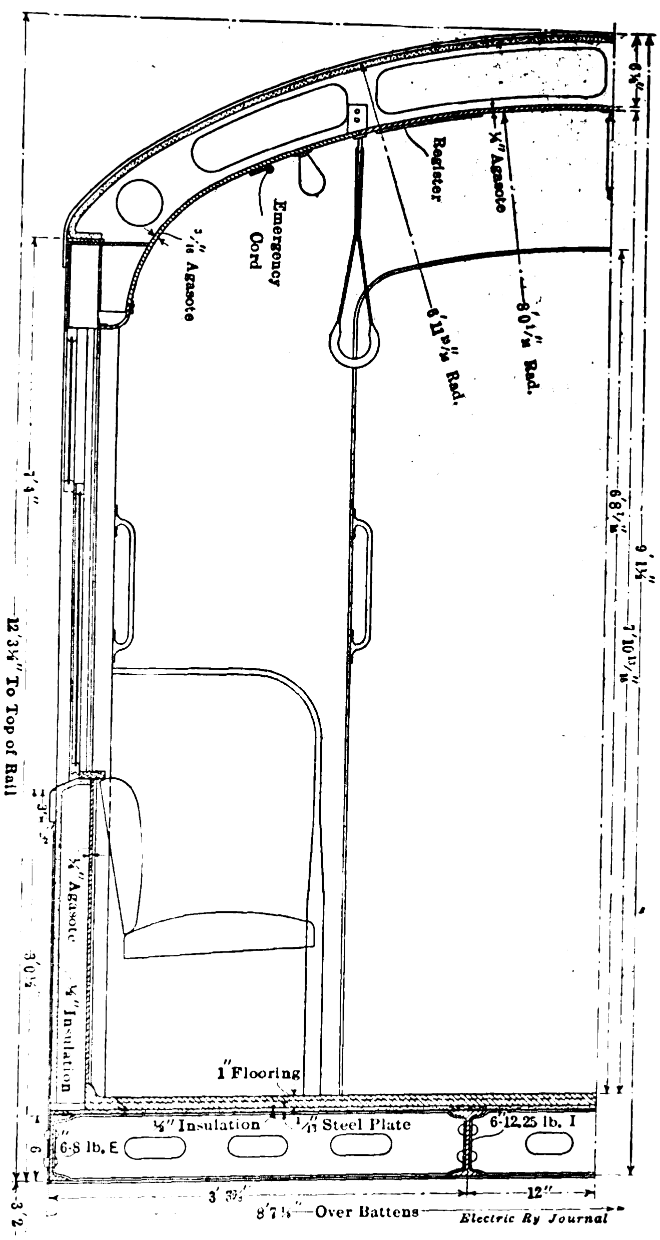
CHICAGO STEEL CAR—DETAILS OF MAIN AND INTERMEDIATE CROSS-BEARERS

Distance between centers of trucks	33 ft. 8 in.
Length of car body on center line over end plate	48 ft.
Length of car body over corner posts	37 ft. 10 in.
Extreme width of car over window sills	8 ft. 8 3/16 in.
Width of end-door opening	3 ft. 8 in.
Width of center-door opening	4 ft.
Height of car from top of rail to top of roof	12 ft. 3½ in.

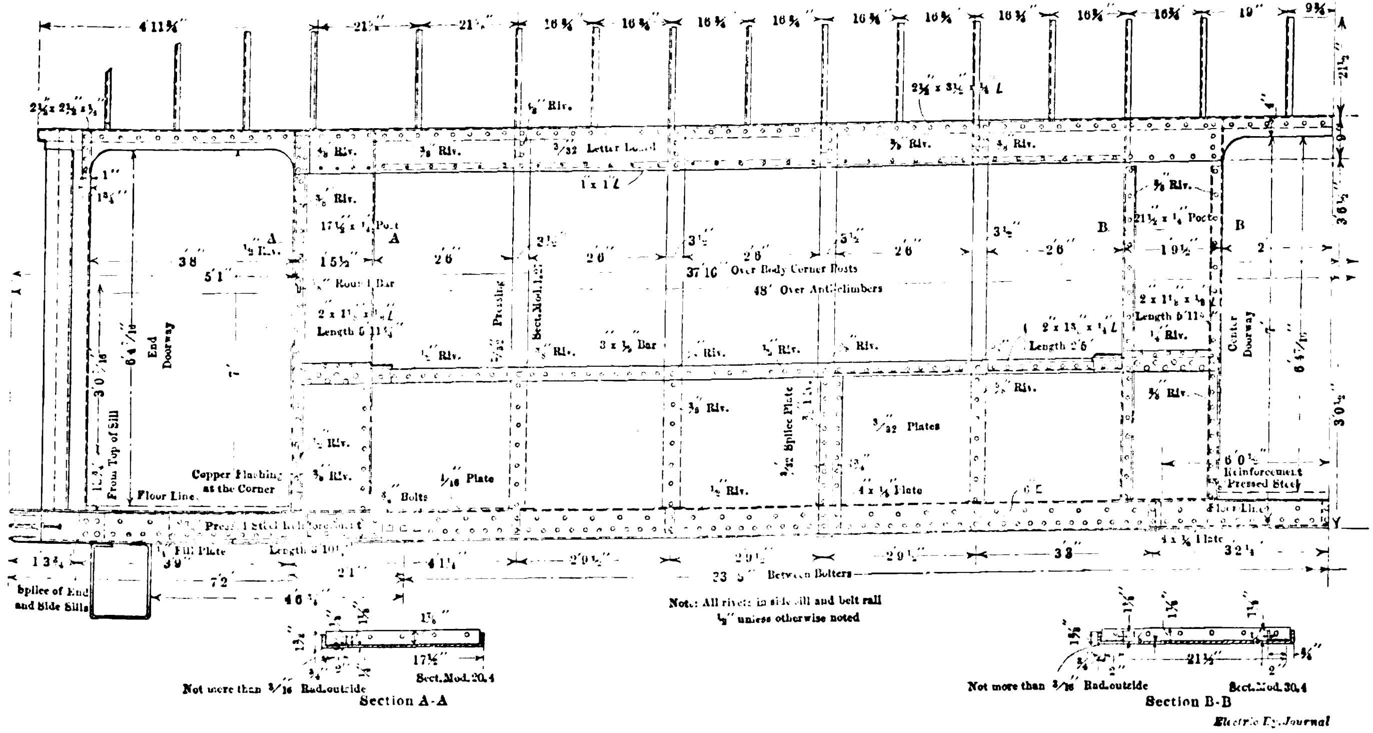
A careful survey of the curve clearances demonstrated that it was praticable to increase the car length 5 in. over the maximum length of existing equipment, but that the over-all width had to remain the same, being limited by platform clearance. It was possible, however, to take advantage of the all-steel construction and increase the interior width of the car 2 in. by reducing the thickness of the sides. The change from the monitor to the arched-roof type of car was made possible only by maintaining the same letterboard height as on existing equipment. This was required to clear station canopies, while the center height of the arched roof was limited only by the curvature necessary to give an attractive appearance to the car roof.

In connection with the choice of over-all dimensions, a rather unusual consideration entered, namely, that these new cars will meet the clearance limitations in any other city where cars of this type are in use. This cautionary measure had the effect of making the equipment trust notes more attractive to purchasers, since it would be possible to dispose of these cars to other companies in case any contingency should arise demanding their sale as second-hand equipment. The inclusion of these clearance considerations, although unusual, represents the thoroughness with which every phase of the car's design was considered.

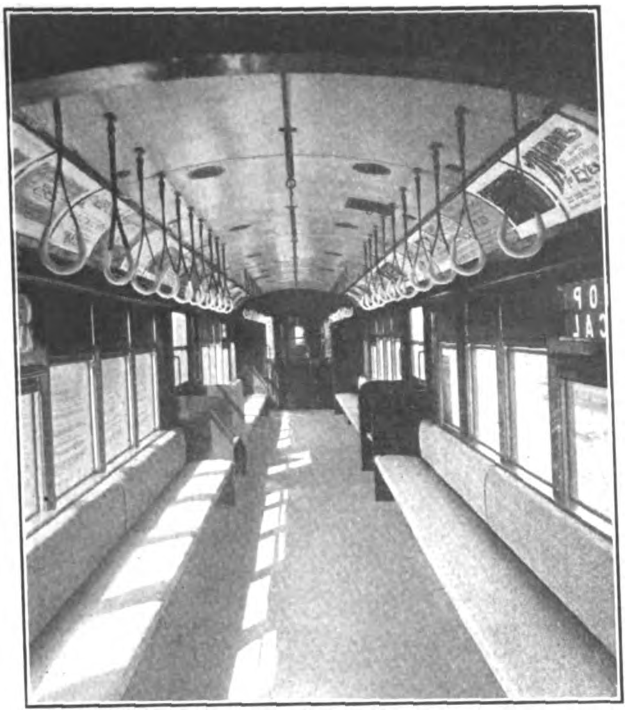
Since the major portion of the Chicago Elevated Railroads' traffic is obtained during rush hours, anything done to decrease boarding and alighting time


Register
¼" Agasote
Emergency Cord
⅜" Agasote
8'0¼" Rad.
6'11⁹⁄₁₆" Rad.
12'3½" To Top of Rail
¼" Agasote
¼" Insulation
1" Flooring
¼" Insulation
⅛" Steel Plate
6-12.25 lb. I
6-8 lb. E
12"
8'7¼"—Over Battens
Electric Ry Journal

CHICAGO STEEL CAR—CROSS-SECTION OF CAR BODY


End Doorway
Center Doorway
Letter Board
37'10" Over Body Corner Posts
48' Over Anticlimbers
Copper Flashing at the Corner
Floor Line
⅛" Plate
Splice Plate
Reinforcement Pressed Steel
Splice of End and Side Sills
23' 5" Between Bolsters
Note: All rivets in side sill and belt rail ½" unless otherwise noted
Not more than ³⁄₁₆" Rad. outside
Sect. Mod. 20.4
Section A-A
Not more than ³⁄₁₆" Rad. outside
Sect. Mod. 30.4
Section B-B
Electric Ry. Journal

CHICAGO STEEL CAR—DETAILS OF SIDE FRAMING



CHICAGO STEEL CAR—INTERIOR VIEW

materially reduces the length of station stops and increases the capacity of track and station facilities. As these rush-hour periods are short and occur between 7 and 9 o'clock in the morning and between 5 and 6:30 o'clock in the evening, the problem of general arrangement of the car resolved itself into one of door location and width. Moreover, the loading problem during rush hours has been made more difficult since the Northwestern and South Side cars have been through-routed, because it is necessary for passengers using these roads to board and alight at one-half as many stations as were used when all cars were looped in the downtown district.

To reduce the boarding and alighting time, three doors in place of two on each side were adopted, the three-door cars being intended for operation in the same trains. After a test of the various styles and sizes of openings now in use on existing rolling stock, varying from 24 in. to 46 in. in width, as well as consideration of doors as wide as 60 in., it was decided to make the two end-door entrances 44 in. wide, and the center-door entrance 48 in. wide. Each of these entrances is fitted with a sliding door operated by the Burdette-Rountree pneumatic device. Three of the doors are operated by each guard from a niche in the vestibule, except in the case of a two-car train, where the conductor handles four doors.

The choice of longitudinal seats practically was a foregone conclusion when it was decided to use the three doors. The length and width of the car were considered to prohibit the satisfactory use of cross-seats, since they would not increase the seating capacity but would form a barrier to free movement in the aisles. The seating capacity of the older equipment varies from forty-four to fifty-two. In the new cars the four longitudinal seats in the car provide space for forty-four passengers, and folding seats across the sliding center doors furnish six additional seats, making a total of fifty when the center doors are not in use.

CHOICE OF MATERIALS

Before the company decided to adopt hand straps, which were finally used in these new cars, various arrangements of stanchions, together with horizontal hand rails, were investigated on several old cars. As a result of this study, it was decided that the stanchion, in any form, was not of sufficient advantage over the hand strap to warrant its adoption. The locations of the hand straps finally adopted provide for one attached to each roof carlin just outside the line of the longitudinal seats and at a height of 5 ft. 8 in. from the floor line. This conclusion was reached after a study had been made of the various heights and locations of hand straps on existing rolling stock with particular reference to the question of complaints of passengers in this regard.

In the selection of the upholstering only rattan was considered. The bottom of the seat is approximately standard, the seat back is of a half-oval section with the larger diameter near the top. This section was selected so that passengers could lean back without striking their headgear against the window posts. At the same time they must assume a posture in which their feet will not block the aisle.

The choice of finishing and insulating materials in the car was largely governed by two considerations, namely, to obtain a fireproof finished car as well as one which was thoroughly insulated against extremes of heat, cold and noise. Conforming with these requirements, a composition fireproof floor was adopted, which combined the necessary qualities of resilience, safety and resistance to wear. This flooring is laid over No. 22 gage galvanized Chanarch sheets, giving it a maximum depth of 1 in. In order to insulate the floor against temperature variations, the Chanarch is laid on ½-in. wood furring strips at the sills and upon a ½-in. fiber insulation or Flaxlinum between sills. This kind of insulation was also used in the car sides and roof, and on the inside of the steel sheathing.

Since some of these cars have been in service, it has been found that the metallic sound incident to steel cars has been entirely eliminated by this method of insulation. Another precaution taken to provide against temperature extremes was to design the steel pressings so that no metal was exposed to both the exterior and interior of the car, except the brass sashes. All steel members which extend into the interior of the car are covered with agasote. In fact, the entire inside finish is agasote, except a few panels in the vestibule, the steel molding covering the agasote joints and the mahogany window stools.

CHICAGO STEEL CAR—INTERIOR VIEW OF BODY, READY FOR FINISH

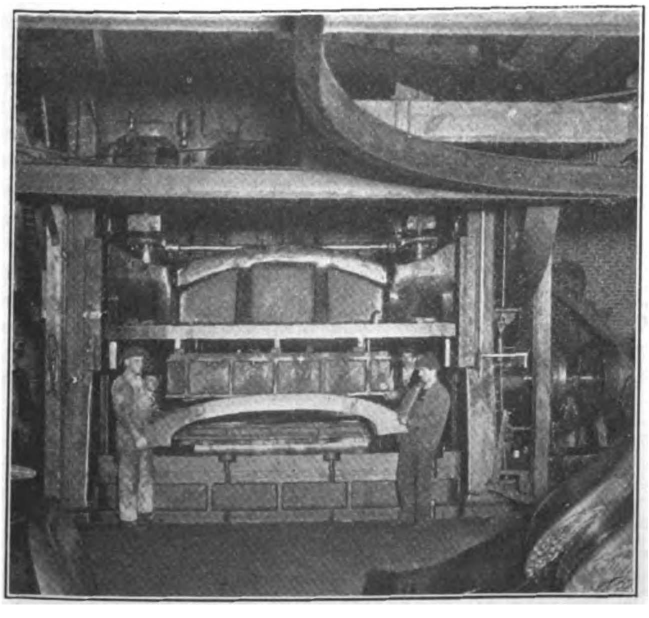
As mentioned in the previous article, an electric heating system was adopted. It was furnished by the Consolidated Car-Heating Company. A combination mechanical and automatic exhaust ventilation system was adopted with air intakes at the floor under the heaters and exhaust outlets at the roof. These are respectively the Auto Utility and the Railway Utility exhaust ventilators installed in conjunction with the Cooke vacuum ventilating system. The interior finish is imitation mahogany with brass sashes and curtain stops. The curtains were furnished by both the Railway Supply & Curtain Company and the Curtain Supply Company, Chicago.

CHARACTER OF DESIGN

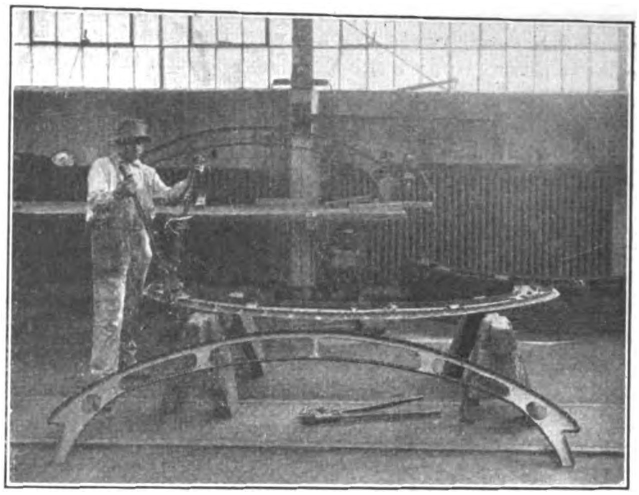
In preparing the general design it was decided that the car sides should be treated as riveted trusses with the side sill forming the bottom cord or tension member and the combination letterboard and deck plate forming the top cord or compression member. The body corner posts, center door posts and window posts, in conjunction with the belt rail and side sheathing, were to serve in the place of diagonal members, to carry the horizontal components of all stresses in the car side framing. This permitted the adoption of a floor system which served merely as a means for transferring the floor loads to the side trusses, and to absorb the pulling and buffing stresses incident to the rapid acceleration and retardation of multiple-unit train operation. The roof carlins and sheathing were so designed that they would tie the trusses together securely and at the same time assist in absorbing the torsional strains coming to the car body.

LOADS ASSUMED

In order to determine the maximum stresses to which the car structure would be subjected, it was assumed that the maximum standing and seated load was 150 passengers, weighing 140 lb. each, or a total of 21,000 lb. The weight of a car body which would safely carry this passenger load and equipment, as well as provide a structure sufficiently rigid to meet operating conditions, was estimated at 35,600 lb. The distribution of this weight was 27,860 lb. between bolsters and 7740 lb. outside the bolsters, the total including all electrical and air-brake apparatus which was attached to the finished car body. In addition to providing for these loads in normal operation, the end of the car, or that portion outside the bolsters, was designed to resist a total weight of 28,500 lb. This precaution was taken to provide against such contingencies as partial telescoping in a collision, the assumed additional load being approximately one-half that of another fully-loaded car.



CHICAGO STEEL CAR—FORMING CARLINS IN LARGE POWER PRESS



CHICAGO STEEL CAR—PUNCHING HOLES IN FLANGE OF CARLIN

PRACTICAL CONSIDERATIONS

Past experience with cars on the elevated railroads' lines indicated the necessity of having the equivalent of two 6-in. channels and two 6-in. I-beams in the underframe to supply the necessary rigidity and to absorb buffing and pulling strains. Accordingly, the side sills have been made of 6-in. 8-lb. channels in continuous lengths between end sills, reinforced with ⅜-in. pressed steel modified-channel sections under the end and center doors. The two center sills, consisting of 6-in. 12¼-lb. I-beams, are each continuous from end sill to end sill. These are also reinforced by ⅜-in. pressed-steel sections extending from the end sills over the bolsters, and they provide for the partial telescoping condition. The end sills are 6-in. 8-lb. channels, reinforced on the outside by Hedley anti-climber buffer plates of rolled steel. The insides of the end sills are reinforced by steel castings riveted between the center sills and serve to transfer buffing stresses. The end of the subframe is further stiffened with a 3/16-in. top cover plate and a ¼-in. bottom cover plate and these, in connection with the reinforced end sills, tend to distribute the stresses proportionately to the subframe members.

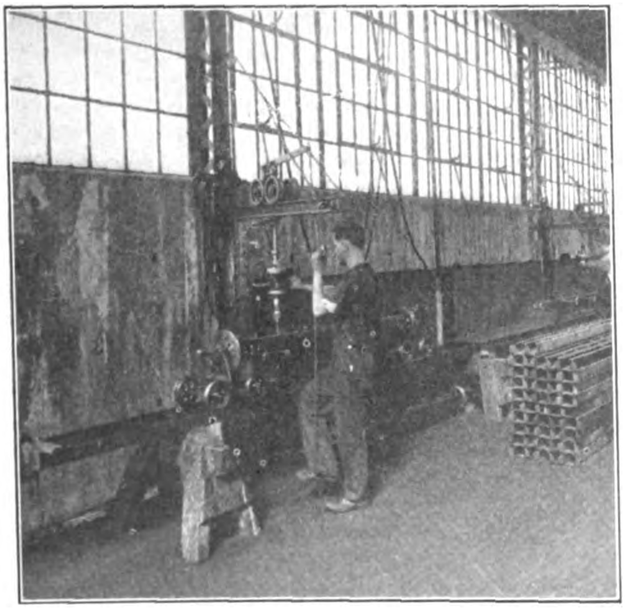
Another member of which the selection was based principally upon convenience for connections was the deck plate. This is a continuous 3½-in. x 2½-in. x ¼-in. angle, to which are connected all the posts, the carlins, the letterboard and the roof sheathing. The letterboard is a 3/32-in. x 9-in. plate, reinforced above the windows with 1-in. angles. Simplicity and convenience in the connections of all of these members to the deck plate were considered of prime importance. Actually, the fiber stress due to the maximum bending moment in the member is quite low. While it might have been possible to have used a smaller section as the deck-plate member, or even to have gone so far as to have eliminated it altogether, such a course would have entailed connection difficulties, weakened the car against side-swiping, and only have saved 380 lb. in the total car weight. In other words, here was a question of design largely dependent upon low fabrication cost, as well as upkeep economy.

Another practical consideration entering into the design was the size and spacing of the window and panel posts. Cut and try methods were largely used in arriving at the most economical section as all panel window posts were considered at one time, each having to transmit its proportion of the stresses between the deck plate and the bottom sill.

The size and spacing of the window posts, which are 3/32-in. pressed-steel U-sections, were so chosen as to give a standard commercial size of glass in the sashes and at the same time leave space for the sliding door pockets without the maximum car load exceeding the allowable fiber stress. The type of window post employed also furnished a light construction, made riveting more convenient, as well as simplified the attachment of the weather stripping, the sash and curtain stops, the insulation material and the agasote finish.

CHOICE OF SHEATHING AND ROOF MEMBERS

The choice of thickness of side sheathing, which is 3/32-in. cold-rolled, patent-level sheets 36½ in. deep, was not dictated by the consideration of the stresses to which it would be subjected, but by experience and operating considerations. It was believed that a thinner plate would dent too easily, or that slight short-circuits or exposure to corrosion would be more likely to cause extensive damage. In other words, the roof and side sheathing, the water table over the belt rail and the letterboard were employed only as inclosures for the framing. It was believed, however, that all of these tended to reduce the fiber stress in the members to which they connected, but this was considered merely as an extra factor of safety. At points where the car framing could be exposed it was finished, thus at these points eliminating the necessity for interior or exterior sheathing.



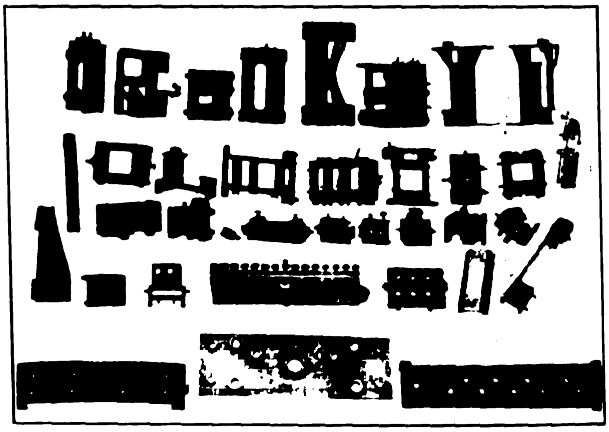
CHICAGO STEEL CAR—REVOLVING BOX JIG FOR DRILLING HOLES IN POSTS

Side sheathing and letterboard plates were purchased in standard commercial lengths and necessitated the use of a single joint with a cover plate between the center door and each end door. The roof sheathing, which is Toncan metal, was selected as the result of an actual test, and its thickness, which is 1/16 in., was governed by its ability to support a man between carlins without undue buckling. Other considerations entering into the choice of the roof sheathing were resistance to corrosion and the rivet bearing areas. The roof sheets were purchased in lengths which would reach transversely from letterboard to letterboard.

The carlins are of a standard design, especially adapted to the operating conditions governing the design of this car. This carlin section was believed to furnish an economical metal distribution, and at the same time weighed only 7 lb. Two designs are used; namely, a principal carlin which connects to the post and deck plate, and an intermediate carlin which connects to the deck plate between posts. Except at the ends and center of the car, the carlin spacing is 16¾ in.

REDUCING COST BY DUPLICATION

While the use of pressed-steel shapes permitted the selection of lighter sections than could be purchased in standard structural-steel shapes, the economies from a cost standpoint lie principally in the number of duplicate sections. Bearing this in mind, the number of pressed-steel sections and structural shapes was reduced to the minimum consistent with reasonable weight in order to obtain full advantage of the consequent reduction of die costs, as well as general simplicity in design. To this end, only one size of I-beam, two sizes of channels and seven different angles were used in the entire car. Steel pressings were standardized in the same manner, similar pressings being used for different purposes as far as practicable. The posts between windows, which were spaced at 2-ft. 9½-in. intervals, are of duplicate sections, being 3⅜-in. x 3½-in. U-sections, pressed from 3/32-in. metal. These posts are riveted to the top of the side sill and between the legs of the angle deck plate, both of which are securely riveted to the roof carlins. All of the posts between windows were made of the same length, being



CHICAGO STEEL CAR—SOME OF THE JIGS USED IN THE CONSTRUCTION

TABLE II.—COMPARATIVE WEIGHTS OF VARIOUS TYPES OF STEEL AND COMPOSITE CARS

	Type of Construction	Length Over Buffer	Over-all Width	Weight Complete, Pounds	Total Area	Seating Capacity	Pounds per Seated Passenger	Pounds per Square Foot Floor
Chicago Elevated Railroads	Steel (1914)	48 ft. 0 in.	8 ft. 8 3/16 in.	70,500	415 ft.	50	1410	170.0
Chicago & Oak Park Elevated Railway	Wood (1909)	47 ft. 1¾ in.	8 ft. 8 3/16 in.	70,300	404 ft.	48	1462	174.0
Interborough Rapid Transit Company	Steel (1909)	51 ft. 0½ in.	8 ft. 6¾ in.	77,870	437 ft.	48	1622	178.1
Pennsylvania Railroad (Newark Service)	Steel (1911)	48 ft. 0 in.	8 ft. 10½ in.	72,500	427 ft.	44	1648	169.5
Hudson & Manhattan Railroad	Steel (1910)	48 ft. 2 in.	8 ft. 10¼ in.	74,100	429 ft.	44	1682	172.6
New York, Westchester & Boston Railway	Steel (1912)	70 ft. 4 in.	9 ft. 9¼ in.	120,000	687 ft.	72	1667	174.5
Long Island Railroad	Steel (1910)	64 ft. 5¾ in.	9 ft. 11½ in.	104,400	642 ft.	72	1450	162.0
New York Municipal Railway	Steel (1914)	67 ft. 0 in.	9 ft. 9 in.	85,000	653 ft.	90	945	130.2
Boston Elevated Railway (Subway Service)	Steel (1912)	69 ft. 2½ in.	9 ft. 6 in.	85,900	657 ft.	72	1192	130.6

so designed as to reduce the number of operations required to form them.

Owing to the very great savings in the cost of fabrication that were effected by the simplification and standardization of shop operations a few of the jigs and templets that were designed for the construction of these cars are shown in the accompanying illustrations. A group of them shown in one of the halftones indicates the extent to which the laying out of drill-press work was eliminated. In addition the jig and machine used in drilling the intermediate posts are shown.

It will be noted that this jig is mounted on a carrier and is arranged to revolve so that the holes may be drilled in all four sides of the post without necessity for changing the position of the work after it has once been fastened in the jig. A view is also shown of the apparatus used for punching carlins. This consists of a substantially-built templet arranged so that the holes may be punched with a hand punch without the necessity for laying out the work and without need for skill on the part of the workman. It is estimated that more than 1000 jigs and templets entered in the construction of these cars. One of the illustrations shows the unusually large power press employed in forming the roof carlins and posts. This measures 12 ft. between uprights and is of 1000-tons capacity, making it capable of handling the widest carlin and the heaviest and longest car post used in the construction of electric railway cars.

METHOD OF ABSORBING BRAKING STRAINS

Accelerating and braking stresses transmitted from the trucks to the car body are transferred directly by the body bolster to the center sills. The body bolster, which was described in the ELECTRIC RAILWAY JOURNAL of Jan. 10, 1914, is composed of two soft-steel plates with a steel separator casting. This casting performs two functions, namely, it serves as a separator for the top and bottom plates of the bolster, and also as a housing for the draft springs. The distribution of accelerating and braking strains is somewhat unusual, requiring a bolster of special design, and it is believed that this one will eliminate overturning under the severest braking conditions. The adoption of this particular type of bolster is the result of experience with existing rolling stock. In case of a severe collision the draw-bar support is arranged to yield and allowed to drop slightly. This brings the anti-climbers into contact, and they absorb the remainder of the blow without further damage to the draft rigging.

WEIGHT COMPARISON

In order to give an idea of the relative weights of the Chicago Elevated Railroads' pressed-steel car when compared with other steel cars the comparative weights of various types have been tabulated and are shown in Table II on page 1238. While the method of calculating the weight per seated passenger is in common use, it is believed that the computations of weight per square foot of floor area will also have reference value. In arriving at the figures for total floor area the over-all width was multiplied by the over-all length in each case.

These cars were designed by the mechanical department of the Chicago Elevated Railroads under the supervision of H. A. Johnson, master mechanic. The order for the bodies was placed with the Cincinnati Car Company, for the trucks with the Baldwin Locomotive Works, for the motors with the General Electric Company, and for the control with the Westinghouse Electric & Manufacturing Company.

Need of Knowledge on Public Utility Questions

Oscar T. Crosby was the principal speaker at a dinner at the Chamber of Commerce in Youngstown, Ohio, on Nov. 19. Among other things he said:

"It is important that the general public should know what were the motives that led investors to put their money into public utilities fifteen or twenty years ago and why there is now confusion. It is important that the public should know that an old and familiar principle of control is no longer applicable and that a new principle can be enunciated which will be a notice to the public as well as to investors concerning the returns which may be made out of such business. It is also important that definiteness should be reached in order that good fellowship will be reached. A vast amount of dangerous class feeling has been engendered because public utility officials have thought it necessary to resist many of the efforts at public control and because spokesmen for the public have denominated as criminal acts which were commonplace of the common law, consecrated by a thousand years of custom.

"For a time public utility officials enjoyed the power which in regulated society must be taken from them. But somebody had to administer. We now run the risk of placing a power vast almost beyond imagining in the hands of men who may be patriotic, but who, like the rest of us, need principles for their guidance. Probably not many in this audience could give the names of the members of the Interstate Commerce Commission. Yet these gentlemen, by a stroke of the pen, can wave a billion dollars from one side to the other of the public utilities of this country and must make determinations so important as almost to pass understanding. The President himself, except by some act like plunging us in war, could not so seriously affect the wealth of millions of our fellow-citizens as can these gentlemen, whose names you do not know.

"Let us, as citizens, urge upon our legislative bodies that they should enunciate principles which shall be as nearly as possible automatic in these matters. We do not want Solomons who shall cut the body in two and kill it so much as we want compassionate judges who will really determine by known principles the proper guardianship of the child."

New Road in Tampico, Mexico

Vice-Consul Thomas H. Bevan, of Tampico, Mexico, reports that construction work has been in progress for more than six months on a new railroad connecting Tampico with the oil fields in Panuco. The road is being built by the Tampico & Panuco Valley Tramways, Ltd., a British corporation, under the direction of Edward Dixon.

The railroad will be 25 miles in length, just one-half the distance between Tampico and Panuco by the River Panuco. It will connect with the Tampico-Mexico City Short Line at Tamos, State of Vera Cruz, and use the National Lines bridge over the Panuco River. Another branch will run down the Vera Cruz bank of the river, where a tide-water terminal will be built with racks to load crude oil to ocean-going steamers. The officials of the road plan to transport oil from Panuco to Tampico for less than one-half the present cost of transporting it down the river by barge.

Notwithstanding the political unrest of the country, construction work on this road has been going ahead steadily, and the officials of the company are hopeful of opening the road to traffic during the latter part of the coming year.

Publicity Work of Public Service Commissions

This Article Contains a Detailed Summary of the Publicity Methods of the New York (First and Second Districts), Pennsylvania and Massachusetts Commissions

By its very nature the public service commission is a news center, for on one side it has access to facts regarding public utilities and on the other, as a public institution, it is looked to by the public as a source of accurate information. In its issue of Oct. 10 the ELECTRIC RAILWAY JOURNAL published an account of publicity methods on a number of electric railway properties. It has been suggested that this article might be supplemented by another regarding the publicity methods of several commissions and data have been secured first hand on this subject. No attempt has been made to cover the whole field in this case, as there would necessarily be a great deal of repetition if the work of all commissions were described.

THE NEW YORK COMMISSION FOR THE FIRST DISTRICT

While the fundamental purpose of the law creating the public service commissions of New York State, passed in 1907 under the administration of Charles E. Hughes as Governor, was regulation of the activities of the public service corporations, the members of both commissions and the Governor felt that if the commissions were to carry out their work to the best advantage access should be made easy for the public to data regarding the companies which previously had been obtained in many cases only with great difficulty.

William R. Willcox, the first chairman of the commission for the first district, from his experience as postmaster of New York and park commissioner, had become thoroughly convinced of the advantage of the fullest publicity with respect to measures in the public interest, and in adopting a similar policy for the commission was seconded by the other members of the commission and by Travis H. Whitney, the secretary, who continues in this capacity.

As soon as the members appointed to the commission by the Governor had perfected their organization, means were sought for bringing to the notice of the public the details of the affairs of the corporations under the jurisdiction of the commission. The position of assistant secretary was created, and to this officer was delegated the work of making the proceedings of the commission available for the newspapers and the public.

The first assistant secretary in charge of this was a practical newspaper man, J. O. Hammitt, who in January, 1908, resigned to accept the secretaryship of the Citizens' Union, and is now chief of the bureau of fire prevention of New York City. He was succeeded by James Blaine Walker, the present assistant secretary, a man long engaged in newspaper work, under whom the elaborate and effective system now in use has been developed in all its details. The commission is not concerned with the amount of space given to its doings by the newspapers. The purpose which actuates it is merely to insure a proper understanding on the part of the public of the work before the body. The design is obviously not advertising, but full publicity. The commission meets formally twice a week, and in addition holds hearings on questions effecting service, rates, etc., which are open to the public. Immediately after each formal meeting Mr. Walker goes over the matters considered by the commission and prepares a story upon it for the newspapers. Twenty-four copies of this are manifolded and distributed to the news agencies and the newspapers. In the case of a special development at any public hearing Mr. Walker obtains a transcript of the most important part of the proceedings for the newspapers directly after the conclusion of the hearing. The full transcripts of the public hearings, covering in most cases many typewritten pages, are available to the public and the newspapers about two days after the hearing. Mr. Walker's purpose in digesting the work of the commission for the papers is that the news may appear promptly after the meetings and be absolutely accurate.

At the end of each week a bulletin is prepared covering in abstract the work of the commission for the week. This is sent to more than 200 daily and weekly newspapers in the State and to a few outside. It is also sent to a selected list of technical and trade papers. The digest contains only what is considered worth while from the newspaper standpoint. It is sent out in mimeograph form and has been used for some time past as the basis of the commission news which appears weekly in the department "News of Electric Railways" in the ELECTRIC RAILWAY JOURNAL.

Whenever the commission finds that there is a widespread interest in a given part of its work a special pamphlet is distributed. One of the most persistent demands made upon the commission is for copies of the laws which govern the actions of the commission. These are the rapid transit act, the public service commissions law and the general railroad law. Thousands of copies of these statutes are distributed annually from the office of the commission. The annual reports of the commission to the State Legislature, consisting usually of three large volumes which contain all the orders of the commission, are sent free to all citizens of New York State who apply for them. A small charge is made to citizens of other states. To meet the demand of those who desire the decisions of the commission more promptly, a monthly publication, *Reports of Decisions of the Public Service Commission*, is issued. A nominal charge of 25 cents a month, or $2 a year, is made for this to cover the cost of printing.

During the current year the publication of a monthly magazine known as the *Public Service Record* was begun. In this magazine technical engineering articles on rapid transit work are featured, as well as matters concerning the regulation work and the personnel of the commission. A particularly interesting department is a summary at the end of each issue prepared by the engineering department and showing the status of the work on the various subway sections which are under contract. These are of especial value to the contractors who desire to follow this work in detail. Every month or two the story of the progress made in subway construction is prepared by Mr. Walker in the shape of a newspaper article, from the detailed reports as they appear in the *Public Service Record*. While these stories are concerned very largely with statistics, the facts are presented so as to attract and hold the attention of the reader, and as the stories are necessarily long they are usually made available for the daily papers on Monday morning, when the pressure upon the columns is not so great as on other days. The subscription price of the *Public Service Record* is 50 cents a year and there are more than 100 subscribers. The edition is 3000 copies, of which 2400 are required for circulation in the organization.

In connection with the dual subway now under construction two very useful booklets have been issued. The first of these was brought out in September, 1912, before the contracts for the subway were let. This booklet told what was planned in the way of subway construction. The first printing was 5000 copies. In June, 1912, this booklet was revised and elaborated and 15,000 copies have been printed up to the present time. An edition of 5000 copies in abridged form is now on the press. This booklet gives in great detail and with elaborate illustrations a summary of the design and construction of the new subway system. Another important pamphlet was prepared by Mr. Walker after the commission had been at work for four years. This was designed especially to tell what had been accomplished in that time. This was issued in September, 1911. The edition was 5000 copies. It has long been out of print. The first pamphlet issued by the commission, in 1909, described briefly the jurisdiction and work of the commission.

The annual report of the commission, which goes to the Legislature in January, is prepared by Mr. Walker, who also makes a summary of it for release to the press when the report is filed, namely, on the second Tuesday in January. One thousand copies of this are printed on one side of the paper so that it can be easily edited and given out to compositors in short "takes," if necessary, so as to facilitate putting the matter into type. It goes to all press associations and to the local papers.

A very effective means of publicity is offered to members of the commission in frequent opportunities of making public addresses. Commissioners and members of the staff are often invited to address public bodies, and wherever it is possible they accept such invitations and take advantage of the opportunity thus presented to bring the problems before the commission to the attention of the public. Not so long ago Mr. Walker himself, in the course of a tour in connection with his work, made several addresses reviewing the work of the commission. This tour took him to a number of cities in the East, among them Philadelphia and Baltimore. The address which he made in Baltimore was delivered at the solicitation of a local civic association during the time that the Maryland Legislature had under consideration the matter of creating the present Maryland Public Utilities Commission. The members of the engineering staff also have done excellent work in connection with the propaganda of publicity by preparing and delivering in various parts of the city illustrated lectures dealing more particularly with the problems that are confronted in the present rapid transit work.

Another very important phase of Mr. Walker's work has to do with contracts for subway construction. A great many inquiries are received regarding these contracts, of which there will ultimately be eighty-three, and Mr. Walker has been intrusted with the work of taking care of inquiries along these lines.

The commission subscribes to a press clipping bureau which is instructed to clip for it items on all public utility matters from New York City papers and papers throughout the State. These clippings were first filed according to date, but some time ago the plan of classification according to subject was adopted. Under this method there is a more consistent arrangement of all material dealing with any particular development. For instance, in case of a bond application by a company, all of the clippings in regard to the application, the hearing and the action by the commission are segregated and pasted in a section of the clipping ledger especially set aside for that particular development. The information so far published in regard to the work of the commission in the newspapers is practically all contained in sixteen large, loose-leaf ledgers, the first of which was started on the inception of the commission.

THE NEW YORK COMMISSION FOR THE SECOND DISTRICT

The Public Service Commission for the Second District of New York, familiarly known as the "up-State commission," causes to be prepared in newspaper form reports of all orders issued, hearings held, investigations made and complaints lodged with the commission.

In giving publicity to its proceedings it has been the effort of this commission to get away from the "press agent" idea. Avoiding every tendency to advertise the commission or its activities or to exploit individuals or prejudice proceedings, the "bulletins" which are prepared for the press are devoid of anything but the strict news value of the items of which they treat, without technical or involved expressions.

Regulative, investigatory and judicial as are the functions of the Public Service Commission, its activities are so divided among open sessions, informal conferences, investigations and general correspondence that it has proved practically impossible for an outside newspaper man adequately to cover its activities without aid from the commission. It is merely this aid which the commission's publicity work aims to supply. At the head of each bulletin is the following statement: "This is not a formal or official statement by the commission, but merely a news summary for the convenience and aid of newspaper men."

All of the important dailies in the State maintain resident correspondents at the Capital, in addition to the bureaus of the four press associations. The commission's bulletins are turned over to these men. Bulletins concerning definite localities are mailed to the papers published there, large and small. Bulletins of general interest usually find mention on the press associations' wires and are mailed throughout the State to supply matter for editorial comment, or news to the smaller papers which do not use the press associations. So far as possible no matter is forwarded to any editor unless it is certain that he can find some legitimate news use for it.

Matters of technical interest, such as rate regulation, setting standards of service and corporate capitalization, are mailed to trade and financial publications. The bulletins of the commission are usually published in the utmost good faith and with a display of proper respect for the judgment of the commission.

In preparing bulletins the quasi-judicial character of the commission is not forgotten. No attempt is ever allowed to discourse on the merits of a case except where testimony or the formally written or publicly expressed opinion of the commission or a commissioner may be properly quoted.

THE PENNSYLVANIA COMMISSION

The Public Service Commission of the Commonwealth of Pennsylvania gives full publicity to its opinions, rulings and orders and to the various complaints that are filed affecting public service. The actions of the commission are published in pamphlet form and sent not only to the parties directly interested, but to hundreds of persons in Pennsylvania and other states who desire to be informed as to the commission's work.

All complaints of a legitimate character, and the answers to the complaints, are made public immediately after they have been received, so that the public is practically familiar with the features of a case from the time it is filed until the commission disposes of it.

The law under which the commission operates provides for the posting of tariffs by utilities and the filing of them in the office of the commission. The posting of tariffs, which means the displaying of charges, is a feature of publicity that is bound to benefit the public, because it enables those who pay the tolls to determine whether or not the rates assessed conform to those sanctioned by the commission. So important is this feature of publicity considered that the commission has divided the State into districts, and the office of every utility coming within the jurisdiction of the commission is visited for the purpose of ascertaining whether any public service company has neglected to post a tariff corresponding with that filed in the office of the commission. A check of this kind is essential for the effective operation of the tariff bureau.

All hearings before the commission are public, but there is a provision in the act that empowers the commission, when it shall determine it to be necessary in the interest of the public, to withhold any facts or information obtained during the progress of any investigation. For instance, the reports of the investigator of accidents are not open to public inspection except by order of the commission, and are not admissible in evidence in damage suits.

Concerning petitions for public convenience, valuation, etc., the commission arranges the time and place for public hearing on such petitions, of which notice, in the form prescribed, shall be given by the petitioner, by publication, once a week, for two weeks. The last of these publications shall be at least five days preceding the date of hearing and in a newspaper published in the municipality where the principal office of the applicant is located, or, if there is no newspaper published in this municipality, in a newspaper published at the county seat of the county in which the office is located. A sample notice is given below:

FORM OF NOTICE TO BE PUBLISHED FOR CERTIFICATE OF VALUATION

Notice is hereby given that application will be made to the Public Service Commission of the Commonwealth of Pennsylvania under the provisions of the Public Service Company Law, for a certificate of valuation, by the..........................., which proposes to issue...................................

A public hearing on this application will be held in the rooms of the commission at Harrisburg on the..........day of..........
19...., at..........o'clock, when and where all persons interested may appear and be heard, if they so desire.

The effect of the operation of these regulations is that every community and individual is given an opportunity of knowing when matters concerning their interests are to be heard before the commission, and if they so desire they may file protests.

The requirements of the commission as embodied in its rules of practice are of such a character that no complaints are made that the proceedings are of a "star chamber" kind, and even the unsuccessful applicant feels that he has been accorded a full and fair opportunity to present his case.

THE MASSACHUSETTS COMMISSION

The Massachusetts Public Service Commission has no department of publicity, nor is any member of the staff specifically charged with the task of constantly informing the people regarding the progress of its work. The policy of the board and that of its predecessor, the Massachusetts Railroad Commission, is and was that of the open door. The docket, hearings, and all formal proceedings of the commission are as open to the public as are the courts; full co-operation with representatives of the press and of the public at large is a conspicuous feature of the office practice; and seekers for information from members of the board or their subordinates are encouraged to press inquiries without restriction.

On questions of import within the State and on matters involving federal relations the chairman occasionally states his views for the benefit of the public, setting forth the conditions as they appear to the head of the board without attempting to forecast official action or to commit his colleagues to opinions not expressed by them. These utterances, in the form of newspaper interviews or statements, are widely read for their interpretative value. They do not interfere with the giving of an interview by any single commissioner desiring to set forth his views informally upon any matter. Circumstances naturally govern the giving of interviews of this sort. They are commonly brought forth by an expressed desire on the part of the public to ascertain the views of the board upon matters of legislative interest, upon occasions when it is desirable that public sentiment shall be informed as to conditions within or outside the jurisdiction of the commission, or when possible changes in the policy of the State with respect to its transportation interests are under discussion. The expert knowledge of the commission is in this way turned effectively to account as an educative force, in addition to the material furnished the public in the formal findings of the board.

At the offices of the commission, 1 Beacon Street, Boston, a complete file of recent findings, orders and decisions is maintained on a counter immediately accessible to the public upon entering. Withdrawals from this file are forbidden, but extra carbon copies of important and of many minor pronouncements of the board are frequently typed and filed on a bulletin board from which withdrawals may be made by newspaper men and other interested parties. Bulletins of forthcoming public hearings are not posted on the wall, as in some commission offices, but a diary of all hearings whose dates have been set is kept in the general office and is open for consultation at any time by anyone interested. Docket books in which entries of each petition are inscribed as rapidly as they are received, are likewise available for public examination, together with the original petitions and all papers bearing upon the case as filed by the board and the parties in interest. A large writing table is provided in the general office for the convenience of persons consulting the commission's papers. On the counter of the general office are also maintained the latest time-tables of the railroads in the East, with various directories, copies of legislative bills of the current or last session, and frequently copies of special reports of the board as issued by the State printer and for which a large demand may exist.

Verbatim reports of the hearings in disputed or other important cases are filed in typewritten form by the commission in the docket folder of each corresponding case, and these are always open to public inspection during office hours. As a rule a single bound copy of the proceedings accompanies each case in which contesting parties appear before the board, or in which financial points are involved of which it is desirable that a full record shall be available.

The Massachusetts Gas & Electric Light Commission, which has jurisdiction over the companies suggested in the title of that board, files a typewritten stenographic report of every case given a public hearing, but the large number of uncontested matters brought before the Public Service Commission have, up to the present, rendered it desirable to confine the stenographic record to cases of what might be called major importance. Pole and location matters, for example, involve no dispute in many cases, and the board holds the view that the cost of stenographic reports in such instances is unwarranted. In the case of a new and important line seeking a location against opposing interests or associated with extensive engineering and legal developments, the record naturally would be complete. All exhibits and data filed in cases are equally at the disposal of the public.

Full stenographic reports of inquests are maintained and are available to all, as are the returns of companies reporting to the board. As a rule, representatives of the daily press in Boston call once or twice a day at the commission's offices to consult the order board and docket, to attend various hearings, or to confer with the staff. Frequently if an important finding is to be issued the reporters on the dailies represented at the Capital are notified by telephone. A liberal policy is followed with respect to advance copies of special reports and of the annual report to the Legislature. The reports of the hearings in the Boston dailies are usually highly abbreviated, and the stenographic record, which reaches the office several days after the hearing, in most cases is obviously of little use to reporters on daily papers.

The annual report of the commission is issued in two volumes, the first covering a summary of the operations of the companies under the board's supervision during the last fiscal year, with a general discussion upon the state of the transportation industry within the commonwealth, the text of orders, decisions, findings, etc., and the second containing the full returns of all companies reporting to the board. The 1913 report consisted of a first volume of 561 pages and a second of 1142 pages. The first volume is printed in paper-bound form early in January each year for submission to the incoming Legislature, and copies of this volume are available at the office for the asking. Cloth-bound copies of the entire report are distributed later in each year.

The appropriations of the Legislature have thus far enabled the commission to furnish copies of its reports to applicants at its offices and through the mails without charge for the volumes themselves, but the demand for these publications has attained such proportions in recent years that the cost of mailing or of expressage has had to be considered and is now usually charged to the recipient except in cases of distribution of publications through official or library channels. Copies of the case records are not supplied directly by the commission, and as these sometimes run to several thousand pages in important sets of hearings, the board does not have them printed. They may, of course, be copied *ad libitum* by the interested party or his representative. Since the commission occupied its present offices a library including many valuable publications bearing upon transportation and the regulation of public utilities has been established on the premises, and this is open to responsible persons having an interest in the work of the commission.

As in most boards of this kind, an immense amount of informal work is handled by the commission and its staff through the various departments, notably in connection with complaints regarding railroad, street railway, telephone or telegraph service. These matters and the correspondence of the board, reports of inspectors, and other work within the organization, obviously are not listed for public examination, nor is the public expected to attend conferences among the board's membership. It is the general policy of the commission, however, to set forth the reasons for its decisions in cases at issue, so that the public may know as far as possible the channels by which the conclusions were reached. The cordial co-operation rendered by the commission and its staff to information seekers from all parts of the world entirely offsets, in the judgment of those experienced in dealing with the board and its employees, the absence of any formal publicity organization.

Effect of Automobiles on Interurban Transportation

Competition with Automobiles Is Being Felt by Interurban Electric Railway Operators

In a recent issue of this paper some interesting figures showing the effect of automobiles on city travel were presented by Robert W. Toll, chief engineer Denver Tramways. A traffic count was made in Denver of the passengers in automobiles entering and leaving the business portion of the city for an average day, and it was found that if the same number of people had used the street cars they would have paid $437,372 annually in 5-cent fares.

Reports from a number of interurban lines indicate that they also are suffering from automobile competition, but whether this competition will be permanent or whether it will practically disappear, as in the case of the bicycle, is hard to say. Perhaps the most conspicuous evidence of the large number of automobiles now in use in the country districts is shown at different county fairs held during the past month or two. In the past, most of the attendants from a distance to the average county fair came by the electric cars. Now anyone who attends such a fair is impressed by the large number of automobiles parked near the grounds. In the case of one county fair held within the last few months in the Central States it was found that the attendance this year was considerably greater than last year, but the receipts of the electric railway companies operating cars to the park were less by between 25 and 40 per cent. In another case the railway company reported a decrease of $9,000 between 1914 and 1913, and it was roughly estimated that at least two-thirds of the decrease was due to automobile travel.

VIEW OF AUTOMOBILES AT FAIR GROUNDS, FREMONT, O.

Accident Reduction on the Northern Pacific Railway

The Northern Pacific Railway Company has had in operation for some time a "bureau of efficiency," the purpose of which is to reduce accidents on the system. During the first six months of 1914, as compared with a similar period of 1913 before the bureau was organized, the number of deaths due to operating accidents has been reduced by 73 per cent. This work has been done through the operation of numerous educational plans, and a special representative spends three-quarters of his time on the line observing physical conditions at stations, trestles and shops. Suggestions are received from employees on special cards provided for the purpose, of which more than 2500 were turned in during 1913. Of these, nearly 90 per cent contained suggestions or complaints which were reasonable and of practical benefit.

A Neglected Principle of the "Safety First" Movement

The Writer Emphasizes the Importance of the Proper Selection of Trainmen—The Ability of the Employment Agent to Judge the Applicant Is the Key to the Situation—Instances Are Cited

BY C. J. FRANKLIN, CONSULTING EXPERT PUBLIC UTILITIES, PORTLAND, ORE.

Since the inception of the "safety first" movement each succeeding year has witnessed a wider application of its principles. Occupying its full share of public attention and receiving serious thought in all lines of business, there has been no movement throughout the history of public service development to equal it in popular approval. Its appeal is to humanity. Originally, this movement took the form of an educational campaign confined to the company's employees and trainmen, later extended to embrace the public schools, and now we attempt to reach the public through whatever mediums prove favorable. The slogan "Safety First" we now understand to embrace any and every form of accident prevention within the company organization or outside of it, and properly so.

THE ACCIDENT SITUATION—PLAN OF ATTACK

The accident situation has been attacked at a number of different points, chief among which have been:

Car design looking to safer operation,
Safety devices,
Improved conditions at crossings, curves, stations, etc.,
Educational work with the public,
Educational work with the trainman,

coupled with which have come improved types of equipment, better track and roadway conditions, etc.

Although these points may not have been approached in the order given, they easily represent the plan of attack thus far.

THE NEGLECTED PRINCIPLE

Observation and study of conditions on many railway properties during the past twenty-five years has amply confirmed a conviction, formed in the early days of the writer's experience, that the real cause of accident growth lies deeper than is commonly thought.

In enlarging upon this conviction my aim is to bring out certain points which have not been regarded as seriously as their importance merits, with the end in view of assisting, in a small way, in this great work of safety. The gratifying results so far obtained are duly appreciated and the means used fully indorsed, but I believe there is still another step to be taken, in conjunction with those outlined, which will lead as nearly to the elimination of accidents as may be consistently expected.

This step is so fundamental that, as soon as it is mentioned, a majority of officials will consider it well looked after in their own organization, but the writer ventures to suggest that many an official, upon applying the simple tests outlined elsewhere in this paper, will find conditions he little dreamed existed.

In a word, sufficient care is not exercised in selecting trainmen or in choosing the man who selects them.

THE WORKING ORGANIZATION

The character and efficiency of the working organization reflects success or failure according to its standard. The character of an organization is measured by that of the individuals of which it is composed. Hence it is clear that by improving the individual we improve the organization. The application of this principle to the safety movement is found partly in the efforts toward the training and education of the trainman, and in this direction a great deal is accomplished, but no one who has studied this question will deny that a large part of the effort is wasted on poor material and, unfortunately, it takes some little time to find this out.

It goes without saying that the best possible organization is desired, and it would seem clear that the right way to begin is by selecting the best men available. If we would eliminate that proportion of accidents within the power of the crew to avoid, why not attack the cause rather than attempt by training to regulate the effect?

Unquestionably the fallibility of the human element is the greatest factor in accident study—more important than equipment, track, safety devices, etc. It ramifies to every fiber of the organization—no branch of operation can escape its consequences. In transportation expense alone, platform cost is by far the largest item.

Toward the training of these men we spend thousands of dollars—toward their selection, comparatively nothing.

Educational work will, of course, improve the efficiency of a man even though he is unfitted for the work, but he cannot be expected to compare favorably with a properly selected and properly trained man.

The accident record invariably registers the selection of men not fitted for the duties of service, and the educational work is increased in proportion. A mahogany table cannot be produced from a piece of fir, neither can a competent trainman be produced by any course of training if the man is not mentally and physically qualified for development.

SYSTEMS OF EMPLOYMENT

Generally speaking, the system of employing motormen and conductors to-day is a gradual improvement of the method used in the old horse car days. The idea then was to keep the runs filled and the cars moving. The character of the trainman did not count for much as long as he could do the work.

On small systems, and on a great many large ones, the selection of the future trainman is placed in the hands of the superintendent of transportation. This official has hundreds of details to attend to and is not in a position, even if qualified, personally to look after the employment with the degree of care it should have. This is as much so on a small system as on a large one, albeit the remedy is not so readily found on the small road.

A number of the large properties have endeavored to relieve the superintendent of this employment work by appointing a superintendent of employment, employment agent, or official with some such title, whose duty it is to attend to all employing. On some properties this official does not have absolute authority. He is supposed only to interview applicants, weed out the undesirables and pass the remainder to the superintendent for examination and approval. Usually this employment officer is recruited from the ranks, possibly from the inspectors or dispatchers, or perhaps from the platform men. His method of selecting men is naturally in line with that of the superintendent. He follows the beaten path, not realizing the serious possibilities of his work.

Aside from the hours set apart for interviewing applicants, other duties are pressed upon him which soon occupy a large share of his attention. Examination of applicants is hurried to gain time for other work, and ultimately these examinations become superficial and purely mechanical.

If a man has ability to read and write, appears physically sound and within age limits, he stands every chance of being put to work, depending on how badly the company needs men at the time. The application blanks are filled in and the required number of references given. These references are supposed to be written to and the replies used to test the applicant's record. Often men are put to work before all their references are communicated with. Perhaps only one reference has replied, and the man goes to work on probation with the understanding that if other references are not satisfactory he cannot continue in service. Once in service, unless something out of the ordinary brings him to the attention of the superintendent or the employment officer, the man is practically lost sight of. If the remaining reference letters do not arrive, his attention is probably not called to it providing he has kept out of trouble. Whatever weak points he may develop are not known to the employment officer. He does not follow the man up. If he hears nothing from him, he considers he has made a good selection.

A CASE IN POINT

Conditions of this kind are not extreme or exceptional. They are of common occurrence on a majority of properties. I know of one case where the man was employed and retained in service with only one of some five or six references heard from and that one very unsatisfactory—"considered the man unreliable and would not re-employ"—the remaining references were never heard from. The man was passed by the employment officer and the superintendent and was ultimately involved in a serious accident.

It might be said that this case is an exception, but it occurred on a large property which considered its system about as good as could be attained; investigation along the lines mentioned above developed numerous cases of like character, not all of which as serious but enough so to convince any one of the inefficiency of the employment system. Similar cases have been found by the writer on properties having what appeared to be a very elaborate and exhaustive system of employment where it seemed that the greatest care was being used, but thorough investigation disclosed the utmost neglect.

You naturally ask why these lax conditions continue to exist. Ask the general manager of any railway for an outline of his employment system. He probably cannot do more than tell you in a very general way. The details he does not attempt to remember, and it is not expected that he keep constantly in mind every detail of his road.

This is the very point I wish to emphasize. In common with many other matters, this has been regarded as not of sufficient importance for the general manager to look into, but as something to be left to subordinates.

A SIMPLE TEST

By way of impressing presidents, general managers and other high officials with the seriousness of these claims, I would suggest that some morning, without warning, they drop into the office of the employment officer and take from the files at random some twenty folders supposed to contain complete records of a like number of trainmen—their applications, references, clearances, etc. These should be sufficiently complete to bring the man's record down to date. Examine each case personally and satisfy yourself whether your road is in the class mentioned.

As a further test, call for complete papers, records of employment and subsequent record of trainmen involved in the last twenty serious accidents and see if you consider that sufficient care was exercised in the selection of these men.

Ask the claim agent about it. There is no one on the property who comes into closer contact with the men, particularly those who fall down, than the claim agent. His opinion is worth considering.

THE REMEDY: SYSTEM 40 PER CENT—MAN 60 PER CENT

Now a word concerning the remedy for this condition. I am not advocating any particular system of employment. This is a matter for the management. However, there is this to consider. The system of employment and training will represent about 40 per cent of the remedy and the man selected to do the employing represents the remaining 60 per cent. The system can accomplish little without the right man.

There are few more important positions in the entire organization of a railway than that of employment officer. The requirements of service to-day are not those of fifteen years ago; they demand a higher type of trainman. He has something more to do than drive a horse or mule. Into his care are entrusted the safety of thousands of lives and an expensive equipment. He represents the company before the public. His conduct is the company's conduct, and by it the company is judged. He can make friends or enemies for his company. His duties are manifold.

The selection of men for this work is a duty not to be entrusted to one who thinks lightly of its importance. Before all else the employment officer should realize the serious possibilities of his work. Errors of judgment on his part can become far-reaching. They may cost his company thousands of dollars and often involve loss of human life. Responsibility for many accidents, apparently resting with the trainman, can, as a matter of fact, be traced directly to the employing officer. I have in mind an instance of this kind which occurred on a large property where a trainman became involved in a more or less serious accident. He was called before the superintendent for examination. The superintendent was astonished to find the man almost utterly lacking in intelligence—wholly unfit for the duties of motorman or conductor. He could hope for nothing other than strictly common labor. The superintendent could not lay the blame at the trainman's door, yet he could not understand how the man passed inspection. On this particular road the employment system was considered to be most efficient, and the superintendent had the greatest confidence in his employment officer, regarding him as an especially capable man. As a matter of fact, the officer was not fitted for his position, while the superintendent himself had not studied him enough to realize this.

QUALIFICATIONS OF AN EMPLOYMENT OFFICER

The really successful employment officer possesses qualifications peculiarly necessary for his duties. He is a man of keen observation and deliberate judgment, has analytical ability of a high order, is approachable and possesses the faculty of putting men at ease. He is always a student of men, of human nature. Rather slow to form conclusions, his judgment will be found well supported by observed facts. He knows the qualifications necessary for the position he is about to fill, and before he passes his man as approved, the qualifications are checked off, one by one, deliberately and accurately, with the result that he delivers a superior grade of human material to the operating department for development. Thus given something really capable of development, the careful course of training now found on our modern roads could produce remarkable results.

Ability to judge men is rare. There are many superintendents and other executives who are capable operating men but lack the qualifications peculiar to a successful employment officer. For this very reason many an employment department is inefficient; it cannot be otherwise when organized and controlled by one who is not fitted for the work.

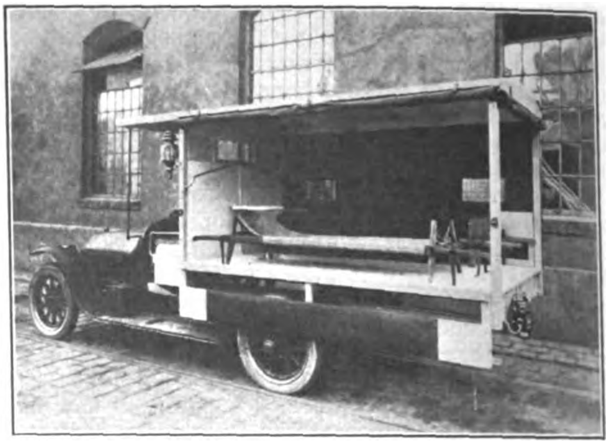
THE FOUNDATION OF SAFE OPERATION

I do not wish to convey the impression that simply by the exercise of proper care in selecting trainmen all accidents will be avoided. Neither do I mean to say that one can determine, when employing a man, whether he is going to have an accident or not. But I do insist that the foundation of accident prevention lies here, in the selection of the man; that the employing officer should be a high-class man especially qualified for this work rather than a graduate trainman, inspector or what-not who does not realize, and often cannot be made to realize the importance of his duties; that if the same proportionate amount was expended in the employment department that is now spent for training and educational work, it would constitute the best paying investment on the property.

The Vienna Tramways and the War

BY LUDWIG SPÄNGLER, DIRECTOR VIENNA MUNICIPAL TRAMWAYS

When Austria declared war against Servia toward the end of July, 1914, the partial mobilization of the Austro-Hungarian army affected the personnel of the Vienna Municipal Tramways but slightly. At that time, in fact, not more than 800 out of 12,000 employees were called to the colors. In the course of the later mobilization orders, however, we have lost 4650 men, of whom 3100 were in platform service. At the same time the government excused 2500 of our older men from army duty in order that the street railway service might be maintained. By calling upon men who had already been pensioned and by the more intensive efforts of the men who had been left behind, we were actually able, with a 45 per cent reduction in the staff, to handle the 25 per cent increase in business which occurred immediately after the heavy mobilization period. This extra business was handled also with a reduction in car mileage, the consequence being an increase in the number of standees.



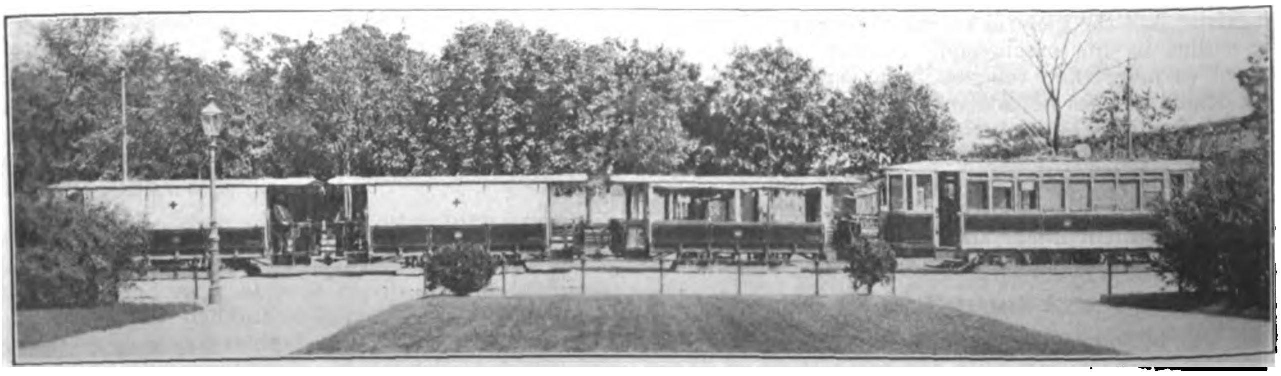
AN AUTO-TAXI IN HOSPITAL SERVICE

The instruction of new employees was taken up so quickly that by the end of October we had in hand 2800 men, of whom 1275 were for transportation service. At this time (November) the car mileage is 15 per cent less than just before the war, and the gross earnings for October were 9 per cent below those of October, 1913. Part of the reduction in earnings, however, is due to the great amount of free riding granted to soldiers. In fact, we are now carrying about one-seventh of our passengers free. Vienna life is now assuming its normal aspect, and with the opening of the theater and concert season we expect that traffic will pick up again.

Another problem which the Vienna Municipal Tramways has had to face because of the war is the great increase in freight transportation, due to the fact that the army authorities commandeered so many horses and auto trucks. Thus we are supplying a part of Vienna with all of its milk, garden and farm produce in connection with neighboring interurban railways. The electric railway is also used very extensively by the army to transfer supplies from large local warehouses to the steam trunk lines which lead to the battlefields. Another class of freight service is the transportation of excavated material from foundations for buildings.

The transportation of wounded soldiers from the steam railroad stations to the Vienna hospitals is carried out chiefly via electric railway. Ordinary cars are used for those men who can stand or sit, but in addition we have converted cars to enable them to carry cots and stretchers. A large part of the wounded men are transported in auto-taxis, the bodies of which have been replaced by special bodies containing two hospital equipments of the type illustrated.

The dependents of the employees who have enlisted are, of course, granted a certain allowance by the gov-



MOTOR CAR HAULING THREE TRAILERS IN RED CROSS SERVICE ernment in accordance with the law. The Vienna Municipal Tramways has also set aside a further allowance for these families, in addition to which voluntary contributions are made by the employees who have remained on the system. The latter have also raised a sum of $10,000 for the Red Cross and similar funds.

In view of the hoped-for increase in traffic after the war we have ordered 135 motor cars and 125 trailers. The order was given at this time to save the workmen of the car builders from unemployment. It is interesting to add that these cars are being built at the prices that obtained before the outbreak of the war.

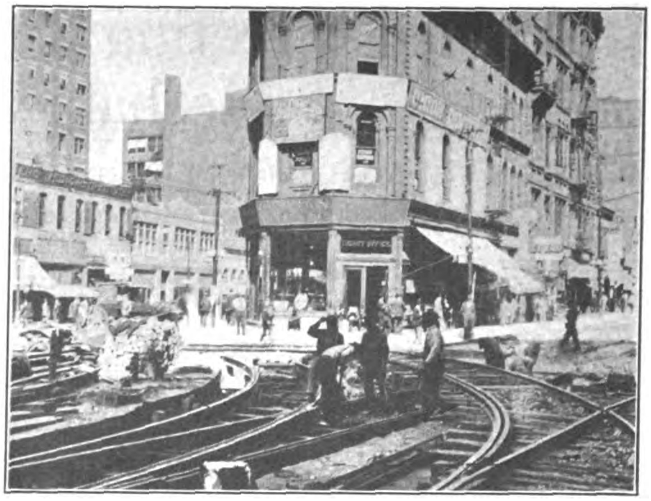
(EDITORS' NOTE: A report received from Eugen Eichel, editor *Elektrische Kraftbetriebe und Bahnen*, who was a recent visitor to Vienna, states that Mr. Spängler is congratulating himself on having storage-battery buses in service, as all of his gasoline buses have been taken for military purposes.)

Reconstructing Both Tracks at Once

The Metropolitan Street Railway, Kansas City, Mo., during the autumn was permitted to reconstruct both tracks simultaneously on Main Street between Ninth and Twelfth Streets, which is one of the busiest sections of the city. During this period all vehicular traffic except the car service was suspended. As the railway company had estimated that by tackling both tracks at once the job could be carried out in thirty days instead of sixty days, this unusual procedure was permitted by the Board of Public Works and approved by the merchants of the city. Work was begun on Sept. 1, but heavy rains delayed completion about two weeks. Despite the confused state of the highway the merchants did not suffer seriously, as passengers from the cars were landed from temporary T-rail tracks close to the curb or to plank platforms.

On Main Street the cable had been abandoned in 1903 and the track reconstructed with 9-in. 106-lb. center-bearing rails. The concrete beam foundation then used had been installed without much disturbance of the old cable construction. The tops of the yokes had been cut off to secure enough depth for the concrete beams, and the cableway was filled with broken stone as a bed for the new pavement.

TRACK RECONSTRUCTION ON MAIN STREET, KANSAS CITY



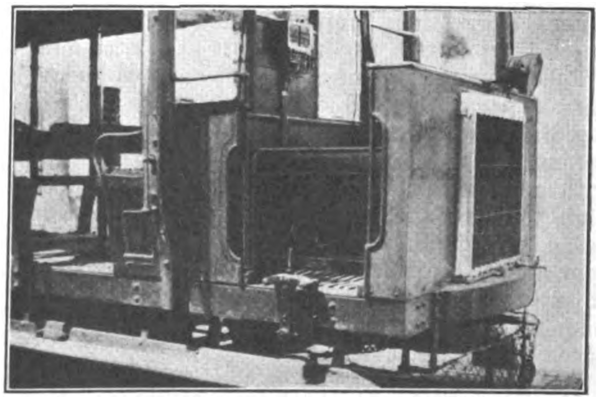
CONSTRUCTION OF TRACK UNDER WAY AT NINTH AND MAIN STREETS, KANSAS CITY

When the present work was undertaken all of the old cable construction that did not interfere with the new track work was left undisturbed, but excavation to a depth of 6 in. was made for fresh concrete under the new ties. No new rails were installed, as those in service had been placed two or three years ago. The paving between the rails and for 18 in. outside of the rails is of Wisconsin granite cut for ¼-in. joints with cement grout, the blocks being bedded on a mixture of sand and cement. The rest of the street paving is of creosoted wooden blocks.

Gasoline Cars of Curacao Tramways

The quaint little town of Curacao, in the Dutch West Indies, boasts what is perhaps one of the smallest street railway systems in the world. The total length is about 1½ miles of narrow gage, single track. The rolling stock consists of but two cars. These cars, however, form the interesting part of the equipment.

Each car is propelled by a six-cylinder 60-hp gasoline engine, which is mounted in the forward part of the body. The radiator is in the dashboard of the car, as shown. The engine may be controlled from either end of the car through a system of chains. After covering about half the distance, the passenger is handed a transfer and is requested to take the car ahead. Then car No. 1 goes back to the starting place while No. 2 takes the passengers to the end of the line. The line is owned and operated by the Curacao Motor Tramway Company, Joseph Cardoze, director.



GASOLINE CAR OF CURACAO TRAMWAYS, SHOWING RADIATOR AND CONTROL APPARATUS

Annual Meeting of American Society of Mechanical Engineers

At the New York Meeting Held on Dec. 1-4, Many Subjects Were Discussed, Among Them Being Snow Removal, Factory Floors, the Elimination of Seams in Steel and the Hardening of Tool Steel

The annual meeting of the American Society of Mechanical Engineers was opened in New York in the evening of Tuesday, Dec. 1, with the address of the president, which was followed by the report of the tellers of the election of officers, John A. Brashear, of Pittsburgh, being elected president for the ensuing year. After this a reception was held by the society for the president-elect and the president.

President James Hartness, in his address, pointed out that the world of mechanism had become so intricate and complex that it had grown beyond the grasp of any single individual. Each one must be content to comprehend only a small part, and only by selecting the character and limiting the amount of material that is taken into the individual mind could the best results be accomplished. The engineer should devote a part of his time to the care and study of his thinking machine instead of devoting it all to the mechanical device created by that thinking machine. The mind should not be overloaded with data to the exclusion of thoughts of an initiative character. Man was a creature of habit to an extent that rendered this characteristic a dominant one, and the most efficient use of mind and body demanded a scheme of life that permitted each one to take advantage of this fact.

At the business meeting which was held on Wednesday morning the reports of the council and standing committees were presented. Among the latter was a progress report of the committee on standard steam boiler specifications, and this brought out an extended discussion regarding details of the report which lasted through the morning session and was finally adjourned until later in the day. At the adjourned session for discussion of this report the entire printed revision of the specifications, exclusive of the proposed model license law, was taken up section by section, and a number of suggestions were accepted by the committee, which is to make a further report at a later meeting.

Following the business session on Wednesday morning, a paper entitled "Floor Surfaces in Fireproof Buildings" was read by Sanford E. Thompson, in which the author advocated the use of the granolithic floor with a ground surface owing to its low first cost and high wearing qualities. In the discussion which followed considerable support developed for the wooden floor and also for the asphalt block floor because of the objections of operatives to stone floors of all kinds. The coldness and hardness of the latter sometimes even produced temporary lameness.

Among the other papers on Wednesday afternoon was the report of a test of the friction losses in the universal joint by P. F. Walker and W. J. Malcolmson. In this it was found that with loads above, say, 50 per cent of the rated capacity of the joint the efficiency was constant and above 95 per cent in all cases where the angle of inclination was less than 9 deg. The use of forks in the same plane was found to give an efficiency from 2 per cent to 3 per cent higher than with forks at 90 deg.

SNOW REMOVAL

At the snow removal conference which was held in Philadelphia on April 16 and 17, 1914, a committee on resolutions was appointed. In its report, which was read before the American Society of Mechanical Engineers at the public service session on Thursday, it was stated that the problem confronting the public officials is the removal of snow in the shortest time and in such a manner as not to interfere with traffic, and at a minimum cost. Therefore, when using the method of scraping, shoveling into trucks or cars and hauling to dumps, the length of haul becomes a most important factor. The utilization of sewer manholes for dumps, and of the sewer system to carry the material away, is the most economical method which can be devised, as it reduces the hauling to a minimum. However, the authorities in charge of the sewer systems have, as a general thing, apprehensions regarding the use of the sewer as a snow carrier.

Nevertheless the bureau of sewers in New York City made experiments during the winter of 1914 which seem to prove that, within certain limits, such apprehensions are ill-founded. Their results indicate that snow may be dumped by wagons into sewers having a flow of 10 cu. ft. per second or more. Pan scrapers can be used where the flow is at least 3 cu. ft. per second and the velocity is greater than 1½ ft. per second. Shoveling can be done where the flow is at least 2 cu. ft. per second and the velocity more than 1½ ft. per second. Under ordinary circumstances if the flow is sufficient to carry snow away, melting will occur within 300 ft. when the temperature is 60 deg. Fahr. Gas and chemical combinations in the sewers have little effect on the rate of melting. Two cubic yards per minute is the maximum rate at which snow can be shoveled into a 24-in. manhole. Tidal sewers can be used to advantage only when the tide is low. Siphon sewers can be used as well as the ordinary type.

Where difficulty is experienced with an insufficient flow in the sewers, or where the flow decreases or stops, the water plug may be opened in the drainage area of the sewer above the manhole in use, until the volume of water is sufficient to carry off the snow, but it has been found most efficient to construct water jets in the manholes into which the snow is dumped. The problem of getting the material into the manholes in the least time with the least interference with traffic opens up a field for the consideration of a special form of manhole to be used satisfactorily for this purpose. Both Pittsburgh and St. Louis use a special form of manhole.

As a result of the experiences and views which had been expressed at the conference and which had since come to its attention, the committee recommended that: (1) The plan of organization and the system to be employed for snow removal should be worked out in advance of the snow season. (2) The work of removal should commence as soon as the snow had covered the pavements and the indications pointed to the continuance of the storm. This principle is successfully followed by street railways in the removal of snow from their track space and by some cities. (3) The carrying capacity of the sewer system should be utilized as far as possible to get the snow away from the streets. (4) When practicable, the work should be performed directly by the municipality by day labor. (5) Co-operation should be sought with the traction companies and use made of adjustable plows and sweepers to open roadways adjacent to street railway tracks at the time that the work of clearing the tracks is being carried on. (6) Effort should be made to obtain the co-operation of the public and to instruct the householders in the method of the removal of snow from private premises. (7) The police force of the city should co-operate with the street cleaning force and the services of patrolmen as inspectors should be utilized as far as possible. (8) A standing committee should be appointed to collect data and report upon such methods or apparatus as may be presented to it. Further, a conference should be held next spring for an interchange of experiences in handling the removal of snow during the winter of 1914 and 1915, and to make further recommendations.

OTHER PUBLIC SERVICE SESSION PAPERS

In a paper entitled "Training for the Municipal Service in Germany," Clyde Lyndon King cited the success of the German nation in commerce and industry through the diminution of economic waste. Specific training was provided for men in all occupations, however mean, and the influence of preparation of men for governmental positions and the preference shown to such men was believed to be a contributing cause.

A paper on the design and operation of the Cleveland municipal electric light plant, by Frederick W. Ballard, stated that the new station, which went into operation July 20, 1914, was the largest central station to be built by a municipality in this country. It was intended not only to supply electric current for street and commercial lighting, but also for power users. The rates which were being charged for service ranged from $0.03 per kw-hr. maximum to $0.01 per kw-hr. minimum. This station had a capacity of 25,000 kw and at present carried one-fifth of this load. The decision to build it was the result of experience since 1906 with a small station of 1500-kw capacity which had made the remarkable record of having acquired from the earnings of the plant itself more than one-half of its total value in eight years.

In the design of this station several new and radical features had been introduced. These were as follows: The use of motor-driven auxiliaries exclusively throughout the plant; the use of large boiler units with high steam pressure; the use of economizers of much greater capacity than ordinarily installed; a new arrangement of coal-handling apparatus; the use of both forced and induced draft with practically atmospheric pressure in the combustion chamber; the automatic control of furnace conditions; the simplicity of the piping layout, due to motor-driven auxiliaries, and the use of an auxiliary steam turbine for driving the auxiliary motors, this turbine being supplied with a jet condenser whose cooling water was fed into the economizers.

PROFESSIONAL SESSION

In describing a series of tests on "Chilled Iron Crane Wheels," at the professional session on Thursday F. K. Vial stated that the vertical load to be carried on any chilled iron wheel was not limited by the capacity of the wheel, but by the carrying capacity of the rail. The bearing power of chilled iron was far in excess of that of a steel rail, and, therefore, might be neglected when considering maximum vertical loads. Under equal loads, the depression in the rail was inversely as the diameter of the wheel. The larger diameter of wheel made a larger area of contact, which reduced the pressure per square inch. On a new A. S. C. E. rail the safe maximum limiting load for a 12-in. wheel was 23,000 lb., and for a 33-in. wheel, 38,150 lb. If the top of the rail was flat, and 2 in. wide, the limiting load on 12-in. wheels was 78,300 lb. and on 33-in. wheels 130,000 lb. Owing to the depression in the rail caused by wheels with extremely heavy loads a 24-in. wheel required 25 per cent more power than a 33-in. wheel and a 16-in. wheel required 68 per cent more power than a 33-in. wheel.

A paper on the mechanical elimination of seams in steel products, notably steel rails, by Robert W. Hunt, outlined the result of an investigation of the subject by T. H. Mathias, assistant general superintendent of the Lackawanna Steel Company, who determined that the most certain way of getting rid of seams was to remove that portion of the metal which contained them. The primary causes of seams existed in the ingots and probably were incident to the casting of the ingots. The surfaces of ingots displayed disk-like apertures, due to entrapped air, which in rolling could easily be elongated into dangerous seams. It was demonstrated that the surfaces of the ingots were decarburized to the extent of eight to ten points carbon and to a depth of 5/16 in., a condition which must be detrimental to the finished product. In a new process to overcome these difficulties the removal of the surface metal was effected by a hot sawing or milling operation during the process of rolling. The ingot was first reduced to a point where the product is 75 per cent finished, in the form of a partially shaped bar 60 ft. long, when it was entered between two pinch rolls with the flange side up and forced between two milling saws. Metal was removed from the top and bottom of the bar, the main object being to eliminate the seams from the central portion of the bottom of the rail which had been found to be the starting point of the well-known moon-shaped failures, and also to remove seams from the top or bearing surface of the head of the rail.

HARDENING TOOL STEEL

In a paper considering the "Factors in Hardening Tool Steel," by John A. Mathews and Howard J. Stagg, Jr., it was stated the position of the critical temperature for carbon steel was fairly constant but was affected to a variable degree by the addition of alloys. For practical hardening the critical temperature must be exceeded by a fairly good margin, at least 25 deg. Fahr. to 50 deg. Fahr., depending on the size, shape, mass and composition.

The time of heating is as important as the temperature to which the steel was heated. At least two dangers must be avoided. First, if the heating is too fast, a uniform temperature does not exist throughout the mass being heated. Second, grain size depends, among other variables, upon temperature and time above the critical temperature. If a piece is held above the critical range for an abnormally long time, the crystals may grow to such an extent that on quenching, the abnormal grain size is retained and the result is a weak, if not cracked, piece. Quick heating in a furnace considerably hotter than the correct hardening temperature is bad practice.

Pure water has a fairly constant quenching rate up to a temperature of 100 deg. Fahr., where it begins to fall off. At 125 deg. Fahr., the increase in time required for cooling is very marked. Brine solutions have a quicker rate of cooling and are more effective at higher temperatures than water. Where water at 70 deg. Fahr. cooled the test piece in 60 seconds, the brine solutions cooled it in 55 seconds. Oils are slower in their quenching powers than water or brine solutions, but the majority of them have a much more constant rate of cooling at higher temperatures than water or brine. Owing to the slower quenching rates of large pieces it is necessary to heat large sections hotter than small ones in order to produce the same amount of hardness. In a certain case it was found that a 3/16-in. round bar would harden at 1395 deg. Fahr., while a ¾-in. round bar should be heated to 1450 deg. Fahr.—a difference of 55 deg. The following table was given to show the decrease of hardness in tempering, expressed in per cent of the original hardness:

100 deg. Cent.	2.5 per cent	400 deg. Cent.	70.0 per cent
200 deg. Cent.	14.0 per cent	500 deg. Cent.	87.5 per cent
300 deg. Cent.	41.0 per cent	600 deg. Cent.	97.5 per cent

Regarding the effect of time on drawing the temper the authors stated that standard ½-in. round A.S.T.M. test pieces, which were quenched from constant temperature and the temper drawn in some salt bath at constant temperature after varying intervals of time, gave the following results:

Elastic Limit	Maximum Strength	Elongation	Reduction	Brinell Hardness	Time Interval, Minutes
228,750	260,137	2.5	....	425	8
201,125	214,562	11.6	45.4	390	20
175,000	183,187	12.0	49.35	340	40

The tendency of steel is to become spherical by repeated quenchings. Changes of forms are conditioned by the original proportions of the piece quenched, by its chemical composition, by the temperature from which it is quenched, and within certain limits by the time of heating. Hardness, brittleness, change of form and liability to crack, generally speaking, increased with the carbon content and the temperature and time of heating. Nevertheless, constant conditions give constant results.

Regarding furnaces and methods of heating the authors said that the fuel used is immaterial so long as the following points are considered: The furnace and hearth should be of sufficient size so as not to be affected materially in temperature by the introduction of the parts to be hardened. It should heat at a uniform rate and should be of uniform temperature over its entire hearth. It should be run under neutral, or reducing, conditions. A good rough test for this is the introduction of a piece of wood or paper upon the hearth. If the paper (or wood) burned, the atmosphere was oxidizing. If it charred, it was reducing or neutral. The temperature control must at all times be exact. A blacksmith's fire is satisfactory under good handling but the difficulty is that for constant work it is too exacting on the operator and requires too many manipulations to secure uniform and continuous results.

CLINKERING OF COAL

Lionel S. Marks in a paper on "The Clinkering of Coal" pointed out that the matter of clinkering ought to be taken care of when contracts for coal are made, and that it has been frequently suggested that specifications ought to include the melting temperature of the ash as indicating the clinkering characteristics of the coal. The only method that seems to be available for measuring both melting temperature and viscosity is the Seger cone method or some modification of it. If the cone is placed horizontally projecting over the edge of its support, the indications are more satisfactory, though far from perfect. Laboratory tests of coal ash by this method indicate that coal ash with a fusing temperature lower than 2500 deg. Fahr. give much trouble, while an ash with a fusing temperature above 2550 deg. Fahr, gives but little trouble. The fusing temperature between these limits cannot be taken as a criterion of the tendency to clinker. A further indication may be obtained from the appearance of the melted cone and the range of temperatures between initial and final bending of the cone. The coals which give most trouble were those of which the ash cones show a very liquid constituent and a small range of temperatures between initial and final bending.

Economics of Electric Railway Distribution

H. F. Parshall Discusses the Effects of Spacing and Capacity of Substations Upon Operating Results

At the Nov. 17 meeting of the British Institution of Civil Engineers, H. F. Parshall, consulting engineer, London, delivered a paper on the effects of spacing and capacity of substations upon operating results. In this he gave the results of an elaborate study based largely upon data of operating costs of the Central London Railway. The author's principal conclusions follow:

With the given energy consumption per unit of length of line that follows from a given train movement, the capacity of the substations increases directly with the distance between them. The energy loss in distribution conductors of a given section varies with the cube of the distance between substations. The cost of attendance is within wide limits independent of the size of the substation. The cost of the plant per kilowatt falls off with the size of the units, but the maintenance and renewals per kilowatt are more or less constant. With rotary-converter substations and a working voltage of 600, and for certain assumed average conditions of train weight, speed and energy consumption the most economical substation spacings are 8½ miles, 5½ miles and 3¼ miles for train services of six, twelve and twenty-four trains per hour respectively. For a working voltage of 1200, the substation spacings are 11 miles, 7½ miles and 5 miles respectively, while when 2400 volts is adopted the most economical substation spacings are 16 miles, 12 miles and 8½ miles for the three train services respectively. With the present arrangement of rotary-converter substations, there is little advantage in a higher voltage than 2400 for the track conductor. The economy of higher voltages is shown to be approximately the same whatever the train service. As between 600 volts and 1200 volts there is a saving of 14 per cent in the total annual costs of the distribution system; as between 1200 volts and 2400 volts there is a further saving of 7 per cent or 21 per cent as between 600 volts and 2400 volts. If the working voltage is further increased to 3600 there is a decrease in total annual expenditure on substation and overhead conductor equipment of only 3 per cent, which will be less than the additional cost of the rolling stock.

For single-phase distribution at 5000 volts the most economical substation spacings are 31 miles, 24 miles and 16 miles for train services of two, three and six trains per hour respectively. At 10,000 volts single-phase, the most economical substation spacings are 45 miles, 34 miles and 26 miles for the same three train services respectively. With three-phase distribution at 5000 volts the most economical distances between substations are 38 miles, 31 miles and 18 miles for the same respective train services. In most of these last cases, however, the economical distance between substations thus determined is greater than would be permissible in practice from considerations of both traffic operation and voltage drop. Further, in the case of single-phase operation, the lower pressure of 5000 volts is found to be the most economical for certain services and the higher pressures of 10,000 volts, 12,000 volts and 15,000 volts in vogue on the Continent are explained by considerations of voltage drop.

The Louisville & Northern Railway & Light Company, New Albany, Ind., one of the southern Indiana Insull lines, has begun to use newspaper space in advertising its service. Recent issues of the Louisville papers have carried display advertisements suggesting Sunday afternoon trips to Silver Hills, a natural park west of New Albany.

The "Safety First" Movement on the Chicago, Ottawa & Peoria Railway

W. F. Carr Outlines His Experience in "Safety First"—Much Tact Necessary in Handling Men

In his paper, read at the November meeting of the Illinois Electric Railways Association, W. F. Carr, engineer of maintenance of way of the above-named railway, outlined the results of his experience in the "safety first" movement. He stated that at first the employees suggested plans for reducing accidents involving money expenditure. They had to be shown that the movement is one requiring co-operation between workmen and operators. In this period of retrenchment it is discouraging to have a man suggest the expenditure of money to offset his blunders. Many of the suggestions received had to be carefully analyzed for, while the men making them are familiar with their own particular surroundings they observe only the phase of the situation which affects themselves.

Mr. Carr emphasized that considerable tact is necessary in disposing of suggestions and stated that the attempt was made to correct the viewpoint of the men when this was in error. He stated that the company endeavors to impress the fact that most present-day employers of labor have surrounded their employees with fairly safe working conditions but that the public needs education on safety matters. Employees can call attention courteously to risks incurred by the public and can advocate laws to compel the public to be careful. The employees of the company have been instructed to show their friends the benefits of laws imposing heavy penalties for trespassing upon railroad property; and to stop cars, if time permits, to call the attention of parents to the dangers of the practice of allowing children to play on the tracks.

In the operation of the railway attention of employees is directed to the following safeguards in the respective departments: Transportation department; air brakes should be properly applied; cars should not be bumped in coupling; moving cars should not be boarded; cars should be kept in safe operating condition; unsafe blocks should not be passed without orders; cars should head into and back out of sidings; cars should be stopped for boarding or alighting passengers; cars should be flagged in backing over highway crossings; drop switches should not be used; cars should be coupled by means of the draw-bar handle; trainmen should be sure that switches and derails are open or closed, and they should keep their heads inside the cab or vestibule; explosives should bear stamps and be handled according to safety rules; the loading of freight cars should be balanced; alighting passengers should be warned of the presence of a trailer when such is used; passengers should be kept out of vestibules; disputes with passengers should be avoided; passengers should be ejected only at stations; window guards should be kept in position; aisles should be kept clear, and passengers should be required to keep their feet off the car seats.

Equipment department: Safeguards should be installed on all machinery; defective ladders, grab irons, running boards and couplers should be repaired promptly; car repairers and inspectors should place blue flags or lights when working on cars; headlight plugs should be carefully examined and repaired; car pits should have foot planks across them; electric welders should be shielded when in operation; machinery should be inspected before using, and first-aid stations should be placed in the shops.

Power department: Operators only should be allowed in the machine rooms of stations; apparatus should be guarded by signs calling attention to danger; first-aid stations should be placed at every substation; C.E.R.A. rules for safety in operating a.c. apparatus should be enforced, and the pulmotor for resuscitation kept at the dispatcher's office in Ottawa should be used when needed.

Track and roadway department: Fire department should be notified when tracks are excavated in city streets; lights and flags should be used to guard excavations in streets; brush and hedge fences and buildings on right-of-way should be cut down or moved back to afford a better view; highway crossings should be kept in condition to avoid breaking of vehicles; track should be carefully patrolled for defects; careless loading of tools and material on hand and push cars and unauthorized use of hand cars should be prohibited; hand cars run after dark should be provided with white lanterns in front and red lanterns behind; the attaching of hand cars to moving trains and their use on main track in foggy weather should be prohibited; highway crossing signs, fences and gates should be kept in repair as a warning and barricade against trespassers.

Bridge and building department: Bridges should be thoroughly inspected at least once every quarter for defects; holes in station platform and floors should be immediately repaired; buildings should be inspected once each month; combustible matter that would cause fire should be removed, and all fire-fighting apparatus should be tested monthly and insurance inspection reports filled out.

In addition to the above rules Mr. Carr stated that, under the direction of the overhead lines and signals departments about 16 miles of block signals have been installed by the company, five crossing bells have been installed at highway crossings, instructions have been issued to linemen to examine all poles before climbing, poles have been moved back to afford safety to trainmen at sidings, "Rymco" overhead trolley switches have been erected at all meeting points and C.E.R.A. rules for the care of high-tension, a.c. lines have been adopted and enforced.

In stations agents have been ordered to report immediately all defects in floors, flues, wiring, etc., in and about buildings, to report and temporarily repair inequalities liable to trip passengers, to avoid leaving trap doors open and to give immediate attention to greasy or slippery steps.

Cost of Service as Basis for Rates

At a meeting of the Western Economic Society in Chicago on Nov. 13, Halford Erickson, of the Railroad Commission of Wisconsin, presented a paper on "The Cost of Service as a Basis of Rate-Making." In this paper Mr. Erickson said that the courts have generally held that rates, to be reasonable, must yield revenues sufficient to cover operating expenses, including a fair return on the fair value of the property used and useful in serving the public. Although this would indicate that the cost of service should be the basis of rate making, there are other theories as to the proper basis of rates.

Utility service may be furnished upon the following bases: (1) Free of charge to all consumers; (2) to cover current operating expenses with no allowance for capital investment; (3) to cover all current cost, including capital cost, or (4) at a rate to yield the greatest possible net return. Each of these four bases is permissible under certain circumstances. The first is for those utilities which a sound public policy dictates should be used by all. An example is the public schools. The second is applicable where the service should be supplied to all on equal terms, regardless of the quantity of use. An example is the postal service. Both 1 and 2 imply public ownership, and a meeting of the capital or operating cost by taxation. The third basis may be used by a utility either publicly or privately owned. The fourth basis applies chiefly to utilities which furnish services in competition with one another.

Mr. Erickson argued in favor of the cost of service basis, which is coming into constantly greater use in railroad work. Even most manufacturing plants, whose prices are based on the fourth principle, have established cost accounting systems to assist in fixing prices. It is practicable to determine approximately the basis of cost of freight and passenger operation in railroad service, although many of the expenses vary with different units, such as the train-mile, train-hour, etc. It would still be permissible, also, to continue a freight classification, with different rates for different commodities, because the interests of all are best preserved by such a discrimination.

The "cost basis" for rates would require the valuation of properties, but Mr. Erickson thinks that when such a valuation has once been made it will not be hard to keep it up, nor would these valuations cause constant fluctuations in the rates, as is sometimes claimed.

Papers on Public Utility Valuation

J. W. Alvord Outlines Scope of Science of Valuation—J. H. Gandolfo Favors Actual Cost as Equitable to All Parties

At a meeting of the American Society of Civil Engineers on Nov. 18 two papers dealing with public utility valuation were presented. One was by John W. Alvord on the subject of "Fundamental Principles of Public Utility Valuation," and the other by J. H. Gandolfo on the subject of "The Valuation of Public Utility Property." The following abstracts of these papers are made from the *Proceedings* of the society for October.

CONTENTS OF MR. ALVORD'S PAPER

The paper by Mr. Alvord was undertaken as a consequence of the voluminous discussion of his prior paper on "The Depreciation of Public Utility Properties as Affecting Valuation and Fair Return," presented on Dec. 17, 1913. To Mr. Alvord's mind this discussion indicated a greatly increased interest in valuation matters, but at the same time, on the part of many engineers, a lack of a clear perception of the fundamental principles involved in such work. His paper, therefore, attempted to show the following: (1) That it is quite idle to argue about the detailed methods of valuation without a fundamental and uniform conception of what valuation and property are in the first instance and what the reasoning of the courts has been on these subjects. (2) That, fundamentally, the art of valuation must rest in the law and in the interpretation of the law by the courts. (3) That the Supreme Court has repeatedly ruled that it is the value of the property used for the public purpose that must be considered, and it is the value of that property now. (4) That most public utility commissions and many estimators who have been following their rulings are at variance with the opinions and decisions of the courts, in that they are insisting upon retracing an investment rather than valuing a property. (5) That the reproduction method is in most cases a most useful line of inquiry in arriving at a conclusion as to what the value of a property may be at the present time, but that it is not the only line of evidence to be considered. (6) That reproduction is a cost method and does not of itself determine value; it is only one of the means and not an end, and must be complete in itself, including going cost, before it can properly be used as a basis for reasoning. (7) That when all lines of evidence are properly presented, appraisers must reason as to what bearing on valuation each one may have.

Mr. Alvord's paper as a whole is an amplification along the above lines. In his opinion the science of valuation calls for a knowledge in three professions: law, engineering and economics, although the law and its interpretation control. Mr. Alvord believes that wherever there are wide differences of opinion as to the value of a property, a large part of the difference is usually caused by differing conceptions as to what is being valued and differing definitions. If appraisers, and especially engineers, would once thoroughly understand that it is the function of the law and not themselves to say what is to be appraised, most of the troubles and confusion in appraisal work would be eliminated.

To produce good results in appraisal work, according to Mr. Alvord, it is necessary to have practical experience in considerable amount, alternately representing both conflicting interests in order to appreciate fully the varying points of view. The only golden rule for the engineering appraiser in valuation work is for him to value the property so that he would be satisfied with the valuation if he had been appointed by the other side, or if at any time hence he found himself on the other side of the issue in some other case. Mr. Alvord states that what is greatly needed is a book compiling in full without partiality the decisions and opinions of courts in valuation cases to be accompanied by a topical index. In connection with his paper he appends a list of the more important decisions for immediate reference.

OUTLINE OF PAPER BY MR. GANDOLFO

The primary purpose of the paper by Mr. Gandolfo is to show that in any valuation or appraisal that is made for purposes of rate-making or security issues the proper figure to be used is actual cost to date of the work in question, provided of course that there has not been extravagance, fraud or gross mismanagement in the origin or development of the enterprise. Although this valuation is a basic figure, however, it is not necessarily the only and final one to be used for any and every purpose for which a valuation may be undertaken. Reproduction or replacement cost, cost of reproduction less depreciation, etc., all have their proper place and should be used under the proper conditions.

To substantiate the above statement, Mr. Gandolfo goes back to the fundamental beginnings of private business and traces the development of the private corporation and the public utility corporation, at the same time showing the similarity and dissimilarity between these three classes. With this as a basis, it is shown how the same principles can and should be applied in the valuation of public utility property as would be used in that of a private individual. In investigating a public utility it is indicated briefly why this class of corporation should be subjected to regulation by the state. Decisions of courts are referred to wherever it is thought necessary to show the trend of judicial opinion.

In conclusion, Mr. Gandolfo states that the actual cost to date is a figure equitable to the investor, the promoter the manager and the public at large. The real object of a valuation of any public utility is to obtain a figure such that any conclusions or regulations founded upon it will be just to all interested parties. Every case must be decided on its own merits with due regard to conditions and circumstances immediately surrounding it.

Consolidation at Ogden, Utah

Important Extensions and New Construction Under Way—New Substation Erected and Others Being Built

The Ogden Rapid Transit Company and the Logan Rapid Transit Company have recently been consolidated under the name of the Ogden, Logan & Idaho Railway Company, which now operates the city system of the Ogden Rapid Transit Company, also the Ogden Canyon interurban line, the North Ogden interurban line, the Brigham City interurban line and the Plain City steam line. It also operates the Logan City lines. In addition it has built a number of extensions to the north and south and has others under way. On the completion of the work already begun, the company will have practically 135 miles of interurban track, in addition to about 6 miles of city system in Logan and practically 40 miles of city system in Ogden.

For the new construction north and south of Logan the company has used 70-lb. A.S.C.E. rail, steel bridges with concrete abutments and catenary overhead construction. It has also constructed a substation in Smithfield, Utah, in which will be located a Westinghouse 235-kva transformer and a 500-kw motor generator set to supply 1500 volts direct current. After the contemplated work is finished next season, the entire interurban system of the company will be changed over from 600 volts to 1500 volts, but the city lines in Ogden will remain at 600 volts.

The cars to be used on the new extensions are being manufactured by the American Car Company, St. Louis. They are all-steel, 68 ft. 8 in. over all in length, and each will have four Westinghouse 110-hp 1500-volt motors with HL control. In addition to the construction mentioned above, the company is building modern concrete and brick depots at a number of the points reached by the new north and south lines.

A union station for the use of the company and also of the Salt Lake & Ogden Railway is being built in Ogden and will be completed about Jan. 1, 1915. This station is of brick, 32 ft. wide and 177 ft. long. The main floor contains a waiting room which extends across the building and is about 64 ft. in length. At the rear are baggage and express rooms and a trainman's room. The ticket office is in the center of the building and on the corridor through which passengers pass to their trains. The ground floor of the building is lighted from the roof by monitor skylights, and a large electric sign is carried in front of the building.

F. D. Kline is general manager of the consolidated company.

Meeting of National Civic Federation

The annual meeting of the National Civic Federation was held at the Hotel Astor, New York, on Dec. 4-5. The address of President Low, which was delivered on Friday morning, discussed briefly the work of the Federation and the problems which had been brought upon this country as a result of the war. He then referred to the recent law creating the Federal Trade Commission, which he said had been favored for a number of years by the National Civic Federation, and believed that in the course of time the powers of this commission would be enlarged so as to permit amendment of the Sherman anti-trust act under government regulation. In conclusion he criticised the Interstate Commerce Commission for recommending an increase in passenger rates rather than in freight rates.

John Hays Hammond then presented a report on business conditions throughout the United States, based upon an extensive inquiry by the Federation. The most gloomy view is that taken by the charity organizations. Next the railroads are the most pessimistic. While electric railway gross receipts have not suffered as have those of the steam railroads, yet these companies also find it impossible to extend their activities, owing to the small margin of their net receipts. A turn seems to have been taken in the steel industry, the savings bank situation has become normal again, and there is a much better situation in the cotton district. Reports of purchases of supplies by belligerent nations may be exaggerated in some cases, but it is nevertheless clear that the aggregate of these orders is enormous. These orders have been a particular help to the commercial vehicle industry, bringing $10,000,000 to the makers of these trucks. The agricultural situation, particularly that between the Mississippi River and the Rocky Mountains, is good.

The Federation was to discuss government ownership of utilities on Friday afternoon.

Annotated Reports of Commissions

Announcement was made this week of the completion of plans for the prompt publication of the decisions and rulings of the public service commissions of the country in convenient form. This work will be undertaken by the Lawyers' Co-operative Publishing Company, of Rochester, N. Y., and the publication will bear the title of "Public Utilities Reports Annotated." The reports will be issued in a series of selected annotated reports similar to the "Lawyers' Reports Annotated," which are published by the same company. The plan is to issue advance sheets in bi-weekly parts. When there is sufficient material in the advance sheets to justify the issue of a bound volume one will be published. It is expected that in the course of a year six bound volumes will be issued. The bound volumes will be on thin paper and each will contain not less than 1200 pages. Each volume will contain tables of cases, arranged by cases and also by states. The cost is to be $5 per volume including the advance sheet service.

The work will start with the decisions of commissions rendered beginning with Jan. 1, 1915, and the first advance sheets will be issued shortly after that date. It is planned to publish all of the important decisions of the commissions in full. Rulings and orders dealing with standards, practices, etc., which are of general interest will also be published in full. The decisions which will be published are those relating to public utilities of all kinds with the exception of steam railroads. It is not planned to publish steam railroad decisions unless they have some incidental bearing on the general public utility situation. Publication will also be made of the decisions of state courts of last resort on public utility commission issues.

The decisions will be so annotated that they may be compared and the harmony or lack of harmony with other decisions in different jurisdictions made clear. The headings, annotations and digest will be so arranged as to provide convenient means of reference, not only for lawyers but also for engineers and others who are unfamiliar with legal practices.

The Missouri Public Service Commission has issued advance sheet No. 5 of its reports of cases. The paging of this advance sheet begins with page 1. This is occasioned by a revision of the reports, cases involving no principles having been withdrawn. The commission feels that this will rid the advance sheets of matter of little or no permanent value and render them more serviceable for ready reference to principles announced. The pages will appear in proper sequence in the bound volume of commission reports.

COMMUNICATIONS

The Code of Principles

STONE & WEBSTER MANAGEMENT ASSOCIATION
BOSTON, MASS., Dec. 1, 1914.

To the Editors:

There is a marked demand from the managers of our various companies for copies of the "Code of Principles." Can you, without inconvenience, send me eighty more copies? EDWARD F. FLYNN, Secretary.

[NOTE: Other requests for copies of the Code, which have been filled during the past ten days, have come from Columbus, Ohio, Davenport, Ia., Denver, Col., Dubuque, Ia., and Fort Wayne, Ind.—EDS.]

Information Wanted by Passengers

BRIDGEPORT, CONN., Nov. 30, 1914.

To the Editors:

The editorial "Helping the Sightseer" in your issue of Nov. 28 affords valuable hints as to the information which the tourist passenger on electric cars wants of the conductor. This suggests the thought that in addition to the places of historical interest along their route the conductors should be educated to know something about the important manufacturing plants. This matter has impressed me because, in my travels, I have often had occasion to inquire the shortest route to reach a certain point, only to find that I could not only get no help from the car conductors on this point but they did not even know of the existence of the company in question. In many cases this has happened when the reputation of the manufacturer was nation wide, and he was a large employer of labor in his city.

It occurs to me that if a railway company should offer a prize for a paper giving the most complete information on points of interest, including industrial establishments, on each of the different runs, it would not only serve to familiarize the men with these things but would awaken an interest in them to keep informed on future developments along their routes.

I submit this as a suggestion and in extension of your recommendation. WILLIAM V. DEE.

A. I. E. E. Standardization Rules

HARVARD UNIVERSITY
CAMBRIDGE, MASS., Dec. 1, 1914.

To the Editors:

Supplementing the statements which you have made in recent issues of the ELECTRIC RAILWAY JOURNAL regarding the new edition of the standardization rules of the American Institute of Electrical Engineers, the following points may be of interest to your readers.

The most fundamental and important improvement in the new rules over the old ones is in connection with the rating of electrical machinery, including limiting temperatures for various kinds of insulation and methods of measuring the same. Although the presumably highest hot-spot temperature allowance for Class B insulation may seem to many far beyond previous practice, it is not so as a matter of fact; but is merely a recognition of a condition which has existed in much of our large capacity machinery. It has not previously been recognized, owing to the inadequate methods of temperature measurement until recently employed. Thermal couples recently inserted in the original Niagara alternators, now twenty years old, have disclosed temperatures as high as 170 deg. Cent.

The new rules contain several entirely new sections, including those on wires and cables, the rating and testing of switches and other circuit-control apparatus, and standards in telephony and telegraphy. This last-mentioned section is only in tentative form, as the nomenclature in this field is still in a state of flux, particularly in the radio corner. Many of the other sections have been completely transformed, so that they are hardly recognizable, but it would be impossible to go into details of these changes here.

I trust that the above statements will serve to direct the attention of your readers to some of the most important and interesting changes in the rules.

C. A. ADAMS,
Professor of Electrical Engineering.

[NOTE: Professor Adams, as the secretary of the standards committee of the Institute, is in an excellent position to point out the novel features of the rules. The attention of the reader is directed also to the editorial printed in this issue of the ELECTRIC RAILWAY JOURNAL.—EDS.]

NEW YORK, Nov. 27, 1914.

To the Editors:

Referring to the electric railway section of the new standardization rules of the American Institute of Electrical Engineers, abstracted in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 28, page 1201, the following point should be noted: The standards committee, at its last meeting, decided to omit section 418 of the tentative issue of the standardization rules, which related to maximum permissible inputs of motors, as this section was believed to contain requirements unsuitable for general use, although quite acceptable for certain motors under certain conditions of service. It is to be hoped that the committee will be able to formulate a rule acceptable to both railway men and manufacturers. In order to do this, it will be necessary to secure the co-operation of all parties who are interested in obtaining the data upon which such a rule must be based.

The reasons for which a motor is called upon to carry heavy currents for short periods are usually as follows:

1. Rapid acceleration.
2. Acceleration of heavy loads.
3. Heavy but short grades.

These conditions are met with in varying degrees in urban, interurban and locomotive passenger and freight traction, so that a table might be constructed for insertion in the rules, giving the maximum input current which motors for such services should be expected to carry.

Railway men and manufacturers unfortunately have different points of view about this matter. The former think of the railway service primarily, and desire the motors to be designed to conform with their particular service requirements. The latter think of the motor capabilities primarily and more or less unconsciously desire the service to conform thereto. Hence, instead of a table such as suggested above, the manufacturers would probably prefer to have the rules give the maximum input current for motors of different types, having regard to interpoles, scheme of ventilation and the proportion of iron and copper used in their construction.

Both the form of the rule and the particular figures which would enter it are therefore subject to discussion, and it is to be hoped that all who can contribute practical information bearing on this subject will do so.

WILLIAM A. DEL MAR.

[NOTE: It is to be hoped that Mr. Del Mar's request for information on the important subject of motor overloads will meet with a prompt response. Such contributions will be printed in this column with a view to bring out still further suggestions.—EDS.]

American Association News

American Executive Committee Met on Dec. 3 and Considered Plans for Washington and San Francisco Meetings —Hooper-Holmes Service to Be Continued—R. E. Danforth Explained to Public Service Section Comprehensive Program Plans

MEETING OF THE AMERICAN ASSOCIATION EXECUTIVE COMMITTEE

The executive committee met in New York on Dec. 3. Those present were: C. Loomis Allen, Syracuse, N. Y., president; Charles L. Henry, Indianapolis, Ind., first vice-president; L. S. Storrs, New Haven Conn, third vice-president; T. S. Williams, Brooklyn, N. Y., fourth vice-president; C. S. Mitchell, Pittsburgh, Pa., president Accountants' Association; L. P. Crecelius, Cleveland, Ohio, president Engineering Association; William Tichenor, Indianapolis, Ind., president Claims Association; H. H. Vreeland, New York., George H. Harries, Louisville, Ky., and Charles S. Sergeant, Boston, Mass., past presidents, and E. B. Burritt, secretary. C. C. Peirce and H. G. McConnaughy of the Manufacturers' Association were also present.

The following were among the important actions taken by the executive committee:

Certain changes in the rules of the Transportation & Traffic Association were approved, as well as the action taken by this association in the matter of train orders. The following resolution, adopted at the meeting of the executive committee of the Transportation & Traffic Association, was approved:

"Resolved, That whenever an interpretation of any rule or rules is asked for by a member company, such request shall be submitted to the rules committee for its opinion. Interpretation of rules made by the rules committee shall be presented to the executive committee for approval and the action of the executive committee shall be entered in the minutes and referred to the association for final action. When member companies request interpretation of rules, a copy of the opinion expressed by the rules committee may be furnished in advance of any action by this association as representing the judgment of the majority of its members, but the opinion of the committee so furnished shall not be considered in any manner as representing the opinion of this association."

The standards which had been approved by the standards committee and the 1914 convention were approved as follows:

Specification for rubber-insulated wire and cable for power distribution purposes.

Specification for round and grooved high-conductivity trolley wire. This is to supersede the specification for No. 00 hard-drawn copper trolley wire adopted as standards in 1911 and shown as Section Dw 3a in the *Engineering Manual.*

Specification for galvanizing or sherardizing on iron and steel. This is to supersede the specification for galvanizing on iron and steel adopted as standard in 1912 and shown as Section Df 2a in the *Engineering Manual.*

Copper wire tables. These are to supersede those adopted in 1912 and conform to the United States bureau of standards' new tables as issued in second edition of Bulletin No. 31 under date of Jan. 1, 1913.

Wire and cable terminology, amended definitions for "wire" and "concentric lay cable."

Specification for 600-volt, d.c. overhead trolley construction. Sections 51, 54 and 61 amended, covering "spans—installation on tangents"; "trolley wire—sag"; "curves—dressing," respectively.

Specification for solid wrought carbon-steel wheels for electric railway service.

Recommendations for specification for air-brake hose, and the diagram of clearances for overhead working conductors were also approved.

The special membership committee made a tentative progress report and received permission to present its final report at the executive committee meeting to be held in connection with the mid-year meeting.

The committees on the annual dinner and the mid-year conference made a progress report in regard to their work. The list of topics and speakers will be announced shortly.

The decision was reached to continue the association subscription to the Hooper-Holmes accident information service. (See ELECTRIC RAILWAY JOURNAL for Nov. 14, page 1104.)

Preliminary consideration was next given to the San Francisco convention which will be held from Oct. 4 to 8, 1915.

The executive committee also discussed the Interstate Commerce Commission order regarding equipment depreciation and the hearing which is to be held by the same body at the request of the railway association in Washington on Dec. 18. This hearing is to consider the question of the jurisdiction of the commission over purely urban electric lines in the reporting of accidents. The executive committee invites the attendance of interested parties to supplement the association representation.

It is President Allen's intention to call at least four meetings of the executivee committee during the year. of which the January meeting will be third.

MEETING OF COMMITTEES ON SUBJECTS AND MID-YEAR DINNER

A joint meeting of the above committee was held on Dec. 2. Those in attendance were Charles L. Henry, Indianapolis, Ind., R. E. Danforth, Newark, N. J., H. C. Clark, New York, C. S. Mitchell, Indianapolis, Ind., L. P. Crecelius, Cleveland, Ohio, and William Tichenor, Pittsburgh, Pa.; of the dinner committee, J. H. Hanna, Washington, D. C., W. F. Ham, Washington, D. C., C. C. Pierce, Boston, Mass., S. K. Colby, Baltimore, Md., Bertram Berry, New York, H. G. McConnaughy, New York, and E. B. Burritt, New York. The committees considered the details of the arrangements as reported by Mr. McConnaughy, made up a tentative list of prominent Washingtonians to be invited to the dinner and considered the visit to be made to the White House.

PUBLIC SERVICE RAILWAY COMPANY SECTION

As announced in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 21, page 1165, an important feature of the meeting held in Newark on Nov. 19 was a talk by R. E. Danforth, general manager, outlining the plans for the coming year. He stated, in substance, as follows:

"The time has arrived to furnish members of this company section with accurate information concerning the various items of cost which enter into the construction, maintenance and operation of street railways

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in order that the members may be intelligently informed upon the subject of the business in which they are engaged. Men engaged in electric railway work have troubles peculiar to this particular line. We get considerable satisfaction, however, in meeting these troubles as they arise and overcoming them. Those in the claim department know that if there were no accidents there would be no claim department, and similarly if equipment needed neither repairs nor inspection, there would be no mechanical department. Therefore not all of the troubles are such as dishearten us. We realize that many of these troubles are expensive, and that it is our duty to decrease not only the expense but the troubles, thus making life easier for us, and to increase the company's profits, with resulting credit to ourselves and the chief executive. However, as we are always in the people's eye, so to speak, and our every act is criticised, we may take satisfaction in the fact that these criticisms by the public are growing rapidly less. This is because there is less to criticise and as a result we stand better to-day before the public than we did a few years ago and our fair-minded citizens speak highly of the class of service we are giving.

"It is in order that we may improve in our work individually, and in the results collectively, that we should be thoroughly posted on the elements and problems entering into the operation of our system. If each employee knows why things are done in a certain way and what is the cost of so doing, such knowledge will aid in the performance of his share of the work.

"In the coming year's section work it is proposed to take up, in due order, the elements which enter into the cost of a railroad; its value, the cost of operating and maintaining a property, what it would cost to run additional trippers during the rush hours, the distance a passenger may profitably be carried for 5 cents, etc. A thorough analysis of the costs entering into the various departmental expenses of construction, operation and maintenance will also be made. These discussions will be opened by members expert in the particular branch of the business under discussion at each meeting. Brief talks will be given by the management on phases of the subject not usually covered in papers presented at meetings of this character."

COMING COMMITTEE MEETINGS

The joint committee of the Engineering and Transportation & Traffic Associations on block signals for electric railways will meet in Newark on Dec. 10.

The national joint committee on overhead and underground line construction (formerly the joint committee on overhead crossings) will meet at 29 West Thirty-ninth Street, New York, on Dec. 16.

MEETING OF THE WASHINGTON RAILWAY & ELECTRIC COMPANY SECTION

The regular meeting of Company Section No. 4 was held on Nov. 23, in accordance with the custom of holding the meetings on the fourth Monday of each month. The program consisted of an address by George P. Hoover, one of the company's attorneys, on "Accidents from the Standpoint of the Trial Attorney." This address was followed by an informal discussion. James L. Wilmeth, chief clerk of the treasury department, described his trip abroad on the United States S. S. *Tennessee*, in aid of American refugees in Europe. The more serious parts of the program were interspersed with vocal and intsrumental music.

DENVER TRAMWAY COMPANY SECTION

Supplementing the preliminary account of the meeting of Nov. 19, Secretary H. G. Mundhenk reports further as follows: In the talk of Vice-President John A. Beeler the speaker endeavored to apply the lessons of the Atlantic City convention to local conditions and urged the necessity for study, by all, of the reports of the meetings. He called attention to the undercurrent of determination on the part of electric railway executives to find sources of economy to offset the general falling off in receipts. He also compared the equipment and operating methods of the local company with those of other properties visited en route to and from the convention. Other speakers, representing different departments, followed Mr. Beeler's lead.

Railway Statistics for 1912

The division of statistics of the Interstate Commerce Commission has just issued its twenty-fifth annual report dealing with statistics of steam railroads in the United States for the year ended June 30, 1912. Besides detailed reports for separate groups of companies there are summaries showing the classification of railways, mileage, equipment; number, territory and compensation of employees; capitalization, traffic statistics, earnings and investments in road and equipment. On June 30, 1912, forty-four railroads operating 9785.83 miles were in the hands of receivers. The total mileage operated (all tracks) as of this date was 371,237.92, an increase of 8413.43 miles for the year. There was very little difference between the proportionate increase in equipment and in length of road. The total railway capital as of June 30 was $19,752,536,264, an increase of $543,601,183 as compared with the previous year. Of this increase $391,917,973 was in the various classes of funded debt and $151,683,210 in stock. The stock increase was caused by a common stock increase of $173,831,981 and a preferred stock decrease of $22,148,771. The average rate on dividend-yielding stock decreased 0.86 per cent as compared with the average of 1911.

The average receipts per passenger per mile were 1.987 cents, the corresponding figure for the previous year being 1.974 cents. Although this was a slight increase, the length of the average journey per passenger and the average receipts per passenger showed a slight decrease. The average receipts per ton per mile were 0.744 cent, which amount is smaller than the corresponding average for any year during the preceding decade. Railroad operating revenues increased $52,933,713 and operating expenses $57,361,771, resulting in a decrease of $4,428,058 in net operating revenue. The total net revenue from operation decreased $5,164,517. Taxes increased nearly 11 per cent, while the dividends declared from current income, as well as additions, betterments, new lines and extensions charged to income, decreased and appropriations to reserves increased. The net decrease in this group of items was $31,389,943. The balance to the credit of profit and loss decreased from $170,212,186 in 1911 to $110,310,963 in 1912. The increased investment in road and equipment during the year amounted to $392,366,121.

The Society for Electrical Development has announced the eight successful contestants in its recent prize story competition. The first prize of $250 was awarded to Roscoe E. Scott, Nela Park, Cleveland, with the National Lamp Works of the General Electric Company. In reaching a decision on the seventh and eighth prizes there were some stories which in the opinion of the judges were so nearly equal in merit that five supplementary "honorable mention" prizes of $5 each were awarded. The stories were submitted under fictitious names and the envelopes in which the names and addresses were contained were not opened until after the awards had been decided upon.

Equipment and Its Maintenance

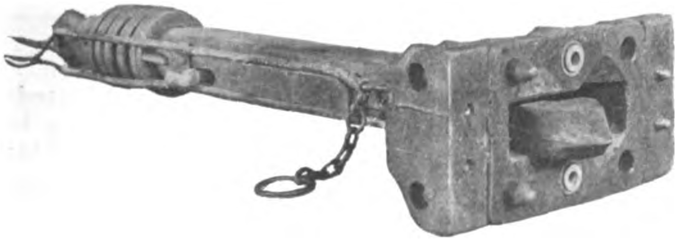
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Omaha Coupler with Air and Electrical Connections for Trailer Service

BY T. E. WOOD, MASTER MECHANIC OMAHA & COUNCIL BLUFFS STREET RAILWAY

Speed in making up trains for rush-hour trailer service is very desirable because every minute counts. On the Omaha & Council Bluffs Street Railway this end has been attained by certain additions to the Tomlinson radial coupler, which in its purchased form already embodied attachments for automatic air brakes. These additions per coupler comprise two curved blocks of paraffined wood, 9¼ in. high, 2¾ in. wide and 5 in. deep, the blocks being bolted to the right and left sides of the coupler proper. One block is fitted with a pair of rigid pins while the other has a pair of sockets fitted with spring contacts. A connection box under the trailer is provided to join up the drawbar connections, which are as follows: Trolley, door signal, buzzer, signal bell. No. 10 wire is used in the power circuit to the trailer and No. 14 wire in the other circuits. In coupling cars all connections are made in one operation, with the exception of opening the air cocks on the two cars and closing the knife switch in the motorman's vestibule.

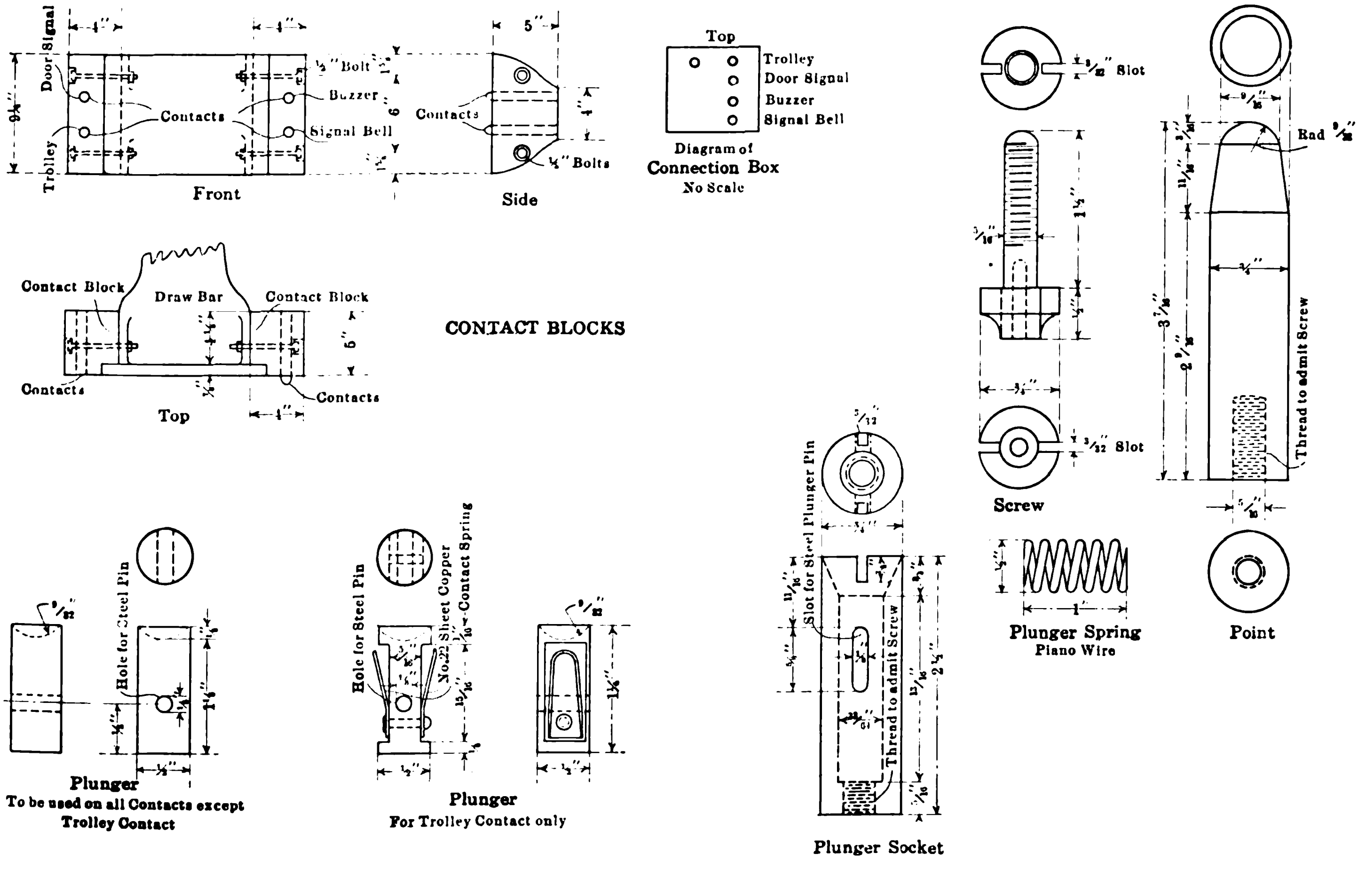


OMAHA COUPLER WITH AIR AND ELECTRICAL CONNECTIONS FOR TRAILER

A Wheel Press for Pressing Pantograph Shoes and Testing Springs and Hose

BY R. R. POTTER, SUPERINTENDENT OF EQUIPMENT NEW YORK, WESTCHESTER & BOSTON RAILWAY

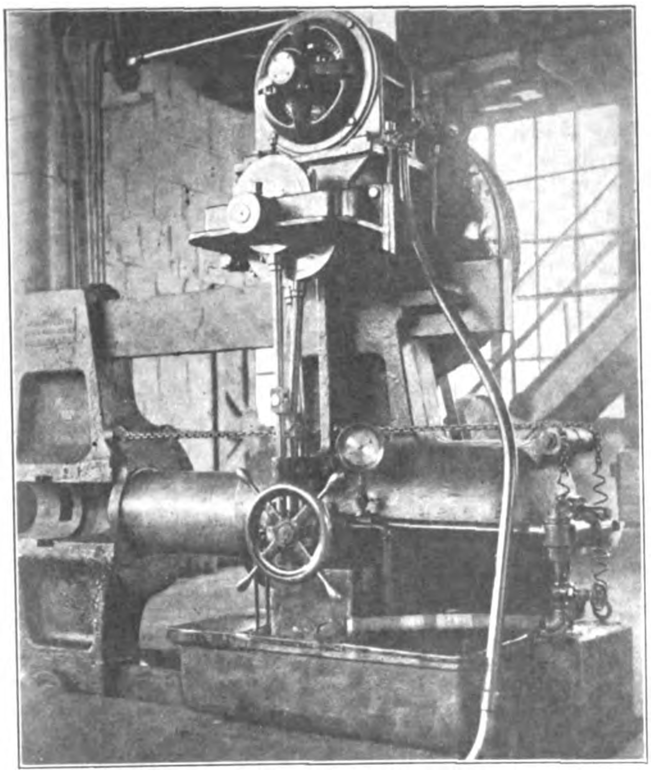
The diverse uses to which a shop tool may be put to advantage in case of necessity may be exemplified by the following description of the work that is done by a wheel press in a modern railway shop. The press has a capacity of 400 tons, the pressure being obtained from a triple-plunger pump that is driven by a 5-hp motor. The pump plungers are of different sizes so that the ram may be moved quickly under a comparatively low pressure by the two large pump plungers, or comparatively slowly under high pressure by the small plunger. Ordinarily all three plungers are used, and the two larger pump cylinders are cut out when the pressure



Door Signal
Trolley
Contacts
½" Bolt
Buzzer
Signal Bell
Front
5"
Side
¼" Bolts
Top
Trolley
Door Signal
Buzzer
Signal Bell
Diagram of Connection Box
No Scale
Contact Block
Draw Bar
Contact Block
Contacts
Top
CONTACT BLOCKS
Hole for Steel Pin
Plunger
To be used on all Contacts except Trolley Contact
Hole for Steel Pin
No. 22 Sheet Copper
Contact Spring
Plunger
For Trolley Contact only
Slot for Steel Plunger Pin
Thread to admit Screw
Plunger Socket
Slot
Screw
Plunger Spring
Piano Wire
Rad
Thread to admit Screw
Point

DETAILS OF CONTACT BLOCK AND CONTACTS FOR COUPLER WITH AIR AND ELECTRICAL CONNECTIONS begins to rise rapidly. Each cylinder is fitted with a safety valve so that there is no danger from excessive pressure.

In addition to the regular work of removing and replacing wheels and gears, the next most important work accomplished is the pressing of steel pantograph trolley shoes. These shoes are 1/16 in. thick, 6 in. wide and 4 ft. long. A force of 100 tons is required in this process and as it is important to have this force exact, the safety valve is set to give 100 tons total force, and the pressure is raised until the safety valve blows off. By this means about seventy shoes can be pressed per hour.



WHEEL PRESS USED FOR HYDROSTATIC TEST FOR THE AIR HOSE SHOWN ON BEDPLATE

The press is also used for testing and lubricating truck springs. For this work a steam gage is used in place of the regular hydraulic gage, which registers only the very heavy pressures and is not suited for comparatively low pressures. With the aid of the low-reading gage the capacity of a spring, when compressed by the ram, is readily obtained, and while the results may not be absolutely accurate, the readings are close enough for practical purposes. Such comparative readings of the loads and deflections of various springs are very valuable. The leaves of all elliptic springs for cars in the shop are thoroughly lubricated by compressing and releasing them a few times and at the same time supplying the surface with an abundance of oil. The easy riding qualities of a spring after this treatment, as compared with one which has become dry, is remarkable. In fact, a spring that has become dry shows practically no working or movement of the spring leaves upon each other on account of the great amount of friction. Where car springs do not work easily, heavy and injurious strains are undoubtedly transmitted to the truck and car body and the slight expense of lubrication is paid for many times in the saving of wear to trucks alone.

Still another use to which the press has been put is the testing of hose or pipe to determine the bursting pressure. For low pressures the usual hydraulic gage is replaced by the low-reading steam gage, and the pipe or hose that is to be tested is connected to a pipe leading from the pump to the cylinder of the press. The ram is then allowed to come solid against the yoke. By this method pressures up to 6000 lb. per square inch can easily be obtained. The press has also been used in the same manner to obtain the tensile strength of chain, rods, etc. In one instance trouble was experienced by the breaking of a certain type of chain. Samples of chain of this size were therefore obtained from various manufacturers, and upon testing in the press one of these was found to answer the purpose for which it was intended much better than the others, and at the same time was much stronger, the comparative readings being 9240 lb. for the new as against 3960 lb. for the old. In consequence, the former was adopted to replace the original chain throughout.

Safe Sand Blasting from An Operating Booth

BY R. H. PARSONS, ELECTRICAL FOREMAN

Generally speaking, there are two kinds of sand-blasting outfits, one portable, when it is necessary to carry the outfit to the work as for sanding the sides of a car, and the other stationary, when the work can be carried to the outfit.

The usual custom in sand blasting is to protect the operator by a hood over the head and by gloves. This combination is awkward and does not permit fast and good work. In the scheme herewith illustrated the operator is not embarrassed by hot and heavy head gear to interfere with his breathing and sight, and yet his sand-blasting attachments are most accessible. In brief, the scheme is to use a comfortable booth wherein the operator can stand while his work, the sand and the dust are on the outside.

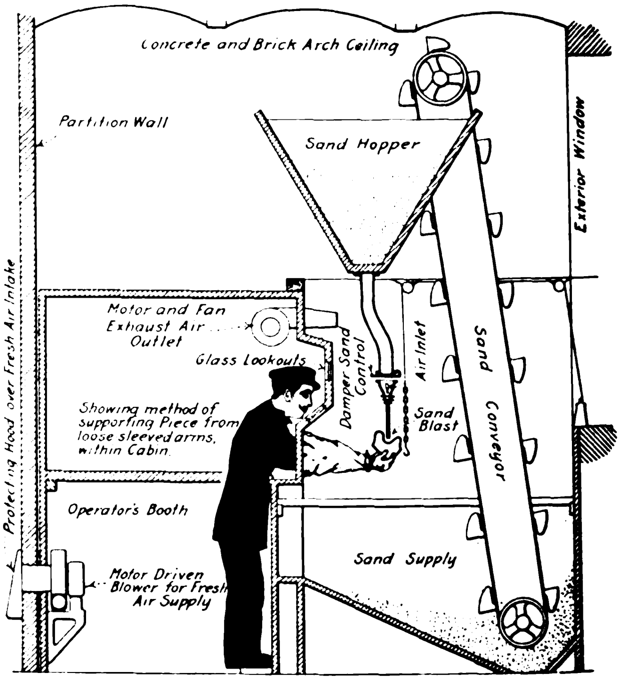

Concrete and Brick Arch Ceiling
Partition Wall
Sand Hopper
Exterior Window
Protecting Hood over Fresh Air Intake
Motor and Fan Exhaust Air Outlet
Glass Lookouts
Damper Sand Control
Air Inlet
Sand Conveyor
Showing method of supporting Piece from loose sleeved arms, within Cabin.
Sand Blast
Operator's Booth
Sand Supply
Motor Driven Blower for Fresh Air Supply

FIG. I—WORKMAN STANDING IN SANDING BOOTH

Fig. 1 illustrates a booth 6 ft. square and 7 ft. high, inside a room about 12 ft. square and separated by floor to ceiling partitions from the other part of the building. Both the booth and the outer room are built practically airtight. The booth for the operator and the outer room for the sand and the work form in themselves a plant which neither interferes with or suffers interference from the rest of the shop. The booth is built with a bay window at a height which permits the operator, when standing, to look at the work through a removable pane of glass. To reach and handle the work the operator puts his arms through the wall of the booth into long and roomy canvas sleeves. One end of each sleeve is permanently fastened to the booth, while the outer end is strapped to the wrists of the operator.

The sand blast is directly in front of this bay window. As the hopper is just above this blast a clear, straight, non-clogging path is presented for the sand. A sliding damper in the pipe between the hopper and the blast nozzle is used to control the passage of the sand. This damper is within easy reach of the operator. A number of iron supports, located outside the booth as shown, are provided for placing the work when not in the operator's hand. The air valve, shown in Fig. 2, is also easily reached by the sleeved arms of the operator. For additional convenience an air gage is placed inside the booth so that the operator can keep watch of the pressure.

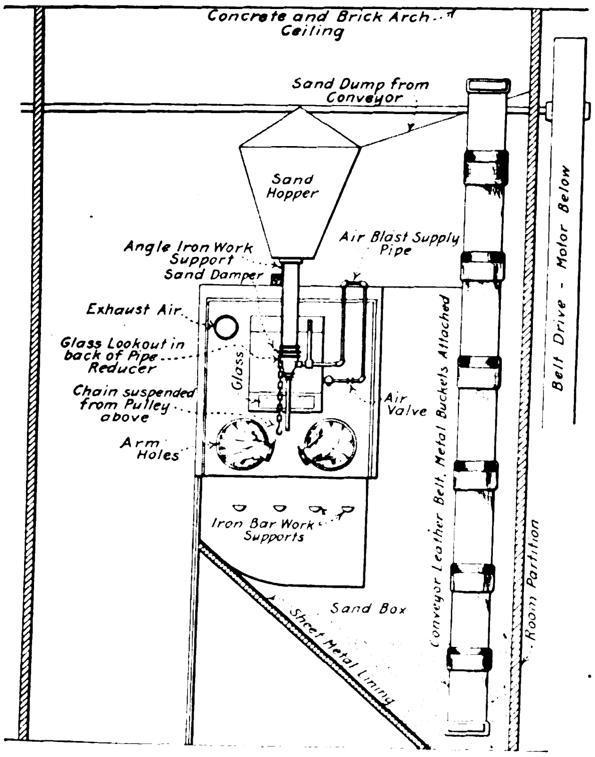

Concrete and Brick Arch Ceiling
Sand Dump from Conveyor
Sand Hopper
Air Blast Supply Pipe
Angle Iron Work Support
Sand Damper
Exhaust Air
Glass Lookout in back of Pipe Reducer
Chain suspended from Pulley above
Arm Holes
Glass
Air Valve
Iron Bar Work Supports
Sand Box
Sheet Metal Lining
Conveyor Leather Belt, Metal Buckets Attached
Room Partition
Belt Drive - Motor Below

FIG. 2—END VIEW OF SAND BLASTING EQUIPMENT

A hook, attached to a rope which passes over two pulleys and fitted with a weight on the other end is suspended near the nozzle. This helps to support heavy parts.

The booth is ventilated by two small blowers. The one shown in the left-hand corner of Fig. 1 draws fresh air from the outside of the main room directly into the booth; the other at the top of the booth has two functions, one being to draw the foul air out of the booth and the other to blow the sand-blast dust out of a window directly opposite. These fans keep both the booth and the outer room fresh and clear.

A sheet-metal chute under the blasting nozzle allows the sand, after it has been used, to run into one corner of the sand room. Thence it is taken up on the belt conveyor illustrated in Figs. 1 and 2 to a chute which dumps the sand again into the hopper. The motor for this conveyor is located at a dust-free point outside of the sand room. The blower motors and the switches for the conveyor motor are inside the booth.

As shown in Fig. 2, the sand blast itself is made up in the usual manner, consisting of a pipe T for 2½-in. pipe at the top and for 1-in. at the air intake and sand outlet. The top of the T is connected to the pipe from the sand hopper. The air is brought in through a pipe in the side, the pipe being reduced to ¼ in. and bent downward, with a very small hole in the end. The damper previously mentioned is above the T, and a nipple which conveys the sand forced by the air to the work is screwed into the bottom. This nipple is about 10 in. long and is the only part which wears out but is easily replaced.

The operator takes all the work he can do for two or three hours and sets out the pieces on the iron-bar supports, closes the door of the outside room, and then enters the booth and closes the door. Upon this he throws in the switch to start the blower motors and places his arms into the canvas sleeves, strapping up each wrist with the other hand. Next he starts the sand and air control, within easy reach of his hands, and after regulating both to the desired degree of blast he is ready to labor.

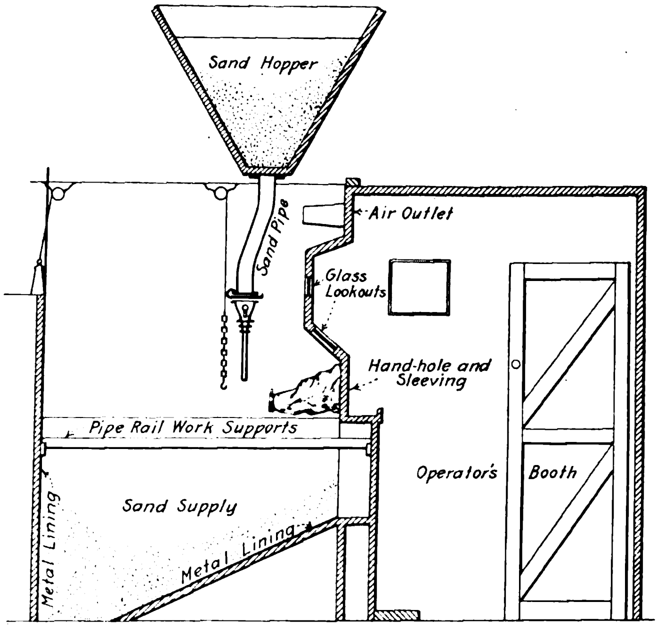

Sand Hopper
Sand Pipe
Air Outlet
Glass Lookouts
Hand-hole and Sleeving
Pipe Rail Work Supports
Operator's
Booth
Sand Supply
Metal Lining
Metal Lining

FIG. 3—SIDE VIEW OF SAND BLASTING EQUIPMENT

Upon completing his first stint, the operator leaves the booth, removes the pieces finished and brings in more. At this time he starts the conveyor motor so that by the time he is ready to resume work all the sand has been returned to the hopper ready for reuse.

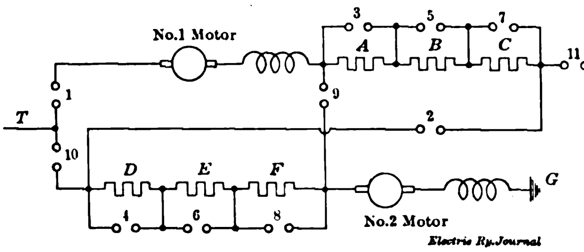
Sand-blasting glass and cleaning iron are old uses for such an outfit, but the many new kinds of work which can be done make it a very good investment for the small outlay necessary. For example, controller connection boards removed from the frame are nicely cleaned without disconnecting the wires or removing the terminals or screws, for although the blast cleans the metal and wood it does not touch the insulation of the wires. Controller cylinders can be perfectly cleaned without removing the plates. Commutators can be cleaned more easily and thoroughly than by the old method of scraping. Controller arc deflectors are made as clean as new in about ten minutes. Controller tops, water collars, etc., also can be cleaned in this manner, although they are usually dipped in acid.

Thus by taking a little pains we have succeeded in making easy and comfortable a class of work that has hitherto been so disagreeable to the operator and so dangerous to his health as to make it almost impossible to get reliable men, who now, under favorable conditions, are able to do better work.

Equipment Defects—Control Apparatus and Connections—IV

BY C. W. SQUIER, E.E.

The Bridging Method of Transition.—This method is quite different from the "open circuit" and "short-circuited motor" methods, in that the current is not shut off from the motors at any time during transition nor is either motor subjected to any sudden rise in voltage like that which takes place in the "short-circuited motor" method. The connections for bridging control are illustrated in Fig. 10. First, the motors are arranged in series with each other and with the regulating resistance, which consists of six groups and is divided into two parts. In operation the control first cuts out the resistance progressively, as shown by the numbers of the different short-circuiting switches. The motors will then be operating in series directly across the line. The resistance is next connected in parallel with the motors, and as it is divided into two parts with the connection between the parts connected between the motors, it follows that there will be the same drop in voltage across each portion as there is across each motor, namely, half the line voltage. The connection between the motors may then be broken provided the resistance connections are not changed. The operation of the different switches and the resulting connections are as follows:



Electric Ry. Journal

FIG. 10—CIRCUIT DIAGRAM FOR BRIDGING TYPE CONTROL

Starting from trolley with contacts 1 and 2 closed both motors are placed in series with all the resistance in the circuit. Contacts 3, 4, 5, 6, 7 and 8 are then closed consecutively, thus cutting out all the resistance. The contacts 9 are then closed, which short-circuits all resistance with their respective contacts. This is the "full series" position of the control and the motors are connected in series across the line with all external resistance cut out. After the contacts 9 have been closed, the contacts 2, 3, 4, 5, 6, 7 and 8 can be opened without changing the circuit, as these have all been short-circuited by the closing of contacts 9. Contacts 10 and 11 are next closed and there is established a circuit from trolley through all the resistance to ground, by way of the contacts 10, 9 and 11. We thus have two circuits through the contacts 9 in opposite directions and current will flow only in the direction of the circuit which has the greater amount of current. If the current in the two circuits is equal, there will be no current through these contacts at all, and they may be opened without causing any change of current in the motor circuits. The opening of the contacts 9 is then the next step in the transition and we have the motors connected in parallel with a section of the resistance in series with each motor. This regulating resistance may then be cut out by closing the resistance contacts as before until the motors are operating in parallel across the line without resistance. Thus the motors have been started in series with the resistance and brought up to full parallel without any greater change of impressed voltage than that derived from cutting out the various steps of resistance.

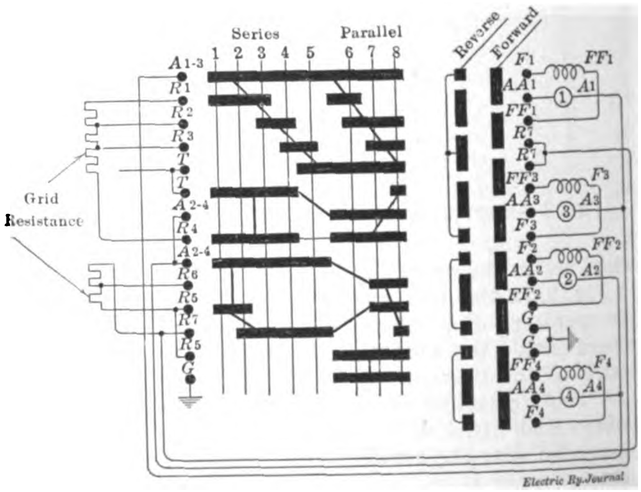
Fig. 11 shows a simplified diagram for the K-35-C controller. This controller uses the bridging method of transition from series to parallel and is used with four-motor equipments with two motors connected permanently in parallel. The controller provides five series and three parallel points and uses five groups of series resistance divided into two parts. However, the first point is intended to be used as a high resistance point for slow movement.

In all the diagrams except Fig. 11 used to illustrate the methods of changing the motors from series to parallel only two motors have been shown, but the various methods apply in like manner for the operation of four motors with the three combinations of four in series; two in series, two in parallel; and four in parallel.

THE JONES SYSTEM OF CONTROL

An interesting method of grouping four motors has been developed by P. N. Jones, general manager Pittsburgh Railways, as fully described in the ELECTRIC RAILWAY JOURNAL of April 11, 1914. The principal features are the elimination of regulating resistance on all points of the controller except the first, and the interruption of the circuit through some of the motors so that in accelerating, all of the motors except No. 4 have periods when they are not connected in circuit. At such times the car is propelled by the remaining motors. The changes from one combination to the next are brought about by means of the "short-circuited" motor method of transition, and the combinations of the motors when all of them are receiving power are four in series; two in series, two in parallel; and four in parallel.

By arranging the circuits so that external resistance is used only on the first point of the control, the resistance losses are cut down very materially. This saving in energy is accomplished, however, by a sacrifice in the uniformity of the voltage steps that are applied to the motors. Thus with a line voltage of 600, in passing from the second to the third point the voltage on motors Nos. 3 and 4 is increased from 150 to 300; in passing from the fourth to the fifth point the voltage on No. 1 motor is increased from 300 to 600, and in passing from the fifth to the sixth point the voltage on No. 4 motor is increased from 300 to 600. While the specially designed "baby" motors used with this equipment may permit this doubling in the applied voltage at one step, still such an increase could not safely be considered with motors having the usual characteristics.



Electric Ry. Journal

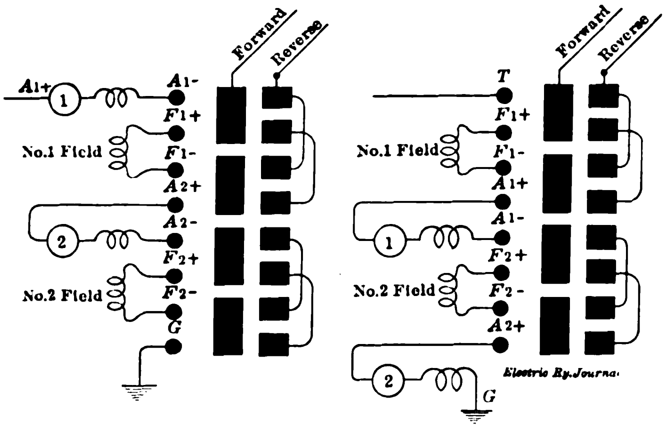
FIG. 11—SIMPLIFIED DIAGRAM OF K-35-C CONTROLLER

CONNECTIONS FOR REVERSING

With all equipments used for car operation it is necessary to arrange the control for changing the direction of rotation of the armatures in the motors. In hand-operated controllers the most common arrangement is that of a separate drum carrying the necessary contacts for reversing and operated by a separate handle. Some rheostatic controllers have the reversing contacts on the main drum, and the handle is moved in one direction for the forward movement and in the opposite direction for the reverse movement. However, when series-parallel operation is desired the latter arrangement makes the drum too large, as but half of the drum is available for the resistance and series-parallel contacts in each direction.

In multiple-unit equipments a separate reverser is usually employed, but in some types of control separate electrically-operated switches are used to give the necessary circuit combinations.

The direction of rotation of a railway motor armature may be changed by reversing the connections of the armature with respect to the field, or by reversing the field connections with respect to those of the armature. In the first designs of controllers the practice was to reverse the armature connections, but since commutating-pole motors have come into general use, the best practice is to reverse the field connections because the commutating field is connected in series with the armature.



FIGS. 12 AND 13—REVERSER CONNECTIONS FOR TWO-MOTOR EQUIPMENT

If the connections of the armature are reversed the commutating-pole fields will be connected first on one side and then on the other side of the armature. In the case of commutating-pole motors, therefore, the reversal of the fields with respect to the armatures has the advantage of securing minimum insulation strains upon the commutating-pole coils by keeping them on the ground side of the armature at all times.

The usual connections for a two-motor reverser are shown in Figs. 12 and 13. Fig. 12 shows the necessary contacts and connections for reversing the fields when they are connected on the ground side of the armature. Where it is desired to operate with the armatures on the ground side, the contacts are the same but the connections should be arranged as in Fig. 13. It will be seen by a comparison of these two diagrams that the only change necessary is in the armature connections, the fields remaining with the same connections in both cases. Equipments that are connected so as to reverse the armature connections can be changed without great expense to reverse the fields instead, as it is necessary to change only the connections from the motors to the controller. No change is required in the reverse drum itself.

Costs of Electric Shovel Work at Cleveland

In building its Seventy-ninth Street line the Cleveland Railway had to do much excavation, for which it employed the electrically-driven Thew automatic shovel illustrated herewith. This shovel is of the horizontal crowding motion type and has several other features of interest. It weighs 13 tons, has a dipper with a capacity of 5/8 cu. yd. and a clearance height over the house of 12 ft. 2 in. It is mounted on regular railway car wheels and in addition is equipped with a set of auxiliary traction wheels, 33 in. in diameter and 15 in. tread, which permits it to run under its own power over the ground, pavement or wherever else it is desired to take it.

The horizontal dipper crowding motion utilized is particularly adapted to electric drive because of the ease of control and power demands. In excavating material with a shovel it is necessary first to crowd the dipper forward into the material, then to hoist it upward through the material. In this case, the first motion is made horizontally and is obtained as follows:

ELECTRICALLY-OPERATED SHOVEL USED AT CLEVELAND

The dipper is suspended by an adjustable arm, hinged to a carriage or trolley moving horizontally along a suitable trackway. This permits the shifting of the point of rotation for the dipper, so that the hoisting force is at all times exerted in the most effective manner, while the crowding force is applied horizontally. The combination of the horizontal trackway and the boom channels produces a structure braced and reinforced to withstand the severe strains which the boom is called upon to endure.

The trolley motion is controlled by a lever. This lever is further connected to a trip rod which is operated automatically when the trolley reaches the limit of its motion in either direction. The crowding motion enables this type of shovel to be advantageously employed for very shallow excavating operations.

The entire motive power for traction, hoisting and swinging consists of one 20-hp Westinghouse compound-wound 550-volt d.c. motor with a starting and reversing control equipment. The motor operates at approximately constant speed, the various motions being controlled through suitable friction and gears. The current is usually admitted to the shovel through a flexible insulated cable connected to a switch on the truck frame and transmitted through copper rings to brushes suspended from the swinging turntable.

The use of one motor appears to be a particularly desirable feature for reducing the initial cost and affording greater flexibility of action in the frequent reversals of the various operating motions; it also means the operation of three levers instead of three separate controllers, and a gain in time over starting and stopping three separate motors. It is distinctly a one-man machine.

The boom is of the jack-knife type with an adjustable section that can easily be lowered, allowing the shovel to pass under the trolley wire without interfering in any way with the efficiency of its operation. The shovel swings through a complete circle, delivering the excavated material at any desired point. A buffer is furnished to take up the shock that occurs when the shovel strikes a hard piece of excavation. This allows the shovel to be released and relieves the whole machine from the strain to which it would otherwise be subjected. The cab is cut away to allow plenty of room for passing cars, a feature of particular importance in street railway work.

The following data, obtained through the courtesy of J. J. Stanley, president, and C. H. Clark, engineer maintenance of way, Cleveland Railway, show the cost of a typical operation for a ten-hour day.

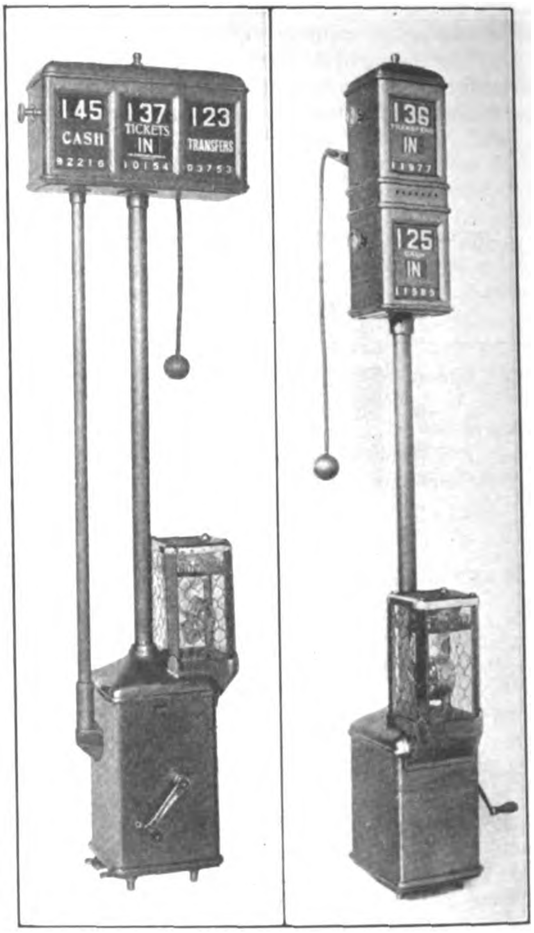
Loading	
Shovel man at 40 cents an hour	$4.00
Four laborers at 21 cents an hour	8.40
Current, oil, repairs, etc	1.50
Loading cost a day	$13.90
Hauling	
Four men at 26 cents an hour	$10.40
Four men at 19 cents an hour	7.60
Two men at 30 cents an hour	6.00
Hauling cost a day	$24.00
One foreman at 30 cents an hour	$3.00
Six laborers at 20 cents an hour	12.00
Dumping cost a day	$15.00
Cubic yards loaded in ten hours, May 8, 1914	540
Cost of loading per cubic yard	2.6 cents
Cost of hauling per cubic yard	4.4 cents
Cost of dumping per cubic yard	2.8 cents
Cost of loading, hauling and dumping	9.8 cents
Lineal feet excavated on this work	2700
Number of ten-hour shifts operated	12
Lineal feet excavated per ten-hour shift	225
Cubic yards loaded (place measure, per ten-hour shift)	450
Average loading cost 450 yds. at 3 cents per cubic yard	$13.90
Average hauling cost 450 yds. at 5½ cents per cubic yard	$24.00
Average dumping cost 450 yds. at 3½ cents per cubic yard	$15.00
Average loading, hauling and dumping cost per cubic yard,	11⅔ cents
Length of haul—approximately 6 miles.	
Average horse-power used in moving shovel	15.0
Maximum horse-power used in moving shovel	20.2
Average horse-power used in operating shovel	11.7
Maximum horse-power used in operating shovel	43.6

The shovel was built by the Thew Automatic Shovel Company, Lorain, Ohio, and the electrical equipment by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.

The returns for September show that the registered exports of British and Irish electrical goods for the month amounted to £287,751, which was a satisfactory increase over the total of £238,621 reported for August. The total imports for September amounted to £111,174, which also represented a comparatively large increase when judged by the August imports of £87,031. While machinery exports remained practically stationary during September, considerable improvement was shown in almost every other export section. The largest exports were as follows: India, £50,354; Argentina, £31,254; New South Wales, £31,037, and Victoria, £26,441. Exports to Brazil amounted to £5,378; British West Indies and British Guiana, £4,615; Peru and Uruguay, £1,423, and Chile, £1,320.

Combination Fare Registers for Coins, Metal Tickets and Transfers

A single self-contained unit which registers coins, metal tickets and transfers has been perfected by the International Register Company, Chicago, Ill. Minimum effort on the part of the conductor is required in the operation of this device. In addition to the cash fare and transfer registers, it embodies a mechanism for separately and automatically registering metal tickets on a ticket-fare register, as illustrated. The metal tickets are deposited in the same hopper as the coins and are counted by the operation of the same crank that counts the coins. The transfer register is operated by a cord within convenient reach of the conductor. The machine is also adapted to single-end and center-entrance prepayment cars.



TWO COMBINATION FARE REGISTERS

Another new type of registering fare box which does not embody the metal ticket register is also shown, the transfer register in this case being placed upon the top of the coin register. The latter is of the standard International type. Simply by turning a crank it will register in dollars and cents the total amount of all cash fares, the large figures on the two registers showing the number of passengers on each half trip.

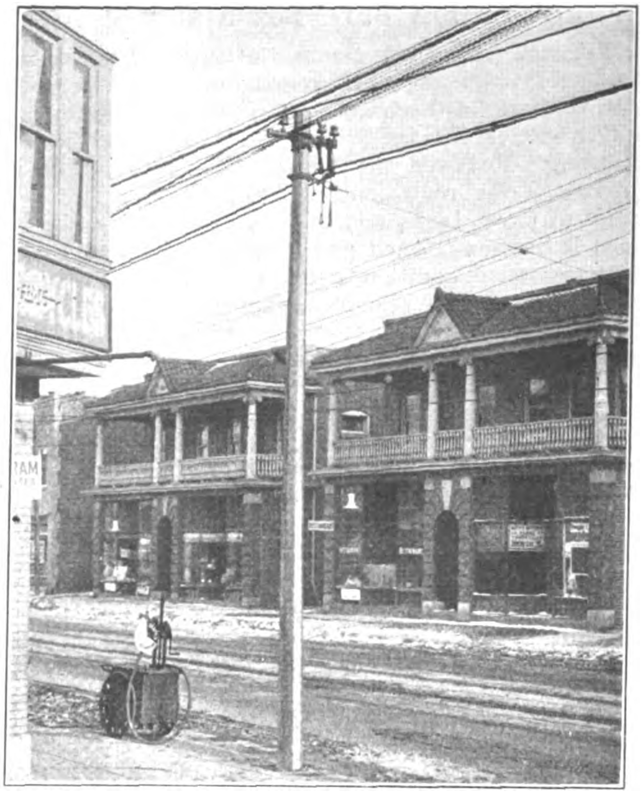
The desirability of having a registration for each passenger that enters a car is now generally admitted. These machines go a step farther in combining in one mechanism functions which have hitherto required separate machines. The registration of metal tickets mechanically is not new, but the automatic operation of a complete ticket-fare register in an elevated position so it can be seen from any part of the car is asserted to be novel. The advantage of combining all these functions into one compact device, that is quick in action and easy to operate, is apparent.

Reinforced Concrete Poles for Railways

Reinforced concrete poles for all classes of service are now being manufactured by the Great Lakes Dredge & Dock Company at its plant in Cleveland, Ohio. During the past several years this company has built thousands of reinforced concrete piles but recently the plant has been extended to include trolley, transmission and telephone poles. A large number of this company's reinforced concrete poles are now in use along the lines of the Cleveland Railway. During a severe storm in the winter of 1913 and 1914, when a great number of wooden poles at Cleveland gave way under the strain, these reinforced concrete poles came through the storm intact. The general dimensions, disposition of reinforcement and section of the poles used by the Cleveland Railway are shown in an accompanying drawing.

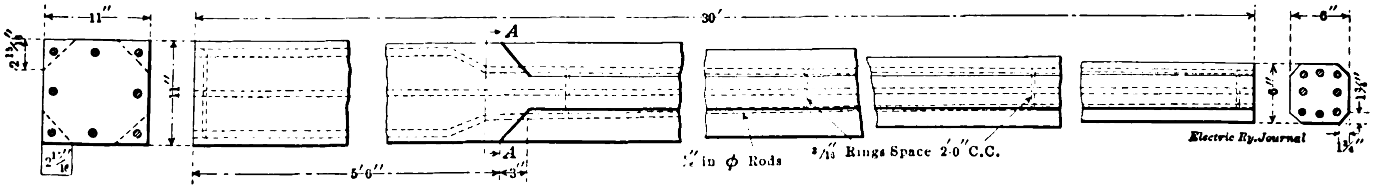
To produce these reinforced concrete poles a special process of manufacture is employed. The steel reinforcing forms are built and anchored firmly in metal forms in their correct position. The forms are then hoisted to a vertical position against the pouring tower, and the concrete is poured in directly from buckets which are elevated from a mixer. The drop of this concrete mixture into the mold insures perfect solidity and a compact column around the reinforcing rods. When the forms are filled they are placed in the horizontal position until the concrete has set sufficiently to allow the mold to be removed.

To accomplish first-class results in the manufacture of concrete poles and piling, the method of curing was considered of prime importance. During the warm summer months these poles are left in the open to dry by natural heat and absorption. During the cold months, however, to prevent freezing, the poles are placed in curing beds where an even temperature is maintained by circulating steam around them until they are thoroughly seasoned. Further to insure these pole against imperfections and to determine whether they will develop their full strength, all poles are tested and inspected.

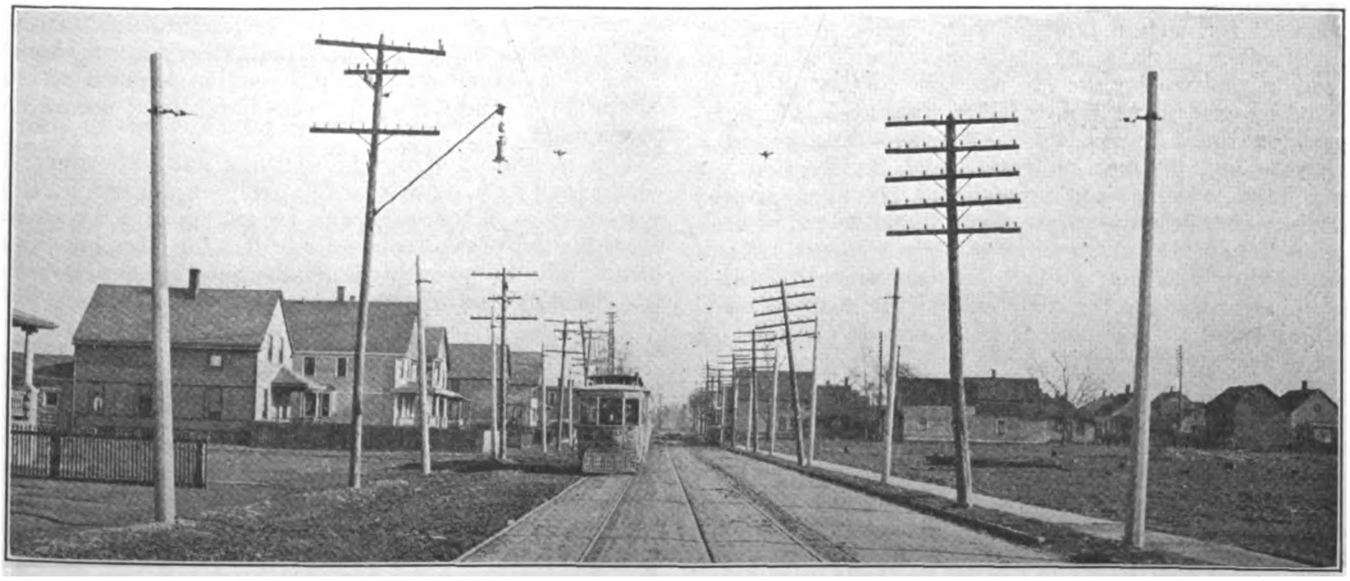


REINFORCED CONCRETE POLE IN CITY CARRYING TROLLEY AND FEEDERS

In the accompanying illustrations are shown two types of concrete poles manufactured by this company, one employed in span wire construction and the other employed in carrying feeder and power lines while also serving to support the trolley lines over double tracks. These are composed of one part cement and three parts sand and gravel which has been screened to reject all particles which will not pass through a 1-in. ring.



DETAILS OF REINFORCED CONCRETE POLE USED BY THE CLEVELAND RAILWAY

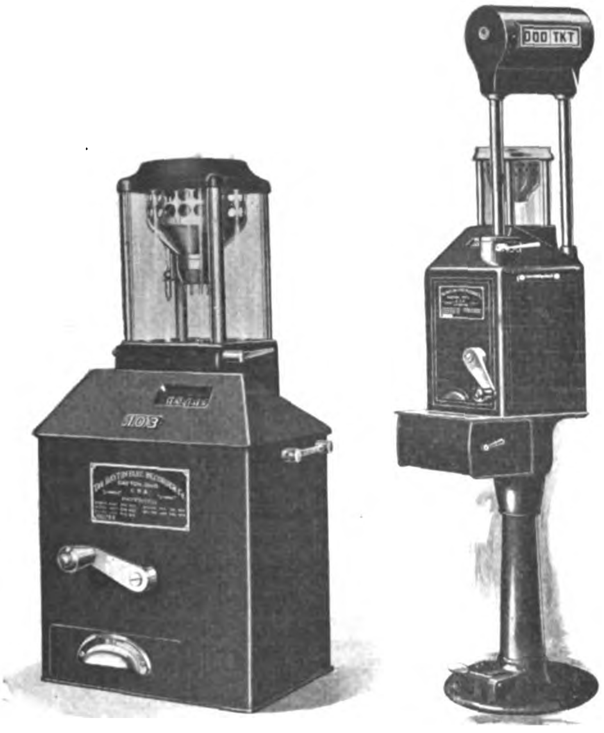


REINFORCED CONCRETE POLES IN SPAN-WIRE CONSTRUCTION IN THE SUBURBS OF CLEVELAND, OHIO

Combination Fare Box and Recorder

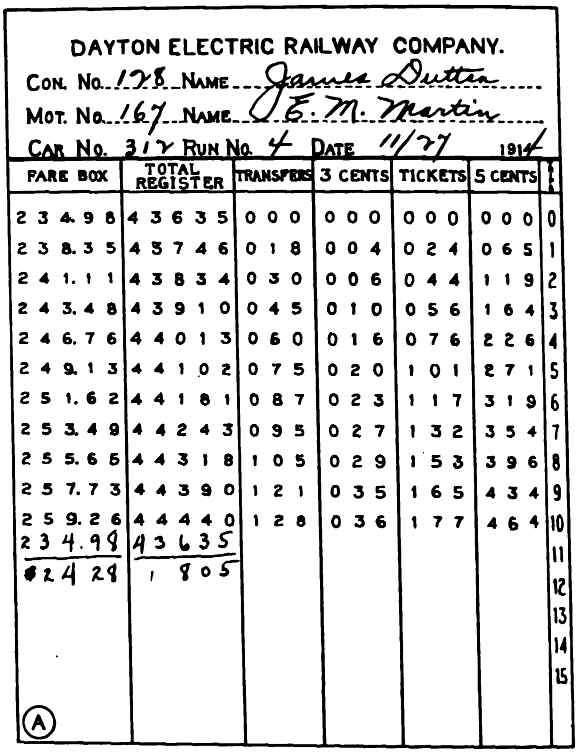
With the proved effectiveness of the registering fare box as a fare-getting and fare-handling device, a marked step forward has been made in fare register equipment and in efficiency in the system of fare collection and accounting. However, the straight cash fare box has no provisions for registering tickets, transfers or other kinds of paper fares, and in most cases where they are used it has been found necessary or desirable to use a fare register in addition to the fare box, to register tickets and transfers. While this arrangement is effective and really affords a double check on the fare registrations, it is nevertheless more or less cumbersome and too slow to be satisfactory for heavy traffic.

To overcome this difficulty the Dayton Fare Recorder Company, Dayton, Ohio, is putting on the market the new "Dayton" fare box-recorder which combines in one device the registering fare box and multiple fare recorder, including fare indicator and trip register attachment for certain types of cars. All cash fares are deposited in the fare box and are computed and registered in the usual way. In addition to this all fares, including cash fares, are classified, indicated and registered on the fare-recorder mechanism, thus giving a separate and distinct indication and registration for each fare collected, and providing a classified printed record which is immediately available at the end of each conductor's period of work. The fares are classified and indicated by means of a small lever conveniently located on the recorder, and the registrations are made by operating a treadle. The method is both rapid and positive and is proving very satisfactory under the most difficult conditions of operation.



COMBINATION FARE BOX ALONE AND WITH TRIP-SHEET RECORD MECHANISM

An important feature of the combination fare box-recorder is the form of printed record made of the fare registrations. The register readings for each trip are taken on a card, approximately 5½ in. wide x 7½ in. long, provided on both sides with blank forms for additional traffic data to be filled in by the conductor. At the beginning of his work the conductor takes a zero reading on the record card to indicate the condition of the register, and then prints the record of the fare registrations for each trip in the order in which the trips are made. At the end of the run the record shows in cumulative amounts the number of each kind of fare collected, the amount in dollars and cents of the fare box registrations and the "Total Register" readings. Thus by making two subtractions the itemized results of the fare collections are immediately and accurately determined.



DAYTON ELECTRIC RAILWAY COMPANY.

CON. No. 128 NAME James Dutton

MOT. No. 167 NAME J. E. M. Martin

CAR No. 312 RUN No. 4 DATE 11/27 1914

FARE BOX	TOTAL REGISTER	TRANSFERS	3 CENTS	TICKETS	5 CENTS	
234.98	43635	000	000	000	000	0
238.35	43746	018	004	024	065	1
241.11	43834	030	006	044	119	2
243.48	43910	045	010	056	164	3
246.76	44013	060	016	076	226	4
249.13	44102	075	020	101	271	5
251.62	44181	087	023	117	319	6
253.49	44243	095	027	132	354	7
255.65	44318	105	029	153	396	8
257.73	44390	121	035	165	434	9
259.26	44440	128	036	177	464	10
234.98	43635					11
$24 28	1 805					12
						13
						14
						15

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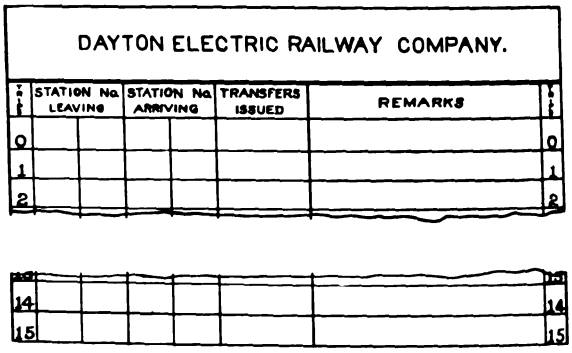
FRONT VIEW OF RECORD CARD



DAYTON ELECTRIC RAILWAY COMPANY.

	STATION No. LEAVING		STATION No. ARRIVING		TRANSFERS ISSUED	REMARKS	
0							0
1							1
2							2
14							14
15							15

BACK VIEW OF RECORD CARD

The inevitable errors in footings and extensions in conductors' trip reports are entirely eliminated by this system of fare collection and recording, and the entire record is in the most convenient form for office handling, having all the advantages of the modern card system for checking and filing.

The Federal Signal Company, Albany, N. Y., announces that on Sunday, Nov. 15, the first section of its signal system on the Centre Street loop of the Brooklyn Rapid Transit System was placed in service. During the rush hours trains pass over this section on less than one-minute headway. It is stated that since the installation there has not been a single failure or other interruption of traffic on the Brooklyn Rapid Transit lines due to the signal system.

LONDON LETTER

Tramway Receipts and the War—Sheffield Power Changes—Bakerloo Extension

(From Our Regular Correspondent)

Since the outbreak of the war the receipts of the various tramways throughout Great Britain have been more or less seriously affected. One of the greatest sufferers is Leeds, where the decrease for August and September was equal to 6.14 per cent. In Manchester there was a decrease for the same period of 5 per cent, in Hull 3.92 per cent, in Birmingham 3.55 per cent, in Cardiff 2.5 per cent, Nottingham 2.2 per cent, Glasgow 1.11 per cent and Sheffield 0.8 per cent. On the other hand, increases are shown by Dublin of 26.57 per cent, Newcastle 12.4 per cent and Bradford 1.70 per cent. Since mobilization men in military uniform in Leeds have been allowed to travel free on the trams. This privilege has been modified recently, and soldiers are now allowed to travel free only at certain hours of the day. The decreases at Leeds are most marked on the routes serving the industrial areas.

In the metropolitan area the increases are quite substantial, even with undertakings which previous to the war suffered very severely from motor omnibus competition. Many petrol motor buses have, however, been requisitioned by the war department. The number of passengers in the London district has seriously diminished, not only on surface traffic but also on the underground railways. The London County Council has necessarily felt a beneficial effect by the removal of the motor buses, though last year, previous to the war, it had stopped the period of serious decreases, and had managed by various changes in operation to bring increases of nearly £2,000 a week. Since the war the increases average about £1,790 a week. No statistics are at present being published by the London General Omnibus Company, as it has followed the example of the railways in ceasing to publish earnings since the beginning of August. The decreases are generally believed to be extremely severe on account of the many vehicles taken by the government.

In order to maintain the normal standard of employment as far as possible during the war, the government has expedited the acceptance of the contract for the new post-office tube railway from Paddington post-office to the eastern distrist office, Whitechapel. The total length of the new railway is 6½ miles, but the plans allow of future extension. Assurance has been given that the new railway will not run under Westminster Abbey or the Houses of Parliament. The trains will run in a 9-ft. tube, without motormen, under control from the various stations, of which there are to be six. The trains will run at a minimum speed of 25 m.p.h, whereas at present the mails are carried at 8 m.p.h. and parcels at 6 m.p.h., at stated intervals only. Parliament has sanctioned an initial expenditure of £1,100,000, but the total cost is estimated to be not more than £950,000.

Important changes have been effected in connection with the electricity department of the Sheffield Corporation. Hitherto, the tramways department has generated power at its own station, quite distinct from the supply for commercial and lighting purposes generated at the corporation station. Both undertakings have now been brought under the control of the electricity department, which now possesses three power stations, with a total generating plant capacity of 35,150 kw. This outfit will be increased to 45,000 kw on the completion of the new plant now being installed at the Neepsend station. The amount of electrical energy generated by the tramways department was more than 18,500,000 units last year, so that the transfer will result in the Sheffield electrical undertaking becoming the fourth largest in the United Kingdom.

At the annual meeting of the Stirling & Bridge of Allan Tramways, Ltd., the chairman referred to the working of the petrol-driven tramway car (the first of its kind in Scotland), with which the company had been experimenting for about a year. This car, he said, had proved an unqualified success. It was the intention of the company to proceed with a provisional order to authorize the general substitution of mechanical traction for the present horse haulage when the Stirling Town Council entered into negotiations with the company regarding a proposal that the corporation take over the tramway system and electrify it. These negotiations were postponed by reason of the outbreak of the war. Meanwhile the company obtained permission to continue to experiment with the petrol tramcar for another year. The number of passengers carried on the St. Ninians section, where the new car was in constant use, increased by 24,300.

The tramways manager and the chairman of the tramways committee of the Southampton Corporation have reported on their recent visits of inspection to various towns in which motor bus services are running, their object being to decide on the type of vehicle best suited to conditions in Southampton. In all, eight different concerns were visited. The two makes of vehicles of which they formed a very good opinion were the petrol cars of Thornycroft & Company and the Tilling-Stevens petrol-electric system. The Tilling-Stevens vehicle is very smooth in starting, and no sudden loads are placed on the engine. The drive is simple and does not call for the skill which the plain petrol vehicle demands. As the construction of the armature is almost identical with that for a tramway motor, no difficulty would be experienced in dealing with repairs by the existing tramways staff. The men reporting recommended that the tramways committee obtain quotations from Thornycroft & Company and W. A. Stevens, Ltd., for three 40-hp buses, fitted with single-deck bodies.

The extension of the Bakerloo tube from its present terminus at Paddington to Queen's Park, Willesden, will be opened for traffic about Jan. 1. Although the new line is only 1½ miles in length, its completion marks an important development in the railway systems of London, for it will link up the underground railways with the London & North-western main line. The connection at Queen's Park does not form merely an exchange station, for the tube lines are brought to the surface and make a physical junction with the North-Western system. When the electrification of its suburban lines is completed, through electric trains will run from the North-Western station at Watford to the Elephant, while if the proposal to extend the Bakerloo southwards to the Crystal Palace is carried out, through running to Watford will be possible, a total distance of 30 miles. Stations built at Warwick Avenue, Elgin Avenue and Kilburn on the new line serve a densely populated area that hitherto has had to depend mainly upon motor omnibuses. The territory is thus put into direct communication with the London & North-Western mail line in one direction, and with Paddington, Charing Cross and Waterloo in the other.

Several corporations have recently installed electric omnibuses as feeders to their regular tramway services. A few of these buses are in Brighton, Southend and South Shields. Various types of batteries are used. The York Corporation also has ordered four single-deck omnibuses.

The draft agreement between the Stoke-on-Trent Corporation and the Potteries Electric Traction Company proposes that the corporation shall not exercise any of its purchase powers before the year 1940, in consideration for which the company will pay the corporation £2,000 a year for the next thirteen years and £3,000 a year after that until 1940. The company also will undertake to double track certain lines and carry out a number of other improvements.

The Brighton Town Council and the Hove Town Council have not yet agreed as to the system of railless traction which both Councils are desirous of having installed between the two towns. J. B. Hamilton, Leeds, asked to report for the Brighton Corporation, favors the under-running form of current collection, similar to the system in Leeds and Bradford, as opposed to the over-running or Mercedes-Stoll system which the Hove Council is desirous of installing. The Brighton committee has informed the Hove Corporation that it is unable to agree to adopt the over-running system, and that unless an agreement is reached to adopt the under-running system, application will be made to the Board of Trade to appoint an arbitrator. Mr. Hamilton also advised the Brighton committee that on the general question of the advantages of the railless traction system over a petrol traction system, there is a saving of 2d. per car-mile in favor of the railless traction system, amounting to £10,416 per annum on the estimated mileage to be run in Brighton and Hove. It is further pointed out that an increase in the cost of coal would not add to the cost of working the railless traction system in anything like the same proportion as an increase in the cost of petrol would add to the cost of working a petrol traction system.

A. C. S.

News of Electric Railways

NEW YORK TRANSIT CONTRACTS

More than 19,000 Men Employed on Contracts Involving $146,253,346—City Paying $2,000,000 a Month—Nineteen Contracts Unlet

Reports showing progress on the new subway contracts of the dual system in New York made by the division engineers to Alfred Craven, chief engineer of the Public Service Commission of the First District, show that there are now 19,223 men employed by the several contractors for the city and the two companies, the Interborough Rapid Transit Company and the New York Municipal Railway Corporation. Of this total, 11,777 are employed on lines for operation by the Interborough Rapid Transit Company and 7446 on lines for operation by the New York Municipal Railway Corporation. Of the total, about 16,000 are employed by contractors working for the city and about 3000 by contractors working on elevated extensions, etc., for the two companies. The construction work to be done by the city is divided into eighty-three contract sections. Contracts have been awarded for sixty-four of these sections, leaving only nineteen to be awarded. Of those already awarded thirty-four are on lines to be operated by the Interborough Rapid Transit Company and thirty on lines to be operated by the New York Municipal Railway Corporation. The total contract prices of the sixty-four sections on city-owned lines already let is $146,253,346, of which $76,172,289 is on Interborough lines and $70,081,056 on New York Municipal lines. In addition, the Interborough Rapid Transit Company has under way the third-tracking of the Manhattan and Bronx elevated lines, which, it is estimated, will cost from $8,000,000 to $10,000,000; and the New York Municipal Railway Corporation has under way elevated third-tracking and extension contracts involving about $6,000,000, so that the grand total of work now going on in different parts of the dual system involves an expenditure of about $162,000,000. The commission is advertising for bids for two additional contracts and it is expected that two or three more will be advertised before the close of the year. Last year the disbursements by the city to contractors on this work averaged about $1,600,000 a month. The average is now about $2,000,000 a month, and for the next year it is estimated payments will run from $2,500,000 to $3,000,000 a month.

As regards the lines for operation by the Interborough Rapid Transit Company, it is expected that the two contracts for the Lexington Avenue Line will be completed during 1917; that both contracts on the Jerome Avenue Line will be finished during 1915; that on the White Plains Road Line, an extension of the existing subway from its terminus at 180th Street north to 241st Street, work will be finished during 1915; that the Southern Boulevard extension of the Lexington Avenue subway to Pelham Bay Park will be completed in 1916; that the Seventh Avenue Line, entirely under contract, will be completed early in 1917; that the Park Place, William and Clark Street line will be completed about the end of 1917; that the Eastern Parkway line, an extension of the existing subway from Flatbush Avenue, in Brooklyn, through Flatbush Avenue and Eastern Parkway to Buffalo Avenue, will be completed during 1917; that the Queens lines, one running north from the Queensboro Bridge through Second Avenue to Ditmars Avenue, Astoria, and the other northeasterly to Alburtis Avenue, Corona, both of which are under contract and well advanced toward completion, will be completed in advance of the contract dates.

The Steinway Tunnel, built by the Interborough interests, and purchased by the city, a portion of which is being reconstructed for temporary operation in connection with the existing subway, is now about 60 per cent completed. The contract for the Steinway tunnel extension, running from the Queens end of the Steinway tunnel in Long Island City to a junction with the Queens lines at the Queensboro Bridge Plaza, is about 28 per cent completed. The contract time for completion expires in July, 1915. As regards the Steinway tunnel extension in Manhattan under Forty-second Street to Times Square, surveys and maps are made and work on the plans is in progress. All the preceding lines are to be owned by the city of New York. In addition the Interborough Company will build at its own expense third-tracks on the Second, Third and Ninth Avenue elevated lines, an extension of the Second Avenue elevated to connect with the Queensboro Bridge and the new lines in Queens, an extension of the Ninth Avenue line from 155th Street across the Harlem River and through 162d Street to the new line in Jerome Avenue, and an extension of the Third Avenue line from its present terminus through Webster Avenue and Gun Hill Road to a junction with the new elevated line in White Plains Road. Work has been going on for several months under the contract let for the third-tracking work. The contract calls for its completion in August, 1915.

As regards the New York Municipal lines it is expected that the whole work on the Broadway line in Manhattan will be completed during 1917. The Whitehall-Montague Street line under the East River is entirely under contract, but the contracts have only recently been awarded. It is now about 2 per cent completed. The time for the completion of the tunnel will expire at the end of 1917. The two-track subway under Canal Street connecting the Broadway line with the Fourth Avenue subway in Brooklyn is about 4 per cent completed. The Fourth Avenue subway, Brooklyn, is practically completed from the Manhattan Bridge to Forty-third Street. The extension from Forty-third Street to Eighty-sixth Street has been under contract since October, 1912. The section north of Sixty-first Street is 72 per cent and the section south of Sixty-first Street 60 per cent completed. It is expected that the whole line will be completed next year. The contractor for the installation of tracks has begun work from both ends of the completed portion of the subway.

The New Utrecht Avenue line of the New York Municipal Railway (Brooklyn Rapid Transit) is entirely under contract. The work in Thirty-eighth Street is 40 per cent and on the elevated portion 27 per cent completed. The time limit for the former expires in August, 1915, and for the latter in July, 1915. In the Center Street Loop line, Manhattan, which connects the Williamsburg, Manhattan and Brooklyn Bridges by subway, two tracks have been in use for more than a year, and work on two other tracks is now more than half done. On the Sea Beach line, a company-owned railroad running to Coney Island, the work is 85 per cent completed. On the Lutheran Cemetery elevated railroad extension the first section, from Wyckoff Avenue to Fresh Pond Road, is finished, and the second section, from Fresh Pond Road to Metropolitan Avenue, is 98 per cent completed. The extension of the Fulton Street elevated railroad of the Brooklyn Rapid Transit System from the Brooklyn-Queens boundary to Lefferts Avenue, Queens, is 52½ per cent completed. The elevated connection between the Myrtle Avenue elevated line and the Broadway elevated line has been finished. Work on the first contract for the Fulton Street elevated third-tracking is about 23 per cent completed. The Broadway elevated third-tracking between Havemeyer Street and Myrtle Avenue should be completed within a year.

With respect to the Broadway line of the New York Municipal Railway Corporation, the commission, on Dec. 11, will open bids for the section from Fifty-first to Fifty-ninth Street, and in a short time will advertise for bids for the section between Thirty-eighth and Fifty-first Streets. The sections in lower Broadway were awarded two years ago and range from 85 to 96 per cent completed. Those awarded later are in various stages of completion, ranging from 1 to 64 per cent.

The New York Municipal Railway Corporation has let contracts for the installation of track equipment on the Liberty Avenue line and the Lutheran Cemetery line and the Myrtle Avenue connection; for the installation of the third-rail in the Fourth Avenue subway; for the signal system in the Centre Street Loop subway; for cables and ducts and manholes in the Fourth Avenue subway and other lines to be operated under the general contract with the city.

KANSAS CITY FRANCHISE EXTENSION

Court Orders Company to Request More Time to Comply with Recent Franchise—Court Control Extended to Light Companies

Judge William C. Hook of the Federal Court at Kansas City, Mo., on Nov. 30 ordered the receivers of the Metropolitan Street Railway to ask Kansas City, Mo., for an extension of six months within which to reorganize under the new franchise. The previous week the judge had intimated that the war and the resulting disturbed financial conditions were sufficient excuse for failure of the receivers and the company to accomplish the reorganization and the liquidations provided in the franchise to be done within six months from July 7, 1914. The order of the court is mandatory on the receivers, but also will have influence in suggesting to the City Council, which has the granting of an extension, that the federal court considers the extension justifiable. Judge Hook urges that suggestions be made to Hermann Brumback, special master, for later transmission to the court, by Jan. 31, 1915, as to the best way to bring about the readjustment of the company's affairs.

The court control over electrical affairs in Kansas City, which heretofore has covered only the Metropolitan Street Railway, was extended on Nov. 30 by Judge Hook to include the Kansas City (Mo.) Electric Light Company and the Standard Electric Light Company, Kansas City, Kan. This was the result of the disclosure in a complete statement of the affairs of the Metropolitan Street Railway filed with the court that there are many interweaving and joint debts and claims of the light companies and the railway, the affairs of which cannot be thoroughly adjusted without court attention to such joint debts and claims. The light companies are in effect operating now under receiverships subject to the orders of the court, except that no receivers have been appointed. The electric light companies are ordered to report all receipts and disbursements to Mr. Brumback every ninety days. The court further ordered the receivers to file ancillary proceedings to clear up title to the various street railway properties in the Metropolitan system, the present proceedings and receivership, in his mind, not being sufficient to comply fully with the new franchise.

ANTE-BELLUM PROGRESS OF ALLGEMEINE ELECTRICITÄTS GESELLSCHAFT

The annual report of the Allgemeine Electricitäts Gesellschaft, Berlin, Germany, covering the fiscal year ended June 30, 1914, shows that despite the depressing conditions that existed for some time previous to the war the company did more business than in the preceding year. On account of the war, however, the business of the company has already been seriously affected, and in some foreign countries almost entirely destroyed. Out of net earnings of $4,723,160 a dividend of 10 per cent on the capitalization of $38,750,000 was declared. The bank deposits of the company after the payment of the dividend were approximately $19,250,000.

One of the accomplishments of the year was the organization of the A. E. G. Rapid Transit Company, which is building a subway system in Berlin. The parent company succeeded in selling $5,625,000 of 4½ per cent preferred stock.

At the close of the fiscal year the company employed 66,100 people, of whom 13,000 are already mobilized for military service. (The actual proportion of male employees is greater as the company employs many women.—Eds.)

The output in machinery and transformers comprised 123,162 pieces with a combined rating of 1,840,273 kw compared with 122,452 pieces and 1,973,987 kw for 1912-1913. The company completed two out of twenty-seven locomotives for the Prussian State Railways and also some driving gear for the experimental train of the Berlin Stadtbahn. The kilowatt output of turbines increased from 559,908 kw to 564,033 kw with a maximum unit of 22,500-kva capacity. The total amount of copper used was 33,250 tons, almost the same as 1912-1913.

The electric railway business was practically the same as for 1912-1913. The railways owned by the company showed gratifying returns. Construction has been begun between Humboldhain and Invalidenstrasse on the subway line in Berlin to extend from Gesundbrunnen to Neukölln.

The subsidiary Felten & Guilleaume Carlswerk Company paid 8 per cent and the A. E. G. Promotion Company formerly the Lahmeyer Works paid 6 per cent as last year.

NO I. T. S. EXTENSION AT PRESENT

In the ELECTRIC RAILWAY JOURNAL for Nov. 14 and 21, reference was made to the proposed extension of the Illinois Traction System via St. Louis proper and via a belt line in East St. Louis, Ill., to connect with the Southern Traction Company's line between East St. Louis and Bellville, Ill. The items in the issues mentioned were based on an alleged interview with officials of the Illinois Traction System since denied as unauthoritative and without foundation. At some time the Illinois Traction System will build an elevated structure from the Illinois end of the McKinley bridge above Main Street in Venice, and the tracks of the Wabash, Alton and other railroads, over a private right-of-way to connect with its line at grade in Madison, Ill., but nothing has been done toward carrying out the work at the present time.

COMPANY RELATIONS IN SAN FRANCISCO

Homes for Employees — President Lilienthal "a Father Rather Than a Boss"

Various plans have been advanced recently by the United Railroads, San Francisco, Cal., for bettering the relations between the company and its employees. On Jan. 1 of this year the company took out group insurance for all employees and about a month ago outlined plans for a remedial loan association formed by the company to make loans to employees. Through President Jesse W. Lilienthal the company is now encouraging the Co-operative Home Builders' Association, the president of which is a conductor with the company, the vice-president a motorman, the secretary an employee of the employment department, and the treasurer a division superintendent. The association has already closed options on the first of a series of plots of land on which it is proposed to erect homes for employees of the company. The association is capitalized at $50,000 with shares of a par value of $1 each, and subscription to stock, confined to employees of the railroad, totaled $22,000 at the end of November. The officers of the association serve without pay, while legal advice is furnished through the company without cost to the association. In discussing the plan Mr. Lilienthal was quoted recently as follows:

"Our only interest in this matter is to encourage every man in our employ to own his little home and to see that he gets that home at the least possible cost. The United Railroads is not financially interested in the Co-operative company, nor are we helping it financially, but we believe it to be a good thing for the men. The scheme has our moral support and we are encouraging the men to support it. We insist upon seeing all contracts before they are closed to make sure the men do not obligate themselves for anything until the money is in sight. Their meetings are held in our offices and under our supervision, but we have carefully refrained from influencing them in the selection of their officers or other similar action. I personally will not interfere with the plan only as much or as little as the men themselves want me to. The ultimate purpose is to help employees to own their own little homes and the benefit of our experience and knowledge is always at their service to prevent the making of mistakes."

One of the officers of the association is quoted as follows by the San Francisco *Call:*

"So far we have worked only among the men of the Turk and Fillmore division. There are eight other divisions, and, judging by the way the plan has taken in the one division, it is certain that the stock of the company will be oversubscribed long before we cover all the divisions. It is therefore to the interest of employees to get in as early as possible.

"The men all regard President Lilienthal as a father rather than as a boss. When they are in trouble they write letters to him, and when the cause seems just he helps them. No step is taken by the Co-operative company without consulting him—not as our employer, but as a friend whose learning, experience and position are of great value in the counsel he gives us."

CLEVELAND SUBWAY GRANT IN COUNCIL

The amended franchise of the Cleveland (Ohio) Rapid Transit Railway was placed on second reading in the City Council on Nov. 30. The revised draft contains the conditions suggested by the franchise committee of the Cleveland Chamber of Commerce, with the exception of the automatic forfeiture clause, which was omitted on the advice of Mayor Newton D. Baker.

The most important provisions of the amended grant have already been mentioned in the ELECTRIC RAILWAY JOURNAL. The grant as it now stands allows the company to build larger tubes than were originally planned, so that larger cars may be used. The price of the property per mile, in case the city desires to purchase it, has been increased in proportion, and the time within which the company is to begin construction and complete certain lines has been extended. The franchise provides, however, that a certain amount of money must be expended each year, after the first construction work is begun. No provision was made for other roads to use the subways, as the Public Utilities Commission has authority to adjust this matter.

GERMAN STORAGE-BATTERY CARS IN BELGIAN HOSPITAL SERVICE

An unexpected use for the 200-odd storage-battery cars which the various State railway systems of Germany have hitherto had in use for branch-line service has developed as a result of the present war. The cars were withdrawn from the lines on which they had been operating, and by means of steam locomotives were hauled to Belgium in trains of about six units each. They are now in use throughout Belgium to carry wounded soldiers from the front. The batteries were fully charged before the trip to Belgium, and as their operating radius varies from 62 to 112 miles their capacity is ample to permit a round trip between any point of the Belgian battle line and one of the larger cities, where the patients are removed to hospitals and the batteries recharged at the local charging stations. The batteries for all of these cars were supplied by the Akkumulatoren Gesellschaft, Berlin, Germany, which has also supplied much equipment to the German navy.

TROLLEY LINES IN WESTERN MASSACHUSETTS

Some interesting testimony in regard to transportation conditions in western Massachusetts was brought out at the recent hearings of the Western Massachusetts Transportation Commission in Boston, reported briefly in the last two issues of this paper. Among those who testified were L. S. Storrs, Bentley W. Warren, Henry C. Page, J. T. Harmer and F. A. Farnham, representing the different railway interests, and a number of representatives from the district concerned.

Chairman Hyde of the commission said that there was a strong public demand for extensions of the trolley system in various parts of western Massachusetts and asked Mr. Farnham, attorney for the New York, New Haven & Hartford Railroad, whether the New Haven would undertake to build these lines, or operate them if they were built by the State, if the national government should change its attitude. At present all of the lines in the State formerly owned by the New Haven have been alienated by the company with the exception of the Berkshire Street Railway. Mr. Farnham said that he could not tell, as that was a matter for the judgment of the directors of the company, but that the plan was impractical now. In answer to a question as to whether the New Haven directors were not living in hopes that the government decree would be modified or revised under a change of administration Mr. Farnham said that he had never heard of any such feeling. Commissioner McKechnie criticised the application of the Sherman act to the railway situation, and Charman Hyde expressed his belief that a wave of reaction might sweep over Massachusetts when the State realized the benefit of joint ownership and operation of steam and trolley lines.

Detroit Appraisals.—It is announced that the appraisal which Prof. E. W. Bemis is making for the city railway commission of Detroit, Mich., of the properties of the Detroit United Railway within the one-fare zone will be completed within two or three weeks. It is not likely that the appraisal being made by Dean Cooley for the State Railroad Commission will be completed before next month.

Automobile Accidents in Ohio.—In discussing the proposed public safety meeting at Columbus in January with the correspondent of the ELECTRIC RAILWAY JOURNAL in Ohio, a prominent electric railway manager said that 95 per cent of the accidents which occur at crossings are due to careless operation of automobiles. The present safety laws are not effective, he said, because little effort is made to enforce them.

Providence Labor Case Decision.—The majority of the board of three arbitrators which has been considering the cases of two men in the employ of the Rhode Island Company discharged for alleged infractions of the company's rule against drinking while on duty has found the men not guilty on the evidence submitted. The board said that the men are entitled to their wages from June 23, 1914, to and including Nov. 21.

The Lexington Arbitration.—Testimony relating to all alleged acts of discrimination by the Kentucky Traction & Terminal Company, Lexington, Ky., against its union employees will be considered, if it is made specific, in the hearing in the case of Robert E. Walker, a motorman dismissed by the company. This is the ruling of Charles C. Bagby, Danville, Ky., umpire in the disagreement between the company and its union employees.

East Liverpool Arbitrators.—Edward M. Crosser, Lisbon; Wilbur A. Snediker, Wellsville, and C. F. Lease, Salem, have been named by Judge J. G. Moore as a board of arbitration to decide whether eleven firemen, boiler tenders and helpers were rightfully discharged by the East Liverpool Traction & Light Company, East Liverpool, Ohio, recently. When the men were discharged a general strike of firemen took place, but the men returned to work pending the findings of a board of arbitration.

Rehabilitating the Pekin Street Railway.—The Mayor and the City Commissioners of Pekin, Ill., have awarded the contract for the rehabilitation and the extension of the street railway in Pekin to the Barnewoit Construction Company, Peoria, Ill., for $38,000. The work must be completed by April 1. The line will be extended from Capitol Street east on Court Street to the Chicago & Alton Railway. The motive power will be changed from storage battery to the overhead trolley system.

Mayor Mitchel for Broad Municipal Powers.—In a speech delivered at the annual dinner of the Academy of Political Science on Nov. 19 at the Hotel Astor, New York, N. Y., Mayor Mitchel defined his views on the measure of home rule that should be given to cities of New York State in the new constitution. The Mayor urged that among other things New York City should have power to own and operate public utilities so broad that under it the municipality might run almost anything from a street railroad to a grocery store.

Kansas Arbitrators Selected.—Frank A. Wightman, member of the Missouri Utilities Commission, has been selected by James A. Cable and John M. Kinkel as the third member of the board of arbitration to consider the wage schedule of the Joplin & Pittsburg Railway, Pittsburg, Kan. Both Mr. Cable and Mr. Kinkel are members of the Kansas Commission. Under the agreement between the men and the company, the finding will automatically become a part of the agreement under which the strike of last summer was settled.

Pittsburgh Subway Plans Furthered.—The public service and surveyor's committee of the City Council of Pittsburgh, Pa., has recommended that $10,000 be set aside to pay for securing engineering data in regard to the construction of the downtown subway loop in which it is intended that surface cars shall be operated. A communication from A. E. Anderson, counsel for the Pittsburgh District Railroad, objecting to the subway as now proposed and asking when the committee intended to resume the hearings on his company's plans for a freight and passenger subway, has been referred to the law department.

State Ownership Bill Filed at Boston.—Representative Harrington, of Fall River, Mass., has filed a bill with the clerk of the House providing that on July 1, 1916, Massachusetts shall take over all the street and electric railways within its borders, with all property necessary to their operation, except in cases where such action shall constitute a breach of contract. The measure, to which a statewide referendum is attached, provides that the Legislature of 1916 shall make provision for the operation of the roads and for compensating their owners. The bill will be considered at the coming session in January.

Right to Force Elevated Stub's Removal Questioned.—For some time past there has been considerable agitation in an endeavor to force the Chicago & Oak Park Elevated Railroad to remove a stub terminal on Market Street which occupies three blocks. The city, through its corporation counsel, has filed a petition in the United States District Court to attain this end. Samuel Insull, receiver of the Chicago & Oak Park Elevated Railroad, in his answer states that the city has no right to force the removal of the stub terminal. He sets forth that in May, 1893, the City Council granted an ordinance to construct the stub terminal and use it for fifty years.

Richmond Franchise Hearing in January.—The committee on streets of the City Council of Richmond, Va., has voted to lay the petition of the Virginia Passenger & Power Company for a blanket franchise on the table until the first meeting in January, at which time it will name a date for an initial public hearing. The Council will meet in regular session for the first time next year on Jan. 11. The company reported to the committee at a recent meeting that the work of compiling its franchise instruments intended for distribution to the Council was still incomplete. The company also plans to prepare an illustrated sketch of the street railway systems in Richmond dating from 1860.

Political Wrath.—The Board of Supervising Engineers, Chicago Traction, is again forced by Mayor Harrison and his henchmen to submit to an investigation of fancied inaccuracies in bookkeeping. The corporation counsel for the city has taken it upon himself to venture an opinion opposed to the various constructions placed by the Board of Supervising Engineers upon provisions of the traction ordinances. Walter L. Fisher, one of the authors of the 1907 settlement ordinances, and counsel for the board members, assailed the entire legal groundwork upon which the city's opinions have been built. The discussions now under way are merely preliminary to the final report of an audit of the books which will be completed shortly.

New Franchise in Cincinnati.—A new franchise has been prepared for the Cincinnati, Newport & Covington Railway, Cincinnati, Ohio. The company asks for a twenty-five-year grant and proposes in return to settle the city's claim for $106,000 for car licenses and taxes on gross earnings for $40,000 cash, with a payment of $8,500 for the first year of the new franchise and an increase of 1 per cent for each succeeding year of the life of the franchise, instead of the tax of 1¼ per cent on its gross earnings. It also asks the right to lay tracks on the south side of Pearl Street between Broadway and Sycamore Streets, and the use of any subway the city may build. The city has a suit pending against the company for the amount claimed to be due for licenses and taxes.

Many Auto Bus Lines Projected in Chicago.—The State Public Utilities Commission of Illinois has before it petitions for permits for the operation of a number of auto bus lines in Chicago. The International Gas & Electric Automobiles Bus Company plans to begin business with 120 motor buses. It is to be capitalized at $1,000,000. The Chicago Motor Bus Company, capitalized at $300,000, proposes to operate in the loop district and upon the boulevards north and south of the central business portion of the city. The fare around the loop will be 5 cents, while 10 cents will be charged for transportation north and south of the city. The petition of the City Electric Omnibus Company will be heard by the commission on Dec. 9. The Chicago Automobile Transportation Company, which was granted a certificate of convenience and necessity more than a month ago, objects to the granting of rights to other companies. Commissioner Richard Yates has instructed the attorney of this company to place his objections in writing.

Subway Labor Problems.—The business agent of the Bricklayers & Masons Union has withdrawn his complaint filed with the Public Service Commission for the First District of New York against the Dock Contractor Company for alleged violation of the labor law. Mr. Gill had complained that this company, which has the contract for the new subway in Broadway between Bleecker Street and Union Square, was employing workmen who are not citizens of the United States and that the labor law forbids the employmnet of any but citizens. Upon the affidavit of the vice-president and general manager of the Dock Contractor Company that the company is now complying with the law and is not employing any non-citizens, Mr. Gill withdrew his complaint; but immediately filed another complaint against the Underpinning & Foundation Company, which is a sub-contractor on the Dock Contractor Company's contract. The allegations against the Underpinning Company are the same as those against the Dock Contractor Company.

Decision in Preliminary Des Moines Case.—Judge McHenry of the equity division of the District Court at Des Moines, Ia., has ruled that the Des Moines City Railway has been proceeding under a misapprehension regarding the proper section of the statute upon which to circulate the petition for a special election on the street railway franchise matter. Judge McHenry held that the present attempt of the company to bring the franchise to a vote would put it under the provisions of the initiative and referendum, which measure he ruled was designed to give the people the right to pass ordinances over the head of the City Council, but did not cover the enactment of original franchise ordinances. Under the statute which Judge McHenry contends the company must follow, the franchise would have to be submitted to the people and be approved by the City Council. Emil G. Schmidt, president of the company, is quoted as follows: "The case will now be taken to the Supreme Court to have it determine which section is the proper one under which to go on with the election. It is merely a friendly suit between the city and the company to get a final decision."

PROGRAMS OF ASSOCIATION MEETINGS

Railway Business Association

In anticipation of the sixth annual meeting of the Railway Business Association in New York on Dec. 10, the executive committee has issued its report. The committee believes that to-day the outstanding phase in the general thought is apprehension that injury may come to the railroads through adverse business and political conditions; that general sentiment is in favor of an increase in steam railroad rates and that legislation relieving the railroads of various burdens should be enacted. It also calls attention to the lack of coordination in jurisdiction between state and federal regulatory bodies. The speakers at the banquet in the evening are to be Fairfax Harrison, president of the Southern Railway, and Warren G. Harding, United States senator-elect from Ohio.

Central Electric Railway Accountants' Association

The annual meeting of the Central Electric Railway Accountants' Association will be held at the Hotel Beckel, Dayton, Ohio, on Dec. 11 and 12. The executive committee will meet at 1:30 p. m. on Dec. 11, and at 2:30 p. m. the regular session will begin. The presentation of the address of the president, the report of the executive committee and the report of the treasurer will be followed by these special committee reports: standing committee on freight accounts, standing committee on passenger accounts, query box committee, committee to confer with C. E. R. A. C. S. Mitchell, comptroller of the Beaver Valley Traction Company, Pittsburgh, Pa., will then deliver an address.

At the session on Dec. 12, which will convene at 9:30 a. m., the following papers and addresses will be presented:

Paper, "Cost Accounting in a Manufacturing Plant," by G. D. Piper, director of works accounting of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa.

Address, "Basis and Methods of Accounting for Depreciation of Equipment," by H. J. Davies, secretary of the Cleveland (Ohio) Railway.

Financial and Corporate

UTILITY SECURITIES AND EARNINGS

The week ended Dec. 2 has seen a marked improvement in general market conditions and the demand for public utility securities. With the opening of the New York Stock Exchange on Nov. 28 local traction issues showed strength, Interborough-Metropolitan 4½'s being the most prominent feature with a gain of one-half over the July 30 price of 72. On Dec. 1 Public Service Corporation 5's sold at 86½ as compared to 88¼ on July 30, while New York Railways 4's brought the minimum price of 70 and the 5's ranged from 47½ to 47¾. On Dec. 2 Hudson & Manhattan adjustment income 4's dropped seven-eighths, but Brooklyn Rapid Transit 5's advanced one-eighth; New York Railways 5's, 1⅛, and Third Avenue Railway adjustment 5's, one-half. Public utility bonds in the Boston, Philadelphia and Chicago markets were steady.

The improvement of the bond market helped both the curb market and the stock market through the clearing house committee. Brooklyn Rapid Transit stock, which closed on July 30 with dividend on at 79½, was quoted on Dec. 2 at 86½ bid, and Interborough-Metropolitan preferred sold at its July 30 price of 52. Third Avenue and Twin City Rapid Transit both sold nearly three points above the established minimum prices. The curb was active, American Light & Traction common and Cities Service issues both showing marked advances.

Current reports concerning railway earnings vary considerably as to increases or decreases, but a general tone of optimism is heard. The Federal Light & Traction Company now looks for a steady improvement, while the Cities Service Company gained a substantial increase in gross for October. Henry A. Blair, president Chicago Railways, says that traffic in Chicago in the middle of November was breaking about even as compared with the banner year of 1913. The gross income for the year ended Jan. 31 is expected to show a slight decrease, but through decreases in operating expenses, the net profits should advance. The company has spent more than $4,000,000 in building 20 miles of track and buying new equipment. Such reports, together with the fact that the Santa Fé Railroad has placed an order for 12,000 tons of steel rails with the United States Steel Corporation, show a tendency toward business recovery.

OPTIMISM IN ENGLAND AND AMERICA

Henry L. Doherty returned to New York on Nov. 17 on the steamship *Transylvania* after a three weeks' trip to England. In speaking to a representative of the ELECTRIC RAILWAY JOURNAL about business conditions as he found them in England, Mr. Doherty said the most significant factor was the general assurance that whatever investments are made, outside of subscriptions to the war loan, will be in American securities. Bankers in England feel that there will be enough new investment buying of American securities to offset the forced liquidation, and that in addition to that factor there will later be an absorption of a reasonable amount of securities from investors in this country.

Regarding the change in American conditions during his absence, Mr. Doherty said:

"On my return from England I was astounded to see how greatly sentiment had changed. People who told me before I left that we would have a long period of business depression were the first to say on my return that we are going to see greatly increased industrial activity here. The news from our operating properties is, on the whole, very encouraging. As a matter of fact, I think that I see a more pronounced change in sentiment than the actual conditions warrant. It is important to remember, on the other hand, that nothing contributes so much to increase and stability of business as a sentimental feeling that conditions will improve. The result of the recent election has played an important part in this condition of sentiment. It has been interpreted by business men, and especially by the people, as an indication that the great body of voters want to have every encouragement given to railroads and business industries. The record of views expressed by the election will tend to lead the present administration to go still further in its encouragement of business."

ANNUAL REPORT

Virginia Railway & Power Company

The comparative statement of income, profit and loss of the Virginia Railway & Power Company, Richmond, Va., for the year ended June 30, 1914, follows:

	1914	1913
Gross earnings	$5,156,048	$4,864,107
Operating expenses, including $100,000 set aside for depreciation	2,565,908	2,416,988
Operating revenue over operating expenses and depreciation	$2,590,140	$2,447,119
Other income	80,909	86,703
Gross income	$2,671,049	$2,533,822
Taxes and licenses	308,111	274,589
Income applicable to fixed charges and rentals	$2,362,938	$2,259,233
Fixed charges and rentals:		
Interest on outstanding funded debt	$1,108,325	$1,086,638
Sinking fund payments	98,779	40,273
Norfolk Railway & Light Company, rental	99,000	99,000
Other interest charges	1,244	....
Total fixed charges	$1,307,348	$1,225,912
Surplus over fixed charges and rentals	$1,055,590	$1,033,321
Other charges:		
Proportion of discount on sale and purchase of bonds and other securities	$25,767	$23,680
Net miscellaneous charges, not operating, charged direct to surplus	57,918	26,464
Total direct charges	$83,685	$50,144
Surplus over fixed and other charges	$971,905	$983,177

The foregoing statement includes the income and disbursements of the Norfolk & Ocean View Railway and the City Gas Company of Norfolk, both of which are controlled by stock ownership and operated as part of the Virginia Railway & Power Company's system. The report of the company is one of the most complete issued by public utilities, with its minutely detailed financial statements and statistics concerning capital and income and expense items of not only the separate railway, light and power, and gas departments, but also the several divisions of each department. The analysis of operating revenues and expenses is particularly interesting. The item of $5,156,048 for gross earnings was made up of $2,173,983 for light, power and gas revenues, an increase of $236,240, and $2,982,065 for railway revenues, an increase of $55,701. This increase in railway revenues arose from increased passenger revenues of $52,470, decreased freight revenues of $1,487, and increased revenues from outside operations of $4,728. The operating expenses of $2,565,908 were divided $845,323 to the light, power and gas departments and $1,720,585 to the railway department. The amount expended for maintenance of way and equipment for the year was 16.01 per cent of the gross railway earnings, as compared to 14.99 per cent for the previous year. This 16.01 per cent was divided 9.72 per cent for maintenance of way and structures, an increase of $26,577, and 6.29 per cent for maintenance of equipment, an increase of $12,000. Railway traffic expenses decreased $6,795, but transportation and general expenses increased $4,803 and $13,762 respectively.

The above operating expenses include a charge of $8,333 per month, aggregating $100,000 for the year, which is charged against operating expenses for the Richmond, Petersburg and Interurban divisions to provide for depreciation. In addition to this amount set aside in cash, the directors authorized the transfer from the surplus as of June 30 to the reserve for depreciation an additional amount of $559,364, making the total amount credited to the reserve since July 1, 1911, the date of consolidation of the Norfolk & Portsmouth Traction Company with the Virginia Railway & Power Company, 6 per cent of the total gross earnings of the company for the period. The total amount to the credit of the several depreciation accounts as of June 30, 1914, was $856,640.

The company has pursued the policy of charging against operation each month and crediting to the injuries and damages reserve a percentage of the gross earnings sufficient to provide for expenditures on this account. During the last fiscal year the amount so credited was $133,572, while the amount paid out for injuries and damages, and expenses incident thereto, was $115,578, leaving a balance of $17,994. For the fiscal year ended June 30, 1913, the expenses on account of injuries and damages amounted to $131,022, which was $15,733 in excess of the amount reserved. It is stated that the results for the year show considerable improvement in this department. The credit balance in the reserve account as of June 30, 1914, was $48,769.

The income from operations of the company for the year increased $143,021, but other income decreased $5,793, giving an increase in gross income of $137,227. Taxes and licenses increased $33,522, and fixed charges and rentals $81,436, giving an increased surplus over fixed charges and rentals of $22,269. The surplus over fixed and other charges decreased $11,272 to an amount of $971,905, which was applied to the payment of two dividends on preferred stock amounting to $192,480 and $230,976 and two dividends on common stock amounting to $179,251 and $179,141. The surplus after payment of dividends was $189,956.

The total mileage of the company as of June 30 was 252.974 miles. Its rolling stock consisted of 289 double-truck cars and 248 single-truck cars. Twenty new steel side-entrance cars were purchased and put in service during the year and three new service cars were built in the company's shops. A number of cars owned by the company were also rebuilt and changed from single to double truck and otherwise improved. The expenditures during the fiscal year for additions, extensions and betterments charged to capital account amounted to $582,453, of which amount $318,429 was applicable to the railway department. The revenue passengers carried during the year totaled 65,695,197, an increase of 1,163,118, while the transfer and free passengers carried totaled 15,676,096, a decrease of 441,608. The car mileage amounted to 12,478,058 car miles, an increase of 270,639, and the total car hours were 1,515,016, an increase of 41,076. The total revenue per car mile was $0.239, a decrease of $0.001, and the operating expenses per mile, including depreciation, were $0.138, an increase of $0.001. The total revenue per car mile was $1.97, a decrease of $0.02, while the operating expenses per car hour, including depreciation, remained the same at $1.13.

The report states that in addition to providing additional coaster meters and extending the system of service rewards to motormen and conductors to avoid accidents, which method has produced excellent results, the company during the last year undertook to extend the provisions for the aid of its employees through the relief association. Plans are now under consideration for the organization of a system of limited pensions to employees to be paid through the relief association and on the recommendation of its board of managers.

NORTHERN ELECTRIC RAILWAY FINANCES

Bankers' Syndicate Formed to Provide Funds for Operation of System for from Two to Five Years

At a recent meeting of up-State bankers, the holders of the overlying bonds of the Northern Electric Railway, Chico, Cal., and the notes indorsed by W. P. Hammon, E. J. De Sabla, Jr., E. R. Lilienthal, Leon Sloss and Louis Sloss, secured by these bonds as collateral, organized the Bankers' Syndicate and appointed A. Bonnheim, Sacramento; A. F. Jones, Oroville, and George P. McNear, Petaluma, as trustees for the syndicate. The object of the syndicate, as defined in the agreement signed by the constituent bankers, is to provide funds for the operation of the several roads constituting the Northern Electric system for at least two years and not more than five years and to provide for the interest on all the underlying bonds of the system.

The agreement, which was signed by a large majority of the stockholders present at the meeting, provides that it shall become effective in thirty days if signed by the holders of $2,500,000 par value of bonds or by the holders of notes secured by that amount of bonds, or it may become effective thirty days after execution in the event of the holders of $2,000,000 signing and the trustees so electing. Sufficient signatures were secured to assure the agreement becoming effective.

The amount which the Bankers' Syndicate pledges itself to subscribe is limited to a total sum for the five years of $500,000. Provision is also made that it shall not be called upon for more than $250,000 in any one year. Interest on the first mortgage bonds, aggregating $94,000, is now overdue, and also $37,840 for the sinking fund. These sums will be subscribed at once, as well as about $100,000 for repairs of roadbed and bridges.

As additional security for the projected outlay, the Sloss Securities Company and the five indorsers of the notes made over to the trustees of the Bankers' Syndicate $29,890,000 of preferred stock and $14,949,000 of common stock of the Northern Electric Railway. This transfer was made in trust to protect the general creditors, as well as to assure the voting control to the syndicate. In the event of an opportunity arising to sell any of this stock the indorsers are to be allowed sixty days in which to buy it at the same price offered by anyone else.

An agreement signed by the holders of the overlying first and consolidated 5 per cent forty-year gold bonds of the Northern Electric Railway provides for postponing the collection of all interest coupons and waiving the sinking fund provisions for five years. The right to bring suit on the notes is postponed for a like term and during this period the bonds securing the notes are not to be sold. Another agreement, signed by many of the general creditors, states that no adverse action will be taken by them during the five-year period. The final agreement provides for the purchase from the present holders at 90 of the $1,400,000 of first mortgage bonds of the Northern Electric Company, Sacramento & Woodland Railway and Marysville & Colusa Branch Railroad now held by banks as collateral for loans to the company. This fund already has been subscribed.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—Charles H. Zehnder, chairman of the committee of holders of first mortgage 5 per cent thirty-year gold bonds of the Birmingham, Ensley & Bessemer Railway, has announced the fixing of Dec. 15 as the limit of time up to which the holders of undeposited bonds may make deposits with the Empire Trust Company, the depositary, or its agents and thereby become parties to any plan or agreement of reorganization which may be adopted by the committee. More than a majority of the outstanding bonds has already been deposited with the committee.

California Street Cable Railroad, San Francisco, Cal.—The California Street Cable Railroad has filed with the Union Trust Company, San Francisco, a new first mortgage to secure $900,000 of bonds. The present mortgage will expire on Jan. 1, 1915, but $516,000 of the bonds thereunder are in the sinking fund, leaving only $384,000 to be refunded by the sale of an equal amount of bonds secured by the new mortgage. The authorization of the issue of these new bonds by the California Railroad Commission was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 21.

California Railway & Power Company, San Francisco, Cal.—The directors of the California Railway & Power Company have authorized the redemption at par for cash of $100,000 prior preference stock, the drawing to take place on Jan. 2, in accordance with the provisions of the certificate of incorporation.

Chicago & Oak Park Elevated Railroad, Chicago, Ill.—Judge Kohlsaat, of the Federal Court at Chicago, has directed Charles D. Morrison, master in chancery, to take proofs in the matter of the application of Samuel Insull, receiver of the Chicago & Oak Park Elevated Railroad, for permission to issue certificates for the purpose of elevation in Oak Park and Austin. The Continental & Commercial Trust & Savings Bank of Chicago, which as trustee of an existing mortgage opposed the petition, has been asked to file a report in the matter as soon as possible. Previous references to this matter were made in ELECTRIC RAILWAY JOURNAL of Oct. 31 and Nov. 21.

Cincinnati, Dayton & Toledo Traction Company, Hamilton, Ohio.—On Nov. 24 the Cincinnati, Dayton & Toledo Traction Company field a mortgage to the Fidelity Trust Company, Philadelphia, to secure not exceeding $7,500,000 of bonds, of which a sufficient amount will be reserved to retire $5,000,000 of existing bonds due from 1916 to 1922. The remaining $2,500,000 of the new bonds will be held by the trustees to provide for future improvements and additions made from time to time. The bonds are a general refunding and gold mortgage thirty-year 5 per cent issue, dated Oct. 1, 1914. The common stock of the company has been reduced from $5,000,000 to $2,000,000, according to an official statement of Nov. 23. The plan of reduction provides for the surrender for cancellation of $1,000,000 par value of common stock owned by the Ohio Electric Railway, which leases the property, and the exchange of one share of new common stock for two shares of the present outstanding common stock. The Ohio Electric Railway has already deposited its $1,000,000 of stock, and the holders of the common stock have been notified to present their stock for exchange. The outstanding preferred stock amounting to $250,000 is not disturbed by the reduction plan. The modification of the lease to the Ohio Electric Railway in accordance with the above plan was noted in the ELECTRIC RAILWAY JOURNAL of July 5, 1913.

Cleveland (Ohio) Railway.—The operating report of the Cleveland Railway for October, presented to the board of directors on Nov. 28, shows that the receipts were $70,622 greater than for the same month in 1913, although there was a decrease of 204,402 in the number of passengers. The penny charge for transfers accounts for $60,543 of the gain, while the remainder was owing to an increase in the number of passengers who paid fares but did not transfer. The interest fund, $200,707 at the end of September, increased $4,279. The operating allowance showed a deficit of $9,618, and the maintenance fund a deficit of $7,644.

Commonwealth Power, Railway & Light Company, Grand Rapids, Mich.—The Michigan Railroad Commission on Nov. 27 authorized the merger of eleven lighting companies with the controlling company, The Consumer's Power Company, which is in turn controlled by the Commonwealth Power, Railway & Light Company through complete stock ownership. The application for the merger, together with a list of the lighting companies affected, was published in the ELECTRIC RAILWAY JOURNAL of Nov. 28, page 1217.

Dominion Power & Transmission Company, Ltd., Hamilton, Ont.—A dividend of 2 per cent has been declared on the $5,100,000 of limited preference stock of the Dominion Power & Transmission Company, payable on Dec. 15 to holders of record on Nov. 30. Three prior payments of 2 per cent and three of one-half of 1 per cent bring the total payments to date up to 7½ per cent. When the dividends aggregate 10 per cent the limited preference stock will bcome ordinary stock, of which $2,614,500 is now outstanding.

Federal Light & Traction Company, New York, N. Y.—The quarterly dividend of 1½ per cent on the preferred stock of the Federal Light & Traction Company, due at this time, has been deferred.

Fresno (Cal.) Interurban Railway.—The Fresno Interurban Railway has filed an application with the California Railroad Commission for authority to issue $212,500 of common stock and $350,000 of first mortgage 6 per cent twenty-five-year bonds at not less than 80. The company also wishes authority to issue $350,000 of 6 per cent cumulative preferred stock only when an equivalent amount of bonds has been retired. The company proposes to use the proceeds in building a standard gauge electric railway from Fresno eastward, with a branch line to Clovis. The total length of the main line and branches as now projected is approximately 26 miles, with an estimated cost of construction per mile of $17,300. This company already has 2 miles of line in operation between Fresno and Belmont Avenues in Fresno and Alvina Heights. Previous authorizations to this company were noted in the ELECTRIC RAILWAY JOURNAL of Oct. 31 and Nov. 7.

Gary & Interurban Railroad, Gary, Ind.—The Gary & Interurban Railroad has deposited with the Baltimore Trust Company, as trustee, the required funds to meet the interest payment, defaulted Sept. 1, upon its $350,000 of three-year 6 per cent notes.

Lehigh Valley Transit Company, Allentown, Pa.—The Philadelphia Stock Exchange has listed $5,124,000 of refunding improvement mortgage fifty-year 5 per cent gold bonds of the Lehigh Valley Transit Company.

Lincoln Railway & Light Company, Lincoln, Ill.—A decree of foreclosure was ordered on Nov. 14 against the Lincoln Railway & Light Company by Judge Thomas M. Harris, sitting in the United States Circuit Court. The order followed a suit by bondholders, the filing of which was noted in the ELECTRIC RAILWAY JOURNAL of June 13. At the end of four weeks the master in chancery is expected to sell the effects of the corporation at public auction. Subsequent to the failure of the company to pay interest and principal on its outstanding bonds, James E. Hoblit was appointed receiver, as stated in the issue of this paper of Aug. 1.

Lorain (Ohio) Street Railway.—The Lorain Street Railway on Nov. 24 applied to the Ohio Public Utilities Commission for authority to issue $200,000 of three-year 6 per cent notes to be sold for not less than 99½. The proceeds, together with cash in the treasury, are to be used for the payment of $200,000 of first 6's due on Jan. 1, 1915.

Los Angeles & San Diego Beach Railway, San Diego, Cal.—The California Railroad Commission has issued a supplemental order authorizing the Los Angeles & San Diego Beach Railway to issue $375,000 of bonds. This authority is in substitution for the commission's order, noted in the ELECTRIC RAILWAY JOURNAL of Nov. 7, by which the company was authorized to issue a sufficient number of bonds to yield $250,000. The new order provides that the bonds are to be sold at not less than 80 and that the proceeds are to be used for electrification and the liquidation of indebtedness. The commission has also issued a supplemental order amending its previous decision authorizing the company to issue $32,000 of one-day promissory notes, as stated in the ELECTRIC RAILWAY JOURNAL of Nov. 21. The company is now given permission to issue ninety-day notes instead.

New York (N. Y.) Railways.—In the purchase of the $600,000 of capital stock of the Twenty-third Street Railway by the New York Railways at $350 per share, the Public Service Commission for the First District of New York has agreed to the amortization of 20 per cent of the $2,100,000 of thirty-year 4 per cent bonds to be issued in payment therefor. When the purchase was authorized, Commissioner Milo R. Maltbie made it a condition precedent to the consummation of the deal that 22 per cent should be amortized, inasmuch as New York Railway bonds were selling at from 78 per cent to 80 per cent of par. The company objected to this amount but has now consented to amortize 20 per cent of the par value of the bonds. The permission to make the stock purchase was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 7.

Norwood, Canton & Sharon Street Railway, Canton, Mass.—On Nov. 26 the Norwood, Canton & Sharon Street Railway petitioned the Massachusetts Public Service Commission for the approval of an issue of $30,000 of twenty-year 5 per cent bonds and the authorization of a reduction in capital stock from $62,500 to $32,500. The new bonds are to be used to finance the $30,000 reduction in stock.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—It is reported that the Oakland, Antioch & Eastern Railway is circulating among bondholders an agreement providing for the payment of bond interest for three years in company notes secured by 200 per cent of bonds. The company on Nov. 23 applied to the California Railroad Commission for authority to renew promissory notes amounting to $295,345.

Pacific Electric Railway, Los Angeles, Cal.—The Pacific Electric Railway on Nov. 25 received permission from the California Railroad Commission to issue $2,942,000 of fifty-year gold bonds at not less than 87½ and accrued interest to provide for improvements already completed or under way. The expenditures already made and to be made for work now under contract include the following items: bridges and paving, $1,050,000; rolling stock, $800,000; additions and betterments, $471,000; extensions and branches, $250,000; station and shop improvements, $177,000; power plant, substations and transmission lines, $100,000, and real estate purchases, $2,500. Of the total issue $1,213,000 is to be used to pay for work long completed. It is made a condition of the order that whenever any of the bonds are used for the above purpose a like amount of the indebtedness of the company shall be paid off and cancelled. The purpose of this provision is to prevent the same money remaining outstanding as an indebtedness and being represented by promissory notes in addition to the bonds authorized.

Pacific Gas & Electric Company, San Francisco, Cal.—As a result of the recent offer of the Pacific Gas & Electric

Company to accept delivery as of Oct. 31 at the lowest prices offered of $2,500,000 of its one-year 5 per cent gold notes maturing March 25, 1915, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 7, $3,751,000 of notes were tendered out of the outstanding issue of $7,000,000. The company purchased $2,511,000 of the tendered bonds at prices netting about 1 per cent as compared to the call price.

San Diego Consolidated Gas & Electric Company, San Diego, Cal.—The California Railroad Commission has authorized the San Diego Consolidated Gas & Electric Company to issue $250,000 face value of 6 per cent debentures payable on Dec. 1, 1922, and $240,000 par value of common stock. The order provides that the bonds are to be sold to net the company not less than 93 and accrued interest, and the stock at not less than par. The proceeds are to be used for discharging or refunding obligations amounting to $472,296.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The original application of the San Francisco-Oakland Terminal Railways to the California Railroad Commission for authority to issue $10,000,000 of 5 per cent general and refunding mortgage bonds has been indefinitely postponed by the commission. This application was noted in the ELECTRIC RAILWAY JOURNAL of June 6, 1914.

Southern Pacific Company, San Francisco, Cal.—Kuhn, Loeb & Company, New York, have purchased and resold an issue of $1,170,000 of 4½ per cent equipment trusts, series C, of the Southern Pacific Company. These notes, the application for the issuance of which was noted in the ELECTRIC RAILWAY JOURNAL of Nov. 28, were authorized by the California Railroad Commission on Nov. 25. These certificates will mature annually in equal installments from Dec. 1, 1915, to Dec. 1, 1924, and will be callable on Dec. 1, 1919, or at any interest date thereafter, at 102½ per cent. The issue will be known as series "C," and will differ from the company's equipment trust certificates of series "A" and "B" in that the present agreement provides for the payment in cash of 15 per cent instead of 10 per cent of the purchase price of the equipment and does not obligate the Southern Pacific Company to pay the federal income tax for the benefit of the holders of the certificates. The equipment that the company proposes to acquire will cost $1,426,053, which besides steam equipment covers sixteen motor coaches at $248,000, six motor coaches at $93,300 and two motor combination coach and express cars at $30,800.

Toronto (Ont.) Railway.—The Toronto Railway has sold to William A. Read & Company, Boston, $1,500,000 of 6 per cent notes, $750,000 of which will be due on Dec. 1, 1915, and the remainder on Dec. 1, 1916. The notes maturing in 1915 are being offered at 100¼, and those maturing in 1916 at par. Surplus earnings of the company in 1913 are reported to have been more than eighteen times the amount required for interest on the present issue.

United Traction & Electric Company, Providence, R. I.—C. S. Sweetland, secretary United Traction & Electric Company, says in a recent circular letter that while the control of the stock of the Rhode Island Company and the management have now been transferred to the five trustees, in accordance with the recent decree of the United States District Court, there has been no change in the relations of this company to the United Traction & Electric Company, or in its obligations to the United Traction & Electric Company and the latter's three lessor companies, so that the stability of income to the United Traction & Electric Company is assured. On June 24, 1902, the Union Railroad, the Pawtucket Street Railway and the Rhode Island Suburban Railway, the entire capital stock of each of which belongs to the United Traction & Electric Company, leased all their properties for 999 years to the Rhode Island Company. The annual rentals of $850,000 have enabled the United Traction & Electric Company to pay the interest on its $9,000,000 of 5 per cent bonds and 5 per cent annual dividends on its $8,000,000 of capital stock. Besides the rentals, however, the Rhode Island company agreed among other things to provide all further equipment and make all improvements necessary, all such equipment and improvements to become the property of the three lessor companies. In case the lessor companies should now resume possession under conditions of default covered by the lease, they would have the benefit of expenditures of more than $7,000,000 that have been made on the leased properties by the Rhode Island Company.

Virginia Railway & Power Company, Richmond, Va.—Coleman Wortham, Richmond, Va., and Finley J. Shepard and Arthur W. Kelly, New York, have been elected directors of the Virginia Railway & Power Company, to succeed Guy Phillips, Victor Cumberson and J. L. Sellman.

DIVIDENDS DECLARED

Brooklyn (N. Y.) Rapid Transit Company, quarterly, 1½ per cent.

Eastern Texas Electric Company, Beaumont, Tex., 3 per cent, preferred.

Frankfort & Southwark Passenger Railway, Philadelphia, Pa., $4.50.

Louisville (Ky.) Traction Company, quarterly, 1 per cent, common.

Massachusetts Electric Companies, Boston, Mass., $2, preferred.

Second & Third Streets Passenger Railway, Philadelphia, Pa., quarterly, $3.

ELECTRIC RAILWAY MONTHLY EARNINGS

AURORA, ELGIN & CHICAGO RAILROAD, WHEATON, ILL.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Sept., '14	$183,355	$120,225	$63,130	$43,274	$19,856
1 " " '13	188,602	117,241	71,361	37,087	34,274
3 " " '14	611,210	361,793	249,417	136,265	119,152
3 " " '13	620,343	351,841	268,502	111,798	156,704

CLEVELAND, PAINESVILLE & EASTERN RAILWAY, CLEVELAND, OHIO.

1m., Sept., '14	$41,638	*$22,058	$19,580	$10,746	$8,834
1 " " '13	43,186	*21,467	21,719	10,396	11,323
9 " " '14	329,930	*176,909	153,021	99,162	53,859
9 " " '13	326,712	*175,185	151,527	93,752	57,775

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

1m., Sept., '14	$2,606,938	$1,002,168	$1,604,770	$1,079,577	$525,193
1 " " '13	2,640,867	1,011,462	1,629,405	1,110,100	519,305
4 " " '14	7,634,320	3,056,280	4,578,049	3,246,120	1,331,929
4 " " '13	7,415,087	3,054,701	4,360,386	3,322,765	1,037,621

JACKSONVILLE (FLA.) TRACTION COMPANY

1m., Sept., '14	$53,567	*$38,085	$15,483	$12,476	$3,007
1 " " '13	55,357	*34,496	20,861	12,976	7,885
12 " " '14	729,870	*472,570	257,300	153,004	104,296
12 " " '13	612,697	*405,337	207,360	136,093	71,267

NORTHERN OHIO TRACTION & LIGHT COMPANY, AKRON, OHIO

1m., Sept., '14	$311,657	*$195,367	$116,290	$51,427	$64,862
1 " " '13	289,023	*169,220	119,802	47,531	72,271
9 " " '14	2,728,559	*1,663,018	1,065,542	455,246	610,295
9 " " '13	2,444,698	*1,471,036	973,662	413,197	560,465

NORTHERN TEXAS ELECTRIC COMPANY, FORT WORTH, TEXAS.

1m., Sept., '14	$164,778	*$89,972	$74,806	$26,541	$48,265
1 " " '13	172,014	*96,021	75,994	24,166	51,828
12 " " '14	2,151,016	*1,199,189	951,827	307,704	644,123
12 " " '13	2,089,776	*1,131,746	958,030	288,911	669,119

PADUCAH TRACTION & LIGHT COMPANY, PADUCAH, KY.

1m., Sept., '14	$23,805	*$15,612	$8,193	$7,659	$534
1 " " '13	24,844	*15,890	8,954	7,583	1,371
12 " " '14	305,732	*196,396	109,336	91,544	17,792
12 " " '13	292,020	*194,090	97,929	89,116	8,813

PENSACOLA (FLA.) ELECTRIC COMPANY

1m., Sept., '14	$20,510	*$13,666	$6,844	$7,272	$428
1 " " '13	23,307	*14,392	8,915	7,175	1,740
12 " " '14	280,441	*176,742	103,699	86,334	17,365
12 " " '13	284,528	*181,649	102,880	78,617	24,263

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, SEATTLE, WASH.

1m., Sept., '14	$683,558	*$399,925	$283,633	$177,817	$105,816
1 " " '13	717,282	*405,054	312,228	174,374	137,854
12 " " '14	8,623,412	*5,054,890	3,568,522	2,108,802	1,459,720
12 " " '13	8,477,119	*4,929,977	3,547,142	2,051,345	1,495,797

SAVANNAH (GA.) ELECTRIC COMPANY

1m., Sept., '14	$65,202	*$42,779	$22,423	$22,800	$377
1 " " '13	67,292	*44,370	22,922	22,672	250
12 " " '14	848,945	*565,072	283,873	274,218	9,655
12 " " '13	808,169	*556,458	251,712	244,170	7,542

TAMPA (FLA.) ELECTRIC COMPANY

1m., Sept., '14	$80,755	*$42,738	$38,017	$4,259	$33,759
1 " " '13	73,362	*39,162	34,200	4,431	29,769
12 " " '14	964,417	*525,974	438,443	55,558	382,884
12 " " '13	806,676	*433,870	372,806	55,105	317,701

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*Includes taxes.

Traffic and Transportation

INCREASE IN FARE ON OHIO-PENNSYLVANIA LINE

Discontinuance of Service Only Other Alternative—Deficit on One Division Since 1910

The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has given notice that beginning Dec. 15 an increase in fares will go into effect on its lines between Sharon and Bedford. The company's statement follows in part:

"The gross earnings of the Sharon & New Castle Street Railway have failed steadily to meet the ordinary operating expenses of the line. An increase in fares and a slight reduction in the schedule of cars operated is imperative. Ordinarily, when the receipts of a line are sufficient to meet its operating expenses and taxes, it is deemed good practice to continue operation in the hope that the road may eventually be placed on a self-sustaining basis and afford the stockholders some return on the money invested to serve the public. But when, as is the case with the Sharon & New Castle line, a road fails to pay operating expenses, let alone interest on indebtedness, abandonment of the line is usually considered necessary to protect the shareholders from the continued drain on their resources.

"This company is reluctant to consider for a moment the withdrawal of electric railway facilities from the communities traversed by this line and has determined upon the only other course that is possible in the circumstances —an increase in fares, so that the line may be placed nearly on a self-sustaining basis. In taking this step the company has kept well within the limit of 2 cents a mile for passenger fares.

"A glance at the financial condition of the Sharon & New Castle Railway for the last five years will show that the increase in fares is in the interest of the people served by the line. In 1910, the gross earnings were $33,333, while the operating expenses, including taxes, were $33,528, creating a deficit of $194. This deficit was increased by interest on notes and bonds to $9,901. This is the best showing made in five years. In 1911, the gross earnings were $31,747, and the operating expenses $33,130, leaving a deficit of $1,383, which was increased to $11,155, by interest on debt. In 1912, gross earnings $31,146, operating expenses $35,052, deficit $3,906; deficit, including interest, $13,719. In 1913, gross earnings $32,278, operating expenses $38,391, deficit $6,113; deficit, including interest $15,954. For nine months of the present year the gross earnings were $24,417, operating expenses $30,556, deficit $6,139; deficit, including interest, $13,611.

"The increase of fares includes the equalization of the charges for transporting the people and the general application of approximately a 2-cent fare per mile. Regular patrons will not be affected by the increase in fare as the rates for commutation tickets and for school tickets are to remain unchanged."

NEW SOUTHERN PACIFIC FARE SCHEDULE

The Southern Pacific Company on Nov. 24 submitted to the Railroad Commission of California for its approval a revised schedule of commutation fares between San Francisco and certain Alameda County points in the company's electric zone. This readjustment was ordered by the commission in the so-called transbay rate cases, which were decided on Oct. 10, 1914. The Southern Pacific Company subsequently applied for a rehearing, which was denied.

The Southern Pacific Company has also asked for permission to eliminate the commutation fare of $2.50 now in effect between Oakland and Stonehurst and intermediate points, and to increase the monthly commutation fare between Oakland and San Leandro from $2.50 to $3. It is stated that there is practically no travel under these latter fares.

In addition to the reductions in one-way and commutation fares between San Francisco and Alameda County points, the Southern Pacific Company was also required by the commission's decision in the transbay rate case to establish a fare of 5 cents between all points in Oakland, with the exception of Oakland Mole. This affects a material reduction in the fares within the city limits between West Oakland and 105th Avenue on the Melrose extension of the Southern Pacific Company, the fares in some cases being as high as 10 cents and 15 cents.

The proposed schedule is shown by the following table:

Between San Francisco and	Monthly Commutation Fares		One-Way Fares	
	Present	Proposed	Present	Proposed
Havenscourt	$4.75	$3.50	..	..
Yokum Avenue	4.90	3.50	..	..
Parker Avenue	5.05	3.50	..	..
Eighty-sixth Avenue	5.20	3.75	..	..
Nintieth Avenue	5.30	3.75	$0.20	$0.15
Ninety-eighth Avenue	4.45	4.00	.20	.15
105th Avenue	5.60	4.00	.20	.15
Broadmoor	5.80	4.00	..	..
Dutton Avenue	5.90	4.40	..	..
Stonehurst	5.00	4.50	..	..
Between Oakland and				
Broadmoor	4.30	3.50	.15	.10
Dutton Avenue	4.40	3.50	.15	.10

Increase in Fare on Jersey Line.—The Atlantic City & Shore Railroad, Atlantic City, N. J., has announced that the fare over its line between Atlantic City and the mainland will be increased from 10 cents to 15 cents.

New Transfer System in Youngstown.—The Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, has announced that a new form of transfer will be put into effect on its lines in Youngstown, Niles, Warren, Sharon and New Castle at a date yet to be announced.

Accident Faker Convicted.—George DeGraff was convicted in Common Pleas Court at Cleveland, Ohio, on Nov. 23 of obtaining $500 from the Cleveland Railway on false pretenses. DeGraff claimed he injured himself in a fall from a car on Jan. 14, 1914. The company produced evidence to show that his injury was received prior to that date.

Park Lease Negotiated.—Arrangements have been perfected by which Crump's Park, on the line of the Macon Railway & Light Company, Macon, Ga., will be leased to the Coney Island Amusement & Realty Company, Coney Island, N. Y., which operates a number of amusement resorts. It is planned to change the name of the resort to "Dreamland."

Finding on Cambridge (Mass.) Subway Station Improvements.—The Massachusetts Public Service Commission has issued an order requiring the Boston Elevated Railway to install a single-file escalator of the cleat type at the Harvard Square station of the Cambridge subway, connecting the inbound Mt. Auburn Street platform with the surface of the square. The estimated cost of the installation is $18,000.

Fast Freight Run.—The Illinois Traction System, Peoria, Ill., has established a fast freight run between Peoria and Decatur, Ill. The train makes connections at Decatur for Springfield and points east of Decatur. Fast freight runs have been in operation between Peoria and St. Louis, through Springfield, for some time. Under the new run a train will leave Peoria at 8:55 p.m. and will arrive at Decatur at 12:45 o'clock.

Interurban Roads Hurt Commuter Business.—Some of the steam railroads entering Cincinnati have filed notice with the Interstate Commerce Commission of an increase of commutation rates, effective about Jan. 15, 1915. They will also do away with the 100-mile ticket, it is said, and substitute a coupon ticket, good for only one month. The railroad men say the interurban electric railways have cut into their business until it is no longer profitable at the rates that have been in effect.

Rochester Fare Hearing.—The hearing in regard to the application of the Mayor of Rochester to the Public Service Commission of the Second District of New York for an order to require the Rochester city lines of the New York State Railways to charge only 3 cents in the rush hours was adjourned from Oct. 31 to Nov. 13. On the latter date the hearing was further adjourned to Nov. 20. Both sides then exchanged briefs. The matter has now gone over until

Jan. 6, 1915, when the commission will hear oral arguments at Albany.

Central States Passenger Rate Increase.—Although the Interstate Commerce Commission received numerous complaints requesting it to suspend the increased passenger rates, some of which became effective in the Central States passenger district on Dec. 1, the remainder to become effective between Dec. 7 and Dec. 15, it held that the investigation in the Eastern rate case, decided last July, was sufficient to prove the necessity and reasonableness of the new rates. It seems likely, however, that further hearings may be held on commuter rates.

Chicago "Skip-Stops."—In order to increase the track capacity by speeding up schedules outside the loop district, the "skip-stop" plan will be tried in Chicago. In the initial test it is proposed to make eight stops to the mile, or approximately every two blocks. Exceptions will, however, be made in heavy traffic zones. Traffic surveys are to be made to determine intersections to be dropped from the schedule. The test will be conducted over a line 10 miles in length in a district which is known to adjust itself readily to new equipment and conditions.

Front-End Collectors in Detroit.—On recommendation of Barclay Parsons & Klapp, New York, N. Y., engineers engaged in a traffic survey of Detroit, the city railway commission has requested the Detroit United Railway to load cars at the front end during the rush hour period in the congested districts. The company will start the experiment on Dec. 7 at two of the busiest intersections on Woodward Avenue. The plan is to have the street collectors handle nothing but ticket and cash fares, the conductor issuing all transfers and making all change.

Employees' Purchases Delivered.—The Interborough Rapid Transit Company, New York, N. Y., has inaugurated a delivery service in connection with its employees' stores. The cost of delivery of purchases less than $2 is 5 cents and on purchases more than $2 it is 10 cents. Arrangements have also been made to fill and deliver orders sent in by mail. In connection with the delivery service a new system of tickets has been installed under which purchasers have only one ticket to present at the cash window no matter how many purchases are made at the various departments which they visit.

Hearing Regarding Fare Petition.—A hearing was held before the Public Service Commission of the Second District of New York on Nov. 24 in regard to the petition for a reduction in the fare on the Schenectady Railway between Albany and Schenectady from 25 cents to 20 cents and for the redivision of the road into four instead of the present five fare zones. At the conclusion of the hearing Commissioner Emmett adjourned the hearing for three weeks. He urged the parties to the petition and the representatives of the company to make an effort to reach an agreement without the need of a formal order from the commission.

"Shop Early in Kansas City"—The Metropolitan Street Railway, Kansas City, Mo., is doing its part to stimulate the "shopping early" movement. In all its cars the company is displaying prominently placards on which is printed in green ink, surrounded by a holly border, the following: "The Metropolitan Street Railway, R. J. Dunham and Ford F. Harvey, receivers. The company requests its patrons to join the nation-wide movement to make Christmas a happy one by shopping early in the season, early in the week, early in the day. By request of the Kansas City Consumers' League. Shoppers should use home-bound cars early in the day."

A Story That Beats any "Movie" Plot.—A conductor in the employ of the Grays Harbor Railway & Light Company, Aberdeen, Wash., sent the following accident report to the operating department of the Federal Light & Traction Company, New York, which controls the Aberdeen company: "A man at Hoquiam came on the car at 7 p.m. He spit and expectorated all over the car and when I asked him to quit he swore strong at me. Then he vomited all over a seat and on the floor. I told him to clean it up or I would have him arrested. He started to clean it up, and then he went to the door, jumped from the car, and ran down E Street to the river and jumped in. I stopped the car, ran after the man, jumped in the river, dragged him out and had him arrested for spitting on the floor of the car."

New Mail Service in Suburban New York.—A trolley mail service has been established between Yonkers and Mount Vernon, N. Y., over the Mount Vernon line of the Yonkers Railroad, and is saving many hours in the delivery of first-class mail, the only kind carried at present. The New York Central & Hudson River Railroad passes through Yonkers and the New York, New Haven & Hartford Railroad through Mount Vernon. All the mail for Mount Vernon coming from the North and West is thrown off at East at Mount Vernon. Previously all mail was carried through to the Grand Central Terminal in New York City, where it was distributed and sent out again.

Donation Day in Cleveland.—The completion of the count by the auditing department of the Cleveland (Ohio) Railway shows that $14,074 was placed in the fare boxes for the Associated Charities on the day before Thanksgiving, known as donation day. On the morning of the day in question the conductors pinned carnations and strips of white ribbon bearing the words "Donation Day" upon their lapels. Posters were placed in the car windows, asking for donations, and small placards were attached to the fareboxes, with words of thanks to those who gave. The crews on the various lines vied with each other in their efforts to secure the largest amount collected. The lines which lead in the contest were Euclid, Detroit and Superior in the order named. Several $5 and $10 bills were taken from the boxes. The auditor's department secured an average of the receipts at this season of the year and based the company's portion of the fund upon this.

Fare Injunction Increase Denied.—The application of the receivers of the Seattle, Renton & Southern Railway for an injunction against the Public Service Commission of the State of Washington, which decided against the railway in its efforts to raise its rates and establish a rate zone, was denied recently by Judges William B. Gilbert, Jeremiah Neterer and Cushman, sitting in the District Court as a circuit court of appeals. The court held that no emergency had been shown for the order at this time. The receivers contended that the injunction of the commission prohibiting the company from raising the rates and establishing fare zones was confiscatory. The commission took the position that the company was bound by the terms of its franchise until such time as the commission or the Legislature should fix a different rate; that the service rendered was not reasonably worth more than the fare charged, and that an increase in rates would reduce the revenue rather than increase it by diminishing the patronage. Under the decision the company will have to continue operating under the schedule of rates granted it in its franchise until the case comes up regularly for trial, which will be some time in January.

Interchange Traffic Into Kansas City.—The Kansas City, Clay County & St. Joseph Railway (electric) has recently assumed terminal service to Kansas City's Union Station for the Quincy, Omaha & Kansas City Railroad (steam). The Quincy, Omaha & Kansas City Railroad, having made no arrangement to enter the station, has established its new terminus at Avondale, 5 miles from Kansas City. Here it transfers passengers to the electric line, which takes them into Kansas City or, in the case of through passengers, to city cars bound for the Union Station and there they board the steam roads for a continuation of their journey. The Quincy, Omaha & Kansas City Railroad sells through tickets to Third and Cherry Streets, Kansas City, the electric line taking up coupons at 2 cents a mile for the 5 miles it carries the passengers. The interurban collects from passengers entering Kansas City the 5 cents city fare after leaving Third and Cherry Streets. Tickets on the steam road reading to points beyond Kansas City provide also for the city fare, and for the city transfers. Passenger traffic routed by the steam railroad from the Union Station is correspondingly handled, the electric line receiving the passengers from the Metropolitan Street Railway and delivering them to the steam road at Avondale. The interurban's city station is ten blocks north of the Union Station, but Union Station loop cars and other cars reaching the depot run on both Walnut Street and Grand Avenue, the two streets used by the interurban.

Personal Mention

Mr. William F. Woerner has resigned as member of the Public Service Commission of Missouri to give his attention to private affairs.

Mr. William S. Ready has been appointed instructor of motormen on the Detroit city lines of the Detroit (Mich.) United Railway to succeed Mr. J. W. McIntosh.

Mr. Bayard Kilgour has been elected president of the Cincinnati (Ohio) Street Railway, operated under lease by the Cincinnati Traction Company, to fill the position caused by the death of his father, John Kilgour.

Mr. G. Masunaga, electrical engineer of the Imperial Government Railways, Tokyo, Japan, is on a tour of inspection of the electrified railways of the United States. Mr. Masunaga is interested particularly in block signal protection for electrified tracks.

Mr. E. A. Johnson has been appointed superintendent of the railway department of the Omaha & Lincoln Railway & Light Company, Ralston, Neb., to succeed Mr. George D. Rice. Mr. Johnson has been with this company as assistant superintendent since February, 1909.

Mr. George B. Wheeler, whose resignation as secretary and general manager of the Chippewa Valley Railway, Light & Power Company, Eau Claire, Wis., was announced in the ELECTRIC RAILWAY JOURNAL of Oct. 17, has been elected president of the Union National Bank, Eau Claire, Wis.

Mr. H. M. Aldrich has been appointed superintendent of the Northampton (Mass.) Street Railway to succeed Mr. E. C. Clark. Mr. Aldrich has recently been an inspector for the Massachusetts Public Service Commission and was formerly superintendent of the Amherst & Sunderland Street Railway, Amherst, Mass.

Mr. Henry Grenacher, who for several years has been connected with the engineering department of H. M Byllesby & Company Chicago, Ill., has been appointed efficiency engineer for all operated properties, in which capacity he will visit the various properties and co-operate with the local managers in improving the efficiency of plant operation.

Mr. Howard Rhoda has been appointed master mechanic of the Binghamton (N. Y.) Railway. For two years prior to his appointment to the Binghamton Railway Mr. Rhoda was employed as master mechanic of the Long Island Electric Railway, Jamaica, L. I., and for ten years prior to that he was assistant master mechanic of the Reading (Pa.) Transit Company.

Mr. C. B. Fairchild, Jr., who has been statistician of the Philadelphia (Pa.) Rapid Transit Company for the last three years, has been appointed executive assistant of the company. Before going to Philadelphia Mr. Fairchild was statistician of the Chicago (Ill.) City Railway for about two and a half years. Prior to that he was engaged in electric railway editorial work.

Mr. E. C. Clark has resigned as superintendent of the Northampton (Mass.) Street Railway. Mr. Clark entered the employ of the company under his father, the late Capt. E. C. Clark, whom he succeeded as manager in 1892. He continued as manager until Mr. L. D. Pellissier became manager of both the Northampton Street Railway and the Holyoke Street Railway a few years ago. Mr. Clark then was appointed superintendent of the Northampton lines.

Mr. Richard Sachse has been appointed chief engineer of the California Railroad Commission, with offices in San Francisco. Mr. Sachse entered the service of the commission in 1911 as assistant engineer. He was promoted to the position of principal assistant engineer in 1913, and has been acting chief engineer since December, 1913. Prior to becoming connected with the commission Mr. Sachse was with the Western Pacific Railway, the Southern Pacific Company and the United States reclamation service.

Mr. Edwin D. Smith, at present vice-president of the Arrow Engineering Company, will become connected with the United Railways, St. Louis, Mo., on Jan. 1, 1915, in a position to be created, having charge of the engineering and construction work of the railway company. Mr. Smith was graduated in engineering at the Missouri State University. He became connected with the United Railways in the power department about 1900, and was placed in charge of that department in 1904. He remained as superintendent of power until Jan. 1, 1911, when he resigned to become chief engineer of the board of education of the city of St. Louis. After serving two years in that capacity he was made vice-president and manager of the Arrow Engineering Company, a subsidiary of the North American Company.

Mr. L. C. Bewsey, who has been the local superintendent for the Union Traction Company of Indiana at Indianapolis since 1911, has resigned to accept the position of superintendent of transportation of the Buffalo, Lockport & Rochester Railway, which has headquarters at Rochester, N. Y. The resignation becomes effective on Dec. 15. Mr. Bewsey was born in Clinton, Ind., in 1882. His first railroad experience was as a fireman and brakeman for the Baltimore & Ohio Railroad and the Big Four Railroad. In 1899 he entered the service of the Lafayette (Ind.) Railway and served as motorman and shop foreman until he became connected with the Union Traction Company. In 1909 when the Muncie Meteor was put on by the Union Traction Company he became motorman and continued in that position until he was appointed local superintendent.

Mr. Maurice E. McCormick, who has been appointed assistant general maanger of the Bangor Railway & Electric Company, Bangor, Maine, entered railway work on Jan. 1, 1896, as an apprentice in the repair shops of the Public Works Company, Bangor, Maine, and has remained continuously in the service of that company and its successor, the Bangor Railway & Electric Company. He has in turn held the positions of shop foreman, master mechanic, assistant superintendent of operation and claim agent. The Bangor Railway & Electric Company owns and operates the electric railway and lighting companies in Bangor and vicinity. The company was organized in 1905 when the Public Works Company, the Bangor, Hampden & Winterport Railway, the Bangor, Orono & Old Town Railway, the Penobscot Central Railway and the Old Town Electric Company were consolidated. It also controls the Bar Harbor & Union River Power Company and the Bangor Power Company.

Mr. H. S. Newton has resigned as general manager of the Mesaba Railway, Virginia, Minn. He has been with the company since August, 1912. Mr. Newton was graduated from Ohio State University as an electrical engineer. He became connected with the General Electric Company at its Lynn shops and was later transferred to the Thompson-Houston Company at Cincinnati, for which he supervised the installation of apparatus on properties throughout the Central West. Subsequently he became electrical engineer for the Wheeling (W. Va.) Railway and later electrical engineer for the Syracuse (N. Y.) Railway and the Syracuse Consolidated Street Railway, eventually serving in the same capacity for the consolidated company, the Syracuse Rapid Transit Railway. Mr. Newton was appointed general manager and chief engineer of the Syracuse, Lakeside & Baldwinsville Railroad when the road was projected and continued with it during the first two years of its operation. He next became general manager of the Beaver Valley Traction Company, Pittsburgh. Before becoming connected with the Mesaba Railway he was general manager of the Hartford & Springfield Street Railway, Warehouse Point, Conn., for nine years.

Mr. E. A. Humphrey has been appointed electrical engineer of the Great Northern Railroad to succeed Mr. C. L. Daugherty, who, as previously noted in the ELECTRIC RAILWAY JOURNAL, has been appointed assistant general manager of the St. Petersburg & Gulf Railway and St. Petersburg Light & Power Company, St. Petersburg, Fla. From March, 1899, to June, 1904, Mr. Humphrey served as "head-end" electrician on the Lake Shore Limited between Chicago and New York on the Lake Shore and the New York Central lines. From June, 1904, to January, 1909, he was electrical foreman in charge of cab lighting at the Root Street Yards of the Lake Shore and Massachusetts Southern Railway. He then entered the employ of the Great Northern Railway, and from January, 1909, to April, 1911, was chief train electrician with that company. From April, 1911, to September, 1911, he was chief electrician of the Cascade Tunnel electrification of the Great Northern Railway. From September, 1911, to November, 1914, Mr. Humphrey was assistant electrical engineer of the Great Northern Railway. He was appointed electrical engineer of the company last month.

Mr. Howard Whitney, Nashua, N. H., formerly with the maintenance of way departments of the Boston & Maine Railroad and the Missouri Pacific Railroad, has been appointed engineer of maintenance of way of the Springfield (Mass.) Street Railway and the Worcester (Mass.) Consolidated Street Railway, to succeed Mr. Herbert Flanders, the newly appointed general manager of the Springfield Street Railway. Mr. Whitney will take charge of the maintenance of track and bridges of the systems owned and controlled by the New England Investment & Security Company. Mr. Whitney has had extended experience on engineering work with several railroads, but has never before been connected with an electric railway. He was graduated from Tufts College and was first employed in the construction of bridges and maintenance of track on the Missouri Pacific Railroad. Later he became construction engineer for the Central Vermont Railroad, a subsidiary of the Grand Trunk System, when it started construction of the branch from Palmer to Providence. During the time he was with the Central Vermont Railroad Mr. Whitney was resident engineer with headquarters in Woonsocket, R. I. He was later employed on the main line of the Boston & Maine Railroad with the maintenance of way department. Previous to the time of his appointment to the position of engineer of maintenance of way of the companies at Springfield and Worcester Mr. Whitney was employed as engineer with a contracting firm in Nashua, N. H.

OBITUARY

Charles J. Canda, a member of the old Rapid Transit Commission of New York City, is dead. Mr. Canda was born in Paris in 1838 and was long prominent in steam railroad work.

Col. George W. Dunn, a member of the State Railroad Commission of New York, the predecessor of the present public service commission, died at his home in Binghamton, N. Y., on Nov. 27. Colonel Dunn was born in Castle Creek, N. Y., in 1839.

Charles E. Hansell, assistant manager of the Esterline Company, Indianapolis, Ind., died on Nov. 25 as the result of injuries received in a collision between his motor car and a street car. Mr. Hansell was born at Medaryville, Ind., in 1883. He was graduated from the electrical engineering department of Purdue University in 1907, and shortly after entered the employ of the Western Electric Company at Chicago. Later he was electrical engineer of the Duncan Electric Company, LaFayette, Ind., and three years ago entered the employ of the Esterline Company as assistant manager and instrument engineer. He is survived by his widow and five children.

Lucius Tuttle, former president of the Boston & Maine Railroad, died at Brookline, Mass., on Nov. 30. Mr. Tuttle was a native of Hartford, Conn. He was an early exponent of the policy of electric railway control by steam railroads with the object of maintaining a centralized transportation system. Under him as head of the Boston & Maine Railroad, the unprofitable State-operated Hoosac tunnel link of the Fitchburg Railroad was taken over by the Maine system and later was electrified. Besides being a director in various banks and industrial corporations Mr. Tuttle was a trustee of Clark University and a member of the corporation of the Massachusetts Institute of Technology.

Forrest E. Barker, chairman of the Massachusetts Gas & Electric Light Commission, died suddenly at Washington, D. C., on Nov. 20, while in attendance upon the convention of the National Association of Railway Commissioners. Mr. Barker was born in Exeter, N. H., in 1853, was graduated from Wesleyan University, Connecticut, in 1874, and later took up the study of law at the Boston University Law School. After being admitted to the bar, he practised law in Worcester, Mass. In 1885 he was appointed a member of the Gas & Electric Light Commission by Governor Robinson of Massachusetts. That the commission was not abolished at the time of the creation of the Massachusetts Public Service Commission in 1913 was in no small part due to the years of devoted service and wise direction given by Mr. Barker in his responsible office.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Richmond Railway & Viaduct Company, Richmond, Va.**—Chartered in Virginia to take over the Richmond & Henrico Railway and the Broad Street viaduct in Richmond. Capital stock, $25,000. Officers: E. R. Williams, president; Thomas B. Gay, vice-president; W. H. Chalkley, secretary and treasurer, all of Richmond.

FRANCHISES

Los Angeles, Cal.—The Los Angeles Railway has received from the Council a sixty-day extension of time on its franchise in which to complete work on Long Beach Avenue and Vernon Avenue in Los Angeles.

Pasadena, Cal.—An agreement as to the North Lake Avenue franchise in Pasadena has been reached between the Pacific Electric Railway and the Council, and the Commission has ordered a notice advertising the sale of the franchise to be published. The duration of the franchise is to be for thirty years.

Pittsfield, Mass.—The Berkshire Street Railway has received from the Massachusetts Public Service Commission an extension of time on its franchise to Dec. 1, 1915, in which to finish the construction and alterations of its lines in North Adams.

Cleveland, Ohio.—The Cleveland & Youngstown Railway has received a franchise from the Council in Cleveland to make certain changes in its grade that have become necessary since the original franchise was granted.

Medford, Ore.—The Southern Oregon Traction Company has received from the Council an extension of time on its franchise until June 30, 1915, in which to complete its 2-mile line in Medford. S. M. Bullis, Medford, president.

San Antonio, Tex.—The San Antonio Traction Company has received a franchise from the Council for an extension on West Commerce Street from Main Plaza to San Saba Street. At the same time authority was given to remove one of the tracks on Dolorosa Street in San Antonio.

Port Arthur, Tex.—The Port Arthur Traction Company has asked the Council for a franchise for an extension to the Pleasure Pier in Port Arthur.

Morgantown, W. Va.—The Morgantown & Wheeling Railway has received a franchise from the County Court to extend its lines through Clay and Battelle districts, bonds having been voted by these two districts to aid in the construction project.

TRACK AND ROADWAY

Pacific Electric Railway, Los Angeles, Cal.—Grading has been begun by this company on the link between Arlington and Corona, 8 miles.

Fresno (Cal.) Interurban Railway.—This company has asked the Railroad Commission for authority to issue $212,500 common stock and $350,000 of bonds. The proceeds will be used to build the 26 miles of railroad, one branch of which will run from Fresno to the Centerville citrus district, and the other from Fresno to Clovis and Gould Colony. The estimated cost of construction per mile is $17,500. After building the line the company plans to issue $350,000 of preferred stock, the proceeds to be used for the purpose of refunding the bonds. This stock is to be sold to landowners along the line of the road.

Fresno (Cal.) Traction Company.—Plans are being revived by the company to build a 2½-mile extension south of Fresno to Calwa.

Benicia Land & Terminal Company, Benicia, Cal.—Financial backing has been secured and plans are being made to begin work soon on this proposed electric line to connect Benicia and Vallejo. [E. R. J., Oct. 24, '14.]

Clear Lake Railroad, Lakeport, Cal.—About 18 miles of track will be built by this company during 1915.

***Ukiah, Cal.**—Plans are being considered to build an electric railway from Ukiah to Lake County via Potter Valley. Among those interested are: Eli Jones, J. G. Newman and Albert Clapp.

Middletown & Chester Railway, Middletown, Conn.—Preliminary arrangements are being made by this company to build its electric line between Middletown and Chester. Richard H. Bunce and Gustaf B. Carlson are among those interested. This railway will be an extension of the Shore Line Electric Railway. A separate company has been formed to obtain the charter for this line, which will be known as the Middletown & Chester Railway.

Washington Railway & Electric Company, Washington, D. C.—Construction of a branch line on Fourteenth Street between F Street and Pennsylvania Avenue so as to provide direct transportation over the lines of the Washington Railway & Electric Company from the northwest section of the city to the bureau of engraving and printing and other government buildings in that section is practically assured. The Public Utilities Commission and the company have reached a tentative agreement as to the building of the extension and work on the improvement may be begun within a few weeks. Details of the plan, which also provides for the establishment of terminal facilities in the neighborhood of the bureau of engraving and printing, will not be made public until after the commission has finally approved the project.

Southern Illinois Railway & Power Company, Chicago, Ill.—Work will be begun at once by this company on its line between Herrin, West Frankfort, Johnson City and Benton in Illinois.

Chicago, Peoria & Quincy Traction Company, Quincy, Ill.—According to officials of this company, the line which the company proposes to build from Peoria to Quincy will be in operation by Jan. 1, 1916. The company has entered into an arrangement with Woolf, Teitel & Company of California and Utah to finance the building of the railway. John L. Soebbing, president. [E. R. J., June 27, '14.]

Kankakee & Urbana Traction Company, Urbana, Ill.—This company opened a 5-mile extension from Rantoul to Ludlow on Dec. 1. About 20 miles are now in operation on this line and the officials plan to build 5 miles more in the spring, which will complete the line to Paxton.

Union Traction Company, Coffeyville, Kan.—This company is asked to consider plans to build a 25-mile line southeast from Coffeyville to Centralia.

***Garden City, Kan.**—The Garden City Sugar Company is making plans to construct an electric railroad to connect its farms with the beet factory.

Arkansas Valley Interurban Railway, Wichita, Kan.—Charles D. Bell, superintendent of this line, has closed a contract with the Hutchinson Street Railway for the use of its track in entering Hutchinson, and it is now planned to ask a franchise in Hutchinson permitting the interurban railway to operate over the street railway's lines; also the interurban railway will ask for a special election at an early date to vote on a $30,000 bond issue for the purpose of building interurban terminals in Hutchinson. The proposed extension of the interurban line would be 22 miles and would cost approximately $350,000. About half of the right-of-way from Halstead to Hutchinson has already been secured.

Kentucky Utilities Company, Somerset, Ky.—A $3,000,000 mortgage, in favor of the Illinois Trust & Savings Bank, and William H. Henkle, trustees, has been recorded in several central Kentucky counties by the Kentucky Utilities Company. With a franchise for using certain of the Winchester streets, the company keeps one electric car in operation in Winchester, the car meeting every train and making the round trip at other intervals. Extension of the lines to some of the outlying residence districts and connection with interurban lines in other directions are contemplated by this company.

Orleans-Kenner Electric Railway, New Orleans, La.—Construction of this line from New Orleans to Kenner, La., and the St. Charles Parish boundary is almost completed. E. A. Stanford, president. [E. R. J., Oct. 24, '14.]

Texas-Louisiana Traction Company, Shreveport, La.—Surveys are being made by this company on the section of its line between Shreveport and Marshall. The contract for financing and for the construction of this line between Shreveport and Monroe has been awarded. This railway will run through Jefferson and Greenville and will connect with the electric line from Dallas. Ultimately this line will connect Shreveport, La., and Jefferson and Longview, Tex., via Mansfield, Vivian, Blanchard, Oil City, Mooringsport, Greenville, Monroe and Marshall. A. B. Blevins, Jefferson, president. [E. R. J., Feb. 14, '14.]

Hagerstown & Frederick Railway, Frederick, Md.—Plans are being made by this company to build a high-tension line to Williamsport, with the possibility of outlets from Williamsport and an extension across the Potomac River into Berkeley County, W. Va. Poles are now being erected from Hagerstown to a point west of Halfway for the new trolley wires. With the installation of the high-tension line, cars can be operated at a greater speed. The new bridge at Williamsport was constructed with a view of carrying the tracks of an electric railway.

Milford & Uxbridge Street Railway, Milford, Mass.—This company is asked to consider plans to extend its lines to Purchase.

Worcester (Mass.) Consolidated Railway.—This company is asked to consider plans to extend its Sandersdale line to the site of the old waiting station in Southbridge.

***Lansing, Mich.**—The project to build an electric railway from Charlotte to Albion has been extended to include Grand Ledge and Lansing. The proposed line is a combination of two old plans. It was proposed to build a railway from Charlotte to Albion many years ago. The right-of-way was completed most of the distance. The new company has secured possession of this grading. Application for a charter will soon be made by the promoters. The new line will connect with the lines of the Michigan United Traction at Albion. A. D. Wood, Lansing, promoter.

Metropolitan Street Railway, Kansas City, Mo.—This company is replacing with iron poles the wooden trolley poles on West Electric Street in Independence.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—At a hearing before Judge John Kennish of the State Public Service Commission on Nov. 18 one of the commission's engineers reported against the Hyde Park Line extension which complainants were asking for. General Manager John H. Van Brunt and H. A. Cowgill, engineer of maintenance of way, also offered testimony to the effect that the proposed loop would entail an unjustifiable expense.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company has placed in operation its new line to Fifty-first Street and Center Street in Omaha.

Brooklyn, N. Y.—Following are unofficial totals of bids opened Dec. 1, at the Public Service Commission, 154 Nassau Street, New York City, N. Y., for reconstructing part of Section No. 9-C-1 of Route No. 9, a part of the Fourth Avenue subway in Brooklyn: Samuel Beskin, Beacon, N. Y., $134,085; Ward & Tulley, Inc., West Twentieth Street and Railroad Avenue, Brooklyn, $141,762; Thomas F. Shaughimessy, Albany, N. Y., $154,144; Frawley, Kaufman Contracting Company, 51 Chambers Street, New York, $158,109; Thomas Crimmins Contracting Company, 444 East Sixty-ninth Street, New York, $168,000; Snare & Triest Company, 233 Broadway, New York, $172,733; Norton & Gorman, 303 Douglas Street, Brooklyn, N. Y., $185,830; J. F. Cogan Company, 233 Broadway, New York, $190,000, and Degnon Contracting Company, 30 East Forty-second Street, New York, $192,389. The work includes the installation of cross-overs and partial reconstruction of De Kalb Avenue Station in the Flatbush Avenue extension in Brooklyn.

Westchester Electric Railroad, Mount Vernon, N. Y.—A tentative proposition recently suggested in connection with the extension of the North Pelham line of this company from Mount Vernon to Tuckahoe, reported in a late issue of the ELECTRIC RAILWAY JOURNAL, provides for the immediate construction of an extension to the Chester Hill station of the New York, Westchester & Boston Railroad and later continuing the line to Waverly Square, Tuckahoe, about 1 mile distant.

Dan River Railway, King, N. C.—Grading will soon be begun by this company on the 3-mile section of its line between King and Granite Quarry. This is part of a plan to build a 30-mile line from King to Asbury. H. A. Miller, Clemons, president. [E. R. J., Jan. 17, '14.]

***Canton, Ohio.**—The Chamber of Commerce at Canton, as well as prominent men in both Canton and Steubenville, are interested in the construction in a proposed electric line between Canton and Steubenville, via Carrollton, Minerva, Osnaburg, Oneida and Amsterdam, a distance of 60 miles.

Cleveland, Youngstown & Eastern Railway, Cleveland, Ohio.—At a rehearing before the Public Utilities Commission on Nov. 25, the commission refused to modify its original order that extensive repairs to track and equipment be made on this railway and that until this is done cars must run very slowly between Chagrin Falls and Garrettsville. The company pleaded the stringency of the money market as a reason for not having made repairs under the order.

East Linden Electric Railway, Linden, Ohio.—The Council committee on railroads at Columbus has approved a resolution establishing the route proposed by this company and asking for bids on the lowest rate of fare to be charged over the route. This step was necessary before the Council could advertise for bids. The line will extend from the western end of Leonard Avenue viaduct, near the present terminus of the Columbus line, into the corporate limits of the town of Linden. Paul H. Kohr, secretary. [E. R. J., June 6, '14.]

Toronto, Ont.—The Board of Control has been asked to place before the public on Jan. 1, 1915, a by-law asking for the extension of the Toronto Civic Car Line from St. Clair Avenue south along Vaughan Road to Badhurst Street Hill, and for a similar extension from St. Clair Avenue down Lansdowne Avenue in Toronto.

Toronto (Ont.) Suburban Street Railway.—On the Guelph extension of this company tracklaying has been completed from Islington to beyond Eden Mills. Considerable ballasting has been done, poles have been placed, and other work done. While some work is still in progress west of Eden Mills, operations on other sections of the line have been suspended.

West Side Electric Street Railway, Charleroi, Pa.—This corporation is yet in the formative stages. At present right-of-way is owned by this company traversing the properties of the West Sacramento Company. Capital stock, $1,000,000. Officers: Samuel Pond, president; J. K. Armsby, vice-president, and William Herlitz, secretary.

Philadelphia & West Chester Traction Company, Philadelphia, Pa.—Plans are being considered by this company for a line for East Lansdowne and Lansdowne. It will extend from the terminal at Sixty-ninth Street, thence through private right-of-way to Church Lane and Pembroke Avenue, East Lansdowne, and thence to Stewart Avenue and Lansdowne Avenue, making the terminus at Lansdowne and Baltimore Avenues, Lansdowne.

Rhode Island Company, Providence, R. I.—This company has placed in operation its new Mount Pleasant Avenue line from Chalkstone Avenue to Atwell's Avenue in Olneyville. Plans are being contemplated for a further extension of the new line to the junction of Manton Avenue and Atwell's Avenue, so that the desired belt line to Olneyville Square may be built.

Cumberland Valley Interurban Railway, Nashville, Tenn.—Surveys have been completed by this company through Wilson County, a few miles south of Lebanon, to Watertown, Alexandria, Smithville, McMinnville and Sparta. Branches will be constructed from points along the line to the Hermitage and Lebanon. This line will penetrate territory much of which is not reached by a railroad of any kind. W. G. Baird, Lebanon, president. [E. R. J., July 11, '14.]

Middle Tennessee Traction Company, Nashville, Tenn.—Grading has been completed by this company on the 23-mile section of its line between Franklin and Eaglesville. This line will ultimately connect Franklin, Eaglesville, Shelbyville, Fayetteville, Tenn., and Huntsville, Ala. John A. Pitts, Nashville, president. [E. R. J., June 20, '14.]

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—Among the improvements planned by this company in the near future will be a branch line leaving the main line at Goodlettsville, to Springfield via Guthrie. Ultimately this line will be extended to Clarksville. Another extension contemplated is from Gallatin, the present northern terminus of the main line, to Bowling Green, Ky. An important extension of the line from Nashville to Franklin is already under way.

Bryan & Central Texas Interurban Railroad, Bryan, Tex.—Plans are being considered by this company to build a line from Bryan to Navasota, Tex.

Dallas (Tex.) Consolidated Electric Railway.—Work involving an expenditure of $40,000 will be begun at once by this company on Main Street between Exposition Avenue and Haskell Avenue in Dallas. The improvement includes relaying the present tracks with new rails. The street will also be paved.

Houston (Tex.) Electric Railway.—This company is asked to consider plans to build an extension from Whitman Street, north on Clark Street to Dudley Street, about 1 mile.

Pier Railway, Port Arthur, Tex.—A 1-mile branch from Procter Street to Pleasure Pier in Port Arthur will be constructed by this company during 1915.

Ogden, Logan & Idaho Railway, Ogden, Utah.—Preliminary arrangements are being made by this company for the extension of its line from Idlewild, the present Ogden canyon terminus, to Huntsville. [E. R. J., Oct. 31, '14.]

Utah Light & Railway Company, Salt Lake City, Utah.—This company has a large force of men repaving, constructing and extending some of its lines in Salt Lake City.

***Walla Walla, Wash.**—Plans are being contemplated to build a 75-mile electric railway from Walla Walla to La Grande. Among those interested are: C. J. Franklin, Boise; J. G. Brown, Galion, Ohio, and E. A. Pack, Weiser, Wash.

Washington-Oregon Corporation, Vancouver, Wash.—About 2 miles of new track will be built by this company in Vancouver during 1915.

Charleston, Parkersburg & Northern Railroad, Parkersburg, W. Va.—Bids will be awarded by this company in January to build its electric line between Parkersburg, Charleston, Sissonville and Guthrie. K. B. Stephenson, Parkersburg, secretary. [E. R. J., Sept. 19, '14.]

SHOPS AND BUILDINGS

Bay State Street Railway, Boston, Mass.—On Jan. 1 all departments of this company located in Lynn will move from the old Currier Building, the quarters which they have occupied, and will locate in the second story offices of the new Security Trust Company building at Central Avenue and Willow Street in Lynn.

POWER HOUSES AND SUBSTATIONS

Cleveland & Eastern Traction Company, Cleveland, Ohio.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for three 185-kva, single-phase, sixty-cycle, 16,500-volt high tension to rotary volts low tension O. I. S. C. transformers.

Schuylkill Valley Traction Company, Norristown, Pa.—After being under construction for more than two years, the new plant of the Phœnix Water Power Company at Black Rock, is in operation to supply current for the Schuylkill Valley Traction Company's line between Pottstown and Chestnut Hill. The plant cost $300,000, but in addition to this the Schuylkill Navigation Company expended $100,000 rebuilding the dam and in constructing concrete retaining walls.

Manufactures and Supplies

ROLLING STOCK

Toronto (Ont.) Civic Railway expects to purchase within about a week three light closed motor cars and one sweeper.

Ogden, Logan & Idaho Railway, Ogden, Utah, expects to purchase one electric locomotive within the next two months.

Tidewater Power Company, Wilmington, N. C., is having three 21-ft. semi-convertible city cars built by The J. G. Brill Company.

Shore Line Electric Railway, Norwich, Conn., has issued specifications for about ten double-truck closed passenger cars for city and suburban service; length over buffers to be 47 ft., length of car-body 36 ft.

Bay State Street Railway, Boston, Mass., has ordered one 30-ft. semi-steel semi-convertible city car from the Laconia Car Company. This company is reported to be preparing plans for the purchase of a large number of cars.

London & Port Stanley Railway, London, Ont., expects to order within the next two or three weeks, three two-compartment and three three-compartment 55-ft. passenger motor cars, four trail cars and three 60-ton locomotives.

Empire United Railways, Syracuse, N. Y., is reported to be expecting to purchase twelve cars before Jan. 1, 1915, in addition to those which were noted in the ELECTRIC RAILWAY JOURNAL of August 15 as having been ordered from the St. Louis Car Company.

Boston (Mass.) Elevated Railway is discussing plans to revise the specifications which it has recently issued for the purchase of 100 new cars. The company is reported as considering the purchase of fifty motor cars and fifty trailers instead of 100 trailers, as formerly intended, to be of lighter construction than the design provided for in the original specifications. No decision, however, has yet been reached on this matter.

Charleston (S. C.) Consolidated Railway & Lighting Company announces that it has not purchased twelve all-steel cars, as recently reported. The car specifications which were published in the ELECTRIC RAILWAY JOURNAL of Nov. 14, 1914, apply to twelve composite pay-within street cars, six of which were ordered by this railway from the Cincinnati Car Company in December, 1911, five in November, 1912, and one in September, 1913.

TRADE NOTES

McLeer Electric & Manufacturing Company, Brooklyn, N. Y., manufacturer and engineer, has changed its name and will hereafter be known as the Electric Operations Company, Inc.

Union Switch & Signal Company, Swissvale, Pa., has made the following changes and appointments: Central district, Chicago office, V. K. Spicer, special representative; W. H. Talbert, resident manager; George Marloff, office manager; S. E. Gillespie and J. L. Lucks, engineers. Eastern district, New York office, A. Dean, resident manager; H. McCready, office manager; H. W. Griffin, R. P. Tuttle, J. W. White and H. H. Hamilton, engineers; T. H. Patenall, resident manager, Montreal, Que.

Manganese Track Society and the Steel Foundries' Society at their October meeting adopted standards for manganese steel pointed switches. The joint standardization committee of these societies has agreed upon what, in their opinion, constitutes the best practice in regard to the design and dimensions of manganese steel pointed switches. Its recommendations include the manner of attaching the manganese steel tips to the switch point, limiting the dimensions of the piece, as well as recommendations governing the position of the manganese steel point when it is in contact with the running rail or when the switch is open.

William F. Bauer has been appointed manager of the Chicago office of the Edison Storage Battery Company, succeeding Charles B. Frayer who retired on Nov. 30 to devote himself to private interests. Mr. Bauer has been a familiar figure in railway and electrical circles of Chicago since he went there in 1906 as sales engineer of the Electric Storage Battery Company. In 1889 he was the electrician in charge of the original train lighting equipment of the Chicago Limited of the Pennsylvania Railroad, a lighting system designed by his father, then chief electrician of the Pullman Company at Chicago. Later, after practical experience with the old Electric Accumulator Company, the Westinghouse Electric & Manufacturing Company and the Pullman Company, he became train electrician of the Lake Shore Limited in the employ of the Wagner Palace Car Company. In 1901 he joined the forces of the Consolidated Railway Electric Lighting & Equipment Company and two years later was appointed chief electrician of the Missouri Pacific Railroad in charge of car lighting. Mr. Bauer has been with the Edison Storage Battery Company about a year as assistant manager of the railway department. He is president of the Railway Electrical Supply Manufacturers' Association, an organization in which he has been active since its formation.

ADVERTISING LITERATURE

American Electrical Works, Philadelphia, R. I., has issued a price list of its wire and cable materials.

Independent Pneumatic Tool Company, Chicago, Ill., has issued a folder which describes its "Thor" portable electric drills.

Nungesser Carbon & Battery Company, Cleveland, Ohio, has issued a card on its dry batteries for railway signal service.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued bulletin No. 34 S, describing its small power-driven compressors.

Watson-Stillman Company, Aldene, N. J., has issued a catalog describing its "Kromax" leather packings for various kinds of machinery.

Electric Service Supply Company, Philadelphia, Pa., has issued a folder describing its "Melobeam" incandescent headlights for traction service.

Railway & Power Equipment Company, Buffalo, N. Y. (Charles F. Johnson—established 1901), has issued For Sale List No. 99 with a practical mailing card and a special circular describing a type of portable crane. This company is covering a broad field of equipment, represents several manufacturers, and is handling both new and second-hand equipment. It announces that a broad advertising campaign for the coming year is being planned to include numerous special pamphlets covering separate departments of their business.

Western Electric Company, New York, N. Y., prints as a leading article in the December issue of the *Western Electric News* an illustrated account, entitled "Telephoning the Isthmus," of the telephone construction work installed by this company in the vicinty of the Panama Canal. The article tells for the first time the story of the important part the telephone plays in the operation and management of the canal. Nearly 4000 telephones, together with magnets and central battery switchboards, power plants, cables and other apparatus have been installed in and around the Canal Zone by this company.

Another consolidation hearing was given on Dec. 2 by the Massachusetts Public Service Commission upon the legislative resolve covering proposed transportation improvements in the Boston metropolitan district. James F. Jackson, counsel for the Bay State Street Railway, appeared on behalf of the consolidation of that company with the Boston Elevated Railway. At a previous hearing the commission had requested Mr. Jackson to discuss more in detail the benefits of the consolidation. He pointed out that equalization of fares would be one of the chief gains and said that the financing of necessary transportation improvements, including new subways and rapid transit lines, would be greatly facilitated if a single organization controlled the service in and about Greater Boston. The studies submitted of proposed plans for handling the suburban railroad traffic in connection with downtown electric railways were only tentative, and until an act approving the consolidation was passed, the detail could not be worked out. In closing, Mr. Jackson pointed out that the working out of the consolidation would be completely under the supervision of the commission.

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LET SHOPMEN HELP DESIGN

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One of the reforms which seem a long time in coming is the skip-stop for city service. Railway managers who have studied the plan approve of it, but the inertia of the public in matters of this kind is so great that this reform has been adopted in very few places. Chicago is now reported to be contemplating a trial of the plan. An account of the Denver experience has been published in recent issues. In Los Angeles, where the skip-stop has also been tried, there seems to be some doubt as to the advisability of its continuance. On the other hand, in Cleveland and in Kansas City, where the skip-stop appears to have been originally introduced in the year 1911, it has been continued in operation with every evidence of success. The increase in schedule speed has been reported to be nearly 10 per cent but since half of the cars stop at "odd" streets and the other half at the "even" streets, only about half of the people that collect at a corner board the first car that arrives. Thus the load is distributed more evenly among the cars on the route. There is no doubt that the public would be greatly benefited by the skip-stop because it materially increases the average speed by cutting out the number of stops and yet does not greatly increase the distance which the passengers have to walk to catch a car. In a number of cities the near-side stop has recently been introduced without creating public opposition. Perhaps this change will make the general adoption of the skip-stop more of a possibility.

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Automobiles for private use have now become so common that it is not surprising they should have invaded the passenger transportation field, and several electric railway companies on the Western Coast report considerable competition from automobiles which carry passengers over certain routes for nickel fares. We have no fear that such cars, with the tire cost and other depreciation inseparable from automobile service, can ever be commercial competitors on the same terms with an electric railway system. The report of Mr. McCullom to the Board of Estimate and Apportionment of New York, abstracted in this paper about a year ago, presents ample evidence to this effect. Nevertheless, experience has shown that this fact will not prevent the owners of cars from attempting a service of this kind. In a free country like this, electric railway companies cannot suppress this competition even if they would, but it is only fair to them as large taxpayers and also to the public as a whole, whose patronage is solicited by these buses, that both classes of transportation should be placed under similar regulations in regard to responsibility, and that strict traffice regulations should be enforced. The Merchants & Manufacturers Association of Los Angeles has called the attention of the City Council of that city to the tremendous liability of street accidents from these irresponsible automobiles, and Long Beach, Cal., has imposed a license fee of $25 a year and has required taking out of a $10,000 liability insurance for every such car. Charges of short changing by irresponsible automobile conductors is also made in some of the Western cities. Railway companies can ask no more than a free field and fair play for all, but both they and the public should demand that fair play means an equal degree of responsibility from the operators of both classes of service.

STREET RAILWAY LOADS ON SOILS

A part of the discussion of the way committee's report on track at the convention was devoted to the distribution of railway loads over the ballast and sub-grade. While this subject is of vital importance to steam railroad engineers, owing to the great increase in the weight of locomotives as well as the adoption of higher scheduled speeds of trains, neither of these factors has any bearing on the study of track foundations in paved streets. Moreover, the conditions governing the depth of loose, unconfined ballast are hardly comparable with those surrounding a foundation of concrete or compactly-rolled ballast, such as is required by a modern electric railway. In steam

***Ukiah, Cal.**—Plans are being considered to build an electric railway from Ukiah to Lake County via Potter Valley. Among those interested are: Eli Jones, J. G. Newman and Albert Clapp.

Middletown & Chester Railway, Middletown, Conn.—Preliminary arrangements are being made by this company to build its electric line between Middletown and Chester. Richard H. Bunce and Gustaf B. Carlson are among those interested. This railway will be an extension of the Shore Line Electric Railway. A separate company has been formed to obtain the charter for this line, which will be known as the Middletown & Chester Railway.

Washington Railway & Electric Company, Washington, D. C.—Construction of a branch line on Fourteenth Street between F Street and Pennsylvania Avenue so as to provide direct transportation over the lines of the Washington Railway & Electric Company from the northwest section of the city to the bureau of engraving and printing and other government buildings in that section is practically assured. The Public Utilities Commission and the company have reached a tentative agreement as to the building of the extension and work on the improvement may be begun within a few weeks. Details of the plan, which also provides for the establishment of terminal facilities in the neighborhood of the bureau of engraving and printing, will not be made public until after the commission has finally approved the project.

Southern Illinois Railway & Power Company, Chicago, Ill.—Work will be begun at once by this company on its line between Herrin, West Frankfort, Johnson City and Benton in Illinois.

Chicago, Peoria & Quincy Traction Company, Quincy, Ill.—According to officials of this company, the line which the company proposes to build from Peoria to Quincy will be in operation by Jan. 1, 1916. The company has entered into an arrangement with Woolf, Teitel & Company of California and Utah to finance the building of the railway. John L. Soebbing, president. [E. R. J., June 27, '14.]

Kankakee & Urbana Traction Company, Urbana, Ill.—This company opened a 5-mile extension from Rantoul to Ludlow on Dec. 1. About 20 miles are now in operation on this line and the officials plan to build 5 miles more in the spring, which will complete the line to Paxton.

Union Traction Company, Coffeyville, Kan.—This company is asked to consider plans to build a 25-mile line southeast from Coffeyville to Centralia.

***Garden City, Kan.**—The Garden City Sugar Company is making plans to construct an electric railroad to connect its farms with the beet factory.

Arkansas Valley Interurban Railway, Wichita, Kan.—Charles D. Bell, superintendent of this line, has closed a contract with the Hutchinson Street Railway for the use of its track in entering Hutchinson, and it is now planned to ask a franchise in Hutchinson permitting the interurban railway to operate over the street railway's lines; also the interurban railway will ask for a special election at an early date to vote on a $30,000 bond issue for the purpose of building interurban terminals in Hutchinson. The proposed extension of the interurban line would be 22 miles and would cost approximately $350,000. About half of the right-of-way from Halstead to Hutchinson has already been secured.

Kentucky Utilities Company, Somerset, Ky.—A $3,000,000 mortgage, in favor of the Illinois Trust & Savings Bank, and William H. Henkle, trustees, has been recorded in several central Kentucky counties by the Kentucky Utilities Company. With a franchise for using certain of the Winchester streets, the company keeps one electric car in operation in Winchester, the car meeting every train and making the round trip at other intervals. Extension of the lines to some of the outlying residence districts and connection with interurban lines in other directions are contemplated by this company.

Orleans-Kenner Electric Railway, New Orleans, La.—Construction of this line from New Orleans to Kenner, La., and the St. Charles Parish boundary is almost completed. E. A. Stanford, president. [E. R. J., Oct. 24, '14.]

Texas-Louisiana Traction Company, Shreveport, La.—Surveys are being made by this company on the section of its line between Shreveport and Marshall. The contract for financing and for the construction of this line between Shreveport and Monroe has been awarded. This railway will run through Jefferson and Greenville and will connect with the electric line from Dallas. Ultimately this line will connect Shreveport, La., and Jefferson and Longview, Tex., via Mansfield, Vivian, Blanchard, Oil City, Mooringsport, Greenville, Monroe and Marshall. A. B. Blevins, Jefferson, president. [E. R. J., Feb. 14, '14.]

Hagerstown & Frederick Railway, Frederick, Md.—Plans are being made by this company to build a high-tension line to Williamsport, with the possibility of outlets from Williamsport and an extension across the Potomac River into Berkeley County, W. Va. Poles are now being erected from Hagerstown to a point west of Halfway for the new trolley wires. With the installation of the high-tension line, cars can be operated at a greater speed. The new bridge at Williamsport was constructed with a view of carrying the tracks of an electric railway.

Milford & Uxbridge Street Railway, Milford, Mass.—This company is asked to consider plans to extend its lines to Purchase.

Worcester (Mass.) Consolidated Railway.—This company is asked to consider plans to extend its Sandersdale line to the site of the old waiting station in Southbridge.

***Lansing, Mich.**—The project to build an electric railway from Charlotte to Albion has been extended to include Grand Ledge and Lansing. The proposed line is a combination of two old plans. It was proposed to build a railway from Charlotte to Albion many years ago. The right-of-way was completed most of the distance. The new company has secured possession of this grading. Application for a charter will soon be made by the promoters. The new line will connect with the lines of the Michigan United Traction at Albion. A. D. Wood, Lansing, promoter.

Metropolitan Street Railway, Kansas City, Mo.—This company is replacing with iron poles the wooden trolley poles on West Electric Street in Independence.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—At a hearing before Judge John Kennish of the State Public Service Commission on Nov. 18 one of the commission's engineers reported against the Hyde Park Line extension which complainants were asking for. General Manager John H. Van Brunt and H. A. Cowgill, engineer of maintenance of way, also offered testimony to the effect that the proposed loop would entail an unjustifiable expense.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company has placed in operation its new line to Fifty-first Street and Center Street in Omaha.

Brooklyn, N. Y.—Following are unofficial totals of bids opened Dec. 1, at the Public Service Commission, 154 Nassau Street, New York City, N. Y., for reconstructing part of Section No. 9-C-1 of Route No. 9, a part of the Fourth Avenue subway in Brooklyn: Samuel Beskin, Beacon, N. Y., $134,085; Ward & Tulley, Inc., West Twentieth Street and Railroad Avenue, Brooklyn, $141,762; Thomas F. Shaughimessy, Albany, N. Y., $154,144; Frawley, Kaufman Contracting Company, 51 Chambers Street, New York, $158,109; Thomas Crimmins Contracting Company, 444 East Sixty-ninth Street, New York, $168,000; Snare & Triest Company, 233 Broadway, New York, $172,733; Norton & Gorman, 303 Douglas Street, Brooklyn, N. Y., $185,830; J. F. Cogan Company, 233 Broadway, New York, $190,000, and Degnon Contracting Company, 30 East Forty-second Street, New York, $192,389. The work includes the installation of cross-overs and partial reconstruction of De Kalb Avenue Station in the Flatbush Avenue extension in Brooklyn.

Westchester Electric Railroad, Mount Vernon, N. Y.—A tentative proposition recently suggested in connection with the extension of the North Pelham line of this company from Mount Vernon to Tuckahoe, reported in a late issue of the Electric Railway Journal, provides for the immediate construction of an extension to the Chester Hill station of the New York, Westchester & Boston Railroad and later continuing the line to Waverly Square, Tuckahoe, about 1 mile distant.

Dan River Railway, King, N. C.—Grading will soon be begun by this company on the 3-mile section of its line between King and Granite Quarry. This is part of a plan to build a 30-mile line from King to Asbury. H. A. Miller, Clemons, president. [E. R. J., Jan. 17, '14.]

***Canton, Ohio.**—The Chamber of Commerce at Canton, as well as prominent men in both Canton and Steubenville, are interested in the construction in a proposed electric line between Canton and Steubenville, via Carrollton, Minerva, Osnaburg, Oneida and Amsterdam, a distance of 60 miles.

Cleveland, Youngstown & Eastern Railway, Cleveland, Ohio.—At a rehearing before the Public Utilities Commission on Nov. 25, the commission refused to modify its original order that extensive repairs to track and equipment be made on this railway and that until this is done cars must run very slowly between Chagrin Falls and Garrettsville. The company pleaded the stringency of the money market as a reason for not having made repairs under the order.

East Linden Electric Railway, Linden, Ohio.—The Council committee on railroads at Columbus has approved a resolution establishing the route proposed by this company and asking for bids on the lowest rate of fare to be charged over the route. This step was necessary before the Council could advertise for bids. The line will extend from the western end of Leonard Avenue viaduct, near the present terminus of the Columbus line, into the corporate limits of the town of Linden. Paul H. Kohr, secretary. [E. R. J., June 6, '14.]

Toronto, Ont.—The Board of Control has been asked to place before the public on Jan. 1, 1915, a by-law asking for the extension of the Toronto Civic Car Line from St. Clair Avenue south along Vaughan Road to Badhurst Street Hill, and for a similar extension from St. Clair Avenue down Lansdowne Avenue in Toronto.

Toronto (Ont.) Suburban Street Railway.—On the Guelph extension of this company tracklaying has been completed from Islington to beyond Eden Mills. Considerable ballasting has been done, poles have been placed, and other work done. While some work is still in progress west of Eden Mills, operations on other sections of the line have been suspended.

West Side Electric Street Railway, Charleroi, Pa.—This corporation is yet in the formative stages. At present right-of-way is owned by this company traversing the properties of the West Sacramento Company. Capital stock, $1,000,000. Officers: Samuel Pond, president; J. K. Armsby, vice-president, and William Herlitz, secretary.

Philadelphia & West Chester Traction Company, Philadelphia, Pa.—Plans are being considered by this company for a line for East Lansdowne and Lansdowne. It will extend from the terminal at Sixty-ninth Street, thence through private right-of-way to Church Lane and Pembroke Avenue, East Lansdowne, and thence to Stewart Avenue and Lansdowne Avenue, making the terminus at Lansdowne and Baltimore Avenues, Lansdowne.

Rhode Island Company, Providence, R. I.—This company has placed in operation its new Mount Pleasant Avenue line from Chalkstone Avenue to Atwell's Avenue in Olneyville. Plans are being contemplated for a further extension of the new line to the junction of Manton Avenue and Atwell's Avenue, so that the desired belt line to Olneyville Square may be built.

Cumberland Valley Interurban Railway, Nashville, Tenn.—Surveys have been completed by this company through Wilson County, a few miles south of Lebanon, to Watertown, Alexandria, Smithville, McMinnville and Sparta. Branches will be constructed from points along the line to the Hermitage and Lebanon. This line will penetrate territory much of which is not reached by a railroad of any kind. W. G. Baird, Lebanon, president. [E. R. J., July 11, '14.]

Middle Tennessee Traction Company, Nashville, Tenn.—Grading has been completed by this company on the 23-mile section of its line between Franklin and Eaglesville. This line will ultimately connect Franklin, Eaglesville, Shelbyville, Fayetteville, Tenn., and Huntsville, Ala. John A. Pitts, Nashville, president. [E. R. J., June 20, '14.]

Nashville-Gallatin Interurban Railway, Nashville, Tenn.—Among the improvements planned by this company in the near future will be a branch line leaving the main line at Goodlettsville, to Springfield via Guthrie. Ultimately this line will be extended to Clarksville. Another extension contemplated is from Gallatin, the present northern terminus of the main line, to Bowling Green, Ky. An important extension of the line from Nashville to Franklin is already under way.

Bryan & Central Texas Interurban Railroad, Bryan, Tex.—Plans are being considered by this company to build a line from Bryan to Navasota, Tex.

Dallas (Tex.) Consolidated Electric Railway.—Work involving an expenditure of $40,000 will be begun at once by this company on Main Street between Exposition Avenue and Haskell Avenue in Dallas. The improvement includes relaying the present tracks with new rails. The street will also be paved.

Houston (Tex.) Electric Railway.—This company is asked to consider plans to build an extension from Whitman Street, north on Clark Street to Dudley Street, about 1 mile.

Pier Railway, Port Arthur, Tex.—A 1-mile branch from Procter Street to Pleasure Pier in Port Arthur will be constructed by this company during 1915.

Ogden, Logan & Idaho Railway, Ogden, Utah.—Preliminary arrangements are being made by this company for the extension of its line from Idlewild, the present Ogden canyon terminus, to Huntsville. [E. R. J., Oct. 31, '14.]

Utah Light & Railway Company, Salt Lake City, Utah.—This company has a large force of men repaving, constructing and extending some of its lines in Salt Lake City.

***Walla Walla, Wash.**—Plans are being contemplated to build a 75-mile electric railway from Walla Walla to La Grande. Among those interested are: C. J. Franklin, Boise; J. G. Brown, Galion, Ohio, and E. A. Pack, Weiser, Wash.

Washington-Oregon Corporation, Vancouver, Wash.—About 2 miles of new track will be built by this company in Vancouver during 1915.

Charleston, Parkersburg & Northern Railroad, Parkersburg, W. Va.—Bids will be awarded by this company in January to build its electric line between Parkersburg, Charleston, Sissonville and Guthrie. K. B. Stephenson, Parkersburg, secretary. [E. R. J., Sept. 19, '14.]

SHOPS AND BUILDINGS

Bay State Street Railway, Boston, Mass.—On Jan. 1 all departments of this company located in Lynn will move from the old Currier Building, the quarters which they have occupied, and will locate in the second story offices of the new Security Trust Company building at Central Avenue and Willow Street in Lynn.

POWER HOUSES AND SUBSTATIONS

Cleveland & Eastern Traction Company, Cleveland, Ohio.—This company has placed an order with the Westinghouse Electric & Manufacturing Company for three 185-kva, single-phase, sixty-cycle, 16,500-volt high tension to rotary volts low tension O. I. S. C. transformers.

Schuylkill Valley Traction Company, Norristown, Pa.—After being under construction for more than two years, the new plant of the Phœnix Water Power Company at Black Rock, is in operation to supply current for the Schuylkill Valley Traction Company's line between Pottstown and Chestnut Hill. The plant cost $300,000, but in addition to this the Schuylkill Navigation Company expended $100,000 rebuilding the dam and in constructing concrete retaining walls.

Manufactures and Supplies

ROLLING STOCK

Toronto (Ont.) Civic Railway expects to purchase within about a week three light closed motor cars and one sweeper.

Ogden, Logan & Idaho Railway, Ogden, Utah, expects to purchase one electric locomotive within the next two months.

Tidewater Power Company, Wilmington, N. C., is having three 21-ft. semi-convertible city cars built by The J. G. Brill Company.

Shore Line Electric Railway, Norwich, Conn., has issued specifications for about ten double-truck closed passenger cars for city and suburban service; length over buffers to be 47 ft., length of car-body 36 ft.

Bay State Street Railway, Boston, Mass., has ordered one 30-ft. semi-steel semi-convertible city car from the Laconia Car Company. This company is reported to be preparing plans for the purchase of a large number of cars.

London & Port Stanley Railway, London, Ont., expects to order within the next two or three weeks, three two-compartment and three three-compartment 55-ft. passenger motor cars, four trail cars and three 60-ton locomotives.

Empire United Railways, Syracuse, N. Y., is reported to be expecting to purchase twelve cars before Jan. 1, 1915, in addition to those which were noted in the ELECTRIC RAILWAY JOURNAL of August 15 as having been ordered from the St. Louis Car Company.

Boston (Mass.) Elevated Railway is discussing plans to revise the specifications which it has recently issued for the purchase of 100 new cars. The company is reported as considering the purchase of fifty motor cars and fifty trailers instead of 100 trailers, as formerly intended, to be of lighter construction than the design provided for in the original specifications. No decision, however, has yet been reached on this matter.

Charleston (S. C.) Consolidated Railway & Lighting Company announces that it has not purchased twelve all-steel cars, as recently reported. The car specifications which were published in the ELECTRIC RAILWAY JOURNAL of Nov. 14, 1914, apply to twelve composite pay-within street cars, six of which were ordered by this railway from the Cincinnati Car Company in December, 1911, five in November, 1912, and one in September, 1913.

TRADE NOTES

McLeer Electric & Manufacturing Company, Brooklyn, N. Y., manufacturer and engineer, has changed its name and will hereafter be known as the Electric Operations Company, Inc.

Union Switch & Signal Company, Swissvale, Pa., has made the following changes and appointments: Central district, Chicago office, V. K. Spicer, special representative; W. H. Talbert, resident manager; George Marloff, office manager; S. E. Gillespie and J. L. Lucks, engineers. Eastern district, New York office, A. Dean, resident manager; H. McCready, office manager; H. W. Griffin, R. P. Tuttle, J. W. White and H. H. Hamilton, engineers; T. H. Patenall, resident manager, Montreal, Que.

Manganese Track Society and the Steel Foundries' Society at their October meeting adopted standards for manganese steel pointed switches. The joint standardization committee of these societies has agreed upon what, in their opinion, constitutes the best practice in regard to the design and dimensions of manganese steel pointed switches. Its recommendations include the manner of attaching the manganese steel tips to the switch point, limiting the dimensions of the piece, as well as recommendations governing the position of the manganese steel point when it is in contact with the running rail or when the switch is open.

William F. Bauer has been appointed manager of the Chicago office of the Edison Storage Battery Company, succeeding Charles B. Frayer who retired on Nov. 30 to devote himself to private interests. Mr. Bauer has been a familiar figure in railway and electrical circles of Chicago since he went there in 1906 as sales engineer of the Electric Storage Battery Company. In 1889 he was the electrician in charge of the original train lighting equipment of the Chicago Limited of the Pennsylvania Railroad, a lighting system designed by his father, then chief electrician of the Pullman Company at Chicago. Later, after practical experience with the old Electric Accumulator Company, the Westinghouse Electric & Manufacturing Company and the Pullman Company, he became train electrician of the Lake Shore Limited in the employ of the Wagner Palace Car Company. In 1901 he joined the forces of the Consolidated Railway Electric Lighting & Equipment Company and two years later was appointed chief electrician of the Missouri Pacific Railroad in charge of car lighting. Mr. Bauer has been with the Edison Storage Battery Company about a year as assistant manager of the railway department. He is president of the Railway Electrical Supply Manufacturers' Association, an organization in which he has been active since its formation.

ADVERTISING LITERATURE

American Electrical Works, Philadelphia, R. I., has issued a price list of its wire and cable materials.

Independent Pneumatic Tool Company, Chicago, Ill., has issued a folder which describes its "Thor" portable electric drills.

Nungesser Carbon & Battery Company, Cleveland, Ohio, has issued a card on its dry batteries for railway signal service.

Chicago Pneumatic Tool Company, Chicago, Ill., has issued bulletin No. 34 S, describing its small power-driven compressors.

Watson-Stillman Company, Aldene, N. J., has issued a catalog describing its "Kromax" leather packings for various kinds of machinery.

Electric Service Supply Company, Philadelphia, Pa., has issued a folder describing its "Melobeam" incandescent headlights for traction service.

Railway & Power Equipment Company, Buffalo, N. Y. (Charles F. Johnson—established 1901), has issued For Sale List No. 99 with a practical mailing card and a special circular describing a type of portable crane. This company is covering a broad field of equipment, represents several manufacturers, and is handling both new and second-hand equipment. It announces that a broad advertising campaign for the coming year is being planned to include numerous special pamphlets covering separate departments of their business.

Western Electric Company, New York, N. Y., prints as a leading article in the December issue of the *Western Electric News* an illustrated account, entitled "Telephoning the Isthmus," of the telephone construction work installed by this company in the vicinty of the Panama Canal. The article tells for the first time the story of the important part the telephone plays in the operation and management of the canal. Nearly 4000 telephones, together with magnets and central battery switchboards, power plants, cables and other apparatus have been installed in and around the Canal Zone by this company.

Another consolidation hearing was given on Dec. 2 by the Massachusetts Public Service Commission upon the legislative resolve covering proposed transportation improvements in the Boston metropolitan district. James F. Jackson, counsel for the Bay State Street Railway, appeared on behalf of the consolidation of that company with the Boston Elevated Railway. At a previous hearing the commission had requested Mr. Jackson to discuss more in detail the benefits of the consolidation. He pointed out that equalization of fares would be one of the chief gains and said that the financing of necessary transportation improvements, including new subways and rapid transit lines, would be greatly facilitated if a single organization controlled the service in and about Greater Boston. The studies submitted of proposed plans for handling the suburban railroad traffic in connection with downtown electric railways were only tentative, and until an act approving the consolidation was passed, the detail could not be worked out. In closing, Mr. Jackson pointed out that the working out of the consolidation would be completely under the supervision of the commission.

Electric Railway Journal

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road, or even interurban road open-track construction, a certain amount of flexibility is required, while track in paved streets must be as rigid as is consistent with economical operation. To obtain rigidity the foundation must be made much heavier than that actually necessary to carry the track loads. In other words, one should determine the average soil-bearing power condition and then select a foundation which will distribute the track loads well within the safe limit. It would be impractical to change the character of foundation with every slight change in the bearing quality of the soil. On the other hand, it is necessary to change the character of foundation when there is a marked change in the soil-bearing power, such as might be found where track is constructed over filled-in areas or where the soil contains excessive moisture. Of course, a drainage system would go far toward improving the latter condition, while rolling the sub-grade will often be all that is necessary to prepare filled-in areas for foundation construction. To sum up, it appears impossible to calculate exactly the distribution of track loads over the foundation and sub-soil. Hence, the selection of the foundation must be based largely on experience, after such mathematical checks as may be required have been made to determine the relation of the load to be carried to the bearing power of the sub-soil.

SNOW REMOVAL

That the removal of snow from city streets should constitute one of the most exasperating of the unsolved engineering problems of long standing is really remarkable when it is considered that the cost of the fuel necessary to melt the snow would be hardly 15 per cent of the expense of removal involved under present methods, the latter consisting, almost without exception, in shoveling the snow into wagons and carting it away. It may be, of course, that snow storms will have to be fought for some time by this primitive scheme, yet in this age of flying machines and wireless telegraphy one must be a true conservative at heart to accept this as a fact, even though the recommendations of the committee on resolutions of the snow removal conference, which were presented before the American Society of Mechanical Engineers last week, approved no new process except the limited use of the sewer system to get the snow off the streets.

The reasons that prevented the general use of sewers, as outlined in the report, could be summed up in the one generality—insufficient sewage flow. In New York, during the last winter, experiments demonstrated that the large trunk sewers with a continuous and fairly rapid flow were not clogged by any snow that might be shoveled into them. The small sewers, however, of about 12-in. diameter required flushing with hydrant water and even then had to be treated with considerable care.

The same idea has been suggested for Philadelphia, where the contractors are supposed to commence the work of plowing or sweeping the snow to the sides of the streets within one hour after a storm begins, the work of carting the piles away being aided by the use of certain sewer manholes for dumps. It is now planned to extend the use of the sewers by having water connections placed inside of the manholes, thus increasing the flow in the sewer and permitting the flushing away of accumulations of snow.

Removal of snow by flushing the streets with cold water naturally seems like carrying coals to Newcastle, but the experience in Scranton has demonstrated that with proper temperature conditions the scheme is capable of reducing the expense of removal to one-half that of cartage. However, when a cold snap follows a snow storm, the presence of great quantities of water on the streets might easily become fraught with considerable danger. This fact, indeed, is implied in the recommendations of the committee. Considerable hope is also held out in regard to the disposal of snow by melting in a furnace. The committee estimates that with a perfect furnace the cost of the coal required would be 3 cents, or with a furnace efficiency of 33 per cent, 9 cents, per cubic yard, against the present cost of carting of about 50 cents. This difference provides a considerable margin from which, of course, the cost of apparatus, labor and maintenance must be deducted. The problem should be an attractive one to the inventor, because there are many objections to carting besides its cost. One is its slowness, another is the congestion caused in the streets by the carts, and a third is the increasing scarcity in most cities of carts suitable for this purpose, owing to the growing tendency to substitute in commercial work for the horse-drawn cart a specialized motor truck not suitable for snow removal.

Surface railways, of course, are not so much interested in the manner of snow removal as in the provisions for operating their lines during and after snow storms. The matters of complaints from the public and of decreased receipts, which are the invariable accompaniments of heavy snow falls, are of serious importance, and at least one road, the New York Railways, is going to great expense to develop a wing sweeper that will clear a passageway beside the track. This has been planned solely to provide space for vehicular traffic which, during snow storms, utilizes the street railway tracks because these provide the only clear space in the street. Obviously the consequent congestion practically prevents the railway company from moving cars. To meet this difficulty wing brooms have also been suggested for Philadelphia and wing plows have been in successful use in Montreal for several years, a layer of snow being intentionally left on the streets in the latter city. It seems unfair to require a railway company, which is responsible only for the clearing of its tracks, to take care of the snow elsewhere on the street. But in many cases, owing to the slowness of the city force, this appears to be necessary for the railways, purely as a means for self-protection, and the development of wing brooms and wing plows seems to constitute peculiarly the railways' share in the problem, just as much as the prompt removal of the snow piles constitutes the share of the municipality.

FEDERAL AND STATE JURISDICTION OVER CITY RAILWAYS

It is not surprising, in view of the recent establishment of commission regulation in this country, that there should be many unsettled questions as to the powers and duties of regulatory commissions. One of the most important of those which remain to be settled is where the power of the federal commission should end and that of the state commissions begin. It would seem that with all of the problems in connection with valuation of steam railroads and the establishment of freight rates that the Interstate Commerce Commission has enough to occupy its time during the next few years, and that to the various state commissions could be assigned the adjudication of all of the intrastate matters which arise in connection with the operation of electric railways. This was the view which a committee of the American Electric Railway Association urged before a sub-committee of the House committee on interstate and foreign commerce last January in a hearing on several bills which would have brought certain equipment of all electric roads which do any interstate business under the jurisdiction of the Interstate Commerce Commission. The protestants at that hearing called attention to the fact that only a small percentage of their business, averaging in most cases less than 1 per cent, was interstate in character.

Now the question has come up again through an order to the Detroit United Railway, which owns about 800 miles of track in Michigan and 2 miles in Ohio, to make reports to the Interstate Commerce Commission on all accidents including, of course, all of those on its large city system in Detroit. If this policy should be adopted as standard, very few urban companies, certainly among those which haul freight and so issue through bills of lading, would be exempt. Moreover, if the jurisdiction of the Interstate Commerce Commission covers this case, it is likely to cover almost any other detail of city operation, and we should then have a centralized government control of our public utilities in addition to state control.

At the last meeting in Washington the railway managers present did not question the good intentions or the ability of the Interstate Commerce Commission in dealing with these matters, as compared with the state commissions. The principal grounds urged were the absence of knowledge of local conditions and the immense amount of work which would be entailed on a central commission and also on the railways themselves in taking up all of these subjects at the federal capital as well as at the state capitals.

If precedent can count for anything, the decision of the Supreme Court in the opinion on the case of the Omaha & Council Bluffs Street Railway vs. the Interstate Commerce Commission (230 U. S. 324) would indicate that that court does not believe that the interstate commerce law covers cases of this kind. At Omaha the situation was somewhat different because the question was one of rates on street railways which happened also to be interstate roads. The conclusion reached then by the court was that the character of the service was the criterion of whether a road is embraced under the interstate commerce law, and certainly the character of the accidents in city service and the means to be taken to avoid them by fenders or otherwise bears little relation to what is generally understood as interstate commerce. We hope that the hearing at Washington next Friday, to which a letter from Arthur W. Brady in our "Communication's" column this week calls attention, will be effective in impressing this fact upon the Interstate Commerce Commission.

HUMANIZING DISCIPLINE

A casual study of a number of bulletins issued to platform men indicates an often unnecessary brusqueness in many of the instructions and little or nothing of a commendatory nature. Of course, the purpose of the merit and demerit system in disciplining trainmen has taken this into account to a certain extent, but attention is here directed to the day-to-day bulletins. Would not the suggestive effect of a meritorious act spread on these bulletins be of much value in disciplining and at the same time offer relief from the constant repetition of "do" and "don't"? Orders must, of course, be issued, but occasional commendation and a mixing of the "sweet" with the "bitter" will help greatly toward better service. The iron hand of discipline might well be covered with the silk glove of consideration. In other words, the human side of disciplining must be recognized.

The frailties of the human mind and body have been thoroughly safeguarded in the operation of trains, so as to make the man as nearly as possible an automaton. All of these precautions have done much to make operation more safe, but they cannot make a machine out of the human body. Hence disciplining in various forms is necessary to make up for this deficiency, and the point we have in mind is that, in disciplinary methods, full cognizance should be taken of the human factor. To illustrate what we mean, take the case of the application of discipline after accidents have occurred. After a serious accident the superintendent's first tendency is to discharge the offenders if they prove to have been guilty of lack of attention or lapse of memory. It is worth while in such cases to go behind the facts and consider some of the contributing causes and thus possibly justify the retention in service of men who will afterward be much more valuable on account of the accident. A momentary mental lapse during a run may result in disaster. Yet we all have mental lapses and the very fact that a man has had no accidents or "near" accidents during his railway career may in itself have made him subject to a false sense of security. As he ages in service his alertness is apt to become sluggish. But this defect may be more than made up, so far as his value of the company is concerned, by better knowledge of local conditions and clearer judgment. This fact should receive consideration when his case is decided. After he gets his "nerve" back he may be a safer man than one with no accident to his credit.

New Cars of Seattle Municipal Railway

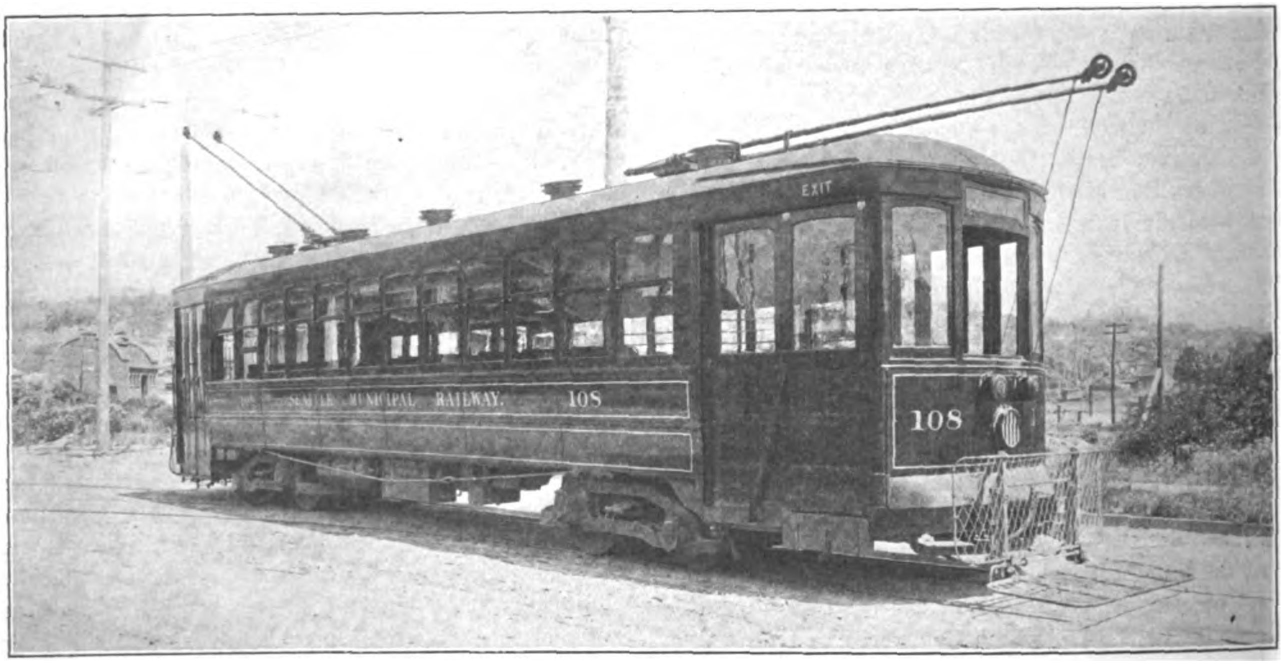
Multiple-Unit Control Arranged for a Double Trolley Wire System, Gearless Air Compressors and Air-Operated Fenders Are Among the Unusual Features of These Cars

BY H. J. KENNEDY, ELECTRICAL AND MECHANICAL ENGINEER

In the ELECTRIC RAILWAY JOURNAL, April 26, 1913, and June 20, 1914, some general accounts were given of the municipal railway construction in Seattle. In the present article the new cars built for this railway by the Cincinnati Car Company are described.

The twelve cars are of the double-end, semi-convertible "pay-within" type, having composite-type framing, exterior doors on platforms, and no interior bulkheads. They have arch roofs, are mounted on maximum-traction trucks, and have the following general dimensions:

Length of car over bumpers	44 ft. 5 in.
Length of car over vestibules	43 ft. 1 in.
Length of car over end posts	31 ft. 1 in.
Spacing of transverse seats	2 ft. 5½ in.
Width of car over posts	8 ft. 5 in.
Height of car over trolley boards	11 ft. 2 in.
Distance between truck centers	23 ft. 1 in.
Seating capacity	48
Weight of car empty, approximately	42,000 lb.
Weight empty, per passenger seat	875 lb.



SEATTLE MUNICIPAL CAR—GENERAL VIEW OF CAR IN OPERATION

The 75-hp motors which are of the Westinghouse 310-C type, were tested at the builders' works by coupling two together, running one as motor and the other as generator, on 125 per cent and 100 per cent loads. In addition, an overspeed test of 1800 r.p.m. and 2600-volt one-minute insulation tests on field and armature were made. One out of each twelve motors had a one-hour A. I. E. E. temperature run, at full load. Commutation was also tested at 200 per cent load. On the one-hour run at 500 volts, a current of 107 amp was applied at 460 r.p.m. to 475 r.p.m., heating the series field (the hottest part) to 79 deg. Cent., the air being 23 deg. Cent.

Among the other items of equipment on the cars are "Utility" ventilators, "Standard" motor trucks, Agasote ceiling, Hale & Kilburn seats, Crouse-Hinds headlights, Earll trolley retrievers, Pantasote curtains, Johnson fare boxes and Forged Steel Wheel Company's rolled steel wheels. The interior lighting of the car is effected by 23-watt, Mazda, half-frosted, incandescent lamps, one lamp being placed over each seat and three being located in each vestibule. The latter are connected in series with the destination sign and headlight at the opposite end of the car.

CONTROL SYSTEM AND WIRING

The control system is Westinghouse type HL, electro-pneumatic, with master controllers at each end of the car. Train line receptacles have not been provided, but they can be added at any time when it is desired to arrange for running multiple-unit trains. At the time the cars were ordered, the future conditions of operation of the road were so uncertain that it was felt to be an advantage to have cars which could, if needed, be used in multiple-unit train operation by the addition of the train line receptacles. At present, with the exception of the third-rail interurban line to Tacoma, electric cars for passenger service in Seattle rarely haul trailers or run in trains. However, the Seattle, Renton & Southern Railway, which connects with the new line is, in conditions affecting rolling-stock, almost an interurban and it is difficult to foretell what future conditions may be.

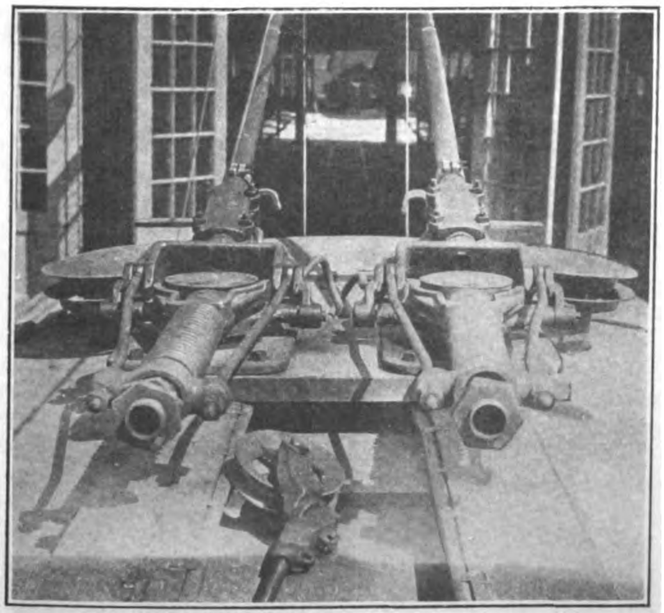
The standard control system has been modified for the double-trolley system which has been installed on the Seattle Municipal Railway, by the addition of an extra line switch in the unit-switch group with corresponding contacts in the master controllers and by an additional control switch in the hood connected on the negative side of the circuit. The overload trip relays on the line switches, positive and negative, of the unit switch groups are set at 325 amp. Instead of one control-

reset switch in the hood, as usual in the unit-switch system, there are two switches, one with fuses on the positive side and one on the negative side of the car circuit, the former being double-throw, the latter single-throw. It may be noted that the apparatus will work if polarity be reversed, the signs mentioned indicating the normal method of operation.

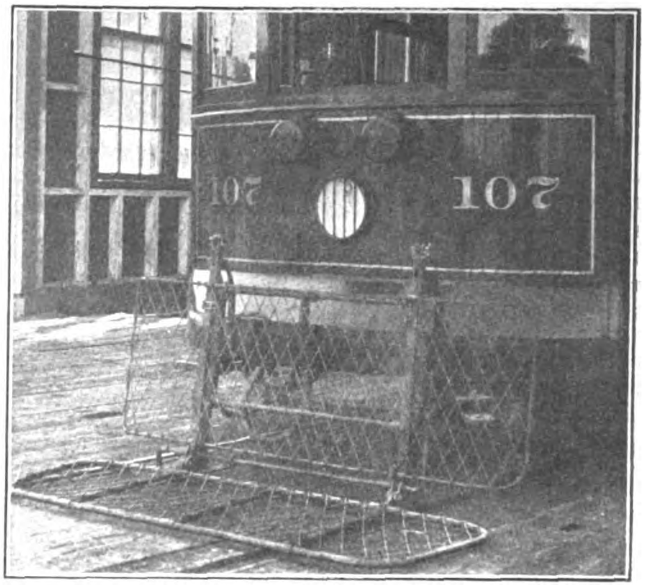
A feature of the wiring peculiar to these cars is the installation under the hood at each end of the car of a single-pole double-throw knife switch encased in a box. The blade of the switch is connected at the hinge to ground to truck, and the terminals to the positive and negative trolleys, respectively. In running from a double-trolley to a single-trolley track, one trolley pole is hooked down and the grounding or transfer switch is thrown to connect the truck with it. It is possible to make the change without stopping the car. For the cars that are in continuous service on the single-trolley Lake Burien Division, however, the negative trolley poles have been entirely removed.

An interesting feature to note in this connection is that, in case of the use of a grounded neutral for the three-wire generators which have been installed in the substation, as soon as a car passes from the double-trolley to the single-trolley line, the position of the ground relative to the outside of circuit moves over by 300 volts, assuming 600 volts total emf. In other words, the potential on the single-trolley wire would be 300 volts higher than that on the positive double-trolley wire, when measured with reference to the ground. Hence there must be an insulated break between the two systems, although, if the car should run past the break with the controller on, the grounding switch being instantly thrown at the same time, there would be no change in the emf impressed on the motors, since the grounding switch raises the negative potential 300 volts simultaneously with the raising of the positive, so that the difference of potential between outside terminals is the same as before. Even if it were possible to perform this experiment, it would not, of course, be made an operating practice because of the consequences in case of failure to perform it successfully. It should be noted that up to date the line has been operated without grounding the direct-current neutral. The three-wire generators are for probable commercial loads.

The trolley bases were designed especially for these cars. The base casting is rectangular, 12 in. x 18 in., the two being mounted side by side on wood trolley boards so as to have a 6-in. air gap between them. The base castings are not themselves live, the trolley poles being insulated from the sockets by a ¼-in. thickness of insulating bushing. The roof cables are connected, not to the bases as is usual but to the poles by flexible pig tails. The poles on diagonally opposite corners of the car are connected to each other, so that the right hand one is positive independent of direction of running, assuming that the overhead system is connected up that way. However, in certain cases of special work, the polarity on the trolley wires is reversed for a short distance. The bases are ball bearing and have one spring.



SEATTLE MUNICIPAL CAR—VIEW SHOWING POSITIVE AND NEGATIVE TROLLEYS AND BASES



SEATTLE MUNICIPAL CAR—VIEW SHOWING FENDER HELD DOWN ON CURVED TRACK BY AIR PRESSURE IN CYLINDERS

GEARLESS AIR COMPRESSOR

An interesting feature of the brake equipment is the gearless air compressor, made by the Allis-Chalmers Manufacturing Company. This is remarkable for its compactness and small weight of 425 lb. including suspension cage. It has three cylinders which are approximately horizontal and are connected to the same shaft with a four-pole 600-volt motor, the latter taking 5.7 amp, 3.42 kw, when delivering 18 cu. ft. of free air per minute against 90 lb. pressure, with a temperature rise not exceeding 50 deg. Cent., when operation does not continue over thirty minutes out of an hour. The cylinders are provided with sliding sleeve intake valves of the type used in the Knight automobile engine. These valves are operated by eccentrics on the crank shaft, compelling the opening and closing to be at exactly the proper instant, and insuring large port openings.

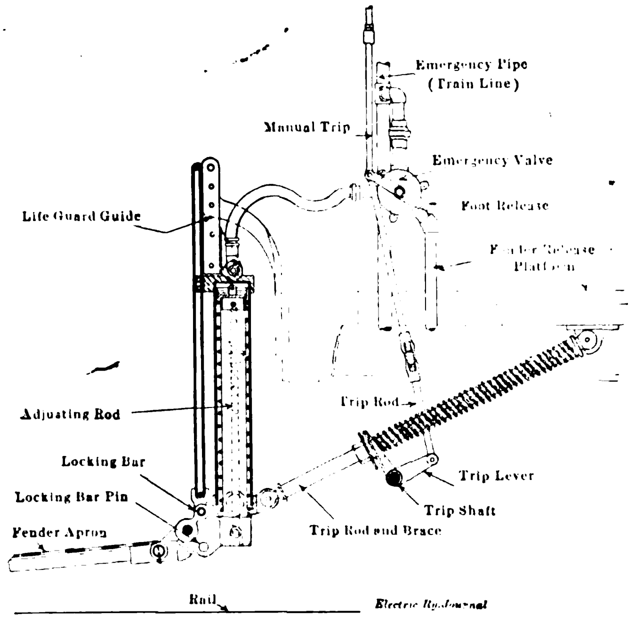
The compressor is 21⅝ in. from the cylinder head to outside of motor casing, and 29⅜ in. long over all measured parallel to shaft. In spite of its speed it operates without any disagreeable vibration. Instead of the noticeable pulsation of the usual geared compressor, the sound takes the form of a hum, due to the speed of rotation and the use of three cylinders instead of two. The motor brushes are readily accessible from the outside of the car by opening the cover located just below the side sill.

PNEUMATIC FENDERS

The fenders on these cars are of the Nelson pneumatically-operated type, generally similar to those used in Portland, Ore., and other places, but of a design improved in several particulars. The fender, both apron

and lifeguard, is hung on slides and kept at its normal height by helical springs contained in two vertical cylinders of 3-in. boiler tube, attached to the bumper beam of the car by brackets. The springs are 2 11/16 in. in outside diameter, 22 in. in free height and have about twenty-three coils of ¼-in. steel. The weight of the moving parts is about 180 lb. Upon admission of air to the cylinders, the springs are compressed and the sliding parts forced down upon the track very quickly and held down with strong pressure so as to scoop up anything lying thereon. The apron is framed of ¾-in. standard wrought-iron pipe and is 78 in. wide over all, and 26 in. deep over all. The frame is filled in with mesh of No. 7 steel wire, 3½-in. diamond mesh. The lifeguard or vertical screen is framed of ¼-in. round iron, is 78 in. wide over all and 27 in. high over all, and is filled in with mesh similar to the apron. The projection of the apron in front of the bumper beam is approximately 33 in. The front edge of the apron is suspended so that it clears the track by about 6 in.

A few inches above the platform floor is placed a special rotary fender valve with axis horizontal. On the stem is a lever with a pedal, and with a link connection to the swinging fender, which is hung on pins on the brackets. Impact with some body on the track will therefore throw the fender back and operate the fender valve. The fender valve can also be operated by a bronze handle placed beside the motorman's brake valve and connected by link with the fender valve. In an emergency, when confronted with the danger of running over someone, the motorman uses this handle instead of the air-brake handle, pushing it away from him in practically the same direction as in moving the brake valve handle to emergency. This results not only in dropping the fender on the rails but also in making an emergency application of the air brakes, by admitting air through the fender valve independent of the regular brake valve. Pressure on the pedal releases the air from the fender cylinders and allows the springs again to raise the fender. The air brake is then released by the brake valve in the ordinary way, a check valve preventing the air from running back through the fender valve, although permitting air to be fed through fender valve to brake cylinders, with brake valve in "lap" position.



SEATTLE MUNICIPAL CAR—ELEVATION SHOWING FENDER MECHANISM

A fender is permanently attached to the bumper beam at each end of car, the fender not in use being folded up against the dashboard, allowing freedom of motion for the drawbars. There is a double articulation for folding, the first motion merely folding the apron against the lifeguard, the second doubling both of them up and back against the dash. The weight specified for each fender is not in excess of 210 lb., and the pressure on the travel stops of the moving part which drops on the track is specified to be at least 500 lb., but not in excess of 1000 lb., with a pressure of 60 lb. per square inch in the air cylinder.

Electric Sign in Street Railway Competition

As a stranger in the city of Topeka emerges from the union railway station, he is greeted with the shouts of hackmen and cabmen seeking business. If he is alert and is inclined to be thrifty, his eye soon catches sight of a small but concisely worded electric sign on a pole across the street. This sign is shown in the accompanying illustration. Its legend reads "Cars Leave This Point Every Five Minutes Reaching All Parts of City."

CARS LEAVE THIS POINT EVERY FIVE MINUTES REACHING ALL PARTS OF CITY

TOPEKA ELECTRIC SIGN WHICH ATTRACTS THE TRAVELER'S CUSTOM

The Topeka Street Railway, operated by the McKinley Syndicate, has chosen electrical advertising as the most efficient method of attracting the attention of the traveling public and thereby bringing the nickels to the company's purse. It is noticeable that in Topeka the bus and cab business is less flourishing than in the neighboring towns and cities.

Passenger Traffic to Illinois State Fair

The Springfield Consolidated Railways Company of Springfield, Ill., reports that 67,000 less passengers were handled in 1914 than in 1913, to and from the Illinois state fair grounds in that city. In 1913 the company handled to the fair grounds a total of 798,000 passengers and in 1914 the number dropped to 731,000. These figures include all transfers from other lines in the city, police passes and all other forms of free transportation allowed by law. The largest day in the state fair week this year was Thursday when 115,000 fares were collected. This is a falling off of 29,000 fares from the largest day in 1913. The company has not sought to ascertain the reason aside from the fact that the state fair of Illinois in 1914 was not as well attended as was the exposition in 1913 and in previous years. The ticket sales at the fair grounds gates showed a decided falling off from the previous year and the receipts of the Springfield Consolidated Railway Company showed a similar decline.

Fair Interest on Investment in Public Utilities

The Author Discusses the Claim that Rates Should Be Based on Depreciated Values and Points Out that the True Criterion Is the Principal Invested—Different Values Also for Rate-Making and Taxation

BY H. J. DAVIES, TREASURER CLEVELAND RAILWAY

John B. Geijsbeek, C.P.A., contributed an article to the April, 1914, number of the *Journal of Accountancy* on "Fair Return to Public Utilities," in which he undertook to show the normal value of a public utility plant to be about 54.55 per cent of its original cost, or half-way between cost and scrap value. Mr. Geijsbeek says that this premise is not new and was described in a report made in September, 1912, to the Public Service Commission of St. Louis by James B. Allison, its chief engineer.

The operating efficiency of a traction plant is probably as high as that of a telephone plant, used by Mr. Geijsbeek for illustration, and higher than 54.55 per cent of its original cost. In a growing city a public utility plant never stands still, never is finished, never stops growing. Demand for additional service requires an increased supply of capital. And so the investment, the amount of "original cost," becomes legitimately larger, annually, monthly, almost daily. And the cost of the additional property is so large a proportion of the total investment that always more than half the property is less than half worn out—has lived less than half its life. The value of such a property, therefore, never falls to an average or "normal" of 54.55 per cent, or half-way from its original cost to its selling price as scrap.

Public utility companies usually own land, and the value of land in a growing community usually appreciates instead of depreciates as the value of all other property does. This enhancement in the value of land tends to keep the average value of the whole property above the half-way point on the road from first cost to final junk pile.

A "normal value line" of 50 per cent or 55 per cent can only apply to or be true of a utility that is neither increasing nor decreasing its plant or its service. Every public service company that is adding to its property to meet the increasing demands and needs of the public has, and must necessarily have, a property worth more than 54.55 per cent of its cost.

DEPRECIATED VALUE STILL IN PROPERTY

Mr. Geijsbeek says that "if depreciation is charged in addition to repairs and renewals, the public, or the consumer, has paid back to the utility company that amount for immediately existing reduction in the value of the property due to wear and tear not yet made good by renewals. That is either in the pockets of investors or stockholders or is in a reserve fund; if not in the fund, then it is in the reserve account and has been used to purchase additional plant. This, the depreciated plant value, added to earned surplus either on hand or paid to stockholders, will equal the original investment. In such a case a fair return can be only on the depreciated value of the original cash investment, and not on the cost of reproduction. Therefore, if depreciation is allowed in addition to repairs and replacements, the cash investment upon which a fair return is allowed is reduced each year by the amount of depreciation so allowed."

This is not so, unless the amount of the depreciation is returned to the investors as part of their principal. If the amount of all depreciation is returned to the investors as part of their principal, then, when replacements are needed, it will be necessary to invest new capital, which also must be returned with full interest.

If the stockholders have received from earnings, in addition to a fair return of interest upon their investment, a part of the investment itself, and if the contract between the utility and the municipality limits the rate of interest upon investment, it may be proper to reduce the capitalization, or the amount upon which interest shall be paid; but if the principal of the stockholders is kept in the business, whether a depreciation reserve adequate to provide for the disappearing value of the physical property is set up or not, the stockholders should receive interest upon the entire amount and not merely on the depreciated value of the property. Mr. Geijsbeek seems to see this in his "Conclusions as to Deterioration," for he says "Instead of paying this depreciation item to its stockholders in dividends out of surplus, this amount may be held by the company in a reserve account or, sometimes, a reserve fund, in order to keep the investment always at 100 per cent, i.e., present value (or, ultimately, normal value) plus unconsumed depreciation reserve, must always equal original cost." He further says, and truly, that it is difficult to divide the difference between "cost new" and "present value" into renewals and what he says is called depreciation, viz., "that unknown portion of plant value lying between reproduction and normal values that will never be replaced by renewals and which should remain in the reserve accounts or funds to be given to the stockholder at the cessation of operations in order to return to him the 100 per cent he originally invested."

In the meantime, and until the cessation of operations, or at least until he gets his money, or some of it, back, the stockholder should receive interest on the entire amount of his original investment and not merely on the remaining value of the property purchased with his money.

INTEREST SHOULD BE PAID ON ENTIRE PRINCIPAL

Again, under the heading "Fair Return on Investment," Mr. Geijsbeek writes: "Having decided the subject of depreciation, the question of fair return on the investment comes up. It seems almost impossible to find any two men who agree on what amount the interest considered to be the fair return should be charged. Especially is there a great difference of opinion as to whether the fair return should be calculated on the original cost value or the cost to reproduce the property, or whether it shall be the depreciated value, or the present value, which ultimately will become the normal value."

On the contrary, it is difficult to see how any two men can disagree as to the amount on which interest should be charged. It should be the full amount of honest investment, not the depreciated or present value of the physical property. The toll or rate of fares should be high enough to pay expenses, taxes, a fair interest on original cost, i.e., investment, and to set up a maintenance reserve equal to the difference between cost and present value. If this reserve, which may be

in cash, securities or other physical property (cash and securities are as much property as cars or telephone wires), is adequate, then the value of the company's property will be equal to the investment—as it should be. If, instead of providing for such a reserve, and then keeping it in cash or investing it in additional physical property or in securities, the company uses it to return to its stockholders a part of their principal, calling in some of the outstanding stock or bonds, it may be argued that, the investment having been reduced, the rate thereafter should be based upon so much of the original amount as is still invested. In no case should the rate be based upon present (depreciated) value—unless the stockholders have received, in addition to their interest, the entire difference between cost and present value. If a part of the investment of the stockholders has been returned from earnings and the amount of stock or bonds originally issued has been correspondingly reduced, or if additional property has been purchased from earnings and the difference between investment and present value has been thus lessened, the ratepayers who have contributed to the earnings so used have paid more than should have been charged them; and the ratepayers of the future will be charged less than they ought to pay, because they will pay upon a valuation smaller than the amount of money invested for their benefit.

For illustration, suppose an investment of $1,000,000 in an electric railway property, under an agreement between the company and the municipality that 10 per cent per annum on the investment shall be paid to the stockholders of the company, and suppose that a depreciation of 20 per cent, or $200,000, ensues, the remaining value of the property being $800,000. The company ought then to have, in addition to the $800,000 worth of physical property, a reserve of $200,000 to take care of the 20 per cent depreciation. If, instead of keeping this reserve in cash or investing it in bonds or other property, the company should pay it to the stockholders, in addition to interest at the rate of 10 per cent per annum, then 10 per cent interest on the remaining $800,000, instead of on the original investment of $1,000,000, may be the fair return thereafter, because 20 per cent of that investment has been returned to the investors. In that case $200,000 of the stock or bonds should be called in.

This transaction is perfectly fair and just to the investors and the company; but is it fair to the car-riders of the period in which the depreciation occurred or the reserve was accumulated? Should they have paid for their rides $200,000 in addition to 10 per cent ($100,000) upon the original investment? And should the car-riders of the future have the benefit of that contribution to capital by the car-riders of the earlier period and receive their rides for 10 per cent ($80,000) on only $800,000? If so, then when the property is worn out, or becomes inadequate or obsolete, and is replaced by other property, the cost of the new property must be provided from new capital, on which interest must be paid. And so, instead of paying off a part of capital as physical property depreciates and calling for additional capital when the time for replacement comes, the practice has been to set aside a reserve for maintenance or for depreciation and replacement of physical property and to invest the reserve, or some part of it, in securities or additional physical property. It is not necessary that the reserve be kept in cash. Invested in securities or physical property it should earn a larger return than savings bank interest. This practice is a better security for the investment than alternate payments of principal and demands or calls for new principal.

The car-riders of each month or year should pay a toll or rate of fare sufficient to enable the company to pay its operating expenses, its taxes and a fair rate on its investment, and, in addition, to set up out of the earnings of the month or year a reserve sufficient to take care of the depreciation, as nearly as it can be estimated, in the value of the physical property in the month or the year. The reserve ought not to be less than the depreciation. It ought not greatly to exceed it. Of course, the depreciation is not susceptible of exact ascertainment in advance; but it is possible to make a reasonable estimate, based on the experience of the company and the known experience of other companies in the same business. The reserve should be ample—too large rather than too small. It is easier to reduce the rate of fare to correct an overestimate than to raise the rate to make good an underestimate.

If it were practicable, from the beginning of such an enterprise as an electric railroad, to pay to the stockholders as a partial return of the investment the amount of the increasing difference between the original cost and the present value of their property until the average or "normal" value, or a still lower value, was reached, calling in outstanding stock or bonds as partial return of investment was made, then it would be necessary, whenever renewals or replacements were required, to call on the investors or the public for additional capital to pay for new property to take the place of the obsolete, inadequate or worn-out equipment.

A reserve to provide for repairs as well as for renewals and depreciation would seem to be better than a reserve for depreciation merely, or for depreciation and renewals. It may be called a maintenance reserve. It should be large enough to provide for the difference between cost and the remaining value, at any time, of the physical property. An amount should be set aside in cash each month or each year, or by other periods, equal to the estimated difference between cost and present value in the period, and charged to expense. This reserve should be used for repairs and renewals. The excess above expenditures may be invested.

Different Values for Rate-Making and Taxation

Public utility managers and taxing officials have been embarrassed and confused by attempts to fix one value of physical property for rate-making purposes and another value for purposes of taxation. There should be no confusion. The value for rate-making purposes may be greater than the value for taxing purposes without inconsistency. The value for rate-making purposes should be cost or reproduction value; the value for purposes of taxation should be the value at the time of the tax assessment. If the maintenance reserve is sufficient to make good the difference between cost and present value, the tax value will be the same as the value for rate determination. The property taxed will include the maintenance reserve, whether the reserve is in cash, securities or plant. If the reserve is not as large as the difference between the original cost and the present value of the property, the loss is not the public's but the company's. It indicates that the fare is not high enough to secure the entire investment and a fair return upon it. The public gains, therefore, rather than loses.

The company should not be taxed on the amount of its loss by reason of the insufficiency of the fare to provide for depreciation and reasonable dividends; it is enough that it be taxed on the fair value of its property, including whatever is in its maintenance reserve. It should not be taxed upon its capitalization, unless its physical property and its reserve are equal to its capitalization; and even then the basis of taxation should

be expressed as the value of the property and not as the capitalization. It should not be taxed on the capitalized value of its supposed or actual net earnings, as has been attempted in Ohio. If the rate of fare is inelastic—fixed by contract for a term of years—and the company cannot pay reasonable dividends and provide a sufficient reserve to take care of the difference between cost and present value, it must forego the dividends or a part of them, or, at the end of the contract, lose the difference between cost and the value at that time of its property. But the value of the property, including the value of the reserve, should be the basis of taxation. If the combined value of the existing property and the reserve is equal to the investment, the value for taxation and the value for rate-making will be the same. If the reserve is too small, the loss of the difference between cost and present value, or any part of that difference, will be, as before stated, the investor's loss, and not the public's, in the case of a franchise with a fixed rate of fare. If the reserve is too large under such a contract, the company will gain, but the public will pay only the rate of fare it contracted to pay and will gain in taxes on the excess of value. In the case of a franchise providing for an elastic fare, like the Cleveland franchise, if the company cannot earn its fixed rate of interest and a sufficient reserve at the going rate of fare, the fare may, and ought to be, raised. If the earnings are more than sufficient to pay the stipulated interest and provide a sufficient reserve for maintaining the property at a value equal to its cost or agreed "capital value," then the rate of fare may be reduced. Capital should equal cost—should be neither more nor less than cost. Conversely, cost should equal capital. Present value, plus reserve, should equal cost. But whether capitalization, original cost and present value plus reserve are equal to each other or not, the basis of taxation should be the present value of the property, including the reserve. That value may be more or less than the original cost or the outstanding capital. In either case, it, and it only, should be taxed.

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Discussion on Government Ownership

The National Civic Federation Devoted One Session to Discussion of This Subject

One session of the fifteenth annual meeting of the National Civic Federation, held at the Hotel Astor, New York, on Dec. 4 and 5, was devoted to discussion on the subject of "Governmental versus Private Enterprise." Samuel Gompers, president American Federation of Labor, presided at this meeting which was held on the afternoon of Dec. 4. In opening the meeting Mr. Gompers spoke of the committee of the American Federation of Labor which went to Europe to investigate the subject of public ownership and its relations to workers in the endeavor to reach proper conclusions on this much-mooted question. An abstract of this report was published in the issue of this paper for Nov. 21. Mr. Gompers added that the question was not merely academic, but the claims of each side should be critically examined to disclose whether the proposal is practicable or impracticable, wise or unwise.

DISCUSSION BY PROFESSOR JENKS

The first speaker was Prof. Jeremiah W. Jenks, New York University, who said that the post-office department, so far as anyone can learn, has made no statement of cost accounting in connection with the parcel post, so that one can determine whether it is really carrying cheaper than do the express companies or whether, as seems not improbable, the difference in charges to shippers is made up by the low rates forced upon the railroads against their will or by shifting the burden upon other branches of the postal service or upon the taxpayers. Concerning the question of whether municipal utilities shall be owned and managed by the municipality or by private companies under municipal control, Professor Jenks thought the advocates of this plan should declare what they considered should be guiding principles. Is it to be better service, cheaper service, even free service, or revenue? Whatever the principles may be, the facts should be known. If we are to compare costs, let us have identical systems of cost accounting. If the question is service, let us know whether the people prefer seats or to wait for half an hour before they get a ride, as passengers often have to do in continental cities. If the government is to take the telephone and telegraph, is it to secure better service or cheaper service or for the protection of the people? The state ought to undertake nothing without definite knowledge of the facts to guide it.

Professor Jenks said that in the discussion of the subway situation in New York City which preceded the settlement and the recent contracts, much time was given to the consideration of the matter by public officials. If this had been the time of the officials of a private corporation their salaries and the interest on the capital would be charged as part of the cost of the undertaking. He had never heard it suggested that if there was to be proper cost accounting these costs should be included under the existing subway arrangement, or that the rent for quarters in the City Hall should be so apportioned that part of the charge should be allocated for the time thus spent. All of these considerations were dropped. If private and public operations are to be compared all of these should be included. There is not now sufficient knowledge to permit careful consideration, and this will not be obtainable until systematic cost accounting is introduced.

DISCUSSION BY CONGRESSMAN LEWIS

Congressman David J. Lewis spoke in favor of public ownership of the telephone and telegraph service.

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"Postalization" of telephone and telegraph service would bring under the control of the government the only outstanding means of communication. Manifestly competition in electrical means of communication is wasteful. On economic grounds that field belongs to monopoly which alone can discharge the functions with proper regard to the price. The speaker pointed out one difference between the express companies, which have been affected by the parcel post, and the telephone and telegraph companies, which would be affected by public ownership. He said that the express companies were really only preferred shippers on the railroad while the telephone and telegraph companies had large investments of their own capital in plants.

DISCUSSION BY MR. GORDON

F. R. G. Gordon, organizer American Federation of Labor, Boston, gave facts and statistics to controvert the argument and statements of Congressman Lewis. He said that practically every telephone and telegraph government system abroad is run with extraordinarily poor service, although paying about one-third of the wages to operatives that are paid by the American Telephone & Telegraph Company and the Western Union Telegraph Company. He said that the so-called wonderful post-office department of the government is the worst managed big business in the country. The post-office department is the recipient of very large favors from other departments of the government because of the failure to introduce cost accounting principles between the various departments. The post-office department does not pay for either use or care of many buildings which it occupies. Mr. Gordon said that the reason why the post-office department is able to claim a success in the parcel post is that it does not pay the railroads what it should pay them for carrying packages. The United States pays less than any other government for transportation of its mail. To take over the telephone and telegraph system would mean that all of the people would be taxed for the benefit of the 5 per cent or 6 per cent who use the service and are best able to pay the bills therefor. He declared that public ownership was cursed by red tape and was characterized by inefficient service, poor wages and large deficits. Governments have always been extravagant and wasteful.

DISCUSSION BY DR. HOWE

Dr. Frederick C. Howe, commissioner of immigration of New York, in his argument in favor of public ownership, declared that probably the political and moral gains would be even more important than the financial and social gains. Public ownership removes one of the principal causes of corruption from politics.

DISCUSSION BY MR. SULLIVAN

J. W. Sullivan, member of Typographical Union, New York, made an address on "Municipalization or a Just Regulation, a Plea for the Facts." Mr. Sullivan was a member of the National Civic Federation commission which studied the subject of municipal ownership abroad in 1907. He also spent last summer in Europe and rendered assistance to the committee of the American Federation of Labor which studies electric railway labor conditions abroad.

He said that comparisons of British and American street railway fares were usually misleading because the British municipal tramways rarely give transfers and that a passenger changing from one line to another paid another fare and was counted as a second passenger. For all distances beyond 5.8 miles the fares in Glasgow are higher than the American 5-cent fare, and Glasgow has only 1 mile of track per 6779 of its population, whereas Philadelphia has 1 mile per 2533, or three times the accommodations. For most British cities, fares beyond 3½ miles are higher than the standard American fare and transfer. The British systems also invariably stand second to American systems in speed, headway, car lighting and in an all-night service. European tramway managers are now abandoning the rule of a seat for every passenger, borrowing from America the practical idea, especially in rush hours, when all the cars possible are run, that the extra people want to travel speedily to their destination standing in the cars rather than to lose time and endanger their health standing on the street corners waiting exposed to the weather. Mr. Sullivan quoted a number of failures of British municipal enterprises, including the municipal Thames River boat system with a loss of $2,500,000, and the Glasgow municipal telephone system with a loss of $275,000, and said that the municipal ferry system of New York was a grand object lesson in municipal ownership.

In discussing the labor situation on municipal roads abroad he said in part: "Strikers against municipalized undertakings are treated as mutineers; the position of the municipal wage-working employee is that of a common soldier directed by a drill sergeant, whose whip is a discharge which closes to the man other municipal employment everywhere. Among the assumed certainties of the early theoretical municipalizers was set down the one that municipal employees would not or could not strike. But bitterly contested tramway strikes, viewed by the authorities as rebellions, have taken place in the last four years in Leeds, Stockport, Blackburn, Cardiff, Oldham, Liverpool and Glasgow. After the Glasgow strike of 1911, 400 of the strikers were victimized and never allowed to return to the service, and after the strike in Leeds in 1913 practically the entire tramway force was similarly victimized. In Glasgow, in the seven years, 1901-1908, 1228 traffic employees were dismissed and 2384 resigned, a number equivalent to a change of the entire traffic force every four years, testimony to an unhappy situation. The Glasgow tramway management, maintaining an open shop, permits no labor union of employees to exist. Were all Britain to imitate the attitude of Glasgow's municipal committee and managers toward labor, no employee would be permitted to be active in politics, no man would be taken on at work without a civil service examination, no trade agreement could be thought of, no liberty of association among the wage-workers could exist, no work at his trade could be found by a man once blacklisted, and no labor movement would be tolerated in the country."

After referring to the report of Messrs. Mahon and Bland on labor conditions abroad, abstracted in a recent issue of this paper, Mr. Sullivan said: "Municipalism breaks down trade union principles; it substitutes for them a one-sided dictation which strips labor of independent action in its own behalf, clothes managers with the powers of an upper caste, backed by the forces of law, and to the extent that it prevails establishes in society a condition destructive of democracy. On that score alone the American wage-worker needs only to have experience with it to reject it. But the American wage-worker, a citizen with the cause of his country at heart, may be depended on to weigh the facts in general relative to municipalism, when he finally obtains access to them, and render fair judgment in the case. Further, whatever is to be said of contests over wages or of the social unrest, it is usually a fact that American employees regard their employers as friends for whose rights they will contend as they would for their own, and if municipalism is to be built up on abuse of the employer and depriving him of any of his just rights, it to-day stands small chance of success."

B. R. T. Safety Work for Employees

Moving Pictures as a Safety Lesson for the Mechanical Department's Men—Safety Programs of Mechanical and Transportation Departments, Including List of Suggestions Adopted by the Former and Employees' Committee—Organization of the Latter

The thorough safety campaign which the Brooklyn Rapid Transit System has carried on for a year or more among the general public, and particularly among the schools, has lately been extended to its employees. As one feature to secure the interest of the men a safety rally was held for the employees of the mechanical department at the East New York headquarters of the B. R. T. Employees' Benefit Association on Saturday night, Dec. 5. The meeting was under the chairmanship of W. G. Gove, superintendent of equipment mechanical department, who introduced as the speakers of the evening H. A. Bullock, chairman of the company's central safety committee, and Dr. Francis D. Patterson, director of the department of sanitation and accident prevention formed jointly by The J. G. Brill Company, Harrison Brothers Paint Company and Electric Storage Battery Company, all of Philadelphia. A concert by the B. R. T. Employees' Band preceded the addresses.

Mr. Gove told what the mechanical department had already done for safe operation. It had occurred to him, however, that a face to face meeting with the men would accomplish even more than correspondence and bulletins. He emphasized the fact that mechanical protection was not everything. Real safety could be achieved only with the co-operation of the individual workers.

Mr. Bullock, after being introduced by Mr. Gove, said that the object of the company was to make the endeavor for safety continuous and permanent. Working rules were just as necessary to maintain the morale of a shop as of an army. He then gave a résumé of the growth of the "safety first" movement and showed particularly how electric railway hazards had been increased by the introduction of heavier, faster cars and the congestion of city tracks. Discussing safety from the psychological standpoint, Mr. Bullock told how custom breeds such indifference to danger that a soldier will risk his life to get a light for his pipe. The same characteristic leads a workman to become careless in doing things that always have an element of danger, such as climbing ladders, serving rip-saws and steam hammers, etc. Co-operative action as well as the physical resistance embodied in rules and devices was necessary to combat this tendency. In conclusion, Mr. Bullock asked every man to appoint himself a safety inspector to aid in the removal of dangerous conditions, and to resolve furthermore that if any casualties did occur to a fellow-worker he would make use of the company's first-aid treatment instead of trying to carry out the cure himself.

Following the showing of the company's well-known safety film, "The Price of Thoughtlessness," the audience was addressed by Dr. Patterson. The speaker first presented some statistics of railway and individual accidents in the United States, and followed this with a splendid collection of slides which illustrated the wrong and right way of doing scores of building, yard and machine tool jobs. As an example of what safety work could do, he said that accidents at the Brill shops had been cut from 260 to thirty a month. One of the most prolific sources of accident had been protruding nails. This evil had been scotched so thoroughly that during the past six months not one nail wound had occurred to a Brill workman. It was a good thing to have employees' safety committees, for a man who had once served on such a committee was likely to retain his interest in the work. Dr. Patterson's pictures and his comments on them were well received.

In taking the floor again, Mr. Gove said that the mechanical department had done much to attain safety, but more remained to be done. He wanted the men to understand that he was just as anxious to have safe and satisfactory working conditions for them as he was to have safe and satisfactory cars. As an individual he could do much for their welfare and he knew that he could rely upon co-operation of the office staff with which he was in daily contact, but his goal would not be attained unless the man behind the tool was also determined to help. Without clean shops, clean floors and clean machines, and without due regard by each man for the welfare of his fellow-employee, the organization would never get anywhere. In analyzing the shop accident reports covering the preceding six months he had been deeply impressed to find that 75 per cent of them could have been avoided had the injured man used ordinary care. In conclusion, Mr. Gove mentioned the probable early formation of employee's safety committees at each shop. He also assured the men that every suggestion for betterment would receive due attention.

The meeting concluded with a display of several moving pictures by Dr. Patterson, one of which told the story of an old-fashioned workman whose ill-timed counsel to remove a safety device on gearing was responsible for a serious injury to his future son-in-law.

DEPARTMENTAL SAFETY COMMITTEE OF THE MECHANICAL DEPARTMENT

The departmental safety committee organized for the mechanical department has already submitted a report for the first three months of its existence, July 1 to Sept. 30, 1914, and will hereafter continue to submit similar quarterly reports. The committee is composed of the following officials: superintendent of equipment, chairman; superintendent Fifty-second Street surface shop, vice-chairman; division shop foreman Southern division; foreman Crosstown surface carhouse shop, and the superintendent of electric car equipment. The chairman serves continuously while the other members hold office for one year from June 30, 1914. The plan is to appoint those holding similar positions in the mechanical department as members of the succeeding committees. Local shop committees, if appointed, will report to the departmental committee. Regular meetings are held at 3 p. m. every Monday in the office of the superintendent of equipment. Special meetings are held at the different shops whenever called by the vice-chairman.

The following is an abstract of the first quarterly report which was distributed in an edition of 3500 to employees of the department. The next edition will total 12,000 copies and will be distributed to all employees of the company. The report was produced by the department with a motor-driven American Multigraph.

SAFETY REPORT OF THE MECHANICAL DEPARTMENT

The first work of the departmental safety committee was to make the following recommendations:

Place mail boxes in all shops for safety suggestions, providing frames to post pictorial matter in reference to safety work; supply supporting beams at maintenance

in cash, securities or other physical property (cash and securities are as much property as cars or telephone wires), is adequate, then the value of the company's property will be equal to the investment—as it should be. If, instead of providing for such a reserve, and then keeping it in cash or investing it in additional physical property or in securities, the company uses it to return to its stockholders a part of their principal, calling in some of the outstanding stock or bonds, it may be argued that, the investment having been reduced, the rate thereafter should be based upon so much of the original amount as is still invested. In no case should the rate be based upon present (depreciated) value—unless the stockholders have received, in addition to their interest, the entire difference between cost and present value. If a part of the investment of the stockholders has been returned from earnings and the amount of stock or bonds originally issued has been correspondingly reduced, or if additional property has been purchased from earnings and the difference between investment and present value has been thus lessened, the ratepayers who have contributed to the earnings so used have paid more than should have been charged them; and the ratepayers of the future will be charged less than they ought to pay, because they will pay upon a valuation smaller than the amount of money invested for their benefit.

For illustration, suppose an investment of $1,000,000 in an electric railway property, under an agreement between the company and the municipality that 10 per cent per annum on the investment shall be paid to the stockholders of the company, and suppose that a depreciation of 20 per cent, or $200,000, ensues, the remaining value of the property being $800,000. The company ought then to have, in addition to the $800,000 worth of physical property, a reserve of $200,000 to take care of the 20 per cent depreciation. If, instead of keeping this reserve in cash or investing it in bonds or other property, the company should pay it to the stockholders, in addition to interest at the rate of 10 per cent per annum, then 10 per cent interest on the remaining $800,000, instead of on the original investment of $1,000,000, may be the fair return thereafter, because 20 per cent of that investment has been returned to the investors. In that case $200,000 of the stock or bonds should be called in.

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One session of the fifteenth annual meeting of the National Civic Federation, held at the Hotel Astor, New York, on Dec. 4 and 5, was devoted to discussion on the subject of "Governmental versus Private Enterprise." Samuel Gompers, president American Federation of Labor, presided at this meeting which was held on the afternoon of Dec. 4. In opening the meeting Mr. Gompers spoke of the committee of the American Federation of Labor which went to Europe to investigate the subject of public ownership and its relations to workers in the endeavor to reach proper conclusions on this much-mooted question. An abstract of this report was published in the issue of this paper for Nov. 21. Mr. Gompers added that the question was not merely academic, but the claims of each side should be critically examined to disclose whether the proposal is practicable or impracticable, wise or unwise.

Discussion by Professor Jenks

The first speaker was Prof. Jeremiah W. Jenks, New York University, who said that the post-office department, so far as anyone can learn, has made no statement of cost accounting in connection with the parcel post, so that one can determine whether it is really carrying cheaper than do the express companies or whether, as seems not improbable, the difference in charges to shippers is made up by the low rates forced upon the railroads against their will or by shifting the burden upon other branches of the postal service or upon the taxpayers. Concerning the question of whether municipal utilities shall be owned and managed by the municipality or by private companies under municipal control, Professor Jenks thought the advocates of this plan should declare what they considered should be guiding principles. Is it to be better service, cheaper service, even free service, or revenue? Whatever the principles may be, the facts should be known. If we are to compare costs, let us have identical systems of cost accounting. If the question is service, let us know whether the people prefer seats or to wait for half an hour before they get a ride, as passengers often have to do in continental cities. If the government is to take the telephone and telegraph, is it to secure better service or cheaper service or for the protection of the people? The state ought to undertake nothing without definite knowledge of the facts to guide it.

Professor Jenks said that in the discussion of the subway situation in New York City which preceded the settlement and the recent contracts, much time was given to the consideration of the matter by public officials. If this had been the time of the officials of a private corporation their salaries and the interest on the capital would be charged as part of the cost of the undertaking. He had never heard it suggested that if there was to be proper cost accounting these costs should be included under the existing subway arrangement, or that the rent for quarters in the City Hall should be so apportioned that part of the charge should be allocated for the time thus spent. All of these considerations were dropped. If private and public operations are to be compared all of these should be included. There is not now sufficient knowledge to permit careful consideration, and this will not be obtainable until systematic cost accounting is introduced.

Discussion by Congressman Lewis

Congressman David J. Lewis spoke in favor of public ownership of the telephone and telegraph service.

LIBRARY OF THE UNIVERSITY

"Postalization" of telephone and telegraph service would bring under the control of the government the only outstanding means of communication. Manifestly competition in electrical means of communication is wasteful. On economic grounds that field belongs to monopoly which alone can discharge the functions with proper regard to the price. The speaker pointed out one difference between the express companies, which have been affected by the parcel post, and the telephone and telegraph companies, which would be affected by public ownership. He said that the express companies were really only preferred shippers on the railroad while the telephone and telegraph companies had large investments of their own capital in plants.

DISCUSSION BY MR. GORDON

F. R. G. Gordon, organizer American Federation of Labor, Boston, gave facts and statistics to controvert the argument and statements of Congressman Lewis. He said that practically every telephone and telegraph government system abroad is run with extraordinarily poor service, although paying about one-third of the wages to operatives that are paid by the American Telephone & Telegraph Company and the Western Union Telegraph Company. He said that the so-called wonderful post-office department of the government is the worst managed big business in the country. The post-office department is the recipient of very large favors from other departments of the government because of the failure to introduce cost accounting principles between the various departments. The post-office department does not pay for either use or care of many buildings which it occupies. Mr. Gordon said that the reason why the post-office department is able to claim a success in the parcel post is that it does not pay the railroads what it should pay them for carrying packages. The United States pays less than any other government for transportation of its mail. To take over the telephone and telegraph system would mean that all of the people would be taxed for the benefit of the 5 per cent or 6 per cent who use the service and are best able to pay the bills therefor. He declared that public ownership was cursed by red tape and was characterized by inefficient service, poor wages and large deficits. Governments have always been extravagant and wasteful.

DISCUSSION BY DR. HOWE

Dr. Frederick C. Howe, commissioner of immigration of New York, in his argument in favor of public ownership, declared that probably the political and moral gains would be even more important than the financial and social gains. Public ownership removes one of the principal causes of corruption from politics.

DISCUSSION BY MR. SULLIVAN

J. W. Sullivan, member of Typographical Union, New York, made an address on "Municipalization or a Just Regulation, a Plea for the Facts." Mr. Sullivan was a member of the National Civic Federation commission which studied the subject of municipal ownership abroad in 1907. He also spent last summer in Europe and rendered assistance to the committee of the American Federation of Labor which studies electric railway labor conditions abroad.

He said that comparisons of British and American street railway fares were usually misleading because the British municipal tramways rarely give transfers and that a passenger changing from one line to another paid another fare and was counted as a second passenger. For all distances beyond 5.8 miles the fares in Glasgow are higher than the American 5-cent fare, and Glasgow has only 1 mile of track per 6779 of its population, whereas Philadelphia has 1 mile per 2533, or three times the accommodations. For most British cities, fares beyond 3½ miles are higher than the standard American fare and transfer. The British systems also invariably stand second to American systems in speed, headway, car lighting and in an all-night service. European tramway managers are now abandoning the rule of a seat for every passenger, borrowing from America the practical idea, especially in rush hours, when all the cars possible are run, tnat the extra people want to travel speedily to their destination standing in the cars rather than to lose time and endanger their health standing on the street corners waiting exposed to the weather. Mr. Sullivan quoted a number of failures of British municipal enterprises, including the municipal Thames River boat system with a loss of $2,500,000, and the Glasgow municipal telephone system with a loss of $275,000, and said that the municipal ferry system of New York was a grand object lesson in municipal ownership.

In discussing the labor situation on municipal roads abroad he said in part: "Strikers against municipalized undertakings are treated as mutineers; the position of the municipal wage-working employee is that of a common soldier directed by a drill sergeant, whose whip is a discharge which closes to the man other municipal employment everywhere. Among the assumed certainties of the early theoretical municipalizers was set down the one that municipal employees would not or could not strike. But bitterly contested tramway strikes, viewed by the authorities as rebellions, have taken place in the last four years in Leeds, Stockport, Blackburn, Cardiff, Oldham, Liverpool and Glasgow. After the Glasgow strike of 1911, 400 of the strikers were victimized and never allowed to return to the service, and after the strike in Leeds in 1913 practically the entire tramway force was similarly victimized. In Glasgow, in the seven years, 1901-1908, 1228 traffic employees were dismissed and 2384 resigned, a number equivalent to a change of the entire traffic force every four years, testimony to an unhappy situation. The Glasgow tramway management, maintaining an open shop, permits no labor union of employees to exist. Were all Britain to imitate the attitude of Glasgow's municipal committee and managers toward labor, no employee would be permitted to be active in politics, no man would be taken on at work without a civil service examination, no trade agreement could be thought of, no liberty of association among the wage-workers could exist, no work at his trade could be found by a man once blacklisted, and no labor movement would be tolerated in the country."

After referring to the report of Messrs. Mahon and Bland on labor conditions abroad, abstracted in a recent issue of this paper, Mr. Sullivan said: "Municipalism breaks down trade union principles; it substitutes for them a one-sided dictation which strips labor of independent action in its own behalf, clothes managers with the powers of an upper caste, backed by the forces of law, and to the extent that it prevails establishes in society a condition destructive of democracy. On that score alone the American wage-worker needs only to have experience with it to reject it. But the American wage-worker, a citizen with the cause of his country at heart, may be depended on to weigh the facts in general relative to municipalism, when he finally obtains access to them, and render fair judgment in the case. Further, whatever is to be said of contests over wages or of the social unrest, it is usually a fact that American employees regard their employers as friends for whose rights they will contend as they would for their own, and if municipalism is to be built up on abuse of the employer and depriving him of any of his just rights, it to-day stands small chance of success."

B. R. T. Safety Work for Employees

Moving Pictures as a Safety Lesson for the Mechanical Department's Men—Safety Programs of Mechanical and Transportation Departments, Including List of Suggestions Adopted by the Former and Employees' Committee—Organization of the Latter

The thorough safety campaign which the Brooklyn Rapid Transit System has carried on for a year or more among the general public, and particularly among the schools, has lately been extended to its employees. As one feature to secure the interest of the men a safety rally was held for the employees of the mechanical department at the East New York headquarters of the B. R. T. Employees' Benefit Association on Saturday night, Dec. 5. The meeting was under the chairmanship of W. G. Gove, superintendent of equipment mechanical department, who introduced as the speakers of the evening H. A. Bullock, chairman of the company's central safety committee, and Dr. Francis D. Patterson, director of the department of sanitation and accident prevention formed jointly by The J. G. Brill Company, Harrison Brothers Paint Company and Electric Storage Battery Company, all of Philadelphia. A concert by the B. R. T. Employees' Band preceded the addresses.

Mr. Gove told what the mechanical department had already done for safe operation. It had occurred to him, however, that a face to face meeting with the men would accomplish even more than correspondence and bulletins. He emphasized the fact that mechanical protection was not everything. Real safety could be achieved only with the co-operation of the individual workers.

Mr. Bullock, after being introduced by Mr. Gove, said that the object of the company was to make the endeavor for safety continuous and permanent. Working rules were just as necessary to maintain the morale of a shop as of an army. He then gave a résumé of the growth of the "safety first" movement and showed particularly how electric railway hazards had been increased by the introduction of heavier, faster cars and the congestion of city tracks. Discussing safety from the psychological standpoint, Mr. Bullock told how custom breeds such indifference to danger that a soldier will risk his life to get a light for his pipe. The same characteristic leads a workman to become careless in doing things that always have an element of danger, such as climbing ladders, serving rip-saws and steam hammers, etc. Co-operative action as well as the physical resistance embodied in rules and devices was necessary to combat this tendency. In conclusion, Mr. Bullock asked every man to appoint himself a safety inspector to aid in the removal of dangerous conditions, and to resolve furthermore that if any casualties did occur to a fellow-worker he would make use of the company's first-aid treatment instead of trying to carry out the cure himself.

Following the showing of the company's well-known safety film, "The Price of Thoughtlessness," the audience was addressed by Dr. Patterson. The speaker first presented some statistics of railway and individual accidents in the United States, and followed this with a splendid collection of slides which illustrated the wrong and right way of doing scores of building, yard and machine tool jobs. As an example of what safety work could do, he said that accidents at the Brill shops had been cut from 260 to thirty a month. One of the most prolific sources of accident had been protruding nails. This evil had been scotched so thoroughly that during the past six months not one nail wound had occurred to a Brill workman. It was a good thing to have employees' safety committees, for a man who had once served on such a committee was likely to retain his interest in the work. Dr. Patterson's pictures and his comments on them were well received.

In taking the floor again, Mr. Gove said that the mechanical department had done much to attain safety, but more remained to be done. He wanted the men to understand that he was just as anxious to have safe and satisfactory working conditions for them as he was to have safe and satisfactory cars. As an individual he could do much for their welfare and he knew that he could rely upon co-operation of the office staff with which he was in daily contact, but his goal would not be attained unless the man behind the tool was also determined to help. Without clean shops, clean floors and clean machines, and without due regard by each man for the welfare of his fellow-employee, the organization would never get anywhere. In analyzing the shop accident reports covering the preceding six months he had been deeply impressed to find that 75 per cent of them could have been avoided had the injured man used ordinary care. In conclusion, Mr. Gove mentioned the probable early formation of employee's safety committees at each shop. He also assured the men that every suggestion for betterment would receive due attention.

The meeting concluded with a display of several moving pictures by Dr. Patterson, one of which told the story of an old-fashioned workman whose ill-timed counsel to remove a safety device on gearing was responsible for a serious injury to his future son-in-law.

DEPARTMENTAL SAFETY COMMITTEE OF THE MECHANICAL DEPARTMENT

The departmental safety committee organized for the mechanical department has already submitted a report for the first three months of its existence, July 1 to Sept. 30, 1914, and will hereafter continue to submit similar quarterly reports. The committee is composed of the following officials: superintendent of equipment, chairman; superintendent Fifty-second Street surface shop, vice-chairman; division shop foreman Southern division; foreman Crosstown surface carhouse shop, and the superintendent of electric car equipment. The chairman serves continuously while the other members hold office for one year from June 30, 1914. The plan is to appoint those holding similar positions in the mechanical department as members of the succeeding committees. Local shop committees, if appointed, will report to the departmental committee. Regular meetings are held at 3 p. m. every Monday in the office of the superintendent of equipment. Special meetings are held at the different shops whenever called by the vice-chairman.

The following is an abstract of the first quarterly report which was distributed in an edition of 3500 to employees of the department. The next edition will total 12,000 copies and will be distributed to all employees of the company. The report was produced by the department with a motor-driven American Multigraph.

SAFETY REPORT OF THE MECHANICAL DEPARTMENT

The first work of the departmental safety committee was to make the following recommendations:

Place mail boxes in all shops for safety suggestions, providing frames to post pictorial matter in reference to safety work; supply supporting beams at maintenance

shops in jacking cars; provide on all air hoists cylinder head with jaw for hanging in place of heads with hook upset inside of head, thereby permitting more ready and easy inspection; take photographs to illustrate accidents that frequently occur and that are due to carelessness; use sheet metal non-slip slings for handling armatures; paint red all safety appliances and devices installed at shops, attached to or placed around machinery.

The following work has already been undertaken:

Installed safeguards around machinery at Thirty-ninth Street elevated shop on Sept. 21 for $397.83; at Southern Division elevated shop on Aug. 13 for $344.35, and at Fifty-second Street surface shop (under way) for about $133; purchased four hydraulic jacks for DeKalb Avenue shop (under way) for about $460; constructed four hooks for hoisting open cars at the Ninth Avenue shop on July 23 for $188.07; constructed and installed mail boxes for safety suggestions, and frames for pictorial matter, at all shops (under way) for about $112.78.

The accidents during the quarter under report are classified in the accompanying table.

SUMMARY OF ACCIDENTS

Class	Injuries	52d St. Srf. Shop	Ea. Div. El. Shop	39th St. El. Shop	El. Mtce. Shops	S. C. H. Shops	Totals
A	Cuts	8	28	87	9	20	152
B	Burns	2	3	3	2	7	17
C	Bruises	6	11	44	9	15	85
D	Bones broken...	..	..	..	..	1	1
E	Sprains and strains	6	..	5	2	1	14
F	Electric shocks.	..	..	1	1	..	2
G	Foot punctures.	1	..	5	..	..	6
H	Nails torn off..	1	2	1	..	..	4
J	Eye	1	5	3	..	..	9
K	Loss of member	1	..	..	..	..	1
L	Internal	..	1	1	..	..	2
	Totals	26	50	150	23	44	293

Attention is specifically directed to the large number of miscellaneous accidents which consist principally of accidents that occurred to employees while they were engaged in their regular duties and which, in most cases, were the result of carelessness, such as striking hand against projecting nails or sharp corners, dropping material which struck the person handling same or others, jumping from car or truck to floor, etc. The figures cover a total of 2000 employees. The comparatively large number of accidents at the Thirty-ninth Street shops were due to the extraordinary reconstruction of 2411 surface cars for air-brake service as described in the ELECTRIC RAILWAY JOURNAL for Oct. 31, 1914.

SURFACE TRANSPORTATION DEPARTMENT

Bulletin No. 11, just issued from the office of William Siebert, superintendent of surface lines, outlines the safety work of the surface transportation department. The safety committee of this department consists of the following: superintendent of surface lines, chairman; chief of the time-table department, supervisor of instruction, supervisor of line inspection, superintendent of employment, general inspector and two assistant superintendents. All the assistant superintendents will serve in turn on the committee.

In every depot there has been organized a depot safety committee, consisting of the following: Assistant superintendent in charge of the depot, chairman; day depot master, night depot master, one starter, one inspector, three motormen and three conductors. The starter and the inspector will be designated in rotation, so that all starters and inspectors will serve in turn. On Dec. 7, 1914, the motormen and conductors were elected by all the motormen and conductors at the depot in the following way:

The twenty motormen longest in service at the depot on the regular list and the five motormen longest in service at the depot on the extra list were the nominees in the first election, and each motorman in the depot force voted for three out of the twenty-five nominees. The same practice was carried out for conductors. The men who led in the vote received will serve six months on the depot safety committee, while those who secured the second largest number of votes will serve four months and the third highest men, two months.

At the future elections which will be held every two months, one motorman and one conductor will be chosen from a list of twenty-five motormen and twenty-five conductors as in the first election. In this way membership of the depot safety committee will rotate.

Membership is voluntary. Members who are paid by the hour are allowed compensation at their regular rate for time actually spent in assignments of safety work made by the departmental committee. The names of those elected are posted in the extra room, together with the names of the other members of the committee. The stenographer attached to the assistant superintendent's office serves as secretary of the committee. Regular meetings will be held weekly.

For the safety suggestion box the company has provided two forms as follows: Form A to cover suggestions submitted for consideration by the depot safety committee and departmental safety committee, but not requiring immediate consideration; Form B to cover suggestions relating to safety matters requiring immediate consideration, and submitted to the assistant superintendent, depot master or other official in charge of the depot at the time such suggestions are made.

Safety suggestions submitted on Form A are considered by the depot safety committee and the departmental safety committee. They are written on a special form (not reproduced), showing the name, class of employment of the man who makes the suggestion, and the badge number, all written above a perforated line, while the suggestion itself is written below a perforated line. These suggestions are deposited in the safety suggestion box, from which they are removed each day by the assistant superintendent, who forwards them to the office of the superintendent of surface lines, where the portion of each form above the perforated line is detached and placed in a file. The portion of each blank below the perforated line will be returned to the safety committee of the originating depot, which will approve or disapprove them without knowing the names of the writers. The depot safety committee's report on the suggestions is transmitted to the departmental safety committee, which reviews the report and recommends to the superintendent of surface lines for immediate or ultimate adoption, any suggestions which it approves. As each part of the form has a serial number, the names of the men whose suggestions are adopted can be readily determined by headquarters and due credit given.

No discipline is administered to any employee on account of facts revealed by safety suggestions submitted, and employees are asked to feel entirely free to discuss in these suggestions any conditions which bear upon the problem of safety without regard to the question of reflecting upon the work of any other employee. The same credit is given to employees who make meritorious suggestions on Form B as in the case of suggestions on Form A submitted through the safety suggestion box.

The following outline of topics for safety suggestions has been prepared for the guidance of employees:

A—Reports of conditions which are observed to be the cause of accidents. B—Reports of conditions which in the judgment of the employee submitting them may be the cause of accidents. C—Changes of methods which will tend to prevent accidents occurring or likely to occur as reported under (A) or (B). D—Changes in track construction or equipment which will tend to prevent accidents occurring or likely to occur as reported under (A) or (B). E—Any idea which in the judgment of an employee will promote safety in operation.

The safety bulletin board which carries bulletins, pictures and other data relating to safe operation is under the jurisdiction of the depot safety committee.

Convention of Pennsylvania Association

A Full Report of This Meeting in Harrisburg, Abstracts of the Various Reports and Papers Presented are Published—The Topics Considered Included Questions Relating to Engineering, Accounting, Transportation and Public Relations

The winter meeting of the Pennsylvania Street Railway Association was held in the Board of Trade Building, Harrisburg, on Dec. 8 and 9. The opening session on Tuesday was called to order at 1:45 p. m. by C. L. S. Tingley, vice-president Scranton Railway, who then read his president's address. This was followed by an address by Prof. Emory R. Johnson, member Public Service Commission of Pennsylvania, on the subject of "Electric Railways and the Public." These addresses are abstracted elsewhere in this issue. At the conclusion of Professor Johnson's address, E. H. Davis, manager Williamsport (Pa.) Passenger Railway, moved a vote of thanks, which was duly seconded and carried, and President Tingley assured the commissioner that the officers and members of the association were always ready to co-operate with the commission along the lines indicated. H. M. Stine, secretary-treasurer, then rendered a report for the year, showing a balance of more than $2,200. On motion of T. A. Wright, vice-president and general manager Wilkes-Barre Railway, the report was referred to an auditing committee to be appointed by the chair.

President Tingley at this point remarked that he had been requested by C. Loomis Allen, president American Electric Railway Association, to remind the delegates of the winter conference of the American Association to be held in Washington on Jan. 29. For specific information he called upon E. B. Burritt, secretary-treasurer of the American Association, who said that a very attractive program had been provided for the Washington meeting. The meeting was being held in that city largely on account of the opportunity for added publicity. President Wilson had promised to receive the delegates at the White House, and the meeting topic of "Public Relations" would be ably discussed by T. S. Williams, president Brooklyn Rapid Transit Company, and other notable speakers. Mr. Burritt also urged attendance at San Francisco next autumn. In closing he emphasized the desirability of closer relations between the national and the state associations, in which he was cordially seconded by President Tingley.

W. A. Heindle, superintendent Southern Pennsylvania Traction Company, Chester, Pa., next presented eight problems that had been referred to the "Question Box" and urged a spirited discussion thereon at the next session. President Tingley appointed F. B. Musser, president and general manager Harrisburg (Pa.) Railways; C. H. Bishop, president Valley Railways, Lemoyne, Pa., and Thomas Cooper, Philadelphia representative Westinghouse Electric & Manufacturing Company, as members of the nominating committee to report on the following day. The meeting was then suspended while the stereopticon apparatus was being set up, after which W. R. Stinemetz, in connection with his paper on "The Latest Developments in Street Railway Equipment," presented pictures and charts to illustrate means of cutting operating expenses through saving power and of increasing revenues through doing a freight business. The paper by Mr. Stinemetz is published in abstract form in another column.

RATES AND TARIFFS

The progress report of the committee on preparing and filing rates and tariffs was read by C. B. Fairchild, Jr., executive assistant Philadelphia Rapid Transit Company. Mr. Fairchild said that the Interstate Commerce Commission tariff requirements were extremely voluminous, but that in consultation with the traffic bureau of the Public Service Commission of Pennsylvania the committee had endeavored to boil down the federal requirements for State use. He mentioned the necessity of filing exceptions to the official classification and the overlapping of fare zones as two matters requiring special attention. The tentative draft submitted by the committee for discussion was criticised by W. B. Rockwell, manager Eastern Pennsylvania Railways, Pottsville, Pa., on the ground that freight and express tariffs were classified under one head. In his opinion the two classes may easily be separated by remembering that all express is delivered and called for, which is not true of freight as regards rates. Mr. Rockwell said that he recently rented a car to the express companies at a fixed sum per car-mile. If electric railways took up the question of express rates, they should charge on the basis of the pound-mile, but the pound must be limited as regards its cubic contents.

President Tingley stated that it was not within the province of the committee to discuss the setting of rates, inasmuch as it was appointed to solve rather the vexatious problem of securing non-cumbersome rules for filing rates and tariffs. As regards the distinction between freight and express, he felt that the combination classification best recognized existing inconsistencies in such kinds of traffic on Pennsylvania electric railways and had the support of the Public Service Commission. Mr. Rockwell said that no company should carry freight or express in passenger cars or handle such traffic at all if its business did not warrant special cars for such purposes. However, according to an analysis of the varieties of freight and express service in the State, made by Mr. Fairchild, many small companies secure both increased revenues and better public relations by offering a little express or light freight service, and the joint classification is well suited to all such railways. Mr. Rockwell moved the acceptance of the progress report and the continuation of the committee, which was duly seconded and carried.

With the meeting then open for new business, Secretary Stine read a letter from R. P. Stevens suggesting that the association follow the lead of the American Association and substitute "Electric" for "Street" in its name. President Tingley said that the committee which drafted the constitution had discussed this point but had deemed the change unwise on account of the prestige of the old name. Mr. Davis called attention to the fact that under the act of 1889 most companies in Pennsylvania are incorporated as "street" railways, and Mr. Fairchild quoted the new public service commission law to show further adherence to this practice. Mr. Wright moved that the letter be laid on the table, which was carried.

CLASSIFICATION OF VOLTAGES AND SAFETY RULES

Owing to the inability of Gordon Campbell, president York Railways, to be present on Wednesday, the report of the committee on classification of voltages, of which he is chairman, was moved ahead a day on the program. An abstract appears elsewhere.

J. W. Welsh, electrical engineer Pittsburgh Railways, stated that the proposed Pennsylvania rules for safety had been submitted to the American Institute of Electrical Engineers and had been referred to the code committee of this association. He attended the meetings of the code committee as a representative of the American Electric Railway Association. At two meetings in the last month the committee recommended several changes in the rules, especially with regard to striking out the classification of low potential as up to 300 volts, high potential as 300 volts to 3500 volts and extra-high potential as above 3500 volts. Mr. Welsh criticised the idea running through the code that less than 300 volts were harmless and more than 300 volts destructive, for such a classification was purely arbitrary and injurious to the public, and no reason existed for such voltage classification from the standpoint of safety. The rules were also modified to apply only to cases of new installation. The general requirements of the code were not stringent and would be acceptable to most electric railway companies.

Mr. Fairchild quoted a recent order on his company to provide a guard on the blank polished end of a converter shaft in a substation as showing how vital this question is. Mr. Davis urged every member to read Circular No. 49, for in his opinion the rules suggested will prevent companies from pleading customary reasonable care against accidents and will increase the physical space required for attachments. President Tingley said that at one conference in Philadelphia the State Department of Labor and Industry had admitted that it had not considered street railways in the voltage classification, and this led to the reference of the question to the American Institute of Electrical Engineers. F. R. Phillips, superintendent of equipment Pittsburgh Railways, said that the real sting of the proposed State code lay in the voltage classification and he desired the opinion of the practical operating men of the American Electric Railway Engineering Association on the subject.

EMPLOYERS' COMPENSATION ACT

President Tingley announced that the draft of the employers' compensation act made by a special commission appointed by the Governor was now in print and ready for distribution. The meeting was then adjourned. At 7:30 p. m. an informal dinner was served to the members of the association and guests at the Harrisburg Club.

WEDNESDAY'S SESSION

The last day's session was called to order on Wednesday at 10 a. m. President Tingley stated that he had been asked by Mr. Burritt to announce that a one-hour hearing on the subject of reporting accidents was to be held before the Interstate Commerce Commission in Washington on Dec. 18. The commission is attempting to require the Detroit (Mich.) United Railway to report all accidents in the city of Detroit because it has a spur line running into Ohio. In view of the fact that many urban lines have extensions crossing state borders, the American Electric Railway Association has taken this matter up. Although only one speaker will be allowed at the hearing, a general demonstration is desired, for the entering of appearances will be allowed by the Interstate Commerce Commission.

The report of the committee on a uniform crossing agreement was then presented by its chairman, R. P. Stevens, president Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. In connection with the report Mr. Stevens said that at a conference in Philadelphia the previous day it seemed that a closer feeling was being manifested between electric railways and other utilities in the State. The telephone companies were showing more co-operation, and if the telegraph companies and the Pennsylvania Railroad could be led to see electric railway difficulties, an acceptable and workable crossing agreement could be devised. An abstract of Mr. Stevens' report is published in another column. On motion the report was accepted and the committee was continued.

HEIGHTS OF CAR STEPS

In the absence of the chairman, H. J. Crowley, vice-president Scranton Railway, the report of the committee on height of street car steps was read by P. N. Jones, general manager Pittsburgh Railways. This committee was appointed to take up with the Public Service Commission of Pennsylvania the matter of the height of car steps. A meeting was held with representatives of the commission during the last national convention, and a large amount of data from the national body was submitted to the commission. Later the committee conferred with car builders, who furnished considerable construction data covering the limitation of minimum height allowable. This, together with photographs taken underneath a car to show the necessary equipment for its operation and control, has been turned over to the commission, upon which now devolves the task of determining the maximum height in accordance therewith. On motion the report was received and filed with thanks.

On account of the unavoidable absence of H. S. Swift, treasurer West Penn Traction Company, Pittsburgh, Pa., his paper on "The Work of the Accounting Officer of Public Service Corporations" was read by Mr. Fairchild. An abstract of this paper is published elsewhere.

QUESTION BOX

In taking over the meeting for the discussion of "Question Box" problems, Mr. Heindle said that fuller information should henceforth be presented with questions so as to cover all essential local conditions. Regarding the first question on what is the best automatic signal system for a medium sized single track interurban line operating at not very high speed, Mr. Heindle said that in times of rigid economy the old hand throw signal of five lights in series would be the most advisable system. With reference to automatic systems, P. T. Riley, Scranton Railways, described the three-year use of Nachod signals on a high speed 10-mile line with a 3 per cent grade, and P. F. Gerhart, electrical engineer Harrisburg Railways, said that on 20 miles of single track with twenty-two blocks the company had fairly good results from Eureka automatic signals. He presented some figures on their performance and maintenance cost. T. A. Wright, Wilkes-Barre Railway, then described the modified Ramsey signal used on part of that line and the Nachod system, which is used on 16 miles. His preference was for the latter system.

R. P. Stevens brought out the point that there is a large personal element in signal operation. After fifteen years' experience with all signals, he had decided that the Nachod system was best for and most satisfactory to his employees. Some trouble had been experienced with the contactor, but on his new Ohio properties there were high speed sections controlled by Nachod signals, and the service was smooth and reliable. The men were trained to use such signals and were in sympathy with them.

W. B. Rockwell was of the opinion that the so-called hand signal should be abolished. He criticised signal manufacturers for saying that their systems would run themselves but also said that electric railway operators had often failed to give signals fair treatment by not having an inspector to keep them in shape.

Mr. Stevens mentioned an absolutely "fool-proof" hand throw target signal, a few of which are used by the Lehigh Valley Transit Company, Allentown, Pa. One man is unable to put his key in the hole until the preceding man has gone through the block to unlock the box. While not advocating a hand-throw system, Mr. Stevens advised companies having such a system and desiring new equipment to investigate these signals.

On the subject of using in cars a small number of large-capacity lamps with reflectors and selector switch, Mr. Phillips said that recent investigations in Cleveland and Indianapolis at first impression showed the economy of such a practice, but that it was now beginning to be believed that small wattage lamps would give more economical service as well as correct illumination. He advised careful consideration of the subject before large lamps were installed. To determine losses in car circuits from trolley to motor and motor to ground, Mr. Phillips advised the use of a voltmeter and the temperature drop method.

The next query dealt with smoking regulations in closed cars. Mr. Heindles' company permits smoking on the rear platform in Delaware, but prohibits the practice in Pennsylvania. President Tingley said that his company in Dayton, Ohio, had tried ejectment proceedings, but after adverse court decisions efforts to stop smoking were abandoned. Mr. Rockwell favored prohibiting smoking on city lines and short suburban runs of fifteen and twenty minutes, but on long lines felt that the practice should be allowed. Mr. Heindle said that in Baltimore smoking is allowed on the rear seats of semi-convertible cars when the windows are open. Mr. Fairchild stated that the Philadelphia lines had prohibited smoking, mostly on account of its unsanitary features. Passengers were not permitted to carry lighted cigars on the cars. Regarding the loss of short riders as a result of such rulings, Mr. Fairchild believed that Chicago and Buffalo experience showed passengers soon chose to save time by riding rather than to walk and smoke.

The discussion on the advisability of concrete poles, especially in city work, was opened by Mr. Heindle, who said that his company had installed about fifty at $12 apiece, including frames and setting expenses. Such poles were often demanded by the public in select districts, but were not advisable for general city use when chestnut poles could be bought for $3.50 or $4. In reply to a question by President Tingley, Mr. Heindle said that concrete poles might well be used in fine districts, being cheaper than steel poles and yet long-lived.

Another question dealt with the use of a $\frac{5}{8}$-in. wheel flange instead of a $\frac{3}{4}$-in. flange in cases where the deeper flanges wear or become chipped before full life is secured. J. H. Yardley stated that a $\frac{5}{8}$-in. flange is used in Philadelphia, and Mr. Fairchild called attention to the investigations on this subject of the American Electric Railway Engineering Association.

STANDARDIZATION OF ACCOUNTS

At this point Dr. John Price Jackson, Commissioner of Labor and Industry of Pennsylvania, delivered an address, which is abstracted elsewhere. Following this, C. J. Joyce, head of the Bureau of Accounts and Statistics of the State Public Service Commission, spoke a few words in connection with the uniform system of accounts yet to be adopted by the commission for electric railways. He said that not all accountants would agree with some details of the new Interstate Commerce Commission uniform system, but that this was quite workable. Moreover, by law it must be used by the interstate electric railways in Pennsylvania, and the adoption of a different system for intrastate lines would make it inconvenient to prepare intelligible statistics for all railways. Mr. Joyce stated that a recent circular letter suggesting the adoption of the national system had resulted in a few replies, all favorable. The State commission will take no action nor set a hearing until all companies have had sufficient time to study the system. If sufficient criticisms come up, the commission will call a meeting of electric railway accountants to thresh the matter out.

PUBLICITY

An additional query was at this point submitted to the "Question Box" on the subject of how far companies should go in giving out construction and operating costs to the public. Mr. Heindle felt that there was a point beyond which facts and figures were unintelligible to the public mind, both on account of lack of education and biased attitude. Mr. Rockwell thought that the greatest trouble was caused by facts being handled by reporters not acquainted with the technique of the industry.

President Tingley then recited how his company had in the last three years secured municipal grants in limited-franchise States by means of publicity. To make the situation more easily understood financial figures should be reduced to divisions of the nickel. Safety campaigns used by the company have been adopted as reading lessons in the public schools of two cities. In one case a good impression was created by showing the cost of an extension, the selling price of adjacent lots before the extension, operating receipts from the opening of the extension and enhanced sales value of lots as a result of the extension.

CONCLUDING BUSINESS

Owing to the recent severe sleet storm in eastern Pennsylvania, E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa., was unable to be present and give his paper on "Efficiency Through Conservation of Time in Interurban Traffic." The auditing committee, W. S. Bell, assistant secretary and treasurer Wilkes-Barre Railway, and John O'Connell, secretary and treasurer Harrisburg Railways, reported on Mr. Stine's financial statements for the year, which were ordered filed.

President Tingley brought up the appointment of a committee to study auto buses, mentioned in his president's address. On Mr. Musser's motion, the matter was referred to the executive committee to prepare a report for next year and to work in conjunction with the committee of the American Association on the same topic. Mr. Heindle moved a vote of thanks to the Westinghouse, Electric & Manufacturing Company for sending a representative to give a paper.

The report of the nominating committee named the following men for office during the ensuing year: President, C. L. S. Tingley, vice-president Scranton Railway; vice-president, T. A. Wright, vice-president and general manager Wilkes-Barre Railway; secretary, H. M. Stine; executive committee, P. N. Jones, general manager Pittsburgh (Pa.) Railways; T. B. Donnelly, claim agent West Penn Traction Company, Pittsburgh, Pa.; Gordon Campbell, president York (Pa.) Railways, and Thomas Cooper, Philadelphia manager Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. The secretary was instructed to cast one ballot for the above nominees and the meeting was then adjourned.

PRESIDENTIAL ADDRESS

BY C. L. S. TINGLEY, VICE-PRESIDENT AMERICAN RAILWAYS COMPANY

President Tingley stated that the work of the association has grown steadily in volume and value, the membership now including thirty-eight active members and thirty-six associates. The only resignation during the past year was caused by a merger. The fortnightly bulletin issued from the secretary's office is giving valuable service.

The work in collaboration with the state departments is of particular importance. Conferences have been held with representatives of the Public Service Commission. A conference on the question of agreement upon a general form for filing rates and tariffs was followed by the appointment of a committee, which has held several conferences with George P. Wilson, chief of the bureau of rates and tariffs. Another conference on the height of car steps was held between Dr. F. Herbert Snow, chief engineer, and J. P. Dohoney, investigator of accidents, representing the commission, and a committee of the association. Still another conference on the subject of wire crossings resulted in a joint conference with other utilities interested. The association has also co-operated with the Department of Labor and Industry with respect to reporting industrial accidents and to safety rules and regulations. These State departments have extended courtesy and consideration to the representatives of the Railway Association at all times.

Mr. Tingley quoted the Code of Principles adopted at the Atlantic City convention and recommended its adoption by the association. He called attention to the reflection of the business depression and unrest in electric railway receipts. Referring to the coming biennial session of the State Legislature he directed special attention to the problems of vital interest to electric railways which will come before that body. The Republican platform contains recommendations in regard to a workmen's compensation law, to changes in the laws governing corporation taxation and to amendments to the public service commission law. He anticipates a demand for "municipal home rule," which would produce a return to the conditions existing prior to the passage of the public service commission law. The Railway Association and its members should oppose any tinkering with the present law, which should be given time to work out and develop efficiency.

Mr. Tingley favored co-operation in connection with the workmen's compensation legislation provided that a reasonable and equitable bill can be secured. In the matter of corporate taxation he feared that an effort will be made to increase such taxes. This should be resisted as corporations are already taxed out of proportion to other property in the State.

Among other topics touched upon by Mr. Tingley were the satisfactory financial condition of the association and the increasing importance of the automobile bus, which is becoming a factor in the transportation problem. He recommended the appointment of a committee to study the latter subject. In closing he summed up an important phase of public relations as follows:

"There is one angle of our proposition which everybody seems prone to forget, namely, that these great utilities are, as a matter of fact, owned by the people. Every man who has a deposit in a savings bank is interested in the integrity of the great utilities corporations that serve this country because their bonds are held as investments by those banks. Every man who has a life insurance policy, and every woman and child who will become dependent upon a life insurance policy, is vitally interested in the prosperity of these great corporations. Four years ago all the railroad bonds owned by the New York State savings banks were worth $5,000,000 less than their par value; at the beginning of the present year these bonds were worth $41,000,000 less than their par value; to-day the depreciation is even greater. I believe that the last election indicated that the voter appreciated that there was something wrong. He realizes dimly that radicalism has gone too far, but he is not yet fully informed and the radicals are still wide awake and on the job; and it is up to us to do our part to enlighten the voter and to see that he is not again lulled to sleep by the siren song of the theorist."

LATEST DEVELOPMENTS IN RAILWAY EQUIPMENT

BY W. R. STINEMETZ, WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Under the above title, Mr. Stinemetz discussed the ways in which the cost of maintaining and operating electric railway motors has been reduced, in spite of the more severe service requirements imposed by present operating conditions. Success in reducing maintenance cost is shown by the decrease from $14.63 per 1000 motor-miles, which was the maintenance cost for the Westinghouse No. 56 motor, to 23.2 cents, which is the cost for the Westinghouse No. 323-A motor. The saving in maintenance cost per year of the latter motor over the Westinghouse No. 12-A, assuming 30,000 car-miles per year, amounts to $267.84. As many roads do not keep accurate records of cost of maintaining old equipment, they do not realize what an important part this plays in their total operating cost. Owing to differences in operating conditions on different roads the figures for one road cannot be compared with those of another.

Modern equipment is not only cheaper in maintenance cost but it is more reliable. As a result the public can be kept satisfied through the elimination of delays on the road due to defective cars and at the same time all cars are available for service at all times. Reliability is particularly important during the rush hours when old equipment is likely to be pressed into service.

Modern equipment requires less power, particularly if the motors are properly geared. The development of the field control motor, reduction in weights, and the use of meters and coasting clocks to encourage proper handling of cars have all contributed to power saving.

Many of the older cars were geared too high. As an example of this Mr. Stinemetz referred to a test made in city service where a change from a gear ratio from 18:66, which was in use, to 15:69, resulted in a saving of 13.8 per cent in power under the same operating conditions. In interurban service high gear ratios have sometimes been made to compensate for voltage drop in the line, whereas redistribution of copper and the use of portable substations, if necessary, would have permitted the making of the required schedules with lower gear ratios.

The use of field control results in power saving, as has been shown from the results published from time to time. This form of control virtually provides an electrical means for changing gear ratio. Power can also be saved by a reduction in weight of equipment. Motors with cast-steel frames have reached the limit in weight reduction as further reduction means higher armature speeds, smaller shafts, thinner bearing shells and fewer commutator bars. All of these result in increased maintenance cost. By the use of pressed-steel frames a reduction in weight of 275 lb. has been secured in 40-hp motors, and at the same time there was greater uniformity in speed characteristics, due to the forged steel ring which is used. This motor weighs 2050 lb., has an armature speed of 540 r.p.m. at rated load, and is adapted for use with 26-in. wheels.

As an example of the saving in power which can be secured by the use of the proper gear ratio and of two-motor field-control equipment instead of four-motor, non-field-control equipment, with the permissibly lighter cars and higher schedule speeds, Mr. Stinemetz states that a road in Utica, N. Y., secured a power saving of nearly 50 per cent, as is shown by the following table:

	With Non-Field-Control	With Field-Control
Weight of car equipped but unloaded—pounds	51,000	36,800
Motors—horse-power	4—40	2—40
Gear ratio	17:69	15:69
Wheel diameter, inches	35	33
Schedule speed—miles per hour	9.8	10.13
Stops per mile	6.59	5.89
Duration of stops—seconds	10.88	10.43
Kilowatt-hours per car mile	3.588	1.892
Weight of loaded car—tons	28.52	21.0
Watt-hours per ton-mile	125.8	90.1
Reduction in watt-hours per car-mile—per cent		47.2

Power can also be saved by proper handling of cars. The use of instruments, such as watt-hour meters, coasting clocks, etc., together with the awarding of prizes for excellent performance, has resulted in savings from 2.7 per cent to 8.5 per cent.

The use of the newer forms of control also effects power saving. The Westinghouse "PK" control keeps down current peaks by regulating the rate of acceleration and the controller is more easily handled by the motorman than those of the older forms. The "HL" control has also proved very reliable in service.

THE ELECTRIC RAILWAYS AND THE PUBLIC

BY EMORY R. JOHNSON, PH.D., SC.D., PROFESSOR OF TRANSPORTATION AND COMMERCE, UNIVERSITY OF PENNSYLVANIA AND MEMBER OF PUBLIC SERVICE COMMISSION

The former antagonistic relationship between the electric railway companies and the public is fortunately changing for one of mutual understanding. The obligations of the service companies to the public and the duty of the public towards the companies are coming to be clearly recognized and to be defined more and more clearly by municipal ordinances and state legislation. It should be the purpose of the board of directors and officials of the service companies and also of all responsible public officials to place the relations of the companies and the public upon a permanent basis of mutual confidence. It is necessary that the companies and the public understand and trust each other, otherwise the companies will not prosper, the service will be poor and the public will suffer.

Electric railway and other public service companies can secure the confidence of the public, provided the companies adhere to methods of financiering and management that square with approved moral standards, provided the companies keep the public fully and accurately informed regarding the affairs of the corporations that serve the public, and provided the service rendered is adequate and efficient.

Little need be said as to the importance of adherence to approved moral standards in corporation management. From now on, the affairs of public service companies must be matters of public knowledge, and it will be impossible for a company successfully to conceal operations that would not meet with public approval. As a matter of fact, no well-managed public service company can afford to adopt business methods that need concealment. Sound financiering and wise accounting have everything to gain and nothing to lose from publicity in corporation management.

All public service companies need particularly to give the public information in order that those who patronize the company may understand what services the company is endeavoring to render and what is needed in order to perform those services adequately. More specifically stated—it is necessary that electric railway and other public service companies should keep accurate accounts according to uniform methods and that their financial obligations should be so straightforward that the public will be convinced that the companies are not resorting to the speculative methods of financiering which, though prevalent in the past, have now come to be condemned. It is also necessary that the companies should systematically publish information that will help the public to understand and correctly judge the financial and service operations of the companies.

Good service is fundamental and all-important. It is essential to the success of the company and is necessary to secure public approval of what the company does. If the public feels that utility companies are straightforward in their financial management and are rendering good service, it will not be opposed to the maintenance of charges that yield adequate profits. The public demand for good service is stronger than for low fares.

The policy of every utility company should be to study the service demands as fully as possible. Such a policy is to be commended, first of all, because it will give the public greater confidence in the companies; the policy is also wise because it may enable the companies to discover what changes are needed in service. It is human nature to keep on doing things as they have been done, and the longer established methods are adhered to, the harder it becomes to change to new, and possibly, better methods. Every electric railway company should seek constantly to discover how its service methods may be changed for the better. Careful attention to complaints as to service will be helpful to the company as well as gratifying to the public.

Many electric railway companies have been apprehensive because of the increasing degree of public regulation of their finances, services and charges, but I believe there is less apprehension now than there was ten years ago. Regulation of public service companies in increasing measure by states and municipal authorities has come about naturally and logically. It is necessary for each municipality to have a unified transportation service, and, with but few exceptions, there is now but one street railway company in each city. The requisite unified service is performed by a consolidated company.

The welfare of the municipality and of the electric railway company which serves the people of the municipality are linked together. The prosperity and development of the municipality require that the management of the public service company conform to the needs of the community served. Municipal regulation is necessary. Likewise, the larger interests of the people of a state as a whole demand that the state shall, by appropriate regulatory authority, supplement municipal regulation of public utilities. State regulation is necessary, first of all, because the public service company often serves more than one municipal area. The power that regulates must be as extensive as the object regulated. Moreover, state regulation is desirable because experience has clearly shown that in the supervision of accounts, finances, services and charges of public service companies there needs to be an executive body whose jurisdiction is state-wide and whose powers are as comprehensive as the tasks to be accomplished. If the regulation of electric railway and other public service companies were left entirely to municipalities, the regulation would be incomplete and would vary greatly as between different localities. Such a condition would be of disadvantage to the companies and not a benefit to the public.

Public service companies may well welcome, and most of them probably do welcome, intelligent public regulation, because the fundamental purpose of such regulation is to bring about an equitable adjustment of the relations of the companies and the public. Wise public regulation makes for the better management of the companies and for improved service; while it also enables the companies, by securing the confidence of the public, to obtain equitable returns upon the property devoted to the performance of their services.

WORK OF PUBLIC SERVICE ACCOUNTANTS

BY H. S. SWIFT, TREASURER WEST PENN TRACTION COMPANY, PITTSBURGH, PA.

In his address concerning the work of accounting officers of public service corporations, Mr. Swift stated that the public no longer regards electric railways and other public utilities as private enterprises to be conducted for the profit of their owners but rather as quasi-public undertakings whose operations, accounts and records are to a certain extent public property. The old order of things under which utilities operated their properties and kept their books as simply or as elaborately as seemed best to the officials, with little or no outside interference as long as they kept within the law, is past. Then the accounting was for the information of the officers, the directors and, lastly, the stockholders, but now the accounting officer has become responsible to governmental authorities and various regulatory bodies for the honesty and the correctness of his work.

Mr. Swift believed that the requirements for the success of public service accountants are many. They should have a general knowledge of what is going on in the operating department, in order to devise proper accounting methods in connection with new construction or reconstruction work. Moreover, a duty sometimes neglected is the inspection of all such undertakings so that accountants shall be prepared to consider intelligently what proportion of expenditures can properly be charged to capital account, as well as the proper amounts to be provided for cost of unproductive labor, cost of new money, interest during construction and similar items. At the present time complete data are probably not available from which to determine proper depreciation and overhead charges, for previous consideration of these subjects has been academic rather than practical. Such problems can best be solved by the collection of accurate historical data. Mr. Swift emphasized the fact that many items of construction cost tend to disappear when it comes to a valuation of physical property years after, but such items should be entered upon the books in sufficient detail to prevent their being overlooked at a later date.

The accounting officer should give some attention to a systematic analysis of the increased cost of operation. A statement to the general manager that a certain power house or carhouse employed so many more men this year as compared to last is much more impressive than the bare statement that the labor cost was greater. A similar analysis can be made of the amount of supplies used, showing the number of units and the cost. In the case of the purchase of the control over underlying companies, the interests of stockholders must sometimes be safeguarded by a careful consideration of the value of services and expenses incurred by each company on account of other companies associated with it under the same management. All expenses for intercompany services should be justly distributed so that the operating costs of each company may be correct.

Mr. Swift stated that the development of the accounting departments of electric railways has been rapid, although it has received less assistance from without than some other departments. One feature of this development was the perfecting and adopting of a suitable uniform system of accounts. Another indication of growth is found in the increasingly important position held by the accounting officers. This position, however, is not without its additional responsibilities. The accountant should have some knowledge of commercial law, particularly at this date in connection with income taxes and special war taxes. He should also be able to keep a record of contracts and agreements in so far as they affect accounting, and he should so study his company's financial affairs and history as to be in a position to offer plans for new financing or refunding existing obligations. In closing, Mr. Swift spoke of the present opportunity of electric railway accounting officers, but said that they should possess imagination, or that quality of grasping the problems that the future may bring and preparing for them.

CO-OPERATION IN ELECTRIC RAILWAY WORK

BY JOHN PRICE JACKSON, COMMISSIONER OF LABOR AND INDUSTRY, PENNSYLVANIA

Mr. Jackson stated that the four human elements in electric railway work are the patron, who uses the service; the stockholder, who placed his money in the enterprise; the employee, who performs the daily labor, and the government, which acts as the representative of the people. The problem of the present day is to instill the proper confidence in and co-operation among all of these elements. The old days of close personal relation between employer and workmen have gone and in their place exists a period of highly systematized organization dealing more and more with impersonal elements. The modern foreman is told to see that expenses are kept down in order to show a proper balance and as a result often deals in an impersonal and unjust manner with the men under him. On the other hand, the workmen have often looked upon their employer only as an insatiable blood-sucker.

In a similar fashion, the patron of an electric railway, in Mr. Jackson's opinion, sometimes believes that the company is deliberately making him unhappy in order to fill its own coffers, and the public official often assumes that a public utility is guilty without proof or reason. Such a lack of confidence and co-operation is largely caused by irresponsible statements made in the press and public places. In fact, ninety-nine out of everv hundred of labor disputes arise from a misunderstanding with the management.

The work of the Bureau of Labor and Industry in devising standard safety rules, however, said Mr. Jackson, has proved that co-operation between some of these elements is possible. In about twelve industries, safety standards have been secured by the unanimous judgment of committees composed of capital, labor and bureau representatives. This marks a tendency toward the age to follow that of electricity—the age devoted to the perfection of the human machine and the proper correlation of co-operation between all of its elements.

In closing, Mr. Jackson offered some data gleaned from his recent European trip, to show that German roads are not so superior to American railways as often stated. The tracks are good, but this is largely a result of lightness of the cars. Many cars have no airbrakes, so that stopping is a long, slow process. The heating arrangements on most cars are of an antiquated type, and there is no vestibule, although the winter is quite severe. The cars, however, have large platforms at each end, on which the crowding exceeds that on American cars. No safety doors are used, and the passengers, both men and women, board and alight while the car is in motion. A notice to ladies, however, is carried on the rear platform, telling them to take hold with the left hand in alighting—a practice which Mr. Jackson thinks American railways might well adopt.

REPORT ON STANDARD SAFETY RULES FOR ELECTRICAL APPARATUS

This committee was appointed on Nov. 12, in connection with the Second Annual Pennsylvania Industrial Welfare and Efficiency Conference, conducted by the Department of Labor and Industry of the State. The matter of especial interest to the committee was suggested standard safety rules for electrical apparatus, which the department has under consideration for use throughout the State. On Nov. 19 a paper was presented by Dr. Rosa of the federal bureau of standards regarding Circular No. 49 of this bureau. This contained standardized safety rules suggested for use in the electrical industry. The rules now under preparation by the Pennsylvania Department of Labor and Industry are a move toward the single safety standard recommended by the bureau of standards. They will, it is understood, be submitted shortly to those interested for study and suggestions, and in the opinion of the committee there should be careful collaboration with electric railway operators in order to avoid imposing needless limitations or establishing hurtful precedents. The dividing lines in classifying voltages should be drawn at the proper points. It is the general practice of electric railways of Pennsylvania to operate at 550 volts, which in actual practice means 600 volts to 650 volts at the busbar, and if boosters are used to compensate for heavy loads, 600 volts to 750 volts to provide for line loss and thereby apply satisfactory voltage at the ends of long lines. This is essential to good service and these voltages are not ordinarily dangerous. Throughout the rules of the bureau of standards 750 volts is specified in overhead construction, above which special precautions are required. Direct current of the above voltage should not be classed with alternating current used for primary distribution, generally at 2200 volts. The committee feels, in general, that there is merit in the suggestion of the bureau of standards, for one standard for all states, but a careful study of proposed rules by all members is recommended.

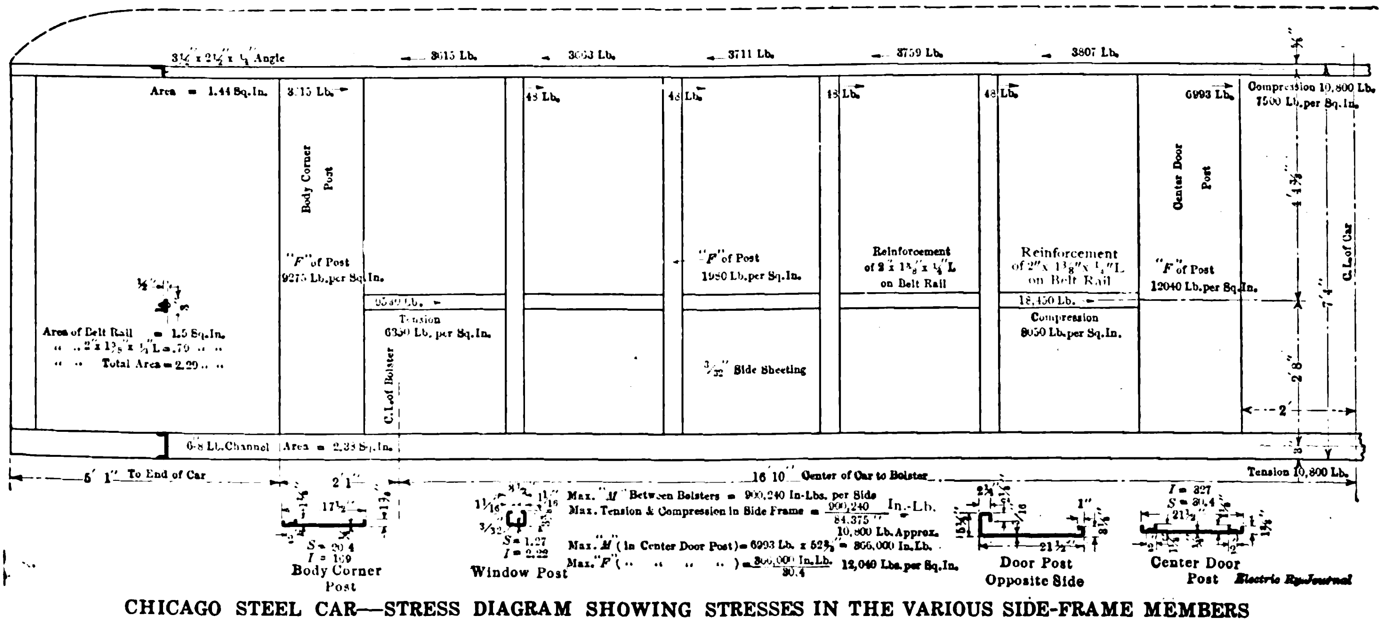
Analysis of Stresses in Chicago Elevated Steel Car

BY H. A. JOHNSON, MASTER MECHANIC CHICAGO ELEVATED LINES

In connection with the methods employed in designing the new pressed steel cars for the Chicago Elevated Railroads, which were described in the ELECTRIC RAILWAY JOURNAL of Dec. 5, 1914, on page 1234, it may be that a detailed description of the stress analysis will be of general interest. As mentioned in the article describing the car, the minimum loads assumed included a standing and seated load of 150 passengers weighing 140 lb. each, or a total of 21,000 lb. To this the dead-load weight of the car body, amounting to 35,600 lb., was added. This weight was distributed 27,860 lb. between bolsters and 7740 lb. outside of the bolsters. In addition to the ordinary loads, the ends of the car were so designed as to support a total load of 28,500 lb. This is approximately the weight of a car body in a partially telescoped position, and the allowance provides for a condition which might occur in a collision.

Each side of the car body was designed as a continuous truss with intermediate supports at the two body bolsters. The entire carload between body bolsters was carried on side trusses while the platform load was distributed over the extended bottom sills, which form cantilevers. The bending moments due to the differently distributed components of the total load were computed and plotted to scale. The resulting diagram showed that the maximum unbalanced bending moment at the center of the car totalled approximately 900,240 in.-lb. on each of the two side trusses. A reproduction of this diagram is shown in one of the accompanying illustrations.

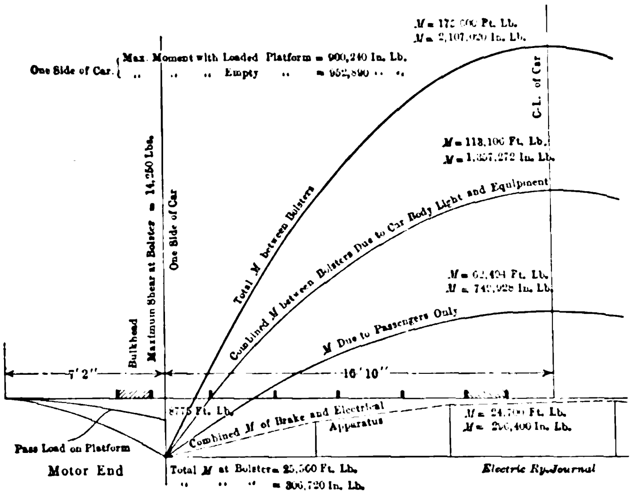
Having determined the general dimensions of the side truss, together with the number of posts required to give standard commercial sizes of window glass, and having calculated the maximum bending moment to be resisted, an analysis was made of the resulting stresses in all members of the side truss. These stresses are also shown in one of the accompanying diagrams, a detailed explanation of which may assist in an understanding of the methods used in the calculations. The side framing of the car, extending from body corner post to body corner post, was treated as a riveted truss. Since this side truss could not be extended effectively beyond the body corner posts of the car, the underframing was designed strong enough to support the loads beyond the


3¼" x 2½" x ¼" Angle
3615 Lb.
3663 Lb.
3711 Lb.
3759 Lb.
3807 Lb.
Area = 1.44 Sq.In.
3615 Lb.
48 Lb.
48 Lb.
48 Lb.
48 Lb.
6993 Lb.
Compression 10,800 Lb.
7500 Lb. per Sq.In.
Body Corner Post
Center Door Post
"F" of Post 9275 Lb. per Sq.In.
"F" of Post 1950 Lb. per Sq.In.
Reinforcement of 2" x 1⅜" x ¼" L on Belt Rail
Reinforcement of 2" x 1⅜" x ¼" L on Belt Rail
"F" of Post 12040 Lb. per Sq.In.
9540 Lb.
Tension 6350 Lb. per Sq.In.
18,450 Lb.
Compression 8050 Lb. per Sq.In.
Area of Belt Rail = 1.5 Sq.In.
" " 2" x 1⅜" x ¼" L = .79 " "
" " Total Area = 2.29 " "
C.L. of Bolster
3/32" Side Sheeting
C.L. of Car
4' 7⅜"
7' 4"
2' 8"
2'
6" 8 Lb. Channel
Area = 2.33 Sq.In.
5' 1" To End of Car
2' 1"
16' 10" Center of Car to Bolster
Tension 10,800 Lb.
17½"
S = 20.4
I = 169
Body Corner Post
S = 1.27
I = 2.22
Window Post
Max. "M" Between Bolsters = 900,240 In-Lbs. per Side
Max. Tension & Compression in Side Frame = 900,240 In.-Lb. / 84.375" = 10,800 Lb. Approx.
Max. "M" (In Center Door Post) = 6993 Lb. x 52⅜" = 366,000 In.Lb.
Max. "F" (" " ") = 366,000 In.Lb. / 30.4 = 12,040 Lbs. per Sq.In.
21½"
Door Post Opposite Side
I = 327
S = 30.4
21½"
Center Door Post
Electric Ry. Journal

CHICAGO STEEL CAR—STRESS DIAGRAM SHOWING STRESSES IN THE VARIOUS SIDE-FRAME MEMBERS bolsters and to contribute a balancing bending moment to the side trusses, as noted on the bending moment diagram.

The maximum unbalanced bending moment of 900,240 in.-lb. in the side truss, which is 84⅜ in. in depth, results in a tension of 10,800 lb. in the bottom chord, or side sill, and an equal compression in the top chord, or deck plate. As there are no effective diagonals in this truss, the compression in the deck plate must be absorbed by the posts rigidly held in a vertical position by the side sheathing and belt rail to which they are riveted. The intermediate posts, together with the panel posts at the vestibules and flanking the center entrance, act as simple beams each rigidly supported at one end and with the total compression in the deck plate, applied to the other end.

In a cantilever beam of length l, the deflection is given by the formula, deflection $= \frac{Wl^3}{3EI}$ where E is the modulus of elasticity of the material and I is the moment of inertia of the section resisting the bending action. As all the side posts are deflected an approximately equal amount by the thrust of the deck plate to which they are riveted, the force each resists is proportional to its moment of inertia. This is true since all the other factors in the formula are constant when the deflection is the same for each post. These forces and the resulting maximum fiber stresses in the posts are noted on the stress diagram.



CHICAGO STEEL CAR—BENDING MOMENT DIAGRAM

The compression shown in the belt rail beside the center entrance is determined by multiplying the 6993-lb. thrust absorbed by the panel post by the depth of the truss and then dividing it by the distance between the belt rail and the base of the post. Similarly, the tension shown in the belt rail at the side of the body corner post is obtained by multiplying the outward thrust of 3615 lb. at the deck plate by the depth of the truss and dividing by the distance between the belt rail and the base of the post. With the completion of this analysis the problem was then one of selecting suitable and economical sizes for the side frame members.

As evidence of his confidence in the business future of this country, W. E. Hodges, vice-president in charge of purchases of the Santa Fé Railroad, announced the purchase of 66,000 tons of 90-lb. main track rail for spring delivery. In connection with this $2,000,000 contract he also announced in an interview that his company would spend $3,000,000 a month for the next few months for supplies and equipment.

COMMUNICATION

Hearing on Jurisdiction of I. C. C. Over Urban Railways

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Dec. 9, 1914.

To the Editors:

The Interstate Commerce Commission is insisting, in the case of certain urban electric railway companies having interstate connections of some sort, that accidents on purely urban lines of such companies be reported to it. The claim of the commission to jurisdiction over these companies appears to be opposed to the principles laid down by the Supreme Court of the United States in the Omaha & Council Bluffs case. Whether this particular question is of great practical importance or not, it is important that the general jurisdiction of the commission over purely urban companies and lines be confined to lawful limits.

A hearing before the commission at Washington on the question of the duty of urban companies of the kind mentioned to report such accidents has been arranged for Friday, Dec. 18, at 10:30 a. m. Argument is limited to one hour. James M. Barrett, president Fort Wayne & Northern Indiana Traction Company, has consented to make the presentation.

It is highly desirable that the commission appreciate the fact that electric railways regard the question as one of importance. The feelings of electric railways with regard to the matter will be partly judged by the interest displayed at the hearing.

It is the wish, therefore, of the committee on federal relations of the American Electric Railway Association, at whose instance the hearing has been arranged, that all electric railways interested be represented at the hearing. Representatives from several large urban companies of the Middle West have already signified their intention to attend.

ARTHUR W. BRADY,
President.

Dinner of Railway Business Association

The two speakers at the dinner of the Railway Business Association at the Waldorf-Astoria on Dec. 10 were Fairfax Harrison, president of the Southern Railway, and Warren G. Harding, Senator-elect from Ohio.

Mr. Harrison said: "In the controversy between the owners of railroads and the representatives of the public, the pendulum has now swung to an extreme on the side of irresponsible public power as it had previously swung to an extreme on the side of irresponsible ownership." In discussing commission regulation he said that one of the most dangerous weaknesses of the system is its inability to give prompt decisions. If a change of policy is demanded in the public interest, the power to pass upon the question must be capable of convenient and prompt exercise. The problem now before the country forms an opportunity for the statesman, who must have the power to impress his views upon his fellowmen. The speaker believed that President Wilson is equal to this great achievement.

Mr. Harding said that the railroads should be prosperous not so much to permit general prosperity but because it was a matter of justice. He believes that ninety-nine out of every 100 thinking people believe the railways are entitled to an increase in rates. He said the country needs to-day fewer legislative bills pending and more bills of lading. In conclusion, he urged managers to have a full understanding with the public.

At the business meeting of the Railway Business Association held during the afternoon George A. Post of New York was re-elected president.

American Association News

The Executive Committees of the Engineering Association and the Transportation & Traffic Association Assign Subjects to Various Committees—Hearing on I. C. C. Jurisdiction Over Electric Railways—Meeting of Joint Committee on Block Signals—Milwaukee Company Section Meeting

ENGINEERING ASSOCIATION COMMITTEE SUBJECT ASSIGNMENTS

The executive committee of the Engineering Association approved the following plan of work for the several committees at its last meeting.

The committee on buildings and structures will prepare general specifications and form of contract for railway structures. It will suggest proper provision for expansion and contraction in concrete structures, together with a provision for properly water-proofing and protecting them. This subject is to be considered along broad lines of application either to thin slab construction or to massive monolithic work, having in mind the carrying of reinforcement throughout either type of work. Further consideration will be given to the fire protection rules, especially with regard to the use of soldering or other heating equipment. The design of a standard fireproof substation building of 1000-kw capacity will also be studied.

The committee on electrolysis will continue its study of the general subject.

The committee on equipment will make a study of, and report upon, the need of a revision of the standard specification for heat treated carbon steel axles, shafts and similar parts, adopted in 1912, and will report upon a specification for gears and pinions, including tolerances. The committee will further make a study of difficulties with M. C. B. journal brasses in heavy electric traction service, by conducting such tests as may seem necessary and will collaborate with the M. C. B. Association and the committee on heavy electric traction. Attention will be given to wires and cables for car equipment, with special reference to fire protection. This subject will be considered jointly with the N. F. P. Association, especially as to the use of lighter conduits in car roofs. The specification for air-brake hose will be broadened to include smaller sizes. The committee will submit a design for a limit-of-wear gage for measuring flange thickness of the Association standard wheel. The steel wheel design will also be revised to include smaller diameters.

The committee on heavy electric traction will conduct a further joint study, with the various other railway associations, of the equipment clearance line shown on the third-rail equipment diagram adopted by this association at the 1912 convention, between the point FE and the gage line of the nearest running rail, and the location of the third-rail clearance line between point ET and the gage line of the nearest running rail. A study of the modern electric locomotive will also be made. Further consideration will be given to the definition of third-rail gage, with reference to the question whether it is advisable to have a definition of the term "Gage Line of Third-Rail." The protection of the contact rail, where an exposed third-rail is used in rapid transit operation, will be considered also.

The committee on lightning protection will take up the general subject as applied to car and line equipment.

The committee on power distribution will study the following specifications: for reinforced concrete poles, for sundry line materials, and for 600-volt d.c. overhead trolley construction with respect to lightning arrester location and grounds. A revision of the standard specification for tubular steel poles will also be prepared.

The committee on power generation will report on good practice in regard to smoke abatement from the standpoint of smoke observations, and in regard to appliances and devices used for determining smoke density. It will consider a specification for boiler tubes, including both open-hearth, seamless, hot-drawn steel tubing and charcoal iron tubes, and others for the purchase of fuel and of power station lubricants. The committee will also review the boiler code of the American Society of Mechanical Engineers with special reference to specifications for boiler tubes.

The committee on standards will determine what roads are using Association standards and recommendations, and will draft a style for the make-up of specifications.

The committee on way matters will continue the study of the proper foundation for tracks in paved streets, and of pavement for use in connection with girder and high T-rails. Traffic counts will be obtained from different companies in accordance with forms submitted in the 1914 report. The committee will prepare specifications, with definitions, for sundry track materials such as ties, track spikes, bolts, tie rods, tie plates, etc., with particular reference to physical characteristics, and a standard specification for special work. A revision will be made of the recommended designs of 7-in. and 9-in. joint plates with special reference to sizes of bolt holes and fits, as covered in Section Wm 4a in the *Engineering Manual.*

TRANSPORTATION & TRAFFIC ASSOCIATION COMMITTEE ASSIGNMENTS

The executive committee of this association recently approved the following list of subjects:

The committee on fares and transfers will continue the study of transfer issuing and collection devices; will study, report, and summarize the fare collection methods used with center-entrance cars; will study the problem of fare collection on prepayment cars on multiple fare lines, reporting on the advisability of stationing extra men at congested points and terminals to collect fares and so to increase the rate of loading on prepayment types of cars, and will investigate the subject of through collection versus zone collection on suburban and interurban lines.

The committee on express and freight traffic will make a further study of the organization of a freight department, giving further and more comprehensive details than were contained in the 1914 report; will investigate the matter of uniform class rates; will report on the relative cost of handling different classes of freight and the relative proportion of each class handled; will continue the investigation of laws, franchises and other restrictions relating to this traffic and will investigate the questions of handling express and of weighing and inspection. The committee will also analyze 1914 passenger and freight earnings as compared with those of 1913, with a view to determining whether, as some companies report, freight business is increasing while passenger business has fallen off. If so, such conclusions will be drawn as are pertinent to the building up of freight and express business by member companies to take the place of passenger revenue lost through the inroads of the automobile.

The committee on passenger traffic will continue the study of the motor bus and the trackless trolley, supplementing the report of the 1914 committee, summarizing the results obtained in European operation and recommending how electric railways can make use of these two modes of travel. Digests of laws and franchises showing specifically where additional restrictions have been imposed by the authorities on these companies will be prepared. The committee will examine into the results of one-man car operation from such standpoints as speed, accidents, equipment, maintenance and other cost, summarizing present practices, and will further study the effects of the increasing use of automobiles on passenger traffic, with particular reference to interurban and suburban roads, giving specific results as determined by studies made by individual companies.

The committee on rules will continue the consideration of markers in the light of the discussion at the 1914 convention; will compile a joint index of similar or identical rules in the two standard codes for the use of companies which desire to issue a joint code; will investigate and report on the flagging rule as instructed by the 1914 convention, and will develop for the approval of the executive committee and for the use of Association members a procedure for the interpretation of rules and train orders. The committee will report as to the state commissions that have approved the standard codes of the Association or have adopted codes of their own, in the latter case making a statement as to the logical points of difference between the adopted codes and the Association standard codes. The number of roads that have adopted the standard codes since the 1914 convention, up to June 1, 1915, will also be reported.

The committee on schedules and time-tables will continue the study of train dispatching in city service, making a summary of results obtained in the various cities in which this practice is in vogue, and the consideration of the problem of developing capable schedule makers. It will recommend methods of making and recording periodical traffic counts, and will make a study of the influence of frequency of stops on schedule speed and the influence of schedule speed on operating cost, possibly developing curves to show results. Other investigations to be made are those of the effect of the use of fully vestibuled cars on schedule speed and other operating factors, including accidents; of near-side stop practice, indicating the increase in this method of operation that has occurred by years for the past three or four years, and of the standard interurban time-table as adopted in 1911, to determine whether changes or modifications should be made.

The standards committee will undertake the formulation of a standard practice and policy for the adoption of standards for the Transportation & Traffic Association, and will issue a Transportation & Traffic syllabus during the present year.

The committee on the training of transportation employees will bring up to date the digest of laws and regulations affecting employment, last printed in the 1912 report. It will investigate the disciplining of new men where this is handled by the instruction department, and will outline a systematic program for improving courtesy on the part of trainmen, to include recommended bulletins and notices to the men as well as a general outline of practice. Another item of the year's work will be an investigation of watch inspection methods.

The committee on uniform definitions will recast and recompile the definitions submitted by the 1914 committee, with such additional definitions as are necessary, these to be submitted to member companies for specific criticism. A co-ordination of the definitions with the standard codes will follow and this is to be submitted to the Transportation & Traffic Association's standards committee in time to have that committee pass upon it before its submission to the next convention.

JOINT COMMITTEE ASSIGNMENTS

The executive committees concerned have approved the following programs of joint committee work:

The joint committee of the Engineering and Transportation & Traffic Associations on block signals for electric railways will prepare a digest of signal laws and rulings to show if any new rulings of state commissions have been made subsequent to the dates of information contained in the 1914 report. A bibliography on block signals installed subsequent to June 1, 1914, will also be compiled. Designs of standard signal apparatus will be prepared, the committee to co-operate with the Railway Signal Association committee on signaling for electric railways in the adoption of standard signal apparatus. The clearance diagram for semaphore signals is to be considered after conference with the committees on power distribution and heavy electric traction, and a revision of the block signal rules for contactor signals is to be considered jointly with the committee on rules of the Transportation & Traffic Association, Rule No. 10 covering this matter having been referred back to the committee. The subject of light signals for interurban railways is to receive further consideration with a view to the adoption of a definite standard for sizes of lenses for light signals operated by continuous track circuits or contactors. The advisability of changing the reading of the standard light aspects in three-position signaling from "Non-Car Counting" or "Car Counting" to "Non-Registering" or "Car Registering" signals, in view of the fact that the new contactor signal rules all read "Car Registering Signals," will also be considered. A study will be made of signal systems on roads that are signaled from end to end, to cover maintenance cost, efficiency of operation and effect on traffic. The remaining subjects listed are: An investigation of the question of a standard definition for signal failure, the general study and summary of highway crossing protection, and the preparation of a report as to the advisability of operating on single-track interurban line blocked by signals alone without dispatching.

The joint committee on engineering accounting will draft a set of standard forms for use with the cost accounting system recommended by the 1914 committee; will revise the subdivision of operating maintenance accounts to meet the new I. C. C. classification, and will develop a proper ledger, looking toward the maintenance of a continuous inventory. Other subjects will presumably be assigned to this committee by the Accountants' Association.

The joint committee of the Engineering and Accountants' Associations on the life of railway physical property will continue its study of the general subject.

The committee on transportation accounting has received the following partial list of assignments: To investigate the cost of handling baggage free to determine whether or not it brings business to the line, and if it does whether the cost of handling this baggage wipes out the profit resulting from the fare received; to investigate the sub-division of power cost among construction, maintenance and operation.

The committee on transportation engineering will study the operation of trains of two cars or more in interurban passenger and freight service to include cost of operation and comparative figures for single-car operation. A second investigation is into the effect of car and equipment design on duration of stops, in both passenger and freight service. Car design is to be studied from a traffic standpoint in all its phases, first standardizing the methods of determining results. The investigation is to include specimen data sheets showing information which should be obtained in order that member companies who desire to follow the recommendations may have full information before them. An investigation of braking distance on interurban cars is to be made with special reference to the location of block signals. In addition current saving devices will be studied and a summary prepared showing the results obtained, together with costs, including maintenance, etc.

STUDY OF A. I. E. E. STANDARDIZATION RULES

The new standardization rules of the American Institute of Electrical Engineers have been brought to the attention of the committees to which parts are of interest, with the recommendation that they be reviewed and considered.

HEARING ON I. C. C. JURISDICTION OVER ELECTRIC RAILWAYS

At the instance of the committee on federal relations of the American Electric Railway Association, of which A. W. Brady, president Union Traction Company of Indiana, is chairman, a hearing on the above subject will be held in Washington at 10:30 a. m. on Friday, Dec. 18. At this time, in the hour allotted by the commission, an argument will be presented by James M. Barrett, president Ft. Wayne & Northern indiana Traction Company, outlining the reasons against the commission order requiring interurban lines to file monthly reports of accidents in urban operation. The act of 1910 requires monthly reporting of accidents on the lines of interstate carriers by railroad. This has been interpreted by the commission, in the case of the Detroit United Railway and others, to cover urban lines operated by such roads which by virtue of their interurban lines come within the commission's jurisdiction. This is held to conflict with the decision of the United States Supreme Court in the Council Bluffs case. Secretary Burritt has sent out a circular letter inviting company members to be represented at the hearing.

MEETING OF JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS

A meeting of the joint committee of the Engineering and Transportation & Traffic Associations on the above subject was held at the offices of the Public Service Railway in Newark, N. J., on Dec. 10. The following members were present: Of the Engineering Association, J. M. Waldron, Interborough Rapid Transit Company, chairman; C. H. Morrison, New York, New Haven & Hartford Railroad; John Leisenring, Illinois Traction System; G. N. Brown, New York State Railways; of the Transportation & Traffic Association, J. W. Brown, Public Service Railway, co-chairman; C. D. Emmons, Chicago, South Bend & Northern Indiana Traction Company. There were also present by invitation H. W. Griffin, Union Switch & Signal Company, and H. H. Norris, ELECTRIC RAILWAY JOURNAL.

Mr. Waldron was elected chairman of the meeting and Mr. Norris secretary. A vote of thanks to the ELECTRIC RAILWAY JOURNAL for its practical interest in the work of the committee was unanimously passed.

The committee then considered the assignments made for the coming year's work, printed elsewhere in this issue, and delegated the work to the following sub-committees, in the lists of which the chairman's name is placed first in each case.

Digest of signal laws and rulings, A. E. Roome, Pacific Electric Railway Company.

Bibliography on block signal installations, H. H. Norris.

Design of standard apparatus, J. M. Waldron, C. H. Morrison.

Clearance diagram for semaphore signals, J. Leisenring, G. N. Brown.

Revision of block signal rules for contactor signals, C. D. Emmons, H. A. Nicholl.

Light signals for interurban railways, J. Leisenring, H. A. Nicholl, C. H. Morrison.

On certain changes in phraseology in regard to standard light aspects, J. W. Brown, C. D. Emmons.

Study of costs of maintenance, etc., of signal systems, G. N. Brown, J. W. Brown.

Review of block signal standards and recommendations, C. H. Morrison, J. M. Waldron.

Consideration of A. I. E. E. standardization rules, as they have bearing on signal matters, G. N. Brown, C. H. Morrison.

Preparation of a definition of "signal failure," A. E. Roome.

Study of highway crossing protection, J. Leisenring, H. A. Nicholl, J. W. Brown.

Report on advisability of operating single-track interurban signal-blocked lines without dispatchers, H. A. Nicholl, J. W. Brown; C. D. Emmons, J. Leisenring.

Preparation of a list of items of information needed in connection with block signal contracts; for trolley contact systems, J. M. Waldron; for track circuit systems, G. N. Brown, J. Leisenring, H. W. Griffin, S. N. Day, General Railway Signal Company.

After making the above assignments the committee considered them informally and discussed the general principles involved.

It was then decided to hold sub-committee meetings in New York on Jan. 4, 5 and 6, and in Chicago on Jan. 18. The next and probably the final meeting of the full committee will be held in Chicago on March 16 and 17 at the time of the meeting of the Railway Signal Association.

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY SECTION

Company section No. 1 has elected the following officers: President, W. W. Cook, superintendent Cold Spring shops; vice-president, V. W. Dentz, engineer; secretary, H. G. Abendroth, valuation committee; treasurer, A. G. Schwenke, auditor railway receipts. E. W. Miller was elected director for a term of three years.

On Dec. 5 Secretary Burritt sent to all company members of the association copies of the war tax act of Congress, officially known as Public Act No. 217. This act affects electric railways in several particulars, principally in requiring a stamp tax to be paid on bonds, debentures and certificates of indebtedness and upon bills of lading. The act became operative on Oct. 23 and remains so to and including Dec. 31.

The merchants and manufacturers of Peoria, Ill., are arranging to establish in that city a traffic bureau which will have supervision over all switching charges and other shipping conditions. The Illinois Traction System has become one of the most important freight lines entering Peoria and it is proposed to include that company under the new arrangement.

Equipment and Its Maintenance

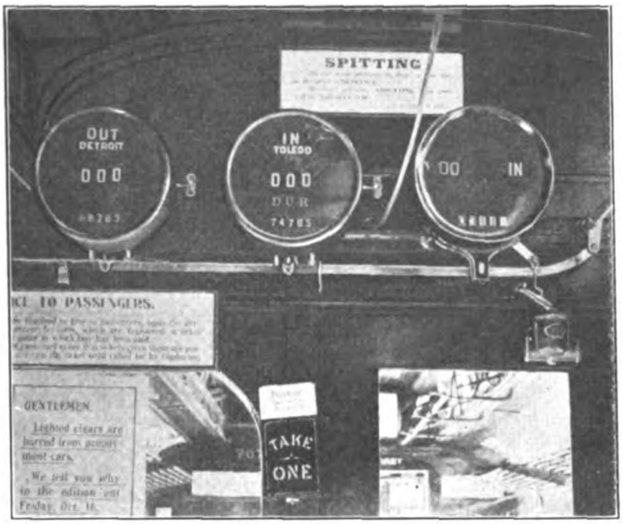
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

An Ingenious Interline Register System

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

Through cars between Detroit, Mich., and Cleveland, Ohio, operate over the tracks of five different companies, namely, the Detroit United Railway, Detroit, Monroe & Toledo Short Line, Toledo Railway & Light Company, Lake Shore Electric Railway and the Cleveland Railways. A separate account must be kept of the fares collected on each line and, in so doing, the city fares collected in Detroit, Toledo and Cleveland are registered on three separate registers.



INSTALLATION OF REGISTERS FOR INTERLINE OPERATION

On a through car recently put in service by the Detroit United Railway, a simple, effective method of ringing each register was installed. The registers used were two Sterling-Meaker No. 8 and one International. Each register was marked with the name of the particular city in which it was to be used, although the illustration shows only two registers so marked. Instead of using separate cords or rods for operating each, the three registers were arranged to be operated by means of one ⅜-in. square cold-rolled steel shaft which extends the full length of the car and has a strap pull at each window.

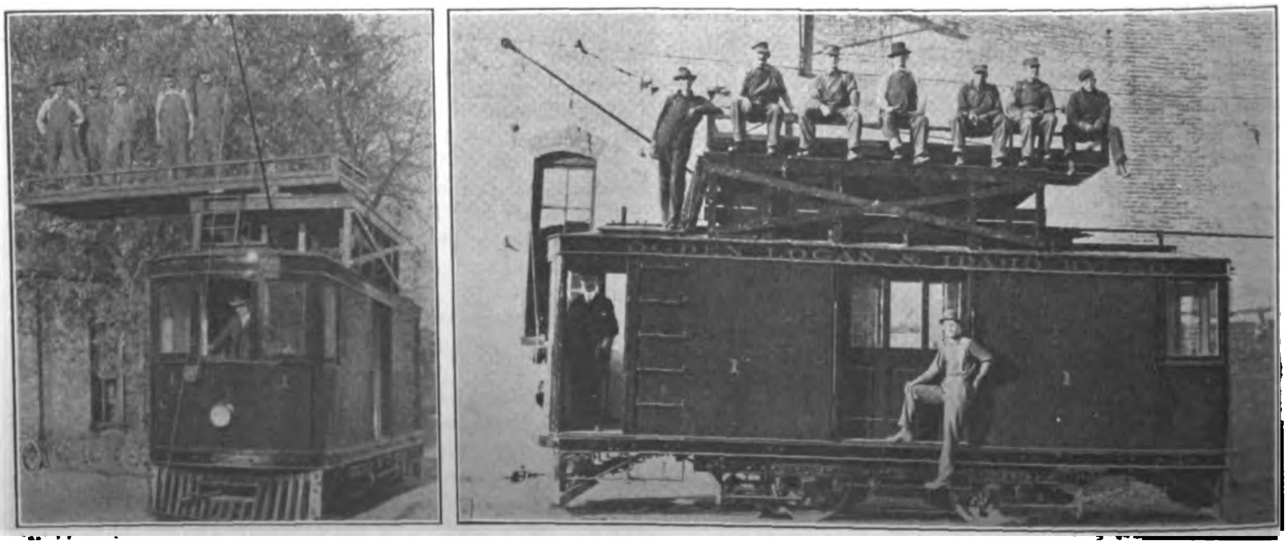
The register racks were placed side by side on the passenger compartment side of the partition between it and the smoking compartment. Just below the racks was placed a ¼-in. x ⅞-in. flat-steel bar. One end of this bar was connected to a clevis fastened to the register rod while the other end was passed through a guide. To the operating lever on each register a 2½-in. steel-wire screwhook was riveted and corresponding screw-eyes were riveted to the steel bar. To use any one of the registers, it is necessary only to unfasten one hook and connect up another. The accompanying half-tone shows the mechanism as installed in a car.

A Home-Made Line Car

BY H. E. WURZBACH, MASTER MECHANIC OGDEN, LOGAN & IDAHO RAILWAY

The accompanying illustrations show a line car designed by the writer and built in the Ogden shops of the Ogden (Utah), Logan & Idaho Railway. In its construction we used an old truck from a single-truck car which had been out of service for some time and two GE-90 motors. The body we built. The principal dimensions of the car follow: Total length, 26 ft.: height from track to top railing, 14 ft. 6 in.; length of turntable platform, 15 ft.; length of turntable platform from center bearing, 12 ft., and width of car, 6 ft. 10 in.

An important feature is the channel iron which completely encircles the body. This channel greatly adds to the strength and rigidity of the car. As the channel flanges are turned outward the beam acts as an anti-climber at the bumper. The car is completely equipped



END AND SIDE VIEW OF LINE CAR MADE BY THE OGDEN, LOGAN & IDAHO RAILWAY with shelving, lockers and hooks for hanging wire and ropes. A place for long bars or shovels is arranged under the top platform. The speed of this car is about 35 m.p.h. It has been in operation since the middle of October.

Rebabbitting Journal Bearings

BY W. L. FULTON, CHIEF DRAFTSMAN OMAHA & COUNCIL BLUFFS STREET RAILWAY

In the rebabbitting of worn-out journal bearings the Omaha & Council Bluffs Street Railway uses molds of home manufacture. The details of three types of these bearings, namely, armature, motor axle and truck journal bearings, together with details of molds for rebabbitting the same, are shown in the accompanying figures.

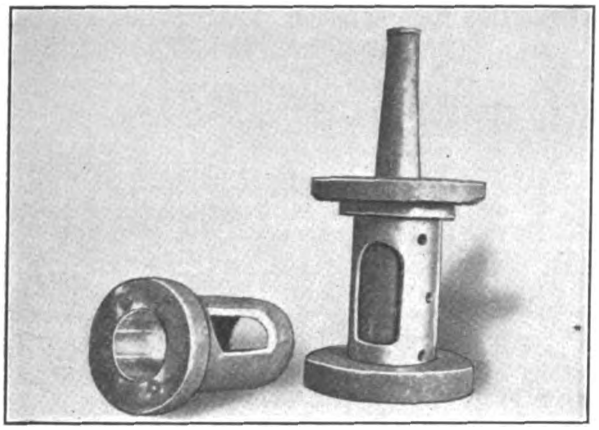
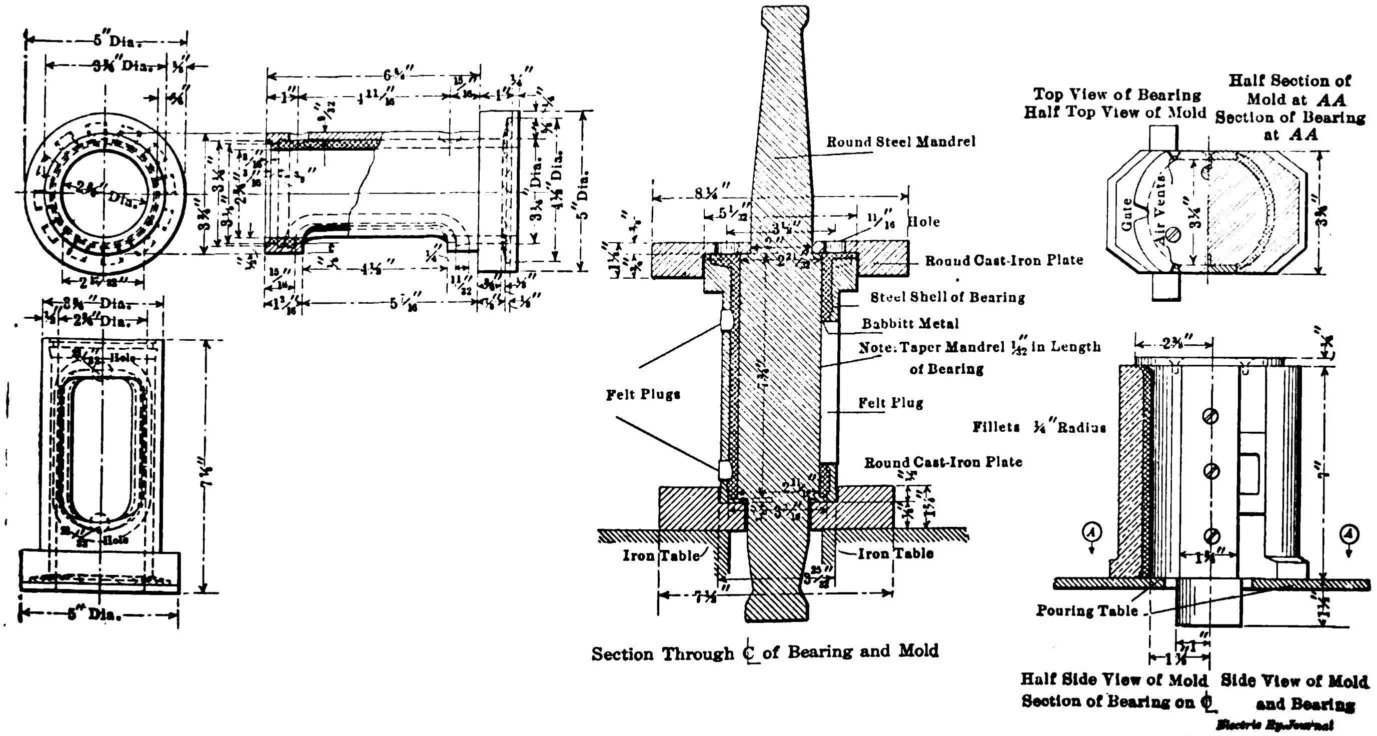


FIG. 3—FINISHED BEARING AND MOLD

Armature Bearings.—A bearing typical of this class is the commutator-end armature bearing for the GE-80 motor, the details of which are shown in Fig. 1. The mold for babbitting the same is shown in Fig. 2. This mold consists of two cast-iron plates and a round steel mandrel. The shell of the bearing forms the outside of the mold. The two cast-iron plates are machined to provide an even bearing for the mandrel and to give true surfaces to the babbitt. The upper plate contains two 11/16-in. holes for gate and air vent. Each plate also contains a hole through which the end of the mandrel projects. At the lower end of the bearing (Fig. 2) the mandrel has a shoulder which centers the bearing shell. Another shoulder, at the upper end of the bearing, supports the upper plate, giving the proper clearance between it and the end of the bearing shell. The projecting ends of the mandrel, and the taper of 1/32 in. in the length of the bearing, are made to facilitate the driving of the mandrel out of the bearing after the babbitt has cooled.


5" Dia.
3⅝" Dia.
2¼" Dia.
6¼"
4¼"
5"
7½"
5" Dia.
Round Steel Mandrel
8¼"
5½"
3⅝"
11/16" Hole
Round Cast-Iron Plate
Steel Shell of Bearing
Babbitt Metal
Note: Taper Mandrel 1/32 in Length of Bearing
Felt Plugs
Felt Plug
Round Cast-Iron Plate
Iron Table
Iron Table
7¼"
Section Through ℄ of Bearing and Mold
Top View of Bearing
Half Top View of Mold
Half Section of Mold at AA
Section of Bearing at AA
Gate
Air Vents
3¾"
2⅜"
Fillets ¼" Radius
Pouring Table
Half Side View of Mold
Section of Bearing on ℄
Side View of Mold and Bearing
Electric Ry. Journal

FIGS. 1, 2 AND 7—CAST-IRON ARMATURE BEARING FOR GE-80 MOTOR, MOLD FOR BABBITTING SAME AND MOLD FOR JOURNAL BEARINGS

Oil holes, etc., in the babbitt are made by the use of felt plugs, inserted in holes in the bearing shell and held in place by wires around the shell. A view of the mold and a finished bearing is shown in Fig. 3.

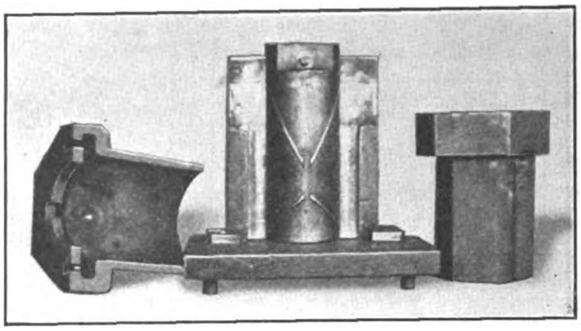


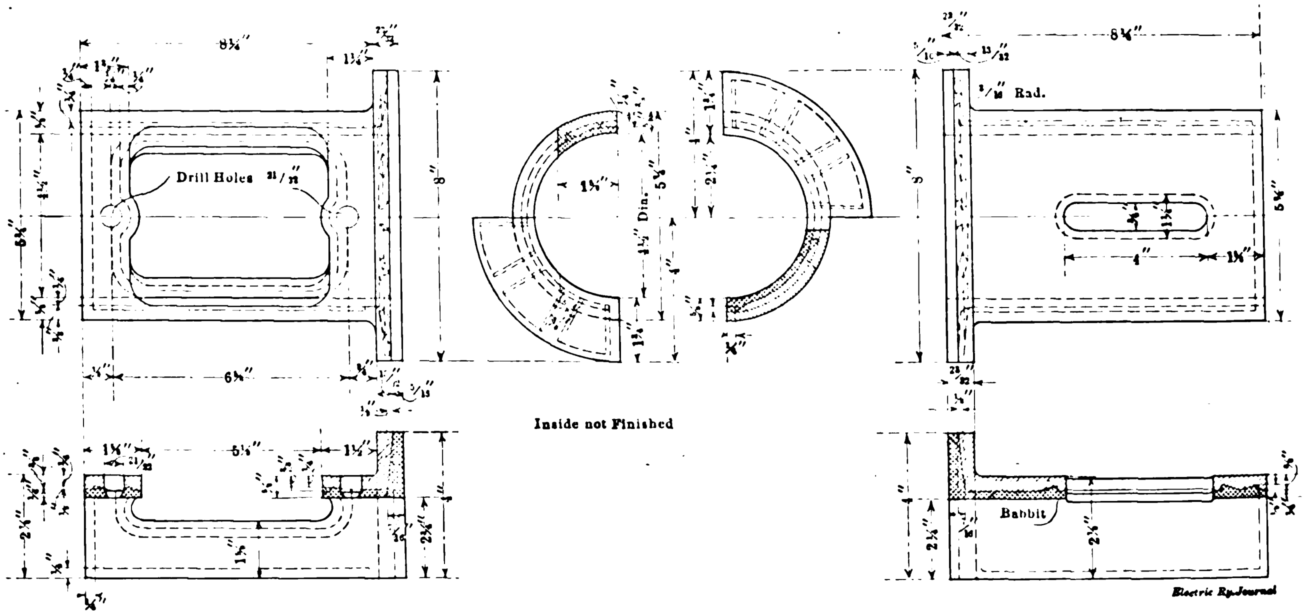
FIG. 6—MOLD FOR MOTOR AXLE BEARINGS WITH CORES IN PLACE AND BACKS REMOVED

After being babbitted, these bearings are machined to an exact fit.

Motor Axle Bearings.—Drawings illustrating this type of bearing and the molds for babbitting it are shown in Figs. 4 and 5, respectively. The mold was designed to cast the two halves of the bearing in one operation and consists of a stand, two cores and two backs. The stand is made of two smooth steel plates connected by cast-iron brackets which also serve to center the backs properly when the mold is being assembled. The cores are placed one on either side of the vertical plate, and are held in place by lugs in the base plate and by a tap bolt extending through the vertical plate. The cores are provided with ridges of the proper size and shape for the purpose of casting oil grooves in the babbitt.

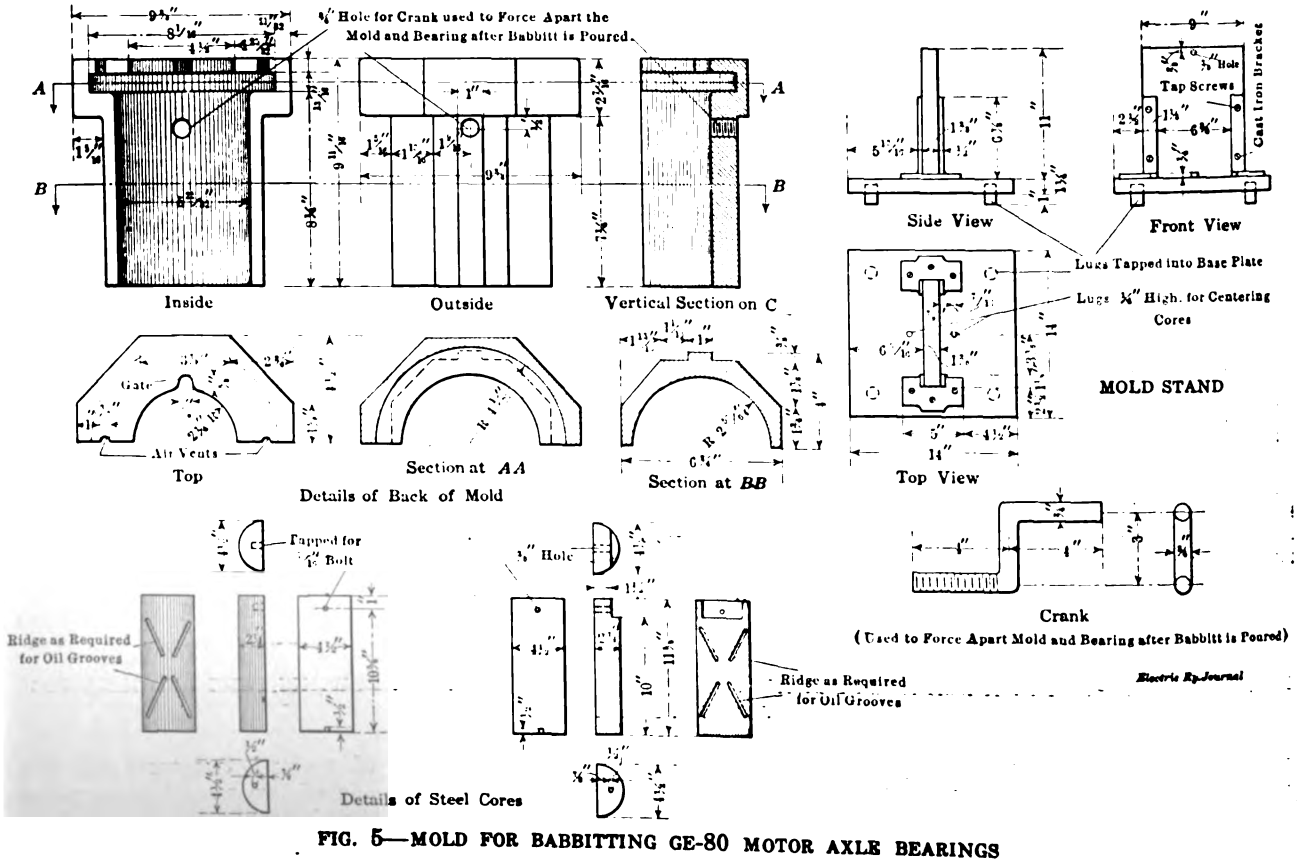
The bearing shells are placed over the cores and the backs are then put in place, covering the shells. The shells and backs fit snugly, centering the shells properly when the backs have been put in place between the brackets of the stand. Each back is provided with a gate and air vent. A ¾-in. threaded hole is also made in each back to admit the crank used for forcing apart the mold and bearing after the babbitt has hardened. Oil holes, etc., are cast by the use of felt plugs of the proper shape and thickness placed in the bearing shell while the mold is being assembled. In Fig. 6 the mold is shown with the cores in place and the backs removed. Axle bearings are not machined after being babbitted.

Truck Journal Bearings.—The molds for babbitting truck journal bearings consist merely of mandrels, each one being shaped to fit one particular type of bearing. These mandrels are usually in the shape of cylinders with lugs or shoulders built out to meet the edges of the bearing shell and of a height to give the proper space between the mandrel and shell. Each mandrel is made to take two bearings at once, one on either side, a clamp being used to hold them in place while babbitt is being poured. Fig. 7, showing the details of the mold for the journal bearings of a Brill 39-E truck, illustrates this type of mold.



Drill Holes
Rad.
Inside not Finished
Babbit
Electric Ry. Journal

FIG. 4—MOTOR AXLE BEARING DETAILS



¾" Hole for Crank used to Force Apart the Mold and Bearing after Babbitt is Poured
A
B
Inside
Outside
Vertical Section on C
Gate
Air Vents
Top
Section at AA
Section at BB
Details of Back of Mold
Side View
Front View
Tap Screws
Cast Iron Bracket
Lugs Tapped into Base Plate
Lugs ⅜" High, for Centering Cores
MOLD STAND
Top View
Tapped for ½" Bolt
Ridge as Required for Oil Grooves
Hole
Details of Steel Cores
Crank
(Used to Force Apart Mold and Bearing after Babbitt is Poured)
Electric Ry. Journal

FIG. 5—MOLD FOR BABBITTING GE-80 MOTOR AXLE BEARINGS

Equipment Defects—Control Apparatus and Connections—V

BY C. W. SQUIER, E.E.

Controllers for Electric Braking—Certain manually-operated controllers for railway equipments are arranged so that the motors may be used to stop the car as well as to propel it. This is accomplished by connecting the motors as series generators and using the current generated to operate magnetic brakeshoes, or by closing their circuit through a rheostat make use of them for dynamic or rheostatic braking.

It is an inherent characteristic of series motors that when they are connected to the line to work in a forward direction, with the same connections between armatures and fields and the working voltage removed they will work as generators if the armatures are caused to rotate in a direction opposite to that required for the forward movement of the car; or if the connections between the armatures and fields are reversed they will work as generators in the direction in which they car is moving.

Magnetic Braking.—When magnetic brakes are used the voltage generated by the motors is utilized to energize an electric track, wheel or axle brake. All the connections necessary for utilizing this current to actuate the magnetic brakes are made by the controller. Such controllers are provided with what is termed braking notches which are usually located so that a movement of the main or "power" handle in a direction opposite from that necessary to propel the car will bring the fingers into contact with the braking segments and make the necessary connections. By using the same handle continually both for "power" and "brake" the motorman acquires promptness and ease of manipulation. This is a most valuable feature because when emergencies do arise the motorman is never called upon to carry out consciously, yet with extreme promptness, an operation which is not in his regular practice. The simple action of moving the single controller handle in one direction for "power" and in the opposite direction for "brake" reduces to a minimum the "human element" which is so frequently responsible for accidents.

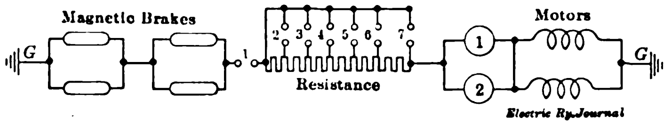


FIG. 14—CONNECTIONS FOR OPERATING MAGNETIC BRAKES

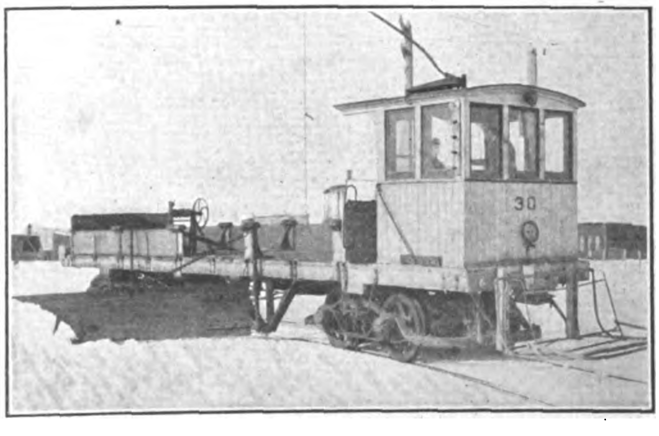
Fig. 14 shows the connections that are necessary to operate magnetic brakes. The motors and the coils of the brake magnets on opposite sides of the car are connected in parallel, and the regulating resistance is placed in series with both. Contacts 2, 3, 4, 5, 6 and 7 are provided for cutting out this resistance so that the amount of current produced by the motors may be varied as required. To apply the electric brakes it is necessary to move the controller handle to the brake notch which agrees with the speed at the moment, and then to move it again notch by notch as the car slows down so as to cut out resistance because the emf generated decreases as the speed of the car falls off. The brake magnets on opposite sides of the car are connected in parallel, as stated, so that the braking force will be the same on both sides.

Magnetic brakes are now seldom used in this country due to the difficulty of securing efficient track braking with the bad track conditions that are encountered on so many roads. In England and on the Continent the track magnets are adjusted so that they are about ¼ in. clear from the rail. It can be readily understood that it would be almost impossible on most American railways to operate with this scant clearance. This trouble could be overcome to a degree by using a less efficient brake magnet. I understand that there has now been developed a magnet which in ordinary service will operate with an adjustment of ¾ in. above the running rail. But even this clearance is much less than we expect for other truck parts.

Dynamic or Rheostatic Braking.—Any controller which is provided with the points necessary for magnetic braking can be used for dynamic or rheostatic braking without any change in the controller itself. No brakeshoes are used with this form of braking. The terminals of the motors are connected to the regulating resistance, and as the current flows there is produced in the motors a back torque (counter emf) which causes the armatures to hold back against their driving force. The greater the torque the quicker will be the stop. Since the armature speed is decreasing the torque will decrease in proportion unless the resistance in the external circuit is decreased as the speed falls off. Therefore, in order that the armatures may exert a uniform back torque while the car slows down, it is necessary that the controller handle be moved from point to point so as to cut out the resistance. As the motors generate current only while the car is in motion, the car will not remain stationary if stopped on a grade unless it is held by some other form of brake. Rheostatic braking uses the back torque alone for making stops. However, where some form of electromagnetic brake is used, the car is not only retarded by the work thrown on the motors, but the current generated is usefully employed in actuating the brakes on the trucks or wheels.

Snow Removal in Montreal

In Montreal the problem of snow removal is a very severe one and the methods used in meeting it have been thoroughly perfected by A. Gaboury, superintendent Montreal Tramway Company. The apparatus consists of the usual sweepers, and, in addition, there are salt cars (which are the equivalent of sand cars) and levelers which are regular motor freight cars fitted up with sheet-iron wings that swing out-board. The latter are for the purpose of pushing the snow into piles along the curbs after it has been thrown aside by the sweepers, thus providing a large clear space beside the track for vehicular traffic. The piles of snow are carted away from the city in sleighs furnished by the city, the cost of removal being borne in part by the company.



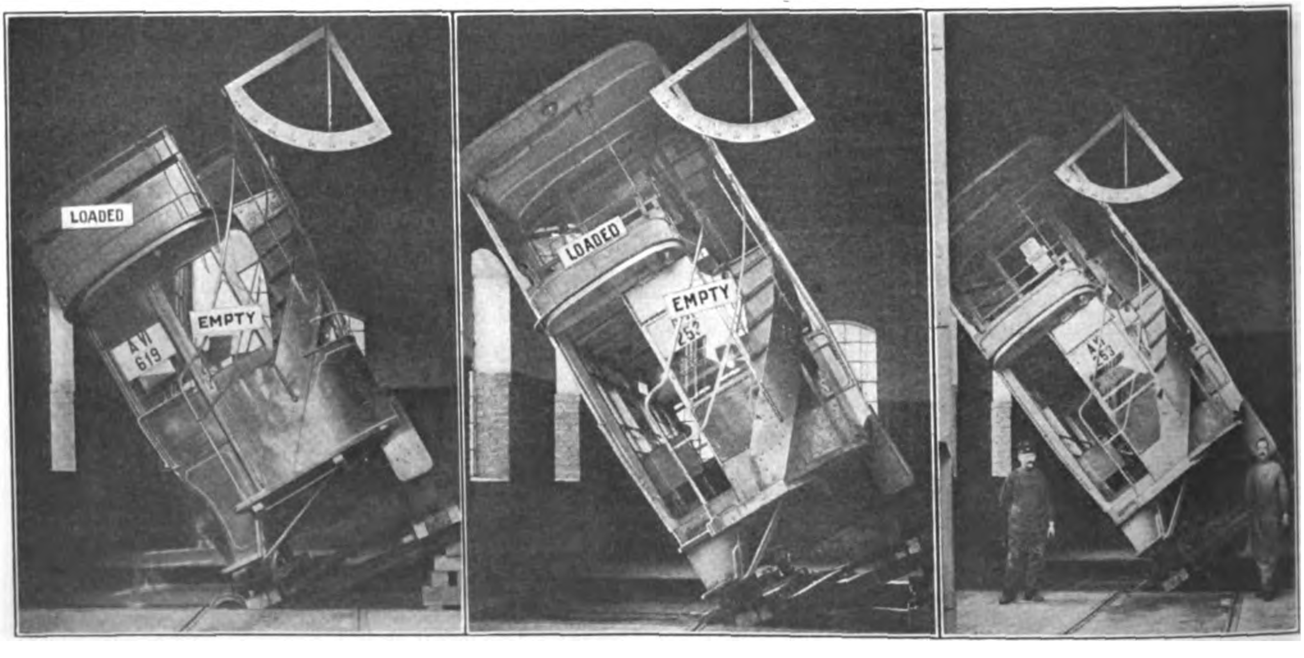
MONTREAL SNOW FIGHTING—FREIGHT CAR TRANSFORMED INTO A LEVELER FOR CLEARING SPACE BESIDES TRACKS

The use of salt has been found to be an absolute necessity during sleet storms or extreme cold weather, and salt cars consisting of old single-truck equipments have been fitted up with longitudinal boxes for holding coarse salt, the material being dropped on the switches through tubes opening from the center part of the bottom of each box.

In operation the snow-fighting equipment is assigned to definite routes so arranged as to have each one completely covered at intervals between forty-five minutes and one hour. In addition the routes provide central conveying points for three or four sweepers, so that one can be diverted if necessity arises on some other route. In addition to the equipment a force of from eighty to one hundred men is constantly employed during the winter on all hills to keep the rails and switches in a safe condition, and during heavy snows this force is augmented from the construction department. As soon as a snow storm begins men are also sent out to sweep and salt every switch and intersection on the system. One prolific source of danger of blockades has been found in the packing of snow on top of fenders in the cars, and to obviate this men are stationed at various points on the system to shovel the snow off of the fenders, and to clear the vestibule windows and destination signs.

Testing the Equilibrium of Double-Deck Buses at Vienna

In making studies for the operation of double-deck auto buses, Ludwig Spängler, director Vienna Tramways, gave particular attention to the question of equilibrium to secure buses that would not tip over when swerving at their highest speeds under the worst possible conditions of grade and curvature. To this end experiments were made to find the permissible angular deviations from the perpendicular for double-deck buses with and without a covering for the upper deck.



EQUILIBRIUM TESTS OF VIENNA BUSES—OPEN-TOP BUS LOADED ON UPPER DECK, EMPTY ON LOWER DECK, TIPPED 31 DEG.—CLOSED-TOP BUS LOADED ON UPPER DECK AND EMPTY ON LOWER DECK, TIPPED 33 DEG.—CLOSED-TOP BUS EMPTY ON BOTH DECKS, TIPPED 40 DEG.

As shown in the accompanying views, the allowable deviation was measured on a protractor fitted with a swinging pointer. One leg of the protractor was fastened at right angles to the side of the bus so that as the bus was tipped away from the perpendicular by putting blocks under one side of the body, the pointer swung away from 0 deg. accordingly.

When empty the center of gravity of the fully-inclosed double-deck bus is not so low, of course, as that of one with an open top deck, but it was found to be low enough for safe operation. When loaded, however, the inclosed type devised by Mr. Spängler has the lower center of gravity because the "well" construction of the upper floor permits the upper seats to be nearly 16 in. lower than the corresponding seats of the Daimler open-top bus.

The tests with the protractor showed that when the open-top bus carried an upper deck load of fourteen 165-lb. bags of sand, and with no load on the lower deck, unstable equilibrium was reached at 31 deg. from the perpendicular. The angle for the fully-inclosed bus when carrying fifteen 165-lb. bags of sand, and with no load on the lower deck, was 33 deg. and this was increased to 40 deg. when the load from the upper deck was removed. All tests were made with gasoline vehicles.

Better Car Illumination Effects Other Economies

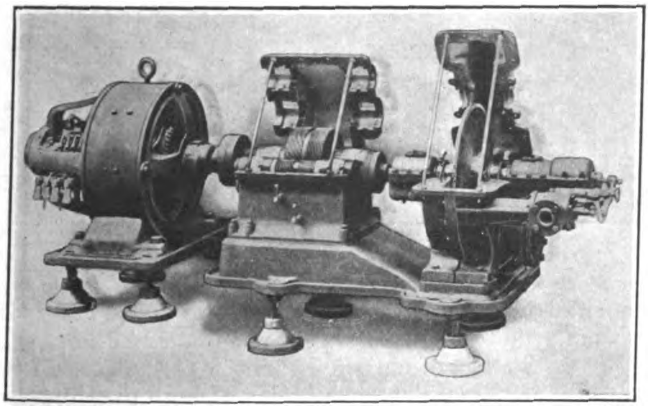
The original lighting scheme on the passenger cars of the Chicago, Lake Shore & South Bend Railway provided for fifty-two 23-watt, 120-volt lamps, five in series in a 600-volt circuit. These lamps were installed one over the back of each seat in a side-wall bracket attached to the window post and a row in the ceiling along the center line of the car. The improved lighting system includes seven 60-watt and five 25-watt Mazda lamps in a 98-volt circuit. The 60-watt lamps serve for general illumination while the 25-watt lamps are installed two in the destination sign, two on the rear platform and one in the toilet. The 60-watt lamps are placed in the ceiling along the center line of the car and are fitted with deep Alba shades set in locked sockets.

This change was a great improvement over the lighting scheme formerly used, which not only supplied too much light but did not distribute it properly. In fact, the light from the lamps in side-bracket fixtures on the window posts was right in the line of vision of seated passengers, and as the light was supplied through thin filaments with energy at twenty-five cycles it was also irritating to the eye. The accessible location of the side brackets also increased the percentage of thefts. In fact, during some months the combined number of lamps broken, stolen or burned out amounted to more than 50 per cent. With the new lighting scheme it is estimated that the savings in lamp replacements and energy consumption will more than pay for the entire installation within one year. All wiring in the new system is in conduit and the circuits are taken off the 98-volt tap of the transformer which forms a part of the 6600-volt, single-phase car equipment. One of the most expensive parts of the improvement was included in replacing the side brackets on the window posts with coat hooks.

Small Geared Turbo Units

The Westinghouse geared turbo-generator set recently brought out is designed to meet the demand for economical turbine units of small capacity. This development was made possible by the Westinghouse reduction gear which permits the efficient coupling of a high-speed turbine to a low-speed generator. These sets are built with either a d.c. or an a.c. generator in capacities from 25 kw to 200 kw, standard voltages. The turbine is designed for condensing or non-condensing operation, as may be desired.

The turbine rotor consists of a single disk, on the periphery of which the blades are carried. On entering the turbine casing the steam expands in a suitable nozzle, passes through these blades and delivers to them part of its velocity energy. On leaving the blades it enters a reversing chamber which redirects it to the blades. This process is repeated as many times as necessary to make efficient use of the energy in the steam.



GEARED TURBO-GENERATOR SET

The gear and the pinion are of the split helical type, mounted in an oil-tight case. Ample lubrication is provided by running the gear in a bath of oil. To make inspection easy, both turbine and gear casings are horizontally split, and all steam nozzles and reversing chambers are mounted in the lower half of the turbine casing. The turbine and gear are mounted on a common bedplate. The bearings are all ring-oiled and self-aligning, and require little attention.

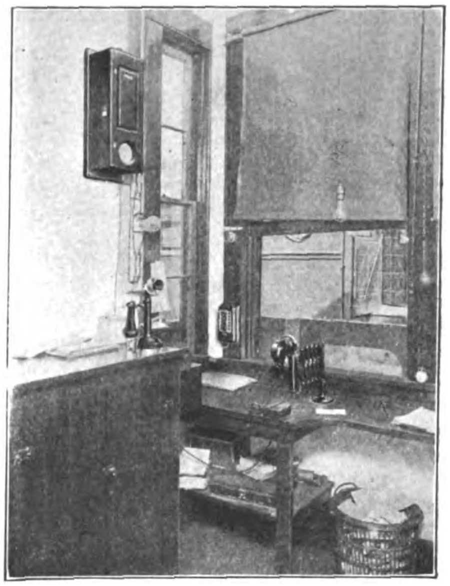
The speed of the turbine is controlled by a centrifugal type governor, mounted on the turbine shaft and connected by a simple lever direct to the stem of the valve. The connection between gear and generator is made by means of a flexible coupling.

Alternating current generators furnished with these sets are of the self-contained revolving field units similar to standard Westinghouse belted and coupled types. They can be wound for two or three-phase sixty-cycle service, and any standard potential between 240 volts and 2400 volts. The d.c. generators furnished are all self-contained similar to the standard Westinghouse belted type, and can be wound for 125 volts and 250 volts, two-wire, and 250 volts, three-wire.

Telephone Train Dispatching on the Cedar Rapids & Iowa City Railway

The Cedar Rapids & Iowa City Railway has recently placed in successful operation a telephone train dispatching equipment covering the entire line. This road runs from Cedar Rapids south to Iowa City, a distance of approximately 30 miles, with a branch going east from Cedar Rapids to Mt. Vernon, an additional distance of 15 miles. This includes some of the best farming land in Iowa, where interurban traffic is exceedingly heavy. The passenger trains on the line are operated by electricity and the freight trains by steam.

Along the route ten open stations are equipped with telephones and selective signaling apparatus. Sets containing the Western Electric selectors are used for signaling station operators and self-contained, folding-gate, telephone arms are used for the operators' talking apparatus. Six way-station outfits are installed between Cedar Rapids and Iowa City and two between Cedar Rapids and Mt. Vernon. The power house, the superintendent's office and the shop are also connected with the telephone distpatching circuit. The dispatcher is located in the shop-office building 2 miles south of Cedar Rapids and is in control of all points on the line.



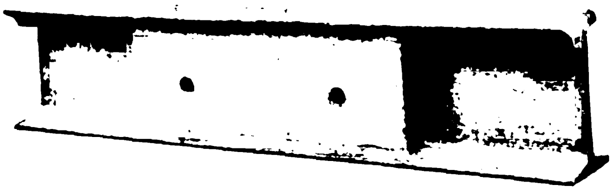
DISPATCHER'S OFFICE, CEDAR RAPIDS & IOWA CITY RAILWAY

A portable telephone set has been furnished to each train crew so that communication may be established with headquarters from various points along the line. These telephones are fitted with cords and plugs arranged for plugging in pole jacks which are placed at a convenient height on the telephone poles along the right-of-way. This equipment is especially valuable in emergencies. Nine pole jacks are placed on the Cedar Rapids and Iowa City division and six on the line to Mt. Vernon.

The normal traffic on this railway system involves the operation of thirty-eight passenger trains and four scheduled freight trains daily between 5 a.m. and 1 a.m. on the Cedar Rapids & Iowa City line and eighteen passenger trains and two scheduled freight trains between 5 a.m. and 12 o'clock midnight on the Cedar Rapids & Mt. Vernon branch. The telephone dispatching system has now been in use for some months and excellent results from every point of view, notably those of economy and efficiency of operation, are reported.

Automatically Welded Electric Joints in Brooklyn

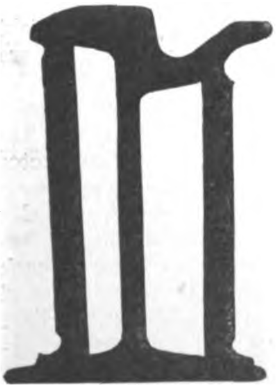
An entirely original method of carbon electrode rail welding was carried out between Nov. 7 and Nov. 18 for the Brooklyn Rapid Transit System by the Atlantic Welding Corporation, New York. The work comprised the installation of sixty-six joints in five-year old rail on the heavily-traveled downtown section of Fulton Street, between Court and Tillary Streets, Brooklyn. Owing to traffic conditions, all work was done between 10 p. m. and 5:30 a. m. and no work at all was permissible on Saturdays and Sundays.



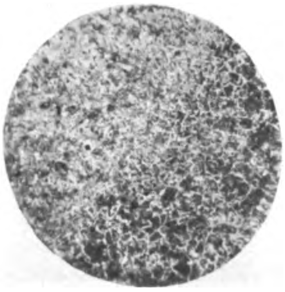
SAMPLE OF A COMPLETE WELD

The rails of Lorain 398 and 423 section had been set on steel ties incased in concrete and had been secured to the ties with clips. In substituting the new welded joint for the riveted type these clips were removed with a cold chisel and the rail was welded directly to the ties. The rectangular joint plates, which support the head as illustrated, were made in lengths of 31 in. and 19 in., several compromise joints with these lengths being, of course, included. Twenty-six of the joints included 12-in. inserts. A metallic electrode process was used to fill the heads of excessively worn rails at joints and at the dishes opposite the joints. The job was finished bv grinding to the original level.

The welding process itself is one which has already been used on a large and successful scale throughout Europe. Its salient features are two: The carbon electrode used is set in a carriage which is moved at a predetermined rate and in a manner which avoids all inequalities due to the varying skill of the welder himself; the welding current is not drawn through wasteful resistance but is taken at an efficiency of 90 per cent or more through a 550/70-volt European-Rosenberg motor-generator set which can withstand a short-circuit indefinitely.



EARLY WELD OF LORAIN NO. 395, 141-LB. RAIL



MICRO-PHOTOGRAPH OF SECTION THROUGH A WELD

A complete welding outfit consists of a covered wagon with the special motor-generator set mentioned, a marble switchboard of power-station type and two portable welding machines or carriages. In executing work, the carriages are operated inside of light-weight tents, which are readily set up or dismantled.

Each outfit has a crew comprising a foreman, two welders and two helpers, one welder and helper working at each carriage. While the special conditions in Brooklyn made work under the best conditions impossible, from twelve to fifteen joints have been made elsewhere per eight-hour day with one outfit and crew, so that the actual time necessary per joint is only twenty-five to thirty minutes. In numerous cases, eighteen joints per day have been made by five men. This rate will suffice to keep step with the tasks of the other track work gangs. If, however, it is necessary to increase the number means can be provided to make as many as twenty-five joints in one shift.

The welding process is purely automatic. After the beveled flat-bar plates have been adjusted, the welding carriage and the arcing element thereon are placed over the joint. The automatic feature lies in the condition that the carbon is set to travel at a predetermined rate over the line to be welded. The carriage is adjustable to any type of rail. The weld is obtained by making the arc fuse the two surfaces (plate and rail), a firm, composite structure being obtained with the help of feed-in material.

MOTOR-GENERATOR WAGON AND TENTS

As shown in an accompanying micro-photograph of a weld made abroad, the transition in the composition of the metal from the plate to the material added and from that material to the head is very gradual and differs only in the percentage of carbon content. As the actual area welded is low in carbon, a junction of high ductility and great strength is obtained. In no case has a microscopic examination shown anything but a close-grained structure with an entire absence of "shoot offs" thus proving that the head had never reached a temperature high enough to change the molecular structure. The intrinsic value of the joints so produced is the firm support given to the head, and the tying together of the head and base to form a rigid box girder of solid section.

In the plant of the United Water, Gas & Electric Company, at Hutchison, Kan., which furnishes power to the Hutchison Interurban Railway, the body of a mouse grounded some important circuits in the station which stopped the railway and put out all the lights in the city. Many other industries depending on electric motors for power were also without energy for about an hour. It appears that the assistant engineer of the plant discovered the mouse and while he was trying to dislodge it from its precarious position without shutting down the plant the little animal jumped into a connection that electrocuted it and caused a serious short-circuit.

News of Electric Railways

DECISION IN PASSAIC GAS CASE

Highest Court in New Jersey Declares Franchises Must Be Valued for Rate-Making Purposes

A decision was rendered on Dec. 9 by the Court of Errors and Appeals of New Jersey upsetting the order of the Board of Public Utility Commissioners requiring the Public Service Gas Company to establish a 90-cent rate for gas in its Passaic district. The interest of this decision to electric railway companies lies in the fact that this rate was based on a valuation in which the commission made an allowance for "going concern" value, but made no special allowance for the value of franchises. The decision of the commission in this case was published on page 35 of the issue of this paper for Jan. 4, 1913. The decision was upheld by the Supreme Court, but was appealed to the Court of Errors and Appeals by the gas company, which is one of the constituent companies of the Public Service Corporation.

The decision of the court, rendered just as this issue was about to go to press, includes the following statement:

"When a public utility corporation is in the enjoyment of privileges to use streets and public places in this State for the purposes of its business, whether such privileges be conferred by the State alone or partly by the State and partly by the municipality, and whether they be exclusive or subject to duplication, such privileges constitute a special franchise which is property, is subject to taxation and has normally a substantial value; and in making a valuation of the property of such corporation for the purpose of establishing a basis for the regulation of rates to be paid to it by the public for its product or service, it is erroneous to assign no value, or a merely nominal value, to such franchise when a substantial value is fairly reflected in the total market value of its securiites."

The report justifies this decision by many citations and also upon grounds of equity. It also considers the statement of the commission that it was the policy of the State not to allow the capitalization of franchises for an amount in excess of the actual cost involved in obtaining such franchises. The court says that even if the franchises are not capitalized this is no reason for the exclusion of the franchise from a valuation for rate-making purposes, because, while the value of the franchise may not be included in the par value of the capital stock it affects its market value.

DES MOINES FRANCHISE MATTER

The Des Moines (Ia.) City Railway is awaiting action by the City Council on its petitions for a special election to vote on the question of granting a franchise. About 10,000 of the voters in the city, or more than half, have signed one petition calling for such an election. The law requires only about 5000 names on this petition. About 1500 property owners have signed a second petition calling for the same election. The law requires only 175 names on this petition. Both petitions were secured so that the city might proceed with both and thus meet the different requirements of two sections of the law governing franchise elections. This was done in order that the date of the election might be fixed without the necessity of delay due to legal proceedings to determine which section of the law should apply.

Members of the City Council, and Mayor Hanna especially, have seen fit to delay the proposition indefinitely and continuously in spite of every effort on the part of the company for speedy action. When the Council refused action on the petitions the company finally took the question to the courts, and in the lower tribunal the decision was soon reached. An appeal has been made to the State Supreme Court and that body has advanced the hearing to Dec. 21. The company's only interest in this decision is to avoid any doubt about the legality of the proceedings. In the meanwhile the city might have proceeded under both sections so that there would be no uncertainty. Instead the city has refused to proceed under either.

Mayor Hanna has stated several times that he proposed to fix Jan. 16 as the date for the election, but he has not yet fixed any date. It has been proposed recently that a vote on the local saloon question be taken at the same time as the vote on the city railway franchise. Mayor Hanna also has proposed to submit a series of amendments to the proposed franchise at the time of the election, but it is thought unlikely that he will be able to do this since the petitions call for an election on the specific franchise called for by the company and none other.

MUNICIPAL OWNERSHIP IN SEATTLE

City Apparently Divided Over Question of Continuing Present System

As a culmination of the controversy waged in Seattle, Wash., the last three years over the question of municipal operation of electric railways, several members of the City Council now advocate disposing of the existing municipal railway system. The leader of the faction in favor of selling the lines was elected to the City Council last year largely on account of his advocacy of municipal ownership, but he is now arrayed on the other side. This state of affairs is attributed to a considerable extent to the filing of a suit on Nov. 27 by the State on behalf of the state board of accountancy against the City Council of Seattle, the Mayor, city treasurer, city comptroller and former Mayor Cotterill to recover money alleged to have been illegally appropriated for the rehabilitation and operation of the Lake Burien Railway outside of the city limits, the second unit in the city's railway system.

The Lake Burien line was accepted as an unincumbered gift from its promoters, property owners along the right-of-way, and $25,000 was appropriated by the City Council to rehabilitate the line. Later $9,000 was appropriated to form an operation fund for this line and Division A of the municipal lines. Since the beginning of operation there has been a deficit each month which has remained a charge against the general fund. Three miles of the Lake Burien line lie outside of the city limits. As if to anticipate the action for recovery of the appropriation a rider to abolish the accountancy board was placed on the ballots which went before the voters at the recent general election, but this issue was defeated at the polls. The attorney-general hopes to establish through the suit whether cities of the State can operate public utilities outside the city limits.

The municipal system of Seattle has been described previously in the ELECTRIC RAILWAY JOURNAL. It consists briefly of a line known as Division A, 4.2 miles long, running from the business district to the mill district of the city, and of the Lake Burien line, 9 miles, which extends from the extreme southern end of the city to Lake Burien. There is a distance of practically 2 miles between the two divisions. The advocates of the municipal railway system have proposed connecting the lines with a motor bus service, and have endeavored to add the Seattle, Renton & Southern Railway to the municipal system. This line traverses the Rainier Valley practically parallel with the Lake Burien line, but 2 miles or 3 miles distant. It crosses the business section of Seattle, however, and could be connected with Division A, but it could not be connected with the Lake Burien line except at considerable expense.

The constant heckling indulged in by members of the City Council has apparently served no purpose except to keep many of the outlying districts of the city without adequate transportation facilities. In five years no extensions of the lines of the Puget Sound Traction, Light & Power Company have been built in Seattle because of the unreasonable demands of a City Council which was determined upon converting the lines of the city into a municipal system.

A resolution since introduced in the Council by A. Allen Dale providing for the sale of Division A and C of the municipal railway has been tabled pending a decision in the suit of the State against the city alleging misappropriation of funds. Mr. Dale advocates the plan of placing the matter of selling the lines before the electorate at the municipal election in Seattle in March.

TOLEDO NEGOTIATIONS HALTED

Nothing has been done toward renewing the negotiations between the city of Toledo, Ohio, and the Toledo Railways & Light Company since the franchise committee of the City Council announced that it had completed a franchise similar in many ways to the one prepared by the company in the first place. It is understood, however, that the draft prepared by the franchise committee contains some requirements objectionable to the company. Copies of the ordinance are in the hands of the attorneys, but they have not as yet been made public.

In overruling the demurrer filed by the Toledo *News-Bee* in the case of the United States against the Toledo Newspaper Company and N. D. Cochran, Judge Killits announced on Dec. 4 that the case would go to trial on its merits on Dec. 28. This is the action in which the defendants were cited for contempt of the Federal Court because of certain publications relating to the receivership case of the Toledo Railways & Light Company, and meetings conducted by so-called agitators after the court had rendered a decision, restoring the old rate of fare pending a final settlement of the franchise question.

CLEVELAND SUBWAY AND LABOR MATTERS

It is stated that the freight subway project under East Fifty-fifth Street, Cleveland, Ohio, as planned by O. C. Barber, Barberton, will depend largely upon the establishment of the harbor line at the foot of the street where he has planned to erect extensive coal and ore docks. The subway would connect the proposed docks with the railroads in the Cuyahoga valley.

Cleveland motormen and conductors are arranging to request the State Industrial Commission to investigate working conditions in the city. They contend that the State law provides for eight hours of continuous rest out of each twenty-four for railway employees and that the commission has authority to investigate and enforce the law. They will, however, ask Attorney-General Hogan for an opinion on the State law before they appeal to the commission.

Several minor amendments to the proposed grant to the Cleveland Rapid Transit Company were submitted at the regular meeting of the City Council on the evening of Dec. 7 and the ordinance was placed back on its second reading.

PROGRESS ON BOSTON SUBWAY CONSTRUCTION

Steady progress is being made in the construction of the Dorchester tunnel and the East Boston tunnel extension, at Boston, Mass., under the direction of the Boston Transit Commission. The former is now completed from Tremont Street to Washington Street, under Winter Street, and the Washington Street station, between Washington and Arch Streets, is completed except for interior finish and equipment. This station is a two-story structure. Transfer between Cambridge subway and Washington Street tunnel and Dorchester trains will be made at the station through passageways or lobby connections. East of this station 270 ft. of tunnel built in open cut is completed, the remaining section of 760 ft. connecting with Dewey Square and the South Station being under construction by the tunneling method. Work has been started on the Dewey Square section, which is to be 800 ft. long.

The East Boston tunnel extension, which connects Scollay Square with the West End, will have stations with island platforms at Scollay and Bowdoin Squares. An inclined elevator will be provided at the former station, which is being built below the Tremont Street subway. The existing entrances will serve for both stations, with an additional entrance at the north side of the square. Between Scollay and Bowdoin Squares the tunnel is a double-barreled structure and throughout the entire extension space for two tracks is provided. West of the Bowdoin Square station an underground loop will be built to enable a portion of the East Boston cars to be turned back at this point, and a switch-back will be installed east of Scollay Square to reverse various Cambridge trips. The general work of construction is practically completed with the exception of the finishing of the stations and the reconstruction of the tunnel between Washington Street and Scollay Square.

MISGIVINGS IN SAN FRANCISCO

"Chronicle" Wants City to Apply Business Principles to Municipal Line

In the issue for Dec. 2 the San Francisco *Chronicle* said in part in an editorial headed "Our Municipal Railroads":

"The profit in owning and operating a street railroad system is made by a very trifling percentage of each fare paid. Now that this city has engaged in the railway business, we all wish it to be successful. The net income ought to be sufficient to make good all that we lose by taxes which private owners have paid, and in addition to pay off all indebtedness incurred in building the system within such a reasonable term as would be accepted by a private company as the period of a franchise. Extensions must be made only when they will pay for themselves during such a period. Upon any other basis, either the taxpayers or those who ride on the cars will have partly to pay for other people's rides. If any section of the city wants a railroad not likely to pay within a reasonable time, the property owners who will benefit by it ought to pay for it.

"In this city we already see different sections vigorously fighting each other before the Supervisors in regard to the location of new railroads. In no case does any faction present figures to show that the road they desire will be profitable. We are already operating lines which for the present are unprofitable, and are operated out of the profits of the paying properties. It is useless to ignore the fact that if the construction of new lines be left entirely to Supervisors their action will be largely determined by its probable ultimate effect on votes. And that is the very worst way there is to fix locations. This scramble for street railroad and other improvements is at the bottom of the movement to return to our old plan of electing Supervisors by wards. The present management of our municipal railroads is competent. Any management if left to itself will strive to make the best possible showing. Such city administrations as we have sometimes had would take care that there was a management to suit them, but that rests with the people. But there should be sufficient backbone in the government to run our street railroads on business principles."

CONSTRUCTION IN TENNESSEE AND KENTUCKY

The extension of existing electric interurban lines and the construction of several others which are definitely projected and some of which are surveyed, are engaging the attention of middle Tennessee and south-central Kentucky. These lines will radiate from Nashville, Tenn., and in connection with two lines already in operation will traverse some of the richest territory in the United States. As has been noted previously, the Nashville & Gallatin Railroad is to build a branch, leaving the main line at Goodlettsville and extending to Springfield, Robertson County, and ultimately to Clarksville, in Montgomery County, passing through Guthrie in southern Kentucky. All of this is a rich tobacco and grain growing section. The same company has outlined an extension northward from Gallatin to Bowling Green, in Warren County, Ky.

An important extension from the line of the Nashville & Franklin line is already under way. Known as the Middle Tennessee Interurban Railroad, it will extend from Franklin, through Eaglesville, Shelbyville, Fayetteville, all in Tennessee, to Huntsville, Ala. The 23 miles between Franklin and Eaglesville is already graded.

Of the new projects, the Tennessee & Kentucky Interurban Railroad is perhaps the most important. This line, as has been indicated, will extend from Nashville, across the State line to Adairville, in Logan County, thence connecting with Russellville, the county seat, and ultimately being extended to Franklin, seat of Simpson County, Ky. The Cumberland Valley Interurban Railway has its line surveyed through Wilson County to Watertown, Alexandria, Smithville, McMinnville and Sparta, from which branches are projected to Lebanon and the Hermitage, the old home of Andrew Jackson. The Nashville & Murfreesboro Interurban Railway is projected to pass through Davidson and Rutherford counties, extending ultimately to Woodbury, seat of Clinton County, while there are various other projects in process of organization, it is said, to build lines from Nashville to Ashland City and out the Charlotte Pike. The Nashville Traction Company is reported to be planning an interurban extension out the Murfreesboro Pike to Una.

The project to build the interurban railway to connect Lexington, Ky., and Richmond, Ky., has received further stimulus from the fact that Lexington's new Board of Commerce is considering it. Louis des Cognets, former president of the Lexington street railway system, said recently:

"Even should the Kentucky Traction & Terminal Company be disinclined to build the line, it has given assurance that it will co-operate in a most friendly spirit with any company operating cars into Lexington from Richmond. The line to Richmond is one of the most important definite plans for the benefit of the whole community that the Board of Commerce can take up."

Costly bridge construction necessary to span the Kentucky River, which has cut a wide deep channel between the two towns, has previously acted as a deterrent to the building of the line. Mr. des Cognets, however, urges that the state law permits toll bridges and that these tolls could be made to meet the fixed charges of such a structure, the cost of which is estimated at $250,000.

Third Track in State Street, Chicago.—The Chicago (Ill.) Surface Lines is asking permission to build an additional third track in State Street, in order to do away with "switchbacks" and to provide loops for cars from the west, northwest and southwest sides.

Washington Air-Brake Order.—The Public Service Commission of the District of Columbia has denied the application of the Washington Railway & Electric Company for an extension of sixty days from Dec. 31, 1914, in which to install air brakes on all cars weighing sixteen tons or more.

Employees Want New Laws.—On Jan. 11 representatives of electric railway employees from all sections of Ohio will meet at Columbus to plan a campaign for the enactment of laws for the regulation of working conditions on electric railways. The call for the meeting was sent out by the Amalgamated Association.

Transportation Commission Favored.—Mayor Hocken of Toronto, Ont., at the recent luncheon of the Municipal Improvement Association in that city, delivered a speech favoring the appointment early next year of a transportation commission to plan civic car line extensions with a view to their unification in 1921 with the present system as operated by the Toronto Railway.

Recovery of Benefit Fund Payments Allowed.—Chief Justice Shepard of the Court of Appeals of the District of Columbia decided on Dec. 9 that an employee of the Philadelphia & Baltimore Railroad was entitled after discharge by the company to recover from the railroad the amounts of money he had paid into the company's benefit fund. The man who sued for recovery had been in the employ of the company twenty years.

Toronto Suburban Railway Rights.—City Solicitor Johnston, of Toronto, Ont., reporting to the Board of Control on Dec. 3 on the rights and privileges held by the Toronto Suburban Railway pointed out that the company had what practically amounted to a perpetual franchise, as provisions were made for its renewal in September, 1929, and at the end of every twenty years thereafter. The only way the city can acquire the rights of the company is by purchase in 1929 or at the end of any other twenty-year period, either by agreement or arbitration.

Service Conference in Pittsburgh.—J. D. Callery, president, and P. N. Jones, general manager of the Pittsburgh (Pa.) Railways conferred with Mayor Joseph G. Armstrong and City Solicitor C. A. O'Brien on Dec. 11 relative to the points at issue between the company and the city. The matter of the suit brought during the term of Mayor Magee to enforce the payment of the car tax was not mentioned, as this is to be handled separately. While transfers, rerouting, street cleaning, track repairing and the establishment of a shuttle between downtown Pittsburgh and the North Side were discussed nothing definite was decided upon. Another conference will be held soon.

The New Haven Indictments.—The case of the indictments against a number of the directors of the New York, New Haven & Hartford Railroad was called in the United States District Court before Judge Rudkin on Dec. 4. Pleas of not guilty were entered for William Rockefeller, Robert W. Taft, Charles F. Brooker, Frederick F. Brewster, D. Newton Barney and Henry K. McHarg. Pleas claiming immunity were entered for William Skinner, James S. Elton and George F. Baker. A. Heaton Robertson and James S. Hemmingway also entered pleas of not guilty. John L. Billard, Edward A. Robins and Thomas De Witt Cuyler have also entered immunity pleas. The remainder of the twenty-one directors indicted for violation of the Sherman law have already entered pleas of not guilty.

Confiscation of Mexican Tramways Reported. — W. E. Pearson, at the New York office of the Pearson Engineering Corporation, Ltd., confirmed the statement recently attributed to Dr. F. S. Pearson, president of the Mexico Tramways, that the latter had received a cable on Dec. 2 from his representative to the effect that the property had been confiscated by the political factions now in control of the city government. The treasurer and other officers were ordered to leave the service forthwith. Both the British and the Brazilian authorities in Mexico City are said to have filed protests. No other advices regarding this matter had been received up to Dec. 9. According to recent reports the Zapatistas have not in any way disturbed the Mexican Light & Power Company, which supplies the tramway, the city and private customers with light and power.

Public Utility Commission Legislation Likely.—The question of a public utilities commission for Michigan, which was before the Legislature two years ago, will probably come up again at the session this winter. It is understood that Governor Ferris and the members of the Michigan Railroad Commission will back the bill, while the Republican state platform pledged the support of that party to such a bill. Two years ago two bills for a utilities commission were before the Legislature, one copied after the Indiana law and the other drawn up by Chairman Hemans of the State Railroad Commission. Both died in committee. Mr. Hemans is now at work on another bill for presentation at the coming Legislature, but his plans are tentative as to what it shall contain. Governor Ferris, it is understood, will make a special plea for a public utilities commission in his message to the Legislature.

Forestall Complaints.—In an editorial "Forestall Complaints Before They Happen," *Printers' Ink*, a journal for advertisers, after quoting from the article "The Importance of Good Public Relations," written by Theodore P. Shonts, president of the Interborough Rapid Transit Company, for the convention issue of the ELECTRIC RAILWAY JOURNAL, says in its isue of Dec. 10: "With Mr. Shonts we are in hearty accord, but *Printers' Ink* would go one step farther. A well-conducted advertising campaign along the general lines of that conducted by the American Telephone & Telegraph Company would forestall most of the complaints before they happen. The American public is not only a reading and a thinking public; it is a public pretty thoroughly alive to the sense of fair play. An understanding of the fundamental problems which 'big business' is forced to solve will go far toward removing hostility on the part of the great mass of the people. In no way can that understanding be given so easily and so quickly as by advertising."

New York's Subway Labor Problem.—The Public Service Commission for the First District of New York has been served with an injunction, otained by William E. Heim, a taxpayer of New York City, restraining it from taking any action to forfeit any construction contract on the new rapid transit lines on account of the alien labor clause of the State labor law, or from withholding payments to such contractors because of violations by them of this clause. Argument on the preliminary order was had in the Special Sessions Court on Dec. 4. It is expected that the decision of this court will be appealed to the Appellate Division and from there to the Court of Appeals, so that the judgment

of the court of last resort may be obtained. The application for the injunction is based upon the allegation that the provision of the labor law forbidding the employment of non-citizens upon public work is unconstitutional and a violation of the treaty between the United States and the Kingdom of Italy and similar treaties with other nations in the most favored nations class.

Reports Requested Regarding Seattle Purchase.—Preliminary to further consideration of the proposition for the purchase of the Seattle, Renton & Southern Railway by the city of Seattle for a consideration of $200,000 in municipal railway bonds and 20 per cent of the gross earnings for a period of twenty-eight years, payable annually, Mayor H. C. Gill recently conferred with the heads of the various departments of the city government on the various phases of the project. The Mayor has asked A. L. Valentine, superintendent of public utilities, to report on the cost of operation of the line by the municipality, the cost of such reconstruction as will be necessary in bringing the tracks to the established grades, and matters of like nature. A. H. Dimock, city engineer, has been requested to furnish an estimate of the cost of grading and regrading the 18 ft. of Rainier Avenue now occupied by the tracks of the Seattle, Renton & Southern Railway. J. D. Ross, lighting superintendent, will report on the estimated cost of current sufficient to operate the line in connection with Division A and the Highland Park & Lake Burien Line, Division C, as well as the advantages that will accrue to the light and power department by city operation of the line. James E. Bradford, corporation counsel, will report on the various suits against the Seattle, Renton & Southern Railway, now in court.

PROGRAMS OF ASSOCIATION MEETINGS

New England Street Railway Club

The regular monthly meeting of the New England Street Railway Club will be held at the American House, Boston, Mass., on Dec. 17. H. A. Bullock, staff assistant to the president of the Brooklyn (N. Y.) Rapid Transit Company, will speak on "The Employee's Welfare." His address will be followed by a discussion in which it is expected that representatives of large corporations in other kinds of business who have had extended experience along this line will take part. The dinner which precedes the meeting will be served at 6 p. m.

American Wood Preservers' Association

The eleventh annual convention of the American Wood Preservers' Association will be held at the Congress Hotel and Annex, Chicago, on Jan. 19, 20 and 21, 1915. The subjects to be treated in papers are as follows:

"Treated Timber for Factory Construction," by F. J. Hoxie, engineer and special inspector of the Associated Factory Mutual Fire Insurance Companies.

"Temperature Changes in Wood under Treatment," by George M. Hunt of the Forest Products Laboratory, Madison, Wis.

"Sill Ties," by F. J. Angier, secretary-treasurer of the association.

"New Data on Properties of Creosote Oil," by Dr. Herman von Schrenk.

"Facts on Treated Ties," by J. H. Waterman, superintendent of timber preservation of the Chicago, Burlington & Quincy Railroad.

"Bleeding and Swelling of Paving Blocks," by Clyde H. Teesdale, in charge of wood preservation at the Forest Products Laboratory, Madison, Wis.

"Economical Use of Steam in Connection with Wood Preserving Plants," by A. M. Lockett, mechanical engineer, New Orleans, La.

"Mechanical Life of Ties as Affected by Ballast," by Earl Stimson, engineer maintenance of way of the Baltimore & Ohio Railroad.

"Determining the Soundness of Timber before Treatment," by C. M. Taylor, superintendent of the Port Reading Creosoting Plant.

"Facts on Creosoted Piling," by T. G. Townsend, piling inspector of the Southern Railway.

"A Problem in Air Seasoning Ties," by A. H. Noyes, assistant treasurer of the Ayer & Lord Tie Company.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The sales of bonds on the New York Stock Exchange on Dec. 9 totaled $1,736,000, par value, as compared with $1,395,500, par value, for the same day last year. This is much the largest day's business in bonds since public trading was resumed. Price movements on the average showed a further gain, but there were reactions in some securities which have lately experienced unnatural advances. Despite the approaching opening of the Stock Exchange for trading in stocks, sterling rates remain normal. Money continues easy. It is not regarded as likely that rates will be materially affected by any borrowing which may be made following the reopening of the exchange for public trading in stocks. Trading in stocks through the clearing house, according to the reports issued on Dec. 9 by the New York Stock Exchange, presented many interesting features. The most important changes reported during the day were in the railroad issues.

CHICAGO TRACTION ACCOUNTING CONTROVERSY

The report of the special audit of the books of the Chicago Railways and the Chicago City Railway being made by the city administration has just been published. That for the Chicago Railways was made by M. & L. W. Scudder, of New York, and that for the Chicago City Railway by Barrow, Wade, Guthrie & Company. In both cases the books were found without important error. The corporation counsel of the city, however, has recommended certain changes in the accounts to which paving and the removal of obstructions should be charged, although both of these questions have either been covered by specific provisions in the ordinance or publicly discussed and decided by the Board of Supervising Engineers, which has had the sole authority under the ordinance in these matters. It has been estimated that these changes, if made, would reduce the Chicago Railways' capital account $6,945,130 and make it necessary to pay the city traction fund $584,264, and that the company should also credit its renewal account with $531,965, and, similarly, that the capital account of the Chicago City Railway would have to be reduced approximately $5,138,000.

Regarding this controversy Henry A. Blair is quoted as saying, in an interview, that the books of the two railway companies have been audited each year by accountants selected by the city and approved by the companies. Through these audits the city comptroller was familiar with the methods of the Board of Supervising Engineers in charging every item which is now sought to be questioned by the Mayor. On these audits the companies have made seven annual settlements with the city, having turned into the traction fund more than $13,000,000,

On the special audits during Mayor Busse's administration the city and the companies had expended approximately $100,000, of which the city has borne 55 per cent. In the audit just completed the city again appropriated $50,000 of its own funds for the work. It would seem that this constituted a liberal expenditure for auditing purposes. Moreover all these firms have reported that the railway companies were conforming to the terms of the 1907 ordinances and the decisions of the Board of Supervising Engineers. The accountants engaged on the work at the present time were not called upon to show what would have been the results of operation during this seven-year period if the companies had followed the ordinance and the decisions, but if they had followed the opinions rendered by corporation counsel. Mr. Blair did not consider these criticisms therefore worthy of serious consideration. Speaking from the standpoint of a financial representative he did not believe that the controversies of this nature were at all helpful either to the city or to the railway companies.

Mr. Blair is also quoted as saying that during the seven-year period the companies had never at any time earned more than a fair rate of return upon the capital fixed by the actual purchase price of the city. The rate of return has been about 7 per cent, which includes the 5 per cent return upon the purchase price, the companies' 45 per cent of the visible net receipts and all construction profits. This rate of return he stated was less than that earned by other public utilities in the city of Chicago.

ANNUAL REPORTS

Eastern Pennsylvania Railways

The consolidated statement of income, profit and loss of the Eastern Pennsylvania Railways, Pottsville, Pa., for the twelve months ended June 30, 1914, follows:

Gross earnings	$826,415
Operating expenses and taxes	503,487
Net earnings from operation	$322,928
Deduct underlying companies charges	45,525
Balance	$277,403
Interest on bonds	$164,863
Other interest and rentals	13,630
Total	$178,493
Surplus for year	$98,909

As compared with the year ended June 30, 1913, the gross earnings increased $56,735, or 7.37 per cent, and the operating expenses increased $67,483, or 15.48 per cent. The net earnings, therefore, decreased $10,748, or 3.22 per cent, while the net profit for the year decreased $19,463. The various departments showed the following earnings results: Railway, an increase of $13,576; electric, an increase of $43,415; gas, a decrease of $55, and park, a decrease of $201. The increased operating expenses were partly caused by higher cost of labor and extra maintenance. Railway maintenance increased by $23,900 to a total of $88,390 for the year, while the cost of transportation increased $13,000. There was charged to capital accounts during the year $115,689, of which $57,666 was for the railway department and $58,023 for the electric department.

San Francisco-Oakland Terminal Railways

Price, Waterhouse & Company recently completed an audit of the books of the San Francisco-Oakland Terminal Railways for the fiscal year ended June 30, 1914, and submitted the following income statement for that period:

Operating revenues		$4,515,798
Operating expenses:		
Maintenance of way and structures	$400,972	
Maintenance of equipment	284,081	
Traffic	25,398	
Conducting transportation	1,923,966	
General and miscellaneous	295,503	
Total operating expenses		$2,929,920
Net operating revenue		$1,585,878
Deduct:		
Taxes and licenses		239,000
Net revenue		$1,346,878
Add:		
Miscellaneous income		125,964
Net income before charging interest, amortization of premiums and discount on bonds and notes, and depreciation of road and equipment		$1,472,842
Deduct:		
Interest on bonds	$859,268	
Interest on collateral trust notes	175,000	
Miscellaneous	23,232	
Total		$1,057,500
Profit after charging all interest, but before providing for amortization of premiums, and discount on bonds purchased, and depreciation of road and equipment.		$415,342
Deduct:		
Amortization of premiums and discount on bonds purchased		10,491
Profit after charging all interest, but before providing for depreciation of road and equipment		$404,851
Add:		
Interest charged by company to capital assets		240,101
Balance carried to surplus account		$644,952

The operating expenses of the company for the fiscal year consumed 64.9 per cent of the operating revenues, divided as follows: maintenance of way and structures, 8.9 per cent; maintenance of equipment, 6.3 per cent; traffic, 0.6 per cent; conducting transportation, 42.6 per cent, and general and miscellaneous, 6.5 per cent. Taxes and licenses absorbed 5.3 per cent of the operating revenues, leaving net revenue of 29.8 per cent. Miscellaneous income constituted 2.8 per cent of the operating revenues, so that the net income before charging interest, amortization and depreciation was 32.6 per cent of the operating revenues.

The auditors report net additions to capital account of $510,927 for road and $105,923 for equipment, a total of $616,850. These amounts are those existing after considerable writing down of the value of land and writing off of the value of abandoned structures. The total amount of bonds outstanding as of June 30, 1914, is certified to amount to $16,656,000 in the hands of the public and $3,256,000 pledged as security for the Oakland Railway notes, making a total outstanding amount of $19,912,000.

The profit of $404,851 after charging all interest, including the interest properly chargeable to capital, does not provide for sinking fund payments. While amply able to maintain itself in excellent operating condition, therefore, the property evidently is not in a position to undertake new construction until, through refinancing, new capital has been obtained.

Barcelona Traction & Light Company, Barcelona, Spain.—Owing to the present European war, the Barcelona Traction, Light & Power Company was unable to meet the semi-annual interest coupons due on Dec. 1 on its outstanding £1,500,000 of first mortgage 5 per cent bonds. According to a statement from the Toronto office, the war has rendered it impossible to continue the arrangement made last June for providing the funds required for the completion of the present program of construction. The board, however, has under consideration a plan which would provide the company the necessary funds for completing the work under construction and for adjusting computing interest. The enterprises of the company at present in operation are said to show satisfactory results, with a steadily increasing revenue. This company was formed in 1911 by F. S. Pearson and associates and it either owns or controls virtually the entire tramway, light and power business of not only the city of Barcelona but the whole district of Cataluna, the industrial center of Spain.

California Street Cable Railroad, San Francisco, Cal.—J. Barth & Company, San Francisco, have purchased the $384,000 of new general first mortgage 6 per cent serial refunding gold bonds of the California Street Cable Railroad, dated Jan. 1, 1915, and due in twelve annual installments beginning Jan. 1, 1916, and ending Jan. 1, 1927. These bonds were referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 31, Nov. 21 and Dec. 5.

Chicago (Ill.) Elevated Railways.—At the annual meeting of the Chicago Elevated Railways collateral trust the trustees reduced the governing board from seven to five members. Ira M. Cobe and F. A. Delano, who joined the Federal Reserve Board in Washington, withdrew. It was not thought necessary to fill their places. The board now stands: Frank A. Vanderlip, Henry A. Blair, Samuel Insull, E. W. Harden and Samuel McRoberts. The governing committee will elect the executive committee at a later meeting. There are three members of that body, Samuel Insull, Henry A. Blair and Ira M. Cobe. Mr. Cobe has tendered his resignation, but his successor has not as yet been selected.

Cumberland County Power & Light Company, Portland, Maine.—It was stated in the ELECTRIC RAILWAY JOURNAL of Nov. 21 that the Cumberland County Power & Light Company has certified and guaranteed, principal and interest, $500,000 of bonds of the York County Power Company, a subsidiary. Of this amount $315,500 are outstanding in the hands of the public, $150,000 are in the treasury of the Cumberland County Power & Light Company and $34,500 are in the treasury of the York County Power Company. The $315,000 outstanding includes $100,500 of bonds which have been exchanged for an equal amount of underlying liens. There has been no offering of these bonds.

Federal Light & Traction Company, New York, N. Y.—E. N. Sanderson, president Federal Light & Traction Company, has issued a circular regarding the recent deferring of dividends on the company's $2,500,000 of 6 per cent cumulative preferred stock, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5. The net income of all companies for the twelve months beginning September, 1913,

is said to have been adversely affected by the disastrous fire at Hot Springs, the serious strike in the Trinidad coal fields, and the drastic rate schedules in Tucson, Ariz., and Springfield, Mo. In the opinion of the board, however, the turning point has been passed, and from now on the company will enjoy increased gross and net earnings. During the last twelve months the gross earnings showed an increase over the corresponding previous period, and only the net earnings suffered substantially from the adverse condition. Since July the net income has been constantly improving, so that during the three months ended Oct. 31 the dividend on the preferred stock has been more than earned.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has granted the application of the Fresno Interurban Railway for permission to make three stock and bond issues to provide for twenty-six miles of new line at an estimated cost of $17,300 per mile.

Interborough Rapid Transit Company, New York, N. Y.—An extra dividend of 5 per cent has been declared on the $35,000,000 of stock of the Interborough Rapid Transit Company, along with the regular quarterly payment of 2½ per cent, both payable on Jan. 2 to holders of record on Dec. 21. Since the Interborough-Metropolitan Company owns $33,912,800 of the stock, its income from the extra disbursements is $1,695,640. The committee on listings of the New York Stock Exchange has received an application from the Interborough-Metropolitan Company to list $17,942,000 of 5 per cent cumulative preferred stock. This is the stock that was formerly in the hands of the voting trust and does not represent an increase in the capitalization of the company.

Joliet & Eastern Traction Company, Joliet, Ill.—The bondholders of the defunct Joliet & Southern Traction Company have almost unanimously decided to accept stock in the Joliet & Eastern Traction Company in exchange for their holdings. The formation of this new company was described in the ELECTRIC RAILWAY JOURNAL of Nov. 21. The greater part of the $80,000 fund paid into court during the period of bankruptcy of the Joliet & Southern Traction Company will be practically all turned into the treasury of the new company.

Kentucky Securities Corporation, Lexington, Ky.—The annual report of the Kentucky Securities Corporation for the fiscal year ended June 30 is made up principally of a report for the Kentucky Traction & Terminal Company and the Lexington Utilities Company, all the stocks of which are owned by the Kentucky Securities Corporation. The combined operating revenue of the two subsidiary companies, exclusive of inter-company charges, amounted to $782,272 for the last fiscal year, as compared to $742,884 for the previous year, an increase of 5.3 per cent. Operating expenses in the two years were $412,509 and $401,507, an increase of 2.7 per cent. Miscellaneous income increased from $29,941 to $32,022 and fixed charges from $225,268 to $245,184, while the final surplus increased from $146,049 to $156,600, or 7.2 per cent. The operating companies as of June 30 had a credit balance in the reserve for accidents and damages of $27,550, and it was directed that $24,000 should be credited to the depreciation reserve as of June 30. A fixed proportion of gross earnings is set aside monthly on account of maintenance, amounting for the current year to 16½ per cent.

Lehigh Traction Company, Hazelton, Pa.—The Lehigh Traction Company, reversing its previous decision as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 28, paid on Dec. 1 the interest due on its first mortgage 5 per cent bonds. The protective committee representing the bondholders refused to accept the offer of President Markle to purchase the bonds for his personal account, as they had done in connection with the interest default on June 1.

Long Island Railroad, New York, N. Y.—The 5 per cent equipment trust series A of the Long Island Railroad, the authorization of which by the Public Service Commission for the Second District of New York was noted in the ELECTRIC RAILWAY JOURNAL of Oct. 24, consist of a total authorized issue of $1,060,000. Of this amount $1,050,000 is issued and outstanding. The trusts are dated June 1, 1914, and mature $106,000 on June 1, 1915, and June 1 of each succeeding year to 1923, inclusive, and $96,000 on June 1, 1924. The principal and the interest are payable in gold and are guaranteed by the Long Island Railroad. The cost of equipment is $1,175,262, of which the railroad has paid to the trustees $125,000.

Massachusetts Electric Companies, Boston, Mass.—George C. Lee has been elected a trustee of the Massachusetts Electric Companies, succeeding the late Gardiner M. Lane.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—The Massachusetts Northeastern Street Railway on Nov. 28 filed a mortgage for $2,000,000 at Lawrence to the American Trust Company, Boston, Mass., as trustee. This mortgage takes the place of an original one issued in 1903 to the New York Trust Company, New York, which is discharged. The filing of the new mortgage simply provides for a change in the fiscal agent of the corporation.

Mexico Tramways, Mexico City, Mexico.—Officers of the Mexican Light & Power Company, a subsidiary of the Mexico Tramways, recently notified the holders of the $9,733,333 of second mortgage fifty-year sinking fund bonds that the payment of the interest coupons due on Dec. 1 would be deferred. The rate of exchange has been falling continuously in the last few months and the Mexican government officials, who are now in control of the operations of the Mexico Tramways, have prohibited further remittance of funds from Mexico until the rate of exchange improves.

New York (N. Y.) Railway.—At the annual meeting of the New York Railways on Dec. 7 Darwin P. Kingsley, F. S. Witherbee, Henry Ollesheimer, F. L. Leland and J. C. Cobb were elected directors to represent the holders of the 5 per cent income bonds. Harry Bronner, Guy E. Tripp, A. J. Hemphill and E. S. Marsten retired. Mr. Cobb was reelected. A statement of the company's income for the four months ended Oct. 31, last, was read by T. P. Shonts, president. It showed that the gross revenue for the period, October being partly estimated, was $4,618,000, as against $4,828,000 last year, and a surplus over interest charges available for the income bonds of $425,000, against $508,000 last year. The so-called Kingsley insurance company interests already have a suit pending in the courts to decide what constitutes a proper allowance for injury and damage claims or whether or not all surplus revenue not actually paid out in any given year shall be applicable to the adjustment of income bonds. The contention of certain bondholders has been that all surplus revenues not actually paid out during any year should be applicable to the payment of interest on the income bonds. Darwin P. Kingsley is president of the New York Life Insurance Company, F. S. Witherbee is a director of the Equitable Life Assurance Society. Henry Ollesheimer is vice-president of the Metropolitan Bank, New York, F. L. Leland is president of the New York County Bank, and J. C. Cobb resides in Boston. The movement to change the present income bondholders' representation on the board has been under way for a year. A total of $18,000,000 of bonds was voted, of which the so-called Kingsley committee cast $14,000,000 and the so-called Hemphill committee $4,000,000.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Railroad Commission of California has rendered a decision authorizing the Oakland, Antioch & Eastern Railway to issue promissory notes of the total face value of $295,345. It is made a condition of the commission's order that these notes shall bear interest at not to exceed 7 per cent per annum.

Rochester Railway & Light Company, Rochester, N. Y.—The Rochester Railway & Light Company has been authorized to issue $250,000 of its 5 per cent fifty-year consolidated trust mortgage bonds for the purpose of refunding a like amount of the underlying bonds of the Brush Electric Light Company, maturing on Jan. 15, 1915. The new bonds are to be sold or exchanged at not less than 95. Should the holders of the underlying bonds not prove willing to exchange for the new bonds at not less than 95, the company has been authorized by the Public Service Commission of the Second District of New York to enter into agreement with such holders whereby an extension of the time for the

payment of the principal may be obtained for one year at an increase from 5 per cent to 6 per cent in interest during that time on the old bonds.

Springfield (Mass.) Street Railway.—The Springfield Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,041,000 of additional stock at 110 to pay floating debt. This is part of an issue of $1,290,000 authorized by the stockholders. There is now $3,708,100 of stock outstanding.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—E. W. Clark & Company, Philadelphia, Pa., are offering for subscription $1,118,000 of St. Joseph Railway, Light, Heat & Power Company 6 per cent sinking fund trust stock certificates due on May 30, 1917, and redeemable at par and accrued dividend on any dividend date. The certificates will be issued by the Guaranty Trust Company, New York, as trustee under an agreement with the Cities Service Company. This agreement provides for the deposit with the trustee of 31,948 shares out of a total of 35,000 shares of the common stock of the St. Joseph Railway, Light, Heat & Power Company. A sinking fund will operate monthly to retire certificates before maturity. The rate at which this fund will work will be $450,000 a year, giving the issue an average life of not more than fifteen months. If the certificates are not obtainable for purchase for the sinking fund at par and accrued dividend or better in the open market, they will be called by lot monthly. All certificates taken up in the sinking fund will be cancelled. The certificates are being offered at 97½ and accrued dividend, yielding more than 7 per cent to maturity and more than 8 per cent on their average life.

Toronto (Ont.) Railway.—William A. Read & Company, New York, N. Y., have sold $1,500,000 of 6 per cent gold bonds of the Toronto Railway, dated Dec. 1, 1914, and due half on Dec. 1, 1915, and half on Dec. 1, 1916, at 100¼ for the former and par for the latter. The purchase of these notes by the bankers was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5.

Washington Railway & Electric Company, Washington, D. C.—Notice has been served on the Washington Railway & Electric Company that because the purchase by the company of 740 shares of stock of the Washington & Rockville Railway was not authorized in writing by the Public Utilities Commission that body recognizes the transaction as void. The purchase was made from the Potomac Electric Power Company for a consideration said to have been $37,000.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has received an application from the West End Street Railway for authority to sell at public auction the $650,000 of stock authorized by the stockholders on Nov. 24, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 28.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.—The Railroad Commission of Wisconsin has authorized the Wisconsin-Minnesota Light & Power Company, a subsidiary of the American Public Utilities Company, to issue preferred stock to the amount of $367,000 and common stock to the amount of $244,000. The company has authority to issue $300,000 in preferred and $200,000 in common stock for the purpose of acquiring the property of the Winona Gas, Light & Coke Company, Winona, Minn., the Red Wing, Gas, Light & Power Company, Red Wing, Minn., the Minnesota-Wisconsin Power Corporation, which furnished electric light to Wabasha and Lake City, Minn., and the Eau Claire Gas Light Company. Under this authorization, stock to the amount of $94,000 may be issued for improvements and extensions to the plants, and preferred stock to the amount of $17,000 may be issued to acquire all property including the accounts receivable of the Neillsville (Wis.) Electric Company.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,880,000 of additional stock to pay floating debt. This is part of an issue of $2,350,000 authorized by the stockholders. The amount of stock already outstanding is $5,112,000.

DIVIDENDS DECLARED

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

California Railway & Power Company, San Francisco, Cal., quarterly, 1¾ per cent, prior preferred.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Continental Passenger Railway, Philadelphia, Pa., $3.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1½ per cent, preferred.

Indianapolis (Ind.) Street Railway, 3 per cent.

Manila Electric Railroad & Light Corporation, Manila, P. I., quarterly, 1¾ per cent.

Union Traction Company, Philadelphia, Pa., $1.50.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred quarterly, three-fourths of 1 per cent, second preferred.

United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $2, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$69,422	*$30,533	$38,889	$17,370	$21,519
1 " "	'13	68,454	*27,938	40,516	17,355	23,161
12 " "	'14	778,690	*374,603	404,087	208,880	195,207
12 " "	'13	755,084	*343,270	411,814	207,455	204,359

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Oct.,	'14	$88,261	*$58,067	$30,194	$28,655	$1,539
1 " "	'13	99,358	*62,447	36,911	25,856	11,055
12 " "	'14	1,108,598	*698,404	410,194	333,135	77,059
12 " "	'13	1,194,265	*709,875	484,390	292,536	191,854

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.

1m., Oct.,	'14	$107,611	*$65,850	$41,760	$32,464	$9,296
1 " "	'13	111,955	*65,988	45,967	32,341	13,626
10 " "	'14	1,058,200	*633,485	424,716	323,776	100,940
10 " "	'13	1,051,382	*627,872	423,509	316,785	106,724

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

1m., Oct.,	'14	$262,685	*$146,703	$115,982	$42,349	$73,633

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1m., Oct.,	'14	$164,692	$76,613	$88,078	$70,182	$17,896
1 " "	'13	145,647	74,303	71,344	47,012	24,332
12 " "	'14	1,882,293	901,171	981,123	712,902	268,221
12 " "	'13	1,758,651	872,587	886,064	552,087	333,977

MEXICO (MEX.) TRAMWAY.

1m., Oct.,	'14	$306,772	$140,342	$164,430	......	......
1 " "	'13	278,377	151,935	126,443	......	......
10 " "	'14	2,854,705	1,327,634	1,527,072	......	......
10 " "	'13	3,024,232	1,541,267	1,482,970	......	......

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Oct.,	'14	$191,814	*$108,204	$83,610	$41,921	$41,689
1 " "	'13	204,178	*122,797	81,381	39,827	41,554
12 " "	'14	2,246,484	*1,354,798	891,686	506,449	385,237
12 " "	'13	2,189,888	*1,306,019	883,869	458,467	425,402

PORTLAND (MAINE) RAILROAD.

1m., Oct.,	'14	$87,095	*$53,623	$33,472	$19,193	$14,279
1 " "	'13	82,620	*52,081	30,539	21,711	8,828
12 " "	'14	1,042,698	*643,206	399,492	254,031	145,461
12 " "	'13	1,034,100	*705,997	328,103	156,193	171,910

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Oct.,	'14	$253,134	*$155,996	$97,138	$83,809	$13,329
1 " "	'13	257,303	*159,280	98,023	86,157	11,866
12 " "	'14	3,074,120	*1,854,458	1,219,663	1,003,677	215,676
12 " "	'13	2,964,266	*1,839,447	1,124,819	994,768	130,051

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Oct.,	'14	$800,097	$392,372	$407,725	$231,438	$178,287
1 " "	'13	765,160	375,156	390,004	238,135	151,869
10 " "	'14	7,746,727	3,995,604	3,751,123	2,278,509	1,472,504
10 " "	'13	7,333,922	3,711,374	3,622,548	2,349,531	1,273,017

*Includes taxes.

Traffic and Transportation

AUTO BUS COMPETITION IN SOUTHERN CALIFORNIA

Auto Bus Invades San Francisco—Los Angeles Railway, Losing $600 a Day, Has Withdrawn Twenty-One Cars

The "jitney" bus, as the nickel-a-passenger automobile is popularly referred to in southern California cities, has invaded San Francisco. On Dec. 1 six automobiles were put in regular service on Market Street, carrying passengers between the ferry and outlying points for 5-cent fares. As yet no special license has been placed upon these vehicles in San Francisco, but the fact that in that city they will be in competition with a municipal street railway may present the matter in a new light. While an increase in local passenger capacity during the exposition would be welcomed it is conceded that enfranchised street railways should not be deprived of their most profitable traffic by companies free from any obligation to serve in unprofitable districts and that automobiles should be subject to regulation, including a guarantee for damages in case of accident.

Long Beach, Cal., recently imposed a license fee of $25 a year on the "jitney" buses, compels the taking out of a $10,000 liability insurance for every car engaged in transporting passengers, and requires the buses to operate over designated routes and maintain reasonable schedules. On the day that this ordinance went into effect only forty-one out of 130 automobiles carrying passengers in competition with the street cars were continued in service. Prior to the passage of this ordinance in Long Beach the Pacific Electric Railway threatened to discontinue its East Ocean Avenue line altogether unless some regulation was placed upon the 5-cent automobile. Legislation is still pending on the matter in Los Angeles. According to the Los Angeles Railway Corporation its loss in revenue on account of the automobile competition amounts to $600 a day, and has caused the company to withdraw twenty-one cars on six lines and eighty-four motormen and conductors. Up to Dec. 1 the secretary of the Los Angeles police commission had issued a total of 1520 permits to chauffeurs to operate auto buses in competition with street cars, and that the rate of increase is rapid is shown by the record of over sixty additional permits issued on Dec. 2.

So serious has the auto bus matter become in Los Angeles that on Dec. 4 the directors of the local association of merchants and manufacturers addressed a letter in part as follows to the City Council:

"We believe that the time has arrived when your honorable body should take some action regulating the passenger traffic of the 5-cent automobile buses. If these buses can run through the city without proper regulation and protection to the lives of not only patrons but the public in general, we will soon be confronted with a number of accidents. In addition, with several hundred of these buses running up and down the main streets the traffic congestion is greatly increased, and the progress of other machines correspondingly retarded. To allow these machines unrestricted freedom is a menace to the entire community, and we believe that no good reason exists why they should not be placed under strict traffic regulations, and we therefore request that this matter receive the early attention of your honorable body."

NEW COMPANY PUBLICATION

The Hudson & Manhattan Railroad, which operates under the Hudson River between New York and New Jersey, has begun the publication of the *H. & M. Review*. The first issue, dated December, contains eight pages, 6 in. x 9 in. in size. In an article entitled "Object and Future of the *H. & M. Review*," Wilbur C. Fisk, president of the company, says in part:

"The need has been felt for months back for a means of intercommunication between all of us who are employed by the company and also between the departments to which we may be assigned. To accomplish this end, it has finally been decided to issue the *H. & M. Review*.

"The prime purpose to be achieved by the publication is the further promotion and cementation of the good fellowship already existing among the employees of the company. This can only be achieved by the hearty co-operation of all and by keeping the editor posted on all news items which are entitled to publication. The editor will always welcome contributions, but will not publish anything not prompted by the best of motives.

"It must not be forgotten that at times the company and your president may have a message which is meant for all of you, and the columns of the *Review* will be open to any officer of the company who has a message, either for the men of his own department, or which he believes will be beneficial to all. It is needless to say that events occurring during any one month will be faithfully reported in the paper.

"I earnestly request not only the officers but all employees of the company to lend the editor their assistance in his efforts to make the *Review* of real value."

The editor of the *H. & M. Review* is J. J. Scovern.

INTERURBAN SAFETY

The Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, of which E. F. Schneider is general manager, is continuing unabated its campaign of safety begun more than five years ago. The custom of the company has been to cover each year the entire system of 250 miles with talks to the 63,000 school children in the territory contiguous to the company's lines. Ben B. Casson of the company in a talk which he delivered recently to the grammar and primary grade pupils at the German Lutheran Parochial School at Elyria, Ohio, reviewed the activity of the company along these lines. In addressing the grammar grade pupils he said that in the year prior to the inauguration of the safety movement eleven children were injured and three killed, but that since then not a child had been injured or killed while going to or from school. He impressed the children with the necessity of exercising care not only as regards street cars but also as regards automobiles, motorcycles, wagons, bicycles and steam railroads. He emphasized the sad task which confronts the officers of the company in going into the homes of parents of children who had been injured or killed and witnessing the grief in the household. Mr. Casson also reviewed his own experiences during the four years that he operated a car over the Cleveland, Southwestern & Columbus Railway. The great problem before the American people to-day was the preservation of the lives of the people. He advised the school children to discuss safety among themselves and suggested similar discussions in the homes. The address to pupils of the primary grade was, of course, a modification of the one made to the grammar grade pupils. Heretofore the safety addresses to the school children have been made by officers of the company. Mr. Casson is a motorman, and his talks have presented a different viewpoint, and possibly for this reason have been especially valuable.

COMPLYING WITH THE NEW REVENUE PROVISION

A circular letter sent out several days before Dec. 1 to the regular shippers over the Louisville & Interurban Railroad, and a supply of stamps laid in by R. H. Wyatt, general freight and passenger agent of the company, enabled that company to start out under the new revenue tax on the first of the month without confusion. The circular letter reviewed briefly the nature and purposes of the revenue measure, explained what were the duties of the shippers, and then added that for the convenience of the patrons of the Louisville & Interurban Railroad stamps had been supplied to all conductors on freight trains, to agents of the company wherever stations were maintained and that the company would gladly obtain for shippers such supplies of stamps as they needed for use in shipments over its lines. As a consequence every shipper knew beforehand just what was expected of him, as, in addition, copies of the letters which were sent out were posted prominently at every shipping point. The company will continue, while the law is in effect, to have conductors and the various freight offices handle stamps for use of the shippers. Since postmasters are not paid for handling the stamps many of them are refusing to do so. The service which the company has installed in regard to stamps also enables the company to keep its records free from charge accounts of numerous shippers with small entries relating to the stamps.

Lifting Jacks in Pennsylvania.—The Lehigh Valley Transit Company, Allentown, Pa., has equipped all of its cars with lifting jacks conforming with the Pennsylvania statute effective on Dec. 1. The jacks are slung on special hang-

ers from the sides of the cars, and special instructions have been issued to the employees on the handling of the jacks in case of personal injury or derailment.

Increase in Fares in Eastern New Jersey.—The proposed increase in fares between Atlantic City and Pleasantville, N. J., referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 5, page 1274, does not apply to the Atlantic City & Shore Railroad. The steam roads operating between the points mentioned plan, however, to put a higher rate of fare into effect on Dec. 15.

Serious Accident on New York Elevated.—In a rear-end collision between two northbound trains on the Ninth Avenue line of the Manhattan Elevated Railway in New York at 116th Street and Eighth Avenue at 6:30 p. m. on Dec. 9, two men were crushed and received burns from which they died, and more than a score of others were injured in the panic which ensued.

Vermont Fare Matter.—The Barre & Montpelier Traction & Power Company, Montpelier, Vt., has filed with the Public Service Commission of that State a proposed tariff increasing the fare over the line between the cities from 10 cents to 15 cents. The Supreme Court of the State recently held that the company was required to maintain a fare not to exceed 5 cents within the limits of each of the cities in which it operates.

Commutation Fare Order.—The Public Service Commission of Missouri on Dec. 7 issued an order to the Kansas City, Clay County & St. Joseph Railroad to begin on Jan. 1, 1915, issuing commutation tickets on definite rate schedules established by the commission, which figure out at about 1.1 cents per mile. Five days from the receipt of the order are allowed for an answer, which will carry until Dec. 14. A request for a rehearing is to be filed.

Car Advertising in Toronto.—Despite the objection of Works Commissioner Harris the Board of Control of Toronto, Ont., has decided to permit street car advertising in the cars on the city's own line. Last spring the commissioner reported against the proposal and it was dropped for the time being. It has been recommended that the contract be awarded to the Canadian Street Car Advertising Company.

Time-Table Prize.—The offer of a $25 prize for the best time-table to be submitted by one of its trainmen, which was published in the September number of the *United Railroads Magazine*, published by the United Railroads, San Francisco, Cal., aroused considerable interest and resulted in five time-tables being submitted by four contestants, one of whom submitted two tables. The prize was awarded to D. W. Sutlief, a conductor in the Twenty-eighth Street carhouse.

Far-Side Stops at Rock Island.—The City Council of Rock Island, Ill., insists that the Tri-City Railway discontinue the near-side stop and adopt the far-side stop. A plan to stop on the far side was suggested by John G. Huntoon, the general manager of the company, a year ago, but the people of Davenport did not favor the change and the matter was dropped. Now the cities of Rock Island and Moline are insisting on the far-side stop, irrespective of the attitude of the city of Davenport toward the proposal.

Company Relations in Galveston.—For many years the Galveston (Tex.) Electric Company has required a deposit of $30 from each of its trainmen as an assurance of good faith. A new policy, however, is now being put into effect. The deposits are being returned to the trainmen and 6 per cent interest is being paid each man for the time the money has been on deposit. The records for most of the deposits date back no further than 1900. Under the new plan the company has its trainmen under bond, the company itself paying the premium.

Market Transfers.—The Edmonton (Alberta) Radial Railway has adopted a special "market transfer," in order to promote business at the newly-opened civic market. Passengers going direct to the market, on market days, receive a "market transfer," which enables them to make the return trip on a single fare. J. H. Larmouth, superintendent of the railway, a municipal line, is reported to have expressed the opinion to the civic authorities that a portion of the cost of the transfer should be borne by the market committee of the City Council.

Transfer Changes in Savannah.—With a view to giving additional transfer privileges to its patrons, the Savannah (Ga.) Electric Company put into effect on Dec. 1 certain changes in its transfer system. Several important transfer points have been relocated and the system of issuing transfers as regards these points has been changed. The company asked the co-operation of its patrons in inaugurating the changes and announced that misunderstanding regarding the changes would be explained over the telephone or in person at the company's office.

Police in Safety Campaign.—The city of Montreal, Que., has decided to co-operate with the Montreal Tramways in the "safety first" campaign inaugurated by A. Gaboury, superintendent of the company. The chief of police is to work with Mr. Gaboury, and later a committee of civic officials is to be formed to study the entire question as it relates to Montreal. The chief of police has sent out thousands of circulars to owners of vehicles referring to the urgency of observing traffic regulations and making suggestions as to how to avoid accidents.

Height of Steps in New Hampshire.—The Public Service Commission of New Hampshire held a hearing in Concord on Dec. 1 to determine whether steps on the electric cars in the State are reasonably safe and low. Various estimates of the cost of changing the height of steps were made. They ranged from $30 to $150 a car, according to the rolling stock operated. All of the roads were represented except the Concord & Manchester Electric Branch of the Boston & Maine Railroad, which has already complied with an order of the commission in regard to steps.

Operating Changes in Vancouver.—Several of the city lines of the British Columbia Electric Railway in Vancouver, B. C., have been rerouted in order to provide greater economy of operation and still meet existing traffic conditions. The general plan affects the service on stub lines slightly. The company's owl service is also being operated in closer accordance with traffic requirements. The trainmen have made an arrangement among themselves providing for a certain lay-off each week in order to enable a larger force to be kept on than would otherwise be possible.

"Safety First" in St. Louis.—Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., is quoted as follows in regard to the "safety first" campaign of the company: "I believe when the public has been impressed fully with the necessity for caution, we will find the number of persons injured in street car accidents far less than heretofore. There seems to be a general disposition to heed the warning of our signs. If wagon drivers will obey the traffic laws and pedestrians cross the streets only at street corners, instead of in the middle of the block, we will have few accidents."

Not Within Commission Jurisdiction.—Chairman McCall of the Public Service Commission for the First District of New York replied on Dec. 9 to Health Commissioner Goldwater of New York, who had written to the commissioner calling attention to alleged unsanitary conditions on the transit lines due to overcrowding. Mr. McCall pointed out that breathing, coughing and sneezing by persons in the cars were not matters subject to the jurisdiction of the Public Service Commission, and referred to the expenditure of $325,000,000 now being made for rapid transit lines intended to relieve the congestion of which Dr. Goldwater complained. There has been considerable other gentle persiflage in this connection recently.

Hunters Beware.—An appeal to hunters to be careful in handling firearms while on street cars has been made by the Detroit (Mich.) United Lines based upon a bulletin to conductors issued by the operating department. The bulletin follows: "Attention is called to the matter of firearms, particularly guns used for hunting purposes, carried by passengers. If at any time a passenger is examining a firearm, or handling it carelessly, or in such a way that it might imperil the lives of other passengers, caution him to desist and explain that this is a rule of the company for the protection of passengers. Also, so far as a conductor is able to do so, he must see that firearms carried by passengers are not loaded."

Passengers Carried in Greater New York.—The number of passengers using the transit systems of Greater New York for the year ending June 30, according to tables compiled by the Public Service Commission of the First District of New York, was 1,813,204,692, an increase over the previous twelve months of 43,328,184. They paid out in fares $89,361,262. The number of passengers carried by the Brooklyn Heights Railroad, the principal surface railway subsidiary of the Brooklyn Rapid Transit Company, fell off by 1,140,585, by the New York Railways by 1,742,267. The Second Avenue Railroad carried 858,189 fewer passengers than the year before, the Third Avenue 75,039, the Forty-second Street, Manhattanville & St. Nicholas Company lost 175,443, and the Dry Dock, East Broadway & Battery Company 1,297,743 passengers.

Chicago Drafts Electric Railway Freight Ordinance.—In an effort to further the recommendations of the Chicago Municipal Markets Commission relative to the advantage of permitting all the electric railways which enter Chicago to handle freight, an ordinance granting this privilege is being prepared. At a preliminary conference between a sub-committee of the Chicago City Council's local transportation committee, the officials of the surface and elevated lines, representatives of the city law department and the Chicago Municipal Markets' Commission, the preliminaries were arranged. According to the city legal department there was nothing to hinder the electric lines from carrying freight within the corporate limits. Upon being questioned regarding their attitude toward a proposition including the right to carry freight, the representatives of the surface and elevated lines expressed a willingness to co-operate in the matter.

Ten Months of Safety in Detroit.—W. C. Cann, chairman of the general safety board of the Detroit (Mich.) United Railway, reports that during the first ten months of this year more than 900 safety suggestions were submitted to the division and general safety board and that favorable action has been secured on 95 per cent of the suggestions. So far this year the number of cars in collision has decreased 47.7 per cent, derailments 7.7 per cent, running over crossings 30 per cent, and passengers hurt in boarding and alighting 32 per cent. The only reports showing any appreciable increase are those covering automobiles struck. These have increased 30.9 per cent. Mr. Cann expresses the opinion that the showing which the company had made in decreasing all accidents other than those in which automobiles are involved indicates that the burden of responsibility for the increase of automobile accidents is on the automobile driver and not on the men operating the street cars.

New Traffic Ordinance in Canton.—A new traffic ordinance was passed by the City Council of Canton, Ohio, on Nov. 9. It is provided that automobiles and horse-drawn vehicles shall cross the center of the intersecting street before turning into it rather than follow a diagonal course from one street into the other. No person under sixteen years of age shall be allowed to operate a motorcycle or automobile on the streets of the city. There are strict regulations with regard to automobiles being allowed to stand along the curb in the business district. A rate of speed exceeding 15 m.p.h. is to be taken as evidence of careless driving, and a rate of speed exceeding 20 m.p.h. is prohibited. Drivers of vehicles passing a street car stopping to discharge or to take on passengers, when said vehicle is going in a direction opposite to that from which the street car is moving, shall slow down and exercise due care so as not to endanger the safety of pedestrians. The driver of every vehicle approaching a street car stopping for the purpose of taking on or discharging passengers shall give some signal plainly visible or audible to such passengers, and shall keep such vehicle at least 6 ft. from the running board or lower step of such car. If it is not possible to preserve such distance from such running board or lower step, the driver or operator shall stop until the street car has again started. All vehicles upon a track in front of a street car shall turn out upon the near approach of the car. The penalty for violating the traffic ordinance is a fine not to exceed $100 and costs. In the section regulating the movement of pedestrians, it is provided that pedestrians shall have the right-of-way over drivers of vehicles at street crossings only.

Personal Mention

Sir George S. Gibb, chairman of the Metropolitan District Railway, London, has been appointed a civil member of the Army Council and will be charged with the supervision of army contracts.

Mr. J. M. Tomlinson, acting vice-president and general auditor of the New York, New Haven & Hartford Railroad since the retirement of Mr. H. M. Kochorsperger, vice-president, has been elected vice-president and comptroller of the company.

Mr. A. Mackrille, assistant general auditor, has been appointed general auditor of the New York, New Haven & Hartford Railroad with office at New Haven, and Mr. T. M. Prentice, assistant auditor, has been appointed auditor of the company with office at New Haven.

Mr. C. C. Collins has resigned as traffic manager of the Lehigh Valley Transit Company, Allentown, Pa., effective on Jan. 1, 1915. Before becoming connected with the Lehigh Valley Transit Company Mr. Collins was traffic manager of the Western Ohio Railroad, Lima, Ohio.

Lieutenant-Colonel G. S. Rennie, M.D., surgeon in chief of the Dominion Power & Transmission Company, Hamilton, Ont., and the Toronto, Hamilton & Buffalo Railway, will be in command of one of the field artillery batteries being mobilized in Toronto for overseas service.

Mr. Daniel L. Turner, deputy engineer of subway construction of the Public Service Commission of the First District of New York, has been appointed to serve on the advisory commission on city planning, which is to assist and co-operate with the committee on city plan of the Board of Estimate, New York City.

Mr. A. E. Beck, one of the permanent counsel of the British Columbia Electric Railway, Vancouver, B. C., and its claim agent, will leave the company's service at the end of the year to practice law on his own account in Vancouver. The company's legal and claims departments will be consolidated under the control of the other permanent counsel, Mr. V. Laursen.

Mr. C. H. Christensen has been appointed manager of the Missoula (Mont.) Street Railway, the Missoula Light & Water Company and the Clark Missoula Power Company, to succeed Mr. George R. Brown, deceased. Mr. Christensen has been connected with the Missoula Light & Power Company in various capacities for twenty years. During the last four years he held the position of superintendent of the Missoula Light & Water Company's Bitter-Root Valley System.

Mr. W. O. Demoss, who has been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Southern Pennsylvania Traction Company, was for ten years foreman of the West Baltimore Street and the Retreat Street carhouses of the United Railways & Electric Company, Baltimore, Md. On Feb. 27, 1911, he became maintenance foreman of the Delaware Avenue carhouse of the Wilmington & Philadelphia Traction Company and in March, 1912, was appointed general foreman of the Wilmington shops of the latter company.

Mr. John W. Graham, Twin Falls, Idaho, will fill the vacancy left on the Idaho Public Utilities Commission by the recent resignation of Judge D. W. Standrod. Mr. Graham has been practicing law in Idaho for the last four years. He is forty-one years of age and a native of Canada, but was educated at the University of Nebraska. He practiced his profession in Fremont, Dodge County, Neb., and was for four years prosecuting attorney of that county, and had altogether fifteen years' experience as a lawyer. The appointment which he has just accepted will hold until January, 1919.

Mr. H. R. LaMontagne has been appointed general agent of the express department of the Worcester (Mass.) Consolidated Street Railway to succeed Mr. F. E. Wood, whose appointment to the Cumberland County Power & Light Company, Portland, Maine, is referred to elsewhere in this column. Mr. LaMontagne entered the service of the passenger department of the Worcester Consolidated Street

Railway after graduation from a technical school. Later he became connected with the freight department, finally being made traveling auditor, from which position he was appointed to succeed Mr. Wood.

Mr. M. H. Bronsdon, chief engineer of the Rhode Island Company, Providence, R. I., from March, 1907, until August, 1912, has returned to that post, succeeding Mr. William Pestell, who recently resigned to accept a position with the B. F. Sturtevant Company of Boston, at Chicago. Mr. Bronsdon has been doing general engineering work in San Francisco since leaving Providence. Mr. Bronsdon was born in San Francisco and he had his first experience in engineering construction on a cable road in Los Angeles. In 1889 he became superintendent of the Providence Cable Tramway. He later was chief engineer at the Eddy Street power plant in Providence, having charge of the installation there. He later went to Duluth as designing and construction engineer of the Duluth-Superior Traction Company, and was afterward appointed engineer for the Old Colony Street Railway, Boston, Mass. His next engagement was with the United Railroads, San Francisco, where he remained until March, 1907, when he succeeded Mr. Fred N. Bushnell as chief engineer of the Rhode Island Company.

Mr. M. A. Tatum, who was appointed superintendent of the southern division of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, recently, began his career in electric railway work in the express and freight department of the Eastern Ohio Traction Company in 1905. In 1906 he resigned this position to enter the engineering department of the Roberts & Abbott Company, Cleveland. About a year later he accepted a position with the Washington, Baltimore & Annapolis Railroad as clerk to Mr. W. E. Slaughter, the superintendent. After the electrification of the road and the completion of the main line between Washington and Baltimore in 1908, Mr. Tatum was appointed clerk to Mr. Joseph O'Hara, superintendent of transportation. During 1909 he was employed in the carhouses and substations of the company, and in 1910 he was made inspector at Washington. During 1911 and 1912 he occupied the position of trainmaster and in 1913 he became general passenger and freight agent of the road. He resigned from the company in September to become connected with the Cleveland, Southwestern & Columbus Railway.

Mr. F. E. Wood has been appointed general freight agent of the Cumberland County Power & Light Company, Portland, Maine, operating the Portland Railroad and the Lewiston, Augusta & Waterville Street Railway. Mr. Wood entered the service of the Springfield (Mass.) Street Railway in 1909 and worked in the repair shop and the pit. Subsequently he entered the express department as general clerk and spare messenger. In February, 1910, on the opening of the express service on the Interstate Consolidated Street Railway operating through Attleboro and North Attleboro, Mass., to Providence, R. I., over the Rhode Island Company's line, Mr. Wood accepted the position of agent at Attleboro in charge of that division. This express service was later extended over the Milford, Attleboro & Woonsocket Street Railway, operating through Franklin and Milford, Mass. In March, 1912, he was transferred to Worcester, Mass. Express service was established on the Worcester Consolidated Street Railway in December, 1912, and in 1913 Mr. Wood was appointed general agent of the Worcester Consolidated Street Railway with headquarters at Worcester and jurisdiction over all the lines previously mentioned, together with the Springfield Street Railway. He resigned from the Worcester Consolidated Street Railway on Nov. 28, 1914, to become connected with the Cumberland County Power & Light Company. Before Mr. Wood left Worcester a banquet was tendered to him at the Hotel Bancroft, that city, by his fellow employees and he was presented with a watch fob by them as a token of their esteem.

OBITUARY

Morris G. Condon, president of H. B. Underwood & Company, Philadelphia, Pa., machinists and engineers, who was shot by an intruder in his room in the Hotel Adelphia in that city on Nov. 25, died from the effects of his wound.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Edmonton Northwestern Radial Railway, Edmonton, Alta.**—Application for a charter has been made by this company in Alberta to build an interurban electric railway from Edmonton northwest to the Pembina River. Messrs. Short, Woods, Bigger & Collison, 14 Howard Avenue, Edmonton, are said to be interested in the project.

***Albion, Charlotte & Northern Railway, Lansing, Mich.**—Chartered in Michigan to build a 53-mile electric railway. Capital stock, $100,000.

***Shelby (N. C.) Northern Railway.**—Chartered in North Carolina to build an electric or steam railway from Shelby to Casar, via Beams, Mills, Fallston, Belwood, Boggs and Warlicks. Capital stock, $400,000. Incorporators: S. S. Royster, Shelby, president, and L. M. Elam, Shelby, secretary and treasurer.

FRANCHISES

Calgary, Alta.—The Chestermere & Calgary Suburban Railway has received an extension of time on its franchise for the completion of its line in Calgary.

Vallejo, Cal.—A. D. Bowen, representing the Benicia Land & Terminal Company, will ask the Council for a franchise to build an electric railway in Vallejo. This is part of a plan to build an electric line to connect Benicia and Vallejo. [E. R. J., Oct. 24, '14.]

Tarpon Springs, Fla.—James H. Murphy, St. Petersburg, has asked the Council for a franchise in Tarpon Springs.

Macon, Ga.—The Macon Railway & Light Company has asked the Council for an extension of time on its franchise in which to remove its tracks from the south side of Tattnall Square Park to the center of College Street in Macon.

***Lewiston, Idaho.**—The State Highway Board has voted approval of a franchise to A. G. Nortz, Lewiston, to build an electric railway across interstate Lewiston-Clarkston bridge.

St. Peter, Minn.—The Electric Short Line Railroad has accepted the forty-nine-year franchise granted it by the Council in October for the use of so much of the levee as lies east of Front Street, between Chestnut Street and Park Row Street, and also to build a line along the entire length of Front Street to the north city limits of St. Peter.

Lockport, N. Y.—The Niagara River & Eastern Railroad had asked the Council for a franchise to use certain streets in the east and south of Lockport to build a line to connect the Buffalo, Lockport & Rochester Railway and the International Railway lines with a new line into Niagara Falls. [E. R. J., Oct. 17, '14.]

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has asked the Council for a franchise to extend its Mahoning Avenue line to Perkins Corners in Youngstown.

Cincinnati, Ohio.—The Street Railway Committee of the Cincinnati City Council has recommended the ordinance granting a twenty-five-year franchise to the Cincinnati, Newport & Covington Railway to be advanced to a second reading, following which a public hearing will be called to discuss its merits.

Cleveland, Ohio.—Mayor Baker of Cleveland has signed the amended franchise granted by the Council to the Cleveland & Youngstown Railroad to make certain necessary changes in its grade. [E. R. J., Oct. 5, '14.]

Findlay, Ohio.—The City Council of Findlay has before it ordinances giving the Toledo, Bowling Green & Southern Railway a twenty-five-year franchise on its streets and also a franchise for furnishing current for light and power purposes. They provide that the company shall pay to the city 2 per cent of the gross receipts from the business.

Guelph, Ont.—The Board of Railway Commissioners has authorized the Guelph Radial Railway to construct an inter-

change track with the Grand Trunk Railway on Suffolk Street, Guelph.

Medford, Ore.—S. Bullis, of the Southern Oregon Electric Railway Company, has asked the City Council and the Southern Pacific Railway Company for permission to cross the tracks of the Southern Pacific on Main Avenue. In case the Southern Pacific refuses to grant the request for crossing rights, the application will be presented to the State Railway Commission for final settlement. An extension of not less than 3500 ft. will be made as soon as the preliminary details are settled.

Philadelphia, Pa.—Peter E. Costello, Philadelphia, has received a franchise from the Council for a two-track elevated railway from Front Street and Arch Street to Rhawn Street, Holmesburg.

Montreal, Que.—The Montreal & Southern Counties Railway has received an extension of time on its franchise in which to complete its lines in Montreal.

Beaumont, Tex.—A petition was presented to the City Council asking that the Council take steps to induce the extension of the Beaumont Traction Company's line to the Magnolia Petroleum Company's refinery south of Beaumont.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company in Seattle will not be allowed to change the terminus of its Yesler Way cable line from its present location, between First and Second Avenues, as it had petitioned, according to a decision rendered by the City Council franchise committee. The company argued that the operation of its cable cars over Second Avenue hindered the headway of its cars north and south on the arterial highway.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—W. L. McKinnon & Company, Toronto, advertised recently inviting bids for $206,700 of this company's first mortgage bonds, maturing in 1943. The Alberta government has guaranteed the principal and interest of the bonds for $7,000 a mile, or $273,700 for 39.1 miles. They bear 5 per cent interest.

Argenta (Ark.) Railway.—Work on the extension from Washington Avenue and Hazel Street to Rock Island station, at Fourth Street and Beech Street in Argenta, has been begun.

Central California Traction Company, San Francisco, Cal.—Negotiations are pending by which portions of the city lines of this company will be abandoned and a universal transfer privilege established between this company's line and the lines of the Stockton Electric Railway.

San Francisco (Cal.) Municipal Railway.—Bids for another branch of this railway are being considered by the Works Board, which has received the offers to construct the California-Street municipal railway line and the Seventeenth-Street carhouse. The line will begin at Geary Street and Second Avenue and run over Second Avenue, Cornwall and California Streets to Thirty-third Avenue.

Marin County Electric Railway, San Francisco, Cal.—This company has received permission from the Railroad Commission of California to construct a line in Sausalito, Cal., on the condition that the present franchise shall be amended so as to give the municipality the right to purchase the system after five years. The company is granted authority to issue 185½ shares of capital stock at par, and it is provided that this stock shall be sold only to property owners and residents of Marin County. It is also provided that all moneys obtained from the sale of stock shall be deposited by the railway company in Marin County banks as trust funds, with the understanding that if a total sum of $18,550 is not deposited within six months, these moneys shall be repaid to subscribers. [E. R. J., Nov. 21, '14.]

Connecticut Company, New Haven, Conn.—Plans are being made by this company to extend its tracks along Railroad Avenue to the station in Westport.

***Havana, Cuba.**—Work has been begun on an electric line between Havana and Guanabacoa in Cuba.

Central Illinois Traction Company, Paris, Ill.—An extension between Charleston and Paris, 30 miles, will be constructed by this company during 1915.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will complete the construction of the Minnesota Street line, between Shelby Street and Churchman Avenue, for operation before Dec. 24. The special work at the corner of Shelby and Minnesota Streets will be completed sixty days fater the opening of the new year.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—This company has completed the survey and secured the right-of-way for the second section of the projected interurban railway between Kansas City and Topeka, Kan. The first section, from Kansas City to Bonner Springs, is now in operation and its business has considerably exceeded expectations. The second section is 21 miles from Bonner Springs to Lawrence. It probably will be in operation within a year. The third section, Lawrence to Topeka, will be built after the second section is in successful operation. Bids for the construction of the Bonner Springs-Lawrence section will probably be asked shortly. On the first section the company advertised for bids, but did with its own forces work for which it considered the bids unreasonable. The construction work which it is planned to start soon involves a bridge over the Kaw River at Lawrence. Carl G. Klemm, 1010 Commerce Building, is secretary of the company.

Kentucky Utilities Company, Somerset, Ky.—With this company disposing of $3,000,000 worth of bonds for needed improvements it is rumored that a part of the company's plans is to extend its line to Burnside, 7 miles south of Somerset, on the Cumberland River.

Winnipeg (Man.) Electric Railway.—Plans are being prepared for filing an application with the City Council for extensions in the northwest section of Winnipeg, in accordance with the City Engineer's directions.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to construct tracks on Pleasant Street, from the mouth of the subway to Washington Street in Boston.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—Surveys, which have been in progress for the extension of this railway to Townsend, have been suspended until spring. This line will ultimately be extended to Nashua, N. H.

Michigan Railway, Jackson, Mich.—This company has placed in operation its line between Kalamazoo and Monteith.

International Transit Company, Buffalo, N. Y.—The Board of Railway Commissioners has authorized the building of a bridge at Tagona, Sault Ste. Marie, Ont., to carry a highway and this company's tracks across the Algoma Central & Hudson Bay Railway. The cost of the bridge is to be borne by the electric railway company.

Cincinnati (Ohio) Traction Company.—A new crosstown line north of the present route on McMillan Street in Cincinnati is being considered by this company and may be built in the near future.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as negotiations are completed work will be begun by this company on the 100-mile line to connect Springer, Woodford, Poolville, Elmore City and Leon. Capital stock, authorized, $300,000. Bonds, authorized, $2,500,000. Officers: A. F. Costigan, Guaranty Bank Building, Ardmore, president; D. E. Allen, Ardmore, vice-president; A. L. Adath, Ardmore, secretary, and T. C. Bridgeman, treasurer. [E. R. J., May 30, '14.]

Forest Hill Electric Railway, Toronto, Ont.—The roadbed is now being prepared for this railway. Work has been begun at Bathurst Street, and the first stage from there to Dufferin Street will be proceeded with as rapidly as possible. The tracks will be laid on their entire route beginning near St. Clair Avenue. T. J. Glover is interested in this projected railway. [E. R. J., April 11, '14.]

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—A contract has been awarded to Eastman, Kenny & Stearns, Russell, Ont., for grading about 6 miles of the projected line. About 2 miles of grading has been completed, and it is expected to have about 8 miles between Russell and Metcalfe completed and ready for the rails within the next three weeks. H. W. Pearson, Confederation Life Building, Toronto, Ont., secretary.

Toronto (Ont.) Civic Car Lines.—A by-law will be submitted to the ratepayers on Jan. 1, 1915, to provide for $455,000 for the extension of the civic car lines in Toronto.

Toronto, Ont.—City Solicitor Johnston advised the Board of Control on Nov. 27 it would be necessary to submit separate by-laws for each of the proposed new electric lines, consequently the board changed its recommendations. The Council will be asked to authorize the submission of a by-law for $105,000 for the proposed Lansdowne Avenue line, $317,000 for the North Toronto line, and $52,000 for the taking over of that portion of the Toronto & York Radial Railway Company's line within the city limits in the east end.

Electric Short Line Railroad, Minneapolis, Minn.—Plans are being considered by this company and the members of the Winthrop Commercial Club to build an electric railway through Winthrop and north as far as Winsted and south through Sleepy Eye to Jackson.

St. Louis, Mo.—The residents of South Lindenwood have submitted a petition to the Missouri Public Service Commission asking the United Railways for an extension of the Tower Grove line. The Tower Grove line terminus is 2½ miles away from the city limits in the Gratiot and Lindenwood section of the city.

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—Surveys have been completed by this company between Madison and Elgin. Right-of-way has been secured between Omaha and Norfolk via Madison. The Elgin line will be a branch proposition. Charles W. Baker, Omaha, is interested. [E. R. J., April 4, '14.]

Corry & Columbus Street Railway, Corry, Pa.—A 30-mile line from Corry, Pa., to Maysville, N. Y., via Columbus, Pa., Clymer and Sherman will be built by this company during 1915.

Slate Belt Electric Street Railway, Penn Argyl, Pa.—A 5-mile line between Wind Gap and Saylors Lake, Pa., will be constructed by this company during 1915.

***San Antonio, Tex.**—James L. Himrod, Thomas Moore, Austin, and others are making plans to build an electric railway to connect New Mexico, Lamesa, Robert Lee, San Angelo, Ballinger, San Antonio and other points with a port on the Gulf of Mexico.

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—Within a few weeks this company will have completed its 6½ mile line between Evans City and Beaver Falls. In addition to passenger service the company announces that it will add trolley freight service over this line as well. The opening of this new line will give a direct electric railway line between Pittsburgh and Beaver Falls.

***Denison, Tex.**—Preliminary surveys are being made for a line betweeen Denison, Dexter and Locust. This is part of a plan to build an electric railway through Pottsboro, Locust, Gordonville, Dexter and Denison.

Houston, Laporte & Bay Shore Railway, Houston, Tex.—Preliminary arrangements are being made and work will be begun some time within the next six months on this line to connect Houston, Pasedana, Deepwater, Deer Park, San Jesenta City, Laporte, Seabrook, Webster, Friendswood and Pearland. The power station will be located at Houston and the repair shops at Pearland. The company will furnish power for lighting purposes. Capital stock, authorized, $2,000,000. Samuel F. George, Houston, president and general manager, and John H. Stoner, Houston, chief engineer.

Houston & Southern Railway, Houston, Tex.—Preliminary arrangements are being made to incorporate this company, which plans to begin work in the spring on its 55-mile electric railway to connect Houston, Pearland, Manville, Danbury, Belasco and Freeport. The company will furnish power for lighting purposes and will locate its power house in Houston and its repair shops at Pearland. It will also have amusement parks at Laporte and at Velasco. Samuel F. George, Dayton, Ohio, president, and John H. Stoner, Houston, chief engineer.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Grading has been completed by this company for its 14-mile line to connect Glen Rose and Walnut Springs, via Seven Knobs. Officers: J. H. Farr, president; F S. Williams, vice-president; John Shields, treasurer, and F. B. Kirby, secretary, all of Glen Rose. [E. R. J., Sept. 12, '14.]

Rutland Railway, Light & Power Company, Rutland, Vt.—This company, a subsidiary of the General Gas & Electric Company, has begun construction under its plans for the conservation of the water supply at Chittenden Dam, near Rutland, Vt. The plans include the construction of two dams, a canal 3000 ft. long, and wood and steel penstocks. When completed, the reservoirs will furnish a large reserve supply of water for the new power station of the company at East Pittsford. Through this plan the water will be used twice for generation of power, once at the East Pittsford station, and once at the Mendon generating station.

Mercer Electric Railway, Athens, W. Va.—The tracks are being laid by this company on its line between Bluefield and Princeton. This line will connect Bluefield, Princeton and Athens. R. G. Meador, Athens, president. [E. R. J., Oct. 17, '14.]

SHOPS AND BUILDINGS

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—This company opened its new depot in Clinton, Ind., on Dec. 3.

Orleans-Kenner Electric Railway, New Orleans, La.—Plans have been prepared by this company to build sixteen shelter houses and way stations along its line between New Orleans and Kenner. The buildings will be on brick construction with tile roofs.

Moncton Tramways, Electricity & Gas Company, Moncton, N. B.—A temporary carhouse was erected to replace the building which was destroyed by fire recently. This building is 30 ft. x 80 ft., with accommodation for five cars, and is on the same site as the one burned. It is the intention of the company to build a steel and brick carhouse in the summer, on a new site which has not yet been acquired.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District has approved the award by the New York Municipal Railway Corporation to the P. J. Carlin Construction Company, the lowest bidder, of a contract for the construction of six stations on the Liberty Avenue elevated railroad extension. The contract price is $232,000.

Brantford (Ont.) Municipal Railway.—This company is building a new passenger station and freight house at Paris. The cost is estimated to be $3,000.

Toronto (Ont.) Civic Car Lines.—The City Council has authorized Commissioner Harris to build a temporary carhouse near Dorval Road to house the cars of the new Bloor Street line in Toronto.

Milwaukee Northern Railway, Cedarburg, Wis.—Work will be begun at once by this company on a new terminal building on Fifth Street between Cedar Street and Wells Street in Milwaukee. The structure will be of brick, fireproof, one story high and will be divided into separate waiting rooms, a ticket office and baggage room. The cost is estimated to be about $40,000.

POWER HOUSES AND SUBSTATIONS

Bay State Street Railway, Boston, Mass.—This company has installed a new engine and generator at its Mason Street plant.

Ottawa (Ont.) Electric Ry.—This company's new auxiliary power plant has been put in operation. It cost $200,000 and has a generating capacity of 5000 hp. The equipment includes three Babcock & Wilcox boilers and a Westinghouse double-flow steam turbine.

West Penn Traction Company, Pittsburgh, Pa.—This company has just placed in operation a 19-000-kva, 6600-volt, three-phase, sixty-cycle, turbo generator, built by the Westinghouse Electric & Manufacturing Company.

Monongahela Valley Traction Company, Mairmont, W. Va.—This company is installing three 1500-kva, water-cooled, sixty-cycle, 22,000-volt high-tension Westinghouse transformers, and a complete electrically-equipped remote-control switchboard in its power house near Fairmont, W. Va.

Manufactures and Supplies

ROLLING STOCK

Sheboygan Railway & Electric Company, Sheboygan, Wis., expects to order two new steel cars for city service, double-end operation, pay-as-you-enter, double-truck, to seat forty passengers. The cars will be equipped with baby motors and 24-in. wheels.

Philadelphia & Reading Railroad, Philadelphia, Pa. is making an investigation into the advisability of establishing storage-battery car operation on branch lines of its Winslow Junction-Cape May division.

Empire United Railways, Syracuse, N. Y., has ordered twelve more cars from the St. Louis Car Company in addition to the twelve cars ordered last summer. These twelve cars are to be the same type as those on the previous order.

London & Port Stanley Railway, London, Ont., has ordered three electric locomotives and electrical equipment for five motor cars from the Canadian General Electric Company. The contracts approximate $135,000. The locomotives will be 1000 hp, capable of hauling a trainload of 1000 tons. The cars will have a four-motor electrical equipment of about 600 hp per car. The motor cars and trailers, of which there will be five each, will be of one pattern and steel construction throughout. Tenders on the car bodies were invited up to Dec. 2.

TRADE NOTES

Thomas A. Edison, Inc., West Orange, N. J., in a fire which started early in the evening of Dec. 9, suffered much damage to its property, calculated at something less than $1,000,000. Part of the phonograph works was destroyed by fire, but Mr. Edison's private laboratory, the Storage Battery Company and the Edison primary-battery department were not affected. The company emphasizes the fact that the business of both battery departments of the company will not be interfered with in any way by the fire and that it is prepared to continue business as usual.

Albert Lawrence Smith has been admitted as a partner in the firm of E. B. Smith & Company, public utility bankers, Philadelphia, Pa. Mr. Smith is a son of the senior member of the firm. He attended Harvard University and began his business career with the Franklin National Bank, Philadelphia. For several years he has been associated with the firm of which he is now a partner. He is a director of the Buffalo & Susquehanna Railroad and of the Easton (Pa.) Consolidated Electric Company.

Kerr Turbine Company, Wellsville, N. Y., builder of "Economy" steam turbines, has appointed A. E. Seelig as general sales manager, and John A. Hense as St. Louis representative. Mr. Seelig for several years held a similar position with the L. J. Wing Manufacturing Company, and more recently has managed the new machine tool department in the New York office of Schuchardt & Schutte. Mr. Hense was formerly with the National Malleable Castings Company, Chicago, and later with the Dravo-Doyle Company, Philadelphia.

Walter A. Zelnicker Company, St. Louis, Mo., has appointed Arthur E. Jackman as manager of its machinery department to succeed J. J. Hilpirt, resigned to become storekeeper of the Compania Mexicana de Petroleo "El Aguila," S. A., Tampico, Mexico. Mr. Jackman has had wide experience, gained as general manager of the Sea View Railroad and Narragansett Pier Electric Light & Power Company. He was several years in the railway and lighting department of the Westinghouse Electric & Manufacturing Company, and lately superintendent of the East St. Louis, Columbia & Waterloo Railway, which position he left to assume his present duties.

W. S. Miller has resigned as general superintendent of the St. Louis Car Company, after being connected with this company about fifteen years. Mr. Miller's first position with the company was superintendent of the brass foundry departments, two years after which he became general foreman of the blacksmith, machine and truck departments. After holding this position for three years he was appointed superintendent of machinery and tools. In 1907 Mr. Miller became works manager and later general superintendent, which position he has held up to the time of his resignation, Nov. 9, 1914. He was formerly a student of Washington University, New York.

Edison Storage Battery Company, Orange, N. J., has appointed Francis V. McGinness, formerly sales engineer, as assistant manager of the railway department, the position formerly held by William F. Bauer, who was recently made manager of the company's Chicago office. Mr. McGinness is a graduate of Columbia University's Schools of Applied Science, class of 1910, and before graduation had considerable practical experience with the New York & New Jersey Telephone Company. After a few months in the engineering department of the New York & Queens Electric Light & Power Company, Long Island City, he joined the sales force of the Edison Storage Battery Company. For the past two years he has been identified with the railway department.

National Corrugated Culvert Manufacturers' Association, Chicago, Ill., announces that the large number of manufacturers operating under the Watson corrugated culvert patent have just been informed by their attorney, Wallace R. Lane, Chicago, that the United States Court of Appeals for the Second Circuit, which has final jurisdiction, has just handed down a mandate reversing the lower court and holding this patent valid and infringed by another culvert which was recently installed. The court says, in part: "The patented culvert is cheap, strong, durable, easily transported, quickly laid down and easily repaired. We cannot believe that the man who gave such a structure to the world should be denied the title of an inventor." The manufacturers of corrugated culverts under this important patent make them out of Armco American ingot iron.

ADVERTISING LITERATURE

Fargo Manufacturing Company, Inc., Poughkeepsie, N. Y., has issued a bulletin describing its straight connector, cable lug, signal connection, ground point and ground meter, "L," "Y" and "T" and terminal connections.

NEW PUBLICATION

Bonds and Stocks—The Elements of Successful Investing. by Roger W. Babson. Babson Statistical Organization, Inc., Wellesley Hills, Mass. 422 pages and three charts. $2 net.

This is the second book of its kind intended for investors received this year for review by the ELECTRIC RAILWAY JOURNAL and written by an authority of national reputation. There are many excellent books planned primarily for the student of corporation finance, but there has been a dearth of books about the science of investing money. Mr. Babson has in his volume rendered a real service to the man unacquainted with security issues who has money to invest, and in addition he has furnished a volume very entertaining aside from its practicable value. Very hazy ideas are frequently held about securities by men otherwise well informed, and to such men the present volume should be more than welcome. It is all very well for the man unacquainted with finance who intends to invest to be sure of the reputation of the house through which he deals, but there is no excuse now that "Bonds and Stocks" has been issued for such a man not to understand the fundamentals of investing. The strong and weak points of stocks and bonds are pointed out with reasons why some classes of securities are attractive and why others are not attractive. Mr. Babson has divided his work into twenty-four chapters. The first four deal with introductory suggestions, the next fifteen with elements of successful investing and the five concluding chapters with supplementary suggestions. There is a chapter on electric railway securities as distinct from lighting, telephone and water power securities. A chapter on the investor's vocabulary contains an explanation of ten phrases, the meaning of which should be understood by every investor. These phrases are the technical ones used frequently by bankers in seeking subscriptions from the public, through the newspapers. Mr. Babson certainly is justified in saying in his conclusion that "if the reader has absorbed all that has gone before he should have in his mind a clear idea of the different kinds and groups of securities and the various questions and terms involved therewith."

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LET SHOPMEN HELP DESIGN

On several occasions we have called attention to errors in maintenance structure design which might have been avoided had the shop employees been taken into consultation. The bad consequences of leaving everything to the man at the drafting board were noted again lately in a certain New England carshop. The building was laid out for aisle sprinklers, but after these were installed it was discovered that thereafter trolley poles on cars would have to be turned in the open air. Another part of the building was confidently laid out as a paint shop, but when car painting began it was found that a painter could not possibly work in the narrow space which had been left between the painting track and the wall. In general, the provision of satisfactory working clearances for a car shop requires more foresight than may reasonably be expected even from the combined experience of the draftsman, the shop superintendent and general manager. A hint or two from the men closest to the job may avoid many distressing incidents of the nature cited.

THE SKIP-STOP IDEA

One of the reforms which seem a long time in coming is the skip-stop for city service. Railway managers who have studied the plan approve of it, but the inertia of the public in matters of this kind is so great that this reform has been adopted in very few places. Chicago is now reported to be contemplating a trial of the plan. An account of the Denver experience has been published in recent issues. In Los Angeles, where the skip-stop has also been tried, there seems to be some doubt as to the advisability of its continuance. On the other hand, in Cleveland and in Kansas City, where the skip-stop appears to have been originally introduced in the year 1911, it has been continued in operation with every evidence of success. The increase in schedule speed has been reported to be nearly 10 per cent but since half of the cars stop at "odd" streets and the other half at the "even" streets, only about half of the people that collect at a corner board the first car that arrives. Thus the load is distributed more evenly among the cars on the route. There is no doubt that the public would be greatly benefited by the skip-stop because it materially increases the average speed by cutting out the number of stops and yet does not greatly increase the distance which the passengers have to walk to catch a car. In a number of cities the near-side stop has recently been introduced without creating public opposition. Perhaps this change will make the general adoption of the skip-stop more of a possibility.

AUTOMOBILES IN CITY TRAFFIC

Automobiles for private use have now become so common that it is not surprising they should have invaded the passenger transportation field, and several electric railway companies on the Western Coast report considerable competition from automobiles which carry passengers over certain routes for nickel fares. We have no fear that such cars, with the tire cost and other depreciation inseparable from automobile service, can ever be commercial competitors on the same terms with an electric railway system. The report of Mr. McCullom to the Board of Estimate and Apportionment of New York, abstracted in this paper about a year ago, presents ample evidence to this effect. Nevertheless, experience has shown that this fact will not prevent the owners of cars from attempting a service of this kind. In a free country like this, electric railway companies cannot suppress this competition even if they would, but it is only fair to them as large taxpayers and also to the public as a whole, whose patronage is solicited by these buses, that both classes of transportation should be placed under similar regulations in regard to responsibility, and that strict traffice regulations should be enforced. The Merchants & Manufacturers Association of Los Angeles has called the attention of the City Council of that city to the tremendous liability of street accidents from these irresponsible automobiles, and Long Beach, Cal., has imposed a license fee of $25 a year and has required taking out of a $10,000 liability insurance for every such car. Charges of short changing by irresponsible automobile conductors is also made in some of the Western cities. Railway companies can ask no more than a free field and fair play for all, but both they and the public should demand that fair play means an equal degree of responsibility from the operators of both classes of service.

STREET RAILWAY LOADS ON SOILS

A part of the discussion of the way committee's report on track at the convention was devoted to the distribution of railway loads over the ballast and sub-grade. While this subject is of vital importance to steam railroad engineers, owing to the great increase in the weight of locomotives as well as the adoption of higher scheduled speeds of trains, neither of these factors has any bearing on the study of track foundations in paved streets. Moreover, the conditions governing the depth of loose, unconfined ballast are hardly comparable with those surrounding a foundation of concrete or compactly-rolled ballast, such as is required by a modern electric railway. In steam

road, or even interurban road open-track construction, a certain amount of flexibility is required, while track in paved streets must be as rigid as is consistent with economical operation. To obtain rigidity the foundation must be made much heavier than that actually necessary to carry the track loads. In other words, one should determine the average soil-bearing power condition and then select a foundation which will distribute the track loads well within the safe limit. It would be impractical to change the character of foundation with every slight change in the bearing quality of the soil. On the other hand, it is necessary to change the character of foundation when there is a marked change in the soil-bearing power, such as might be found where track is constructed over filled-in areas or where the soil contains excessive moisture. Of course, a drainage system would go far toward improving the latter condition, while rolling the sub-grade will often be all that is necessary to prepare filled-in areas for foundation construction. To sum up, it appears impossible to calculate exactly the distribution of track loads over the foundation and sub-soil. Hence, the selection of the foundation must be based largely on experience, after such mathematical checks as may be required have been made to determine the relation of the load to be carried to the bearing power of the sub-soil.

SNOW REMOVAL

That the removal of snow from city streets should constitute one of the most exasperating of the unsolved engineering problems of long standing is really remarkable when it is considered that the cost of the fuel necessary to melt the snow would be hardly 15 per cent of the expense of removal involved under present methods, the latter consisting, almost without exception, in shoveling the snow into wagons and carting it away. It may be, of course, that snow storms will have to be fought for some time by this primitive scheme, yet in this age of flying machines and wireless telegraphy one must be a true conservative at heart to accept this as a fact, even though the recommendations of the committee on resolutions of the snow removal conference, which were presented before the American Society of Mechanical Engineers last week, approved no new process except the limited use of the sewer system to get the snow off the streets.

The reasons that prevented the general use of sewers, as outlined in the report, could be summed up in the one generality—insufficient sewage flow. In New York, during the last winter, experiments demonstrated that the large trunk sewers with a continuous and fairly rapid flow were not clogged by any snow that might be shoveled into them. The small sewers, however, of about 12-in. diameter required flushing with hydrant water and even then had to be treated with considerable care.

The same idea has been suggested for Philadelphia, where the contractors are supposed to commence the work of plowing or sweeping the snow to the sides of the streets within one hour after a storm begins, the work of carting the piles away being aided by the use of certain sewer manholes for dumps. It is now planned to extend the use of the sewers by having water connections placed inside of the manholes, thus increasing the flow in the sewer and permitting the flushing away of accumulations of snow.

Removal of snow by flushing the streets with cold water naturally seems like carrying coals to Newcastle, but the experience in Scranton has demonstrated that with proper temperature conditions the scheme is capable of reducing the expense of removal to one-half that of cartage. However, when a cold snap follows a snow storm, the presence of great quantities of water on the streets might easily become fraught with considerable danger. This fact, indeed, is implied in the recommendations of the committee. Considerable hope is also held out in regard to the disposal of snow by melting in a furnace. The committee estimates that with a perfect furnace the cost of the coal required would be 3 cents, or with a furnace efficiency of 33 per cent, 9 cents, per cubic yard, against the present cost of carting of about 50 cents. This difference provides a considerable margin from which, of course, the cost of apparatus, labor and maintenance must be deducted. The problem should be an attractive one to the inventor, because there are many objections to carting besides its cost. One is its slowness, another is the congestion caused in the streets by the carts, and a third is the increasing scarcity in most cities of carts suitable for this purpose, owing to the growing tendency to substitute in commercial work for the horse-drawn cart a specialized motor truck not suitable for snow removal.

Surface railways, of course, are not so much interested in the manner of snow removal as in the provisions for operating their lines during and after snow storms. The matters of complaints from the public and of decreased receipts, which are the invariable accompaniments of heavy snow falls, are of serious importance, and at least one road, the New York Railways, is going to great expense to develop a wing sweeper that will clear a passageway beside the track. This has been planned solely to provide space for vehicular traffic which, during snow storms, utilizes the street railway tracks because these provide the only clear space in the street. Obviously the consequent congestion practically prevents the railway company from moving cars. To meet this difficulty wing brooms have also been suggested for Philadelphia and wing plows have been in successful use in Montreal for several years, a layer of snow being intentionally left on the streets in the latter city. It seems unfair to require a railway company, which is responsible only for the clearing of its tracks, to take care of the snow elsewhere on the street. But in many cases, owing to the slowness of the city force, this appears to be necessary for the railways, purely as a means for self-protection, and the development of wing brooms and wing plows seems to constitute peculiarly the railways' share in the problem, just as much as the prompt removal of the snow piles constitutes the share of the municipality.

FEDERAL AND STATE JURISDICTION OVER CITY RAILWAYS

It is not surprising, in view of the recent establishment of commission regulation in this country, that there should be many unsettled questions as to the powers and duties of regulatory commissions. One of the most important of those which remain to be settled is where the power of the federal commission should end and that of the state commissions begin. It would seem that with all of the problems in connection with valuation of steam railroads and the establishment of freight rates that the Interstate Commerce Commission has enough to occupy its time during the next few years, and that to the various state commissions could be assigned the adjudication of all of the intrastate matters which arise in connection with the operation of electric railways. This was the view which a committee of the American Electric Railway Association urged before a sub-committee of the House committee on interstate and foreign commerce last January in a hearing on several bills which would have brought certain equipment of all electric roads which do any interstate business under the jurisdiction of the Interstate Commerce Commission. The protestants at that hearing called attention to the fact that only a small percentage of their business, averaging in most cases less than 1 per cent, was interstate in character.

Now the question has come up again through an order to the Detroit United Railway, which owns about 800 miles of track in Michigan and 2 miles in Ohio, to make reports to the Interstate Commerce Commission on all accidents including, of course, all of those on its large city system in Detroit. If this policy should be adopted as standard, very few urban companies, certainly among those which haul freight and so issue through bills of lading, would be exempt. Moreover, if the jurisdiction of the Interstate Commerce Commission covers this case, it is likely to cover almost any other detail of city operation, and we should then have a centralized government control of our public utilities in addition to state control.

At the last meeting in Washington the railway managers present did not question the good intentions or the ability of the Interstate Commerce Commission in dealing with these matters, as compared with the state commissions. The principal grounds urged were the absence of knowledge of local conditions and the immense amount of work which would be entailed on a central commission and also on the railways themselves in taking up all of these subjects at the federal capital as well as at the state capitals.

If precedent can count for anything, the decision of the Supreme Court in the opinion on the case of the Omaha & Council Bluffs Street Railway vs. the Interstate Commerce Commission (230 U. S. 324) would indicate that that court does not believe that the interstate commerce law covers cases of this kind. At Omaha the situation was somewhat different because the question was one of rates on street railways which happened also to be interstate roads. The conclusion reached then by the court was that the character of the service was the criterion of whether a road is embraced under the interstate commerce law, and certainly the character of the accidents in city service and the means to be taken to avoid them by fenders or otherwise bears little relation to what is generally understood as interstate commerce. We hope that the hearing at Washington next Friday, to which a letter from Arthur W. Brady in our "Communication's" column this week calls attention, will be effective in impressing this fact upon the Interstate Commerce Commission.

HUMANIZING DISCIPLINE

A casual study of a number of bulletins issued to platform men indicates an often unnecessary brusqueness in many of the instructions and little or nothing of a commendatory nature. Of course, the purpose of the merit and demerit system in disciplining trainmen has taken this into account to a certain extent, but attention is here directed to the day-to-day bulletins. Would not the suggestive effect of a meritorious act spread on these bulletins be of much value in disciplining and at the same time offer relief from the constant repetition of "do" and "don't"? Orders must, of course, be issued, but occasional commendation and a mixing of the "sweet" with the "bitter" will help greatly toward better service. The iron hand of discipline might well be covered with the silk glove of consideration. In other words, the human side of disciplining must be recognized.

The frailties of the human mind and body have been thoroughly safeguarded in the operation of trains, so as to make the man as nearly as possible an automaton. All of these precautions have done much to make operation more safe, but they cannot make a machine out of the human body. Hence disciplining in various forms is necessary to make up for this deficiency, and the point we have in mind is that, in disciplinary methods, full cognizance should be taken of the human factor. To illustrate what we mean, take the case of the application of discipline after accidents have occurred. After a serious accident the superintendent's first tendency is to discharge the offenders if they prove to have been guilty of lack of attention or lapse of memory. It is worth while in such cases to go behind the facts and consider some of the contributing causes and thus possibly justify the retention in service of men who will afterward be much more valuable on account of the accident. A momentary mental lapse during a run may result in disaster. Yet we all have mental lapses and the very fact that a man has had no accidents or "near" accidents during his railway career may in itself have made him subject to a false sense of security. As he ages in service his alertness is apt to become sluggish. But this defect may be more than made up, so far as his value of the company is concerned, by better knowledge of local conditions and clearer judgment. This fact should receive consideration when his case is decided. After he gets his "nerve" back he may be a safer man than one with no accident to his credit.

of the court of last resort may be obtained. The application for the injunction is based upon the allegation that the provision of the labor law forbidding the employment of non-citizens upon public work is unconstitutional and a violation of the treaty between the United States and the Kingdom of Italy and similar treaties with other nations in the most favored nations class.

Reports Requested Regarding Seattle Purchase.—Preliminary to further consideration of the proposition for the purchase of the Seattle, Renton & Southern Railway by the city of Seattle for a consideration of $200,000 in municipal railway bonds and 20 per cent of the gross earnings for a period of twenty-eight years, payable annually, Mayor H. C. Gill recently conferred with the heads of the various departments of the city government on the various phases of the project. The Mayor has asked A. L. Valentine, superintendent of public utilities, to report on the cost of operation of the line by the municipality, the cost of such reconstruction as will be necessary in bringing the tracks to the established grades, and matters of like nature. A. H. Dimock, city engineer, has been requested to furnish an estimate of the cost of grading and regrading the 18 ft. of Rainier Avenue now occupied by the tracks of the Seattle, Renton & Southern Railway. J. D. Ross, lighting superintendent, will report on the estimated cost of current sufficient to operate the line in connection with Division A and the Highland Park & Lake Burien Line, Division C, as well as the advantages that will accrue to the light and power department by city operation of the line. James E. Bradford, corporation counsel, will report on the various suits against the Seattle, Renton & Southern Railway, now in court.

PROGRAMS OF ASSOCIATION MEETINGS

New England Street Railway Club

The regular monthly meeting of the New England Street Railway Club will be held at the American House, Boston, Mass., on Dec. 17. H. A. Bullock, staff assistant to the president of the Brooklyn (N. Y.) Rapid Transit Company, will speak on "The Employee's Welfare." His address will be followed by a discussion in which it is expected that representatives of large corporations in other kinds of business who have had extended experience along this line will take part. The dinner which precedes the meeting will be served at 6 p. m.

American Wood Preservers' Association

The eleventh annual convention of the American Wood Preservers' Association will be held at the Congress Hotel and Annex, Chicago, on Jan. 19, 20 and 21, 1915. The subjects to be treated in papers are as follows:

"Treated Timber for Factory Construction," by F. J. Hoxie, engineer and special inspector of the Associated Factory Mutual Fire Insurance Companies.

"Temperature Changes in Wood under Treatment," by George M. Hunt of the Forest Products Laboratory, Madison, Wis.

"Sill Ties," by F. J. Angier, secretary-treasurer of the association.

"New Data on Properties of Creosote Oil," by Dr. Herman von Schrenk.

"Facts on Treated Ties," by J. H. Waterman, superintendent of timber preservation of the Chicago, Burlington & Quincy Railroad.

"Bleeding and Swelling of Paving Blocks," by Clyde H. Teesdale, in charge of wood preservation at the Forest Products Laboratory, Madison, Wis.

"Economical Use of Steam in Connection with Wood Preserving Plants," by A. M. Lockett, mechanical engineer, New Orleans, La.

"Mechanical Life of Ties as Affected by Ballast," by Earl Stimson, engineer maintenance of way of the Baltimore & Ohio Railroad.

"Determining the Soundness of Timber before Treatment," by C. M. Taylor, superintendent of the Port Reading Creosoting Plant.

"Facts on Creosoted Piling," by T. G. Townsend, piling inspector of the Southern Railway.

"A Problem in Air Seasoning Ties," by A. H. Noyes, assistant treasurer of the Ayer & Lord Tie Company.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The sales of bonds on the New York Stock Exchange on Dec. 9 totaled $1,736,000, par value, as compared with $1,395,500, par value, for the same day last year. This is much the largest day's business in bonds since public trading was resumed. Price movements on the average showed a further gain, but there were reactions in some securities which have lately experienced unnatural advances. Despite the approaching opening of the Stock Exchange for trading in stocks, sterling rates remain normal. Money continues easy. It is not regarded as likely that rates will be materially affected by any borrowing which may be made following the reopening of the exchange for public trading in stocks. Trading in stocks through the clearing house, according to the reports issued on Dec. 9 by the New York Stock Exchange, presented many interesting features. The most important changes reported during the day were in the railroad issues.

CHICAGO TRACTION ACCOUNTING CONTROVERSY

The report of the special audit of the books of the Chicago Railways and the Chicago City Railway being made by the city administration has just been published. That for the Chicago Railways was made by M. & L. W. Scudder, of New York, and that for the Chicago City Railway by Barrow, Wade, Guthrie & Company. In both cases the books were found without important error. The corporation counsel of the city, however, has recommended certain changes in the accounts to which paving and the removal of obstructions should be charged, although both of these questions have either been covered by specific provisions in the ordinance or publicly discussed and decided by the Board of Supervising Engineers, which has had the sole authority under the ordinance in these matters. It has been estimated that these changes, if made, would reduce the Chicago Railways' capital account $6,945,130 and make it necessary to pay the city traction fund $584,264, and that the company should also credit its renewal account with $531,965, and, similarly, that the capital account of the Chicago City Railway would have to be reduced approximately $5,138,000.

Regarding this controversy Henry A. Blair is quoted as saying, in an interview, that the books of the two railway companies have been audited each year by accountants selected by the city and approved by the companies. Through these audits the city comptroller was familiar with the methods of the Board of Supervising Engineers in charging every item which is now sought to be questioned by the Mayor. On these audits the companies have made seven annual settlements with the city, having turned into the traction fund more than $13,000,000,

On the special audits during Mayor Busse's administration the city and the companies had expended approximately $100,000, of which the city has borne 55 per cent. In the audit just completed the city again appropriated $50,000 of its own funds for the work. It would seem that this constituted a liberal expenditure for auditing purposes. Moreover all these firms have reported that the railway companies were conforming to the terms of the 1907 ordinances and the decisions of the Board of Supervising Engineers. The accountants engaged on the work at the present time were not called upon to show what would have been the results of operation during this seven-year period if the companies had followed the ordinance and the decisions, but if they had followed the opinions rendered by corporation counsel. Mr. Blair did not consider these criticisms therefore worthy of serious consideration. Speaking from the standpoint of a financial representative he did not believe that the controversies of this nature were at all helpful either to the city or to the railway companies.

Mr. Blair is also quoted as saying that during the seven-year period the companies had never at any time earned more than a fair rate of return upon the capital fixed by the actual purchase price of the city. The rate of return has been about 7 per cent, which includes the 5 per cent return upon the purchase price, the companies' 45 per cent of the visible net receipts and all construction profits. This rate of return he stated was less than that earned by other public utilities in the city of Chicago.

ANNUAL REPORTS

Eastern Pennsylvania Railways

The consolidated statement of income, profit and loss of the Eastern Pennsylvania Railways, Pottsville, Pa., for the twelve months ended June 30, 1914, follows:

Gross earnings	$826,415
Operating expenses and taxes	503,487
Net earnings from operation	$322,928
Deduct underlying companies charges	45,525
Balance	$277,403
Interest on bonds	$164,863
Other interest and rentals	13,630
Total	$178,493
Surplus for year	$98,909

As compared with the year ended June 30, 1913, the gross earnings increased $56,735, or 7.37 per cent, and the operating expenses increased $67,483, or 15.48 per cent. The net earnings, therefore, decreased $10,748, or 3.22 per cent, while the net profit for the year decreased $19,463. The various departments showed the following earnings results: Railway, an increase of $13,576; electric, an increase of $43,415; gas, a decrease of $55, and park, a decrease of $201. The increased operating expenses were partly caused by higher cost of labor and extra maintenance. Railway maintenance increased by $23,900 to a total of $88,390 for the year, while the cost of transportation increased $13,000. There was charged to capital accounts during the year $115,689, of which $57,666 was for the railway department and $58,023 for the electric department.

San Francisco-Oakland Terminal Railways

Price, Waterhouse & Company recently completed an audit of the books of the San Francisco-Oakland Terminal Railways for the fiscal year ended June 30, 1914, and submitted the following income statement for that period:

Operating revenues	$4,515,798
Operating expenses:	
Maintenance of way and structures	$400,972
Maintenance of equipment	284,081
Traffic	25,398
Conducting transportation	1,923,966
General and miscellaneous	295,503
Total operating expenses	$2,929,920
Net operating revenue	$1,585,878
Deduct:	
Taxes and licenses	239,000
Net revenue	$1,346,878
Add:	
Miscellaneous income	125,964
Net income before charging interest, amortization of premiums and discount on bonds and notes, and depreciation of road and equipment	$1,472,842
Deduct:	
Interest on bonds	$859,268
Interest on collateral trust notes	175,000
Miscellaneous	23,232
Total	$1,057,500
Profit after charging all interest, but before providing for amortization of premiums, and discount on bonds purchased, and depreciation of road and equipment.	$415,342
Deduct:	
Amortization of premiums and discount on bonds purchased	10,491
Profit after charging all interest, but before providing for depreciation of road and equipment	$404,851
Add:	
Interest charged by company to capital assets	240,101
Balance carried to surplus account	$644,952

The operating expenses of the company for the fiscal year consumed 64.9 per cent of the operating revenues, divided as follows: maintenance of way and structures, 8.9 per cent; maintenance of equipment, 6.3 per cent; traffic, 0.6 per cent; conducting transportation, 42.6 per cent, and general and miscellaneous, 6.5 per cent. Taxes and licenses absorbed 5.3 per cent of the operating revenues, leaving net revenue of 29.8 per cent. Miscellaneous income constituted 2.8 per cent of the operating revenues, so that the net income before charging interest, amortization and depreciation was 32.6 per cent of the operating revenues.

The auditors report net additions to capital account of $510,927 for road and $105,923 for equipment, a total of $616,850. These amounts are those existing after considerable writing down of the value of land and writing off of the value of abandoned structures. The total amount of bonds outstanding as of June 30, 1914, is certified to amount to $16,656,000 in the hands of the public and $3,256,000 pledged as security for the Oakland Railway notes, making a total outstanding amount of $19,912,000.

The profit of $404,851 after charging all interest, including the interest properly chargeable to capital, does not provide for sinking fund payments. While amply able to maintain itself in excellent operating condition, therefore, the property evidently is not in a position to undertake new construction until, through refinancing, new capital has been obtained.

Barcelona Traction & Light Company, Barcelona, Spain.—Owing to the present European war, the Barcelona Traction, Light & Power Company was unable to meet the semi-annual interest coupons due on Dec. 1 on its outstanding £1,500,000 of first mortgage 5 per cent bonds. According to a statement from the Toronto office, the war has rendered it impossible to continue the arrangement made last June for providing the funds required for the completion of the present program of construction. The board, however, has under consideration a plan which would provide the company the necessary funds for completing the work under construction and for adjusting computing interest. The enterprises of the company at present in operation are said to show satisfactory results, with a steadily increasing revenue. This company was formed in 1911 by F. S. Pearson and associates and it either owns or controls virtually the entire tramway, light and power business of not only the city of Barcelona but the whole district of Cataluna, the industrial center of Spain.

California Street Cable Railroad, San Francisco, Cal.—J. Barth & Company, San Francisco, have purchased the $384,000 of new general first mortgage 6 per cent serial refunding gold bonds of the California Street Cable Railroad, dated Jan. 1, 1915, and due in twelve annual installments beginning Jan. 1, 1916, and ending Jan. 1, 1927. These bonds were referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 31, Nov. 21 and Dec. 5.

Chicago (Ill.) Elevated Railways.—At the annual meeting of the Chicago Elevated Railways collateral trust the trustees reduced the governing board from seven to five members. Ira M. Cobe and F. A. Delano, who joined the Federal Reserve Board in Washington, withdrew. It was not thought necessary to fill their places. The board now stands: Frank A. Vanderlip, Henry A. Blair, Samuel Insull, E. W. Harden and Samuel McRoberts. The governing committee will elect the executive committee at a later meeting. There are three members of that body, Samuel Insull, Henry A. Blair and Ira M. Cobe. Mr. Cobe has tendered his resignation, but his successor has not as yet been selected.

Cumberland County Power & Light Company, Portland, Maine.—It was stated in the ELECTRIC RAILWAY JOURNAL of Nov. 21 that the Cumberland County Power & Light Company has certified and guaranteed, principal and interest, $500,000 of bonds of the York County Power Company, a subsidiary. Of this amount $315,500 are outstanding in the hands of the public, $150,000 are in the treasury of the Cumberland County Power & Light Company and $34,500 are in the treasury of the York County Power Company. The $315,000 outstanding includes $100,500 of bonds which have been exchanged for an equal amount of underlying liens. There has been no offering of these bonds.

Federal Light & Traction Company, New York, N. Y.—E. N. Sanderson, president Federal Light & Traction Company, has issued a circular regarding the recent deferring of dividends on the company's $2,500,000 of 6 per cent cumulative preferred stock, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5. The net income of all companies for the twelve months beginning September, 1913,

is said to have been adversely affected by the disastrous fire at Hot Springs, the serious strike in the Trinidad coal fields, and the drastic rate schedules in Tucson, Ariz., and Springfield, Mo. In the opinion of the board, however, the turning point has been passed, and from now on the company will enjoy increased gross and net earnings. During the last twelve months the gross earnings showed an increase over the corresponding previous period, and only the net earnings suffered substantially from the adverse condition. Since July the net income has been constantly improving, so that during the three months ended Oct. 31 the dividend on the preferred stock has been more than earned.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has granted the application of the Fresno Interurban Railway for permission to make three stock and bond issues to provide for twenty-six miles of new line at an estimated cost of $17,300 per mile.

Interborough Rapid Transit Company, New York, N. Y.—An extra dividend of 5 per cent has been declared on the $35,000,000 of stock of the Interborough Rapid Transit Company, along with the regular quarterly payment of 2½ per cent, both payable on Jan. 2 to holders of record on Dec. 21. Since the Interborough-Metropolitan Company owns $33,912,800 of the stock, its income from the extra disbursements is $1,695,640. The committee on listings of the New York Stock Exchange has received an application from the Interborough-Metropolitan Company to list $17,942,000 of 5 per cent cumulative preferred stock. This is the stock that was formerly in the hands of the voting trust and does not represent an increase in the capitalization of the company.

Joliet & Eastern Traction Company, Joliet, Ill.—The bondholders of the defunct Joliet & Southern Traction Company have almost unanimously decided to accept stock in the Joliet & Eastern Traction Company in exchange for their holdings. The formation of this new company was described in the Electric Railway Journal of Nov. 21. The greater part of the $80,000 fund paid into court during the period of bankruptcy of the Joliet & Southern Traction Company will be practically all turned into the treasury of the new company.

Kentucky Securities Corporation, Lexington, Ky.—The annual report of the Kentucky Securities Corporation for the fiscal year ended June 30 is made up principally of a report for the Kentucky Traction & Terminal Company and the Lexington Utilities Company, all the stocks of which are owned by the Kentucky Securities Corporation. The combined operating revenue of the two subsidiary companies, exclusive of inter-company charges, amounted to $782,272 for the last fiscal year, as compared to $742,884 for the previous year, an increase of 5.3 per cent. Operating expenses in the two years were $412,509 and $401,507, an increase of 2.7 per cent. Miscellaneous income increased from $29,941 to $32,022 and fixed charges from $225,268 to $245,184, while the final surplus increased from $146,049 to $156,600, or 7.2 per cent. The operating companies as of June 30 had a credit balance in the reserve for accidents and damages of $27,550, and it was directed that $24,000 should be credited to the depreciation reserve as of June 30. A fixed proportion of gross earnings is set aside monthly on account of maintenance, amounting for the current year to 16½ per cent.

Lehigh Traction Company, Hazelton, Pa.—The Lehigh Traction Company, reversing its previous decision as noted in the Electric Railway Journal of Nov. 28, paid on Dec. 1 the interest due on its first mortgage 5 per cent bonds. The protective committee representing the bondholders refused to accept the offer of President Markle to purchase the bonds for his personal account, as they had done in connection with the interest default on June 1.

Long Island Railroad, New York, N. Y.—The 5 per cent equipment trust series A of the Long Island Railroad, the authorization of which by the Public Service Commission for the Second District of New York was noted in the Electric Railway Journal of Oct. 24, consist of a total authorized issue of $1,060,000. Of this amount $1,050,000 is issued and outstanding. The trusts are dated June 1, 1914, and mature $106,000 on June 1, 1915, and June 1 of each succeeding year to 1923, inclusive, and $96,000 on June 1, 1924. The principal and the interest are payable in gold and are guaranteed by the Long Island Railroad. The cost of equipment is $1,175,262, of which the railroad has paid to the trustees $125,000.

Massachusetts Electric Companies, Boston, Mass.—George C. Lee has been elected a trustee of the Massachusetts Electric Companies, succeeding the late Gardiner M. Lane.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—The Massachusetts Northeastern Street Railway on Nov. 28 filed a mortgage for $2,000,000 at Lawrence to the American Trust Company, Boston, Mass., as trustee. This mortgage takes the place of an original one issued in 1903 to the New York Trust Company, New York, which is discharged. The filing of the new mortgage simply provides for a change in the fiscal agent of the corporation.

Mexico Tramways, Mexico City, Mexico.—Officers of the Mexican Light & Power Company, a subsidiary of the Mexico Tramways, recently notified the holders of the $9,733,333 of second mortgage fifty-year sinking fund bonds that the payment of the interest coupons due on Dec. 1 would be deferred. The rate of exchange has been falling continuously in the last few months and the Mexican government officials, who are now in control of the operations of the Mexico Tramways, have prohibited further remittance of funds from Mexico until the rate of exchange improves.

New York (N. Y.) Railway.—At the annual meeting of the New York Railways on Dec. 7 Darwin P. Kingsley, F. S. Witherbee, Henry Ollesheimer, F. L. Leland and J. C. Cobb were elected directors to represent the holders of the 5 per cent income bonds. Harry Bronner, Guy E. Tripp, A. J. Hemphill and E. S. Marsten retired. Mr. Cobb was reelected. A statement of the company's income for the four months ended Oct. 31, last, was read by T. P. Shonts, president. It showed that the gross revenue for the period, October being partly estimated, was $4,618,000, as against $4,828,000 last year, and a surplus over interest charges available for the income bonds of $425,000, against $508,000 last year. The so-called Kingsley insurance company interests already have a suit pending in the courts to decide what constitutes a proper allowance for injury and damage claims or whether or not all surplus revenue not actually paid out in any given year shall be applicable to the adjustment of income bonds. The contention of certain bondholders has been that all surplus revenues not actually paid out during any year should be applicable to the payment of interest on the income bonds. Darwin P. Kingsley is president of the New York Life Insurance Company, F. S. Witherbee is a director of the Equitable Life Assurance Society. Henry Ollesheimer is vice-president of the Metropolitan Bank, New York, F. L. Leland is president of the New York County Bank, and J. C. Cobb resides in Boston. The movement to change the present income bondholders' representation on the board has been under way for a year. A total of $18,000,000 of bonds was voted, of which the so-called Kingsley committee cast $14,000,000 and the so-called Hemphill committee $4,000,000.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Railroad Commission of California has rendered a decision authorizing the Oakland, Antioch & Eastern Railway to issue promissory notes of the total face value of $295,345. It is made a condition of the commission's order that these notes shall bear interest at not to exceed 7 per cent per annum.

Rochester Railway & Light Company, Rochester, N. Y.—The Rochester Railway & Light Company has been authorized to issue $250,000 of its 5 per cent fifty-year consolidated trust mortgage bonds for the purpose of refunding a like amount of the underlying bonds of the Brush Electric Light Company, maturing on Jan. 15, 1915. The new bonds are to be sold or exchanged at not less than 95. Should the holders of the underlying bonds not prove willing to exchange for the new bonds at not less than 95, the company has been authorized by the Public Service Commission of the Second District of New York to enter into agreement with such holders whereby an extension of the time for the

payment of the principal may be obtained for one year at an increase from 5 per cent to 6 per cent in interest during that time on the old bonds.

Springfield (Mass.) Street Railway.—The Springfield Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,041,000 of additional stock at 110 to pay floating debt. This is part of an issue of $1,290,000 authorized by the stockholders. There is now $3,708,100 of stock outstanding.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—E. W. Clark & Company, Philadelphia, Pa., are offering for subscription $1,118,000 of St. Joseph Railway, Light, Heat & Power Company 6 per cent sinking fund trust stock certificates due on May 30, 1917, and redeemable at par and accrued dividend on any dividend date. The certificates will be issued by the Guaranty Trust Company, New York, as trustee under an agreement with the Cities Service Company. This agreement provides for the deposit with the trustee of 31,948 shares out of a total of 35,000 shares of the common stock of the St. Joseph Railway, Light, Heat & Power Company. A sinking fund will operate monthly to retire certificates before maturity. The rate at which this fund will work will be $450,000 a year, giving the issue an average life of not more than fifteen months. If the certificates are not obtainable for purchase for the sinking fund at par and accrued dividend or better in the open market, they will be called by lot monthly. All certificates taken up in the sinking fund will be cancelled. The certificates are being offered at 97½ and accrued dividend, yielding more than 7 per cent to maturity and more than 8 per cent on their average life.

Toronto (Ont.) Railway.—William A. Read & Company, New York, N. Y., have sold $1,500,000 of 6 per cent gold bonds of the Toronto Railway, dated Dec. 1, 1914, and due half on Dec. 1, 1915, and half on Dec. 1, 1916, at 100¼ for the former and par for the latter. The purchase of these notes by the bankers was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5.

Washington Railway & Electric Company, Washington, D. C.—Notice has been served on the Washington Railway & Electric Company that because the purchase by the company of 740 shares of stock of the Washington & Rockville Railway was not authorized in writing by the Public Utilities Commission that body recognizes the transaction as void. The purchase was made from the Potomac Electric Power Company for a consideration said to have been $37,000.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has received an application from the West End Street Railway for authority to sell at public auction the $650,000 of stock authorized by the stockholders on Nov. 24, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 28.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.—The Railroad Commission of Wisconsin has authorized the Wisconsin-Minnesota Light & Power Company, a subsidiary of the American Public Utilities Company, to issue preferred stock to the amount of $367,000 and common stock to the amount of $244,000. The company has authority to issue $300,000 in preferred and $200,000 in common stock for the purpose of acquiring the property of the Winona Gas, Light & Coke Company, Winona, Minn., the Red Wing, Gas, Light & Power Company, Red Wing, Minn., the Minnesota-Wisconsin Power Corporation, which furnished electric light to Wabasha and Lake City, Minn., and the Eau Claire Gas Light Company. Under this authorization, stock to the amount of $94,000 may be issued for improvements and extensions to the plants, and preferred stock to the amount of $17,000 may be issued to acquire all property including the accounts receivable of the Neillsville (Wis.) Electric Company.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,880,000 of additional stock to pay floating debt. This is part of an issue of $2,350,000 authorized by the stockholders. The amount of stock already outstanding is $5,112,000.

DIVIDENDS DECLARED

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

California Railway & Power Company, San Francisco, Cal., quarterly, 1¾ per cent, prior preferred.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Continental Passenger Railway, Philadelphia, Pa., $3.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1½ per cent, preferred.

Indianapolis (Ind.) Street Railway, 3 per cent.

Manila Electric Railroad & Light Corporation, Manila, P. I., quarterly, 1¾ per cent.

Union Traction Company, Philadelphia, Pa., $1.50.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred quarterly, three-fourths of 1 per cent, second preferred.

United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $2, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct., '14	$69,422	*$30,533	$38,889	$17,370	$21,519
1 " " '13	68,454	*27,938	40,516	17,355	23,161
12 " " '14	778,690	*374,603	404,087	208,880	195,207
12 " " '13	755,084	*343,270	411,814	207,455	204,359

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Oct., '14	$88,261	*$58,067	$30,194	$28,655	$1,539
1 " " '13	99,358	*62,447	36,911	25,856	11,055
12 " " '14	1,108,598	*698,404	410,194	333,135	77,059
12 " " '13	1,194,265	*709,875	484,390	292,536	191,854

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.

1m., Oct., '14	$107,611	*$65,850	$41,760	$32,464	$9,296
1 " " '13	111,955	*65,988	45,967	32,341	13,626
10 " " '14	1,058,200	*633,485	424,716	323,776	100,940
10 " " '13	1,051,382	*627,872	423,509	316,785	106,724

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

1m., Oct., '14	$262,685	*$146,703	$115,982	$42,349	$73,633

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1m., Oct., '14	$164,692	$76,613	$88,078	$70,182	$17,896
1 " " '13	145,647	74,303	71,344	47,012	24,332
12 " " '14	1,882,293	901,171	981,123	712,902	268,221
12 " " '13	1,758,651	872,587	886,064	552,087	333,977

MEXICO (MEX.) TRAMWAY.

1m., Oct., '14	$306,772	$140,342	$164,430	......	......
1 " " '13	278,377	151,935	126,443	......	......
10 " " '14	2,854,705	1,327,634	1,527,072	......	......
10 " " '13	3,024,232	1,541,267	1,482,970	......	......

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Oct., '14	$191,814	*$108,204	$83,610	$41,921	$41,689
1 " " '13	204,178	*122,797	81,381	39,827	41,554
12 " " '14	2,246,484	*1,354,798	891,686	506,449	385,237
12 " " '13	2,189,888	*1,306,019	883,869	458,467	425,402

PORTLAND (MAINE) RAILROAD.

1m., Oct., '14	$87,095	*$53,623	$33,472	$19,193	$14,279
1 " " '13	82,620	*52,081	30,539	21,711	8,828
12 " " '14	1,042,698	*643,206	399,492	254,031	145,461
12 " " '13	1,034,100	*705,997	328,103	156,193	171,910

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Oct., '14	$253,134	*$155,996	$97,138	$83,809	$13,329
1 " " '13	257,303	*159,280	98,023	86,157	11,866
12 " " '14	3,074,120	*1,854,458	1,219,663	1,003,677	215,676
12 " " '13	2,964,266	*1,839,447	1,124,819	994,768	130,051

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Oct., '14	$800,097	$392,372	$407,725	$231,438	$178,287
1 " " '13	765,160	375,156	390,004	238,135	151,869
10 " " '14	7,746,727	3,995,604	3,751,123	2,278,509	1,472,504
10 " " '13	7,333,922	3,711,374	3,622,548	2,349,531	1,273,017

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*Includes taxes.

Traffic and Transportation

AUTO BUS COMPETITION IN SOUTHERN CALIFORNIA

Auto Bus Invades San Francisco—Los Angeles Railway, Losing $600 a Day, Has Withdrawn Twenty-One Cars

The "jitney" bus, as the nickel-a-passenger automobile is popularly referred to in southern California cities, has invaded San Francisco. On Dec. 1 six automobiles were put in regular service on Market Street, carrying passengers between the ferry and outlying points for 5-cent fares. As yet no special license has been placed upon these vehicles in San Francisco, but the fact that in that city they will be in competition with a municipal street railway may present the matter in a new light. While an increase in local passenger capacity during the exposition would be welcomed it is conceded that enfranchised street railways should not be deprived of their most profitable traffic by companies free from any obligation to serve in unprofitable districts and that automobiles should be subject to regulation, including a guarantee for damages in case of accident.

Long Beach, Cal., recently imposed a license fee of $25 a year on the "jitney" buses, compels the taking out of a $10,000 liability insurance for every car engaged in transporting passengers, and requires the buses to operate over designated routes and maintain reasonable schedules. On the day that this ordinance went into effect only forty-one out of 130 automobiles carrying passengers in competition with the street cars were continued in service. Prior to the passage of this ordinance in Long Beach the Pacific Electric Railway threatened to discontinue its East Ocean Avenue line altogether unless some regulation was placed upon the 5-cent automobile. Legislation is still pending on the matter in Los Angeles. According to the Los Angeles Railway Corporation its loss in revenue on account of the automobile competition amounts to $600 a day, and has caused the company to withdraw twenty-one cars on six lines and eighty-four motormen and conductors. Up to Dec. 1 the secretary of the Los Angeles police commission had issued a total of 1520 permits to chauffeurs to operate auto buses in competition with street cars, and that the rate of increase is rapid is shown by the record of over sixty additional permits issued on Dec. 2.

So serious has the auto bus matter become in Los Angeles that on Dec. 4 the directors of the local association of merchants and manufacturers addressed a letter in part as follows to the City Council:

"We believe that the time has arrived when your honorable body should take some action regulating the passenger traffic of the 5-cent automobile buses. If these buses can run through the city without proper regulation and protection to the lives of not only patrons but the public in general, we will soon be confronted with a number of accidents. In addition, with several hundred of these buses running up and down the main streets the traffic congestion is greatly increased, and the progress of other machines correspondingly retarded. To allow these machines unrestricted freedom is a menace to the entire community, and we believe that no good reason exists why they should not be placed under strict traffic regulations, and we therefore request that this matter receive the early attention of your honorable body."

NEW COMPANY PUBLICATION

The Hudson & Manhattan Railroad, which operates under the Hudson River between New York and New Jersey, has begun the publication of the *H. & M. Review*. The first issue, dated December, contains eight pages, 6 in. x 9 in. in size. In an article entitled "Object and Future of the *H. & M. Review*," Wilbur C. Fisk, president of the company, says in part:

"The need has been felt for months back for a means of intercommunication between all of us who are employed by the company and also between the departments to which we may be assigned. To accomplish this end, it has finally been decided to issue the *H. & M. Review*.

"The prime purpose to be achieved by the publication is the further promotion and cementation of the good fellowship already existing among the employees of the company. This can only be achieved by the hearty co-operation of all and by keeping the editor posted on all news items which are entitled to publication. The editor will always welcome contributions, but will not publish anything not prompted by the best of motives.

"It must not be forgotten that at times the company and your president may have a message which is meant for all of you, and the columns of the *Review* will be open to any officer of the company who has a message, either for the men of his own department, or which he believes will be beneficial to all. It is needless to say that events occurring during any one month will be faithfully reported in the paper.

"I earnestly request not only the officers but all employees of the company to lend the editor their assistance in his efforts to make the *Review* of real value."

The editor of the *H. & M. Review* is J. J. Scovern.

INTERURBAN SAFETY

The Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, of which E. F. Schneider is general manager, is continuing unabated its campaign of safety begun more than five years ago. The custom of the company has been to cover each year the entire system of 250 miles with talks to the 63,000 school children in the territory contiguous to the company's lines. Ben B. Casson of the company in a talk which he delivered recently to the grammar and primary grade pupils at the German Lutheran Parochial School at Elyria, Ohio, reviewed the activity of the company along these lines. In addressing the grammar grade pupils he said that in the year prior to the inauguration of the safety movement eleven children were injured and three killed, but that since then not a child had been injured or killed while going to or from school. He impressed the children with the necessity of exercising care not only as regards street cars but also as regards automobiles, motorcycles, wagons, bicycles and steam railroads. He emphasized the sad task which confronts the officers of the company in going into the homes of parents of children who had been injured or killed and witnessing the grief in the household. Mr. Casson also reviewed his own experiences during the four years that he operated a car over the Cleveland, Southwestern & Columbus Railway. The great problem before the American people to-day was the preservation of the lives of the people. He advised the school children to discuss safety among themselves and suggested similar discussions in the homes. The address to pupils of the primary grade was, of course, a modification of the one made to the grammar grade pupils. Heretofore the safety addresses to the school children have been made by officers of the company. Mr. Casson is a motorman, and his talks have presented a different viewpoint, and possibly for this reason have been especially valuable.

COMPLYING WITH THE NEW REVENUE PROVISION

A circular letter sent out several days before Dec. 1 to the regular shippers over the Louisville & Interurban Railroad, and a supply of stamps laid in by R. H. Wyatt, general freight and passenger agent of the company, enabled that company to start out under the new revenue tax on the first of the month without confusion. The circular letter reviewed briefly the nature and purposes of the revenue measure, explained what were the duties of the shippers, and then added that for the convenience of the patrons of the Louisville & Interurban Railroad stamps had been supplied to all conductors on freight trains, to agents of the company wherever stations were maintained and that the company would gladly obtain for shippers such supplies of stamps as they needed for use in shipments over its lines. As a consequence every shipper knew beforehand just what was expected of him, as, in addition, copies of the letters which were sent out were posted prominently at every shipping point. The company will continue, while the law is in effect, to have conductors and the various freight offices handle stamps for use of the shippers. Since postmasters are not paid for handling the stamps many of them are refusing to do so. The service which the company has installed in regard to stamps also enables the company to keep its records free from charge accounts of numerous shippers with small entries relating to the stamps.

Lifting Jacks in Pennsylvania.—The Lehigh Valley Transit Company, Allentown, Pa., has equipped all of its cars with lifting jacks conforming with the Pennsylvania statute effective on Dec. 1. The jacks are slung on special hang-

ers from the sides of the cars, and special instructions have been issued to the employees on the handling of the jacks in case of personal injury or derailment.

Increase in Fares in Eastern New Jersey.—The proposed increase in fares between Atlantic City and Pleasantville, N. J., referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 5, page 1274, does not apply to the Atlantic City & Shore Railroad. The steam roads operating between the points mentioned plan, however, to put a higher rate of fare into effect on Dec. 15.

Serious Accident on New York Elevated.—In a rear-end collision between two northbound trains on the Ninth Avenue line of the Manhattan Elevated Railway in New York at 116th Street and Eighth Avenue at 6:30 p. m. on Dec. 9, two men were crushed and received burns from which they died, and more than a score of others were injured in the panic which ensued.

Vermont Fare Matter.—The Barre & Montpelier Traction & Power Company, Montpelier, Vt., has filed with the Public Service Commission of that State a proposed tariff increasing the fare over the line between the cities from 10 cents to 15 cents. The Supreme Court of the State recently held that the company was required to maintain a fare not to exceed 5 cents within the limits of each of the cities in which it operates.

Commutation Fare Order.—The Public Service Commission of Missouri on Dec. 7 issued an order to the Kansas City, Clay County & St. Joseph Railroad to begin on Jan. 1, 1915, issuing commutation tickets on definite rate schedules established by the commission, which figure out at about 1.1 cents per mile. Five days from the receipt of the order are allowed for an answer, which will carry until Dec. 14. A request for a rehearing is to be filed.

Car Advertising in Toronto.—Despite the objection of Works Commissioner Harris the Board of Control of Toronto, Ont., has decided to permit street car advertising in the cars on the city's own line. Last spring the commissioner reported against the proposal and it was dropped for the time being. It has been recommended that the contract be awarded to the Canadian Street Car Advertising Company.

Time-Table Prize.—The offer of a $25 prize for the best time-table to be submitted by one of its trainmen, which was published in the September number of the *United Railroads Magazine*, published by the United Railroads, San Francisco, Cal., aroused considerable interest and resulted in five time-tables being submitted by four contestants, one of whom submitted two tables. The prize was awarded to D. W. Sutlief, a conductor in the Twenty-eighth Street carhouse.

Far-Side Stops at Rock Island.—The City Council of Rock Island, Ill., insists that the Tri-City Railway discontinue the near-side stop and adopt the far-side stop. A plan to stop on the far side was suggested by John G. Huntoon, the general manager of the company, a year ago, but the people of Davenport did not favor the change and the matter was dropped. Now the cities of Rock Island and Moline are insisting on the far-side stop, irrespective of the attitude of the city of Davenport toward the proposal.

Company Relations in Galveston.—For many years the Galveston (Tex.) Electric Company has required a deposit of $30 from each of its trainmen as an assurance of good faith. A new policy, however, is now being put into effect. The deposits are being returned to the trainmen and 6 per cent interest is being paid each man for the time the money has been on deposit. The records for most of the deposits date back no further than 1900. Under the new plan the company has its trainmen under bond, the company itself paying the premium.

Market Transfers.—The Edmonton (Alberta) Radial Railway has adopted a special "market transfer," in order to promote business at the newly-opened civic market. Passengers going direct to the market, on market days, receive a "market transfer," which enables them to make the return trip on a single fare. J. H. Larmouth, superintendent of the railway, a municipal line, is reported to have expressed the opinion to the civic authorities that a portion of the cost of the transfer should be borne by the market committee of the City Council.

Transfer Changes in Savannah.—With a view to giving additional transfer privileges to its patrons, the Savannah (Ga.) Electric Company put into effect on Dec. 1 certain changes in its transfer system. Several important transfer points have been relocated and the system of issuing transfers as regards these points has been changed. The company asked the co-operation of its patrons in inaugurating the changes and announced that misunderstanding regarding the changes would be explained over the telephone or in person at the company's office.

Police in Safety Campaign.—The city of Montreal, Que., has decided to co-operate with the Montreal Tramways in the "safety first" campaign inaugurated by A. Gaboury, superintendent of the company. The chief of police is to work with Mr. Gaboury, and later a committee of civic officials is to be formed to study the entire question as it relates to Montreal. The chief of police has sent out thousands of circulars to owners of vehicles referring to the urgency of observing traffic regulations and making suggestions as to how to avoid accidents.

Height of Steps in New Hampshire.—The Public Service Commission of New Hampshire held a hearing in Concord on Dec. 1 to determine whether steps on the electric cars in the State are reasonably safe and low. Various estimates of the cost of changing the height of steps were made. They ranged from $30 to $150 a car, according to the rolling stock operated. All of the roads were represented except the Concord & Manchester Electric Branch of the Boston & Maine Railroad, which has already complied with an order of the commission in regard to steps.

Operating Changes in Vancouver.—Several of the city lines of the British Columbia Electric Railway in Vancouver, B. C., have been rerouted in order to provide greater economy of operation and still meet existing traffic conditions. The general plan affects the service on stub lines slightly. The company's owl service is also being operated in closer accordance with traffic requirements. The trainmen have made an arrangement among themselves providing for a certain lay-off each week in order to enable a larger force to be kept on than would otherwise be possible.

"Safety First" in St. Louis.—Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., is quoted as follows in regard to the "safety first" campaign of the company: "I believe when the public has been impressed fully with the necessity for caution, we will find the number of persons injured in street car accidents far less than heretofore. There seems to be a general disposition to heed the warning of our signs. If wagon drivers will obey the traffic laws and pedestrians cross the streets only at street corners, instead of in the middle of the block, we will have few accidents."

Not Within Commission Jurisdiction.—Chairman McCall of the Public Service Commission for the First District of New York replied on Dec. 9 to Health Commissioner Goldwater of New York, who had written to the commissioner calling attention to alleged unsanitary conditions on the transit lines due to overcrowding. Mr. McCall pointed out that breathing, coughing and sneezing by persons in the cars were not matters subject to the jurisdiction of the Public Service Commission, and referred to the expenditure of $325,000,000 now being made for rapid transit lines intended to relieve the congestion of which Dr. Goldwater complained. There has been considerable other gentle persiflage in this connection recently.

Hunters Beware.—An appeal to hunters to be careful in handling firearms while on street cars has been made by the Detroit (Mich.) United Lines based upon a bulletin to conductors issued by the operating department. The bulletin follows: "Attention is called to the matter of firearms, particularly guns used for hunting purposes, carried by passengers. If at any time a passenger is examining a firearm, or handling it carelessly, or in such a way that it might imperil the lives of other passengers, caution him to desist and explain that this is a rule of the company for the protection of passengers. Also, so far as a conductor is able to do so, he must see that firearms carried by passengers are not loaded."

Passengers Carried in Greater New York.—The number of passengers using the transit systems of Greater New York for the year ending June 30, according to tables compiled by the Public Service Commission of the First District of New York, was 1,813,204,692, an increase over the previous twelve months of 43,328,184. They paid out in fares $89,361,262. The number of passengers carried by the Brooklyn Heights Railroad, the principal surface railway subsidiary of the Brooklyn Rapid Transit Company, fell off by 1,140,585, by the New York Railways by 1,742,267. The Second Avenue Railroad carried 858,189 fewer passengers than the year before, the Third Avenue 75,039, the Forty-second Street, Manhattanville & St. Nicholas Company lost 175,443, and the Dry Dock, East Broadway & Battery Company 1,297,743 passengers.

Chicago Drafts Electric Railway Freight Ordinance.—In an effort to further the recommendations of the Chicago Municipal Markets Commission relative to the advantage of permitting all the electric railways which enter Chicago to handle freight, an ordinance granting this privilege is being prepared. At a preliminary conference between a sub-committee of the Chicago City Council's local transportation committee, the officials of the surface and elevated lines, representatives of the city law department and the Chicago Municipal Markets' Commission, the preliminaries were arranged. According to the city legal department there was nothing to hinder the electric lines from carrying freight within the corporate limits. Upon being questioned regarding their attitude toward a proposition including the right to carry freight, the representatives of the surface and elevated lines expressed a willingness to co-operate in the matter.

Ten Months of Safety in Detroit.—W. C. Cann, chairman of the general safety board of the Detroit (Mich.) United Railway, reports that during the first ten months of this year more than 900 safety suggestions were submitted to the division and general safety board and that favorable action has been secured on 95 per cent of the suggestions. So far this year the number of cars in collision has decreased 47.7 per cent, derailments 7.7 per cent, running over crossings 30 per cent, and passengers hurt in boarding and alighting 32 per cent. The only reports showing any appreciable increase are those covering automobiles struck. These have increased 30.9 per cent. Mr. Cann expresses the opinion that the showing which the company had made in decreasing all accidents other than those in which automobiles are involved indicates that the burden of responsibility for the increase of automobile accidents is on the automobile driver and not on the men operating the street cars.

New Traffic Ordinance in Canton.—A new traffic ordinance was passed by the City Council of Canton, Ohio, on Nov. 9. It is provided that automobiles and horse-drawn vehicles shall cross the center of the intersecting street before turning into it rather than follow a diagonal course from one street into the other. No person under sixteen years of age shall be allowed to operate a motorcycle or automobile on the streets of the city. There are strict regulations with regard to automobiles being allowed to stand along the curb in the business district. A rate of speed exceeding 15 m.p.h. is to be taken as evidence of careless driving, and a rate of speed exceeding 20 m.p.h. is prohibited. Drivers of vehicles passing a street car stopping to discharge or to take on passengers, when said vehicle is going in a direction opposite to that from which the street car is moving, shall slow down and exercise due care so as not to endanger the safety of pedestrians. The driver of every vehicle approaching a street car stopping for the purpose of taking on or discharging passengers shall give some signal plainly visible or audible to such passengers, and shall keep such vehicle at least 6 ft. from the running board or lower step of such car. If it is not possible to preserve such distance from such running board or lower step, the driver or operator shall stop until the street car has again started. All vehicles upon a track in front of a street car shall turn out upon the near approach of the car. The penalty for violating the traffic ordinance is a fine not to exceed $100 and costs. In the section regulating the movement of pedestrians, it is provided that pedestrians shall have the right-of-way over drivers of vehicles at street crossings only.

Personal Mention

Sir George S. Gibb, chairman of the Metropolitan District Railway, London, has been appointed a civil member of the Army Council and will be charged with the supervision of army contracts.

Mr. J. M. Tomlinson, acting vice-president and general auditor of the New York, New Haven & Hartford Railroad since the retirement of Mr. H. M. Kochorsperger, vice-president, has been elected vice-president and comptroller of the company.

Mr. A. Mackrille, assistant general auditor, has been appointed general auditor of the New York, New Haven & Hartford Railroad with office at New Haven, and **Mr. T. M. Prentice**, assistant auditor, has been appointed auditor of the company with office at New Haven.

Mr. C. C. Collins has resigned as traffic manager of the Lehigh Valley Transit Company, Allentown, Pa., effective on Jan. 1, 1915. Before becoming connected with the Lehigh Valley Transit Company Mr. Collins was traffic manager of the Western Ohio Railroad, Lima, Ohio.

Lieutenant-Colonel G. S. Rennie, M.D., surgeon in chief of the Dominion Power & Transmission Company, Hamilton, Ont., and the Toronto, Hamilton & Buffalo Railway, will be in command of one of the field artillery batteries being mobilized in Toronto for overseas service.

Mr. Daniel L. Turner, deputy engineer of subway construction of the Public Service Commission of the First District of New York, has been appointed to serve on the advisory commission on city planning, which is to assist and co-operate with the committee on city plan of the Board of Estimate, New York City.

Mr. A. E. Beck, one of the permanent counsel of the British Columbia Electric Railway, Vancouver, B. C., and its claim agent, will leave the company's service at the end of the year to practice law on his own account in Vancouver. The company's legal and claims departments will be consolidated under the control of the other permanent counsel, Mr. V. Laursen.

Mr. C. H. Christensen has been appointed manager of the Missoula (Mont.) Street Railway, the Missoula Light & Water Company and the Clark Missoula Power Company, to succeed Mr. George R. Brown, deceased. Mr. Christensen has been connected with the Missoula Light & Power Company in various capacities for twenty years. During the last four years he held the position of superintendent of the Missoula Light & Water Company's Bitter-Root Valley System.

Mr. W. O. Demoss, who has been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Southern Pennsylvania Traction Company, was for ten years foreman of the West Baltimore Street and the Retreat Street carhouses of the United Railways & Electric Company, Baltimore, Md. On Feb. 27, 1911, he became maintenance foreman of the Delaware Avenue carhouse of the Wilmington & Philadelphia Traction Company and in March, 1912, was appointed general foreman of the Wilmington shops of the latter company.

Mr. John W. Graham, Twin Falls, Idaho, will fill the vacancy left on the Idaho Public Utilities Commission by the recent resignation of Judge D. W. Standrod. Mr. Graham has been practicing law in Idaho for the last four years. He is forty-one years of age and a native of Canada, but was educated at the University of Nebraska. He practiced his profession in Fremont, Dodge County, Neb., and was for four years prosecuting attorney of that county, and had altogether fifteen years' experience as a lawyer. The appointment which he has just accepted will hold until January, 1919.

Mr. H. R. LaMontagne has been appointed general agent of the express department of the Worcester (Mass.) Consolidated Street Railway to succeed Mr. F. E. Wood, whose appointment to the Cumberland County Power & Light Company, Portland, Maine, is referred to elsewhere in this column. Mr. LaMontagne entered the service of the passenger department of the Worcester Consolidated Street

Railway after graduation from a technical school. Later he became connected with the freight department, finally being made traveling auditor, from which position he was appointed to succeed Mr. Wood.

Mr. M. H. Bronsdon, chief engineer of the Rhode Island Company, Providence, R. I., from March, 1907, until August, 1912, has returned to that post, succeeding Mr. William Pestell, who recently resigned to accept a position with the B. F. Sturtevant Company of Boston, at Chicago. Mr. Bronsdon has been doing general engineering work in San Francisco since leaving Providence. Mr. Bronsdon was born in San Francisco and he had his first experience in engineering construction on a cable road in Los Angeles. In 1889 he became superintendent of the Providence Cable Tramway. He later was chief engineer at the Eddy Street power plant in Providence, having charge of the installation there. He later went to Duluth as designing and construction engineer of the Duluth-Superior Traction Company, and was afterward appointed engineer for the Old Colony Street Railway, Boston, Mass. His next engagement was with the United Railroads, San Francisco, where he remained until March, 1907, when he succeeded Mr. Fred N. Bushnell as chief engineer of the Rhode Island Company.

Mr. M. A. Tatum, who was appointed superintendent of the southern division of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, recently, began his career in electric railway work in the express and freight department of the Eastern Ohio Traction Company in 1905. In 1906 he resigned this position to enter the engineering department of the Roberts & Abbott Company, Cleveland. About a year later he accepted a position with the Washington, Baltimore & Annapolis Railroad as clerk to Mr. W. E. Slaughter, the superintendent. After the electrification of the road and the completion of the main line between Washington and Baltimore in 1908, Mr. Tatum was appointed clerk to Mr. Joseph O'Hara, superintendent of transportation. During 1909 he was employed in the carhouses and substations of the company, and in 1910 he was made inspector at Washington. During 1911 and 1912 he occupied the position of trainmaster and in 1913 he became general passenger and freight agent of the road. He resigned from the company in September to become connected with the Cleveland, Southwestern & Columbus Railway.

Mr. F. E. Wood has been appointed general freight agent of the Cumberland County Power & Light Company, Portland, Maine, operating the Portland Railroad and the Lewiston, Augusta & Waterville Street Railway. Mr. Wood entered the service of the Springfield (Mass.) Street Railway in 1909 and worked in the repair shop and the pit. Subsequently he entered the express department as general clerk and spare messenger. In February, 1910, on the opening of the express service on the Interstate Consolidated Street Railway operating through Attleboro and North Attleboro, Mass., to Providence, R. I., over the Rhode Island Company's line, Mr. Wood accepted the position of agent at Attleboro in charge of that division. This express service was later extended over the Milford, Attleboro & Woonsocket Street Railway, operating through Franklin and Milford, Mass. In March, 1912, he was transferred to Worcester, Mass. Express service was established on the Worcester Consolidated Street Railway in December, 1912, and in 1913 Mr. Wood was appointed general agent of the Worcester Consolidated Street Railway with headquarters at Worcester and jurisdiction over all the lines previously mentioned, together with the Springfield Street Railway. He resigned from the Worcester Consolidated Street Railway on Nov. 28, 1914, to become connected with the Cumberland County Power & Light Company. Before Mr. Wood left Worcester a banquet was tendered to him at the Hotel Bancroft, that city, by his fellow employees and he was presented with a watch fob by them as a token of their esteem.

OBITUARY

Morris G. Condon, president of H. B. Underwood & Company, Philadelphia, Pa., machinists and engineers, who was shot by an intruder in his room in the Hotel Adelphia in that city on Nov. 25, died from the effects of his wound.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Edmonton Northwestern Radial Railway, Edmonton, Alta.**—Application for a charter has been made by this company in Alberta to build an interurban electric railway from Edmonton northwest to the Pembina River. Messrs. Short, Woods, Bigger & Collison, 14 Howard Avenue, Edmonton, are said to be interested in the project.

***Albion, Charlotte & Northern Railway, Lansing, Mich.**—Chartered in Michigan to build a 53-mile electric railway. Capital stock, $100,000.

***Shelby (N. C.) Northern Railway.**—Chartered in North Carolina to build an electric or steam railway from Shelby to Casar, via Beams, Mills, Fallston, Belwood, Boggs and Warlicks. Capital stock, $400,000. Incorporators: S. S. Royster, Shelby, president, and L. M. Elam, Shelby, secretary and treasurer.

FRANCHISES

Calgary, Alta.—The Chestermere & Calgary Suburban Railway has received an extension of time on its franchise for the completion of its line in Calgary.

Vallejo, Cal.—A. D. Bowen, representing the Benicia Land & Terminal Company, will ask the Council for a franchise to build an electric railway in Vallejo. This is part of a plan to build an electric line to connect Benicia and Vallejo. [E. R. J., Oct. 24, '14.]

Tarpon Springs, Fla.—James H. Murphy, St. Petersburg, has asked the Council for a franchise in Tarpon Springs.

Macon, Ga.—The Macon Railway & Light Company has asked the Council for an extension of time on its franchise in which to remove its tracks from the south side of Tattnall Square Park to the center of College Street in Macon.

***Lewiston, Idaho.**—The State Highway Board has voted approval of a franchise to A. G. Nortz, Lewiston, to build an electric railway across interstate Lewiston-Clarkston bridge.

St. Peter, Minn.—The Electric Short Line Railroad has accepted the forty-nine-year franchise granted it by the Council in October for the use of so much of the levee as lies east of Front Street, between Chestnut Street and Park Row Street, and also to build a line along the entire length of Front Street to the north city limits of St. Peter.

Lockport, N. Y.—The Niagara River & Eastern Railroad had asked the Council for a franchise to use certain streets in the east and south of Lockport to build a line to connect the Buffalo, Lockport & Rochester Railway and the International Railway lines with a new line into Niagara Falls. [E. R. J., Oct. 17, '14.]

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has asked the Council for a franchise to extend its Mahoning Avenue line to Perkins Corners in Youngstown.

Cincinnati, Ohio.—The Street Railway Committee of the Cincinnati City Council has recommended the ordinance granting a twenty-five-year franchise to the Cincinnati, Newport & Covington Railway to be advanced to a second reading, following which a public hearing will be called to discuss its merits.

Cleveland, Ohio.—Mayor Baker of Cleveland has signed the amended franchise granted by the Council to the Cleveland & Youngstown Railroad to make certain necessary changes in its grade. [E. R. J., Oct. 5, '14.]

Findlay, Ohio.—The City Council of Findlay has before it ordinances giving the Toledo, Bowling Green & Southern Railway a twenty-five-year franchise on its streets and also a franchise for furnishing current for light and power purposes. They provide that the company shall pay to the city 2 per cent of the gross receipts from the business.

Guelph, Ont.—The Board of Railway Commissioners has authorized the Guelph Radial Railway to construct an inter-

change track with the Grand Trunk Railway on Suffolk Street, Guelph.

Medford, Ore.—S. Bullis, of the Southern Oregon Electric Railway Company, has asked the City Council and the Southern Pacific Railway Company for permission to cross the tracks of the Southern Pacific on Main Avenue. In case the Southern Pacific refuses to grant the request for crossing rights, the application will be presented to the State Railway Commission for final settlement. An extension of not less than 3500 ft. will be made as soon as the preliminary details are settled.

Philadelphia, Pa.—Peter E. Costello, Philadelphia, has received a franchise from the Council for a two-track elevated railway from Front Street and Arch Street to Rhawn Street, Holmesburg.

Montreal, Que.—The Montreal & Southern Counties Railway has received an extension of time on its franchise in which to complete its lines in Montreal.

Beaumont, Tex.—A petition was presented to the City Council asking that the Council take steps to induce the extension of the Beaumont Traction Company's line to the Magnolia Petroleum Company's refinery south of Beaumont.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company in Seattle will not be allowed to change the terminus of its Yesler Way cable line from its present location, between First and Second Avenues, as it had petitioned, according to a decision rendered by the City Council franchise committee. The company argued that the operation of its cable cars over Second Avenue hindered the headway of its cars north and south on the arterial highway.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—W. L. McKinnon & Company, Toronto, advertised recently inviting bids for $206,700 of this company's first mortgage bonds, maturing in 1943. The Alberta government has guaranteed the principal and interest of the bonds for $7,000 a mile, or $273,700 for 39.1 miles. They bear 5 per cent interest.

Argenta (Ark.) Railway.—Work on the extension from Washington Avenue and Hazel Street to Rock Island station, at Fourth Street and Beech Street in Argenta, has been begun.

Central California Traction Company, San Francisco, Cal.—Negotiations are pending by which portions of the city lines of this company will be abandoned and a universal transfer privilege established between this company's line and the lines of the Stockton Electric Railway.

San Francisco (Cal.) Municipal Railway.—Bids for another branch of this railway are being considered by the Works Board, which has received the offers to construct the California-Street municipal railway line and the Seventeenth-Street carhouse. The line will begin at Geary Street and Second Avenue and run over Second Avenue, Cornwall and California Streets to Thirty-third Avenue.

Marin County Electric Railway, San Francisco, Cal.—This company has received permission from the Railroad Commission of California to construct a line in Sausalito, Cal., on the condition that the present franchise shall be amended so as to give the municipality the right to purchase the system after five years. The company is granted authority to issue 185½ shares of capital stock at par, and it is provided that this stock shall be sold only to property owners and residents of Marin County. It is also provided that all moneys obtained from the sale of stock shall be deposited by the railway company in Marin County banks as trust funds, with the understanding that if a total sum of $18,550 is not deposited within six months, these moneys shall be repaid to subscribers. [E. R. J., Nov. 21, '14.]

Connecticut Company, New Haven, Conn.—Plans are being made by this company to extend its tracks along Railroad Avenue to the station in Westport.

***Havana, Cuba.**—Work has been begun on an electric line between Havana and Guanabacoa in Cuba.

Central Illinois Traction Company, Paris, Ill.—An extension between Charleston and Paris, 30 miles, will be constructed by this company during 1915.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will complete the construction of the Minnesota Street line, between Shelby Street and Churchman Avenue, for operation before Dec. 24. The special work at the corner of Shelby and Minnesota Streets will be completed sixty days fater the opening of the new year.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—This company has completed the survey and secured the right-of-way for the second section of the projected interurban railway between Kansas City and Topeka, Kan. The first section, from Kansas City to Bonner Springs, is now in operation and its business has considerably exceeded expectations. The second section is 21 miles from Bonner Springs to Lawrence. It probably will be in operation within a year. The third section, Lawrence to Topeka, will be built after the second section is in successful operation. Bids for the construction of the Bonner Springs-Lawrence section will probably be asked shortly. On the first section the company advertised for bids, but did with its own forces work for which it considered the bids unreasonable. The construction work which it is planned to start soon involves a bridge over the Kaw River at Lawrence. Carl G. Klemm, 1010 Commerce Building, is secretary of the company.

Kentucky Utilities Company, Somerset, Ky.—With this company disposing of $3,000,000 worth of bonds for needed improvements it is rumored that a part of the company's plans is to extend its line to Burnside, 7 miles south of Somerset, on the Cumberland River.

Winnipeg (Man.) Electric Railway.—Plans are being prepared for filing an application with the City Council for extensions in the northwest section of Winnipeg, in accordance with the City Engineer's directions.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to construct tracks on Pleasant Street, from the mouth of the subway to Washington Street in Boston.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—Surveys, which have been in progress for the extension of this railway to Townsend, have been suspended until spring. This line will ultimately be extended to Nashua, N. H.

Michigan Railway, Jackson, Mich.—This company has placed in operation its line between Kalamazoo and Monteith.

International Transit Company, Buffalo, N. Y.—The Board of Railway Commissioners has authorized the building of a bridge at Tagona, Sault Ste. Marie, Ont., to carry a highway and this company's tracks across the Algoma Central & Hudson Bay Railway. The cost of the bridge is to be borne by the electric railway company.

Cincinnati (Ohio) Traction Company.—A new crosstown line north of the present route on McMillan Street in Cincinnati is being considered by this company and may be built in the near future.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as negotiations are completed work will be begun by this company on the 100-mile line to connect Springer, Woodford, Poolville, Elmore City and Leon. Capital stock, authorized, $300,000. Bonds, authorized, $2,500,000. Officers: A. F. Costigan, Guaranty Bank Building, Ardmore, president; D. E. Allen, Ardmore, vice-president; A. L. Adath, Ardmore, secretary, and T. C. Bridgeman, treasurer. [E. R. J., May 30, '14.]

Forest Hill Electric Railway, Toronto, Ont.—The roadbed is now being prepared for this railway. Work has been begun at Bathurst Street, and the first stage from there to Dufferin Street will be proceeded with as rapidly as possible. The tracks will be laid on their entire route beginning near St. Clair Avenue. T. J. Glover is interested in this projected railway. [E. R. J., April 11, '14.]

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—A contract has been awarded to Eastman, Kenny & Stearns, Russell, Ont., for grading about 6 miles of the projected line. About 2 miles of grading has been completed, and it is expected to have about 8 miles between Russell and Metcalfe completed and ready for the rails within the next three weeks. H. W. Pearson, Confederation Life Building, Toronto, Ont., secretary.

Toronto (Ont.) Civic Car Lines.—A by-law will be submitted to the ratepayers on Jan. 1, 1915, to provide for $455,000 for the extension of the civic car lines in Toronto.

Toronto, Ont.—City Solicitor Johnston advised the Board of Control on Nov. 27 it would be necessary to submit separate by-laws for each of the proposed new electric lines, consequently the board changed its recommendations. The Council will be asked to authorize the submission of a by-law for $105,000 for the proposed Lansdowne Avenue line, $317,000 for the North Toronto line, and $52,000 for the taking over of that portion of the Toronto & York Radial Railway Company's line within the city limits in the east end.

Electric Short Line Railroad, Minneapolis, Minn.—Plans are being considered by this company and the members of the Winthrop Commercial Club to build an electric railway through Winthrop and north as far as Winsted and south through Sleepy Eye to Jackson.

St. Louis, Mo.—The residents of South Lindenwood have submitted a petition to the Missouri Public Service Commission asking the United Railways for an extension of the Tower Grove line. The Tower Grove line terminus is 2½ miles away from the city limits in the Gratiot and Lindenwood section of the city.

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—Surveys have been completed by this company between Madison and Elgin. Right-of-way has been secured between Omaha and Norfolk via Madison. The Elgin line will be a branch proposition. Charles W. Baker, Omaha, is interested. [E. R. J., April 4, '14.]

Corry & Columbus Street Railway, Corry, Pa.—A 30-mile line from Corry, Pa., to Maysville, N. Y., via Columbus, Pa., Clymer and Sherman will be built by this company during 1915.

Slate Belt Electric Street Railway, Penn Argyl, Pa.—A 5-mile line between Wind Gap and Saylors Lake, Pa., will be constructed by this company during 1915.

***San Antonio, Tex.**—James L. Himrod, Thomas Moore, Austin, and others are making plans to build an electric railway to connect New Mexico, Lamesa, Robert Lee, San Angelo, Ballinger, San Antonio and other points with a port on the Gulf of Mexico.

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—Within a few weeks this company will have completed its 6½ mile line between Evans City and Beaver Falls. In addition to passenger service the company announces that it will add trolley freight service over this line as well. The opening of this new line will give a direct electric railway line between Pittsburgh and Beaver Falls.

***Denison, Tex.**—Preliminary surveys are being made for a line betweeen Denison, Dexter and Locust. This is part of a plan to build an electric railway through Pottsboro, Locust, Gordonville, Dexter and Denison.

Houston, Laporte & Bay Shore Railway, Houston, Tex.—Preliminary arrangements are being made and work will be begun some time within the next six months on this line to connect Houston, Pasedana, Deepwater, Deer Park, San Jesenta City, Laporte, Seabrook, Webster, Friendswood and Pearland. The power station will be located at Houston and the repair shops at Pearland. The company will furnish power for lighting purposes. Capital stock, authorized, $2,000,000. Samuel F. George, Houston, president and general manager, and John H. Stoner, Houston, chief engineer.

Houston & Southern Railway, Houston, Tex.—Preliminary arrangements are being made to incorporate this company, which plans to begin work in the spring on its 55-mile electric railway to connect Houston, Pearland, Manville, Danbury, Belasco and Freeport. The company will furnish power for lighting purposes and will locate its power house in Houston and its repair shops at Pearland. It will also have amusement parks at Laporte and at Velasco. Samuel F. George, Dayton, Ohio, president, and John H. Stoner, Houston, chief engineer.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Grading has been completed by this company for its 14-mile line to connect Glen Rose and Walnut Springs, via Seven Knobs. Officers: J. H. Farr, president; F S. Williams, vice-president; John Shields, treasurer, and F. B. Kirby, secretary, all of Glen Rose. [E. R. J., Sept. 12, '14.]

Rutland Railway, Light & Power Company, Rutland, Vt.—This company, a subsidiary of the General Gas & Electric Company, has begun construction under its plans for the conservation of the water supply at Chittenden Dam, near Rutland, Vt. The plans include the construction of two dams, a canal 3000 ft. long, and wood and steel penstocks. When completed, the reservoirs will furnish a large reserve supply of water for the new power station of the company at East Pittsford. Through this plan the water will be used twice for generation of power, once at the East Pittsford station, and once at the Mendon generating station.

Mercer Electric Railway, Athens, W. Va.—The tracks are being laid by this company on its line between Bluefield and Princeton. This line will connect Bluefield, Princeton and Athens. R. G. Meador, Athens, president. [E. R. J., Oct. 17, '14.]

SHOPS AND BUILDINGS

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—This company opened its new depot in Clinton, Ind., on Dec. 3.

Orleans-Kenner Electric Railway, New Orleans, La.—Plans have been prepared by this company to build sixteen shelter houses and way stations along its line between New Orleans and Kenner. The buildings will be on brick construction with tile roofs.

Moncton Tramways, Electricity & Gas Company, Moncton, N. B.—A temporary carhouse was erected to replace the building which was destroyed by fire recently. This building is 30 ft. x 80 ft., with accommodation for five cars, and is on the same site as the one burned. It is the intention of the company to build a steel and brick carhouse in the summer, on a new site which has not yet been acquired.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District has approved the award by the New York Municipal Railway Corporation to the P. J. Carlin Construction Company, the lowest bidder, of a contract for the construction of six stations on the Liberty Avenue elevated railroad extension. The contract price is $232,000.

Brantford (Ont.) Municipal Railway.—This company is building a new passenger station and freight house at Paris. The cost is estimated to be $3,000.

Toronto (Ont.) Civic Car Lines.—The City Council has authorized Commissioner Harris to build a temporary carhouse near Dorval Road to house the cars of the new Bloor Street line in Toronto.

Milwaukee Northern Railway, Cedarburg, Wis.—Work will be begun at once by this company on a new terminal building on Fifth Street between Cedar Street and Wells Street in Milwaukee. The structure will be of brick, fireproof, one story high and will be divided into separate waiting rooms, a ticket office and baggage room. The cost is estimated to be about $40,000.

POWER HOUSES AND SUBSTATIONS

Bay State Street Railway, Boston, Mass.—This company has installed a new engine and generator at its Mason Street plant.

Ottawa (Ont.) Electric Ry.—This company's new auxiliary power plant has been put in operation. It cost $200,000 and has a generating capacity of 5000 hp. The equipment includes three Babcock & Wilcox boilers and a Westinghouse double-flow steam turbine.

West Penn Traction Company, Pittsburgh, Pa.—This company has just placed in operation a 19-000-kva, 6600-volt, three-phase, sixty-cycle, turbo generator, built by the Westinghouse Electric & Manufacturing Company.

Monongahela Valley Traction Company, Mairmont, W. Va.—This company is installing three 1500-kva, water-cooled, sixty-cycle, 22,000-volt high-tension Westinghouse transformers, and a complete electrically-equipped remote-control switchboard in its power house near Fairmont, W. Va.

Manufactures and Supplies

ROLLING STOCK

Sheboygan Railway & Electric Company, Sheboygan, Wis., expects to order two new steel cars for city service, double-end operation, pay-as-you-enter, double-truck, to seat forty passengers. The cars will be equipped with baby motors and 24-in. wheels.

Philadelphia & Reading Railroad, Philadelphia, Pa. is making an investigation into the advisability of establishing storage-battery car operation on branch lines of its Winslow Junction-Cape May division.

Empire United Railways, Syracuse, N. Y., has ordered twelve more cars from the St. Louis Car Company in addition to the twelve cars ordered last summer. These twelve cars are to be the same type as those on the previous order.

London & Port Stanley Railway, London, Ont., has ordered three electric locomotives and electrical equipment for five motor cars from the Canadian General Electric Company. The contracts approximate $135,000. The locomotives will be 1000 hp, capable of hauling a trainload of 1000 tons. The cars will have a four-motor electrical equipment of about 600 hp per car. The motor cars and trailers, of which there will be five each, will be of one pattern and steel construction throughout. Tenders on the car bodies were invited up to Dec. 2.

TRADE NOTES

Thomas A. Edison, Inc., West Orange, N. J., in a fire which started early in the evening of Dec. 9, suffered much damage to its property, calculated at something less than $1,000,000. Part of the phonograph works was destroyed by fire, but Mr. Edison's private laboratory, the Storage Battery Company and the Edison primary-battery department were not affected. The company emphasizes the fact that the business of both battery departments of the company will not be interfered with in any way by the fire and that it is prepared to continue business as usual.

Albert Lawrence Smith has been admitted as a partner in the firm of E. B. Smith & Company, public utility bankers, Philadelphia, Pa. Mr. Smith is a son of the senior member of the firm. He attended Harvard University and began his business career with the Franklin National Bank, Philadelphia. For several years he has been associated with the firm of which he is now a partner. He is a director of the Buffalo & Susquehanna Railroad and of the Easton (Pa.) Consolidated Electric Company.

Kerr Turbine Company, Wellsville, N. Y., builder of "Economy" steam turbines, has appointed A. E. Seelig as general sales manager, and John A. Hense as St. Louis representative. Mr. Seelig for several years held a similar position with the L. J. Wing Manufacturing Company, and more recently has managed the new machine tool department in the New York office of Schuchardt & Schutte. Mr. Hense was formerly with the National Malleable Castings Company, Chicago, and later with the Dravo-Doyle Company, Philadelphia.

Walter A. Zelnicker Company, St. Louis, Mo., has appointed Arthur E. Jackman as manager of its machinery department to succeed J. J. Hilpirt, resigned to become storekeeper of the Compania Mexicana de Petroleo "El Aguila," S. A., Tampico, Mexico. Mr. Jackman has had wide experience, gained as general manager of the Sea View Railroad and Narragansett Pier Electric Light & Power Company. He was several years in the railway and lighting department of the Westinghouse Electric & Manufacturing Company, and lately superintendent of the East St. Louis, Columbia & Waterloo Railway, which position he left to assume his present duties.

W. S. Miller has resigned as general superintendent of the St. Louis Car Company, after being connected with this company about fifteen years. Mr. Miller's first position with the company was superintendent of the brass foundry departments, two years after which he became general foreman of the blacksmith, machine and truck departments. After holding this position for three years he was appointed superintendent of machinery and tools. In 1907 Mr. Miller became works manager and later general superintendent, which position he has held up to the time of his resignation, Nov. 9, 1914. He was formerly a student of Washington University, New York.

Edison Storage Battery Company, Orange, N. J., has appointed Francis V. McGinness, formerly sales engineer, as assistant manager of the railway department, the position formerly held by William F. Bauer, who was recently made manager of the company's Chicago office. Mr. McGinness is a graduate of Columbia University's Schools of Applied Science, class of 1910, and before graduation had considerable practical experience with the New York & New Jersey Telephone Company. After a few months in the engineering department of the New York & Queens Electric Light & Power Company, Long Island City, he joined the sales force of the Edison Storage Battery Company. For the past two years he has been identified with the railway department.

National Corrugated Culvert Manufacturers' Association, Chicago, Ill., announces that the large number of manufacturers operating under the Watson corrugated culvert patent have just been informed by their attorney, Wallace R. Lane, Chicago, that the United States Court of Appeals for the Second Circuit, which has final jurisdiction, has just handed down a mandate reversing the lower court and holding this patent valid and infringed by another culvert which was recently installed. The court says, in part: "The patented culvert is cheap, strong, durable, easily transported, quickly laid down and easily repaired. We cannot believe that the man who gave such a structure to the world should be denied the title of an inventor." The manufacturers of corrugated culverts under this important patent make them out of Armco American ingot iron.

ADVERTISING LITERATURE

Fargo Manufacturing Company, Inc., Poughkeepsie, N. Y., has issued a bulletin describing its straight connector, cable lug, signal connection, ground point and ground meter, "L," "Y" and "T" and terminal connections.

NEW PUBLICATION

Bonds and Stocks—The Elements of Successful Investing. by Roger W. Babson. Babson Statistical Organization, Inc., Wellesley Hills, Mass. 422 pages and three charts. $2 net.

This is the second book of its kind intended for investors received this year for review by the ELECTRIC RAILWAY JOURNAL and written by an authority of national reputation. There are many excellent books planned primarily for the student of corporation finance, but there has been a dearth of books about the science of investing money. Mr. Babson has in his volume rendered a real service to the man unacquainted with security issues who has money to invest, and in addition he has furnished a volume very entertaining aside from its practicable value. Very hazy ideas are frequently held about securities by men otherwise well informed, and to such men the present volume should be more than welcome. It is all very well for the man unacquainted with finance who intends to invest to be sure of the reputation of the house through which he deals, but there is no excuse now that "Bonds and Stocks" has been issued for such a man not to understand the fundamentals of investing. The strong and weak points of stocks and bonds are pointed out with reasons why some classes of securities are attractive and why others are not attractive. Mr. Babson has divided his work into twenty-four chapters. The first four deal with introductory suggestions, the next fifteen with elements of successful investing and the five concluding chapters with supplementary suggestions. There is a chapter on electric railway securities as distinct from lighting, telephone and water power securities. A chapter on the investor's vocabulary contains an explanation of ten phrases, the meaning of which should be understood by every investor. These phrases are the technical ones used frequently by bankers in seeking subscriptions from the public, through the newspapers. Mr. Babson certainly is justified in saying in his conclusion that "if the reader has absorbed all that has gone before he should have in his mind a clear idea of the different kinds and groups of securities and the various questions and terms involved therewith."

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LET SHOPMEN HELP DESIGN

On several occasions we have called attention to errors in maintenance structure design which might have been avoided had the shop employees been taken into consultation. The bad consequences of leaving everything to the man at the drafting board were noted again lately in a certain New England carshop. The building was laid out for aisle sprinklers, but after these were installed it was discovered that thereafter trolley poles on cars would have to be turned in the open air. Another part of the building was confidently laid out as a paint shop, but when car painting began it was found that a painter could not possibly work in the narrow space which had been left between the painting track and the wall. In general, the provision of satisfactory working clearances for a car shop requires more foresight than may reasonably be expected even from the combined experience of the draftsman, the shop superintendent and general manager. A hint or two from the men closest to the job may avoid many distressing incidents of the nature cited.

THE SKIP-STOP IDEA

One of the reforms which seem a long time in coming is the skip-stop for city service. Railway managers who have studied the plan approve of it, but the inertia of the public in matters of this kind is so great that this reform has been adopted in very few places. Chicago is now reported to be contemplating a trial of the plan. An account of the Denver experience has been published in recent issues. In Los Angeles, where the skip-stop has also been tried, there seems to be some doubt as to the advisability of its continuance. On the other hand, in Cleveland and in Kansas City, where the skip-stop appears to have been originally introduced in the year 1911, it has been continued in operation with every evidence of success. The increase in schedule speed has been reported to be nearly 10 per cent but since half of the cars stop at "odd" streets and the other half at the "even" streets, only about half of the people that collect at a corner board the first car that arrives. Thus the load is distributed more evenly among the cars on the route. There is no doubt that the public would be greatly benefited by the skip-stop because it materially increases the average speed by cutting out the number of stops and yet does not greatly increase the distance which the passengers have to walk to catch a car. In a number of cities the near-side stop has recently been introduced without creating public opposition. Perhaps this change will make the general adoption of the skip-stop more of a possibility.

AUTOMOBILES IN CITY TRAFFIC

Automobiles for private use have now become so common that it is not surprising they should have invaded the passenger transportation field, and several electric railway companies on the Western Coast report considerable competition from automobiles which carry passengers over certain routes for nickel fares. We have no fear that such cars, with the tire cost and other depreciation inseparable from automobile service, can ever be commercial competitors on the same terms with an electric railway system. The report of Mr. McCullom to the Board of Estimate and Apportionment of New York, abstracted in this paper about a year ago, presents ample evidence to this effect. Nevertheless, experience has shown that this fact will not prevent the owners of cars from attempting a service of this kind. In a free country like this, electric railway companies cannot suppress this competition even if they would, but it is only fair to them as large taxpayers and also to the public as a whole, whose patronage is solicited by these buses, that both classes of transportation should be placed under similar regulations in regard to responsibility, and that strict traffice regulations should be enforced. The Merchants & Manufacturers Association of Los Angeles has called the attention of the City Council of that city to the tremendous liability of street accidents from these irresponsible automobiles, and Long Beach, Cal., has imposed a license fee of $25 a year and has required taking out of a $10,000 liability insurance for every such car. Charges of short changing by irresponsible automobile conductors is also made in some of the Western cities. Railway companies can ask no more than a free field and fair play for all, but both they and the public should demand that fair play means an equal degree of responsibility from the operators of both classes of service.

STREET RAILWAY LOADS ON SOILS

A part of the discussion of the way committee's report on track at the convention was devoted to the distribution of railway loads over the ballast and sub-grade. While this subject is of vital importance to steam railroad engineers, owing to the great increase in the weight of locomotives as well as the adoption of higher scheduled speeds of trains, neither of these factors has any bearing on the study of track foundations in paved streets. Moreover, the conditions governing the depth of loose, unconfined ballast are hardly comparable with those surrounding a foundation of concrete or compactly-rolled ballast, such as is required by a modern electric railway. In steam

road, or even interurban road open-track construction, a certain amount of flexibility is required, while track in paved streets must be as rigid as is consistent with economical operation. To obtain rigidity the foundation must be made much heavier than that actually necessary to carry the track loads. In other words, one should determine the average soil-bearing power condition and then select a foundation which will distribute the track loads well within the safe limit. It would be impractical to change the character of foundation with every slight change in the bearing quality of the soil. On the other hand, it is necessary to change the character of foundation when there is a marked change in the soil-bearing power, such as might be found where track is constructed over filled-in areas or where the soil contains excessive moisture. Of course, a drainage system would go far toward improving the latter condition, while rolling the sub-grade will often be all that is necessary to prepare filled-in areas for foundation construction. To sum up, it appears impossible to calculate exactly the distribution of track loads over the foundation and sub-soil. Hence, the selection of the foundation must be based largely on experience, after such mathematical checks as may be required have been made to determine the relation of the load to be carried to the bearing power of the sub-soil.

SNOW REMOVAL

That the removal of snow from city streets should constitute one of the most exasperating of the unsolved engineering problems of long standing is really remarkable when it is considered that the cost of the fuel necessary to melt the snow would be hardly 15 per cent of the expense of removal involved under present methods, the latter consisting, almost without exception, in shoveling the snow into wagons and carting it away. It may be, of course, that snow storms will have to be fought for some time by this primitive scheme, yet in this age of flying machines and wireless telegraphy one must be a true conservative at heart to accept this as a fact, even though the recommendations of the committee on resolutions of the snow removal conference, which were presented before the American Society of Mechanical Engineers last week, approved no new process except the limited use of the sewer system to get the snow off the streets.

The reasons that prevented the general use of sewers, as outlined in the report, could be summed up in the one generality—insufficient sewage flow. In New York, during the last winter, experiments demonstrated that the large trunk sewers with a continuous and fairly rapid flow were not clogged by any snow that might be shoveled into them. The small sewers, however, of about 12-in. diameter required flushing with hydrant water and even then had to be treated with considerable care.

The same idea has been suggested for Philadelphia, where the contractors are supposed to commence the work of plowing or sweeping the snow to the sides of the streets within one hour after a storm begins, the work of carting the piles away being aided by the use of certain sewer manholes for dumps. It is now planned to extend the use of the sewers by having water connections placed inside of the manholes, thus increasing the flow in the sewer and permitting the flushing away of accumulations of snow.

Removal of snow by flushing the streets with cold water naturally seems like carrying coals to Newcastle, but the experience in Scranton has demonstrated that with proper temperature conditions the scheme is capable of reducing the expense of removal to one-half that of cartage. However, when a cold snap follows a snow storm, the presence of great quantities of water on the streets might easily become fraught with considerable danger. This fact, indeed, is implied in the recommendations of the committee. Considerable hope is also held out in regard to the disposal of snow by melting in a furnace. The committee estimates that with a perfect furnace the cost of the coal required would be 3 cents, or with a furnace efficiency of 33 per cent, 9 cents, per cubic yard, against the present cost of carting of about 50 cents. This difference provides a considerable margin from which, of course, the cost of apparatus, labor and maintenance must be deducted. The problem should be an attractive one to the inventor, because there are many objections to carting besides its cost. One is its slowness, another is the congestion caused in the streets by the carts, and a third is the increasing scarcity in most cities of carts suitable for this purpose, owing to the growing tendency to substitute in commercial work for the horse-drawn cart a specialized motor truck not suitable for snow removal.

Surface railways, of course, are not so much interested in the manner of snow removal as in the provisions for operating their lines during and after snow storms. The matters of complaints from the public and of decreased receipts, which are the invariable accompaniments of heavy snow falls, are of serious importance, and at least one road, the New York Railways, is going to great expense to develop a wing sweeper that will clear a passageway beside the track. This has been planned solely to provide space for vehicular traffic which, during snow storms, utilizes the street railway tracks because these provide the only clear space in the street. Obviously the consequent congestion practically prevents the railway company from moving cars. To meet this difficulty wing brooms have also been suggested for Philadelphia and wing plows have been in successful use in Montreal for several years, a layer of snow being intentionally left on the streets in the latter city. It seems unfair to require a railway company, which is responsible only for the clearing of its tracks, to take care of the snow elsewhere on the street. But in many cases, owing to the slowness of the city force, this appears to be necessary for the railways, purely as a means for self-protection, and the development of wing brooms and wing plows seems to constitute peculiarly the railways' share in the problem, just as much as the prompt removal of the snow piles constitutes the share of the municipality.

FEDERAL AND STATE JURISDICTION OVER CITY RAILWAYS

It is not surprising, in view of the recent establishment of commission regulation in this country, that there should be many unsettled questions as to the powers and duties of regulatory commissions. One of the most important of those which remain to be settled is where the power of the federal commission should end and that of the state commissions begin. It would seem that with all of the problems in connection with valuation of steam railroads and the establishment of freight rates that the Interstate Commerce Commission has enough to occupy its time during the next few years, and that to the various state commissions could be assigned the adjudication of all of the intrastate matters which arise in connection with the operation of electric railways. This was the view which a committee of the American Electric Railway Association urged before a sub-committee of the House committee on interstate and foreign commerce last January in a hearing on several bills which would have brought certain equipment of all electric roads which do any interstate business under the jurisdiction of the Interstate Commerce Commission. The protestants at that hearing called attention to the fact that only a small percentage of their business, averaging in most cases less than 1 per cent, was interstate in character.

Now the question has come up again through an order to the Detroit United Railway, which owns about 800 miles of track in Michigan and 2 miles in Ohio, to make reports to the Interstate Commerce Commission on all accidents including, of course, all of those on its large city system in Detroit. If this policy should be adopted as standard, very few urban companies, certainly among those which haul freight and so issue through bills of lading, would be exempt. Moreover, if the jurisdiction of the Interstate Commerce Commission covers this case, it is likely to cover almost any other detail of city operation, and we should then have a centralized government control of our public utilities in addition to state control.

At the last meeting in Washington the railway managers present did not question the good intentions or the ability of the Interstate Commerce Commission in dealing with these matters, as compared with the state commissions. The principal grounds urged were the absence of knowledge of local conditions and the immense amount of work which would be entailed on a central commission and also on the railways themselves in taking up all of these subjects at the federal capital as well as at the state capitals.

If precedent can count for anything, the decision of the Supreme Court in the opinion on the case of the Omaha & Council Bluffs Street Railway vs. the Interstate Commerce Commission (230 U. S. 324) would indicate that that court does not believe that the interstate commerce law covers cases of this kind. At Omaha the situation was somewhat different because the question was one of rates on street railways which happened also to be interstate roads. The conclusion reached then by the court was that the character of the service was the criterion of whether a road is embraced under the interstate commerce law, and certainly the character of the accidents in city service and the means to be taken to avoid them by fenders or otherwise bears little relation to what is generally understood as interstate commerce. We hope that the hearing at Washington next Friday, to which a letter from Arthur W. Brady in our "Communication's" column this week calls attention, will be effective in impressing this fact upon the Interstate Commerce Commission.

HUMANIZING DISCIPLINE

A casual study of a number of bulletins issued to platform men indicates an often unnecessary brusqueness in many of the instructions and little or nothing of a commendatory nature. Of course, the purpose of the merit and demerit system in disciplining trainmen has taken this into account to a certain extent, but attention is here directed to the day-to-day bulletins. Would not the suggestive effect of a meritorious act spread on these bulletins be of much value in disciplining and at the same time offer relief from the constant repetition of "do" and "don't"? Orders must, of course, be issued, but occasional commendation and a mixing of the "sweet" with the "bitter" will help greatly toward better service. The iron hand of discipline might well be covered with the silk glove of consideration. In other words, the human side of disciplining must be recognized.

The frailties of the human mind and body have been thoroughly safeguarded in the operation of trains, so as to make the man as nearly as possible an automaton. All of these precautions have done much to make operation more safe, but they cannot make a machine out of the human body. Hence disciplining in various forms is necessary to make up for this deficiency, and the point we have in mind is that, in disciplinary methods, full cognizance should be taken of the human factor. To illustrate what we mean, take the case of the application of discipline after accidents have occurred. After a serious accident the superintendent's first tendency is to discharge the offenders if they prove to have been guilty of lack of attention or lapse of memory. It is worth while in such cases to go behind the facts and consider some of the contributing causes and thus possibly justify the retention in service of men who will afterward be much more valuable on account of the accident. A momentary mental lapse during a run may result in disaster. Yet we all have mental lapses and the very fact that a man has had no accidents or "near" accidents during his railway career may in itself have made him subject to a false sense of security. As he ages in service his alertness is apt to become sluggish. But this defect may be more than made up, so far as his value of the company is concerned, by better knowledge of local conditions and clearer judgment. This fact should receive consideration when his case is decided. After he gets his "nerve" back he may be a safer man than one with no accident to his credit.

New Cars of Seattle Municipal Railway

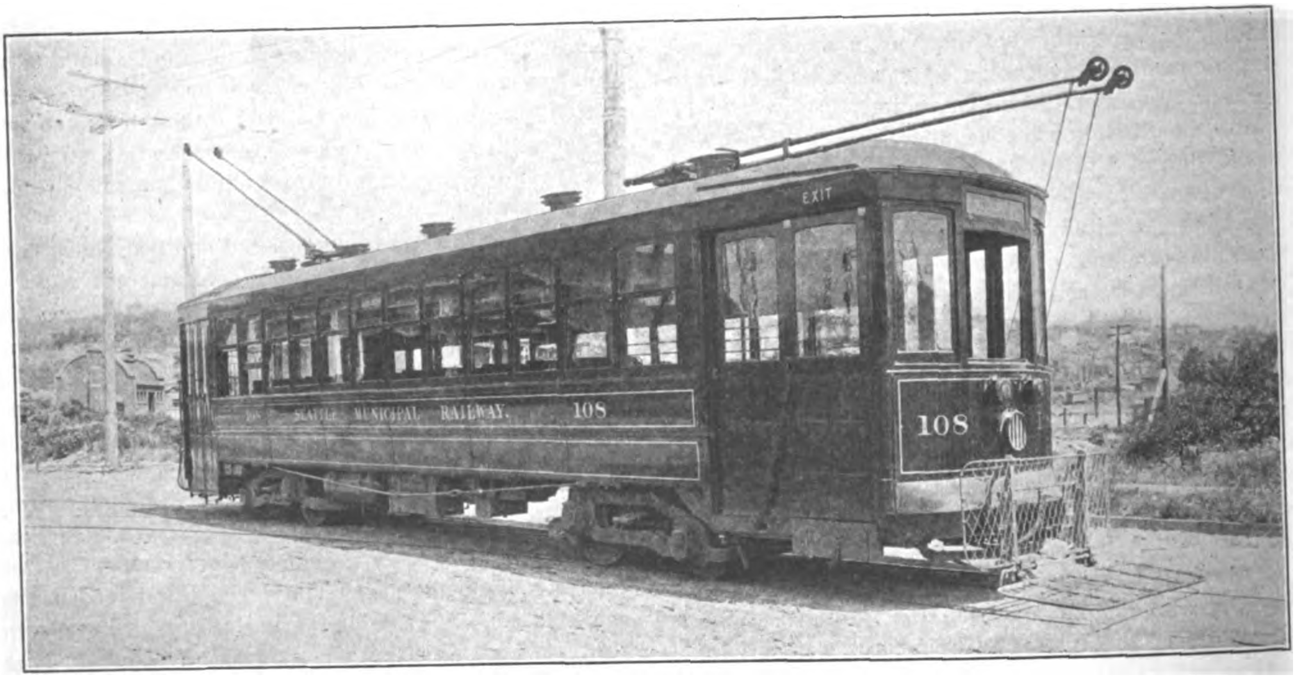
Multiple-Unit Control Arranged for a Double Trolley Wire System, Gearless Air Compressors and Air-Operated Fenders Are Among the Unusual Features of These Cars

BY H. J. KENNEDY, ELECTRICAL AND MECHANICAL ENGINEER

In the ELECTRIC RAILWAY JOURNAL, April 26, 1913, and June 20, 1914, some general accounts were given of the municipal railway construction in Seattle. In the present article the new cars built for this railway by the Cincinnati Car Company are described.

The twelve cars are of the double-end, semi-convertible "pay-within" type, having composite-type framing, exterior doors on platforms, and no interior bulkheads. They have arch roofs, are mounted on maximum-traction trucks, and have the following general dimensions:

Length of car over bumpers	44 ft. 5 in.
Length of car over vestibules	43 ft. 1 in.
Length of car over end posts	31 ft. 1 in.
Spacing of transverse seats	2 ft. 5½ in.
Width of car over posts	8 ft. 5 in.
Height of car over trolley boards	11 ft. 2 in.
Distance between truck centers	23 ft. 1 in.
Seating capacity	48
Weight of car empty, approximately	42,000 lb.
Weight empty, per passenger seat	875 lb.



SEATTLE MUNICIPAL CAR—GENERAL VIEW OF CAR IN OPERATION

The 75-hp motors which are of the Westinghouse 310-C type, were tested at the builders' works by coupling two together, running one as motor and the other as generator, on 125 per cent and 100 per cent loads. In addition, an overspeed test of 1800 r.p.m. and 2600-volt one-minute insulation tests on field and armature were made. One out of each twelve motors had a one-hour A. I. E. E. temperature run, at full load. Commutation was also tested at 200 per cent load. On the one-hour run at 500 volts, a current of 107 amp was applied at 460 r.p.m. to 475 r.p.m., heating the series field (the hottest part) to 79 deg. Cent., the air being 23 deg. Cent.

Among the other items of equipment on the cars are "Utility" ventilators, "Standard" motor trucks, Agasote ceiling, Hale & Kilburn seats, Crouse-Hinds headlights, Earll trolley retrievers, Pantasote curtains, Johnson fare boxes and Forged Steel Wheel Company's rolled steel wheels. The interior lighting of the car is effected by 23-watt, Mazda, half-frosted, incandescent lamps, one lamp being placed over each seat and three being located in each vestibule. The latter are connected in series with the destination sign and headlight at the opposite end of the car.

CONTROL SYSTEM AND WIRING

The control system is Westinghouse type HL, electro-pneumatic, with master controllers at each end of the car. Train line receptacles have not been provided, but they can be added at any time when it is desired to arrange for running multiple-unit trains. At the time the cars were ordered, the future conditions of operation of the road were so uncertain that it was felt to be an advantage to have cars which could, if needed, be used in multiple-unit train operation by the addition of the train line receptacles. At present, with the exception of the third-rail interurban line to Tacoma, electric cars for passenger service in Seattle rarely haul trailers or run in trains. However, the Seattle, Renton & Southern Railway, which connects with the new line is, in conditions affecting rolling-stock, almost an interurban and it is difficult to foretell what future conditions may be.

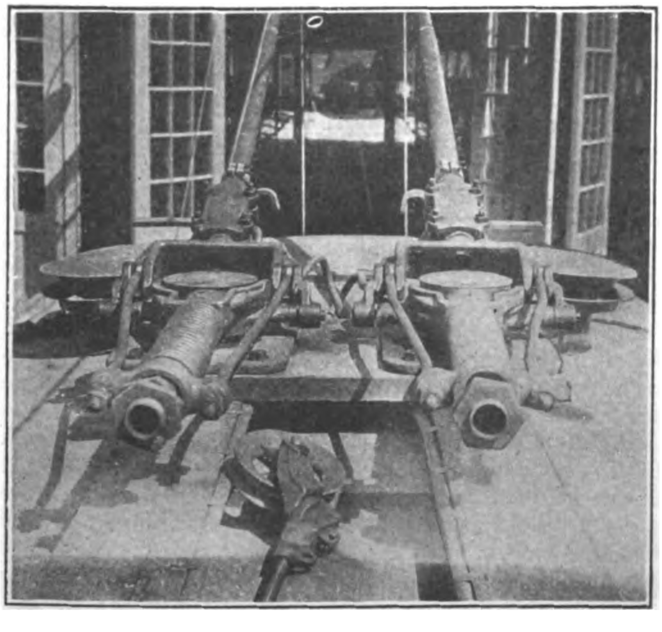
The standard control system has been modified for the double-trolley system which has been installed on the Seattle Municipal Railway, by the addition of an extra line switch in the unit-switch group with corresponding contacts in the master controllers and by an additional control switch in the hood connected on the negative side of the circuit. The overload trip relays on the line switches, positive and negative, of the unit switch groups are set at 325 amp. Instead of one control-

reset switch in the hood, as usual in the unit-switch system, there are two switches, one with fuses on the positive side and one on the negative side of the car circuit, the former being double-throw, the latter single-throw. It may be noted that the apparatus will work if polarity be reversed, the signs mentioned indicating the normal method of operation.

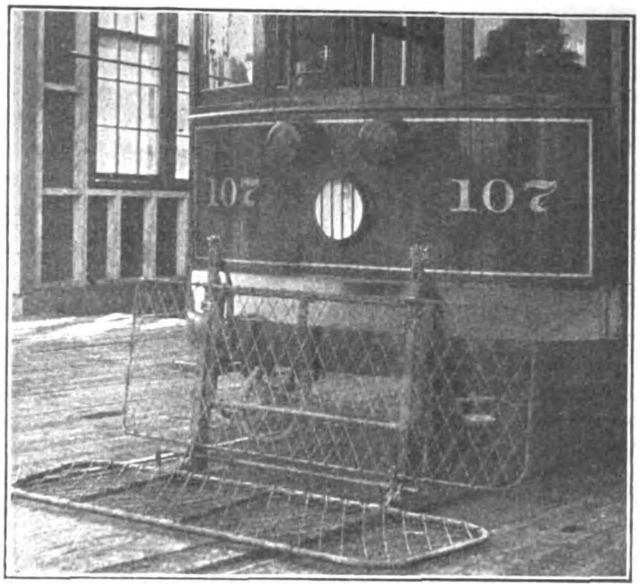
A feature of the wiring peculiar to these cars is the installation under the hood at each end of the car of a single-pole double-throw knife switch encased in a box. The blade of the switch is connected at the hinge to ground to truck, and the terminals to the positive and negative trolleys, respectively. In running from a double-trolley to a single-trolley track, one trolley pole is hooked down and the grounding or transfer switch is thrown to connect the truck with it. It is possible to make the change without stopping the car. For the cars that are in continuous service on the single-trolley Lake Burien Division, however, the negative trolley poles have been entirely removed.

An interesting feature to note in this connection is that, in case of the use of a grounded neutral for the three-wire generators which have been installed in the substation, as soon as a car passes from the double-trolley to the single-trolley line, the position of the ground relative to the outside of circuit moves over by 300 volts, assuming 600 volts total emf. In other words, the potential on the single-trolley wire would be 300 volts higher than that on the positive double-trolley wire, when measured with reference to the ground. Hence there must be an insulated break between the two systems, although, if the car should run past the break with the controller on, the grounding switch being instantly thrown at the same time, there would be no change in the emf impressed on the motors, since the grounding switch raises the negative potential 300 volts simultaneously with the raising of the positive, so that the difference of potential between outside terminals is the same as before. Even if it were possible to perform this experiment, it would not, of course, be made an operating practice because of the consequences in case of failure to perform it successfully. It should be noted that up to date the line has been operated without grounding the direct-current neutral. The three-wire generators are for probable commercial loads.

The trolley bases were designed especially for these cars. The base casting is rectangular, 12 in. x 18 in., the two being mounted side by side on wood trolley boards so as to have a 6-in. air gap between them. The base castings are not themselves live, the trolley poles being insulated from the sockets by a ¼-in. thickness of insulating bushing. The roof cables are connected, not to the bases as is usual but to the poles by flexible pig tails. The poles on diagonally opposite corners of the car are connected to each other, so that the right hand one is positive independent of direction of running, assuming that the overhead system is connected up that way. However, in certain cases of special work, the polarity on the trolley wires is reversed for a short distance. The bases are ball bearing and have one spring.



SEATTLE MUNICIPAL CAR—VIEW SHOWING POSITIVE AND NEGATIVE TROLLEYS AND BASES



SEATTLE MUNICIPAL CAR—VIEW SHOWING FENDER HELD DOWN ON CURVED TRACK BY AIR PRESSURE IN CYLINDERS

GEARLESS AIR COMPRESSOR

An interesting feature of the brake equipment is the gearless air compressor, made by the Allis-Chalmers Manufacturing Company. This is remarkable for its compactness and small weight of 425 lb. including suspension cage. It has three cylinders which are approximately horizontal and are connected to the same shaft with a four-pole 600-volt motor, the latter taking 5.7 amp, 3.42 kw, when delivering 18 cu. ft. of free air per minute against 90 lb. pressure, with a temperature rise not exceeding 50 deg. Cent., when operation does not continue over thirty minutes out of an hour. The cylinders are provided with sliding sleeve intake valves of the type used in the Knight automobile engine. These valves are operated by eccentrics on the crank shaft, compelling the opening and closing to be at exactly the proper instant, and insuring large port openings.

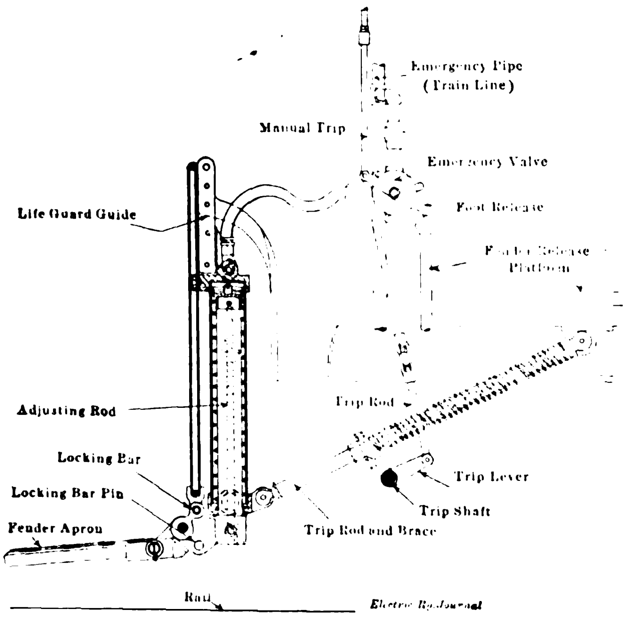
The compressor is 21⅝ in. from the cylinder head to outside of motor casing, and 29⅜ in. long over all measured parallel to shaft. In spite of its speed it operates without any disagreeable vibration. Instead of the noticeable pulsation of the usual geared compressor, the sound takes the form of a hum, due to the speed of rotation and the use of three cylinders instead of two. The motor brushes are readily accessible from the outside of the car by opening the cover located just below the side sill.

PNEUMATIC FENDERS

The fenders on these cars are of the Nelson pneumatically-operated type, generally similar to those used in Portland, Ore., and other places, but of a design improved in several particulars. The fender, both apron

and lifeguard, is hung on slides and kept at its normal height by helical springs contained in two vertical cylinders of 3-in. boiler tube, attached to the bumper beam of the car by brackets. The springs are 2 11/16 in. in outside diameter, 22 in. in free height and have about twenty-three coils of ¼-in. steel. The weight of the moving parts is about 180 lb. Upon admission of air to the cylinders, the springs are compressed and the sliding parts forced down upon the track very quickly and held down with strong pressure so as to scoop up anything lying thereon. The apron is framed of ¾-in. standard wrought-iron pipe and is 78 in. wide over all, and 26 in. deep over all. The frame is filled in with mesh of No. 7 steel wire, 3½-in. diamond mesh. The lifeguard or vertical screen is framed of ¼-in. round iron, is 78 in. wide over all and 27 in. high over all, and is filled in with mesh similar to the apron. The projection of the apron in front of the bumper beam is approximately 33 in. The front edge of the apron is suspended so that it clears the track by about 6 in.

A few inches above the platform floor is placed a special rotary fender valve with axis horizontal. On the stem is a lever with a pedal, and with a link connection to the swinging fender, which is hung on pins on the brackets. Impact with some body on the track will therefore throw the fender back and operate the fender valve. The fender valve can also be operated by a bronze handle placed beside the motorman's brake valve and connected by link with the fender valve. In an emergency, when confronted with the danger of running over someone, the motorman uses this handle instead of the air-brake handle, pushing it away from him in practically the same direction as in moving the brake valve handle to emergency. This results not only in dropping the fender on the rails but also in making an emergency application of the air brakes, by admitting air through the fender valve independent of the regular brake valve. Pressure on the pedal releases the air from the fender cylinders and allows the springs again to raise the fender. The air brake is then released by the brake valve in the ordinary way, a check valve preventing the air from running back through the fender valve, although permitting air to be fed through fender valve to brake cylinders, with brake valve in "lap" position.



SEATTLE MUNICIPAL CAR—ELEVATION SHOWING FENDER MECHANISM

A fender is permanently attached to the bumper beam at each end of car, the fender not in use being folded up against the dashboard, allowing freedom of motion for the drawbars. There is a double articulation for folding, the first motion merely folding the apron against the lifeguard, the second doubling both of them up and back against the dash. The weight specified for each fender is not in excess of 210 lb., and the pressure on the travel stops of the moving part which drops on the track is specified to be at least 500 lb., but not in excess of 1000 lb., with a pressure of 60 lb. per square inch in the air cylinder.

Electric Sign in Street Railway Competition

As a stranger in the city of Topeka emerges from the union railway station, he is greeted with the shouts of hackmen and cabmen seeking business. If he is alert and is inclined to be thrifty, his eye soon catches sight of a small but concisely worded electric sign on a pole across the street. This sign is shown in the accompanying illustration. Its legend reads "Cars Leave This Point Every Five Minutes Reaching All Parts of City."

CARS LEAVE THIS POINT EVERY FIVE MINUTES REACHING ALL PARTS OF CITY

TOPEKA ELECTRIC SIGN WHICH ATTRACTS THE TRAVELER'S CUSTOM

The Topeka Street Railway, operated by the McKinley Syndicate, has chosen electrical advertising as the most efficient method of attracting the attention of the traveling public and thereby bringing the nickels to the company's purse. It is noticeable that in Topeka the bus and cab business is less flourishing than in the neighboring towns and cities.

Passenger Traffic to Illinois State Fair

The Springfield Consolidated Railways Company of Springfield, Ill., reports that 67,000 less passengers were handled in 1914 than in 1913, to and from the Illinois state fair grounds in that city. In 1913 the company handled to the fair grounds a total of 798,000 passengers and in 1914 the number dropped to 731,000. These figures include all transfers from other lines in the city, police passes and all other forms of free transportation allowed by law. The largest day in the state fair week this year was Thursday when 115,000 fares were collected. This is a falling off of 29,000 fares from the largest day in 1913. The company has not sought to ascertain the reason aside from the fact that the state fair of Illinois in 1914 was not as well attended as was the exposition in 1913 and in previous years. The ticket sales at the fair grounds gates showed a decided falling off from the previous year and the receipts of the Springfield Consolidated Railway Company showed a similar decline.

Fair Interest on Investment in Public Utilities

The Author Discusses the Claim that Rates Should Be Based on Depreciated Values and Points Out that the True Criterion Is the Principal Invested—Different Values Also for Rate-Making and Taxation

BY H. J. DAVIES, TREASURER CLEVELAND RAILWAY

John B. Geijsbeek, C.P.A., contributed an article to the April, 1914, number of the *Journal of Accountancy* on "Fair Return to Public Utilities," in which he undertook to show the normal value of a public utility plant to be about 54.55 per cent of its original cost, or half-way between cost and scrap value. Mr. Geijsbeek says that this premise is not new and was described in a report made in September, 1912, to the Public Service Commission of St. Louis by James B. Allison, its chief engineer.

The operating efficiency of a traction plant is probably as high as that of a telephone plant, used by Mr. Geijsbeek for illustration, and higher than 54.55 per cent of its original cost. In a growing city a public utility plant never stands still, never is finished, never stops growing. Demand for additional service requires an increased supply of capital. And so the investment, the amount of "original cost," becomes legitimately larger, annually, monthly, almost daily. And the cost of the additional property is so large a proportion of the total investment that always more than half the property is less than half worn out—has lived less than half its life. The value of such a property, therefore, never falls to an average or "normal" of 54.55 per cent, or half-way from its original cost to its selling price as scrap.

Public utility companies usually own land, and the value of land in a growing community usually appreciates instead of depreciates as the value of all other property does. This enhancement in the value of land tends to keep the average value of the whole property above the half-way point on the road from first cost to final junk pile.

A "normal value line" of 50 per cent or 55 per cent can only apply to or be true of a utility that is neither increasing nor decreasing its plant or its service. Every public service company that is adding to its property to meet the increasing demands and needs of the public has, and must necessarily have, a property worth more than 54.55 per cent of its cost.

DEPRECIATED VALUE STILL IN PROPERTY

Mr. Geijsbeek says that "if depreciation is charged in addition to repairs and renewals, the public, or the consumer, has paid back to the utility company that amount for immediately existing reduction in the value of the property due to wear and tear not yet made good by renewals. That is either in the pockets of investors or stockholders or is in a reserve fund; if not in the fund, then it is in the reserve account and has been used to purchase additional plant. This, the depreciated plant value, added to earned surplus either on hand or paid to stockholders, will equal the original investment. In such a case a fair return can be only on the depreciated value of the original cash investment, and not on the cost of reproduction. Therefore, if depreciation is allowed in addition to repairs and replacements, the cash investment upon which a fair return is allowed is reduced each year by the amount of depreciation so allowed."

This is not so, unless the amount of the depreciation is returned to the investors as part of their principal. If the amount of all depreciation is returned to the investors as part of their principal, then, when replacements are needed, it will be necessary to invest new capital, which also must be returned with full interest.

If the stockholders have received from earnings, in addition to a fair return of interest upon their investment, a part of the investment itself, and if the contract between the utility and the municipality limits the rate of interest upon investment, it may be proper to reduce the capitalization, or the amount upon which interest shall be paid; but if the principal of the stockholders is kept in the business, whether a depreciation reserve adequate to provide for the disappearing value of the physical property is set up or not, the stockholders should receive interest upon the entire amount and not merely on the depreciated value of the property. Mr. Geijsbeek seems to see this in his "Conclusions as to Deterioration," for he says "Instead of paying this depreciation item to its stockholders in dividends out of surplus, this amount may be held by the company in a reserve account or, sometimes, a reserve fund, in order to keep the investment always at 100 per cent, i.e., present value (or, ultimately, normal value) plus unconsumed depreciation reserve, must always equal original cost." He further says, and truly, that it is difficult to divide the difference between "cost new" and "present value" into renewals and what he says is called depreciation, viz., "that unknown portion of plant value lying between reproduction and normal values that will never be replaced by renewals and which should remain in the reserve accounts or funds to be given to the stockholder at the cessation of operations in order to return to him the 100 per cent he originally invested."

In the meantime, and until the cessation of operations, or at least until he gets his money, or some of it, back, the stockholder should receive interest on the entire amount of his original investment and not merely on the remaining value of the property purchased with his money.

INTEREST SHOULD BE PAID ON ENTIRE PRINCIPAL

Again, under the heading "Fair Return on Investment," Mr. Geijsbeek writes: "Having decided the subject of depreciation, the question of fair return on the investment comes up. It seems almost impossible to find any two men who agree on what amount the interest considered to be the fair return should be charged. Especially is there a great difference of opinion as to whether the fair return should be calculated on the original cost value or the cost to reproduce the property, or whether it shall be the depreciated value, or the present value, which ultimately will become the normal value."

On the contrary, it is difficult to see how any two men can disagree as to the amount on which interest should be charged. It should be the full amount of honest investment, not the depreciated or present value of the physical property. The toll or rate of fares should be high enough to pay expenses, taxes, a fair interest on original cost, i.e., investment, and to set up a maintenance reserve equal to the difference between cost and present value. If this reserve, which may be

in cash, securities or other physical property (cash and securities are as much property as cars or telephone wires), is adequate, then the value of the company's property will be equal to the investment—as it should be. If, instead of providing for such a reserve, and then keeping it in cash or investing it in additional physical property or in securities, the company uses it to return to its stockholders a part of their principal, calling in some of the outstanding stock or bonds, it may be argued that, the investment having been reduced, the rate thereafter should be based upon so much of the original amount as is still invested. In no case should the rate be based upon present (depreciated) value—unless the stockholders have received, in addition to their interest, the entire difference between cost and present value. If a part of the investment of the stockholders has been returned from earnings and the amount of stock or bonds originally issued has been correspondingly reduced, or if additional property has been purchased from earnings and the difference between investment and present value has been thus lessened, the ratepayers who have contributed to the earnings so used have paid more than should have been charged them; and the ratepayers of the future will be charged less than they ought to pay, because they will pay upon a valuation smaller than the amount of money invested for their benefit.

For illustration, suppose an investment of $1,000,000 in an electric railway property, under an agreement between the company and the municipality that 10 per cent per annum on the investment shall be paid to the stockholders of the company, and suppose that a depreciation of 20 per cent, or $200,000, ensues, the remaining value of the property being $800,000. The company ought then to have, in addition to the $800,000 worth of physical property, a reserve of $200,000 to take care of the 20 per cent depreciation. If, instead of keeping this reserve in cash or investing it in bonds or other property, the company should pay it to the stockholders, in addition to interest at the rate of 10 per cent per annum, then 10 per cent interest on the remaining $800,000, instead of on the original investment of $1,000,000, may be the fair return thereafter, because 20 per cent of that investment has been returned to the investors. In that case $200,000 of the stock or bonds should be called in.

This transaction is perfectly fair and just to the investors and the company; but is it fair to the car-riders of the period in which the depreciation occurred or the reserve was accumulated? Should they have paid for their rides $200,000 in addition to 10 per cent ($100,000) upon the original investment? And should the car-riders of the future have the benefit of that contribution to capital by the car-riders of the earlier period and receive their rides for 10 per cent ($80,000) on only $800,000? If so, then when the property is worn out, or becomes inadequate or obsolete, and is replaced by other property, the cost of the new property must be provided from new capital, on which interest must be paid. And so, instead of paying off a part of capital as physical property depreciates and calling for additional capital when the time for replacement comes, the practice has been to set aside a reserve for maintenance or for depreciation and replacement of physical property and to invest the reserve, or some part of it, in securities or additional physical property. It is not necessary that the reserve be kept in cash. Invested in securities or physical property it should earn a larger return than savings bank interest. This practice is a better security for the investment than alternate payments of principal and demands or calls for new principal.

The car-riders of each month or year should pay a toll or rate of fare sufficient to enable the company to pay its operating expenses, its taxes and a fair rate on its investment, and, in addition, to set up out of the earnings of the month or year a reserve sufficient to take care of the depreciation, as nearly as it can be estimated, in the value of the physical property in the month or the year. The reserve ought not to be less than the depreciation. It ought not greatly to exceed it. Of course, the depreciation is not susceptible of exact ascertainment in advance; but it is possible to make a reasonable estimate, based on the experience of the company and the known experience of other companies in the same business. The reserve should be ample—too large rather than too small. It is easier to reduce the rate of fare to correct an overestimate than to raise the rate to make good an underestimate.

If it were practicable, from the beginning of such an enterprise as an electric railroad, to pay to the stockholders as a partial return of the investment the amount of the increasing difference between the original cost and the present value of their property until the average or "normal" value, or a still lower value, was reached, calling in outstanding stock or bonds as partial return of investment was made, then it would be necessary, whenever renewals or replacements were required, to call on the investors or the public for additional capital to pay for new property to take the place of the obsolete, inadequate or worn-out equipment.

A reserve to provide for repairs as well as for renewals and depreciation would seem to be better than a reserve for depreciation merely, or for depreciation and renewals. It may be called a maintenance reserve. It should be large enough to provide for the difference between cost and the remaining value, at any time, of the physical property. An amount should be set aside in cash each month or each year, or by other periods, equal to the estimated difference between cost and present value in the period, and charged to expense. This reserve should be used for repairs and renewals. The excess above expenditures may be invested.

DIFFERENT VALUES FOR RATE-MAKING AND TAXATION

Public utility managers and taxing officials have been embarrassed and confused by attempts to fix one value of physical property for rate-making purposes and another value for purposes of taxation. There should be no confusion. The value for rate-making purposes may be greater than the value for taxing purposes without inconsistency. The value for rate-making purposes should be cost or reproduction value; the value for purposes of taxation should be the value at the time of the tax assessment. If the maintenance reserve is sufficient to make good the difference between cost and present value, the tax value will be the same as the value for rate determination. The property taxed will include the maintenance reserve, whether the reserve is in cash, securities or plant. If the reserve is not as large as the difference between the original cost and the present value of the property, the loss is not the public's but the company's. It indicates that the fare is not high enough to secure the entire investment and a fair return upon it. The public gains, therefore, rather than loses.

The company should not be taxed on the amount of its loss by reason of the insufficiency of the fare to provide for depreciation and reasonable dividends; it is enough that it be taxed on the fair value of its property, including whatever is in its maintenance reserve. It should not be taxed upon its capitalization, unless its physical property and its reserve are equal to its capitalization; and even then the basis of taxation should

be expressed as the value of the property and not as the capitalization. It should not be taxed on the capitalized value of its supposed or actual net earnings, as has been attempted in Ohio. If the rate of fare is inelastic—fixed by contract for a term of years—and the company cannot pay reasonable dividends and provide a sufficient reserve to take care of the difference between cost and present value, it must forego the dividends or a part of them, or, at the end of the contract, lose the difference between cost and the value at that time of its property. But the value of the property, including the value of the reserve, should be the basis of taxation. If the combined value of the existing property and the reserve is equal to the investment, the value for taxation and the value for rate-making will be the same. If the reserve is too small, the loss of the difference between cost and present value, or any part of that difference, will be, as before stated, the investor's loss, and not the public's, in the case of a franchise with a fixed rate of fare. If the reserve is too large under such a contract, the company will gain, but the public will pay only the rate of fare it contracted to pay and will gain in taxes on the excess of value. In the case of a franchise providing for an elastic fare, like the Cleveland franchise, if the company cannot earn its fixed rate of interest and a sufficient reserve at the going rate of fare, the fare may, and ought to be, raised. If the earnings are more than sufficient to pay the stipulated interest and provide a sufficient reserve for maintaining the property at a value equal to its cost or agreed "capital value," then the rate of fare may be reduced. Capital should equal cost—should be neither more nor less than cost. Conversely, cost should equal capital. Present value, plus reserve, should equal cost. But whether capitalization, original cost and present value plus reserve are equal to each other or not, the basis of taxation should be the present value of the property, including the reserve. That value may be more or less than the original cost or the outstanding capital. In either case, it, and it only, should be taxed.

I do not mean that there should be excluded from cost any proper "overhead charge," using that phrase in its widest application, nor the value at the time of its acquisition or subsequently of any land, money or other property donated to the company.

Chicago Elevated Safety Rule Book

As a part of its general safety movement, the Chicago Elevated Railways has issued a book of safety rules. In the preface President Budd states that the purpose of these rules and regulations is to induce habits of caution and cultivate in every employee the thought of being careful of his own safety as well as that of his fellow employees. The rules and cautionary instructions are the result of experience, and putting them in printed form merely places general information in definite and convenient shape for reference by employees.

The book contains about eighty pages of safety rules applying to all departments, and others intended specifically for the transportation department, trainmen, motormen, guardmen, towermen, crossing flagmen and gatemen, and the shop, road and electrical departments. In addition to these rules the book contains a set of first-aid instructions, a list of the first-aid relief stations on the elevated system and the contents and use of the first-aid boxes. In the back of the book several pages are devoted to a telephone directory of the various offices and departments of the road, as well as the telephone numbers and addresses of the company's physicians.

Discussion on Government Ownership

The National Civic Federation Devoted One Session to Discussion of This Subject

One session of the fifteenth annual meeting of the National Civic Federation, held at the Hotel Astor, New York, on Dec. 4 and 5, was devoted to discussion on the subject of "Governmental versus Private Enterprise." Samuel Gompers, president American Federation of Labor, presided at this meeting which was held on the afternoon of Dec. 4. In opening the meeting Mr. Gompers spoke of the committee of the American Federation of Labor which went to Europe to investigate the subject of public ownership and its relations to workers in the endeavor to reach proper conclusions on this much-mooted question. An abstract of this report was published in the issue of this paper for Nov. 21. Mr. Gompers added that the question was not merely academic, but the claims of each side should be critically examined to disclose whether the proposal is practicable or impracticable, wise or unwise.

DISCUSSION BY PROFESSOR JENKS

The first speaker was Prof. Jeremiah W. Jenks, New York University, who said that the post-office department, so far as anyone can learn, has made no statement of cost accounting in connection with the parcel post, so that one can determine whether it is really carrying cheaper than do the express companies or whether, as seems not improbable, the difference in charges to shippers is made up by the low rates forced upon the railroads against their will or by shifting the burden upon other branches of the postal service or upon the taxpayers. Concerning the question of whether municipal utilities shall be owned and managed by the municipality or by private companies under municipal control, Professor Jenks thought the advocates of this plan should declare what they considered should be guiding principles. Is it to be better service, cheaper service, even free service, or revenue? Whatever the principles may be, the facts should be known. If we are to compare costs, let us have identical systems of cost accounting. If the question is service, let us know whether the people prefer seats or to wait for half an hour before they get a ride, as passengers often have to do in continental cities. If the government is to take the telephone and telegraph, is it to secure better service or cheaper service or for the protection of the people? The state ought to undertake nothing without definite knowledge of the facts to guide it.

Professor Jenks said that in the discussion of the subway situation in New York City which preceded the settlement and the recent contracts, much time was given to the consideration of the matter by public officials. If this had been the time of the officials of a private corporation their salaries and the interest on the capital would be charged as part of the cost of the undertaking. He had never heard it suggested that if there was to be proper cost accounting these costs should be included under the existing subway arrangement, or that the rent for quarters in the City Hall should be so apportioned that part of the charge should be allocated for the time thus spent. All of these considerations were dropped. If private and public operations are to be compared all of these should be included. There is not now sufficient knowledge to permit careful consideration, and this will not be obtainable until systematic cost accounting is introduced.

DISCUSSION BY CONGRESSMAN LEWIS

Congressman David J. Lewis spoke in favor of public ownership of the telephone and telegraph service.

Passengers Carried in Greater New York.—The number of passengers using the transit systems of Greater New York for the year ending June 30, according to tables compiled by the Public Service Commission of the First District of New York, was 1,813,204,692, an increase over the previous twelve months of 43,328,184. They paid out in fares $89,361,262. The number of passengers carried by the Brooklyn Heights Railroad, the principal surface railway subsidiary of the Brooklyn Rapid Transit Company, fell off by 1,140,585, by the New York Railways by 1,742,267. The Second Avenue Railroad carried 858,189 fewer passengers than the year before, the Third Avenue 75,039, the Forty-second Street, Manhattanville & St. Nicholas Company lost 175,443, and the Dry Dock, East Broadway & Battery Company 1,297,743 passengers.

Chicago Drafts Electric Railway Freight Ordinance.—In an effort to further the recommendations of the Chicago Municipal Markets Commission relative to the advantage of permitting all the electric railways which enter Chicago to handle freight, an ordinance granting this privilege is being prepared. At a preliminary conference between a sub-committee of the Chicago City Council's local transportation committee, the officials of the surface and elevated lines, representatives of the city law department and the Chicago Municipal Markets' Commission, the preliminaries were arranged. According to the city legal department there was nothing to hinder the electric lines from carrying freight within the corporate limits. Upon being questioned regarding their attitude toward a proposition including the right to carry freight, the representatives of the surface and elevated lines expressed a willingness to co-operate in the matter.

Ten Months of Safety in Detroit.—W. C. Cann, chairman of the general safety board of the Detroit (Mich.) United Railway, reports that during the first ten months of this year more than 900 safety suggestions were submitted to the division and general safety board and that favorable action has been secured on 95 per cent of the suggestions. So far this year the number of cars in collision has decreased 47.7 per cent, derailments 7.7 per cent, running over crossings 30 per cent, and passengers hurt in boarding and alighting 32 per cent. The only reports showing any appreciable increase are those covering automobiles struck. These have increased 30.9 per cent. Mr. Cann expresses the opinion that the showing which the company had made in decreasing all accidents other than those in which automobiles are involved indicates that the burden of responsibility for the increase of automobile accidents is on the automobile driver and not on the men operating the street cars.

New Traffic Ordinance in Canton.—A new traffic ordinance was passed by the City Council of Canton, Ohio, on Nov. 9. It is provided that automobiles and horse-drawn vehicles shall cross the center of the intersecting street before turning into it rather than follow a diagonal course from one street into the other. No person under sixteen years of age shall be allowed to operate a motorcycle or automobile on the streets of the city. There are strict regulations with regard to automobiles being allowed to stand along the curb in the business district. A rate of speed exceeding 15 m.p.h. is to be taken as evidence of careless driving, and a rate of speed exceeding 20 m.p.h. is prohibited. Drivers of vehicles passing a street car stopping to discharge or to take on passengers, when said vehicle is going in a direction opposite to that from which the street car is moving, shall slow down and exercise due care so as not to endanger the safety of pedestrians. The driver of every vehicle approaching a street car stopping for the purpose of taking on or discharging passengers shall give some signal plainly visible or audible to such passengers, and shall keep such vehicle at least 6 ft. from the running board or lower step of such car. If it is not possible to preserve such distance from such running board or lower step, the driver or operator shall stop until the street car has again started. All vehicles upon a track in front of a street car shall turn out upon the near approach of the car. The penalty for violating the traffic ordinance is a fine not to exceed $100 and costs. In the section regulating the movement of pedestrians, it is provided that pedestrians shall have the right-of-way over drivers of vehicles at street crossings only.

Personal Mention

Sir George S. Gibb, chairman of the Metropolitan District Railway, London, has been appointed a civil member of the Army Council and will be charged with the supervision of army contracts.

Mr. J. M. Tomlinson, acting vice-president and general auditor of the New York, New Haven & Hartford Railroad since the retirement of Mr. H. M. Kochorsperger, vice-president, has been elected vice-president and comptroller of the company.

Mr. A. Mackrille, assistant general auditor, has been appointed general auditor of the New York, New Haven & Hartford Railroad with office at New Haven, and Mr. T. M. Prentice, assistant auditor, has been appointed auditor of the company with office at New Haven.

Mr. C. C. Collins has resigned as traffic manager of the Lehigh Valley Transit Company, Allentown, Pa., effective on Jan. 1, 1915. Before becoming connected with the Lehigh Valley Transit Company Mr. Collins was traffic manager of the Western Ohio Railroad, Lima, Ohio.

Lieutenant-Colonel G. S. Rennie, M.D., surgeon in chief of the Dominion Power & Transmission Company, Hamilton, Ont., and the Toronto, Hamilton & Buffalo Railway, will be in command of one of the field artillery batteries being mobilized in Toronto for overseas service.

Mr. Daniel L. Turner, deputy engineer of subway construction of the Public Service Commission of the First District of New York, has been appointed to serve on the advisory commission on city planning, which is to assist and co-operate with the committee on city plan of the Board of Estimate, New York City.

Mr. A. E. Beck, one of the permanent counsel of the British Columbia Electric Railway, Vancouver, B. C., and its claim agent, will leave the company's service at the end of the year to practice law on his own account in Vancouver. The company's legal and claims departments will be consolidated under the control of the other permanent counsel, Mr. V. Laursen.

Mr. C. H. Christensen has been appointed manager of the Missoula (Mont.) Street Railway, the Missoula Light & Water Company and the Clark Missoula Power Company, to succeed Mr. George R. Brown, deceased. Mr. Christensen has been connected with the Missoula Light & Power Company in various capacities for twenty years. During the last four years he held the position of superintendent of the Missoula Light & Water Company's Bitter-Root Valley System.

Mr. W. O. Demoss, who has been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Southern Pennsylvania Traction Company, was for ten years foreman of the West Baltimore Street and the Retreat Street carhouses of the United Railways & Electric Company, Baltimore, Md. On Feb. 27, 1911, he became maintenance foreman of the Delaware Avenue carhouse of the Wilmington & Philadelphia Traction Company and in March, 1912, was appointed general foreman of the Wilmington shops of the latter company.

Mr. John W. Graham, Twin Falls, Idaho, will fill the vacancy left on the Idaho Public Utilities Commission by the recent resignation of Judge D. W. Standrod. Mr. Graham has been practicing law in Idaho for the last four years. He is forty-one years of age and a native of Canada, but was educated at the University of Nebraska. He practiced his profession in Fremont, Dodge County, Neb., and was for four years prosecuting attorney of that county, and had altogether fifteen years' experience as a lawyer. The appointment which he has just accepted will hold until January, 1919.

Mr. H. R. LaMontagne has been appointed general agent of the express department of the Worcester (Mass.) Consolidated Street Railway to succeed Mr. F. E. Wood, whose appointment to the Cumberland County Power & Light Company, Portland, Maine, is referred to elsewhere in this column. Mr. LaMontagne entered the service of the passenger department of the Worcester Consolidated Street

Railway after graduation from a technical school. Later he became connected with the freight department, finally being made traveling auditor, from which position he was appointed to succeed Mr. Wood.

Mr. M. H. Bronsdon, chief engineer of the Rhode Island Company, Providence, R. I., from March, 1907, until August, 1912, has returned to that post, succeeding Mr. William Pestell, who recently resigned to accept a position with the B. F. Sturtevant Company of Boston, at Chicago. Mr. Bronsdon has been doing general engineering work in San Francisco since leaving Providence. Mr. Bronsdon was born in San Francisco and he had his first experience in engineering construction on a cable road in Los Angeles. In 1889 he became superintendent of the Providence Cable Tramway. He later was chief engineer at the Eddy Street power plant in Providence, having charge of the installation there. He later went to Duluth as designing and construction engineer of the Duluth-Superior Traction Company, and was afterward appointed engineer for the Old Colony Street Railway, Boston, Mass. His next engagement was with the United Railroads, San Francisco, where he remained until March, 1907, when he succeeded Mr. Fred N. Bushnell as chief engineer of the Rhode Island Company.

Mr. M. A. Tatum, who was appointed superintendent of the southern division of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, recently, began his career in electric railway work in the express and freight department of the Eastern Ohio Traction Company in 1905. In 1906 he resigned this position to enter the engineering department of the Roberts & Abbott Company, Cleveland. About a year later he accepted a position with the Washington, Baltimore & Annapolis Railroad as clerk to Mr. W. E. Slaughter, the superintendent. After the electrification of the road and the completion of the main line between Washington and Baltimore in 1908, Mr. Tatum was appointed clerk to Mr. Joseph O'Hara, superintendent of transportation. During 1909 he was employed in the carhouses and substations of the company, and in 1910 he was made inspector at Washington. During 1911 and 1912 he occupied the position of trainmaster and in 1913 he became general passenger and freight agent of the road. He resigned from the company in September to become connected with the Cleveland, Southwestern & Columbus Railway.

Mr. F. E. Wood has been appointed general freight agent of the Cumberland County Power & Light Company, Portland, Maine, operating the Portland Railroad and the Lewiston, Augusta & Waterville Street Railway. Mr. Wood entered the service of the Springfield (Mass.) Street Railway in 1909 and worked in the repair shop and the pit. Subsequently he entered the express department as general clerk and spare messenger. In February, 1910, on the opening of the express service on the Interstate Consolidated Street Railway operating through Attleboro and North Attleboro, Mass., to Providence, R. I., over the Rhode Island Company's line, Mr. Wood accepted the position of agent at Attleboro in charge of that division. This express service was later extended over the Milford, Attleboro & Woonsocket Street Railway, operating through Franklin and Milford, Mass. In March, 1912, he was transferred to Worcester, Mass. Express service was established on the Worcester Consolidated Street Railway in December, 1912, and in 1913 Mr. Wood was appointed general agent of the Worcester Consolidated Street Railway with headquarters at Worcester and jurisdiction over all the lines previously mentioned, together with the Springfield Street Railway. He resigned from the Worcester Consolidated Street Railway on Nov. 28, 1914, to become connected with the Cumberland County Power & Light Company. Before Mr. Wood left Worcester a banquet was tendered to him at the Hotel Bancroft, that city, by his fellow employees and he was presented with a watch fob by them as a token of their esteem.

OBITUARY

Morris G. Condon, president of H. B. Underwood & Company, Philadelphia, Pa., machinists and engineers, who was shot by an intruder in his room in the Hotel Adelphia in that city on Nov. 25, died from the effects of his wound.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Edmonton Northwestern Radial Railway, Edmonton, Alta.**—Application for a charter has been made by this company in Alberta to build an interurban electric railway from Edmonton northwest to the Pembina River. Messrs. Short, Woods, Bigger & Collison, 14 Howard Avenue, Edmonton, are said to be interested in the project.

***Albion, Charlotte & Northern Railway, Lansing, Mich.**—Chartered in Michigan to build a 53-mile electric railway. Capital stock, $100,000.

***Shelby (N. C.) Northern Railway.**—Chartered in North Carolina to build an electric or steam railway from Shelby to Casar, via Beams, Mills, Fallston, Belwood, Boggs and Warlicks. Capital stock, $400,000. Incorporators: S. S. Royster, Shelby, president, and L. M. Elam, Shelby, secretary and treasurer.

FRANCHISES

Calgary, Alta.—The Chestermere & Calgary Suburban Railway has received an extension of time on its franchise for the completion of its line in Calgary.

Vallejo, Cal.—A. D. Bowen, representing the Benicia Land & Terminal Company, will ask the Council for a franchise to build an electric railway in Vallejo. This is part of a plan to build an electric line to connect Benicia and Vallejo. [E. R. J., Oct. 24, '14.]

Tarpon Springs, Fla.—James H. Murphy, St. Petersburg, has asked the Council for a franchise in Tarpon Springs.

Macon, Ga.—The Macon Railway & Light Company has asked the Council for an extension of time on its franchise in which to remove its tracks from the south side of Tattnall Square Park to the center of College Street in Macon.

***Lewiston, Idaho.**—The State Highway Board has voted approval of a franchise to A. G. Nortz, Lewiston, to build an electric railway across interstate Lewiston-Clarkston bridge.

St. Peter, Minn.—The Electric Short Line Railroad has accepted the forty-nine-year franchise granted it by the Council in October for the use of so much of the levee as lies east of Front Street, between Chestnut Street and Park Row Street, and also to build a line along the entire length of Front Street to the north city limits of St. Peter.

Lockport, N. Y.—The Niagara River & Eastern Railroad had asked the Council for a franchise to use certain streets in the east and south of Lockport to build a line to connect the Buffalo, Lockport & Rochester Railway and the International Railway lines with a new line into Niagara Falls. [E. R. J., Oct. 17, '14.]

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has asked the Council for a franchise to extend its Mahoning Avenue line to Perkins Corners in Youngstown.

Cincinnati, Ohio.—The Street Railway Committee of the Cincinnati City Council has recommended the ordinance granting a twenty-five-year franchise to the Cincinnati, Newport & Covington Railway to be advanced to a second reading, following which a public hearing will be called to discuss its merits.

Cleveland, Ohio.—Mayor Baker of Cleveland has signed the amended franchise granted by the Council to the Cleveland & Youngstown Railroad to make certain necessary changes in its grade. [E. R. J., Oct. 5, '14.]

Findlay, Ohio.—The City Council of Findlay has before it ordinances giving the Toledo, Bowling Green & Southern Railway a twenty-five-year franchise on its streets and also a franchise for furnishing current for light and power purposes. They provide that the company shall pay to the city 2 per cent of the gross receipts from the business.

Guelph, Ont.—The Board of Railway Commissioners has authorized the Guelph Radial Railway to construct an inter-

change track with the Grand Trunk Railway on Suffolk Street, Guelph.

Medford, Ore.—S. Bullis, of the Southern Oregon Electric Railway Company, has asked the City Council and the Southern Pacific Railway Company for permission to cross the tracks of the Southern Pacific on Main Avenue. In case the Southern Pacific refuses to grant the request for crossing rights, the application will be presented to the State Railway Commission for final settlement. An extension of not less than 3500 ft. will be made as soon as the preliminary details are settled.

Philadelphia, Pa.—Peter E. Costello, Philadelphia, has received a franchise from the Council for a two-track elevated railway from Front Street and Arch Street to Rhawn Street, Holmesburg.

Montreal, Que.—The Montreal & Southern Counties Railway has received an extension of time on its franchise in which to complete its lines in Montreal.

Beaumont, Tex.—A petition was presented to the City Council asking that the Council take steps to induce the extension of the Beaumont Traction Company's line to the Magnolia Petroleum Company's refinery south of Beaumont.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company in Seattle will not be allowed to change the terminus of its Yesler Way cable line from its present location, between First and Second Avenues, as it had petitioned, according to a decision rendered by the City Council franchise committee. The company argued that the operation of its cable cars over Second Avenue hindered the headway of its cars north and south on the arterial highway.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—W. L. McKinnon & Company, Toronto, advertised recently inviting bids for $206,700 of this company's first mortgage bonds, maturing in 1943. The Alberta government has guaranteed the principal and interest of the bonds for $7,000 a mile, or $273,700 for 39.1 miles. They bear 5 per cent interest.

Argenta (Ark.) Railway.—Work on the extension from Washington Avenue and Hazel Street to Rock Island station, at Fourth Street and Beech Street in Argenta, has been begun.

Central California Traction Company, San Francisco, Cal.—Negotiations are pending by which portions of the city lines of this company will be abandoned and a universal transfer privilege established between this company's line and the lines of the Stockton Electric Railway.

San Francisco (Cal.) Municipal Railway.—Bids for another branch of this railway are being considered by the Works Board, which has received the offers to construct the California-Street municipal railway line and the Seventeenth-Street carhouse. The line will begin at Geary Street and Second Avenue and run over Second Avenue, Cornwall and California Streets to Thirty-third Avenue.

Marin County Electric Railway, San Francisco, Cal.—This company has received permission from the Railroad Commission of California to construct a line in Sausalito, Cal., on the condition that the present franchise shall be amended so as to give the municipality the right to purchase the system after five years. The company is granted authority to issue 185½ shares of capital stock at par, and it is provided that this stock shall be sold only to property owners and residents of Marin County. It is also provided that all moneys obtained from the sale of stock shall be deposited by the railway company in Marin County banks as trust funds, with the understanding that if a total sum of $18,550 is not deposited within six months, these moneys shall be repaid to subscribers. [E. R. J., Nov. 21, '14.]

Connecticut Company, New Haven, Conn.—Plans are being made by this company to extend its tracks along Railroad Avenue to the station in Westport.

***Havana, Cuba.**—Work has been begun on an electric line between Havana and Guanabacoa in Cuba.

Central Illinois Traction Company, Paris, Ill.—An extension between Charleston and Paris, 30 miles, will be constructed by this company during 1915.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will complete the construction of the Minnesota Street line, between Shelby Street and Churchman Avenue, for operation before Dec. 24. The special work at the corner of Shelby and Minnesota Streets will be completed sixty days fater the opening of the new year.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—This company has completed the survey and secured the right-of-way for the second section of the projected interurban railway between Kansas City and Topeka, Kan. The first section, from Kansas City to Bonner Springs, is now in operation and its business has considerably exceeded expectations. The second section is 21 miles from Bonner Springs to Lawrence. It probably will be in operation within a year. The third section, Lawrence to Topeka, will be built after the second section is in successful operation. Bids for the construction of the Bonner Springs-Lawrence section will probably be asked shortly. On the first section the company advertised for bids, but did with its own forces work for which it considered the bids unreasonable. The construction work which it is planned to start soon involves a bridge over the Kaw River at Lawrence. Carl G. Klemm, 1010 Commerce Building, is secretary of the company.

Kentucky Utilities Company, Somerset, Ky.—With this company disposing of $3,000,000 worth of bonds for needed improvements it is rumored that a part of the company's plans is to extend its line to Burnside, 7 miles south of Somerset, on the Cumberland River.

Winnipeg (Man.) Electric Railway.—Plans are being prepared for filing an application with the City Council for extensions in the northwest section of Winnipeg, in accordance with the City Engineer's directions.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to construct tracks on Pleasant Street, from the mouth of the subway to Washington Street in Boston.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—Surveys, which have been in progress for the extension of this railway to Townsend, have been suspended until spring. This line will ultimately be extended to Nashua, N. H.

Michigan Railway, Jackson, Mich.—This company has placed in operation its line between Kalamazoo and Monteith.

International Transit Company, Buffalo, N. Y.—The Board of Railway Commissioners has authorized the building of a bridge at Tagona, Sault Ste. Marie, Ont., to carry a highway and this company's tracks across the Algoma Central & Hudson Bay Railway. The cost of the bridge is to be borne by the electric railway company.

Cincinnati (Ohio) Traction Company.—A new crosstown line north of the present route on McMillan Street in Cincinnati is being considered by this company and may be built in the near future.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as negotiations are completed work will be begun by this company on the 100-mile line to connect Springer, Woodford, Poolville, Elmore City and Leon. Capital stock, authorized, $300,000. Bonds, authorized, $2,500,000. Officers: A. F. Costigan, Guaranty Bank Building, Ardmore, president; D. E. Allen, Ardmore, vice-president; A. L. Adath, Ardmore, secretary, and T. C. Bridgeman, treasurer. [E. R. J., May 30, '14.]

Forest Hill Electric Railway, Toronto, Ont.—The roadbed is now being prepared for this railway. Work has been begun at Bathurst Street, and the first stage from there to Dufferin Street will be proceeded with as rapidly as possible. The tracks will be laid on their entire route beginning near St. Clair Avenue. T. J. Glover is interested in this projected railway. [E. R. J., April 11, '14.]

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—A contract has been awarded to Eastman, Kenny & Stearns, Russell, Ont., for grading about 6 miles of the projected line. About 2 miles of grading has been completed, and it is expected to have about 8 miles between Russell and Metcalfe completed and ready for the rails within the next three weeks. H. W. Pearson, Confederation Life Building, Toronto, Ont., secretary.

Toronto (Ont.) Civic Car Lines.—A by-law will be submitted to the ratepayers on Jan. 1, 1915, to provide for $455,000 for the extension of the civic car lines in Toronto.

Toronto, Ont.—City Solicitor Johnston advised the Board of Control on Nov. 27 it would be necessary to submit separate by-laws for each of the proposed new electric lines, consequently the board changed its recommendations. The Council will be asked to authorize the submission of a by-law for $105,000 for the proposed Lansdowne Avenue line, $317,000 for the North Toronto line, and $52,000 for the taking over of that portion of the Toronto & York Radial Railway Company's line within the city limits in the east end.

Electric Short Line Railroad, Minneapolis, Minn.—Plans are being considered by this company and the members of the Winthrop Commercial Club to build an electric railway through Winthrop and north as far as Winsted and south through Sleepy Eye to Jackson.

St. Louis, Mo.—The residents of South Lindenwood have submitted a petition to the Missouri Public Service Commission asking the United Railways for an extension of the Tower Grove line. The Tower Grove line terminus is 2½ miles away from the city limits in the Gratiot and Lindenwood section of the city.

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—Surveys have been completed by this company between Madison and Elgin. Right-of-way has been secured between Omaha and Norfolk via Madison. The Elgin line will be a branch proposition. Charles W. Baker, Omaha, is interested. [E. R. J., April 4, '14.]

Corry & Columbus Street Railway, Corry, Pa.—A 30-mile line from Corry, Pa., to Maysville, N. Y., via Columbus, Pa., Clymer and Sherman will be built by this company during 1915.

Slate Belt Electric Street Railway, Penn Argyl, Pa.—A 5-mile line between Wind Gap and Saylors Lake, Pa., will be constructed by this company during 1915.

***San Antonio, Tex.**—James L. Himrod, Thomas Moore, Austin, and others are making plans to build an electric railway to connect New Mexico, Lamesa, Robert Lee, San Angelo, Ballinger, San Antonio and other points with a port on the Gulf of Mexico.

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—Within a few weeks this company will have completed its 6½ mile line between Evans City and Beaver Falls. In addition to passenger service the company announces that it will add trolley freight service over this line as well. The opening of this new line will give a direct electric railway line between Pittsburgh and Beaver Falls.

***Denison, Tex.**—Preliminary surveys are being made for a line betweeen Denison, Dexter and Locust. This is part of a plan to build an electric railway through Pottsboro, Locust, Gordonville, Dexter and Denison.

Houston, Laporte & Bay Shore Railway, Houston, Tex.—Preliminary arrangements are being made and work will be begun some time within the next six months on this line to connect Houston, Pasedana, Deepwater, Deer Park, San Jesenta City, Laporte, Seabrook, Webster, Friendswood and Pearland. The power station will be located at Houston and the repair shops at Pearland. The company will furnish power for lighting purposes. Capital stock, authorized, $2,000,000. Samuel F. George, Houston, president and general manager, and John H. Stoner, Houston, chief engineer.

Houston & Southern Railway, Houston, Tex.—Preliminary arrangements are being made to incorporate this company, which plans to begin work in the spring on its 55-mile electric railway to connect Houston, Pearland, Manville, Danbury, Belasco and Freeport. The company will furnish power for lighting purposes and will locate its power house in Houston and its repair shops at Pearland. It will also have amusement parks at Laporte and at Velasco. Samuel F. George, Dayton, Ohio, president, and John H. Stoner, Houston, chief engineer.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Grading has been completed by this company for its 14-mile line to connect Glen Rose and Walnut Springs, via Seven Knobs. Officers: J. H. Farr, president; F S. Williams, vice-president; John Shields, treasurer, and F. B. Kirby, secretary, all of Glen Rose. [E. R. J., Sept. 12, '14.]

Rutland Railway, Light & Power Company, Rutland, Vt.—This company, a subsidiary of the General Gas & Electric Company, has begun construction under its plans for the conservation of the water supply at Chittenden Dam, near Rutland, Vt. The plans include the construction of two dams, a canal 3000 ft. long, and wood and steel penstocks. When completed, the reservoirs will furnish a large reserve supply of water for the new power station of the company at East Pittsford. Through this plan the water will be used twice for generation of power, once at the East Pittsford station, and once at the Mendon generating station.

Mercer Electric Railway, Athens, W. Va.—The tracks are being laid by this company on its line between Bluefield and Princeton. This line will connect Bluefield, Princeton and Athens. R. G. Meador, Athens, president. [E. R. J., Oct. 17, '14.]

SHOPS AND BUILDINGS

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—This company opened its new depot in Clinton, Ind., on Dec. 3.

Orleans-Kenner Electric Railway, New Orleans, La.—Plans have been prepared by this company to build sixteen shelter houses and way stations along its line between New Orleans and Kenner. The buildings will be on brick construction with tile roofs.

Moncton Tramways, Electricity & Gas Company, Moncton, N. B.—A temporary carhouse was erected to replace the building which was destroyed by fire recently. This building is 30 ft. x 80 ft., with accommodation for five cars, and is on the same site as the one burned. It is the intention of the company to build a steel and brick carhouse in the summer, on a new site which has not yet been acquired.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District has approved the award by the New York Municipal Railway Corporation to the P. J. Carlin Construction Company, the lowest bidder, of a contract for the construction of six stations on the Liberty Avenue elevated railroad extension. The contract price is $232,000.

Brantford (Ont.) Municipal Railway.—This company is building a new passenger station and freight house at Paris. The cost is estimated to be $3,000.

Toronto (Ont.) Civic Car Lines.—The City Council has authorized Commissioner Harris to build a temporary carhouse near Dorval Road to house the cars of the new Bloor Street line in Toronto.

Milwaukee Northern Railway, Cedarburg, Wis.—Work will be begun at once by this company on a new terminal building on Fifth Street between Cedar Street and Wells Street in Milwaukee. The structure will be of brick, fireproof, one story high and will be divided into separate waiting rooms, a ticket office and baggage room. The cost is estimated to be about $40,000.

POWER HOUSES AND SUBSTATIONS

Bay State Street Railway, Boston, Mass.—This company has installed a new engine and generator at its Mason Street plant.

Ottawa (Ont.) Electric Ry.—This company's new auxiliary power plant has been put in operation. It cost $200,000 and has a generating capacity of 5000 hp. The equipment includes three Babcock & Wilcox boilers and a Westinghouse double-flow steam turbine.

West Penn Traction Company, Pittsburgh, Pa.—This company has just placed in operation a 19-000-kva, 6600-volt, three-phase, sixty-cycle, turbo generator, built by the Westinghouse Electric & Manufacturing Company.

Monongahela Valley Traction Company, Mairmont, W. Va.—This company is installing three 1500-kva, water-cooled, sixty-cycle, 22,000-volt high-tension Westinghouse transformers, and a complete electrically-equipped remote-control switchboard in its power house near Fairmont, W. Va.

Manufactures and Supplies

ROLLING STOCK

Sheboygan Railway & Electric Company, Sheboygan, Wis., expects to order two new steel cars for city service, double-end operation, pay-as-you-enter, double-truck, to seat forty passengers. The cars will be equipped with baby motors and 24-in. wheels.

Philadelphia & Reading Railroad, Philadelphia, Pa. is making an investigation into the advisability of establishing storage-battery car operation on branch lines of its Winslow Junction-Cape May division.

Empire United Railways, Syracuse, N. Y., has ordered twelve more cars from the St. Louis Car Company in addition to the twelve cars ordered last summer. These twelve cars are to be the same type as those on the previous order.

London & Port Stanley Railway, London, Ont., has ordered three electric locomotives and electrical equipment for five motor cars from the Canadian General Electric Company. The contracts approximate $135,000. The locomotives will be 1000 hp, capable of hauling a trainload of 1000 tons. The cars will have a four-motor electrical equipment of about 600 hp per car. The motor cars and trailers, of which there will be five each, will be of one pattern and steel construction throughout. Tenders on the car bodies were invited up to Dec. 2.

TRADE NOTES

Thomas A. Edison, Inc., West Orange, N. J., in a fire which started early in the evening of Dec. 9, suffered much damage to its property, calculated at something less than $1,000,000. Part of the phonograph works was destroyed by fire, but Mr. Edison's private laboratory, the Storage Battery Company and the Edison primary-battery department were not affected. The company emphasizes the fact that the business of both battery departments of the company will not be interfered with in any way by the fire and that it is prepared to continue business as usual.

Albert Lawrence Smith has been admitted as a partner in the firm of E. B. Smith & Company, public utility bankers, Philadelphia, Pa. Mr. Smith is a son of the senior member of the firm. He attended Harvard University and began his business career with the Franklin National Bank, Philadelphia. For several years he has been associated with the firm of which he is now a partner. He is a director of the Buffalo & Susquehanna Railroad and of the Easton (Pa.) Consolidated Electric Company.

Kerr Turbine Company, Wellsville, N. Y., builder of "Economy" steam turbines, has appointed A. E. Seelig as general sales manager, and John A. Hense as St. Louis representative. Mr. Seelig for several years held a similar position with the L. J. Wing Manufacturing Company, and more recently has managed the new machine tool department in the New York office of Schuchardt & Schutte. Mr. Hense was formerly with the National Malleable Castings Company, Chicago, and later with the Dravo-Doyle Company, Philadelphia.

Walter A. Zelnicker Company, St. Louis, Mo., has appointed Arthur E. Jackman as manager of its machinery department to succeed J. J. Hilpirt, resigned to become storekeeper of the Compania Mexicana de Petroleo "El Aguila," S. A., Tampico, Mexico. Mr. Jackman has had wide experience, gained as general manager of the Sea View Railroad and Narragansett Pier Electric Light & Power Company. He was several years in the railway and lighting department of the Westinghouse Electric & Manufacturing Company, and lately superintendent of the East St. Louis, Columbia & Waterloo Railway, which position he left to assume his present duties.

W. S. Miller has resigned as general superintendent of the St. Louis Car Company, after being connected with this company about fifteen years. Mr. Miller's first position with the company was superintendent of the brass foundry departments, two years after which he became general foreman of the blacksmith, machine and truck departments. After holding this position for three years he was appointed superintendent of machinery and tools. In 1907 Mr. Miller became works manager and later general superintendent, which position he has held up to the time of his resignation, Nov. 9, 1914. He was formerly a student of Washington University, New York.

Edison Storage Battery Company, Orange, N. J., has appointed Francis V. McGinness, formerly sales engineer, as assistant manager of the railway department, the position formerly held by William F. Bauer, who was recently made manager of the company's Chicago office. Mr. McGinness is a graduate of Columbia University's Schools of Applied Science, class of 1910, and before graduation had considerable practical experience with the New York & New Jersey Telephone Company. After a few months in the engineering department of the New York & Queens Electric Light & Power Company, Long Island City, he joined the sales force of the Edison Storage Battery Company. For the past two years he has been identified with the railway department.

National Corrugated Culvert Manufacturers' Association, Chicago, Ill., announces that the large number of manufacturers operating under the Watson corrugated culvert patent have just been informed by their attorney, Wallace R. Lane, Chicago, that the United States Court of Appeals for the Second Circuit, which has final jurisdiction, has just handed down a mandate reversing the lower court and holding this patent valid and infringed by another culvert which was recently installed. The court says, in part: "The patented culvert is cheap, strong, durable, easily transported, quickly laid down and easily repaired. We cannot believe that the man who gave such a structure to the world should be denied the title of an inventor." The manufacturers of corrugated culverts under this important patent make them out of Armco American ingot iron.

ADVERTISING LITERATURE

Fargo Manufacturing Company, Inc., Poughkeepsie, N. Y., has issued a bulletin describing its straight connector, cable lug, signal connection, ground point and ground meter, "L," "Y" and "T" and terminal connections.

NEW PUBLICATION

Bonds and Stocks—The Elements of Successful Investing, by Roger W. Babson. Babson Statistical Organization, Inc., Wellesley Hills, Mass. 422 pages and three charts. $2 net.

This is the second book of its kind intended for investors received this year for review by the Electric Railway Journal and written by an authority of national reputation. There are many excellent books planned primarily for the student of corporation finance, but there has been a dearth of books about the science of investing money. Mr. Babson has in his volume rendered a real service to the man unacquainted with security issues who has money to invest, and in addition he has furnished a volume very entertaining aside from its practicable value. Very hazy ideas are frequently held about securities by men otherwise well informed, and to such men the present volume should be more than welcome. It is all very well for the man unacquainted with finance who intends to invest to be sure of the reputation of the house through which he deals, but there is no excuse now that "Bonds and Stocks" has been issued for such a man not to understand the fundamentals of investing. The strong and weak points of stocks and bonds are pointed out with reasons why some classes of securities are attractive and why others are not attractive. Mr. Babson has divided his work into twenty-four chapters. The first four deal with introductory suggestions, the next fifteen with elements of successful investing and the five concluding chapters with supplementary suggestions. There is a chapter on electric railway securities as distinct from lighting, telephone and water power securities. A chapter on the investor's vocabulary contains an explanation of ten phrases, the meaning of which should be understood by every investor. These phrases are the technical ones used frequently by bankers in seeking subscriptions from the public, through the newspapers. Mr. Babson certainly is justified in saying in his conclusion that "if the reader has absorbed all that has gone before he should have in his mind a clear idea of the different kinds and groups of securities and the various questions and terms involved therewith."

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LET SHOPMEN HELP DESIGN

On several occasions we have called attention to errors in maintenance structure design which might have been avoided had the shop employees been taken into consultation. The bad consequences of leaving everything to the man at the drafting board were noted again lately in a certain New England carshop. The building was laid out for aisle sprinklers, but after these were installed it was discovered that thereafter trolley poles on cars would have to be turned in the open air. Another part of the building was confidently laid out as a paint shop, but when car painting began it was found that a painter could not possibly work in the narrow space which had been left between the painting track and the wall. In general, the provision of satisfactory working clearances for a car shop requires more foresight than may reasonably be expected even from the combined experience of the draftsman, the shop superintendent and general manager. A hint or two from the men closest to the job may avoid many distressing incidents of the nature cited.

THE SKIP-STOP IDEA

One of the reforms which seem a long time in coming is the skip-stop for city service. Railway managers who have studied the plan approve of it, but the inertia of the public in matters of this kind is so great that this reform has been adopted in very few places. Chicago is now reported to be contemplating a trial of the plan. An account of the Denver experience has been published in recent issues. In Los Angeles, where the skip-stop has also been tried, there seems to be some doubt as to the advisability of its continuance. On the other hand, in Cleveland and in Kansas City, where the skip-stop appears to have been originally introduced in the year 1911, it has been continued in operation with every evidence of success. The increase in schedule speed has been reported to be nearly 10 per cent but since half of the cars stop at "odd" streets and the other half at the "even" streets, only about half of the people that collect at a corner board the first car that arrives. Thus the load is distributed more evenly among the cars on the route. There is no doubt that the public would be greatly benefited by the skip-stop because it materially increases the average speed by cutting out the number of stops and yet does not greatly increase the distance which the passengers have to walk to catch a car. In a number of cities the near-side stop has recently been introduced without creating public opposition. Perhaps this change will make the general adoption of the skip-stop more of a possibility.

AUTOMOBILES IN CITY TRAFFIC

Automobiles for private use have now become so common that it is not surprising they should have invaded the passenger transportation field, and several electric railway companies on the Western Coast report considerable competition from automobiles which carry passengers over certain routes for nickel fares. We have no fear that such cars, with the tire cost and other depreciation inseparable from automobile service, can ever be commercial competitors on the same terms with an electric railway system. The report of Mr. McCullom to the Board of Estimate and Apportionment of New York, abstracted in this paper about a year ago, presents ample evidence to this effect. Nevertheless, experience has shown that this fact will not prevent the owners of cars from attempting a service of this kind. In a free country like this, electric railway companies cannot suppress this competition even if they would, but it is only fair to them as large taxpayers and also to the public as a whole, whose patronage is solicited by these buses, that both classes of transportation should be placed under similar regulations in regard to responsibility, and that strict traffice regulations should be enforced. The Merchants & Manufacturers Association of Los Angeles has called the attention of the City Council of that city to the tremendous liability of street accidents from these irresponsible automobiles, and Long Beach, Cal., has imposed a license fee of $25 a year and has required taking out of a $10,000 liability insurance for every such car. Charges of short changing by irresponsible automobile conductors is also made in some of the Western cities. Railway companies can ask no more than a free field and fair play for all, but both they and the public should demand that fair play means an equal degree of responsibility from the operators of both classes of service.

STREET RAILWAY LOADS ON SOILS

A part of the discussion of the way committee's report on track at the convention was devoted to the distribution of railway loads over the ballast and sub-grade. While this subject is of vital importance to steam railroad engineers, owing to the great increase in the weight of locomotives as well as the adoption of higher scheduled speeds of trains, neither of these factors has any bearing on the study of track foundations in paved streets. Moreover, the conditions governing the depth of loose, unconfined ballast are hardly comparable with those surrounding a foundation of concrete or compactly-rolled ballast, such as is required by a modern electric railway. In steam

road, or even interurban road open-track construction, a certain amount of flexibility is required, while track in paved streets must be as rigid as is consistent with economical operation. To obtain rigidity the foundation must be made much heavier than that actually necessary to carry the track loads. In other words, one should determine the average soil-bearing power condition and then select a foundation which will distribute the track loads well within the safe limit. It would be impractical to change the character of foundation with every slight change in the bearing quality of the soil. On the other hand, it is necessary to change the character of foundation when there is a marked change in the soil-bearing power, such as might be found where track is constructed over filled-in areas or where the soil contains excessive moisture. Of course, a drainage system would go far toward improving the latter condition, while rolling the sub-grade will often be all that is necessary to prepare filled-in areas for foundation construction. To sum up, it appears impossible to calculate exactly the distribution of track loads over the foundation and sub-soil. Hence, the selection of the foundation must be based largely on experience, after such mathematical checks as may be required have been made to determine the relation of the load to be carried to the bearing power of the sub-soil.

SNOW REMOVAL

That the removal of snow from city streets should constitute one of the most exasperating of the unsolved engineering problems of long standing is really remarkable when it is considered that the cost of the fuel necessary to melt the snow would be hardly 15 per cent of the expense of removal involved under present methods, the latter consisting, almost without exception, in shoveling the snow into wagons and carting it away. It may be, of course, that snow storms will have to be fought for some time by this primitive scheme, yet in this age of flying machines and wireless telegraphy one must be a true conservative at heart to accept this as a fact, even though the recommendations of the committee on resolutions of the snow removal conference, which were presented before the American Society of Mechanical Engineers last week, approved no new process except the limited use of the sewer system to get the snow off the streets.

The reasons that prevented the general use of sewers, as outlined in the report, could be summed up in the one generality—insufficient sewage flow. In New York, during the last winter, experiments demonstrated that the large trunk sewers with a continuous and fairly rapid flow were not clogged by any snow that might be shoveled into them. The small sewers, however, of about 12-in. diameter required flushing with hydrant water and even then had to be treated with considerable care.

The same idea has been suggested for Philadelphia, where the contractors are supposed to commence the work of plowing or sweeping the snow to the sides of the streets within one hour after a storm begins, the work of carting the piles away being aided by the use of certain sewer manholes for dumps. It is now planned to extend the use of the sewers by having water connections placed inside of the manholes, thus increasing the flow in the sewer and permitting the flushing away of accumulations of snow.

Removal of snow by flushing the streets with cold water naturally seems like carrying coals to Newcastle, but the experience in Scranton has demonstrated that with proper temperature conditions the scheme is capable of reducing the expense of removal to one-half that of cartage. However, when a cold snap follows a snow storm, the presence of great quantities of water on the streets might easily become fraught with considerable danger. This fact, indeed, is implied in the recommendations of the committee. Considerable hope is also held out in regard to the disposal of snow by melting in a furnace. The committee estimates that with a perfect furnace the cost of the coal required would be 3 cents, or with a furnace efficiency of 33 per cent, 9 cents, per cubic yard, against the present cost of carting of about 50 cents. This difference provides a considerable margin from which, of course, the cost of apparatus, labor and maintenance must be deducted. The problem should be an attractive one to the inventor, because there are many objections to carting besides its cost. One is its slowness, another is the congestion caused in the streets by the carts, and a third is the increasing scarcity in most cities of carts suitable for this purpose, owing to the growing tendency to substitute in commercial work for the horse-drawn cart a specialized motor truck not suitable for snow removal.

Surface railways, of course, are not so much interested in the manner of snow removal as in the provisions for operating their lines during and after snow storms. The matters of complaints from the public and of decreased receipts, which are the invariable accompaniments of heavy snow falls, are of serious importance, and at least one road, the New York Railways, is going to great expense to develop a wing sweeper that will clear a passageway beside the track. This has been planned solely to provide space for vehicular traffic which, during snow storms, utilizes the street railway tracks because these provide the only clear space in the street. Obviously the consequent congestion practically prevents the railway company from moving cars. To meet this difficulty wing brooms have also been suggested for Philadelphia and wing plows have been in successful use in Montreal for several years, a layer of snow being intentionally left on the streets in the latter city. It seems unfair to require a railway company, which is responsible only for the clearing of its tracks, to take care of the snow elsewhere on the street. But in many cases, owing to the slowness of the city force, this appears to be necessary for the railways, purely as a means for self-protection, and the development of wing brooms and wing plows seems to constitute peculiarly the railways' share in the problem, just as much as the prompt removal of the snow piles constitutes the share of the municipality.

FEDERAL AND STATE JURISDICTION OVER CITY RAILWAYS

It is not surprising, in view of the recent establishment of commission regulation in this country, that there should be many unsettled questions as to the powers and duties of regulatory commissions. One of the most important of those which remain to be settled is where the power of the federal commission should end and that of the state commissions begin. It would seem that with all of the problems in connection with valuation of steam railroads and the establishment of freight rates that the Interstate Commerce Commission has enough to occupy its time during the next few years, and that to the various state commissions could be assigned the adjudication of all of the intrastate matters which arise in connection with the operation of electric railways. This was the view which a committee of the American Electric Railway Association urged before a sub-committee of the House committee on interstate and foreign commerce last January in a hearing on several bills which would have brought certain equipment of all electric roads which do any interstate business under the jurisdiction of the Interstate Commerce Commission. The protestants at that hearing called attention to the fact that only a small percentage of their business, averaging in most cases less than 1 per cent, was interstate in character.

Now the question has come up again through an order to the Detroit United Railway, which owns about 800 miles of track in Michigan and 2 miles in Ohio, to make reports to the Interstate Commerce Commission on all accidents including, of course, all of those on its large city system in Detroit. If this policy should be adopted as standard, very few urban companies, certainly among those which haul freight and so issue through bills of lading, would be exempt. Moreover, if the jurisdiction of the Interstate Commerce Commission covers this case, it is likely to cover almost any other detail of city operation, and we should then have a centralized government control of our public utilities in addition to state control.

At the last meeting in Washington the railway managers present did not question the good intentions or the ability of the Interstate Commerce Commission in dealing with these matters, as compared with the state commissions. The principal grounds urged were the absence of knowledge of local conditions and the immense amount of work which would be entailed on a central commission and also on the railways themselves in taking up all of these subjects at the federal capital as well as at the state capitals.

If precedent can count for anything, the decision of the Supreme Court in the opinion on the case of the Omaha & Council Bluffs Street Railway vs. the Interstate Commerce Commission (230 U. S. 324) would indicate that that court does not believe that the interstate commerce law covers cases of this kind. At Omaha the situation was somewhat different because the question was one of rates on street railways which happened also to be interstate roads. The conclusion reached then by the court was that the character of the service was the criterion of whether a road is embraced under the interstate commerce law, and certainly the character of the accidents in city service and the means to be taken to avoid them by fenders or otherwise bears little relation to what is generally understood as interstate commerce. We hope that the hearing at Washington next Friday, to which a letter from Arthur W. Brady in our "Communication's" column this week calls attention, will be effective in impressing this fact upon the Interstate Commerce Commission.

HUMANIZING DISCIPLINE

A casual study of a number of bulletins issued to platform men indicates an often unnecessary brusqueness in many of the instructions and little or nothing of a commendatory nature. Of course, the purpose of the merit and demerit system in disciplining trainmen has taken this into account to a certain extent, but attention is here directed to the day-to-day bulletins. Would not the suggestive effect of a meritorious act spread on these bulletins be of much value in disciplining and at the same time offer relief from the constant repetition of "do" and "don't"? Orders must, of course, be issued, but occasional commendation and a mixing of the "sweet" with the "bitter" will help greatly toward better service. The iron hand of discipline might well be covered with the silk glove of consideration. In other words, the human side of disciplining must be recognized.

The frailties of the human mind and body have been thoroughly safeguarded in the operation of trains, so as to make the man as nearly as possible an automaton. All of these precautions have done much to make operation more safe, but they cannot make a machine out of the human body. Hence disciplining in various forms is necessary to make up for this deficiency, and the point we have in mind is that, in disciplinary methods, full cognizance should be taken of the human factor. To illustrate what we mean, take the case of the application of discipline after accidents have occurred. After a serious accident the superintendent's first tendency is to discharge the offenders if they prove to have been guilty of lack of attention or lapse of memory. It is worth while in such cases to go behind the facts and consider some of the contributing causes and thus possibly justify the retention in service of men who will afterward be much more valuable on account of the accident. A momentary mental lapse during a run may result in disaster. Yet we all have mental lapses and the very fact that a man has had no accidents or "near" accidents during his railway career may in itself have made him subject to a false sense of security. As he ages in service his alertness is apt to become sluggish. But this defect may be more than made up, so far as his value of the company is concerned, by better knowledge of local conditions and clearer judgment. This fact should receive consideration when his case is decided. After he gets his "nerve" back he may be a safer man than one with no accident to his credit.

New Cars of Seattle Municipal Railway

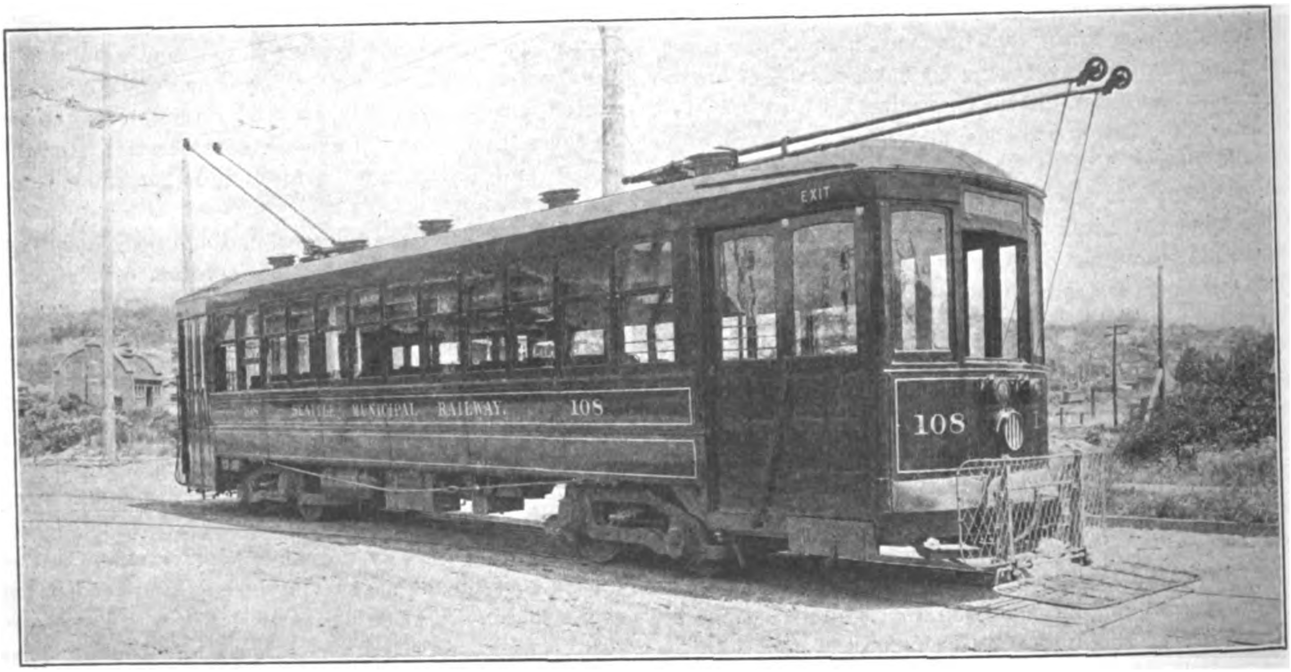
Multiple-Unit Control Arranged for a Double Trolley Wire System, Gearless Air Compressors and Air-Operated Fenders Are Among the Unusual Features of These Cars

BY H. J. KENNEDY, ELECTRICAL AND MECHANICAL ENGINEER

In the ELECTRIC RAILWAY JOURNAL, April 26, 1913, and June 20, 1914, some general accounts were given of the municipal railway construction in Seattle. In the present article the new cars built for this railway by the Cincinnati Car Company are described.

The twelve cars are of the double-end, semi-convertible "pay-within" type, having composite-type framing, exterior doors on platforms, and no interior bulkheads. They have arch roofs, are mounted on maximum-traction trucks, and have the following general dimensions:

Length of car over bumpers	44 ft. 5 in.
Length of car over vestibules	43 ft. 1 in.
Length of car over end posts	31 ft. 1 in.
Spacing of transverse seats	2 ft. 5½ in.
Width of car over posts	8 ft. 5 in.
Height of car over trolley boards	11 ft. 2 in.
Distance between truck centers	23 ft. 1 in.
Seating capacity	48
Weight of car empty, approximately	42,000 lb.
Weight empty, per passenger seat	875 lb.



SEATTLE MUNICIPAL CAR—GENERAL VIEW OF CAR IN OPERATION

The 75-hp motors which are of the Westinghouse 810-C type, were tested at the builders' works by coupling two together, running one as motor and the other as generator, on 125 per cent and 100 per cent loads. In addition, an overspeed test of 1800 r.p.m. and 2600-volt one-minute insulation tests on field and armature were made. One out of each twelve motors had a one-hour A. I. E. E. temperature run, at full load. Commutation was also tested at 200 per cent load. On the one-hour run at 500 volts, a current of 107 amp was applied at 460 r.p.m. to 475 r.p.m., heating the series field (the hottest part) to 79 deg. Cent., the air being 23 deg. Cent.

Among the other items of equipment on the cars are "Utility" ventilators, "Standard" motor trucks, Agasote ceiling, Hale & Kilburn seats, Crouse-Hinds headlights, Earll trolley retrievers, Pantasote curtains, Johnson fare boxes and Forged Steel Wheel Company's rolled steel wheels. The interior lighting of the car is effected by 23-watt, Mazda, half-frosted, incandescent lamps, one lamp being placed over each seat and three being located in each vestibule. The latter are connected in series with the destination sign and headlight at the opposite end of the car.

CONTROL SYSTEM AND WIRING

The control system is Westinghouse type HL, electro-pneumatic, with master controllers at each end of the car. Train line receptacles have not been provided, but they can be added at any time when it is desired to arrange for running multiple-unit trains. At the time the cars were ordered, the future conditions of operation of the road were so uncertain that it was felt to be an advantage to have cars which could, if needed, be used in multiple-unit train operation by the addition of the train line receptacles. At present, with the exception of the third-rail interurban line to Tacoma, electric cars for passenger service in Seattle rarely haul trailers or run in trains. However, the Seattle, Renton & Southern Railway, which connects with the new line is, in conditions affecting rolling-stock, almost an interurban and it is difficult to foretell what future conditions may be.

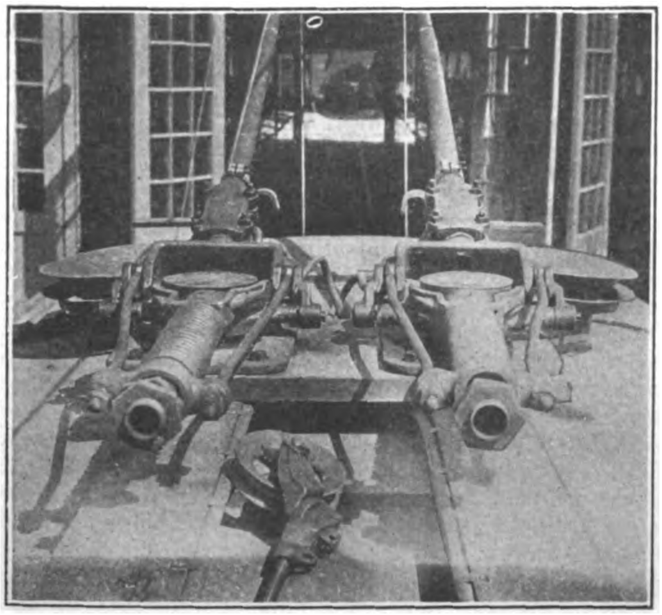
The standard control system has been modified for the double-trolley system which has been installed on the Seattle Municipal Railway, by the addition of an extra line switch in the unit-switch group with corresponding contacts in the master controllers and by an additional control switch in the hood connected on the negative side of the circuit. The overload trip relays on the line switches, positive and negative, of the unit switch groups are set at 325 amp. Instead of one control-

reset switch in the hood, as usual in the unit-switch system, there are two switches, one with fuses on the positive side and one on the negative side of the car circuit, the former being double-throw, the latter single-throw. It may be noted that the apparatus will work if polarity be reversed, the signs mentioned indicating the normal method of operation.

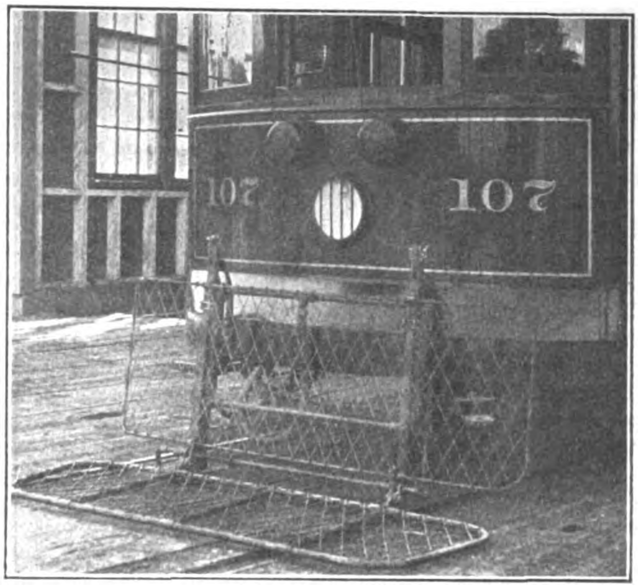
A feature of the wiring peculiar to these cars is the installation under the hood at each end of the car of a single-pole double-throw knife switch encased in a box. The blade of the switch is connected at the hinge to ground to truck, and the terminals to the positive and negative trolleys, respectively. In running from a double-trolley to a single-trolley track, one trolley pole is hooked down and the grounding or transfer switch is thrown to connect the truck with it. It is possible to make the change without stopping the car. For the cars that are in continuous service on the single-trolley Lake Burien Division, however, the negative trolley poles have been entirely removed.

An interesting feature to note in this connection is that, in case of the use of a grounded neutral for the three-wire generators which have been installed in the substation, as soon as a car passes from the double-trolley to the single-trolley line, the position of the ground relative to the outside of circuit moves over by 300 volts, assuming 600 volts total emf. In other words, the potential on the single-trolley wire would be 300 volts higher than that on the positive double-trolley wire, when measured with reference to the ground. Hence there must be an insulated break between the two systems, although, if the car should run past the break with the controller on, the grounding switch being instantly thrown at the same time, there would be no change in the emf impressed on the motors, since the grounding switch raises the negative potential 300 volts simultaneously with the raising of the positive, so that the difference of potential between outside terminals is the same as before. Even if it were possible to perform this experiment, it would not, of course, be made an operating practice because of the consequences in case of failure to perform it successfully. It should be noted that up to date the line has been operated without grounding the direct-current neutral. The three-wire generators are for probable commercial loads.

The trolley bases were designed especially for these cars. The base casting is rectangular, 12 in. x 18 in., the two being mounted side by side on wood trolley boards so as to have a 6-in. air gap between them. The base castings are not themselves live, the trolley poles being insulated from the sockets by a ¼-in. thickness of insulating bushing. The roof cables are connected, not to the bases as is usual but to the poles by flexible pig tails. The poles on diagonally opposite corners of the car are connected to each other, so that the right hand one is positive independent of direction of running, assuming that the overhead system is connected up that way. However, in certain cases of special work, the polarity on the trolley wires is reversed for a short distance. The bases are ball bearing and have one spring.



SEATTLE MUNICIPAL CAR—VIEW SHOWING POSITIVE AND NEGATIVE TROLLEYS AND BASES



SEATTLE MUNICIPAL CAR—VIEW SHOWING FENDER HELD DOWN ON CURVED TRACK BY AIR PRESSURE IN CYLINDERS

GEARLESS AIR COMPRESSOR

An interesting feature of the brake equipment is the gearless air compressor, made by the Allis-Chalmers Manufacturing Company. This is remarkable for its compactness and small weight of 425 lb. including suspension cage. It has three cylinders which are approximately horizontal and are connected to the same shaft with a four-pole 600-volt motor, the latter taking 5.7 amp, 3.42 kw, when delivering 18 cu. ft. of free air per minute against 90 lb. pressure, with a temperature rise not exceeding 50 deg. Cent., when operation does not continue over thirty minutes out of an hour. The cylinders are provided with sliding sleeve intake valves of the type used in the Knight automobile engine. These valves are operated by eccentrics on the crank shaft, compelling the opening and closing to be at exactly the proper instant, and insuring large port openings.

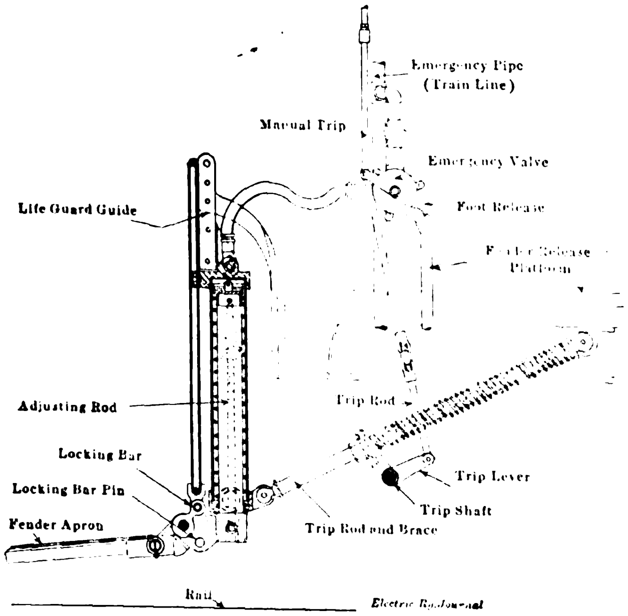
The compressor is 21⅝ in. from the cylinder head to outside of motor casing, and 29⅜ in. long over all measured parallel to shaft. In spite of its speed it operates without any disagreeable vibration. Instead of the noticeable pulsation of the usual geared compressor, the sound takes the form of a hum, due to the speed of rotation and the use of three cylinders instead of two. The motor brushes are readily accessible from the outside of the car by opening the cover located just below the side sill.

PNEUMATIC FENDERS

The fenders on these cars are of the Nelson pneumatically-operated type, generally similar to those used in Portland, Ore., and other places, but of a design improved in several particulars. The fender, both apron

and lifeguard, is hung on slides and kept at its normal height by helical springs contained in two vertical cylinders of 3-in. boiler tube, attached to the bumper beam of the car by brackets. The springs are 2 11/16 in. in outside diameter, 22 in. in free height and have about twenty-three coils of ¼-in. steel. The weight of the moving parts is about 180 lb. Upon admission of air to the cylinders, the springs are compressed and the sliding parts forced down upon the track very quickly and held down with strong pressure so as to scoop up anything lying thereon. The apron is framed of ¾-in. standard wrought-iron pipe and is 78 in. wide over all, and 26 in. deep over all. The frame is filled in with mesh of No. 7 steel wire, 3½-in. diamond mesh. The lifeguard or vertical screen is framed of ¼-in. round iron, is 78 in. wide over all and 27 in. high over all, and is filled in with mesh similar to the apron. The projection of the apron in front of the bumper beam is approximately 33 in. The front edge of the apron is suspended so that it clears the track by about 6 in.

A few inches above the platform floor is placed a special rotary fender valve with axis horizontal. On the stem is a lever with a pedal, and with a link connection to the swinging fender, which is hung on pins on the brackets. Impact with some body on the track will therefore throw the fender back and operate the fender valve. The fender valve can also be operated by a bronze handle placed beside the motorman's brake valve and connected by link with the fender valve. In an emergency, when confronted with the danger of running over someone, the motorman uses this handle instead of the air-brake handle, pushing it away from him in practically the same direction as in moving the brake valve handle to emergency. This results not only in dropping the fender on the rails but also in making an emergency application of the air brakes, by admitting air through the fender valve independent of the regular brake valve. Pressure on the pedal releases the air from the fender cylinders and allows the springs again to raise the fender. The air brake is then released by the brake valve in the ordinary way, a check valve preventing the air from running back through the fender valve, although permitting air to be fed through fender valve to brake cylinders, with brake valve in "lap" position.



SEATTLE MUNICIPAL CAR—ELEVATION SHOWING FENDER MECHANISM

A fender is permanently attached to the bumper beam at each end of car, the fender not in use being folded up against the dashboard, allowing freedom of motion for the drawbars. There is a double articulation for folding, the first motion merely folding the apron against the lifeguard, the second doubling both of them up and back against the dash. The weight specified for each fender is not in excess of 210 lb., and the pressure on the travel stops of the moving part which drops on the track is specified to be at least 500 lb., but not in excess of 1000 lb., with a pressure of 60 lb. per square inch in the air cylinder.

Electric Sign in Street Railway Competition

As a stranger in the city of Topeka emerges from the union railway station, he is greeted with the shouts of hackmen and cabmen seeking business. If he is alert and is inclined to be thrifty, his eye soon catches sight of a small but concisely worded electric sign on a pole across the street. This sign is shown in the accompanying illustration. Its legend reads "Cars Leave This Point Every Five Minutes Reaching All Parts of City."

CARS LEAVE THIS POINT EVERY FIVE MINUTES REACHING ALL PARTS OF CITY
H. B. MOBERG JEWELER

TOPEKA ELECTRIC SIGN WHICH ATTRACTS THE TRAVELER'S CUSTOM

The Topeka Street Railway, operated by the McKinley Syndicate, has chosen electrical advertising as the most efficient method of attracting the attention of the traveling public and thereby bringing the nickels to the company's purse. It is noticeable that in Topeka the bus and cab business is less flourishing than in the neighboring towns and cities.

Passenger Traffic to Illinois State Fair

The Springfield Consolidated Railways Company of Springfield, Ill., reports that 67,000 less passengers were handled in 1914 than in 1913, to and from the Illinois state fair grounds in that city. In 1913 the company handled to the fair grounds a total of 798,000 passengers and in 1914 the number dropped to 731,000. These figures include all transfers from other lines in the city, police passes and all other forms of free transportation allowed by law. The largest day in the state fair week this year was Thursday when 115,000 fares were collected. This is a falling off of 29,000 fares from the largest day in 1913. The company has not sought to ascertain the reason aside from the fact that the state fair of Illinois in 1914 was not as well attended as was the exposition in 1913 and in previous years. The ticket sales at the fair grounds gates showed a decided falling off from the previous year and the receipts of the Springfield Consolidated Railway Company showed a similar decline.

Fair Interest on Investment in Public Utilities

The Author Discusses the Claim that Rates Should Be Based on Depreciated Values and Points Out that the True Criterion Is the Principal Invested—Different Values Also for Rate-Making and Taxation

BY H. J. DAVIES, TREASURER CLEVELAND RAILWAY

John B. Geijsbeek, C.P.A., contributed an article to the April, 1914, number of the *Journal of Accountancy* on "Fair Return to Public Utilities," in which he undertook to show the normal value of a public utility plant to be about 54.55 per cent of its original cost, or half-way between cost and scrap value. Mr. Geijsbeek says that this premise is not new and was described in a report made in September, 1912, to the Public Service Commission of St. Louis by James B. Allison, its chief engineer.

The operating efficiency of a traction plant is probably as high as that of a telephone plant, used by Mr. Geijsbeek for illustration, and higher than 54.55 per cent of its original cost. In a growing city a public utility plant never stands still, never is finished, never stops growing. Demand for additional service requires an increased supply of capital. And so the investment, the amount of "original cost," becomes legitimately larger, annually, monthly, almost daily. And the cost of the additional property is so large a proportion of the total investment that always more than half the property is less than half worn out—has lived less than half its life. The value of such a property, therefore, never falls to an average or "normal" of 54.55 per cent, or half-way from its original cost to its selling price as scrap.

Public utility companies usually own land, and the value of land in a growing community usually appreciates instead of depreciates as the value of all other property does. This enhancement in the value of land tends to keep the average value of the whole property above the half-way point on the road from first cost to final junk pile.

A "normal value line" of 50 per cent or 55 per cent can only apply to or be true of a utility that is neither increasing nor decreasing its plant or its service. Every public service company that is adding to its property to meet the increasing demands and needs of the public has, and must necessarily have, a property worth more than 54.55 per cent of its cost.

DEPRECIATED VALUE STILL IN PROPERTY

Mr. Geijsbeek says that "if depreciation is charged in addition to repairs and renewals, the public, or the consumer, has paid back to the utility company that amount for immediately existing reduction in the value of the property due to wear and tear not yet made good by renewals. That is either in the pockets of investors or stockholders or is in a reserve fund; if not in the fund, then it is in the reserve account and has been used to purchase additional plant. This, the depreciated plant value, added to earned surplus either on hand or paid to stockholders, will equal the original investment. In such a case a fair return can be only on the depreciated value of the original cash investment, and not on the cost of reproduction. Therefore, if depreciation is allowed in addition to repairs and replacements, the cash investment upon which a fair return is allowed is reduced each year by the amount of depreciation so allowed."

This is not so, unless the amount of the depreciation is returned to the investors as part of their principal. If the amount of all depreciation is returned to the investors as part of their principal, then, when replacements are needed, it will be necessary to invest new capital, which also must be returned with full interest.

If the stockholders have received from earnings, in addition to a fair return of interest upon their investment, a part of the investment itself, and if the contract between the utility and the municipality limits the rate of interest upon investment, it may be proper to reduce the capitalization, or the amount upon which interest shall be paid; but if the principal of the stockholders is kept in the business, whether a depreciation reserve adequate to provide for the disappearing value of the physical property is set up or not, the stockholders should receive interest upon the entire amount and not merely on the depreciated value of the property. Mr. Geijsbeek seems to see this in his "Conclusions as to Deterioration," for he says "Instead of paying this depreciation item to its stockholders in dividends out of surplus, this amount may be held by the company in a reserve account or, sometimes, a reserve fund, in order to keep the investment always at 100 per cent, i.e., present value (or, ultimately, normal value) plus unconsumed depreciation reserve, must always equal original cost." He further says, and truly, that it is difficult to divide the difference between "cost new" and "present value" into renewals and what he says is called depreciation, viz., "that unknown portion of plant value lying between reproduction and normal values that will never be replaced by renewals and which should remain in the reserve accounts or funds to be given to the stockholder at the cessation of operations in order to return to him the 100 per cent he originally invested."

In the meantime, and until the cessation of operations, or at least until he gets his money, or some of it, back, the stockholder should receive interest on the entire amount of his original investment and not merely on the remaining value of the property purchased with his money.

INTEREST SHOULD BE PAID ON ENTIRE PRINCIPAL

Again, under the heading "Fair Return on Investment," Mr. Geijsbeek writes: "Having decided the subject of depreciation, the question of fair return on the investment comes up. It seems almost impossible to find any two men who agree on what amount the interest considered to be the fair return should be charged. Especially is there a great difference of opinion as to whether the fair return should be calculated on the original cost value or the cost to reproduce the property, or whether it shall be the depreciated value, or the present value, which ultimately will become the normal value."

On the contrary, it is difficult to see how any two men can disagree as to the amount on which interest should be charged. It should be the full amount of honest investment, not the depreciated or present value of the physical property. The toll or rate of fares should be high enough to pay expenses, taxes, a fair interest on original cost, i.e., investment, and to set up a maintenance reserve equal to the difference between cost and present value. If this reserve, which may be

in cash, securities or other physical property (cash and securities are as much property as cars or telephone wires), is adequate, then the value of the company's property will be equal to the investment—as it should be. If, instead of providing for such a reserve, and then keeping it in cash or investing it in additional physical property or in securities, the company uses it to return to its stockholders a part of their principal, calling in some of the outstanding stock or bonds, it may be argued that, the investment having been reduced, the rate thereafter should be based upon so much of the original amount as is still invested. In no case should the rate be based upon present (depreciated) value—unless the stockholders have received, in addition to their interest, the entire difference between cost and present value. If a part of the investment of the stockholders has been returned from earnings and the amount of stock or bonds originally issued has been correspondingly reduced, or if additional property has been purchased from earnings and the difference between investment and present value has been thus lessened, the ratepayers who have contributed to the earnings so used have paid more than should have been charged them; and the ratepayers of the future will be charged less than they ought to pay, because they will pay upon a valuation smaller than the amount of money invested for their benefit.

For illustration, suppose an investment of $1,000,000 in an electric railway property, under an agreement between the company and the municipality that 10 per cent per annum on the investment shall be paid to the stockholders of the company, and suppose that a depreciation of 20 per cent, or $200,000, ensues, the remaining value of the property being $800,000. The company ought then to have, in addition to the $800,000 worth of physical property, a reserve of $200,000 to take care of the 20 per cent depreciation. If, instead of keeping this reserve in cash or investing it in bonds or other property, the company should pay it to the stockholders, in addition to interest at the rate of 10 per cent per annum, then 10 per cent interest on the remaining $800,000, instead of on the original investment of $1,000,000, may be the fair return thereafter, because 20 per cent of that investment has been returned to the investors. In that case $200,000 of the stock or bonds should be called in.

This transaction is perfectly fair and just to the investors and the company; but is it fair to the car-riders of the period in which the depreciation occurred or the reserve was accumulated? Should they have paid for their rides $200,000 in addition to 10 per cent ($100,000) upon the original investment? And should the car-riders of the future have the benefit of that contribution to capital by the car-riders of the earlier period and receive their rides for 10 per cent ($80,000) on only $800,000? If so, then when the property is worn out, or becomes inadequate or obsolete, and is replaced by other property, the cost of the new property must be provided from new capital, on which interest must be paid. And so, instead of paying off a part of capital as physical property depreciates and calling for additional capital when the time for replacement comes, the practice has been to set aside a reserve for maintenance or for depreciation and replacement of physical property and to invest the reserve, or some part of it, in securities or additional physical property. It is not necessary that the reserve be kept in cash. Invested in securities or physical property it should earn a larger return than savings bank interest. This practice is a better security for the investment than alternate payments of principal and demands or calls for new principal.

The car-riders of each month or year should pay a toll or rate of fare sufficient to enable the company to pay its operating expenses, its taxes and a fair rate on its investment, and, in addition, to set up out of the earnings of the month or year a reserve sufficient to take care of the depreciation, as nearly as it can be estimated, in the value of the physical property in the month or the year. The reserve ought not to be less than the depreciation. It ought not greatly to exceed it. Of course, the depreciation is not susceptible of exact ascertainment in advance; but it is possible to make a reasonable estimate, based on the experience of the company and the known experience of other companies in the same business. The reserve should be ample—too large rather than too small. It is easier to reduce the rate of fare to correct an overestimate than to raise the rate to make good an underestimate.

If it were practicable, from the beginning of such an enterprise as an electric railroad, to pay to the stockholders as a partial return of the investment the amount of the increasing difference between the original cost and the present value of their property until the average or "normal" value, or a still lower value, was reached, calling in outstanding stock or bonds as partial return of investment was made, then it would be necessary, whenever renewals or replacements were required, to call on the investors or the public for additional capital to pay for new property to take the place of the obsolete, inadequate or worn-out equipment.

A reserve to provide for repairs as well as for renewals and depreciation would seem to be better than a reserve for depreciation merely, or for depreciation and renewals. It may be called a maintenance reserve. It should be large enough to provide for the difference between cost and the remaining value, at any time, of the physical property. An amount should be set aside in cash each month or each year, or by other periods, equal to the estimated difference between cost and present value in the period, and charged to expense. This reserve should be used for repairs and renewals. The excess above expenditures may be invested.

DIFFERENT VALUES FOR RATE-MAKING AND TAXATION

Public utility managers and taxing officials have been embarrassed and confused by attempts to fix one value of physical property for rate-making purposes and another value for purposes of taxation. There should be no confusion. The value for rate-making purposes may be greater than the value for taxing purposes without inconsistency. The value for rate-making purposes should be cost or reproduction value; the value for purposes of taxation should be the value at the time of the tax assessment. If the maintenance reserve is sufficient to make good the difference between cost and present value, the tax value will be the same as the value for rate determination. The property taxed will include the maintenance reserve, whether the reserve is in cash, securities or plant. If the reserve is not as large as the difference between the original cost and the present value of the property, the loss is not the public's but the company's. It indicates that the fare is not high enough to secure the entire investment and a fair return upon it. The public gains, therefore, rather than loses.

The company should not be taxed on the amount of its loss by reason of the insufficiency of the fare to provide for depreciation and reasonable dividends; it is enough that it be taxed on the fair value of its property, including whatever is in its maintenance reserve. It should not be taxed upon its capitalization, unless its physical property and its reserve are equal to its capitalization; and even then the basis of taxation should

be expressed as the value of the property and not as the capitalization. It should not be taxed on the capitalized value of its supposed or actual net earnings, as has been attempted in Ohio. If the rate of fare is inelastic—fixed by contract for a term of years—and the company cannot pay reasonable dividends and provide a sufficient reserve to take care of the difference between cost and present value, it must forego the dividends or a part of them, or, at the end of the contract, lose the difference between cost and the value at that time of its property. But the value of the property, including the value of the reserve, should be the basis of taxation. If the combined value of the existing property and the reserve is equal to the investment, the value for taxation and the value for rate-making will be the same. If the reserve is too small, the loss of the difference between cost and present value, or any part of that difference, will be, as before stated, the investor's loss, and not the public's, in the case of a franchise with a fixed rate of fare. If the reserve is too large under such a contract, the company will gain, but the public will pay only the rate of fare it contracted to pay and will gain in taxes on the excess of value. In the case of a franchise providing for an elastic fare, like the Cleveland franchise, if the company cannot earn its fixed rate of interest and a sufficient reserve at the going rate of fare, the fare may, and ought to be, raised. If the earnings are more than sufficient to pay the stipulated interest and provide a sufficient reserve for maintaining the property at a value equal to its cost or agreed "capital value," then the rate of fare may be reduced. Capital should equal cost—should be neither more nor less than cost. Conversely, cost should equal capital. Present value, plus reserve, should equal cost. But whether capitalization, original cost and present value plus reserve are equal to each other or not, the basis of taxation should be the present value of the property, including the reserve. That value may be more or less than the original cost or the outstanding capital. In either case, it, and it only, should be taxed.

I do not mean that there should be excluded from cost any proper "overhead charge," using that phrase in its widest application, nor the value at the time of its acquisition or subsequently of any land, money or other property donated to the company.

Chicago Elevated Safety Rule Book

As a part of its general safety movement, the Chicago Elevated Railways has issued a book of safety rules. In the preface President Budd states that the purpose of these rules and regulations is to induce habits of caution and cultivate in every employee the thought of being careful of his own safety as well as that of his fellow employees. The rules and cautionary instructions are the result of experience, and putting them in printed form merely places general information in definite and convenient shape for reference by employees.

The book contains about eighty pages of safety rules applying to all departments, and others intended specifically for the transportation department, trainmen, motormen, guardmen, towermen, crossing flagmen and gatemen, and the shop, road and electrical departments. In addition to these rules the book contains a set of first-aid instructions, a list of the first-aid relief stations on the elevated system and the contents and use of the first-aid boxes. In the back of the book several pages are devoted to a telephone directory of the various offices and departments of the road, as well as the telephone numbers and addresses of the company's physicians.

Discussion on Government Ownership

The National Civic Federation Devoted One Session to Discussion of This Subject

One session of the fifteenth annual meeting of the National Civic Federation, held at the Hotel Astor, New York, on Dec. 4 and 5, was devoted to discussion on the subject of "Governmental versus Private Enterprise." Samuel Gompers, president American Federation of Labor, presided at this meeting which was held on the afternoon of Dec. 4. In opening the meeting Mr. Gompers spoke of the committee of the American Federation of Labor which went to Europe to investigate the subject of public ownership and its relations to workers in the endeavor to reach proper conclusions on this much-mooted question. An abstract of this report was published in the issue of this paper for Nov. 21. Mr. Gompers added that the question was not merely academic, but the claims of each side should be critically examined to disclose whether the proposal is practicable or impracticable, wise or unwise.

DISCUSSION BY PROFESSOR JENKS

The first speaker was Prof. Jeremiah W. Jenks, New York University, who said that the post-office department, so far as anyone can learn, has made no statement of cost accounting in connection with the parcel post, so that one can determine whether it is really carrying cheaper than do the express companies or whether, as seems not improbable, the difference in charges to shippers is made up by the low rates forced upon the railroads against their will or by shifting the burden upon other branches of the postal service or upon the taxpayers. Concerning the question of whether municipal utilities shall be owned and managed by the municipality or by private companies under municipal control, Professor Jenks thought the advocates of this plan should declare what they considered should be guiding principles. Is it to be better service, cheaper service, even free service, or revenue? Whatever the principles may be, the facts should be known. If we are to compare costs, let us have identical systems of cost accounting. If the question is service, let us know whether the people prefer seats or to wait for half an hour before they get a ride, as passengers often have to do in continental cities. If the government is to take the telephone and telegraph, is it to secure better service or cheaper service or for the protection of the people? The state ought to undertake nothing without definite knowledge of the facts to guide it.

Professor Jenks said that in the discussion of the subway situation in New York City which preceded the settlement and the recent contracts, much time was given to the consideration of the matter by public officials. If this had been the time of the officials of a private corporation their salaries and the interest on the capital would be charged as part of the cost of the undertaking. He had never heard it suggested that if there was to be proper cost accounting these costs should be included under the existing subway arrangement, or that the rent for quarters in the City Hall should be so apportioned that part of the charge should be allocated for the time thus spent. All of these considerations were dropped. If private and public operations are to be compared all of these should be included. There is not now sufficient knowledge to permit careful consideration, and this will not be obtainable until systematic cost accounting is introduced.

DISCUSSION BY CONGRESSMAN LEWIS

Congressman David J. Lewis spoke in favor of public ownership of the telephone and telegraph service.

"Postalization" of telephone and telegraph service would bring under the control of the government the only outstanding means of communication. Manifestly competition in electrical means of communication is wasteful. On economic grounds that field belongs to monopoly which alone can discharge the functions with proper regard to the price. The speaker pointed out one difference between the express companies, which have been affected by the parcel post, and the telephone and telegraph companies, which would be affected by public ownership. He said that the express companies were really only preferred shippers on the railroad while the telephone and telegraph companies had large investments of their own capital in plants.

DISCUSSION BY MR. GORDON

F. R. G. Gordon, organizer American Federation of Labor, Boston, gave facts and statistics to controvert the argument and statements of Congressman Lewis. He said that practically every telephone and telegraph government system abroad is run with extraordinarily poor service, although paying about one-third of the wages to operatives that are paid by the American Telephone & Telegraph Company and the Western Union Telegraph Company. He said that the so-called wonderful post-office department of the government is the worst managed big business in the country. The post-office department is the recipient of very large favors from other departments of the government because of the failure to introduce cost accounting principles between the various departments. The post-office department does not pay for either use or care of many buildings which it occupies. Mr. Gordon said that the reason why the post-office department is able to claim a success in the parcel post is that it does not pay the railroads what it should pay them for carrying packages. The United States pays less than any other government for transportation of its mail. To take over the telephone and telegraph system would mean that all of the people would be taxed for the benefit of the 5 per cent or 6 per cent who use the service and are best able to pay the bills therefor. He declared that public ownership was cursed by red tape and was characterized by inefficient service, poor wages and large deficits. Governments have always been extravagant and wasteful.

DISCUSSION BY DR. HOWE

Dr. Frederick C. Howe, commissioner of immigration of New York, in his argument in favor of public ownership, declared that probably the political and moral gains would be even more important than the financial and social gains. Public ownership removes one of the principal causes of corruption from politics.

DISCUSSION BY MR. SULLIVAN

J. W. Sullivan, member of Typographical Union, New York, made an address on "Municipalization or a Just Regulation, a Plea for the Facts." Mr. Sullivan was a member of the National Civic Federation commission which studied the subject of municipal ownership abroad in 1907. He also spent last summer in Europe and rendered assistance to the committee of the American Federation of Labor which studies electric railway labor conditions abroad.

He said that comparisons of British and American street railway fares were usually misleading because the British municipal tramways rarely give transfers and that a passenger changing from one line to another paid another fare and was counted as a second passenger. For all distances beyond 5.8 miles the fares in Glasgow are higher than the American 5-cent fare, and Glasgow has only 1 mile of track per 6779 of its population, whereas Philadelphia has 1 mile per 2533, or three times the accommodations. For most British cities, fares beyond 3½ miles are higher than the standard American fare and transfer. The British systems also invariably stand second to American systems in speed, headway, car lighting and in an all-night service. European tramway managers are now abandoning the rule of a seat for every passenger, borrowing from America the practical idea, especially in rush hours, when all the cars possible are run, that the extra people want to travel speedily to their destination standing in the cars rather than to lose time and endanger their health standing on the street corners waiting exposed to the weather. Mr. Sullivan quoted a number of failures of British municipal enterprises, including the municipal Thames River boat system with a loss of $2,500,000, and the Glasgow municipal telephone system with a loss of $275,000, and said that the municipal ferry system of New York was a grand object lesson in municipal ownership.

In discussing the labor situation on municipal roads abroad he said in part: "Strikers against municipalized undertakings are treated as mutineers; the position of the municipal wage-working employee is that of a common soldier directed by a drill sergeant, whose whip is a discharge which closes to the man other municipal employment everywhere. Among the assumed certainties of the early theoretical municipalizers was set down the one that municipal employees would not or could not strike. But bitterly contested tramway strikes, viewed by the authorities as rebellions, have taken place in the last four years in Leeds, Stockport, Blackburn, Cardiff, Oldham, Liverpool and Glasgow. After the Glasgow strike of 1911, 400 of the strikers were victimized and never allowed to return to the service, and after the strike in Leeds in 1913 practically the entire tramway force was similarly victimized. In Glasgow, in the seven years, 1901-1908, 1228 traffic employees were dismissed and 2384 resigned, a number equivalent to a change of the entire traffic force every four years, testimony to an unhappy situation. The Glasgow tramway management, maintaining an open shop, permits no labor union of employees to exist. Were all Britain to imitate the attitude of Glasgow's municipal committee and managers toward labor, no employee would be permitted to be active in politics, no man would be taken on at work without a civil service examination, no trade agreement could be thought of, no liberty of association among the wage-workers could exist, no work at his trade could be found by a man once blacklisted, and no labor movement would be tolerated in the country."

After referring to the report of Messrs. Mahon and Bland on labor conditions abroad, abstracted in a recent issue of this paper, Mr. Sullivan said: "Municipalism breaks down trade union principles; it substitutes for them a one-sided dictation which strips labor of independent action in its own behalf, clothes managers with the powers of an upper caste, backed by the forces of law, and to the extent that it prevails establishes in society a condition destructive of democracy. On that score alone the American wage-worker needs only to have experience with it to reject it. But the American wage-worker, a citizen with the cause of his country at heart, may be depended on to weigh the facts in general relative to municipalism, when he finally obtains access to them, and render fair judgment in the case. Further, whatever is to be said of contests over wages or of the social unrest, it is usually a fact that American employees regard their employers as friends for whose rights they will contend as they would for their own, and if municipalism is to be built up on abuse of the employer and depriving him of any of his just rights, it to-day stands small chance of success."

B. R. T. Safety Work for Employees

Moving Pictures as a Safety Lesson for the Mechanical Department's Men—Safety Programs of Mechanical and Transportation Departments, Including List of Suggestions Adopted by the Former and Employees' Committee—Organization of the Latter

The thorough safety campaign which the Brooklyn Rapid Transit System has carried on for a year or more among the general public, and particularly among the schools, has lately been extended to its employees. As one feature to secure the interest of the men a safety rally was held for the employees of the mechanical department at the East New York headquarters of the B. R. T. Employees' Benefit Association on Saturday night, Dec. 5. The meeting was under the chairmanship of W. G. Gove, superintendent of equipment mechanical department, who introduced as the speakers of the evening H. A. Bullock, chairman of the company's central safety committee, and Dr. Francis D. Patterson, director of the department of sanitation and accident prevention formed jointly by The J. G. Brill Company, Harrison Brothers Paint Company and Electric Storage Battery Company, all of Philadelphia. A concert by the B. R. T. Employees' Band preceded the addresses.

Mr. Gove told what the mechanical department had already done for safe operation. It had occurred to him, however, that a face to face meeting with the men would accomplish even more than correspondence and bulletins. He emphasized the fact that mechanical protection was not everything. Real safety could be achieved only with the co-operation of the individual workers.

Mr. Bullock, after being introduced by Mr. Gove, said that the object of the company was to make the endeavor for safety continuous and permanent. Working rules were just as necessary to maintain the morale of a shop as of an army. He then gave a résumé of the growth of the "safety first" movement and showed particularly how electric railway hazards had been increased by the introduction of heavier, faster cars and the congestion of city tracks. Discussing safety from the psychological standpoint, Mr. Bullock told how custom breeds such indifference to danger that a soldier will risk his life to get a light for his pipe. The same characteristic leads a workman to become careless in doing things that always have an element of danger, such as climbing ladders, serving rip-saws and steam hammers, etc. Co-operative action as well as the physical resistance embodied in rules and devices was necessary to combat this tendency. In conclusion, Mr. Bullock asked every man to appoint himself a safety inspector to aid in the removal of dangerous conditions, and to resolve furthermore that if any casualties did occur to a fellow-worker he would make use of the company's first-aid treatment instead of trying to carry out the cure himself.

Following the showing of the company's well-known safety film, "The Price of Thoughtlessness," the audience was addressed by Dr. Patterson. The speaker first presented some statistics of railway and individual accidents in the United States, and followed this with a splendid collection of slides which illustrated the wrong and right way of doing scores of building, yard and machine tool jobs. As an example of what safety work could do, he said that accidents at the Brill shops had been cut from 260 to thirty a month. One of the most prolific sources of accident had been protruding nails. This evil had been scotched so thoroughly that during the past six months not one nail wound had occurred to a Brill workman. It was a good thing to have employees' safety committees, for a man who had once served on such a committee was likely to retain his interest in the work. Dr. Patterson's pictures and his comments on them were well received.

In taking the floor again, Mr. Gove said that the mechanical department had done much to attain safety, but more remained to be done. He wanted the men to understand that he was just as anxious to have safe and satisfactory working conditions for them as he was to have safe and satisfactory cars. As an individual he could do much for their welfare and he knew that he could rely upon co-operation of the office staff with which he was in daily contact, but his goal would not be attained unless the man behind the tool was also determined to help. Without clean shops, clean floors and clean machines, and without due regard by each man for the welfare of his fellow-employee, the organization would never get anywhere. In analyzing the shop accident reports covering the preceding six months he had been deeply impressed to find that 75 per cent of them could have been avoided had the injured man used ordinary care. In conclusion, Mr. Gove mentioned the probable early formation of employee's safety committees at each shop. He also assured the men that every suggestion for betterment would receive due attention.

The meeting concluded with a display of several moving pictures by Dr. Patterson, one of which told the story of an old-fashioned workman whose ill-timed counsel to remove a safety device on gearing was responsible for a serious injury to his future son-in-law.

DEPARTMENTAL SAFETY COMMITTEE OF THE MECHANICAL DEPARTMENT

The departmental safety committee organized for the mechanical department has already submitted a report for the first three months of its existence, July 1 to Sept. 30, 1914, and will hereafter continue to submit similar quarterly reports. The committee is composed of the following officials: superintendent of equipment, chairman; superintendent Fifty-second Street surface shop, vice-chairman; division shop foreman Southern division; foreman Crosstown surface carhouse shop, and the superintendent of electric car equipment. The chairman serves continuously while the other members hold office for one year from June 30, 1914. The plan is to appoint those holding similar positions in the mechanical department as members of the succeeding committees. Local shop committees, if appointed, will report to the departmental committee. Regular meetings are held at 3 p. m. every Monday in the office of the superintendent of equipment. Special meetings are held at the different shops whenever called by the vice-chairman.

The following is an abstract of the first quarterly report which was distributed in an edition of 3500 to employees of the department. The next edition will total 12,000 copies and will be distributed to all employees of the company. The report was produced by the department with a motor-driven American Multigraph.

SAFETY REPORT OF THE MECHANICAL DEPARTMENT

The first work of the departmental safety committee was to make the following recommendations:

Place mail boxes in all shops for safety suggestions, providing frames to post pictorial matter in reference to safety work; supply supporting beams at maintenance

shops in jacking cars; provide on all air hoists cylinder head with jaw for hanging in place of heads with hook upset inside of head, thereby permitting more ready and easy inspection; take photographs to illustrate accidents that frequently occur and that are due to carelessness; use sheet metal non-slip slings for handling armatures; paint red all safety appliances and devices installed at shops, attached to or placed around machinery.

The following work has already been undertaken:

Installed safeguards around machinery at Thirty-ninth Street elevated shop on Sept. 21 for $397.83; at Southern Division elevated shop on Aug. 13 for $344.35, and at Fifty-second Street surface shop (under way) for about $133; purchased four hydraulic jacks for De-Kalb Avenue shop (under way) for about $460; constructed four hooks for hoisting open cars at the Ninth Avenue shop on July 23 for $188.07; constructed and installed mail boxes for safety suggestions, and frames for pictorial matter, at all shops (under way) for about $112.78.

The accidents during the quarter under report are classified in the accompanying table.

SUMMARY OF ACCIDENTS

Class	Injuries	52d St. Srf. Shop	Ea. Div. El. Shop	39th St. El. Shop	El. Mtce. Shops	S. C. H. Shops	Totals
A	Cuts	8	28	87	9	20	152
B	Burns	2	3	3	2	7	17
C	Bruises	6	11	44	9	15	85
D	Bones broken...	..	..	..	..	1	1
E	Sprains and strains	6	..	5	2	1	14
F	Electric shocks.	..	..	1	1	..	2
G	Foot punctures.	1	..	5	..	..	6
H	Nails torn off..	1	2	1	..	..	4
J	Eye	1	5	3	..	..	9
K	Loss of member	1	..	..	..	..	1
L	Internal	..	1	1	..	..	2
	Totals	26	50	150	23	44	293

Attention is specifically directed to the large number of miscellaneous accidents which consist principally of accidents that occurred to employees while they were engaged in their regular duties and which, in most cases, were the result of carelessness, such as striking hand against projecting nails or sharp corners, dropping material which struck the person handling same or others, jumping from car or truck to floor, etc. The figures cover a total of 2000 employees. The comparatively large number of accidents at the Thirty-ninth Street shops were due to the extraordinary reconstruction of 2411 surface cars for air-brake service as described in the ELECTRIC RAILWAY JOURNAL for Oct. 31, 1914.

SURFACE TRANSPORTATION DEPARTMENT

Bulletin No. 11, just issued from the office of William Siebert, superintendent of surface lines, outlines the safety work of the surface transportation department. The safety committee of this department consists of the following: superintendent of surface lines, chairman; chief of the time-table department, supervisor of instruction, supervisor of line inspection, superintendent of employment, general inspector and two assistant superintendents. All the assistant superintendents will serve in turn on the committee.

In every depot there has been organized a depot safety committee, consisting of the following: Assistant superintendent in charge of the depot, chairman; day depot master, night depot master, one starter, one inspector, three motormen and three conductors. The starter and the inspector will be designated in rotation, so that all starters and inspectors will serve in turn. On Dec. 7, 1914, the motormen and conductors were elected by all the motormen and conductors at the depot in the following way:

The twenty motormen longest in service at the depot on the regular list and the five motormen longest in service at the depot on the extra list were the nominees in the first election, and each motorman in the depot force voted for three out of the twenty-five nominees. The same practice was carried out for conductors. The men who led in the vote received will serve six months on the depot safety committee, while those who secured the second largest number of votes will serve four months and the third highest men, two months.

At the future elections which will be held every two months, one motorman and one conductor will be chosen from a list of twenty-five motormen and twenty-five conductors as in the first election. In this way membership of the depot safety committee will rotate.

Membership is voluntary. Members who are paid by the hour are allowed compensation at their regular rate for time actually spent in assignments of safety work made by the departmental committee. The names of those elected are posted in the extra room, together with the names of the other members of the committee. The stenographer attached to the assistant superintendent's office serves as secretary of the committee. Regular meetings will be held weekly.

For the safety suggestion box the company has provided two forms as follows: Form A to cover suggestions submitted for consideration by the depot safety committee and departmental safety committee, but not requiring immediate consideration; Form B to cover suggestions relating to safety matters requiring immediate consideration, and submitted to the assistant superintendent, depot master or other official in charge of the depot at the time such suggestions are made.

Safety suggestions submitted on Form A are considered by the depot safety committee and the departmental safety committee. They are written on a special form (not reproduced), showing the name, class of employment of the man who makes the suggestion, and the badge number, all written above a perforated line, while the suggestion itself is written below a perforated line. These suggestions are deposited in the safety suggestion box, from which they are removed each day by the assistant superintendent, who forwards them to the office of the superintendent of surface lines, where the portion of each form above the perforated line is detached and placed in a file. The portion of each blank below the perforated line will be returned to the safety committee of the originating depot, which will approve or disapprove them without knowing the names of the writers. The depot safety committee's report on the suggestions is transmitted to the departmental safety committee, which reviews the report and recommends to the superintendent of surface lines for immediate or ultimate adoption, any suggestions which it approves. As each part of the form has a serial number, the names of the men whose suggestions are adopted can be readily determined by headquarters and due credit given.

No discipline is administered to any employee on account of facts revealed by safety suggestions submitted, and employees are asked to feel entirely free to discuss in these suggestions any conditions which bear upon the problem of safety without regard to the question of reflecting upon the work of any other employee. The same credit is given to employees who make meritorious suggestions on Form B as in the case of suggestions on Form A submitted through the safety suggestion box.

The following outline of topics for safety suggestions has been prepared for the guidance of employees:

A—Reports of conditions which are observed to be the cause of accidents. B—Reports of conditions which in the judgment of the employee submitting them may be the cause of accidents. C—Changes of methods which will tend to prevent accidents occurring or likely to occur as reported under (A) or (B). D—Changes in track construction or equipment which will tend to prevent accidents occurring or likely to occur as reported under (A) or (B). E—Any idea which in the judgment of an employee will promote safety in operation.

The safety bulletin board which carries bulletins, pictures and other data relating to safe operation is under the jurisdiction of the depot safety committee.

Convention of Pennsylvania Association

A Full Report of This Meeting in Harrisburg, Abstracts of the Various Reports and Papers Presented are Published—The Topics Considered Included Questions Relating to Engineering, Accounting, Transportation and Public Relations

The winter meeting of the Pennsylvania Street Railway Association was held in the Board of Trade Building, Harrisburg, on Dec. 8 and 9. The opening session on Tuesday was called to order at 1:45 p. m. by C. L. S. Tingley, vice-president Scranton Railway, who then read his president's address. This was followed by an address by Prof. Emory R. Johnson, member Public Service Commission of Pennsylvania, on the subject of "Electric Railways and the Public." These addresses are abstracted elsewhere in this issue. At the conclusion of Professor Johnson's address, E. H. Davis, manager Williamsport (Pa.) Passenger Railway, moved a vote of thanks, which was duly seconded and carried, and President Tingley assured the commissioner that the officers and members of the association were always ready to co-operate with the commission along the lines indicated. H. M. Stine, secretary-treasurer, then rendered a report for the year, showing a balance of more than $2,200. On motion of T. A. Wright, vice-president and general manager Wilkes-Barre Railway, the report was referred to an auditing committee to be appointed by the chair.

President Tingley at this point remarked that he had been requested by C. Loomis Allen, president American Electric Railway Association, to remind the delegates of the winter conference of the American Association to be held in Washington on Jan. 29. For specific information he called upon E. B. Burritt, secretary-treasurer of the American Association, who said that a very attractive program had been provided for the Washington meeting. The meeting was being held in that city largely on account of the opportunity for added publicity. President Wilson had promised to receive the delegates at the White House, and the meeting topic of "Public Relations" would be ably discussed by T. S. Williams, president Brooklyn Rapid Transit Company, and other notable speakers. Mr. Burritt also urged attendance at San Francisco next autumn. In closing he emphasized the desirability of closer relations between the national and the state associations, in which he was cordially seconded by President Tingley.

W. A. Heindle, superintendent Southern Pennsylvania Traction Company, Chester, Pa., next presented eight problems that had been referred to the "Question Box" and urged a spirited discussion thereon at the next session. President Tingley appointed F. B. Musser, president and general manager Harrisburg (Pa.) Railways; C. H. Bishop, president Valley Railways, Lemoyne, Pa., and Thomas Cooper, Philadelphia representative Westinghouse Electric & Manufacturing Company, as members of the nominating committee to report on the following day. The meeting was then suspended while the stereopticon apparatus was being set up, after which W. R. Stinemetz, in connection with his paper on "The Latest Developments in Street Railway Equipment," presented pictures and charts to illustrate means of cutting operating expenses through saving power and of increasing revenues through doing a freight business. The paper by Mr. Stinemetz is published in abstract form in another column.

RATES AND TARIFFS

The progress report of the committee on preparing and filing rates and tariffs was read by C. B. Fairchild, Jr., executive assistant Philadelphia Rapid Transit Company. Mr. Fairchild said that the Interstate Commerce Commission tariff requirements were extremely voluminous, but that in consultation with the traffic bureau of the Public Service Commission of Pennsylvania the committee had endeavored to boil down the federal requirements for State use. He mentioned the necessity of filing exceptions to the official classification and the overlapping of fare zones as two matters requiring special attention. The tentative draft submitted by the committee for discussion was criticised by W. B. Rockwell, manager Eastern Pennsylvania Railways, Pottsville, Pa., on the ground that freight and express tariffs were classified under one head. In his opinion the two classes may easily be separated by remembering that all express is delivered and called for, which is not true of freight as regards rates. Mr. Rockwell said that he recently rented a car to the express companies at a fixed sum per car-mile. If electric railways took up the question of express rates, they should charge on the basis of the pound-mile, but the pound must be limited as regards its cubic contents.

President Tingley stated that it was not within the province of the committee to discuss the setting of rates, inasmuch as it was appointed to solve rather the vexatious problem of securing non-cumbersome rules for filing rates and tariffs. As regards the distinction between freight and express, he felt that the combination classification best recognized existing inconsistencies in such kinds of traffic on Pennsylvania electric railways and had the support of the Public Service Commission. Mr. Rockwell said that no company should carry freight or express in passenger cars or handle such traffic at all if it's business did not warrant special cars for such purposes. However, according to an analysis of the varieties of freight and express service in the State, made by Mr. Fairchild, many small companies secure both increased revenues and better public relations by offering a little express or light freight service, and the joint classification is well suited to all such railways. Mr. Rockwell moved the acceptance of the progress report and the continuation of the committee, which was duly seconded and carried.

With the meeting then open for new business, Secretary Stine read a letter from R. P. Stevens suggesting that the association follow the lead of the American Association and substitute "Electric" for "Street" in its name. President Tingley said that the committee which drafted the constitution had discussed this point but had deemed the change unwise on account of the prestige of the old name. Mr. Davis called attention to the fact that under the act of 1889 most companies in Pennsylvania are incorporated as "street" railways, and Mr. Fairchild quoted the new public service commission law to show further adherence to this practice. Mr. Wright moved that the letter be laid on the table, which was carried.

CLASSIFICATION OF VOLTAGES AND SAFETY RULES

Owing to the inability of Gordon Campbell, president York Railways, to be present on Wednesday, the report of the committee on classification of voltages, of which he is chairman, was moved ahead a day on the program. An abstract appears elsewhere.

J. W. Welsh, electrical engineer Pittsburgh Railways, stated that the proposed Pennsylvania rules for safety had been submitted to the American Institute of Electrical Engineers and had been referred to the code committee of this association. He attended the meetings of the code committee as a representative of the American Electric Railway Association. At two meetings in the last month the committee recommended several changes in the rules, especially with regard to striking out the classification of low potential as up to 300 volts, high potential as 300 volts to 3500 volts and extra-high potential as above 3500 volts. Mr. Welsh criticised the idea running through the code that less than 300 volts were harmless and more than 300 volts destructive, for such a classification was purely arbitrary and injurious to the public, and no reason existed for such voltage classification from the standpoint of safety. The rules were also modified to apply only to cases of new installation. The general requirements of the code were not stringent and would be acceptable to most electric railway companies.

Mr. Fairchild quoted a recent order on his company to provide a guard on the blank polished end of a converter shaft in a substation as showing how vital this question is. Mr. Davis urged every member to read Circular No. 49, for in his opinion the rules suggested will prevent companies from pleading customary reasonable care against accidents and will increase the physical space required for attachments. President Tingley said that at one conference in Philadelphia the State Department of Labor and Industry had admitted that it had not considered street railways in the voltage classification, and this led to the reference of the question to the American Institute of Electrical Engineers. F. R. Phillips, superintendent of equipment Pittsburgh Railways, said that the real sting of the proposed State code lay in the voltage classification and he desired the opinion of the practical operating men of the American Electric Railway Engineering Association on the subject.

EMPLOYERS' COMPENSATION ACT

President Tingley announced that the draft of the employers' compensation act made by a special commission appointed by the Governor was now in print and ready for distribution. The meeting was then adjourned. At 7:30 p. m. an informal dinner was served to the members of the association and guests at the Harrisburg Club.

WEDNESDAY'S SESSION

The last day's session was called to order on Wednesday at 10 a. m. President Tingley stated that he had been asked by Mr. Burritt to announce that a one-hour hearing on the subject of reporting accidents was to be held before the Interstate Commerce Commission in Washington on Dec. 18. The commission is attempting to require the Detroit (Mich.) United Railway to report all accidents in the city of Detroit because it has a spur line running into Ohio. In view of the fact that many urban lines have extensions crossing state borders, the American Electric Railway Association has taken this matter up. Although only one speaker will be allowed at the hearing, a general demonstration is desired, for the entering of appearances will be allowed by the Interstate Commerce Commission.

The report of the committee on a uniform crossing agreement was then presented by its chairman, R. P. Stevens, president Mahoning & Shenango Railway & Light Company, Youngstown, Ohio. In connection with the report Mr. Stevens said that at a conference in Philadelphia the previous day it seemed that a closer feeling was being manifested between electric railways and other utilities in the State. The telephone companies were showing more co-operation, and if the telegraph companies and the Pennsylvania Railroad could be led to see electric railway difficulties, an acceptable and workable crossing agreement could be devised. An abstract of Mr. Stevens' report is published in another column. On motion the report was accepted and the committee was continued.

HEIGHTS OF CAR STEPS

In the absence of the chairman, H. J. Crowley, vice-president Scranton Railway, the report of the committee on height of street car steps was read by P. N. Jones, general manager Pittsburgh Railways. This committee was appointed to take up with the Public Service Commission of Pennsylvania the matter of the height of car steps. A meeting was held with representatives of the commission during the last national convention, and a large amount of data from the national body was submitted to the commission. Later the committee conferred with car builders, who furnished considerable construction data covering the limitation of minimum height allowable. This, together with photographs taken underneath a car to show the necessary equipment for its operation and control, has been turned over to the commission, upon which now devolves the task of determining the maximum height in accordance therewith. On motion the report was received and filed with thanks.

On account of the unavoidable absence of H. S. Swift, treasurer West Penn Traction Company, Pittsburgh, Pa., his paper on "The Work of the Accounting Officer of Public Service Corporations" was read by Mr. Fairchild. An abstract of this paper is published elsewhere.

QUESTION BOX

In taking over the meeting for the discussion of "Question Box" problems, Mr. Heindle said that fuller information should henceforth be presented with questions so as to cover all essential local conditions. Regarding the first question on what is the best automatic signal system for a medium sized single track interurban line operating at not very high speed, Mr. Heindle said that in times of rigid economy the old hand throw signal of five lights in series would be the most advisable system. With reference to automatic systems, P. T. Riley, Scranton Railways, described the three-year use of Nachod signals on a high speed 10-mile line with a 3 per cent grade, and P. F. Gerhart, electrical engineer Harrisburg Railways, said that on 20 miles of single track with twenty-two blocks the company had fairly good results from Eureka automatic signals. He presented some figures on their performance and maintenance cost. T. A. Wright, Wilkes-Barre Railway, then described the modified Ramsey signal used on part of that line and the Nachod system, which is used on 16 miles. His preference was for the latter system.

R. P. Stevens brought out the point that there is a large personal element in signal operation. After fifteen years' experience with all signals, he had decided that the Nachod system was best for and most satisfactory to his employees. Some trouble had been experienced with the contactor, but on his new Ohio properties there were high speed sections controlled by Nachod signals, and the service was smooth and reliable. The men were trained to use such signals and were in sympathy with them.

W. B. Rockwell was of the opinion that the so-called hand signal should be abolished. He criticised signal manufacturers for saying that their systems would run themselves but also said that electric railway operators had often failed to give signals fair treatment by not having an inspector to keep them in shape.

Mr. Stevens mentioned an absolutely "fool-proof" hand throw target signal, a few of which are used by the Lehigh Valley Transit Company, Allentown, Pa. One man is unable to put his key in the hole until the preceding man has gone through the block to unlock the box. While not advocating a hand-throw system, Mr. Stevens advised companies having such a system and desiring new equipment to investigate these signals.

On the subject of using in cars a small number of large-capacity lamps with reflectors and selector switch, Mr. Phillips said that recent investigations in Cleveland and Indianapolis at first impression showed the economy of such a practice, but that it was now beginning to be believed that small wattage lamps would give more economical service as well as correct illumination. He advised careful consideration of the subject before large lamps were installed. To determine losses in car circuits from trolley to motor and motor to ground, Mr. Phillips advised the use of a voltmeter and the temperature drop method.

The next query dealt with smoking regulations in closed cars. Mr. Heindles' company permits smoking on the rear platform in Delaware, but prohibits the practice in Pennsylvania. President Tingley said that his company in Dayton, Ohio, had tried ejectment proceedings, but after adverse court decisions efforts to stop smoking were abandoned. Mr. Rockwell favored prohibiting smoking on city lines and short suburban runs of fifteen and twenty minutes, but on long lines felt that the practice should be allowed. Mr. Heindle said that in Baltimore smoking is allowed on the rear seats of semi-convertible cars when the windows are open. Mr. Fairchild stated that the Philadelphia lines had prohibited smoking, mostly on account of its unsanitary features. Passengers were not permitted to carry lighted cigars on the cars. Regarding the loss of short riders as a result of such rulings, Mr. Fairchild believed that Chicago and Buffalo experience showed passengers soon chose to save time by riding rather than to walk and smoke.

The discussion on the advisability of concrete poles, especially in city work, was opened by Mr. Heindle, who said that his company had installed about fifty at $12 apiece, including frames and setting expenses. Such poles were often demanded by the public in select districts, but were not advisable for general city use when chestnut poles could be bought for $3.50 or $4. In reply to a question by President Tingley, Mr. Heindle said that concrete poles might well be used in fine districts, being cheaper than steel poles and yet long-lived.

Another question dealt with the use of a 5/8-in. wheel flange instead of a 3/4-in. flange in cases where the deeper flanges wear or become chipped before full life is secured. J. H. Yardley stated that a 5/8-in. flange is used in Philadelphia, and Mr. Fairchild called attention to the investigations on this subject of the American Electric Railway Engineering Association.

STANDARDIZATION OF ACCOUNTS

At this point Dr. John Price Jackson, Commissioner of Labor and Industry of Pennsylvania, delivered an address, which is abstracted elsewhere. Following this, C. J. Joyce, head of the Bureau of Accounts and Statistics of the State Public Service Commission, spoke a few words in connection with the uniform system of accounts yet to be adopted by the commission for electric railways. He said that not all accountants would agree with some details of the new Interstate Commerce Commission uniform system, but that this was quite workable. Moreover, by law it must be used by the interstate electric railways in Pennsylvania, and the adoption of a different system for intrastate lines would make it inconvenient to prepare intelligible statistics for all railways. Mr. Joyce stated that a recent circular letter suggesting the adoption of the national system had resulted in a few replies, all favorable. The State commission will take no action nor set a hearing until all companies have had sufficient time to study the system. If sufficient criticisms come up, the commission will call a meeting of electric railway accountants to thresh the matter out.

PUBLICITY

An additional query was at this point submitted to the "Question Box" on the subject of how far companies should go in giving out construction and operating costs to the public. Mr. Heindle felt that there was a point beyond which facts and figures were unintelligible to the public mind, both on account of lack of education and biased attitude. Mr. Rockwell thought that the greatest trouble was caused by facts being handled by reporters not acquainted with the technique of the industry.

President Tingley then recited how his company had in the last three years secured municipal grants in limited-franchise States by means of publicity. To make the situation more easily understood financial figures should be reduced to divisions of the nickel. Safety campaigns used by the company have been adopted as reading lessons in the public schools of two cities. In one case a good impression was created by showing the cost of an extension, the selling price of adjacent lots before the extension, operating receipts from the opening of the extension and enhanced sales value of lots as a result of the extension.

CONCLUDING BUSINESS

Owing to the recent severe sleet storm in eastern Pennsylvania, E. C. Spring, Lehigh Valley Transit Company, Allentown, Pa., was unable to be present and give his paper on "Efficiency Through Conservation of Time in Interurban Traffic." The auditing committee, W. S. Bell, assistant secretary and treasurer Wilkes-Barre Railway, and John O'Connell, secretary and treasurer Harrisburg Railways, reported on Mr. Stine's financial statements for the year, which were ordered filed.

President Tingley brought up the appointment of a committee to study auto buses, mentioned in his president's address. On Mr. Musser's motion, the matter was referred to the executive committee to prepare a report for next year and to work in conjunction with the committee of the American Association on the same topic. Mr. Heindle moved a vote of thanks to the Westinghouse, Electric & Manufacturing Company for sending a representative to give a paper.

The report of the nominating committee named the following men for office during the ensuing year: President, C. L. S. Tingley, vice-president Scranton Railway; vice-president, T. A. Wright, vice-president and general manager Wilkes-Barre Railway; secretary, H. M. Stine; executive committee, P. N. Jones, general manager Pittsburgh (Pa.) Railways; T. B. Donnelly, claim agent West Penn Traction Company, Pittsburgh, Pa.; Gordon Campbell, president York (Pa.) Railways, and Thomas Cooper, Philadelphia manager Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. The secretary was instructed to cast one ballot for the above nominees and the meeting was then adjourned.

PRESIDENTIAL ADDRESS

BY C. L. S. TINGLEY, VICE-PRESIDENT AMERICAN RAILWAYS COMPANY

President Tingley stated that the work of the association has grown steadily in volume and value, the membership now including thirty-eight active members and thirty-six associates. The only resignation during the past year was caused by a merger. The fortnightly bulletin issued from the secretary's office is giving valuable service.

The work in collaboration with the state departments is of particular importance. Conferences have been held with representatives of the Public Service Commission. A conference on the question of agreement upon a general form for filing rates and tariffs was followed by the appointment of a committee, which has held several conferences with George P. Wilson, chief of the bureau of rates and tariffs. Another conference on the height of car steps was held between Dr. F. Herbert Snow, chief engineer, and J. P. Dohoney, investigator of accidents, representing the commission, and a committee of the association. Still another conference on the subject of wire crossings resulted in a joint conference with other utilities interested. The association has also co-operated with the Department of Labor and Industry with respect to reporting industrial accidents and to safety rules and regulations. These State departments have extended courtesy and consideration to the representatives of the Railway Association at all times.

Mr. Tingley quoted the Code of Principles adopted at the Atlantic City convention and recommended its adoption by the association. He called attention to the reflection of the business depression and unrest in electric railway receipts. Referring to the coming biennial session of the State Legislature he directed special attention to the problems of vital interest to electric railways which will come before that body. The Republican platform contains recommendations in regard to a workmen's compensation law, to changes in the laws governing corporation taxation and to amendments to the public service commission law. He anticipates a demand for "municipal home rule," which would produce a return to the conditions existing prior to the passage of the public service commission law. The Railway Association and its members should oppose any tinkering with the present law, which should be given time to work out and develop efficiency.

Mr. Tingley favored co-operation in connection with the workmen's compensation legislation provided that a reasonable and equitable bill can be secured. In the matter of corporate taxation he feared that an effort will be made to increase such taxes. This should be resisted as corporations are already taxed out of proportion to other property in the State.

Among other topics touched upon by Mr. Tingley were the satisfactory financial condition of the association and the increasing importance of the automobile bus, which is becoming a factor in the transportation problem. He recommended the appointment of a committee to study the latter subject. In closing he summed up an important phase of public relations as follows:

"There is one angle of our proposition which everybody seems prone to forget, namely, that these great utilities are, as a matter of fact, owned by the people. Every man who has a deposit in a savings bank is interested in the integrity of the great utilities corporations that serve this country because their bonds are held as investments by those banks. Every man who has a life insurance policy, and every woman and child who will become dependent upon a life insurance policy, is vitally interested in the prosperity of these great corporations. Four years ago all the railroad bonds owned by the New York State savings banks were worth $5,000,000 less than their par value; at the beginning of the present year these bonds were worth $41,000,000 less than their par value; to-day the depreciation is even greater. I believe that the last election indicated that the voter appreciated that there was something wrong. He realizes dimly that radicalism has gone too far, but he is not yet fully informed and the radicals are still wide awake and on the job; and it is up to us to do our part to enlighten the voter and to see that he is not again lulled to sleep by the siren song of the theorist."

LATEST DEVELOPMENTS IN RAILWAY EQUIPMENT

BY W. R. STINEMETZ, WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY

Under the above title, Mr. Stinemetz discussed the ways in which the cost of maintaining and operating electric railway motors has been reduced, in spite of the more severe service requirements imposed by present operating conditions. Success in reducing maintenance cost is shown by the decrease from $14.63 per 1000 motor-miles, which was the maintenance cost for the Westinghouse No. 56 motor, to 23.2 cents, which is the cost for the Westinghouse No. 323-A motor. The saving in maintenance cost per year of the latter motor over the Westinghouse No. 12-A, assuming 30,000 car-miles per year, amounts to $267.84. As many roads do not keep accurate records of cost of maintaining old equipment, they do not realize what an important part this plays in their total operating cost. Owing to differences in operating conditions on different roads the figures for one road cannot be compared with those of another.

Modern equipment is not only cheaper in maintenance cost but it is more reliable. As a result the public can be kept satisfied through the elimination of delays on the road due to defective cars and at the same time all cars are available for service at all times. Reliability is particularly important during the rush hours when old equipment is likely to be pressed into service.

Modern equipment requires less power, particularly if the motors are properly geared. The development of the field control motor, reduction in weights, and the use of meters and coasting clocks to encourage proper handling of cars have all contributed to power saving.

Many of the older cars were geared too high. As an example of this Mr. Stinemetz referred to a test made in city service where a change from a gear ratio from 18:66, which was in use, to 15:69, resulted in a saving of 13.8 per cent in power under the same operating conditions. In interurban service high gear ratios have sometimes been made to compensate for voltage drop in the line, whereas redistribution of copper and the use of portable substations, if necessary, would have permitted the making of the required schedules with lower gear ratios.

The use of field control results in power saving, as has been shown from the results published from time to time. This form of control virtually provides an electrical means for changing gear ratio. Power can also be saved by a reduction in weight of equipment. Motors with cast-steel frames have reached the limit in weight reduction as further reduction means higher armature speeds, smaller shafts, thinner bearing shells and fewer commutator bars. All of these result in increased maintenance cost. By the use of pressed-steel frames a reduction in weight of 275 lb. has been secured in 40-hp motors, and at the same time there was greater uniformity in speed characteristics, due to the forged steel ring which is used. This motor weighs 2050 lb., has an armature speed of 540 r.p.m. at rated load, and is adapted for use with 26-in. wheels.

As an example of the saving in power which can be secured by the use of the proper gear ratio and of two-motor field-control equipment instead of four-motor, non-field-control equipment, with the permissibly lighter cars and higher schedule speeds, Mr. Stinemetz states that a road in Utica, N. Y., secured a power saving of nearly 50 per cent, as is shown by the following table:

	With Non-Field-Control	With Field-Control
Weight of car equipped but unloaded—pounds	51,000	36,800
Motors—horse-power	4—40	2—40
Gear ratio	17:69	15:69
Wheel diameter, inches	35	33
Schedule speed—miles per hour	9.8	10.13
Stops per mile	6.59	5.89
Duration of stops—seconds	10.88	10.43
Kilowatt-hours per car mile	3.588	1.892
Weight of loaded car—tons	28.52	21.0
Watt-hours per ton-mile	125.8	90.1
Reduction in watt-hours per car-mile—per cent		47.2

Power can also be saved by proper handling of cars. The use of instruments, such as watt-hour meters, coasting clocks, etc., together with the awarding of prizes for excellent performance, has resulted in savings from 2.7 per cent to 8.5 per cent.

The use of the newer forms of control also effects power saving. The Westinghouse "PK" control keeps down current peaks by regulating the rate of acceleration and the controller is more easily handled by the motorman than those of the older forms. The "HL" control has also proved very reliable in service.

THE ELECTRIC RAILWAYS AND THE PUBLIC

BY EMORY R. JOHNSON, PH.D., SC.D., PROFESSOR OF TRANSPORTATION AND COMMERCE, UNIVERSITY OF PENNSYLVANIA AND MEMBER OF PUBLIC SERVICE COMMISSION

The former antagonistic relationship between the electric railway companies and the public is fortunately changing for one of mutual understanding. The obligations of the service companies to the public and the duty of the public towards the companies are coming to be clearly recognized and to be defined more and more clearly by municipal ordinances and state legislation. It should be the purpose of the board of directors and officials of the service companies and also of all responsible public officials to place the relations of the companies and the public upon a permanent basis of mutual confidence. It is necessary that the companies and the public understand and trust each other, otherwise the companies will not prosper, the service will be poor and the public will suffer.

Electric railway and other public service companies can secure the confidence of the public, provided the companies adhere to methods of financiering and management that square with approved moral standards, provided the companies keep the public fully and accurately informed regarding the affairs of the corporations that serve the public, and provided the service rendered is adequate and efficient.

Little need be said as to the importance of adherence to approved moral standards in corporation management. From now on, the affairs of public service companies must be matters of public knowledge, and it will be impossible for a company successfully to conceal operations that would not meet with public approval. As a matter of fact, no well-managed public service company can afford to adopt business methods that need concealment. Sound financiering and wise accounting have everything to gain and nothing to lose from publicity in corporation management.

All public service companies need particularly to give the public information in order that those who patronize the company may understand what services the company is endeavoring to render and what is needed in order to perform those services adequately. More specifically stated—it is necessary that electric railway and other public service companies should keep accurate accounts according to uniform methods and that their financial obligations should be so straightforward that the public will be convinced that the companies are not resorting to the speculative methods of financiering which, though prevalent in the past, have now come to be condemned. It is also necessary that the companies should systematically publish information that will help the public to understand and correctly judge the financial and service operations of the companies.

Good service is fundamental and all-important. It is essential to the success of the company and is necessary to secure public approval of what the company does. If the public feels that utility companies are straightforward in their financial management and are rendering good service, it will not be opposed to the maintenance of charges that yield adequate profits. The public demand for good service is stronger than for low fares.

The policy of every utility company should be to study the service demands as fully as possible. Such a policy is to be commended, first of all, because it will give the public greater confidence in the companies; the policy is also wise because it may enable the companies to discover what changes are needed in service. It is human nature to keep on doing things as they have been done, and the longer established methods are adhered to, the harder it becomes to change to new, and possibly, better methods. Every electric railway company should seek constantly to discover how its service methods may be changed for the better. Careful attention to complaints as to service will be helpful to the company as well as gratifying to the public.

Many electric railway companies have been apprehensive because of the increasing degree of public regulation of their finances, services and charges, but I believe there is less apprehension now than there was ten years ago. Regulation of public service companies in increasing measure by states and municipal authorities has come about naturally and logically. It is necessary for each municipality to have a unified transportation service, and, with but few exceptions, there is now but one street railway company in each city. The requisite unified service is performed by a consolidated company.

The welfare of the municipality and of the electric railway company which serves the people of the municipality are linked together. The prosperity and development of the municipality require that the management of the public service company conform to the needs of the community served. Municipal regulation is necessary. Likewise, the larger interests of the people of a state as a whole demand that the state shall, by appropriate regulatory authority, supplement municipal regulation of public utilities. State regulation is necessary, first of all, because the public service company often serves more than one municipal area. The power that regulates must be as extensive as the object regulated. Moreover, state regulation is desirable because experience has clearly shown that in the supervision of accounts, finances, services and charges of public service companies there needs to be an executive body whose jurisdiction is state-wide and whose powers are as comprehensive as the tasks to be accomplished. If the regulation of electric railway and other public service companies were left entirely to municipalities, the regulation would be incomplete and would vary greatly as between different localities. Such a condition would be of disadvantage to the companies and not a benefit to the public.

Public service companies may well welcome, and most of them probably do welcome, intelligent public regulation, because the fundamental purpose of such regulation is to bring about an equitable adjustment of the relations of the companies and the public. Wise public regulation makes for the better management of the companies and for improved service; while it also enables the companies, by securing the confidence of the public, to obtain equitable returns upon the property devoted to the performance of their services.

WORK OF PUBLIC SERVICE ACCOUNTANTS

BY H. S. SWIFT, TREASURER WEST PENN TRACTION COMPANY, PITTSBURGH, PA.

In his address concerning the work of accounting officers of public service corporations, Mr. Swift stated that the public no longer regards electric railways and other public utilities as private enterprises to be conducted for the profit of their owners but rather as quasi-public undertakings whose operations, accounts and records are to a certain extent public property. The old order of things under which utilities operated their properties and kept their books as simply or as elaborately as seemed best to the officials, with little or no outside interference as long as they kept within the law, is past. Then the accounting was for the information of the officers, the directors and, lastly, the stockholders, but now the accounting officer has become responsible to governmental authorities and various regulatory bodies for the honesty and the correctness of his work.

Mr. Swift believed that the requirements for the success of public service accountants are many. They should have a general knowledge of what is going on in the operating department, in order to devise proper accounting methods in connection with new construction or reconstruction work. Moreover, a duty sometimes neglected is the inspection of all such undertakings so that accountants shall be prepared to consider intelligently what proportion of expenditures can properly be charged to capital account, as well as the proper amounts to be provided for cost of unproductive labor, cost of new money, interest during construction and similar items. At the present time complete data are probably not available from which to determine proper depreciation and overhead charges, for previous consideration of these subjects has been academic rather than practical. Such problems can best be solved by the collection of accurate historical data. Mr. Swift emphasized the fact that many items of construction cost tend to disappear when it comes to a valuation of physical property years after, but such items should be entered upon the books in sufficient detail to prevent their being overlooked at a later date.

The accounting officer should give some attention to a systematic analysis of the increased cost of operation. A statement to the general manager that a certain power house or carhouse employed so many more men this year as compared to last is much more impressive than the bare statement that the labor cost was greater. A similar analysis can be made of the amount of supplies used, showing the number of units and the cost. In the case of the purchase of the control over underlying companies, the interests of stockholders must sometimes be safeguarded by a careful consideration of the value of services and expenses incurred by each company on account of other companies associated with it under the same management. All expenses for inter-company services should be justly distributed so that the operating costs of each company may be correct.

Mr. Swift stated that the development of the accounting departments of electric railways has been rapid, although it has received less assistance from without than some other departments. One feature of this development was the perfecting and adopting of a suitable uniform system of accounts. Another indication of growth is found in the increasingly important position held by the accounting officers. This position, however, is not without its additional responsibilities. The accountant should have some knowledge of commercial law, particularly at this date in connection with income taxes and special war taxes. He should also be able to keep a record of contracts and agreements in so far as they affect accounting, and he should so study his company's financial affairs and history as to be in a position to offer plans for new financing or refunding existing obligations. In closing, Mr. Swift spoke of the present opportunity of electric railway accounting officers, but said that they should possess imagination, or that quality of grasping the problems that the future may bring and preparing for them.

CO-OPERATION IN ELECTRIC RAILWAY WORK

BY JOHN PRICE JACKSON, COMMISSIONER OF LABOR AND INDUSTRY, PENNSYLVANIA

Mr. Jackson stated that the four human elements in electric railway work are the patron, who uses the service; the stockholder, who placed his money in the enterprise; the employee, who performs the daily labor, and the government, which acts as the representative of the people. The problem of the present day is to instill the proper confidence in and co-operation among all of these elements. The old days of close personal relation between employer and workmen have gone and in their place exists a period of highly systematized organization dealing more and more with impersonal elements. The modern foreman is told to see that expenses are kept down in order to show a proper balance and as a result often deals in an impersonal and unjust manner with the men under him. On the other hand, the workmen have often looked upon their employer only as an insatiable blood-sucker.

In a similar fashion, the patron of an electric railway, in Mr. Jackson's opinion, sometimes believes that the company is deliberately making him unhappy in order to fill its own coffers, and the public official often assumes that a public utility is guilty without proof or reason. Such a lack of confidence and co-operation is largely caused by irresponsible statements made in the press and public places. In fact, ninety-nine out of every hundred of labor disputes arise from a misunderstanding with the management.

The work of the Bureau of Labor and Industry in devising standard safety rules, however, said Mr. Jackson, has proved that co-operation between some of these elements is possible. In about twelve industries, safety standards have been secured by the unanimous judgment of committees composed of capital, labor and bureau representatives. This marks a tendency toward the age to follow that of electricity—the age devoted to the perfection of the human machine and the proper correlation of co-operation between all of its elements.

In closing, Mr. Jackson offered some data gleaned from his recent European trip, to show that German roads are not so superior to American railways as often stated. The tracks are good, but this is largely a result of lightness of the cars. Many cars have no airbrakes, so that stopping is a long, slow process. The heating arrangements on most cars are of an antiquated type, and there is no vestibule, although the winter is quite severe. The cars, however, have large platforms at each end, on which the crowding exceeds that on American cars. No safety doors are used, and the passengers, both men and women, board and alight while the car is in motion. A notice to ladies, however, is carried on the rear platform, telling them to take hold with the left hand in alighting—a practice which Mr. Jackson thinks American railways might well adopt.

REPORT ON STANDARD SAFETY RULES FOR ELECTRICAL APPARATUS

This committee was appointed on Nov. 12, in connection with the Second Annual Pennsylvania Industrial Welfare and Efficiency Conference, conducted by the Department of Labor and Industry of the State. The matter of especial interest to the committee was suggested standard safety rules for electrical apparatus, which the department has under consideration for use throughout the State. On Nov. 19 a paper was presented by Dr. Rosa of the federal bureau of standards regarding Circular No. 49 of this bureau. This contained standardized safety rules suggested for use in the electrical industry. The rules now under preparation by the Pennsylvania Department of Labor and Industry are a move toward the single safety standard recommended by the bureau of standards. They will, it is understood, be submitted shortly to those interested for study and suggestions, and in the opinion of the committee there should be careful collaboration with electric railway operators in order to avoid imposing needless limitations or establishing hurtful precedents. The dividing lines in classifying voltages should be drawn at the proper points. It is the general practice of electric railways of Pennsylvania to operate at 550 volts, which in actual practice means 600 volts to 650 volts at the busbar, and if boosters are used to compensate for heavy loads, 600 volts to 750 volts to provide for line loss and thereby apply satisfactory voltage at the ends of long lines. This is essential to good service and these voltages are not ordinarily dangerous. Throughout the rules of the bureau of standards 750 volts is specified in overhead construction, above which special precautions are required. Direct current of the above voltage should not be classed with alternating current used for primary distribution, generally at 2200 volts. The committee feels, in general, that there is merit in the suggestion of the bureau of standards, for one standard for all states, but a careful study of proposed rules by all members is recommended.

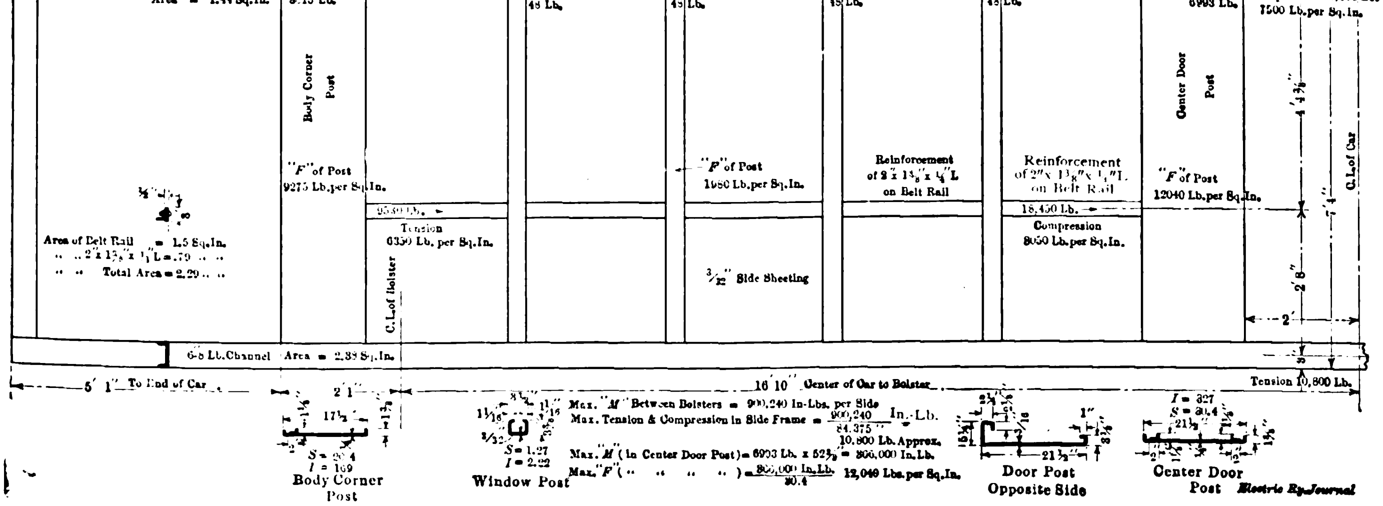
Analysis of Stresses in Chicago Elevated Steel Car

BY H. A. JOHNSON, MASTER MECHANIC CHICAGO ELEVATED LINES

In connection with the methods employed in designing the new pressed steel cars for the Chicago Elevated Railroads, which were described in the ELECTRIC RAILWAY JOURNAL of Dec. 5, 1914, on page 1234, it may be that a detailed description of the stress analysis will be of general interest. As mentioned in the article describing the car, the minimum loads assumed included a standing and seated load of 150 passengers weighing 140 lb. each, or a total of 21,000 lb. To this the dead-load weight of the car body, amounting to 35,600 lb., was added. This weight was distributed 27,860 lb. between bolsters and 7740 lb. outside of the bolsters. In addition to the ordinary loads, the ends of the car were so designed as to support a total load of 28,500 lb. This is approximately the weight of a car body in a partially telescoped position, and the allowance provides for a condition which might occur in a collision.

Each side of the car body was designed as a continuous truss with intermediate supports at the two body bolsters. The entire carload between body bolsters was carried on side trusses while the platform load was distributed over the extended bottom sills, which form cantilevers. The bending moments due to the differently distributed components of the total load were computed and plotted to scale. The resulting diagram showed that the maximum unbalanced bending moment at the center of the car totalled approximately 900,240 in.-lb. on each of the two side trusses. A reproduction of this diagram is shown in one of the accompanying illustrations.

Having determined the general dimensions of the side truss, together with the number of posts required to give standard commercial sizes of window glass, and having calculated the maximum bending moment to be resisted, an analysis was made of the resulting stresses in all members of the side truss. These stresses are also shown in one of the accompanying diagrams, a detailed explanation of which may assist in an understanding of the methods used in the calculations. The side framing of the car, extending from body corner post to body corner post, was treated as a riveted truss. Since this side truss could not be extended effectively beyond the body corner posts of the car, the underframing was designed strong enough to support the loads beyond the

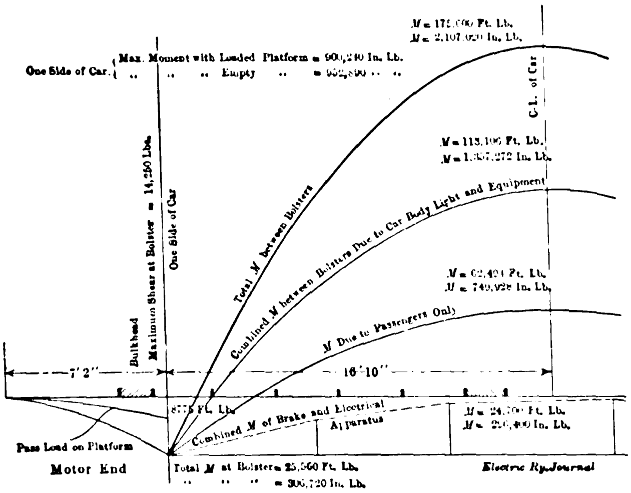


3¼" x 2¼" x ¼" Angle
3615 Lb.
3663 Lb.
3711 Lb.
3759 Lb.
3807 Lb.
Area = 1.44 Sq.In.
3615 Lb.
48 Lb.
48 Lb.
48 Lb.
48 Lb.
6993 Lb.
Compression 10,800 Lb.
7500 Lb. per Sq. In.
Body Corner Post
"F" of Post 9275 Lb. per Sq. In.
"F" of Post 1960 Lb. per Sq. In.
Reinforcement of 2" x 1⅜" x ¼" L on Belt Rail
Reinforcement of 2" x 1⅜" x ¼" L on Belt Rail
Center Door Post
"F" of Post 12040 Lb. per Sq. In.
9530 Lb.
Tension 6350 Lb. per Sq. In.
18,450 Lb.
Compression 8050 Lb. per Sq. In.
Area of Belt Rail = 1.5 Sq. In.
" " 2" x 1⅜" x ¼" L = .79 " "
" " Total Area = 2.29 " "
3/32" Side Sheeting
C. L. of Bolster
C. L. of Car
4' 4⅞"
2' 8"
7' 4"
2'
6-8 Lb. Channel Area = 2.38 Sq. In.
5' 1" To End of Car
2' 1"
16' 10" Center of Car to Bolster
Tension 10,800 Lb.
17½"
S = 20.4
I = 169
Body Corner Post
S = 1.27
I = 2.22
Window Post
Max. "M" Between Bolsters = 900,240 In-Lbs. per Side
Max. Tension & Compression in Side Frame = 900,240 / 84.375" In.-Lb. = 10,800 Lb. Approx.
Max. "M" (In Center Door Post) = 6993 Lb. x 52⅜" = 366,000 In. Lb.
Max. "F" (" " " ") = 366,000 In. Lb. / 30.4 = 12,040 Lbs. per Sq. In.
21½"
Door Post Opposite Side
I = 327
S = 30.4
21½"
Center Door Post
Electric Ry. Journal

CHICAGO STEEL CAR—STRESS DIAGRAM SHOWING STRESSES IN THE VARIOUS SIDE-FRAME MEMBERS bolsters and to contribute a balancing bending moment to the side trusses, as noted on the bending moment diagram.

The maximum unbalanced bending moment of 900,240 in.-lb. in the side truss, which is 84⅜ in. in depth, results in a tension of 10,800 lb. in the bottom chord, or side sill, and an equal compression in the top chord, or deck plate. As there are no effective diagonals in this truss, the compression in the deck plate must be absorbed by the posts rigidly held in a vertical position by the side sheathing and belt rail to which they are riveted. The intermediate posts, together with the panel posts at the vestibules and flanking the center entrance, act as simple beams each rigidly supported at one end and with the total compression in the deck plate, applied to the other end.

In a cantilever beam of length l, the deflection is given by the formula, deflection $= \frac{Wl^3}{3EI}$ where E is the modulus of elasticity of the material and I is the moment of inertia of the section resisting the bending action. As all the side posts are deflected an approximately equal amount by the thrust of the deck plate to which they are riveted, the force each resists is proportional to its moment of inertia. This is true since all the other factors in the formula are constant when the deflection is the same for each post. These forces and the resulting maximum fiber stresses in the posts are noted on the stress diagram.



CHICAGO STEEL CAR—BENDING MOMENT DIAGRAM

The compression shown in the belt rail beside the center entrance is determined by multiplying the 6993-lb. thrust absorbed by the panel post by the depth of the truss and then dividing it by the distance between the belt rail and the base of the post. Similarly, the tension shown in the belt rail at the side of the body corner post is obtained by multiplying the outward thrust of 3615 lb. at the deck plate by the depth of the truss and dividing by the distance between the belt rail and the base of the post. With the completion of this analysis the problem was then one of selecting suitable and economical sizes for the side frame members.

As evidence of his confidence in the business future of this country, W. E. Hodges, vice-president in charge of purchases of the Santa Fé Railroad, announced the purchase of 66,000 tons of 90-lb. main track rail for spring delivery. In connection with this $2,000,000 contract he also announced in an interview that his company would spend $3,000,000 a month for the next few months for supplies and equipment.

COMMUNICATION

Hearing on Jurisdiction of I. C. C. Over Urban Railways

UNION TRACTION COMPANY OF INDIANA
ANDERSON, IND., Dec. 9, 1914.

To the Editors:

The Interstate Commerce Commission is insisting, in the case of certain urban electric railway companies having interstate connections of some sort, that accidents on purely urban lines of such companies be reported to it. The claim of the commission to jurisdiction over these companies appears to be opposed to the principles laid down by the Supreme Court of the United States in the Omaha & Council Bluffs case. Whether this particular question is of great practical importance or not, it is important that the general jurisdiction of the commission over purely urban companies and lines be confined to lawful limits.

A hearing before the commission at Washington on the question of the duty of urban companies of the kind mentioned to report such accidents has been arranged for Friday, Dec. 18, at 10:30 a. m. Argument is limited to one hour. James M. Barrett, president Fort Wayne & Northern Indiana Traction Company, has consented to make the presentation.

It is highly desirable that the commission appreciate the fact that electric railways regard the question as one of importance. The feelings of electric railways with regard to the matter will be partly judged by the interest displayed at the hearing.

It is the wish, therefore, of the committee on federal relations of the American Electric Railway Association, at whose instance the hearing has been arranged, that all electric railways interested be represented at the hearing. Representatives from several large urban companies of the Middle West have already signified their intention to attend.

ARTHUR W. BRADY,
President.

Dinner of Railway Business Association

The two speakers at the dinner of the Railway Business Association at the Waldorf-Astoria on Dec. 10 were Fairfax Harrison, president of the Southern Railway, and Warren G. Harding, Senator-elect from Ohio.

Mr. Harrison said: "In the controversy between the owners of railroads and the representatives of the public, the pendulum has now swung to an extreme on the side of irresponsible public power as it had previously swung to an extreme on the side of irresponsible ownership." In discussing commission regulation he said that one of the most dangerous weaknesses of the system is its inability to give prompt decisions. If a change of policy is demanded in the public interest, the power to pass upon the question must be capable of convenient and prompt exercise. The problem now before the country forms an opportunity for the statesman, who must have the power to impress his views upon his fellowmen. The speaker believed that President Wilson is equal to this great achievement.

Mr. Harding said that the railroads should be prosperous not so much to permit general prosperity but because it was a matter of justice. He believes that ninety-nine out of every 100 thinking people believe the railways are entitled to an increase in rates. He said the country needs to-day fewer legislative bills pending and more bills of lading. In conclusion, he urged managers to have a full understanding with the public.

At the business meeting of the Railway Business Association held during the afternoon George A. Post of New York was re-elected president.

American Association News

The Executive Committees of the Engineering Association and the Transportation & Traffic Association Assign Subjects to Various Committees—Hearing on I. C. C. Jurisdiction Over Electric Railways—Meeting of Joint Committee on Block Signals—Milwaukee Company Section Meeting

ENGINEERING ASSOCIATION COMMITTEE SUBJECT ASSIGNMENTS

The executive committee of the Engineering Association approved the following plan of work for the several committees at its last meeting.

The committee on buildings and structures will prepare general specifications and form of contract for railway structures. It will suggest proper provision for expansion and contraction in concrete structures, together with a provision for properly water-proofing and protecting them. This subject is to be considered along broad lines of application either to thin slab construction or to massive monolithic work, having in mind the carrying of reinforcement throughout either type of work. Further consideration will be given to the fire protection rules, especially with regard to the use of soldering or other heating equipment. The design of a standard fireproof substation building of 1000-kw capacity will also be studied.

The committee on electrolysis will continue its study of the general subject.

The committee on equipment will make a study of, and report upon, the need of a revision of the standard specification for heat treated carbon steel axles, shafts and similar parts, adopted in 1912, and will report upon a specification for gears and pinions, including tolerances. The committee will further make a study of difficulties with M. C. B. journal brasses in heavy electric traction service, by conducting such tests as may seem necessary and will collaborate with the M. C. B. Association and the committee on heavy electric traction. Attention will be given to wires and cables for car equipment, with special reference to fire protection. This subject will be considered jointly with the N. F. P. Association, especially as to the use of lighter conduits in car roofs. The specification for air-brake hose will be broadened to include smaller sizes. The committee will submit a design for a limit-of-wear gage for measuring flange thickness of the Association standard wheel. The steel wheel design will also be revised to include smaller diameters.

The committee on heavy electric traction will conduct a further joint study, with the various other railway associations, of the equipment clearance line shown on the third-rail equipment diagram adopted by this association at the 1912 convention, between the point FE and the gage line of the nearest running rail, and the location of the third-rail clearance line between point ET and the gage line of the nearest running rail. A study of the modern electric locomotive will also be made. Further consideration will be given to the definition of third-rail gage, with reference to the question whether it is advisable to have a definition of the term "Gage Line of Third-Rail." The protection of the contact rail, where an exposed third-rail is used in rapid transit operation, will be considered also.

The committee on lightning protection will take up the general subject as applied to car and line equipment.

The committee on power distribution will study the following specifications: for reinforced concrete poles, for sundry line materials, and for 600-volt d.c. overhead trolley construction with respect to lightning arrester location and grounds. A revision of the standard specification for tubular steel poles will also be prepared.

The committee on power generation will report on good practice in regard to smoke abatement from the standpoint of smoke observations, and in regard to appliances and devices used for determining smoke density. It will consider a specification for boiler tubes, including both open-hearth, seamless, hot-drawn steel tubing and charcoal iron tubes, and others for the purchase of fuel and of power station lubricants. The committee will also review the boiler code of the American Society of Mechanical Engineers with special reference to specifications for boiler tubes.

The committee on standards will determine what roads are using Association standards and recommendations, and will draft a style for the make-up of specifications.

The committee on way matters will continue the study of the proper foundation for tracks in paved streets, and of pavement for use in connection with girder and high T-rails. Traffic counts will be obtained from different companies in accordance with forms submitted in the 1914 report. The committee will prepare specifications, with definitions, for sundry track materials such as ties, track spikes, bolts, tie rods, tie plates, etc., with particular reference to physical characteristics, and a standard specification for special work. A revision will be made of the recommended designs of 7-in. and 9-in. joint plates with special reference to sizes of bolt holes and fits, as covered in Section Wm 4a in the *Engineering Manual.*

TRANSPORTATION & TRAFFIC ASSOCIATION COMMITTEE ASSIGNMENTS

The executive committee of this association recently approved the following list of subjects:

The committee on fares and transfers will continue the study of transfer issuing and collection devices; will study, report, and summarize the fare collection methods used with center-entrance cars; will study the problem of fare collection on prepayment cars on multiple fare lines, reporting on the advisability of stationing extra men at congested points and terminals to collect fares and so to increase the rate of loading on prepayment types of cars, and will investigate the subject of through collection versus zone collection on suburban and interurban lines.

The committee on express and freight traffic will make a further study of the organization of a freight department, giving further and more comprehensive details than were contained in the 1914 report; will investigate the matter of uniform class rates; will report on the relative cost of handling different classes of freight and the relative proportion of each class handled; will continue the investigation of laws, franchises and other restrictions relating to this traffic and will investigate the questions of handling express and of weighing and inspection. The committee will also analyze 1914 passenger and freight earnings as compared with those of 1913, with a view to determining whether, as some companies report, freight business is increasing while passenger business has fallen off. If so, such conclusions will be drawn as are pertinent to

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the building up of freight and express business by member companies to take the place of passenger revenue lost through the inroads of the automobile.

The committee on passenger traffic will continue the study of the motor bus and the trackless trolley, supplementing the report of the 1914 committee, summarizing the results obtained in European operation and recommending how electric railways can make use of these two modes of travel. Digests of laws and franchises showing specifically where additional restrictions have been imposed by the authorities on these companies will be prepared. The committee will examine into the results of one-man car operation from such standpoints as speed, accidents, equipment, maintenance and other cost, summarizing present practices, and will further study the effects of the increasing use of automobiles on passenger traffic, with particular reference to interurban and suburban roads, giving specific results as determined by studies made by individual companies.

The committee on rules will continue the consideration of markers in the light of the discussion at the 1914 convention; will compile a joint index of similar or identical rules in the two standard codes for the use of companies which desire to issue a joint code; will investigate and report on the flagging rule as instructed by the 1914 convention, and will develop for the approval of the executive committee and for the use of Association members a procedure for the interpretation of rules and train orders. The committee will report as to the state commissions that have approved the standard codes of the Association or have adopted codes of their own, in the latter case making a statement as to the logical points of difference between the adopted codes and the Association standard codes. The number of roads that have adopted the standard codes since the 1914 convention, up to June 1, 1915, will also be reported.

The committee on schedules and time-tables will continue the study of train dispatching in city service, making a summary of results obtained in the various cities in which this practice is in vogue, and the consideration of the problem of developing capable schedule makers. It will recommend methods of making and recording periodical traffic counts, and will make a study of the influence of frequency of stops on schedule speed and the influence of schedule speed on operating cost, possibly developing curves to show results. Other investigations to be made are those of the effect of the use of fully vestibuled cars on schedule speed and other operating factors, including accidents; of near-side stop practice, indicating the increase in this method of operation that has occurred by years for the past three or four years, and of the standard interurban time-table as adopted in 1911, to determine whether changes or modifications should be made.

The standards committee will undertake the formulation of a standard practice and policy for the adoption of standards for the Transportation & Traffic Association, and will issue a Transportation & Traffic syllabus during the present year.

The committee on the training of transportation employees will bring up to date the digest of laws and regulations affecting employment, last printed in the 1912 report. It will investigate the disciplining of new men where this is handled by the instruction department, and will outline a systematic program for improving courtesy on the part of trainmen, to include recommended bulletins and notices to the men as well as a general outline of practice. Another item of the year's work will be an investigation of watch inspection methods.

The committee on uniform definitions will recast and recompile the definitions submitted by the 1914 committee, with such additional definitions as are necessary, these to be submitted to member companies for specific criticism. A co-ordination of the definitions with the standard codes will follow and this is to be submitted to the Transportation & Traffic Association's standards committee in time to have that committee pass upon it before its submission to the next convention.

JOINT COMMITTEE ASSIGNMENTS

The executive committees concerned have approved the following programs of joint committee work:

The joint committee of the Engineering and Transportation & Traffic Associations on block signals for electric railways will prepare a digest of signal laws and rulings to show if any new rulings of state commissions have been made subsequent to the dates of information contained in the 1914 report. A bibliography on block signals installed subsequent to June 1, 1914, will also be compiled. Designs of standard signal apparatus will be prepared, the committee to co-operate with the Railway Signal Association committee on signaling for electric railways in the adoption of standard signal apparatus. The clearance diagram for semaphore signals is to be considered after conference with the committees on power distribution and heavy electric traction, and a revision of the block signal rules for contactor signals is to be considered jointly with the committee on rules of the Transportation & Traffic Association, Rule No. 10 covering this matter having been referred back to the committee. The subject of light signals for interurban railways is to receive further consideration with a view to the adoption of a definite standard for sizes of lenses for light signals operated by continuous track circuits or contactors. The advisability of changing the reading of the standard light aspects in three-position signaling from "Non-Car Counting" or "Car Counting" to "Non-Registering" or "Car Registering" signals, in view of the fact that the new contactor signal rules all read "Car Registering Signals," will also be considered. A study will be made of signal systems on roads that are signaled from end to end, to cover maintenance cost, efficiency of operation and effect on traffic. The remaining subjects listed are: An investigation of the question of a standard definition for signal failure, the general study and summary of highway crossing protection, and the preparation of a report as to the advisability of operating on single-track interurban line blocked by signals alone without dispatching.

The joint committee on engineering accounting will draft a set of standard forms for use with the cost accounting system recommended by the 1914 committee; will revise the subdivision of operating maintenance accounts to meet the new I. C. C. classification, and will develop a proper ledger, looking toward the maintenance of a continuous inventory. Other subjects will presumably be assigned to this committee by the Accountants' Association.

The joint committee of the Engineering and Accountants' Associations on the life of railway physical property will continue its study of the general subject.

The committee on transportation accounting has received the following partial list of assignments: To investigate the cost of handling baggage free to determine whether or not it brings business to the line, and if it does whether the cost of handling this baggage wipes out the profit resulting from the fare received; to investigate the sub-division of power cost among construction, maintenance and operation.

The committee on transportation engineering will study the operation of trains of two cars or more in interurban passenger and freight service to include cost of operation and comparative figures for single-car operation. A second investigation is into the effect of car and equipment design on duration of stops, in both passenger and freight service. Car design is to be studied from a traffic standpoint in all its phases, first standardizing the methods of determining results. The investigation is to include specimen data sheets showing information which should be obtained in order that member companies who desire to follow the recommendations may have full information before them. An investigation of braking distance on interurban cars is to be made with special reference to the location of block signals. In addition current saving devices will be studied and a summary prepared showing the results obtained, together with costs, including maintenance, etc.

STUDY OF A. I. E. E. STANDARDIZATION RULES

The new standardization rules of the American Institute of Electrical Engineers have been brought to the attention of the committees to which parts are of interest, with the recommendation that they be reviewed and considered.

HEARING ON I. C. C. JURISDICTION OVER ELECTRIC RAILWAYS

At the instance of the committee on federal relations of the American Electric Railway Association, of which A. W. Brady, president Union Traction Company of Indiana, is chairman, a hearing on the above subject will be held in Washington at 10:30 a. m. on Friday, Dec. 18. At this time, in the hour allotted by the commission, an argument will be presented by James M. Barrett, president Ft. Wayne & Northern indiana Traction Company, outlining the reasons against the commission order requiring interurban lines to file monthly reports of accidents in urban operation. The act of 1910 requires monthly reporting of accidents on the lines of interstate carriers by railroad. This has been interpreted by the commission, in the case of the Detroit United Railway and others, to cover urban lines operated by such roads which by virtue of their interurban lines come within the commission's jurisdiction. This is held to conflict with the decision of the United States Supreme Court in the Council Bluffs case. Secretary Burritt has sent out a circular letter inviting company members to be represented at the hearing.

MEETING OF JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS

A meeting of the joint committee of the Engineering and Transportation & Traffic Associations on the above subject was held at the offices of the Public Service Railway in Newark, N. J., on Dec. 10. The following members were present: Of the Engineering Association, J. M. Waldron, Interborough Rapid Transit Company, chairman; C. H. Morrison, New York, New Haven & Hartford Railroad; John Leisenring, Illinois Traction System; G. N. Brown, New York State Railways; of the Transportation & Traffic Association, J. W. Brown, Public Service Railway, co-chairman; C. D. Emmons, Chicago, South Bend & Northern Indiana Traction Company. There were also present by invitation H. W. Griffin, Union Switch & Signal Company, and H. H. Norris, ELECTRIC RAILWAY JOURNAL.

Mr. Waldron was elected chairman of the meeting and Mr. Norris secretary. A vote of thanks to the ELECTRIC RAILWAY JOURNAL for its practical interest in the work of the committee was unanimously passed.

The committee then considered the assignments made for the coming year's work, printed elsewhere in this issue, and delegated the work to the following sub-committees, in the lists of which the chairman's name is placed first in each case.

Digest of signal laws and rulings, A. E. Roome, Pacific Electric Railway Company.

Bibliography on block signal installations, H. H. Norris.

Design of standard apparatus, J. M. Waldron, C. H. Morrison.

Clearance diagram for semaphore signals, J. Leisenring, G. N. Brown.

Revision of block signal rules for contactor signals, C. D. Emmons, H. A. Nicholl.

Light signals for interurban railways, J. Leisenring, H. A. Nicholl, C. H. Morrison.

On certain changes in phraseology in regard to standard light aspects, J. W. Brown, C. D. Emmons.

Study of costs of maintenance, etc., of signal systems, G. N. Brown, J. W. Brown.

Review of block signal standards and recommendations, C. H. Morrison, J. M. Waldron.

Consideration of A. I. E. E. standardization rules, as they have bearing on signal matters, G. N. Brown, C. H. Morrison.

Preparation of a definition of "signal failure," A. E. Roome.

Study of highway crossing protection, J. Leisenring, H. A. Nicholl, J. W. Brown.

Report on advisability of operating single-track interurban signal-blocked lines without dispatchers, H. A. Nicholl, J. W. Brown, C. D. Emmons, J. Leisenring.

Preparation of a list of items of information needed in connection with block signal contracts; for trolley contact systems, J. M. Waldron; for track circuit systems, G. N. Brown, J. Leisenring, H. W. Griffin, S. N. Day, General Railway Signal Company.

After making the above assignments the committee considered them informally and discussed the general principles involved.

It was then decided to hold sub-committee meetings in New York on Jan. 4, 5 and 6, and in Chicago on Jan. 18. The next and probably the final meeting of the full committee will be held in Chicago on March 16 and 17 at the time of the meeting of the Railway Signal Association.

MILWAUKEE ELECTRIC RAILWAY & LIGHT COMPANY SECTION

Company section No. 1 has elected the following officers: President, W. W. Cook, superintendent Cold Spring shops; vice-president, V. W. Dentz, engineer; secretary, H. G. Abendroth, valuation committee; treasurer, A. G. Schwenke, auditor railway receipts. E. W. Miller was elected director for a term of three years.

On Dec. 5 Secretary Burritt sent to all company members of the association copies of the war tax act of Congress, officially known as Public Act No. 217. This act affects electric railways in several particulars, principally in requiring a stamp tax to be paid on bonds, debentures and certificates of indebtedness and upon bills of lading. The act became operative on Oct. 23 and remains so to and including Dec. 31.

The merchants and manufacturers of Peoria, Ill., are arranging to establish in that city a traffic bureau which will have supervision over all switching charges and other shipping conditions. The Illinois Traction System has become one of the most important freight lines entering Peoria and it is proposed to include that company under the new arrangement.

Equipment and Its Maintenance

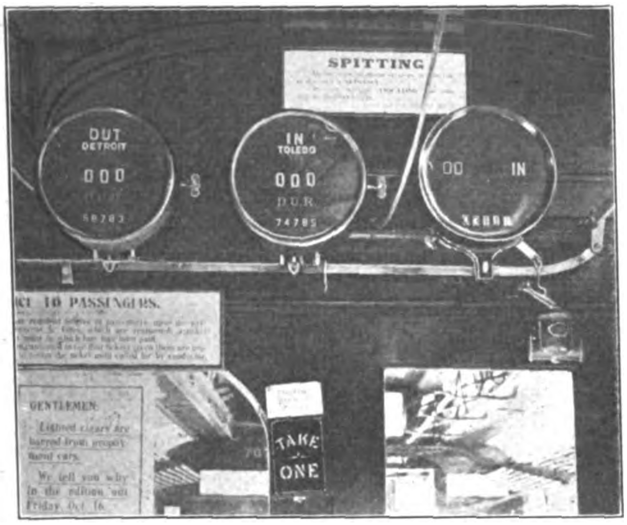
Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

An Ingenious Interline Register System

BY C. L. KELLER, ASSISTANT MASTER MECHANIC DETROIT UNITED RAILWAY

Through cars between Detroit, Mich., and Cleveland, Ohio, operate over the tracks of five different companies, namely, the Detroit United Railway, Detroit, Monroe & Toledo Short Line, Toledo Railway & Light Company, Lake Shore Electric Railway and the Cleveland Railways. A separate account must be kept of the fares collected on each line and, in so doing, the city fares collected in Detroit, Toledo and Cleveland are registered on three separate registers.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TO PASSENGERS.
GENTLEMEN:
Lighted cigars are barred from properly hand cars.
We tell you why in the edition out Friday, Oct. 16.
TAKE ONE

INSTALLATION OF REGISTERS FOR INTERLINE OPERATION

On a through car recently put in service by the Detroit United Railway, a simple, effective method of ringing each register was installed. The registers used were two Sterling-Meaker No. 8 and one International. Each register was marked with the name of the particular city in which it was to be used, although the illustration shows only two registers so marked. Instead of using separate cords or rods for operating each, the three registers were arranged to be operated by means of one ⅝-in. square cold-rolled steel shaft which extends the full length of the car and has a strap pull at each window.

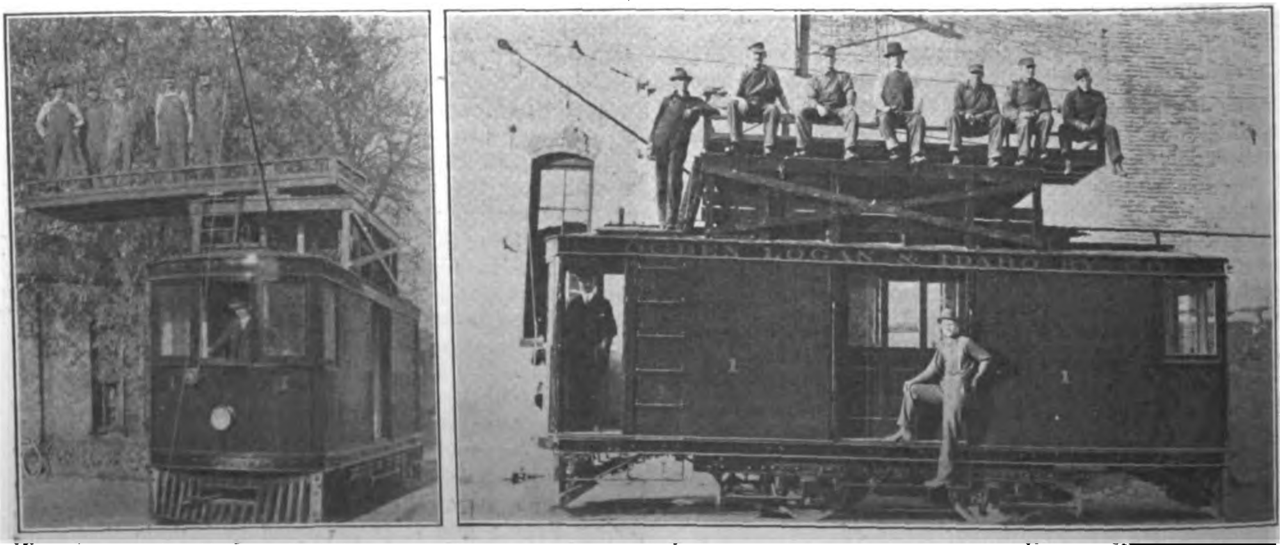
The register racks were placed side by side on the passenger compartment side of the partition between it and the smoking compartment. Just below the racks was placed a ¼-in. x ⅞-in. flat-steel bar. One end of this bar was connected to a clevis fastened to the register rod while the other end was passed through a guide. To the operating lever on each register a 2½-in. steel-wire screwhook was riveted and corresponding screw-eyes were riveted to the steel bar. To use any one of the registers, it is necessary only to unfasten one hook and connect up another. The accompanying halftone shows the mechanism as installed in a car.

A Home-Made Line Car

BY H. E. WURZBACH, MASTER MECHANIC OGDEN, LOGAN & IDAHO RAILWAY

The accompanying illustrations show a line car designed by the writer and built in the Ogden shops of the Ogden (Utah), Logan & Idaho Railway. In its construction we used an old truck from a single-truck car which had been out of service for some time and two GE-90 motors. The body we built. The principal dimensions of the car follow: Total length, 26 ft.; height from track to top railing, 14 ft. 6 in.; length of turntable platform, 15 ft.; length of turntable platform from center bearing, 12 ft., and width of car, 6 ft. 10 in.

An important feature is the channel iron which completely encircles the body. This channel greatly adds to the strength and rigidity of the car. As the channel flanges are turned outward the beam acts as an anti-climber at the bumper. The car is completely equipped



END AND SIDE VIEW OF LINE CAR MADE BY THE OGDEN, LOGAN & IDAHO RAILWAY with shelving, lockers and hooks for hanging wire and ropes. A place for long bars or shovels is arranged under the top platform. The speed of this car is about 35 m.p.h. It has been in operation since the middle of October.

Rebabbitting Journal Bearings

BY W. L. FULTON, CHIEF DRAFTSMAN OMAHA & COUNCIL BLUFFS STREET RAILWAY

In the rebabbitting of worn-out journal bearings the Omaha & Council Bluffs Street Railway uses molds of home manufacture. The details of three types of these bearings, namely, armature, motor axle and truck journal bearings, together with details of molds for rebabbitting the same, are shown in the accompanying figures.

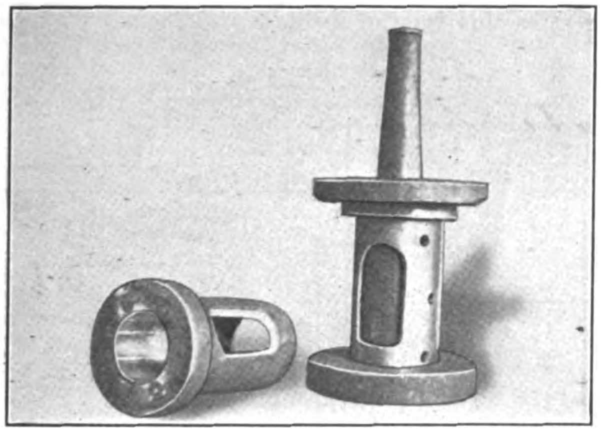
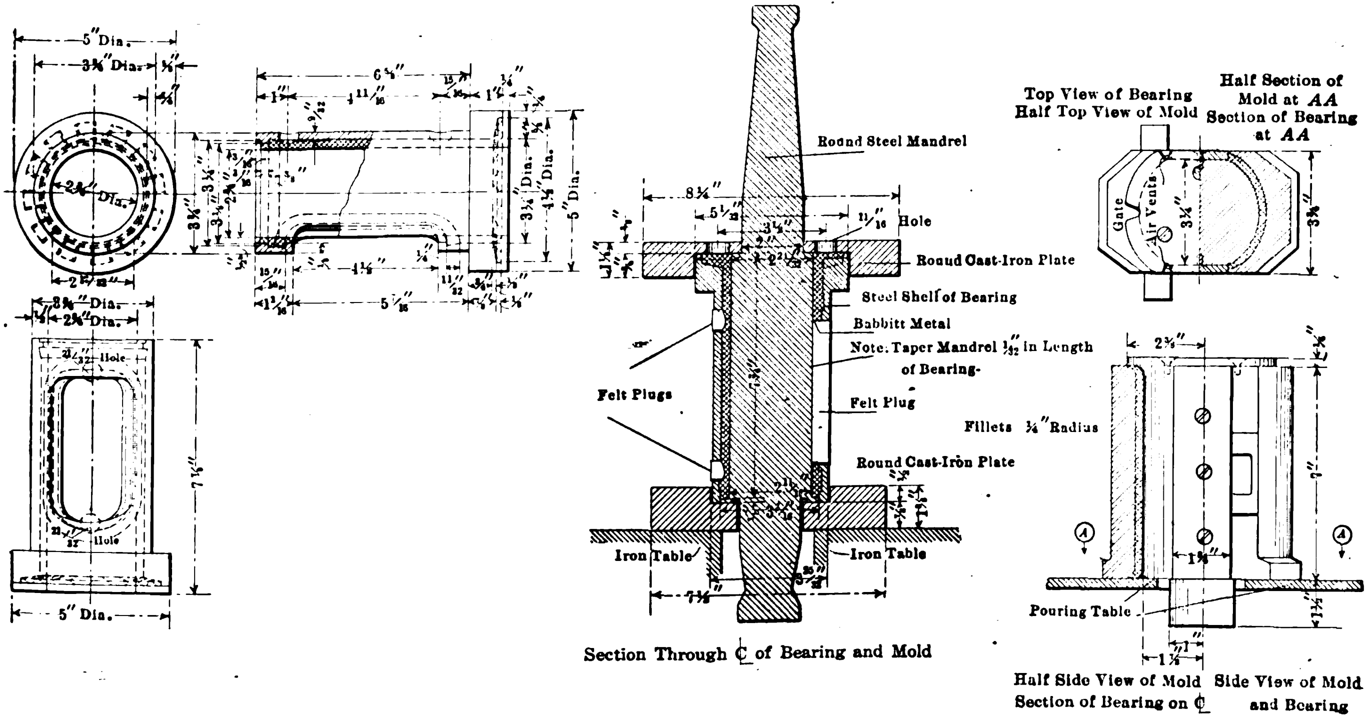


FIG. 3—FINISHED BEARING AND MOLD

Armature Bearings.—A bearing typical of this class is the commutator-end armature bearing for the GE-80 motor, the details of which are shown in Fig. 1. The mold for babbitting the same is shown in Fig. 2. This mold consists of two cast-iron plates and a round steel mandrel. The shell of the bearing forms the outside of the mold. The two cast-iron plates are machined to provide an even bearing for the mandrel and to give true surfaces to the babbitt. The upper plate contains two 11/16-in. holes for gate and air vent. Each plate also contains a hole through which the end of the mandrel projects. At the lower end of the bearing (Fig. 2) the mandrel has a shoulder which centers the bearing shell. Another shoulder, at the upper end of the bearing, supports the upper plate, giving the proper clearance between it and the end of the bearing shell. The projecting ends of the mandrel, and the taper of 1/32 in. in the length of the bearing, are made to facilitate the driving of the mandrel out of the bearing after the babbitt has cooled.


5" Dia.
3⅝" Dia.
2⅛" Dia.
6⅝"
1¼"
5⅛"
7½"
5" Dia.
Round Steel Mandrel
8¼"
5⅟₃₂"
3½"
11/16 Hole
Round Cast-Iron Plate
Steel Shell of Bearing
Babbitt Metal
Note: Taper Mandrel 1/32" in Length of Bearing.
Felt Plugs
Felt Plug
Round Cast-Iron Plate
Iron Table
Iron Table
7½"
Section Through ℄ of Bearing and Mold
Top View of Bearing
Half Top View of Mold
Half Section of Mold at AA
Section of Bearing at AA
Gate
Air Vents
3¼"
3⅝"
2⅜"
Fillets ¼" Radius
A
A
1⅝"
Pouring Table
1⅛"
Half Side View of Mold
Section of Bearing on ℄
Side View of Mold and Bearing
Electric Ry. Journal

FIGS. 1, 2 AND 7—CAST-IRON ARMATURE BEARING FOR GE-80 MOTOR, MOLD FOR BABBITTING SAME AND MOLD FOR JOURNAL BEARINGS

Oil holes, etc., in the babbitt are made by the use of felt plugs, inserted in holes in the bearing shell and held in place by wires around the shell. A view of the mold and a finished bearing is shown in Fig. 3.

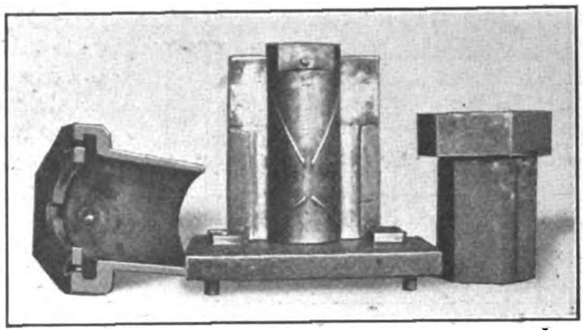


FIG. 6—MOLD FOR MOTOR AXLE BEARINGS WITH CORES IN PLACE AND BACKS REMOVED

After being babbitted, these bearings are machined to an exact fit.

Motor Axle Bearings.—Drawings illustrating this type of bearing and the molds for babbitting it are shown in Figs. 4 and 5, respectively. The mold was designed to cast the two halves of the bearing in one operation and consists of a stand, two cores and two backs. The stand is made of two smooth steel plates connected by cast-iron brackets which also serve to center the backs properly when the mold is being assembled. The cores are placed one on either side of the vertical plate, and are held in place by lugs in the base plate and by a tap bolt extending through the vertical plate. The cores are provided with ridges of the proper size and shape for the purpose of casting oil grooves in the babbitt.

The bearing shells are placed over the cores and the backs are then put in place, covering the shells. The shells and backs fit snugly, centering the shells properly when the backs have been put in place between the brackets of the stand. Each back is provided with a gate and air vent. A ¾-in. threaded hole is also made in each back to admit the crank used for forcing apart the mold and bearing after the babbitt has hardened. Oil holes, etc., are cast by the use of felt plugs of the proper shape and thickness placed in the bearing shell while the mold is being assembled. In Fig. 6 the mold is shown with the cores in place and the backs removed. Axle bearings are not machined after being babbitted.

Truck Journal Bearings.—The molds for babbitting truck journal bearings consist merely of mandrels, each one being shaped to fit one particular type of bearing. These mandrels are usually in the shape of cylinders with lugs or shoulders built out to meet the edges of the bearing shell and of a height to give the proper space between the mandrel and shell. Each mandrel is made to take two bearings at once, one on either side, a clamp being used to hold them in place while babbitt is being poured. Fig. 7, showing the details of the mold for the journal bearings of a Brill 39-E truck, illustrates this type of mold.

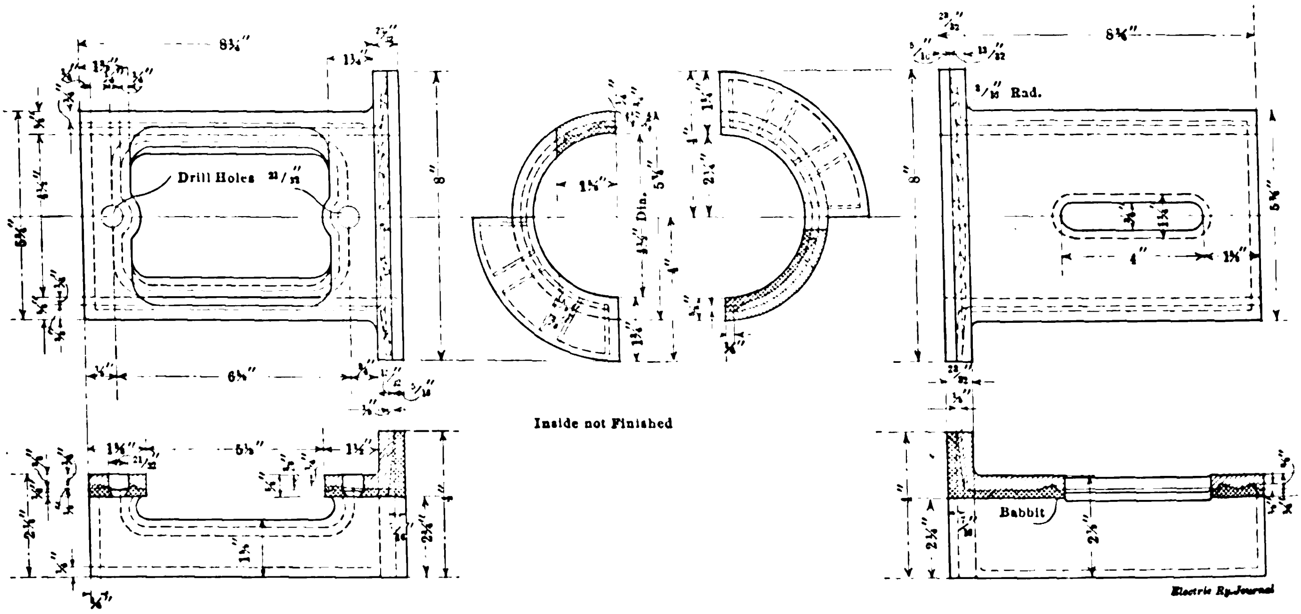

Drill Holes 21/32
Inside not Finished
Babbitt
Electric Ry. Journal

FIG. 4—MOTOR AXLE BEARING DETAILS

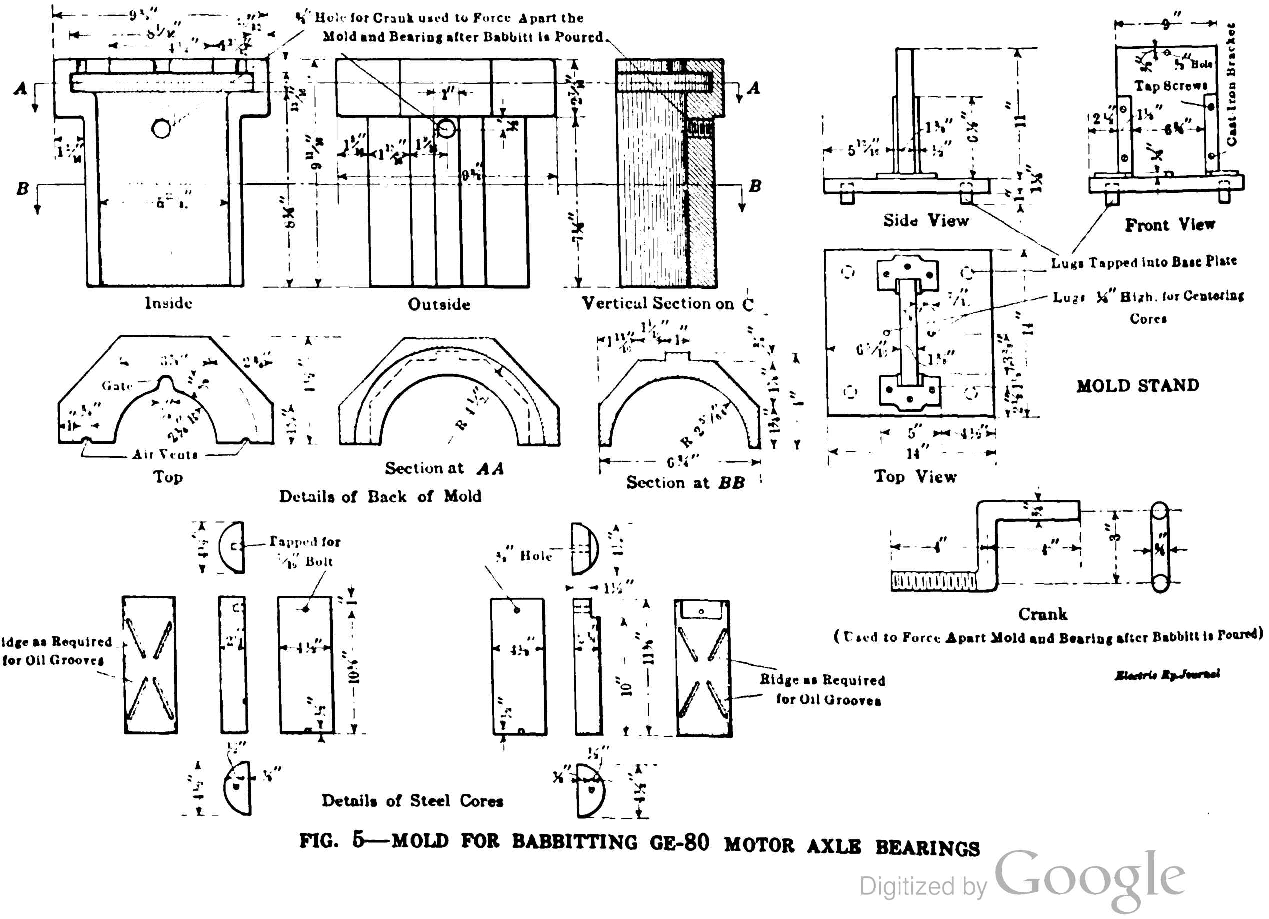

¾" Hole for Crank used to Force Apart the Mold and Bearing after Babbitt is Poured
A
B
Inside
Outside
Vertical Section on C
Gate
Air Vents
Top
Section at AA
Details of Back of Mold
Section at BB
Side View
Front View
Tap Screws
Cast Iron Bracket
Lugs Tapped into Base Plate
Lugs ¼" High, for Centering Cores
MOLD STAND
Top View
Crank
(Used to Force Apart Mold and Bearing after Babbitt is Poured)
Tapped for ⅝" Bolt
Hole
Ridge as Required for Oil Grooves
Ridge as Required for Oil Grooves
Details of Steel Cores
Electric Ry. Journal

FIG. 5—MOLD FOR BABBITTING GE-80 MOTOR AXLE BEARINGS

Equipment Defects—Control Apparatus and Connections—V

BY C. W. SQUIER, E.E.

Controllers for Electric Braking—Certain manually-operated controllers for railway equipments are arranged so that the motors may be used to stop the car as well as to propel it. This is accomplished by connecting the motors as series generators and using the current generated to operate magnetic brakeshoes, or by closing their circuit through a rheostat make use of them for dynamic or rheostatic braking.

It is an inherent characteristic of series motors that when they are connected to the line to work in a forward direction, with the same connections between armatures and fields and the working voltage removed they will work as generators if the armatures are caused to rotate in a direction opposite to that required for the forward movement of the car; or if the connections between the armatures and fields are reversed they will work as generators in the direction in which they car is moving.

Magnetic Braking.—When magnetic brakes are used the voltage generated by the motors is utilized to energize an electric track, wheel or axle brake. All the connections necessary for utilizing this current to actuate the magnetic brakes are made by the controller. Such controllers are provided with what is termed braking notches which are usually located so that a movement of the main or "power" handle in a direction opposite from that necessary to propel the car will bring the fingers into contact with the braking segments and make the necessary connections. By using the same handle continually both for "power" and "brake" the motorman acquires promptness and ease of manipulation. This is a most valuable feature because when emergencies do arise the motorman is never called upon to carry out consciously, yet with extreme promptness, an operation which is not in his regular practice. The simple action of moving the single controller handle in one direction for "power" and in the opposite direction for "brake" reduces to a minimum the "human element" which is so frequently responsible for accidents.

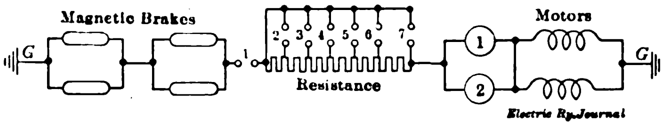


FIG. 14—CONNECTIONS FOR OPERATING MAGNETIC BRAKES

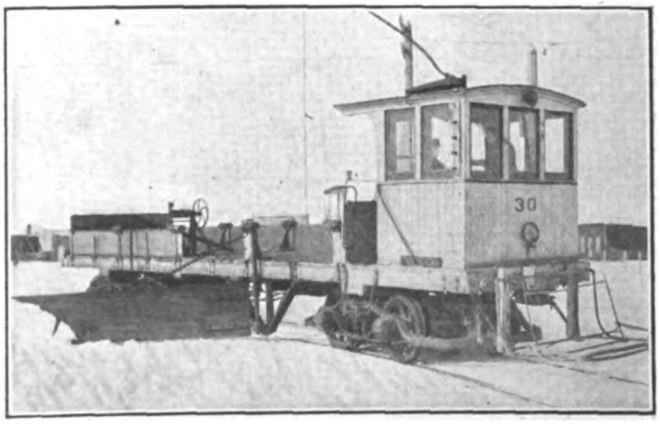
Fig. 14 shows the connections that are necessary to operate magnetic brakes. The motors and the coils of the brake magnets on opposite sides of the car are connected in parallel, and the regulating resistance is placed in series with both. Contacts 2, 3, 4, 5, 6 and 7 are provided for cutting out this resistance so that the amount of current produced by the motors may be varied as required. To apply the electric brakes it is necessary to move the controller handle to the brake notch which agrees with the speed at the moment, and then to move it again notch by notch as the car slows down so as to cut out resistance because the emf generated decreases as the speed of the car falls off. The brake magnets on opposite sides of the car are connected in parallel, as stated, so that the braking force will be the same on both sides.

Magnetic brakes are now seldom used in this country due to the difficulty of securing efficient track braking with the bad track conditions that are encountered on so many roads. In England and on the Continent the track magnets are adjusted so that they are about ¼ in. clear from the rail. It can be readily understood that it would be almost impossible on most American railways to operate with this scant clearance. This trouble could be overcome to a degree by using a less efficient brake magnet. I understand that there has now been developed a magnet which in ordinary service will operate with an adjustment of ¾ in. above the running rail. But even this clearance is much less than we expect for other truck parts.

Dynamic or Rheostatic Braking.—Any controller which is provided with the points necessary for magnetic braking can be used for dynamic or rheostatic braking without any change in the controller itself. No brakeshoes are used with this form of braking. The terminals of the motors are connected to the regulating resistance, and as the current flows there is produced in the motors a back torque (counter emf) which causes the armatures to hold back against their driving force. The greater the torque the quicker will be the stop. Since the armature speed is decreasing the torque will decrease in proportion unless the resistance in the external circuit is decreased as the speed falls off. Therefore, in order that the armatures may exert a uniform back torque while the car slows down, it is necessary that the controller handle be moved from point to point so as to cut out the resistance. As the motors generate current only while the car is in motion, the car will not remain stationary if stopped on a grade unless it is held by some other form of brake. Rheostatic braking uses the back torque alone for making stops. However, where some form of electromagnetic brake is used, the car is not only retarded by the work thrown on the motors, but the current generated is usefully employed in actuating the brakes on the trucks or wheels.

Snow Removal in Montreal

In Montreal the problem of snow removal is a very severe one and the methods used in meeting it have been thoroughly perfected by A. Gaboury, superintendent Montreal Tramway Company. The apparatus consists of the usual sweepers, and, in addition, there are salt cars (which are the equivalent of sand cars) and levelers which are regular motor freight cars fitted up with sheet-iron wings that swing out-board. The latter are for the purpose of pushing the snow into piles along the curbs after it has been thrown aside by the sweepers, thus providing a large clear space beside the track for vehicular traffic. The piles of snow are carted away from the city in sleighs furnished by the city, the cost of removal being borne in part by the company.



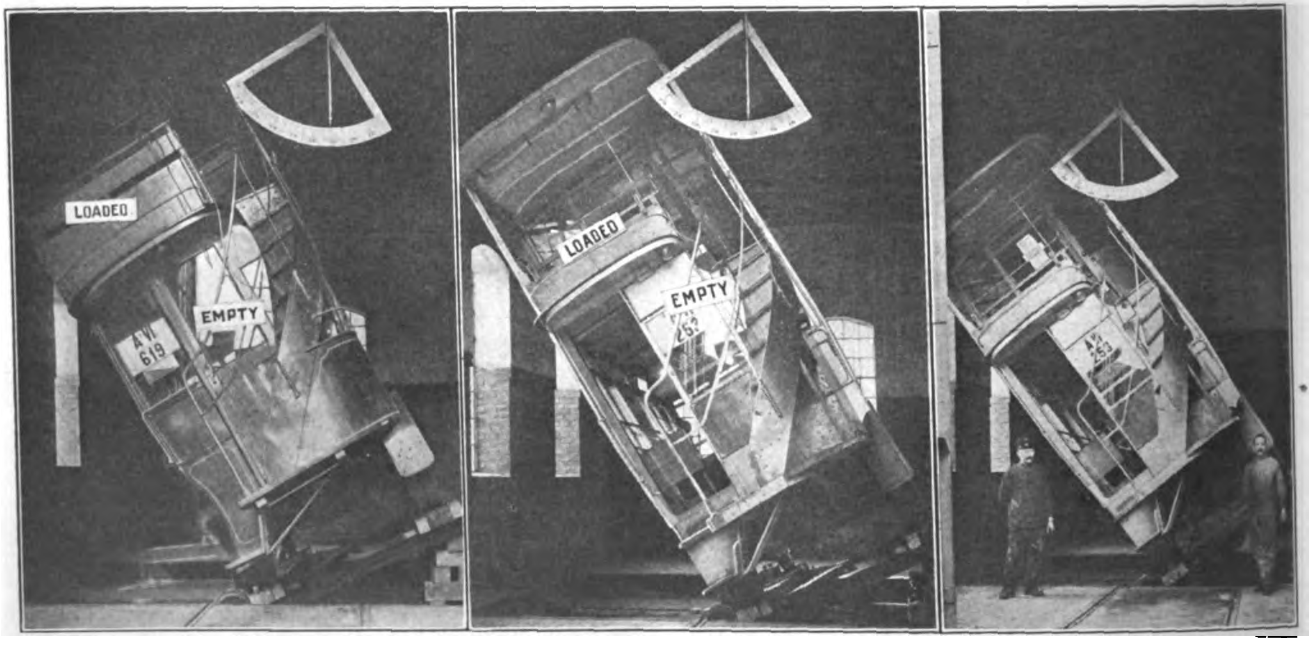
MONTREAL SNOW FIGHTING—FREIGHT CAR TRANSFORMED INTO A LEVELER FOR CLEARING SPACE BESIDES TRACKS

The use of salt has been found to be an absolute necessity during sleet storms or extreme cold weather, and salt cars consisting of old single-truck equipments have been fitted up with longitudinal boxes for holding coarse salt, the material being dropped on the switches through tubes opening from the center part of the bottom of each box.

In operation the snow-fighting equipment is assigned to definite routes so arranged as to have each one completely covered at intervals between forty-five minutes and one hour. In addition the routes provide central conveying points for three or four sweepers, so that one can be diverted if necessity arises on some other route. In addition to the equipment a force of from eighty to one hundred men is constantly employed during the winter on all hills to keep the rails and switches in a safe condition, and during heavy snows this force is augmented from the construction department. As soon as a snow storm begins men are also sent out to sweep and salt every switch and intersection on the system. One prolific source of danger of blockades has been found in the packing of snow on top of fenders in the cars, and to obviate this men are stationed at various points on the system to shovel the snow off of the fenders, and to clear the vestibule windows and destination signs.

Testing the Equilibrium of Double-Deck Buses at Vienna

In making studies for the operation of double-deck auto buses, Ludwig Spängler, director Vienna Tramways, gave particular attention to the question of equilibrium to secure buses that would not tip over when swerving at their highest speeds under the worst possible conditions of grade and curvature. To this end experiments were made to find the permissible angular deviations from the perpendicular for double-deck buses with and without a covering for the upper deck.



EQUILIBRIUM TESTS OF VIENNA BUSES—OPEN-TOP BUS LOADED ON UPPER DECK, EMPTY ON LOWER DECK, TIPPED 31 DEG.—CLOSED-TOP BUS LOADED ON UPPER DECK AND EMPTY ON LOWER DECK, TIPPED 33 DEG.—CLOSED-TOP BUS EMPTY ON BOTH DECKS, TIPPED 40 DEG.

As shown in the accompanying views, the allowable deviation was measured on a protractor fitted with a swinging pointer. One leg of the protractor was fastened at right angles to the side of the bus so that as the bus was tipped away from the perpendicular by putting blocks under one side of the body, the pointer swung away from 0 deg. accordingly.

When empty the center of gravity of the fully-inclosed double-deck bus is not so low, of course, as that of one with an open top deck, but it was found to be low enough for safe operation. When loaded, however, the inclosed type devised by Mr. Spängler has the lower center of gravity because the "well" construction of the upper floor permits the upper seats to be nearly 16 in. lower than the corresponding seats of the Daimler open-top bus.

The tests with the protractor showed that when the open-top bus carried an upper deck load of fourteen 165-lb. bags of sand, and with no load on the lower deck, unstable equilibrium was reached at 31 deg. from the perpendicular. The angle for the fully-inclosed bus when carrying fifteen 165-lb. bags of sand, and with no load on the lower deck, was 33 deg. and this was increased to 40 deg. when the load from the upper deck was removed. All tests were made with gasoline vehicles.

Better Car Illumination Effects Other Economies

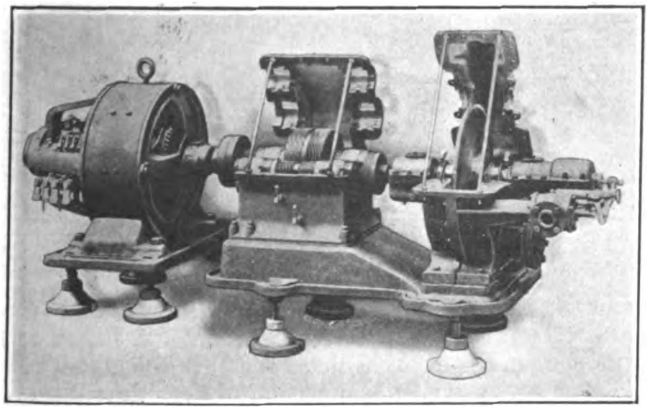
The original lighting scheme on the passenger cars of the Chicago, Lake Shore & South Bend Railway provided for fifty-two 23-watt, 120-volt lamps, five in series in a 600-volt circuit. These lamps were installed one over the back of each seat in a side-wall bracket attached to the window post and a row in the ceiling along the center line of the car. The improved lighting system includes seven 60-watt and five 25-watt Mazda lamps in a 98-volt circuit. The 60-watt lamps serve for general illumination while the 25-watt lamps are installed two in the destination sign, two on the rear platform and one in the toilet. The 60-watt lamps are placed in the ceiling along the center line of the car and are fitted with deep Alba shades set in locked sockets.

This change was a great improvement over the lighting scheme formerly used, which not only supplied too much light but did not distribute it properly. In fact, the light from the lamps in side-bracket fixtures on the window posts was right in the line of vision of seated passengers, and as the light was supplied through thin filaments with energy at twenty-five cycles it was also irritating to the eye. The accessible location of the side brackets also increased the percentage of thefts. In fact, during some months the combined number of lamps broken, stolen or burned out amounted to more than 50 per cent. With the new lighting scheme it is estimated that the savings in lamp replacements and energy consumption will more than pay for the entire installation within one year. All wiring in the new system is in conduit and the circuits are taken off the 98-volt tap of the transformer which forms a part of the 6600-volt, single-phase car equipment. One of the most expensive parts of the improvement was included in replacing the side brackets on the window posts with coat hooks.

Small Geared Turbo Units

The Westinghouse geared turbo-generator set recently brought out is designed to meet the demand for economical turbine units of small capacity. This development was made possible by the Westinghouse reduction gear which permits the efficient coupling of a high-speed turbine to a low-speed generator. These sets are built with either a d.c. or an a.c. generator in capacities from 25 kw to 200 kw, standard voltages. The turbine is designed for condensing or non-condensing operation, as may be desired.

The turbine rotor consists of a single disk, on the periphery of which the blades are carried. On entering the turbine casing the steam expands in a suitable nozzle, passes through these blades and delivers to them part of its velocity energy. On leaving the blades it enters a reversing chamber which redirects it to the blades. This process is repeated as many times as necessary to make efficient use of the energy in the steam.



GEARED TURBO-GENERATOR SET

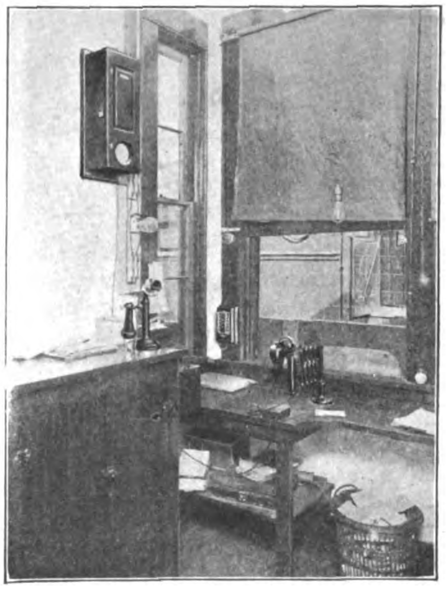
The gear and the pinion are of the split helical type, mounted in an oil-tight case. Ample lubrication is provided by running the gear in a bath of oil. To make inspection easy, both turbine and gear casings are horizontally split, and all steam nozzles and reversing chambers are mounted in the lower half of the turbine casing. The turbine and gear are mounted on a common bedplate. The bearings are all ring-oiled and self-aligning, and require little attention.

The speed of the turbine is controlled by a centrifugal type governor, mounted on the turbine shaft and connected by a simple lever direct to the stem of the valve. The connection between gear and generator is made by means of a flexible coupling.

Alternating current generators furnished with these sets are of the self-contained revolving field units similar to standard Westinghouse belted and coupled types. They can be wound for two or three-phase sixty-cycle service, and any standard potential between 240 volts and 2400 volts. The d.c. generators furnished are all self-contained similar to the standard Westinghouse belted type, and can be wound for 125 volts and 250 volts, two-wire, and 250 volts, three-wire.

Telephone Train Dispatching on the Cedar Rapids & Iowa City Railway

The Cedar Rapids & Iowa City Railway has recently placed in successful operation a telephone train dispatching equipment covering the entire line. This road runs from Cedar Rapids south to Iowa City, a distance of approximately 30 miles, with a branch going east from Cedar Rapids to Mt. Vernon, an additional distance of 15 miles. This includes some of the best farming land in Iowa, where interurban traffic is exceedingly heavy. The passenger trains on the line are operated by electricity and the freight trains by steam.



DISPATCHER'S OFFICE, CEDAR RAPIDS & IOWA CITY RAILWAY

Along the route ten open stations are equipped with telephones and selective signaling apparatus. Sets containing the Western Electric selectors are used for signaling station operators and self-contained, folding-gate, telephone arms are used for the operators' talking apparatus. Six way-station outfits are installed between Cedar Rapids and Iowa City and two between Cedar Rapids and Mt. Vernon. The power house, the superintendent's office and the shop are also connected with the telephone distpatching circuit. The dispatcher is located in the shop-office building 2 miles south of Cedar Rapids and is in control of all points on the line.

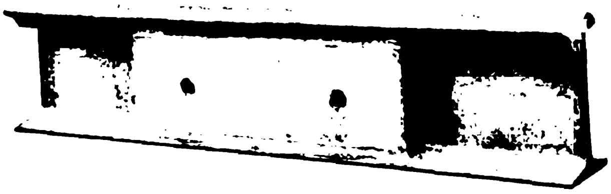
A portable telephone set has been furnished to each train crew so that communication may be established with headquarters from various points along the line. These telephones are fitted with cords and plugs arranged for plugging in pole jacks which are placed at a convenient height on the telephone poles along the right-of-way. This equipment is especially valuable in emergencies. Nine pole jacks are placed on the Cedar Rapids and Iowa City division and six on the line to Mt. Vernon.

The normal traffic on this railway system involves the operation of thirty-eight passenger trains and four scheduled freight trains daily between 5 a.m. and 1 a.m. on the Cedar Rapids & Iowa City line and eighteen passenger trains and two scheduled freight trains between 5 a.m. and 12 o'clock midnight on the Cedar Rapids & Mt. Vernon branch. The telephone dispatching system has now been in use for some months and excellent results from every point of view, notably those of economy and efficiency of operation, are reported.

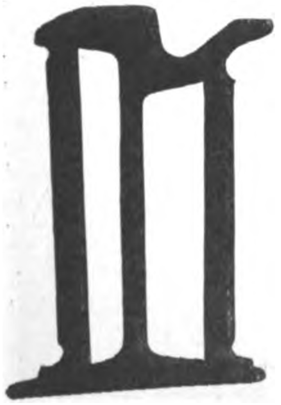
Automatically Welded Electric Joints in Brooklyn

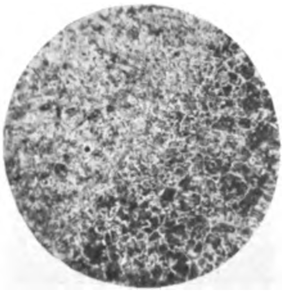
An entirely original method of carbon electrode rail welding was carried out between Nov. 7 and Nov. 18 for the Brooklyn Rapid Transit System by the Atlantic Welding Corporation, New York. The work comprised the installation of sixty-six joints in five-year old rail on the heavily-traveled downtown section of Fulton Street, between Court and Tillary Streets, Brooklyn. Owing to traffic conditions, all work was done between 10 p. m. and 5:30 a. m. and no work at all was permissible on Saturdays and Sundays.

The rails of Lorain 398 and 423 section had been set on steel ties incased in concrete and had been secured to the ties with clips. In substituting the new welded joint for the riveted type these clips were removed with a cold chisel and the rail was welded directly to the ties. The rectangular joint plates, which support the head as illustrated, were made in lengths of 31 in. and 19 in., several compromise joints with these lengths being, of course, included. Twenty-six of the joints included 12-in. inserts. A metallic electrode process was used to fill the heads of excessively worn rails at joints and at the dishes opposite the joints. The job was finished bv grinding to the original level.


SAMPLE OF A COMPLETE WELD

The welding process itself is one which has already been used on a large and successful scale throughout Europe. Its salient features are two: The carbon electrode used is set in a carriage which is moved at a predetermined rate and in a manner which avoids all inequalities due to the varying skill of the welder himself; the welding current is not drawn through wasteful resistance but is taken at an efficiency of 90 per cent or more through a 550/70-volt European-Rosenberg motor-generator set which can withstand a short-circuit indefinitely.


EARLY WELD OF LORAIN NO. 395, 141-LB. RAIL


MICRO-PHOTOGRAPH OF SECTION THROUGH A WELD

A complete welding outfit consists of a covered wagon with the special motor-generator set mentioned, a marble switchboard of power-station type and two portable welding machines or carriages. In executing work, the carriages are operated inside of light-weight tents, which are readily set up or dismantled.

Each outfit has a crew comprising a foreman, two welders and two helpers, one welder and helper working at each carriage. While the special conditions in Brooklyn made work under the best conditions impossible, from twelve to fifteen joints have been made elsewhere per eight-hour day with one outfit and crew, so that the actual time necessary per joint is only twenty-five to thirty minutes. In numerous cases, eighteen joints per day have been made by five men. This rate will suffice to keep step with the tasks of the other track work gangs. If, however, it is necessary to increase the number means can be provided to make as many as twenty-five joints in one shift.

The welding process is purely automatic. After the beveled flat-bar plates have been adjusted, the welding carriage and the arcing element thereon are placed over the joint. The automatic feature lies in the condition that the carbon is set to travel at a predetermined rate over the line to be welded. The carriage is adjustable to any type of rail. The weld is obtained by making the arc fuse the two surfaces (plate and rail), a firm, composite structure being obtained with the help of feed-in material.

As shown in an accompanying micro-photograph of a weld made abroad, the transition in the composition of the metal from the plate to the material added and from that material to the head is very gradual and differs only in the percentage of carbon content. As the actual area welded is low in carbon, a junction of high ductility and great strength is obtained. In no case has a microscopic examination shown anything but a close-grained structure with an entire absence of "shoot offs" thus proving that the head had never reached a temperature high enough to change the molecular structure. The intrinsic value of the joints so produced is the firm support given to the head, and the tying together of the head and base to form a rigid box girder of solid section.

MOTOR-GENERATOR WAGON AND TENTS

In the plant of the United Water, Gas & Electric Company, at Hutchison, Kan., which furnishes power to the Hutchison Interurban Railway, the body of a mouse grounded some important circuits in the station which stopped the railway and put out all the lights in the city. Many other industries depending on electric motors for power were also without energy for about an hour. It appears that the assistant engineer of the plant discovered the mouse and while he was trying to dislodge it from its precarious position without shutting down the plant the little animal jumped into a connection that electrocuted it and caused a serious short-circuit.

News of Electric Railways

DECISION IN PASSAIC GAS CASE

Highest Court in New Jersey Declares Franchises Must Be Valued for Rate-Making Purposes

A decision was rendered on Dec. 9 by the Court of Errors and Appeals of New Jersey upsetting the order of the Board of Public Utility Commissioners requiring the Public Service Gas Company to establish a 90-cent rate for gas in its Passaic district. The interest of this decision to electric railway companies lies in the fact that this rate was based on a valuation in which the commission made an allowance for "going concern" value, but made no special allowance for the value of franchises. The decision of the commission in this case was published on page 35 of the issue of this paper for Jan. 4, 1913. The decision was upheld by the Supreme Court, but was appealed to the Court of Errors and Appeals by the gas company, which is one of the constituent companies of the Public Service Corporation.

The decision of the court, rendered just as this issue was about to go to press, includes the following statement:

"When a public utility corporation is in the enjoyment of privileges to use streets and public places in this State for the purposes of its business, whether such privileges be conferred by the State alone or partly by the State and partly by the municipality, and whether they be exclusive or subject to duplication, such privileges constitute a special franchise which is property, is subject to taxation and has normally a substantial value; and in making a valuation of the property of such corporation for the purpose of establishing a basis for the regulation of rates to be paid to it by the public for its product or service, it is erroneous to assign no value, or a merely nominal value, to such franchise when a substantial value is fairly reflected in the total market value of its securiites."

The report justifies this decision by many citations and also upon grounds of equity. It also considers the statement of the commission that it was the policy of the State not to allow the capitalization of franchises for an amount in excess of the actual cost involved in obtaining such franchises. The court says that even if the franchises are not capitalized this is no reason for the exclusion of the franchise from a valuation for rate-making purposes, because, while the value of the franchise may not be included in the par value of the capital stock it affects its market value.

DES MOINES FRANCHISE MATTER

The Des Moines (Ia.) City Railway is awaiting action by the City Council on its petitions for a special election to vote on the question of granting a franchise. About 10,000 of the voters in the city, or more than half, have signed one petition calling for such an election. The law requires only about 5000 names on this petition. About 1500 property owners have signed a second petition calling for the same election. The law requires only 175 names on this petition. Both petitions were secured so that the city might proceed with both and thus meet the different requirements of two sections of the law governing franchise elections. This was done in order that the date of the election might be fixed without the necessity of delay due to legal proceedings to determine which section of the law should apply.

Members of the City Council, and Mayor Hanna especially, have seen fit to delay the proposition indefinitely and continuously in spite of every effort on the part of the company for speedy action. When the Council refused action on the petitions the company finally took the question to the courts, and in the lower tribunal the decision was soon reached. An appeal has been made to the State Supreme Court and that body has advanced the hearing to Dec. 21. The company's only interest in this decision is to avoid any doubt about the legality of the proceedings. In the meanwhile the city might have proceeded under both sections so that there would be no uncertainty. Instead the city has refused to proceed under either.

Mayor Hanna has stated several times that he proposed to fix Jan. 16 as the date for the election, but he has not yet fixed any date. It has been proposed recently that a vote on the local saloon question be taken at the same time as the vote on the city railway franchise. Mayor Hanna also has proposed to submit a series of amendments to the proposed franchise at the time of the election, but it is thought unlikely that he will be able to do this since the petitions call for an election on the specific franchise called for by the company and none other.

MUNICIPAL OWNERSHIP IN SEATTLE

City Apparently Divided Over Question of Continuing Present System

As a culmination of the controversy waged in Seattle, Wash., the last three years over the question of municipal operation of electric railways, several members of the City Council now advocate disposing of the existing municipal railway system. The leader of the faction in favor of selling the lines was elected to the City Council last year largely on account of his advocacy of municipal ownership, but he is now arrayed on the other side. This state of affairs is attributed to a considerable extent to the filing of a suit on Nov. 27 by the State on behalf of the state board of accountancy against the City Council of Seattle, the Mayor, city treasurer, city comptroller and former Mayor Cotterill to recover money alleged to have been illegally appropriated for the rehabilitation and operation of the Lake Burien Railway outside of the city limits, the second unit in the city's railway system.

The Lake Burien line was accepted as an unincumbered gift from its promoters, property owners along the right-of-way, and $25,000 was appropriated by the City Council to rehabilitate the line. Later $9,000 was appropriated to form an operation fund for this line and Division A of the municipal lines. Since the beginning of operation there has been a deficit each month which has remained a charge against the general fund. Three miles of the Lake Burien line lie outside of the city limits. As if to anticipate the action for recovery of the appropriation a rider to abolish the accountancy board was placed on the ballots which went before the voters at the recent general election, but this issue was defeated at the polls. The attorney-general hopes to establish through the suit whether cities of the State can operate public utilities outside the city limits.

The municipal system of Seattle has been described previously in the ELECTRIC RAILWAY JOURNAL. It consists briefly of a line known as Division A, 4.2 miles long, running from the business district to the mill district of the city, and of the Lake Burien line, 9 miles, which extends from the extreme southern end of the city to Lake Burien. There is a distance of practically 2 miles between the two divisions. The advocates of the municipal railway system have proposed connecting the lines with a motor bus service, and have endeavored to add the Seattle, Renton & Southern Railway to the municipal system. This line traverses the Rainier Valley practically parallel with the Lake Burien line, but 2 miles or 3 miles distant. It crosses the business section of Seattle, however, and could be connected with Division A, but it could not be connected with the Lake Burien line except at considerable expense.

The constant heckling indulged in by members of the City Council has apparently served no purpose except to keep many of the outlying districts of the city without adequate transportation facilities. In five years no extensions of the lines of the Puget Sound Traction, Light & Power Company have been built in Seattle because of the unreasonable demands of a City Council which was determined upon converting the lines of the city into a municipal system.

A resolution since introduced in the Council by A. Allen Dale providing for the sale of Division A and C of the municipal railway has been tabled pending a decision in the suit of the State against the city alleging misappropriation of funds. Mr. Dale advocates the plan of placing the matter of selling the lines before the electorate at the municipal election in Seattle in March.

TOLEDO NEGOTIATIONS HALTED

Nothing has been done toward renewing the negotiations between the city of Toledo, Ohio, and the Toledo Railways & Light Company since the franchise committee of the City Council announced that it had completed a franchise similar in many ways to the one prepared by the company in the first place. It is understood, however, that the draft prepared by the franchise committee contains some requirements objectionable to the company. Copies of the ordinance are in the hands of the attorneys, but they have not as yet been made public.

In overruling the demurrer filed by the Toledo *News-Bee* in the case of the United States against the Toledo Newspaper Company and N. D. Cochran, Judge Killits announced on Dec. 4 that the case would go to trial on its merits on Dec. 28. This is the action in which the defendants were cited for contempt of the Federal Court because of certain publications relating to the receivership case of the Toledo Railways & Light Company, and meetings conducted by so-called agitators after the court had rendered a decision, restoring the old rate of fare pending a final settlement of the franchise question.

CLEVELAND SUBWAY AND LABOR MATTERS

It is stated that the freight subway project under East Fifty-fifth Street, Cleveland, Ohio, as planned by O. C. Barber, Barberton, will depend largely upon the establishment of the harbor line at the foot of the street where he has planned to erect extensive coal and ore docks. The subway would connect the proposed docks with the railroads in the Cuyahoga valley.

Cleveland motormen and conductors are arranging to request the State Industrial Commission to investigate working conditions in the city. They contend that the State law provides for eight hours of continuous rest out of each twenty-four for railway employees and that the commission has authority to investigate and enforce the law. They will, however, ask Attorney-General Hogan for an opinion on the State law before they appeal to the commission.

Several minor amendments to the proposed grant to the Cleveland Rapid Transit Company were submitted at the regular meeting of the City Council on the evening of Dec. 7 and the ordinance was placed back on its second reading.

PROGRESS ON BOSTON SUBWAY CONSTRUCTION

Steady progress is being made in the construction of the Dorchester tunnel and the East Boston tunnel extension, at Boston, Mass., under the direction of the Boston Transit Commission. The former is now completed from Tremont Street to Washington Street, under Winter Street, and the Washington Street station, between Washington and Arch Streets, is completed except for interior finish and equipment. This station is a two-story structure. Transfer between Cambridge subway and Washington Street tunnel and Dorchester trains will be made at the station through passageways or lobby connections. East of this station 270 ft. of tunnel built in open cut is completed, the remaining section of 760 ft. connecting with Dewey Square and the South Station being under construction by the tunneling method. Work has been started on the Dewey Square section, which is to be 800 ft. long.

The East Boston tunnel extension, which connects Scollay Square with the West End, will have stations with island platforms at Scollay and Bowdoin Squares. An inclined elevator will be provided at the former station, which is being built below the Tremont Street subway. The existing entrances will serve for both stations, with an additional entrance at the north side of the square. Between Scollay and Bowdoin Squares the tunnel is a double-barreled structure and throughout the entire extension space for two tracks is provided. West of the Bowdoin Square station an underground loop will be built to enable a portion of the East Boston cars to be turned back at this point, and a switch-back will be installed east of Scollay Square to reverse various Cambridge trips. The general work of construction is practically completed with the exception of the finishing of the stations and the reconstruction of the tunnel between Washington Street and Scollay Square.

MISGIVINGS IN SAN FRANCISCO

"Chronicle" Wants City to Apply Business Principles to Municipal Line

In the issue for Dec. 2 the San Francisco *Chronicle* said in part in an editorial headed "Our Municipal Railroads":

"The profit in owning and operating a street railroad system is made by a very trifling percentage of each fare paid. Now that this city has engaged in the railway business, we all wish it to be successful. The net income ought to be sufficient to make good all that we lose by taxes which private owners have paid, and in addition to pay off all indebtedness incurred in building the system within such a reasonable term as would be accepted by a private company as the period of a franchise. Extensions must be made only when they will pay for themselves during such a period. Upon any other basis, either the taxpayers or those who ride on the cars will have partly to pay for other people's rides. If any section of the city wants a railroad not likely to pay within a reasonable time, the property owners who will benefit by it ought to pay for it.

"In this city we already see different sections vigorously fighting each other before the Supervisors in regard to the location of new railroads. In no case does any faction present figures to show that the road they desire will be profitable. We are already operating lines which for the present are unprofitable, and are operated out of the profits of the paying properties. It is useless to ignore the fact that if the construction of new lines be left entirely to Supervisors their action will be largely determined by its probable ultimate effect on votes. And that is the very worst way there is to fix locations. This scramble for street railroad and other improvements is at the bottom of the movement to return to our old plan of electing Supervisors by wards. The present management of our municipal railroads is competent. Any management if left to itself will strive to make the best possible showing. Such city administrations as we have sometimes had would take care that there was a management to suit them, but that rests with the people. But there should be sufficient backbone in the government to run our street railroads on business principles."

CONSTRUCTION IN TENNESSEE AND KENTUCKY

The extension of existing electric interurban lines and the construction of several others which are definitely projected and some of which are surveyed, are engaging the attention of middle Tennessee and south-central Kentucky. These lines will radiate from Nashville, Tenn., and in connection with two lines already in operation will traverse some of the richest territory in the United States. As has been noted previously, the Nashville & Gallatin Railroad is to build a branch, leaving the main line at Goodlettsville and extending to Springfield, Robertson County, and ultimately to Clarksville, in Montgomery County, passing through Guthrie in southern Kentucky. All of this is a rich tobacco and grain growing section. The same company has outlined an extension northward from Gallatin to Bowling Green, in Warren County, Ky.

An important extension from the line of the Nashville & Franklin line is already under way. Known as the Middle Tennessee Interurban Railroad, it will extend from Franklin, through Eaglesville, Shelbyville, Fayetteville, all in Tennessee, to Huntsville, Ala. The 23 miles between Franklin and Eaglesville is already graded.

Of the new projects, the Tennessee & Kentucky Interurban Railroad is perhaps the most important. This line, as has been indicated, will extend from Nashville, across the State line to Adairville, in Logan County, thence connecting with Russellville, the county seat, and ultimately being extended to Franklin, seat of Simpson County, Ky. The Cumberland Valley Interurban Railway has its line surveyed through Wilson County to Watertown, Alexandria, Smithville, McMinnville and Sparta, from which branches are projected to Lebanon and the Hermitage, the old home of Andrew Jackson. The Nashville & Murfreesboro Interurban Railway is projected to pass through Davidson and Rutherford counties, extending ultimately to Woodbury, seat of Clinton County, while there are various other projects in process of organization, it is said, to build lines from Nashville to Ashland City and out the Charlotte Pike. The Nashville Traction Company is reported to be planning an interurban extension out the Murfreesboro Pike to Una.

The project to build the interurban railway to connect Lexington, Ky., and Richmond, Ky., has received further stimulus from the fact that Lexington's new Board of Commerce is considering it. Louis des Cognets, former president of the Lexington street railway system, said recently:

"Even should the Kentucky Traction & Terminal Company be disinclined to build the line, it has given assurance that it will co-operate in a most friendly spirit with any company operating cars into Lexington from Richmond. The line to Richmond is one of the most important definite plans for the benefit of the whole community that the Board of Commerce can take up."

Costly bridge construction necessary to span the Kentucky River, which has cut a wide deep channel between the two towns, has previously acted as a deterrent to the building of the line. Mr. des Cognets, however, urges that the state law permits toll bridges and that these tolls could be made to meet the fixed charges of such a structure, the cost of which is estimated at $250,000.

Third Track in State Street, Chicago.—The Chicago (Ill.) Surface Lines is asking permission to build an additional third track in State Street, in order to do away with "switchbacks" and to provide loops for cars from the west, northwest and southwest sides.

Washington Air-Brake Order.—The Public Service Commission of the District of Columbia has denied the application of the Washington Railway & Electric Company for an extension of sixty days from Dec. 31, 1914, in which to install air brakes on all cars weighing sixteen tons or more.

Employees Want New Laws.—On Jan. 11 representatives of electric railway employees from all sections of Ohio will meet at Columbus to plan a campaign for the enactment of laws for the regulation of working conditions on electric railways. The call for the meeting was sent out by the Amalgamated Association.

Transportation Commission Favored.—Mayor Hocken of Toronto, Ont., at the recent luncheon of the Municipal Improvement Association in that city, delivered a speech favoring the appointment early next year of a transportation commission to plan civic car line extensions with a view to their unification in 1921 with the present system as operated by the Toronto Railway.

Recovery of Benefit Fund Payments Allowed.—Chief Justice Shepard of the Court of Appeals of the District of Columbia decided on Dec. 9 that an employee of the Philadelphia & Baltimore Railroad was entitled after discharge by the company to recover from the railroad the amounts of money he had paid into the company's benefit fund. The man who sued for recovery had been in the employ of the company twenty years.

Toronto Suburban Railway Rights.—City Solicitor Johnston, of Toronto, Ont., reporting to the Board of Control on Dec. 3 on the rights and privileges held by the Toronto Suburban Railway pointed out that the company had what practically amounted to a perpetual franchise, as provisions were made for its renewal in September, 1929, and at the end of every twenty years thereafter. The only way the city can acquire the rights of the company is by purchase in 1929 or at the end of any other twenty-year period, either by agreement or arbitration.

Service Conference in Pittsburgh.—J. D. Callery, president, and P. N. Jones, general manager of the Pittsburgh (Pa.) Railways conferred with Mayor Joseph G. Armstrong and City Solicitor C. A. O'Brien on Dec. 11 relative to the points at issue between the company and the city. The matter of the suit brought during the term of Mayor Magee to enforce the payment of the car tax was not mentioned, as this is to be handled separately. While transfers, rerouting, street cleaning, track repairing and the establishment of a shuttle between downtown Pittsburgh and the North Side were discussed nothing definite was decided upon. Another conference will be held soon.

The New Haven Indictments.—The case of the indictments against a number of the directors of the New York, New Haven & Hartford Railroad was called in the United States District Court before Judge Rudkin on Dec. 4. Pleas of not guilty were entered for William Rockefeller, Robert W. Taft, Charles F. Brooker, Frederick F. Brewster, D. Newton Barney and Henry K. McHarg. Pleas claiming immunity were entered for William Skinner, James S. Elton and George F. Baker. A. Heaton Robertson and James S. Hemmingway also entered pleas of not guilty. John L. Billard, Edward A. Robins and Thomas De Witt Cuyler have also entered immunity pleas. The remainder of the twenty-one directors indicted for violation of the Sherman law have already entered pleas of not guilty.

Confiscation of Mexican Tramways Reported. — W. E. Pearson, at the New York office of the Pearson Engineering Corporation, Ltd., confirmed the statement recently attributed to Dr. F. S. Pearson, president of the Mexico Tramways, that the latter had received a cable on Dec. 2 from his representative to the effect that the property had been confiscated by the political factions now in control of the city government. The treasurer and other officers were ordered to leave the service forthwith. Both the British and the Brazilian authorities in Mexico City are said to have filed protests. No other advices regarding this matter had been received up to Dec. 9. According to recent reports the Zapatistas have not in any way disturbed the Mexican Light & Power Company, which supplies the tramway, the city and private customers with light and power.

Public Utility Commission Legislation Likely.—The question of a public utilities commission for Michigan, which was before the Legislature two years ago, will probably come up again at the session this winter. It is understood that Governor Ferris and the members of the Michigan Railroad Commission will back the bill, while the Republican state platform pledged the support of that party to such a bill. Two years ago two bills for a utilities commission were before the Legislature, one copied after the Indiana law and the other drawn up by Chairman Hemans of the State Railroad Commission. Both died in committee. Mr. Hemans is now at work on another bill for presentation at the coming Legislature, but his plans are tentative as to what it shall contain. Governor Ferris, it is understood, will make a special plea for a public utilities commission in his message to the Legislature.

Forestall Complaints.—In an editorial "Forestall Complaints Before They Happen," *Printers' Ink*, a journal for advertisers, after quoting from the article "The Importance of Good Public Relations," written by Theodore P. Shonts, president of the Interborough Rapid Transit Company, for the convention issue of the ELECTRIC RAILWAY JOURNAL, says in its isue of Dec. 10: "With Mr. Shonts we are in hearty accord, but *Printers' Ink* would go one step farther. A well-conducted advertising campaign along the general lines of that conducted by the American Telephone & Telegraph Company would forestall most of the complaints before they happen. The American public is not only a reading and a thinking public; it is a public pretty thoroughly alive to the sense of fair play. An understanding of the fundamental problems which 'big business' is forced to solve will go far toward removing hostility on the part of the great mass of the people. In no way can that understanding be given so easily and so quickly as by advertising."

New York's Subway Labor Problem.—The Public Service Commission for the First District of New York has been served with an injunction, otained by William E. Heim, a taxpayer of New York City, restraining it from taking any action to forfeit any construction contract on the new rapid transit lines on account of the alien labor clause of the State labor law, or from withholding payments to such contractors because of violations by them of this clause. Argument on the preliminary order was had in the Special Sessions Court on Dec. 4. It is expected that the decision of this court will be appealed to the Appellate Division and from there to the Court of Appeals, so that the judgment

of the court of last resort may be obtained. The application for the injunction is based upon the allegation that the provision of the labor law forbidding the employment of non-citizens upon public work is unconstitutional and a violation of the treaty between the United States and the Kingdom of Italy and similar treaties with other nations in the most favored nations class.

Reports Requested Regarding Seattle Purchase.—Preliminary to further consideration of the proposition for the purchase of the Seattle, Renton & Southern Railway by the city of Seattle for a consideration of $200,000 in municipal railway bonds and 20 per cent of the gross earnings for a period of twenty-eight years, payable annually, Mayor H. C. Gill recently conferred with the heads of the various departments of the city government on the various phases of the project. The Mayor has asked A. L. Valentine, superintendent of public utilities, to report on the cost of operation of the line by the municipality, the cost of such reconstruction as will be necessary in bringing the tracks to the established grades, and matters of like nature. A. H. Dimock, city engineer, has been requested to furnish an estimate of the cost of grading and regrading the 18 ft. of Rainier Avenue now occupied by the tracks of the Seattle, Renton & Southern Railway. J. D. Ross, lighting superintendent, will report on the estimated cost of current sufficient to operate the line in connection with Division A and the Highland Park & Lake Burien Line, Division C, as well as the advantages that will accrue to the light and power department by city operation of the line. James E. Bradford, corporation counsel, will report on the various suits against the Seattle, Renton & Southern Railway, now in court.

PROGRAMS OF ASSOCIATION MEETINGS

New England Street Railway Club

The regular monthly meeting of the New England Street Railway Club will be held at the American House, Boston, Mass., on Dec. 17. H. A. Bullock, staff assistant to the president of the Brooklyn (N. Y.) Rapid Transit Company, will speak on "The Employee's Welfare." His address will be followed by a discussion in which it is expected that representatives of large corporations in other kinds of business who have had extended experience along this line will take part. The dinner which precedes the meeting will be served at 6 p. m.

American Wood Preservers' Association

The eleventh annual convention of the American Wood Preservers' Association will be held at the Congress Hotel and Annex, Chicago, on Jan. 19, 20 and 21, 1915. The subjects to be treated in papers are as follows:

"Treated Timber for Factory Construction," by F. J. Hoxie, engineer and special inspector of the Associated Factory Mutual Fire Insurance Companies.

"Temperature Changes in Wood under Treatment," by George M. Hunt of the Forest Products Laboratory, Madison, Wis.

"Sill Ties," by F. J. Angier, secretary-treasurer of the association.

"New Data on Properties of Creosote Oil," by Dr. Herman von Schrenk.

"Facts on Treated Ties," by J. H. Waterman, superintendent of timber preservation of the Chicago, Burlington & Quincy Railroad.

"Bleeding and Swelling of Paving Blocks," by Clyde H. Teesdale, in charge of wood preservation at the Forest Products Laboratory, Madison, Wis.

"Economical Use of Steam in Connection with Wood Preserving Plants," by A. M. Lockett, mechanical engineer, New Orleans, La.

"Mechanical Life of Ties as Affected by Ballast," by Earl Stimson, engineer maintenance of way of the Baltimore & Ohio Railroad.

"Determining the Soundness of Timber before Treatment," by C. M. Taylor, superintendent of the Port Reading Creosoting Plant.

"Facts on Creosoted Piling," by T. G. Townsend, piling inspector of the Southern Railway.

"A Problem in Air Seasoning Ties," by A. H. Noyes, assistant treasurer of the Ayer & Lord Tie Company.

Financial and Corporate

RECENT FINANCIAL TENDENCY

The sales of bonds on the New York Stock Exchange on Dec. 9 totaled $1,736,000, par value, as compared with $1,395,500, par value, for the same day last year. This is much the largest day's business in bonds since public trading was resumed. Price movements on the average showed a further gain, but there were reactions in some securities which have lately experienced unnatural advances. Despite the approaching opening of the Stock Exchange for trading in stocks, sterling rates remain normal. Money continues easy. It is not regarded as likely that rates will be materially affected by any borrowing which may be made following the reopening of the exchange for public trading in stocks. Trading in stocks through the clearing house, according to the reports issued on Dec. 9 by the New York Stock Exchange, presented many interesting features. The most important changes reported during the day were in the railroad issues.

CHICAGO TRACTION ACCOUNTING CONTROVERSY

The report of the special audit of the books of the Chicago Railways and the Chicago City Railway being made by the city administration has just been published. That for the Chicago Railways was made by M. & L. W. Scudder, of New York, and that for the Chicago City Railway by Barrow, Wade, Guthrie & Company. In both cases the books were found without important error. The corporation counsel of the city, however, has recommended certain changes in the accounts to which paving and the removal of obstructions should be charged, although both of these questions have either been covered by specific provisions in the ordinance or publicly discussed and decided by the Board of Supervising Engineers, which has had the sole authority under the ordinance in these matters. It has been estimated that these changes, if made, would reduce the Chicago Railways' capital account $6,945,130 and make it necessary to pay the city traction fund $584,264, and that the company should also credit its renewal account with $531,965, and, similarly, that the capital account of the Chicago City Railway would have to be reduced approximately $5,138,000.

Regarding this controversy Henry A. Blair is quoted as saying, in an interview, that the books of the two railway companies have been audited each year by accountants selected by the city and approved by the companies. Through these audits the city comptroller was familiar with the methods of the Board of Supervising Engineers in charging every item which is now sought to be questioned by the Mayor. On these audits the companies have made seven annual settlements with the city, having turned into the traction fund more than $13,000,000,

On the special audits during Mayor Busse's administration the city and the companies had expended approximately $100,000, of which the city has borne 55 per cent. In the audit just completed the city again appropriated $50,000 of its own funds for the work. It would seem that this constituted a liberal expenditure for auditing purposes. Moreover all these firms have reported that the railway companies were conforming to the terms of the 1907 ordinances and the decisions of the Board of Supervising Engineers. The accountants engaged on the work at the present time were not called upon to show what would have been the results of operation during this seven-year period if the companies had followed the ordinance and the decisions, but if they had followed the opinions rendered by corporation counsel. Mr. Blair did not consider these criticisms therefore worthy of serious consideration. Speaking from the standpoint of a financial representative he did not believe that the controversies of this nature were at all helpful either to the city or to the railway companies.

Mr. Blair is also quoted as saying that during the seven-year period the companies had never at any time earned more than a fair rate of return upon the capital fixed by the actual purchase price of the city. The rate of return has been about 7 per cent, which includes the 5 per cent return upon the purchase price, the companies' 45 per cent of the visible net receipts and all construction profits. This rate of return he stated was less than that earned by other public utilities in the city of Chicago.

ANNUAL REPORTS

Eastern Pennsylvania Railways

The consolidated statement of income, profit and loss of the Eastern Pennsylvania Railways, Pottsville, Pa., for the twelve months ended June 30, 1914, follows:

Gross earnings	$826,415
Operating expenses and taxes	503,487
Net earnings from operation	$322,928
Deduct underlying companies charges	45,525
Balance	$277,403
Interest on bonds	$164,863
Other interest and rentals	13,630
Total	$178,493
Surplus for year	$98,909

As compared with the year ended June 30, 1913, the gross earnings increased $56,735, or 7.37 per cent, and the operating expenses increased $67,483, or 15.48 per cent. The net earnings, therefore, decreased $10,748, or 3.22 per cent, while the net profit for the year decreased $19,463. The various departments showed the following earnings results: Railway, an increase of $13,576; electric, an increase of $43,415; gas, a decrease of $55, and park, a decrease of $201. The increased operating expenses were partly caused by higher cost of labor and extra maintenance. Railway maintenance increased by $23,900 to a total of $88,390 for the year, while the cost of transportation increased $13,000. There was charged to capital accounts during the year $115,689, of which $57,666 was for the railway department and $58,023 for the electric department.

San Francisco-Oakland Terminal Railways

Price, Waterhouse & Company recently completed an audit of the books of the San Francisco-Oakland Terminal Railways for the fiscal year ended June 30, 1914, and submitted the following income statement for that period:

Operating revenues		$4,515,798
Operating expenses:		
Maintenance of way and structures	$400,972	
Maintenance of equipment	284,081	
Traffic	25,398	
Conducting transportation	1,923,966	
General and miscellaneous	295,503	
Total operating expenses		$2,929,920
Net operating revenue		$1,585,878
Deduct:		
Taxes and licenses		239,000
Net revenue		$1,346,878
Add:		
Miscellaneous income		125,964
Net income before charging interest, amortization of premiums and discount on bonds and notes, and depreciation of road and equipment		$1,472,842
Deduct:		
Interest on bonds	$859,268	
Interest on collateral trust notes	175,000	
Miscellaneous	23,232	
Total		$1,057,500
Profit after charging all interest, but before providing for amortization of premiums, and discount on bonds purchased, and depreciation of road and equipment.		$415,342
Deduct:		
Amortization of premiums and discount on bonds purchased		10,491
Profit after charging all interest, but before providing for depreciation of road and equipment		$404,851
Add:		
Interest charged by company to capital assets		240,101
Balance carried to surplus account		$644,952

The operating expenses of the company for the fiscal year consumed 64.9 per cent of the operating revenues, divided as follows: maintenance of way and structures, 8.9 per cent; maintenance of equipment, 6.3 per cent; traffic, 0.6 per cent; conducting transportation, 42.6 per cent, and general and miscellaneous, 6.5 per cent. Taxes and licenses absorbed 5.3 per cent of the operating revenues, leaving net revenue of 29.8 per cent. Miscellaneous income constituted 2.8 per cent of the operating revenues, so that the net income before charging interest, amortization and depreciation was 32.6 per cent of the operating revenues.

The auditors report net additions to capital account of $510,927 for road and $105,923 for equipment, a total of $616,850. These amounts are those existing after considerable writing down of the value of land and writing off of the value of abandoned structures. The total amount of bonds outstanding as of June 30, 1914, is certified to amount to $16,656,000 in the hands of the public and $3,256,000 pledged as security for the Oakland Railway notes, making a total outstanding amount of $19,912,000.

The profit of $404,851 after charging all interest, including the interest properly chargeable to capital, does not provide for sinking fund payments. While amply able to maintain itself in excellent operating condition, therefore, the property evidently is not in a position to undertake new construction until, through refinancing, new capital has been obtained.

Barcelona Traction & Light Company, Barcelona, Spain.—Owing to the present European war, the Barcelona Traction, Light & Power Company was unable to meet the semi-annual interest coupons due on Dec. 1 on its outstanding £1,500,000 of first mortgage 5 per cent bonds. According to a statement from the Toronto office, the war has rendered it impossible to continue the arrangement made last June for providing the funds required for the completion of the present program of construction. The board, however, has under consideration a plan which would provide the company the necessary funds for completing the work under construction and for adjusting computing interest. The enterprises of the company at present in operation are said to show satisfactory results, with a steadily increasing revenue. This company was formed in 1911 by F. S. Pearson and associates and it either owns or controls virtually the entire tramway, light and power business of not only the city of Barcelona but the whole district of Cataluna, the industrial center of Spain.

California Street Cable Railroad, San Francisco, Cal.—J. Barth & Company, San Francisco, have purchased the $384,000 of new general first mortgage 6 per cent serial refunding gold bonds of the California Street Cable Railroad, dated Jan. 1, 1915, and due in twelve annual installments beginning Jan. 1, 1916, and ending Jan. 1, 1927. These bonds were referred to in the ELECTRIC RAILWAY JOURNAL of Oct. 31, Nov. 21 and Dec. 5.

Chicago (Ill.) Elevated Railways.—At the annual meeting of the Chicago Elevated Railways collateral trust the trustees reduced the governing board from seven to five members. Ira M. Cobe and F. A. Delano, who joined the Federal Reserve Board in Washington, withdrew. It was not thought necessary to fill their places. The board now stands: Frank A. Vanderlip, Henry A. Blair, Samuel Insull, E. W. Harden and Samuel McRoberts. The governing committee will elect the executive committee at a later meeting. There are three members of that body, Samuel Insull, Henry A. Blair and Ira M. Cobe. Mr. Cobe has tendered his resignation, but his successor has not as yet been selected.

Cumberland County Power & Light Company, Portland, Maine.—It was stated in the ELECTRIC RAILWAY JOURNAL of Nov. 21 that the Cumberland County Power & Light Company has certified and guaranteed, principal and interest, $500,000 of bonds of the York County Power Company, a subsidiary. Of this amount $315,500 are outstanding in the hands of the public, $150,000 are in the treasury of the Cumberland County Power & Light Company and $34,500 are in the treasury of the York County Power Company. The $315,000 outstanding includes $100,500 of bonds which have been exchanged for an equal amount of underlying liens. There has been no offering of these bonds.

Federal Light & Traction Company, New York, N. Y.—E. N. Sanderson, president Federal Light & Traction Company, has issued a circular regarding the recent deferring of dividends on the company's $2,500,000 of 6 per cent cumulative preferred stock, as noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5. The net income of all companies for the twelve months beginning September, 1913,

is said to have been adversely affected by the disastrous fire at Hot Springs, the serious strike in the Trinidad coal fields, and the drastic rate schedules in Tucson, Ariz., and Springfield, Mo. In the opinion of the board, however, the turning point has been passed, and from now on the company will enjoy increased gross and net earnings. During the last twelve months the gross earnings showed an increase over the corresponding previous period, and only the net earnings suffered substantially from the adverse condition. Since July the net income has been constantly improving, so that during the three months ended Oct. 31 the dividend on the preferred stock has been more than earned.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has granted the application of the Fresno Interurban Railway for permission to make three stock and bond issues to provide for twenty-six miles of new line at an estimated cost of $17,300 per mile.

Interborough Rapid Transit Company, New York, N. Y.—An extra dividend of 5 per cent has been declared on the $35,000,000 of stock of the Interborough Rapid Transit Company, along with the regular quarterly payment of 2½ per cent, both payable on Jan. 2 to holders of record on Dec. 21. Since the Interborough-Metropolitan Company owns $33,912,800 of the stock, its income from the extra disbursements is $1,695,640. The committee on listings of the New York Stock Exchange has received an application from the Interborough-Metropolitan Company to list $17,942,000 of 5 per cent cumulative preferred stock. This is the stock that was formerly in the hands of the voting trust and does not represent an increase in the capitalization of the company.

Joliet & Eastern Traction Company, Joliet, Ill.—The bondholders of the defunct Joliet & Southern Traction Company have almost unanimously decided to accept stock in the Joliet & Eastern Traction Company in exchange for their holdings. The formation of this new company was described in the Electric Railway Journal of Nov. 21. The greater part of the $80,000 fund paid into court during the period of bankruptcy of the Joliet & Southern Traction Company will be practically all turned into the treasury of the new company.

Kentucky Securities Corporation, Lexington, Ky.—The annual report of the Kentucky Securities Corporation for the fiscal year ended June 30 is made up principally of a report for the Kentucky Traction & Terminal Company and the Lexington Utilities Company, all the stocks of which are owned by the Kentucky Securities Corporation. The combined operating revenue of the two subsidiary companies, exclusive of inter-company charges, amounted to $782,272 for the last fiscal year, as compared to $742,884 for the previous year, an increase of 5.3 per cent. Operating expenses in the two years were $412,509 and $401,507, an increase of 2.7 per cent. Miscellaneous income increased from $29,941 to $32,022 and fixed charges from $225,268 to $245,184, while the final surplus increased from $146,049 to $156,600, or 7.2 per cent. The operating companies as of June 30 had a credit balance in the reserve for accidents and damages of $27,550, and it was directed that $24,000 should be credited to the depreciation reserve as of June 30. A fixed proportion of gross earnings is set aside monthly on account of maintenance, amounting for the current year to 16½ per cent.

Lehigh Traction Company, Hazelton, Pa.—The Lehigh Traction Company, reversing its previous decision as noted in the Electric Railway Journal of Nov. 28, paid on Dec. 1 the interest due on its first mortgage 5 per cent bonds. The protective committee representing the bondholders refused to accept the offer of President Markle to purchase the bonds for his personal account, as they had done in connection with the interest default on June 1.

Long Island Railroad, New York, N. Y.—The 5 per cent equipment trust series A of the Long Island Railroad, the authorization of which by the Public Service Commission for the Second District of New York was noted in the Electric Railway Journal of Oct. 24, consist of a total authorized issue of $1,060,000. Of this amount $1,050,000 is issued and outstanding. The trusts are dated June 1, 1914, and mature $106,000 on June 1, 1915, and June 1 of each succeeding year to 1923, inclusive, and $96,000 on June 1, 1924. The principal and the interest are payable in gold and are guaranteed by the Long Island Railroad. The cost of equipment is $1,175,262, of which the railroad has paid to the trustees $125,000.

Massachusetts Electric Companies, Boston, Mass.—George C. Lee has been elected a trustee of the Massachusetts Electric Companies, succeeding the late Gardiner M. Lane.

Massachusetts Northeastern Street Railway, Haverhill, Mass.—The Massachusetts Northeastern Street Railway on Nov. 28 filed a mortgage for $2,000,000 at Lawrence to the American Trust Company, Boston, Mass., as trustee. This mortgage takes the place of an original one issued in 1903 to the New York Trust Company, New York, which is discharged. The filing of the new mortgage simply provides for a change in the fiscal agent of the corporation.

Mexico Tramways, Mexico City, Mexico.—Officers of the Mexican Light & Power Company, a subsidiary of the Mexico Tramways, recently notified the holders of the $9,733,333 of second mortgage fifty-year sinking fund bonds that the payment of the interest coupons due on Dec. 1 would be deferred. The rate of exchange has been falling continuously in the last few months and the Mexican government officials, who are now in control of the operations of the Mexico Tramways, have prohibited further remittance of funds from Mexico until the rate of exchange improves.

New York (N. Y.) Railway.—At the annual meeting of the New York Railways on Dec. 7 Darwin P. Kingsley, F. S. Witherbee, Henry Ollesheimer, F. L. Leland and J. C. Cobb were elected directors to represent the holders of the 5 per cent income bonds. Harry Bronner, Guy E. Tripp, A. J. Hemphill and E. S. Marsten retired. Mr. Cobb was reelected. A statement of the company's income for the four months ended Oct. 31, last, was read by T. P. Shonts, president. It showed that the gross revenue for the period, October being partly estimated, was $4,618,000, as against $4,828,000 last year, and a surplus over interest charges available for the income bonds of $425,000, against $508,000 last year. The so-called Kingsley insurance company interests already have a suit pending in the courts to decide what constitutes a proper allowance for injury and damage claims or whether or not all surplus revenue not actually paid out in any given year shall be applicable to the adjustment of income bonds. The contention of certain bondholders has been that all surplus revenues not actually paid out during any year should be applicable to the payment of interest on the income bonds. Darwin P. Kingsley is president of the New York Life Insurance Company, F. S. Witherbee is a director of the Equitable Life Assurance Society. Henry Ollesheimer is vice-president of the Metropolitan Bank, New York, F. L. Leland is president of the New York County Bank, and J. C. Cobb resides in Boston. The movement to change the present income bondholders' representation on the board has been under way for a year. A total of $18,000,000 of bonds was voted, of which the so-called Kingsley committee cast $14,000,000 and the so-called Hemphill committee $4,000,000.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Railroad Commission of California has rendered a decision authorizing the Oakland, Antioch & Eastern Railway to issue promissory notes of the total face value of $295,345. It is made a condition of the commission's order that these notes shall bear interest at not to exceed 7 per cent per annum.

Rochester Railway & Light Company, Rochester, N. Y.—The Rochester Railway & Light Company has been authorized to issue $250,000 of its 5 per cent fifty-year consolidated trust mortgage bonds for the purpose of refunding a like amount of the underlying bonds of the Brush Electric Light Company, maturing on Jan. 15, 1915. The new bonds are to be sold or exchanged at not less than 95. Should the holders of the underlying bonds not prove willing to exchange for the new bonds at not less than 95, the company has been authorized by the Public Service Commission of the Second District of New York to enter into agreement with such holders whereby an extension of the time for the

payment of the principal may be obtained for one year at an increase from 5 per cent to 6 per cent in interest during that time on the old bonds.

Springfield (Mass.) Street Railway.—The Springfield Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,041,000 of additional stock at 110 to pay floating debt. This is part of an issue of $1,290,000 authorized by the stockholders. There is now $3,708,100 of stock outstanding.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—E. W. Clark & Company, Philadelphia, Pa., are offering for subscription $1,118,000 of St. Joseph Railway, Light, Heat & Power Company 6 per cent sinking fund trust stock certificates due on May 30, 1917, and redeemable at par and accrued dividend on any dividend date. The certificates will be issued by the Guaranty Trust Company, New York, as trustee under an agreement with the Cities Service Company. This agreement provides for the deposit with the trustee of 31,948 shares out of a total of 35,000 shares of the common stock of the St. Joseph Railway, Light, Heat & Power Company. A sinking fund will operate monthly to retire certificates before maturity. The rate at which this fund will work will be $450,000 a year, giving the issue an average life of not more than fifteen months. If the certificates are not obtainable for purchase for the sinking fund at par and accrued dividend or better in the open market, they will be called by lot monthly. All certificates taken up in the sinking fund will be cancelled. The certificates are being offered at 97½ and accrued dividend, yielding more than 7 per cent to maturity and more than 8 per cent on their average life.

Toronto (Ont.) Railway.—William A. Read & Company, New York, N. Y., have sold $1,500,000 of 6 per cent gold bonds of the Toronto Railway, dated Dec. 1, 1914, and due half on Dec. 1, 1915, and half on Dec. 1, 1916, at 100¼ for the former and par for the latter. The purchase of these notes by the bankers was noted in the ELECTRIC RAILWAY JOURNAL of Dec. 5.

Washington Railway & Electric Company, Washington, D. C.—Notice has been served on the Washington Railway & Electric Company that because the purchase by the company of 740 shares of stock of the Washington & Rockville Railway was not authorized in writing by the Public Utilities Commission that body recognizes the transaction as void. The purchase was made from the Potomac Electric Power Company for a consideration said to have been $37,000.

West End Street Railway, Boston, Mass.—The Massachusetts Public Service Commission has received an application from the West End Street Railway for authority to sell at public auction the $650,000 of stock authorized by the stockholders on Nov. 24, as noted in the ELECTRIC RAILWAY JOURNAL of Nov. 28.

Wisconsin-Minnesota Light & Power Company, Eau Claire, Wis.—The Railroad Commission of Wisconsin has authorized the Wisconsin-Minnesota Light & Power Company, a subsidiary of the American Public Utilities Company, to issue preferred stock to the amount of $367,000 and common stock to the amount of $244,000. The company has authority to issue $300,000 in preferred and $200,000 in common stock for the purpose of acquiring the property of the Winona Gas, Light & Coke Company, Winona, Minn., the Red Wing, Gas, Light & Power Company, Red Wing, Minn., the Minnesota-Wisconsin Power Corporation, which furnished electric light to Wabasha and Lake City, Minn., and the Eau Claire Gas Light Company. Under this authorization, stock to the amount of $94,000 may be issued for improvements and extensions to the plants, and preferred stock to the amount of $17,000 may be issued to acquire all property including the accounts receivable of the Neillsville (Wis.) Electric Company.

Worcester (Mass.) Consolidated Street Railway.—The Worcester Consolidated Street Railway has applied to the Massachusetts Public Service Commission for authority to issue $1,880,000 of additional stock to pay floating debt. This is part of an issue of $2,350,000 authorized by the stockholders. The amount of stock already outstanding is $5,112,000.

DIVIDENDS DECLARED

Arkansas Valley Railway, Light & Power Company, Pueblo, Col., quarterly, 1¾ per cent, preferred.

Brazilian Traction, Light & Power Company, Toronto, Ont., quarterly, 1½ per cent, preferred.

California Railway & Power Company, San Francisco, Cal., quarterly, 1¾ per cent, prior preferred.

Cleveland (Ohio) Railway, quarterly, 1½ per cent.

Columbus (Ga.) Electric Company, 3 per cent, preferred.

Continental Passenger Railway, Philadelphia, Pa., $3.

Eastern Power & Light Corporation, New York, N. Y., quarterly, 1½ per cent, preferred.

Indianapolis (Ind.) Street Railway, 3 per cent.

Manila Electric Railroad & Light Corporation, Manila, P. I., quarterly, 1¾ per cent.

Union Traction Company, Philadelphia, Pa., $1.50.

United Light & Railways Company, Grand Rapids, Mich., quarterly, 1½ per cent, first preferred quarterly, three-fourths of 1 per cent, second preferred.

United Railways & Electric Company, Baltimore, Md., 2 per cent, preferred.

United Traction & Electric Company, Providence, R. I., quarterly, 1¼ per cent.

West End Street Railway, Boston, Mass., $2, preferred.

ELECTRIC RAILWAY MONTHLY EARNINGS

BANGOR RAILWAY & ELECTRIC COMPANY, BANGOR, MAINE.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$69,422	*$30,533	$38,889	$17,370	$21,519
1 " "	'13	68,454	*27,938	40,516	17,355	23,161
12 " "	'14	778,690	*374,603	404,087	208,880	195,207
12 " "	'13	755,084	*343,270	411,814	207,455	204,359

CHATTANOOGA RAILWAY & LIGHT COMPANY, CHATTANOOGA, TENN.

1m., Oct.,	'14	$88,261	*$58,067	$30,194	$28,655	$1,539
1 " "	'13	99,358	*62,447	36,911	25,856	11,055
12 " "	'14	1,108,598	*698,404	410,194	333,135	77,059
12 " "	'13	1,194,265	*709,875	484,390	292,536	191,854

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY, CLEVELAND, OHIO.

1m., Oct.,	'14	$107,611	*$65,850	$41,760	$32,464	$9,296
1 " "	'13	111,955	*65,988	45,967	32,341	13,626
10 " "	'14	1,058,200	*633,485	424,716	323,776	100,940
10 " "	'13	1,051,382	*627,872	423,509	316,785	106,724

COLUMBUS RAILWAY, POWER & LIGHT COMPANY, COLUMBUS, OHIO.

1m., Oct.,	'14	$262,685	*$146,703	$115,982	$42,349	$73,633

LEHIGH VALLEY TRANSIT COMPANY, ALLENTOWN, PA.

1m., Oct.,	'14	$164,692	$76,613	$88,078	$70,182	$17,896
1 " "	'13	145,647	74,303	71,344	47,012	24,332
12 " "	'14	1,882,293	901,171	981,123	712,902	268,221
12 " "	'13	1,758,651	872,587	886,064	552,087	333,977

MEXICO (MEX.) TRAMWAY.

1m., Oct.,	'14	$306,772	$140,342	$164,430	......	......
1 " "	'13	278,377	151,935	126,443	......	......
10 " "	'14	2,854,705	1,327,634	1,527,072	......	......
10 " "	'13	3,024,232	1,541,267	1,482,970	......	......

NASHVILLE RAILWAY & LIGHT COMPANY, NASHVILLE, TENN.

1m., Oct.,	'14	$191,814	*$108,204	$83,610	$41,921	$41,689
1 " "	'13	204,178	*122,797	81,381	39,827	41,554
12 " "	'14	2,246,484	*1,354,798	891,686	506,449	385,237
12 " "	'13	2,189,888	*1,306,019	883,869	458,467	425,402

PORTLAND (MAINE) RAILROAD.

1m., Oct.,	'14	$87,095	*$53,623	$33,472	$19,193	$14,279
1 " "	'13	82,620	*52,081	30,539	21,711	8,828
12 " "	'14	1,042,698	*643,206	399,492	254,031	145,461
12 " "	'13	1,034,100	*705,997	328,103	156,193	171,910

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Oct.,	'14	$253,134	*$155,996	$97,138	$83,809	$13,329
1 " "	'13	257,303	*159,280	98,023	86,157	11,866
12 " "	'14	3,074,120	*1,854,458	1,219,663	1,003,677	215,676
12 " "	'13	2,964,266	*1,839,447	1,124,819	994,768	130,051

TWIN CITY RAPID TRANSIT COMPANY, MINNEAPOLIS, MINN.

1m., Oct.,	'14	$800,097	$392,372	$407,725	$231,438	$178,287
1 " "	'13	765,160	375,156	390,004	238,135	151,869
10 " "	'14	7,746,727	3,995,604	3,751,123	2,278,509	1,472,504
10 " "	'13	7,333,922	3,711,374	3,622,548	2,349,531	1,273,017

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*Includes taxes.

Traffic and Transportation

AUTO BUS COMPETITION IN SOUTHERN CALIFORNIA

Auto Bus Invades San Francisco—Los Angeles Railway, Losing $600 a Day, Has Withdrawn Twenty-One Cars

The "jitney" bus, as the nickel-a-passenger automobile is popularly referred to in southern California cities, has invaded San Francisco. On Dec. 1 six automobiles were put in regular service on Market Street, carrying passengers between the ferry and outlying points for 5-cent fares. As yet no special license has been placed upon these vehicles in San Francisco, but the fact that in that city they will be in competition with a municipal street railway may present the matter in a new light. While an increase in local passenger capacity during the exposition would be welcomed it is conceded that enfranchised street railways should not be deprived of their most profitable traffic by companies free from any obligation to serve in unprofitable districts and that automobiles should be subject to regulation, including a guarantee for damages in case of accident.

Long Beach, Cal., recently imposed a license fee of $25 a year on the "jitney" buses, compels the taking out of a $10,000 liability insurance for every car engaged in transporting passengers, and requires the buses to operate over designated routes and maintain reasonable schedules. On the day that this ordinance went into effect only forty-one out of 130 automobiles carrying passengers in competition with the street cars were continued in service. Prior to the passage of this ordinance in Long Beach the Pacific Electric Railway threatened to discontinue its East Ocean Avenue line altogether unless some regulation was placed upon the 5-cent automobile. Legislation is still pending on the matter in Los Angeles. According to the Los Angeles Railway Corporation its loss in revenue on account of the automobile competition amounts to $600 a day, and has caused the company to withdraw twenty-one cars on six lines and eighty-four motormen and conductors. Up to Dec. 1 the secretary of the Los Angeles police commission had issued a total of 1520 permits to chauffeurs to operate auto buses in competition with street cars, and that the rate of increase is rapid is shown by the record of over sixty additional permits issued on Dec. 2.

So serious has the auto bus matter become in Los Angeles that on Dec. 4 the directors of the local association of merchants and manufacturers addressed a letter in part as follows to the City Council:

"We believe that the time has arrived when your honorable body should take some action regulating the passenger traffic of the 5-cent automobile buses. If these buses can run through the city without proper regulation and protection to the lives of not only patrons but the public in general, we will soon be confronted with a number of accidents. In addition, with several hundred of these buses running up and down the main streets the traffic congestion is greatly increased, and the progress of other machines correspondingly retarded. To allow these machines unrestricted freedom is a menace to the entire community, and we believe that no good reason exists why they should not be placed under strict traffic regulations, and we therefore request that this matter receive the early attention of your honorable body."

NEW COMPANY PUBLICATION

The Hudson & Manhattan Railroad, which operates under the Hudson River between New York and New Jersey, has begun the publication of the *H. & M. Review*. The first issue, dated December, contains eight pages, 6 in. x 9 in. in size. In an article entitled "Object and Future of the *H. & M. Review*," Wilbur C. Fisk, president of the company, says in part:

"The need has been felt for months back for a means of intercommunication between all of us who are employed by the company and also between the departments to which we may be assigned. To accomplish this end, it has finally been decided to issue the *H. & M. Review*.

"The prime purpose to be achieved by the publication is the further promotion and cementation of the good fellowship already existing among the employees of the company. This can only be achieved by the hearty cooperation of all and by keeping the editor posted on all news items which are entitled to publication. The editor will always welcome contributions, but will not publish anything not prompted by the best of motives.

"It must not be forgotten that at times the company and your president may have a message which is meant for all of you, and the columns of the *Review* will be open to any officer of the company who has a message, either for the men of his own department, or which he believes will be beneficial to all. It is needless to say that events occurring during any one month will be faithfully reported in the paper.

"I earnestly request not only the officers but all employees of the company to lend the editor their assistance in his efforts to make the *Review* of real value."

The editor of the *H. & M. Review* is J. J. Scovern.

INTERURBAN SAFETY

The Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, of which E. F. Schneider is general manager, is continuing unabated its campaign of safety begun more than five years ago. The custom of the company has been to cover each year the entire system of 250 miles with talks to the 63,000 school children in the territory contiguous to the company's lines. Ben B. Casson of the company in a talk which he delivered recently to the grammar and primary grade pupils at the German Lutheran Parochial School at Elyria, Ohio, reviewed the activity of the company along these lines. In addressing the grammar grade pupils he said that in the year prior to the inauguration of the safety movement eleven children were injured and three killed, but that since then not a child had been injured or killed while going to or from school. He impressed the children with the necessity of exercising care not only as regards street cars but also as regards automobiles, motorcycles, wagons, bicycles and steam railroads. He emphasized the sad task which confronts the officers of the company in going into the homes of parents of children who had been injured or killed and witnessing the grief in the household. Mr. Casson also reviewed his own experiences during the four years that he operated a car over the Cleveland, Southwestern & Columbus Railway. The great problem before the American people to-day was the preservation of the lives of the people. He advised the school children to discuss safety among themselves and suggested similar discussions in the homes. The address to pupils of the primary grade was, of course, a modification of the one made to the grammar grade pupils. Heretofore the safety addresses to the school children have been made by officers of the company. Mr. Casson is a motorman, and his talks have presented a different viewpoint, and possibly for this reason have been especially valuable.

COMPLYING WITH THE NEW REVENUE PROVISION

A circular letter sent out several days before Dec. 1 to the regular shippers over the Louisville & Interurban Railroad, and a supply of stamps laid in by R. H. Wyatt, general freight and passenger agent of the company, enabled that company to start out under the new revenue tax on the first of the month without confusion. The circular letter reviewed briefly the nature and purposes of the revenue measure, explained what were the duties of the shippers, and then added that for the convenience of the patrons of the Louisville & Interurban Railroad stamps had been supplied to all conductors on freight trains, to agents of the company wherever stations were maintained and that the company would gladly obtain for shippers such supplies of stamps as they needed for use in shipments over its lines. As a consequence every shipper knew beforehand just what was expected of him, as, in addition, copies of the letters which were sent out were posted prominently at every shipping point. The company will continue, while the law is in effect, to have conductors and the various freight offices handle stamps for use of the shippers. Since postmasters are not paid for handling the stamps many of them are refusing to do so. The service which the company has installed in regard to stamps also enables the company to keep its records free from charge accounts of numerous shippers with small entries relating to the stamps.

Lifting Jacks in Pennsylvania.—The Lehigh Valley Transit Company, Allentown, Pa., has equipped all of its cars with lifting jacks conforming with the Pennsylvania statute effective on Dec. 1. The jacks are slung on special hang-

ers from the sides of the cars, and special instructions have been issued to the employees on the handling of the jacks in case of personal injury or derailment.

Increase in Fares in Eastern New Jersey.—The proposed increase in fares between Atlantic City and Pleasantville, N. J., referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 5, page 1274, does not apply to the Atlantic City & Shore Railroad. The steam roads operating between the points mentioned plan, however, to put a higher rate of fare into effect on Dec. 15.

Serious Accident on New York Elevated.—In a rear-end collision between two northbound trains on the Ninth Avenue line of the Manhattan Elevated Railway in New York at 116th Street and Eighth Avenue at 6:30 p. m. on Dec. 9, two men were crushed and received burns from which they died, and more than a score of others were injured in the panic which ensued.

Vermont Fare Matter.—The Barre & Montpelier Traction & Power Company, Montpelier, Vt., has filed with the Public Service Commission of that State a proposed tariff increasing the fare over the line between the cities from 10 cents to 15 cents. The Supreme Court of the State recently held that the company was required to maintain a fare not to exceed 5 cents within the limits of each of the cities in which it operates.

Commutation Fare Order.—The Public Service Commission of Missouri on Dec. 7 issued an order to the Kansas City, Clay County & St. Joseph Railroad to begin on Jan. 1, 1915, issuing commutation tickets on definite rate schedules established by the commission, which figure out at about 1.1 cents per mile. Five days from the receipt of the order are allowed for an answer, which will carry until Dec. 14. A request for a rehearing is to be filed.

Car Advertising in Toronto.—Despite the objection of Works Commissioner Harris the Board of Control of Toronto, Ont., has decided to permit street car advertising in the cars on the city's own line. Last spring the commissioner reported against the proposal and it was dropped for the time being. It has been recommended that the contract be awarded to the Canadian Street Car Advertising Company.

Time-Table Prize.—The offer of a $25 prize for the best time-table to be submitted by one of its trainmen, which was published in the September number of the *United Railroads Magazine*, published by the United Railroads, San Francisco, Cal., aroused considerable interest and resulted in five time-tables being submitted by four contestants, one of whom submitted two tables. The prize was awarded to D. W. Sutlief, a conductor in the Twenty-eighth Street carhouse.

Far-Side Stops at Rock Island.—The City Council of Rock Island, Ill., insists that the Tri-City Railway discontinue the near-side stop and adopt the far-side stop. A plan to stop on the far side was suggested by John G. Huntoon, the general manager of the company, a year ago, but the people of Davenport did not favor the change and the matter was dropped. Now the cities of Rock Island and Moline are insisting on the far-side stop, irrespective of the attitude of the city of Davenport toward the proposal.

Company Relations in Galveston.—For many years the Galveston (Tex.) Electric Company has required a deposit of $30 from each of its trainmen as an assurance of good faith. A new policy, however, is now being put into effect. The deposits are being returned to the trainmen and 6 per cent interest is being paid each man for the time the money has been on deposit. The records for most of the deposits date back no further than 1900. Under the new plan the company has its trainmen under bond, the company itself paying the premium.

Market Transfers.—The Edmonton (Alberta) Radial Railway has adopted a special "market transfer," in order to promote business at the newly-opened civic market. Passengers going direct to the market, on market days, receive a "market transfer," which enables them to make the return trip on a single fare. J. H. Larmouth, superintendent of the railway, a municipal line, is reported to have expressed the opinion to the civic authorities that a portion of the cost of the transfer should be borne by the market committee of the City Council.

Transfer Changes in Savannah.—With a view to giving additional transfer privileges to its patrons, the Savannah (Ga.) Electric Company put into effect on Dec. 1 certain changes in its transfer system. Several important transfer points have been relocated and the system of issuing transfers as regards these points has been changed. The company asked the co-operation of its patrons in inaugurating the changes and announced that misunderstanding regarding the changes would be explained over the telephone or in person at the company's office.

Police in Safety Campaign.—The city of Montreal, Que., has decided to co-operate with the Montreal Tramways in the "safety first" campaign inaugurated by A. Gaboury, superintendent of the company. The chief of police is to work with Mr. Gaboury, and later a committee of civic officials is to be formed to study the entire question as it relates to Montreal. The chief of police has sent out thousands of circulars to owners of vehicles referring to the urgency of observing traffic regulations and making suggestions as to how to avoid accidents.

Height of Steps in New Hampshire.—The Public Service Commission of New Hampshire held a hearing in Concord on Dec. 1 to determine whether steps on the electric cars in the State are reasonably safe and low. Various estimates of the cost of changing the height of steps were made. They ranged from $30 to $150 a car, according to the rolling stock operated. All of the roads were represented except the Concord & Manchester Electric Branch of the Boston & Maine Railroad, which has already complied with an order of the commission in regard to steps.

Operating Changes in Vancouver.—Several of the city lines of the British Columbia Electric Railway in Vancouver, B. C., have been rerouted in order to provide greater economy of operation and still meet existing traffic conditions. The general plan affects the service on stub lines slightly. The company's owl service is also being operated in closer accordance with traffic requirements. The trainmen have made an arrangement among themselves providing for a certain lay-off each week in order to enable a larger force to be kept on than would otherwise be possible.

"Safety First" in St. Louis.—Bruce Cameron, superintendent of transportation of the United Railways, St. Louis, Mo., is quoted as follows in regard to the "safety first" campaign of the company: "I believe when the public has been impressed fully with the necessity for caution, we will find the number of persons injured in street car accidents far less than heretofore. There seems to be a general disposition to heed the warning of our signs. If wagon drivers will obey the traffic laws and pedestrians cross the streets only at street corners, instead of in the middle of the block, we will have few accidents."

Not Within Commission Jurisdiction.—Chairman McCall of the Public Service Commission for the First District of New York replied on Dec. 9 to Health Commissioner Goldwater of New York, who had written to the commissioner calling attention to alleged unsanitary conditions on the transit lines due to overcrowding. Mr. McCall pointed out that breathing, coughing and sneezing by persons in the cars were not matters subject to the jurisdiction of the Public Service Commission, and referred to the expenditure of $325,000,000 now being made for rapid transit lines intended to relieve the congestion of which Dr. Goldwater complained. There has been considerable other gentle persiflage in this connection recently.

Hunters Beware.—An appeal to hunters to be careful in handling firearms while on street cars has been made by the Detroit (Mich.) United Lines based upon a bulletin to conductors issued by the operating department. The bulletin follows: "Attention is called to the matter of firearms, particularly guns used for hunting purposes, carried by passengers. If at any time a passenger is examining a firearm, or handling it carelessly, or in such a way that it might imperil the lives of other passengers, caution him to desist and explain that this is a rule of the company for the protection of passengers. Also, so far as a conductor is able to do so, he must see that firearms carried by passengers are not loaded."

Passengers Carried in Greater New York.—The number of passengers using the transit systems of Greater New York for the year ending June 30, according to tables compiled by the Public Service Commission of the First District of New York, was 1,813,204,692, an increase over the previous twelve months of 43,328,184. They paid out in fares $89,361,262. The number of passengers carried by the Brooklyn Heights Railroad, the principal surface railway subsidiary of the Brooklyn Rapid Transit Company, fell off by 1,140,585, by the New York Railways by 1,742,267. The Second Avenue Railroad carried 858,189 fewer passengers than the year before, the Third Avenue 75,039, the Forty-second Street, Manhattanville & St. Nicholas Company lost 175,443, and the Dry Dock, East Broadway & Battery Company 1,297,743 passengers.

Chicago Drafts Electric Railway Freight Ordinance.—In an effort to further the recommendations of the Chicago Municipal Markets Commission relative to the advantage of permitting all the electric railways which enter Chicago to handle freight, an ordinance granting this privilege is being prepared. At a preliminary conference between a sub-committee of the Chicago City Council's local transportation committee, the officials of the surface and elevated lines, representatives of the city law department and the Chicago Municipal Markets' Commission, the preliminaries were arranged. According to the city legal department there was nothing to hinder the electric lines from carrying freight within the corporate limits. Upon being questioned regarding their attitude toward a proposition including the right to carry freight, the representatives of the surface and elevated lines expressed a willingness to co-operate in the matter.

Ten Months of Safety in Detroit.—W. C. Cann, chairman of the general safety board of the Detroit (Mich.) United Railway, reports that during the first ten months of this year more than 900 safety suggestions were submitted to the division and general safety board and that favorable action has been secured on 95 per cent of the suggestions. So far this year the number of cars in collision has decreased 47.7 per cent, derailments 7.7 per cent, running over crossings 30 per cent, and passengers hurt in boarding and alighting 32 per cent. The only reports showing any appreciable increase are those covering automobiles struck. These have increased 30.9 per cent. Mr. Cann expresses the opinion that the showing which the company had made in decreasing all accidents other than those in which automobiles are involved indicates that the burden of responsibility for the increase of automobile accidents is on the automobile driver and not on the men operating the street cars.

New Traffic Ordinance in Canton.—A new traffic ordinance was passed by the City Council of Canton, Ohio, on Nov. 9. It is provided that automobiles and horse-drawn vehicles shall cross the center of the intersecting street before turning into it rather than follow a diagonal course from one street into the other. No person under sixteen years of age shall be allowed to operate a motorcycle or automobile on the streets of the city. There are strict regulations with regard to automobiles being allowed to stand along the curb in the business district. A rate of speed exceeding 15 m.p.h. is to be taken as evidence of careless driving, and a rate of speed exceeding 20 m.p.h. is prohibited. Drivers of vehicles passing a street car stopping to discharge or to take on passengers, when said vehicle is going in a direction opposite to that from which the street car is moving, shall slow down and exercise due care so as not to endanger the safety of pedestrians. The driver of every vehicle approaching a street car stopping for the purpose of taking on or discharging passengers shall give some signal plainly visible or audible to such passengers, and shall keep such vehicle at least 6 ft. from the running board or lower step of such car. If it is not possible to preserve such distance from such running board or lower step, the driver or operator shall stop until the street car has again started. All vehicles upon a track in front of a street car shall turn out upon the near approach of the car. The penalty for violating the traffic ordinance is a fine not to exceed $100 and costs. In the section regulating the movement of pedestrians, it is provided that pedestrians shall have the right-of-way over drivers of vehicles at street crossings only.

Personal Mention

Sir George S. Gibb, chairman of the Metropolitan District Railway, London, has been appointed a civil member of the Army Council and will be charged with the supervision of army contracts.

Mr. J. M. Tomlinson, acting vice-president and general auditor of the New York, New Haven & Hartford Railroad since the retirement of Mr. H. M. Kochorsperger, vice-president, has been elected vice-president and comptroller of the company.

Mr. A. Mackrille, assistant general auditor, has been appointed general auditor of the New York, New Haven & Hartford Railroad with office at New Haven, and Mr. T. M. Prentice, assistant auditor, has been appointed auditor of the company with office at New Haven.

Mr. C. C. Collins has resigned as traffic manager of the Lehigh Valley Transit Company, Allentown, Pa., effective on Jan. 1, 1915. Before becoming connected with the Lehigh Valley Transit Company Mr. Collins was traffic manager of the Western Ohio Railroad, Lima, Ohio.

Lieutenant-Colonel G. S. Rennie, M.D., surgeon in chief of the Dominion Power & Transmission Company, Hamilton, Ont., and the Toronto, Hamilton & Buffalo Railway, will be in command of one of the field artillery batteries being mobilized in Toronto for overseas service.

Mr. Daniel L. Turner, deputy engineer of subway construction of the Public Service Commission of the First District of New York, has been appointed to serve on the advisory commission on city planning, which is to assist and co-operate with the committee on city plan of the Board of Estimate, New York City.

Mr. A. E. Beck, one of the permanent counsel of the British Columbia Electric Railway, Vancouver, B. C., and its claim agent, will leave the company's service at the end of the year to practice law on his own account in Vancouver. The company's legal and claims departments will be consolidated under the control of the other permanent counsel, Mr. V. Laursen.

Mr. C. H. Christensen has been appointed manager of the Missoula (Mont.) Street Railway, the Missoula Light & Water Company and the Clark Missoula Power Company, to succeed Mr. George R. Brown, deceased. Mr. Christensen has been connected with the Missoula Light & Power Company in various capacities for twenty years. During the last four years he held the position of superintendent of the Missoula Light & Water Company's Bitter-Root Valley System.

Mr. W. O. Demoss, who has been appointed master mechanic of the Wilmington & Philadelphia Traction Company, Wilmington, Del., and the Southern Pennsylvania Traction Company, was for ten years foreman of the West Baltimore Street and the Retreat Street carhouses of the United Railways & Electric Company, Baltimore, Md. On Feb. 27, 1911, he became maintenance foreman of the Delaware Avenue carhouse of the Wilmington & Philadelphia Traction Company and in March, 1912, was appointed general foreman of the Wilmington shops of the latter company.

Mr. John W. Graham, Twin Falls, Idaho, will fill the vacancy left on the Idaho Public Utilities Commission by the recent resignation of Judge D. W. Standrod. Mr. Graham has been practicing law in Idaho for the last four years. He is forty-one years of age and a native of Canada, but was educated at the University of Nebraska. He practiced his profession in Fremont, Dodge County, Neb., and was for four years prosecuting attorney of that county, and had altogether fifteen years' experience as a lawyer. The appointment which he has just accepted will hold until January, 1919.

Mr. H. R. LaMontagne has been appointed general agent of the express department of the Worcester (Mass.) Consolidated Street Railway to succeed Mr. F. E. Wood, whose appointment to the Cumberland County Power & Light Company, Portland, Maine, is referred to elsewhere in this column. Mr. LaMontagne entered the service of the passenger department of the Worcester Consolidated Street

Railway after graduation from a technical school. Later he became connected with the freight department, finally being made traveling auditor, from which position he was appointed to succeed Mr. Wood.

Mr. M. H. Bronsdon, chief engineer of the Rhode Island Company, Providence, R. I., from March, 1907, until August, 1912, has returned to that post, succeeding Mr. William Pestell, who recently resigned to accept a position with the B. F. Sturtevant Company of Boston, at Chicago. Mr. Bronsdon has been doing general engineering work in San Francisco since leaving Providence. Mr. Bronsdon was born in San Francisco and he had his first experience in engineering construction on a cable road in Los Angeles. In 1889 he became superintendent of the Providence Cable Tramway. He later was chief engineer at the Eddy Street power plant in Providence, having charge of the installation there. He later went to Duluth as designing and construction engineer of the Duluth-Superior Traction Company, and was afterward appointed engineer for the Old Colony Street Railway, Boston, Mass. His next engagement was with the United Railroads, San Francisco, where he remained until March, 1907, when he succeeded Mr. Fred N. Bushnell as chief engineer of the Rhode Island Company.

Mr. M. A. Tatum, who was appointed superintendent of the southern division of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio, recently, began his career in electric railway work in the express and freight department of the Eastern Ohio Traction Company in 1905. In 1906 he resigned this position to enter the engineering department of the Roberts & Abbott Company, Cleveland. About a year later he accepted a position with the Washington, Baltimore & Annapolis Railroad as clerk to Mr. W. E. Slaughter, the superintendent. After the electrification of the road and the completion of the main line between Washington and Baltimore in 1908, Mr. Tatum was appointed clerk to Mr. Joseph O'Hara, superintendent of transportation. During 1909 he was employed in the carhouses and substations of the company, and in 1910 he was made inspector at Washington. During 1911 and 1912 he occupied the position of trainmaster and in 1913 he became general passenger and freight agent of the road. He resigned from the company in September to become connected with the Cleveland, Southwestern & Columbus Railway.

Mr. F. E. Wood has been appointed general freight agent of the Cumberland County Power & Light Company, Portland, Maine, operating the Portland Railroad and the Lewiston, Augusta & Waterville Street Railway. Mr. Wood entered the service of the Springfield (Mass.) Street Railway in 1909 and worked in the repair shop and the pit. Subsequently he entered the express department as general clerk and spare messenger. In February, 1910, on the opening of the express service on the Interstate Consolidated Street Railway operating through Attleboro and North Attleboro, Mass., to Providence, R. I., over the Rhode Island Company's line, Mr. Wood accepted the position of agent at Attleboro in charge of that division. This express service was later extended over the Milford, Attleboro & Woonsocket Street Railway, operating through Franklin and Milford, Mass. In March, 1912, he was transferred to Worcester, Mass. Express service was established on the Worcester Consolidated Street Railway in December, 1912, and in 1913 Mr. Wood was appointed general agent of the Worcester Consolidated Street Railway with headquarters at Worcester and jurisdiction over all the lines previously mentioned, together with the Springfield Street Railway. He resigned from the Worcester Consolidated Street Railway on Nov. 28, 1914, to become connected with the Cumberland County Power & Light Company. Before Mr. Wood left Worcester a banquet was tendered to him at the Hotel Bancroft, that city, by his fellow employees and he was presented with a watch fob by them as a token of their esteem.

OBITUARY

Morris G. Condon, president of H. B. Underwood & Company, Philadelphia, Pa., machinists and engineers, who was shot by an intruder in his room in the Hotel Adelphia in that city on Nov. 25, died from the effects of his wound.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Edmonton Northwestern Radial Railway, Edmonton, Alta.**—Application for a charter has been made by this company in Alberta to build an interurban electric railway from Edmonton northwest to the Pembina River. Messrs. Short, Woods, Bigger & Collison, 14 Howard Avenue, Edmonton, are said to be interested in the project.

***Albion, Charlotte & Northern Railway, Lansing, Mich.**—Chartered in Michigan to build a 53-mile electric railway. Capital stock, $100,000.

***Shelby (N. C.) Northern Railway.**—Chartered in North Carolina to build an electric or steam railway from Shelby to Casar, via Beams, Mills, Fallston, Belwood, Boggs and Warlicks. Capital stock, $400,000. Incorporators: S. S. Royster, Shelby, president, and L. M. Elam, Shelby, secretary and treasurer.

FRANCHISES

Calgary, Alta.—The Chestermere & Calgary Suburban Railway has received an extension of time on its franchise for the completion of its line in Calgary.

Vallejo, Cal.—A. D. Bowen, representing the Benicia Land & Terminal Company, will ask the Council for a franchise to build an electric railway in Vallejo. This is part of a plan to build an electric line to connect Benicia and Vallejo. [E. R. J., Oct. 24, '14.]

Tarpon Springs, Fla.—James H. Murphy, St. Petersburg, has asked the Council for a franchise in Tarpon Springs.

Macon, Ga.—The Macon Railway & Light Company has asked the Council for an extension of time on its franchise in which to remove its tracks from the south side of Tattnall Square Park to the center of College Street in Macon.

***Lewiston, Idaho.**—The State Highway Board has voted approval of a franchise to A. G. Nortz, Lewiston, to build an electric railway across interstate Lewiston-Clarkston bridge.

St. Peter, Minn.—The Electric Short Line Railroad has accepted the forty-nine-year franchise granted it by the Council in October for the use of so much of the levee as lies east of Front Street, between Chestnut Street and Park Row Street, and also to build a line along the entire length of Front Street to the north city limits of St. Peter.

Lockport, N. Y.—The Niagara River & Eastern Railroad had asked the Council for a franchise to use certain streets in the east and south of Lockport to build a line to connect the Buffalo, Lockport & Rochester Railway and the International Railway lines with a new line into Niagara Falls. [E. R. J., Oct. 17, '14.]

Youngstown, Ohio.—The Mahoning & Shenango Railway & Light Company has asked the Council for a franchise to extend its Mahoning Avenue line to Perkins Corners in Youngstown.

Cincinnati, Ohio.—The Street Railway Committee of the Cincinnati City Council has recommended the ordinance granting a twenty-five-year franchise to the Cincinnati, Newport & Covington Railway to be advanced to a second reading, following which a public hearing will be called to discuss its merits.

Cleveland, Ohio.—Mayor Baker of Cleveland has signed the amended franchise granted by the Council to the Cleveland & Youngstown Railroad to make certain necessary changes in its grade. [E. R. J., Oct. 5, '14.]

Findlay, Ohio.—The City Council of Findlay has before it ordinances giving the Toledo, Bowling Green & Southern Railway a twenty-five-year franchise on its streets and also a franchise for furnishing current for light and power purposes. They provide that the company shall pay to the city 2 per cent of the gross receipts from the business.

Guelph, Ont.—The Board of Railway Commissioners has authorized the Guelph Radial Railway to construct an inter-

change track with the Grand Trunk Railway on Suffolk Street, Guelph.

Medford, Ore.—S. Bullis, of the Southern Oregon Electric Railway Company, has asked the City Council and the Southern Pacific Railway Company for permission to cross the tracks of the Southern Pacific on Main Avenue. In case the Southern Pacific refuses to grant the request for crossing rights, the application will be presented to the State Railway Commission for final settlement. An extension of not less than 3500 ft. will be made as soon as the preliminary details are settled.

Philadelphia, Pa.—Peter E. Costello, Philadelphia, has received a franchise from the Council for a two-track elevated railway from Front Street and Arch Street to Rhawn Street, Holmesburg.

Montreal, Que.—The Montreal & Southern Counties Railway has received an extension of time on its franchise in which to complete its lines in Montreal.

Beaumont, Tex.—A petition was presented to the City Council asking that the Council take steps to induce the extension of the Beaumont Traction Company's line to the Magnolia Petroleum Company's refinery south of Beaumont.

Seattle, Wash.—The Puget Sound Traction, Light & Power Company in Seattle will not be allowed to change the terminus of its Yesler Way cable line from its present location, between First and Second Avenues, as it had petitioned, according to a decision rendered by the City Council franchise committee. The company argued that the operation of its cable cars over Second Avenue hindered the headway of its cars north and south on the arterial highway.

TRACK AND ROADWAY

Lacombe & Blindman Valley Electric Railway, Lacombe, Alta.—W. L. McKinnon & Company, Toronto, advertised recently inviting bids for $206,700 of this company's first mortgage bonds, maturing in 1943. The Alberta government has guaranteed the principal and interest of the bonds for $7,000 a mile, or $273,700 for 39.1 miles. They bear 5 per cent interest.

Argenta (Ark.) Railway.—Work on the extension from Washington Avenue and Hazel Street to Rock Island station, at Fourth Street and Beech Street in Argenta, has been begun.

Central California Traction Company, San Francisco, Cal.—Negotiations are pending by which portions of the city lines of this company will be abandoned and a universal transfer privilege established between this company's line and the lines of the Stockton Electric Railway.

San Francisco (Cal.) Municipal Railway.—Bids for another branch of this railway are being considered by the Works Board, which has received the offers to construct the California-Street municipal railway line and the Seventeenth-Street carhouse. The line will begin at Geary Street and Second Avenue and run over Second Avenue, Cornwall and California Streets to Thirty-third Avenue.

Marin County Electric Railway, San Francisco, Cal.—This company has received permission from the Railroad Commission of California to construct a line in Sausalito, Cal., on the condition that the present franchise shall be amended so as to give the municipality the right to purchase the system after five years. The company is granted authority to issue 185½ shares of capital stock at par, and it is provided that this stock shall be sold only to property owners and residents of Marin County. It is also provided that all moneys obtained from the sale of stock shall be deposited by the railway company in Marin County banks as trust funds, with the understanding that if a total sum of $18,550 is not deposited within six months, these moneys shall be repaid to subscribers. [E. R. J., Nov. 21, '14.]

Connecticut Company, New Haven, Conn.—Plans are being made by this company to extend its tracks along Railroad Avenue to the station in Westport.

***Havana, Cuba.**—Work has been begun on an electric line between Havana and Guanabacoa in Cuba.

Central Illinois Traction Company, Paris, Ill.—An extension between Charleston and Paris, 30 miles, will be constructed by this company during 1915.

Indianapolis Traction & Terminal Company, Indianapolis, Ind.—This company will complete the construction of the Minnesota Street line, between Shelby Street and Churchman Avenue, for operation before Dec. 24. The special work at the corner of Shelby and Minnesota Streets will be completed sixty days fater the opening of the new year.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—This company has completed the survey and secured the right-of-way for the second section of the projected interurban railway between Kansas City and Topeka, Kan. The first section, from Kansas City to Bonner Springs, is now in operation and its business has considerably exceeded expectations. The second section is 21 miles from Bonner Springs to Lawrence. It probably will be in operation within a year. The third section, Lawrence to Topeka, will be built after the second section is in successful operation. Bids for the construction of the Bonner Springs-Lawrence section will probably be asked shortly. On the first section the company advertised for bids, but did with its own forces work for which it considered the bids unreasonable. The construction work which it is planned to start soon involves a bridge over the Kaw River at Lawrence. Carl G. Klemm, 1010 Commerce Building, is secretary of the company.

Kentucky Utilities Company, Somerset, Ky.—With this company disposing of $3,000,000 worth of bonds for needed improvements it is rumored that a part of the company's plans is to extend its line to Burnside, 7 miles south of Somerset, on the Cumberland River.

Winnipeg (Man.) Electric Railway.—Plans are being prepared for filing an application with the City Council for extensions in the northwest section of Winnipeg, in accordance with the City Engineer's directions.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to construct tracks on Pleasant Street, from the mouth of the subway to Washington Street in Boston.

Fitchburg & Leominster Street Railway, Fitchburg, Mass.—Surveys, which have been in progress for the extension of this railway to Townsend, have been suspended until spring. This line will ultimately be extended to Nashua, N. H.

Michigan Railway, Jackson, Mich.—This company has placed in operation its line between Kalamazoo and Monteith.

International Transit Company, Buffalo, N. Y.—The Board of Railway Commissioners has authorized the building of a bridge at Tagona, Sault Ste. Marie, Ont., to carry a highway and this company's tracks across the Algoma Central & Hudson Bay Railway. The cost of the bridge is to be borne by the electric railway company.

Cincinnati (Ohio) Traction Company.—A new crosstown line north of the present route on McMillan Street in Cincinnati is being considered by this company and may be built in the near future.

Ardmore & Western Interurban Railway, Ardmore, Okla.—As soon as negotiations are completed work will be begun by this company on the 100-mile line to connect Springer, Woodford, Poolville, Elmore City and Leon. Capital stock, authorized, $300,000. Bonds, authorized, $2,500,000. Officers: A. F. Costigan, Guaranty Bank Building, Ardmore, president; D. E. Allen, Ardmore, vice-president; A. L. Adath, Ardmore, secretary, and T. C. Bridgeman, treasurer. [E. R. J., May 30, '14.]

Forest Hill Electric Railway, Toronto, Ont.—The roadbed is now being prepared for this railway. Work has been begun at Bathurst Street, and the first stage from there to Dufferin Street will be proceeded with as rapidly as possible. The tracks will be laid on their entire route beginning near St. Clair Avenue. T. J. Glover is interested in this projected railway. [E. R. J., April 11, '14.]

Ottawa & St. Lawrence Electric Railway, Ottawa, Ont.—A contract has been awarded to Eastman, Kenny & Stearns, Russell, Ont., for grading about 6 miles of the projected line. About 2 miles of grading has been completed, and it is expected to have about 8 miles between Russell and Metcalfe completed and ready for the rails within the next three weeks. H. W. Pearson, Confederation Life Building, Toronto, Ont., secretary.

Toronto (Ont.) Civic Car Lines.—A by-law will be submitted to the ratepayers on Jan. 1, 1915, to provide for $455,000 for the extension of the civic car lines in Toronto.

Toronto, Ont.—City Solicitor Johnston advised the Board of Control on Nov. 27 it would be necessary to submit separate by-laws for each of the proposed new electric lines, consequently the board changed its recommendations. The Council will be asked to authorize the submission of a by-law for $105,000 for the proposed Lansdowne Avenue line, $317,000 for the North Toronto line, and $52,000 for the taking over of that portion of the Toronto & York Radial Railway Company's line within the city limits in the east end.

Electric Short Line Railroad, Minneapolis, Minn.—Plans are being considered by this company and the members of the Winthrop Commercial Club to build an electric railway through Winthrop and north as far as Winsted and south through Sleepy Eye to Jackson.

St. Louis, Mo.—The residents of South Lindenwood have submitted a petition to the Missouri Public Service Commission asking the United Railways for an extension of the Tower Grove line. The Tower Grove line terminus is 2½ miles away from the city limits in the Gratiot and Lindenwood section of the city.

Niobrara, Sioux City & Omaha Railway, Omaha, Neb.—Surveys have been completed by this company between Madison and Elgin. Right-of-way has been secured between Omaha and Norfolk via Madison. The Elgin line will be a branch proposition. Charles W. Baker, Omaha, is interested. [E. R. J., April 4, '14.]

Corry & Columbus Street Railway, Corry, Pa.—A 30-mile line from Corry, Pa., to Maysville, N. Y., via Columbus, Pa., Clymer and Sherman will be built by this company during 1915.

Slate Belt Electric Street Railway, Penn Argyl, Pa.—A 5-mile line between Wind Gap and Saylors Lake, Pa., will be constructed by this company during 1915.

***San Antonio, Tex.**—James L. Himrod, Thomas Moore, Austin, and others are making plans to build an electric railway to connect New Mexico, Lamesa, Robert Lee, San Angelo, Ballinger, San Antonio and other points with a port on the Gulf of Mexico.

Pittsburgh, Harmony, Butler & Newcastle Railway, Pittsburgh, Pa.—Within a few weeks this company will have completed its 6½ mile line between Evans City and Beaver Falls. In addition to passenger service the company announces that it will add trolley freight service over this line as well. The opening of this new line will give a direct electric railway line between Pittsburgh and Beaver Falls.

***Denison, Tex.**—Preliminary surveys are being made for a line betweeen Denison, Dexter and Locust. This is part of a plan to build an electric railway through Pottsboro, Locust, Gordonville, Dexter and Denison.

Houston, Laporte & Bay Shore Railway, Houston, Tex.—Preliminary arrangements are being made and work will be begun some time within the next six months on this line to connect Houston, Pasedana, Deepwater, Deer Park, San Jesenta City, Laporte, Seabrook, Webster, Friendswood and Pearland. The power station will be located at Houston and the repair shops at Pearland. The company will furnish power for lighting purposes. Capital stock, authorized, $2,000,000. Samuel F. George, Houston, president and general manager, and John H. Stoner, Houston, chief engineer.

Houston & Southern Railway, Houston, Tex.—Preliminary arrangements are being made to incorporate this company, which plans to begin work in the spring on its 55-mile electric railway to connect Houston, Pearland, Manville, Danbury, Belasco and Freeport. The company will furnish power for lighting purposes and will locate its power house in Houston and its repair shops at Pearland. It will also have amusement parks at Laporte and at Velasco. Samuel F. George, Dayton, Ohio, president, and John H. Stoner, Houston, chief engineer.

Glen Rose & Walnut Springs Railway, Walnut Springs, Tex.—Grading has been completed by this company for its 14-mile line to connect Glen Rose and Walnut Springs, via Seven Knobs. Officers: J. H. Farr, president; F S. Williams, vice-president; John Shields, treasurer, and F. B. Kirby, secretary, all of Glen Rose. [E. R. J., Sept. 12, '14.]

Rutland Railway, Light & Power Company, Rutland, Vt.—This company, a subsidiary of the General Gas & Electric Company, has begun construction under its plans for the conservation of the water supply at Chittenden Dam, near Rutland, Vt. The plans include the construction of two dams, a canal 3000 ft. long, and wood and steel penstocks. When completed, the reservoirs will furnish a large reserve supply of water for the new power station of the company at East Pittsford. Through this plan the water will be used twice for generation of power, once at the East Pittsford station, and once at the Mendon generating station.

Mercer Electric Railway, Athens, W. Va.—The tracks are being laid by this company on its line between Bluefield and Princeton. This line will connect Bluefield, Princeton and Athens. R. G. Meador, Athens, president. [E. R. J., Oct. 17, '14.]

SHOPS AND BUILDINGS

Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind.—This company opened its new depot in Clinton, Ind., on Dec. 3.

Orleans-Kenner Electric Railway, New Orleans, La.—Plans have been prepared by this company to build sixteen shelter houses and way stations along its line between New Orleans and Kenner. The buildings will be on brick construction with tile roofs.

Moncton Tramways, Electricity & Gas Company, Moncton, N. B.—A temporary carhouse was erected to replace the building which was destroyed by fire recently. This building is 30 ft. x 80 ft., with accommodation for five cars, and is on the same site as the one burned. It is the intention of the company to build a steel and brick carhouse in the summer, on a new site which has not yet been acquired.

Brooklyn (N. Y.) Rapid Transit Company.—The Public Service Commission for the First District has approved the award by the New York Municipal Railway Corporation to the P. J. Carlin Construction Company, the lowest bidder, of a contract for the construction of six stations on the Liberty Avenue elevated railroad extension. The contract price is $232,000.

Brantford (Ont.) Municipal Railway.—This company is building a new passenger station and freight house at Paris. The cost is estimated to be $3,000.

Toronto (Ont.) Civic Car Lines.—The City Council has authorized Commissioner Harris to build a temporary carhouse near Dorval Road to house the cars of the new Bloor Street line in Toronto.

Milwaukee Northern Railway, Cedarburg, Wis.—Work will be begun at once by this company on a new terminal building on Fifth Street between Cedar Street and Wells Street in Milwaukee. The structure will be of brick, fireproof, one story high and will be divided into separate waiting rooms, a ticket office and baggage room. The cost is estimated to be about $40,000.

POWER HOUSES AND SUBSTATIONS

Bay State Street Railway, Boston, Mass.—This company has installed a new engine and generator at its Mason Street plant.

Ottawa (Ont.) Electric Ry.—This company's new auxiliary power plant has been put in operation. It cost $200,000 and has a generating capacity of 5000 hp. The equipment includes three Babcock & Wilcox boilers and a Westinghouse double-flow steam turbine.

West Penn Traction Company, Pittsburgh, Pa.—This company has just placed in operation a 19-000-kva, 6600-volt, three-phase, sixty-cycle, turbo generator, built by the Westinghouse Electric & Manufacturing Company.

Monongahela Valley Traction Company, Mairmont, W. Va.—This company is installing three 1500-kva, water-cooled, sixty-cycle, 22,000-volt high-tension Westinghouse transformers, and a complete electrically-equipped remote-control switchboard in its power house near Fairmont, W. Va.

Manufactures and Supplies

ROLLING STOCK

Sheboygan Railway & Electric Company, Sheboygan, Wis., expects to order two new steel cars for city service, double-end operation, pay-as-you-enter, double-truck, to seat forty passengers. The cars will be equipped with baby motors and 24-in. wheels.

Philadelphia & Reading Railroad, Philadelphia, Pa. is making an investigation into the advisability of establishing storage-battery car operation on branch lines of its Winslow Junction-Cape May division.

Empire United Railways, Syracuse, N. Y., has ordered twelve more cars from the St. Louis Car Company in addition to the twelve cars ordered last summer. These twelve cars are to be the same type as those on the previous order.

London & Port Stanley Railway, London, Ont., has ordered three electric locomotives and electrical equipment for five motor cars from the Canadian General Electric Company. The contracts approximate $135,000. The locomotives will be 1000 hp, capable of hauling a trainload of 1000 tons. The cars will have a four-motor electrical equipment of about 600 hp per car. The motor cars and trailers, of which there will be five each, will be of one pattern and steel construction throughout. Tenders on the car bodies were invited up to Dec. 2.

TRADE NOTES

Thomas A. Edison, Inc., West Orange, N. J., in a fire which started early in the evening of Dec. 9, suffered much damage to its property, calculated at something less than $1,000,000. Part of the phonograph works was destroyed by fire, but Mr. Edison's private laboratory, the Storage Battery Company and the Edison primary-battery department were not affected. The company emphasizes the fact that the business of both battery departments of the company will not be interfered with in any way by the fire and that it is prepared to continue business as usual.

Albert Lawrence Smith has been admitted as a partner in the firm of E. B. Smith & Company, public utility bankers, Philadelphia, Pa. Mr. Smith is a son of the senior member of the firm. He attended Harvard University and began his business career with the Franklin National Bank, Philadelphia. For several years he has been associated with the firm of which he is now a partner. He is a director of the Buffalo & Susquehanna Railroad and of the Easton (Pa.) Consolidated Electric Company.

Kerr Turbine Company, Wellsville, N. Y., builder of "Economy" steam turbines, has appointed A. E. Seelig as general sales manager, and John A. Hense as St. Louis representative. Mr. Seelig for several years held a similar position with the L. J. Wing Manufacturing Company, and more recently has managed the new machine tool department in the New York office of Schuchardt & Schutte. Mr. Hense was formerly with the National Malleable Castings Company, Chicago, and later with the Dravo-Doyle Company, Philadelphia.

Walter A. Zelnicker Company, St. Louis, Mo., has appointed Arthur E. Jackman as manager of its machinery department to succeed J. J. Hilpirt, resigned to become storekeeper of the Compania Mexicana de Petroleo "El Aguila," S. A., Tampico, Mexico. Mr. Jackman has had wide experience, gained as general manager of the Sea View Railroad and Narragansett Pier Electric Light & Power Company. He was several years in the railway and lighting department of the Westinghouse Electric & Manufacturing Company, and lately superintendent of the East St. Louis, Columbia & Waterloo Railway, which position he left to assume his present duties.

W. S. Miller has resigned as general superintendent of the St. Louis Car Company, after being connected with this company about fifteen years. Mr. Miller's first position with the company was superintendent of the brass foundry departments, two years after which he became general foreman of the blacksmith, machine and truck departments. After holding this position for three years he was appointed superintendent of machinery and tools. In 1907 Mr. Miller became works manager and later general superintendent, which position he has held up to the time of his resignation, Nov. 9, 1914. He was formerly a student of Washington University, New York.

Edison Storage Battery Company, Orange, N. J., has appointed Francis V. McGinness, formerly sales engineer, as assistant manager of the railway department, the position formerly held by William F. Bauer, who was recently made manager of the company's Chicago office. Mr. McGinness is a graduate of Columbia University's Schools of Applied Science, class of 1910, and before graduation had considerable practical experience with the New York & New Jersey Telephone Company. After a few months in the engineering department of the New York & Queens Electric Light & Power Company, Long Island City, he joined the sales force of the Edison Storage Battery Company. For the past two years he has been identified with the railway department.

National Corrugated Culvert Manufacturers' Association, Chicago, Ill., announces that the large number of manufacturers operating under the Watson corrugated culvert patent have just been informed by their attorney, Wallace R. Lane, Chicago, that the United States Court of Appeals for the Second Circuit, which has final jurisdiction, has just handed down a mandate reversing the lower court and holding this patent valid and infringed by another culvert which was recently installed. The court says, in part: "The patented culvert is cheap, strong, durable, easily transported, quickly laid down and easily repaired. We cannot believe that the man who gave such a structure to the world should be denied the title of an inventor." The manufacturers of corrugated culverts under this important patent make them out of Armco American ingot iron.

ADVERTISING LITERATURE

Fargo Manufacturing Company, Inc., Poughkeepsie, N. Y., has issued a bulletin describing its straight connector, cable lug, signal connection, ground point and ground meter, "L," "Y" and "T" and terminal connections.

NEW PUBLICATION

Bonds and Stocks—The Elements of Successful Investing. by Roger W. Babson. Babson Statistical Organization, Inc., Wellesley Hills, Mass. 422 pages and three charts. $2 net.

This is the second book of its kind intended for investors received this year for review by the ELECTRIC RAILWAY JOURNAL and written by an authority of national reputation. There are many excellent books planned primarily for the student of corporation finance, but there has been a dearth of books about the science of investing money. Mr. Babson has in his volume rendered a real service to the man unacquainted with security issues who has money to invest, and in addition he has furnished a volume very entertaining aside from its practicable value. Very hazy ideas are frequently held about securities by men otherwise well informed, and to such men the present volume should be more than welcome. It is all very well for the man unacquainted with finance who intends to invest to be sure of the reputation of the house through which he deals, but there is no excuse now that "Bonds and Stocks" has been issued for such a man not to understand the fundamentals of investing. The strong and weak points of stocks and bonds are pointed out with reasons why some classes of securities are attractive and why others are not attractive. Mr. Babson has divided his work into twenty-four chapters. The first four deal with introductory suggestions, the next fifteen with elements of successful investing and the five concluding chapters with supplementary suggestions. There is a chapter on electric railway securities as distinct from lighting, telephone and water power securities. A chapter on the investor's vocabulary contains an explanation of ten phrases, the meaning of which should be understood by every investor. These phrases are the technical ones used frequently by bankers in seeking subscriptions from the public, through the newspapers. Mr. Babson certainly is justified in saying in his conclusion that "if the reader has absorbed all that has gone before he should have in his mind a clear idea of the different kinds and groups of securities and the various questions and terms involved therewith."

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THE COMPANY'S SHARE IN SAFETY

To tell every employee the specific nature and exact cost of each safety installation is an unusual undertaking for a large property, but this is the policy that has been begun by the mechanical department of the Brooklyn Rapid Transit System. This policy is a logical step toward that employee's co-operation which has become a feature of the safety movement on smaller properties. The report of the B. R. T. mechanical department's safety committee, as quoted in the ELECTRIC RAILWAY JOURNAL of Dec. 12, declared that within three months the department had set aside more than $1,600 for such tangible items as machinery safeguards, hydraulic jacks and car-hoisting hooks. In addition, the men have been informed individually of other safety plans which are under way by the department. Further, they have been invited to suggest any additional betterments that they think feasible because of their specialized knowledge. On account of these conditions, the appeal to the men to do their share to avoid accident will meet with a heartier response than if the management had placed on them alone all the burden of watchfulness. As with other good causes, an ounce of sincere action is worth more in promoting safety than a pound of fine talk.

NEW JERSEY RATE DECISION

The decision of the highest court in New Jersey that an allowance must be made for the value of franchises in any public utility valuation for rate-making purposes accords with common sense. It seems difficult sometimes for the ordinary layman to understand the reason underlying this principle. He says: "The franchise originally cost the company nothing, and its only value has come from the growth of the community. The public should not have to pay increased rates because of this unearned increment." Just as fairly he might say that the men who took up land under the government homestead act thirty or forty years ago, developed the land and farmed it until it became valuable should receive no compensation for their property when it is taken for public purposes. The franchise, like the homestead, was not valuable until the occupant came and made it so. This possibility of a future increase in value was part of the consideration which induced the railway company to build its line, just as the grant of land under the homestead act induced the farmers to settle in the Far West, and it should be allowed just as definitely in one case as in the other. This point is clearly brought out in the decision of the Court of Errors and Appeals of New Jersey. The decision also cites cases where franchises are taxed in New Jersey and other cases where allowances have been made for franchises when water companies have been taken over for public use. Where this condition exists it is difficult to understand why a franchise should not also be considered as part of the property on which a company should be permitted to earn a return. We hope that the clear exposition of this entire subject by the New Jersey court will help to clarify public opinion on this important matter.

LETTERS TO THE EDITORS

One of the most important departments of a technical paper is that in which discussion among readers is carried on. Just as a technical meeting is most successful and interesting when the papers and reports produce discussion, so the use of a journal is most productive of the general viewpoint when some readers call the attention of others to important debatable or misunderstood topics through the communications column. When an engineer has a plan in mind for a movement which he would like to get started promptly he cannot do so, as a rule, through the appropriate national society because necessarily the machinery for this purpose is very elaborate and its operation is time-consuming. Through a "letter to the editor" of the technical journal reaching his field, however, he can quickly reach the eye of a large number of interested persons. Many ideas, not elaborate enough to warrant the preparation of extended articles, can be clothed appropriately in "communication" form. The author of such a communication is responsible for the accuracy of the assumptions which he makes and of the conclusions which he draws. While the editors endeavor to check statements of fact they cannot properly challenge assumptions and certainly not conclusions except in the editorial pages where they present their own opinions. The ELECTRIC RAILWAY JOURNAL is gratified by the interest shown in its correspondence section, as indicated by the increasing number of topics discussed therein, but still greater use should be made of this opportunity for interchange of the fruit of experience. Within the past few weeks letters have been printed on such diverse but relevant topics as operation of trains without train orders, the flagging rule, insert special-work failures, effect of wheel diameter on motors, indexing technical information, the truss-rod fallacy, economic limits of passenger haul, steel sheathing for car siding, advantages of the near-side stop, etc. Such letters ought to furnish an index to the vital problems of the hour. That such an index is desirable goes without saying, but the editors are dependent upon the readers to make it a success.

STANDARDIZING ELECTRIC RAILWAY FORMS

Different accounting problems and conditions for electric railways make an absolute uniformity of books and forms impossible and, even if this were not so, inadvisable. Yet this fact is no reason why individual books and forms commonly used by most railways or those used in interline accounting should not be made up with the goal of standardization ever in mind. Electric railways, and particularly electric railway accountants' associations, have already taken great strides toward this goal, but the result thus far has been confined to the attainment of that primary but not exclusively important feature, the standardization of copy or information desired and kept in accounting records.

As pointed out last week at the meeting of the Central Electric Railway Accountants' Association, however, other features of forms may be standardized, such as size, weight, color and quality of paper and style of ruling. These matters are more important than may be realized at first glance. Paper stock is made in standard sizes, and definite economies in printing cost can be secured if forms are cut to standard sizes so that waste will be avoided. The matter of weight is also important, for ledger papers, way bills, claim blanks, auditors' forms, car cards, etc., have to suffer varying degrees of usage, and not only should the weight be suited thereto but all the forms should be grouped by weight in order to effect the saving and greater purchase power secured by combination buying. Then, too, the proper choice of the quality in paper obviates the unending variation of manilas, bonds, fibers, etc., and also proves economical in press work and paper by making all printers bid on the same and best quality for each class of use. As to colors, the more in number and the more unusual in character the greater the first cost and the cost of matching. Lastly, except with extra large forms or small orders, standardized print rulings with a wax plate or standing form are preferable, making for a decrease in press cost and an expedition of deliveries.

Although all the above-named opportunities for standardization seem to have a more intimate connection with the printers' trade than with electric railway accounting, we believe that the securing of such ends is more properly the work of the accountants. In the first place, the latter already know the lettering to be used and its preferred arrangement, and it would be much easier for them to collect existing forms and standardize them along the suggested lines than for the printers to try to collect the forms, study their uses and induce the railways to use the ones decided upon. The success of such a standardization movement can only be secured when it is brought about by those most vitally interested in the tangible results, while the printers as manufacturers must be depended upon for their expert advice regarding the processes and materials used. In the second place, public accountants and systematizers have long since secured developments along these very lines. Every university school of commerce in teaching accounting theory and systems lays great stress upon a proper understanding by the accountant of the principles of printing that underly the make-up of forms, in order that the completed job may be secured with the greatest economy, fitness for peculiar usages, ease of replacement and adherence to standard practices.

In short, it seems to us that along this line electric railway accountants can make valuable and effective efforts to round out the excellent standardization work they have already accomplished. With the assistance of representative printers, they would surely lay a firm basis for the proper combination of standard accounting methods, decreased cost and easier inter-company accounting relations. In this connection, too, it would be well to remember the computing machines of various makes. The determination of the proper size and weight should be made with consideration for the way in which companies may desire to use the forms in such aids to efficiency and time saving. Finally, the yearly contract method of buying might be examined. With forms completely standardized, a railway could estimate the number of each class, contract for the immediate running of the whole and requisition sections from the printer during the year as needed. The advantage of competitive bidding would be retained, and economies would be secured in stores space, time in ordering and receiving goods, uniformity in supplies and fewer printers' accounts to handle.

HIGH-VOLTAGE INSULATOR PROBLEMS

The papers and discussion at last week's New York meeting of the American Institute of Electrical Engineers brought out clearly the facts that failure due to mechanical stresses is a large element in insulator depreciation; that the selection of the proper number of units in a suspension insulator is susceptible of mathematical analysis; that suspension insulators can be made partly puncture-proof by reducing the arc-over distance; that some kind of periodical test for insulators in situ is desirable, and that an altitude rating for insulators, high-tension bushings, etc., is a necessity.

This bill of particulars indicates some of the problems that are agitating the minds of electric transmission engineers. An insulator looks like such a simple construction, and the materials of which it is composed are, under ordinary conditions, so durable that a casual inspection would lead one to expect it to last for a long period unless punctured by an electric discharge or a hunter's bullet. Those on the inside tell us that insulator design is one of the most difficult arts, and this is substantiated in Mr. Austin's paper, abstracted elsewhere in this issue. Porcelain tends to absorb moisture and thus lose its electrical resistance; differences of temperature and chemical changes in the cement produce internal mechanical stresses; grooves on the porcelain surfaces and minute electrical discharges tend to start checking of the porcelain body, etc. When the condition of weather, the combined mechanical and electrical stresses to be resisted and the inaccessibility for inspection are considered it is remarkable that the depreciation of first-class insulators is as low as that of electrical machinery. That it is so was claimed at the Institute meeting, and the claim was not disputed.

A COMMON MISTAKE ABOUT TRANSFERS

A great many people are far too prone to judge the attitude of a street railway company toward the public by the number of transfers it issues. If a road makes a striking showing in the number of transfer passengers and thus obtains a low average rate of fare per passenger carried, it is looked on as rather beneficent in its attitude, while the system which issues a comparatively small number of transfers and shows a high earning per passenger carried is too often looked upon with suspicion and held up to entirely unjust criticism. As a matter of fact the proportion of passengers who ride on transfers has comparatively little significance unless one can ascertain that which no accounting system takes into reckoning, the real purpose of the transfer. A road may carry 5 per cent of its passengers on transfer slips and be almost needlessly generous to the public, or it may carry 30 per cent and confer no proportionate benefits.

Transfers are issued for two purposes, first, to give the public needed access to branch lines without payment of extra fare, and second, to avoid through routing of cars in a manner which may interfere with the best development of the traffic. In the former case the transfer may or may not mean an exceptionally long ride for a nickel. Often, too, actual physical transfer is made of which no definite record is kept, simply because such a plan is of more convenience to the riding public or perhaps to the road itself. We have in mind, for example, one small road in which there is near one end of the line a physical transfer of which no account is taken by reason of the particular circumstances in the case. The passengers get their full ride for a nickel, and the shift is made very promptly and easily, accommodating as it happens a large number of passengers. Now if transfer slips were issued in this particular instance the apparent fare per passenger of record would fall off and the road would seem to be liberal in transfers, whereas as a matter of fact it is saving the cost of the slips and making some other incidental savings without the slightest inconvenience to the public.

On the other hand, we can conceive of routes involving four or five transfers where the public would be better served by a larger number of through cars. Such a condition is apt to arise when changed conditions of business in a city alter the natural arteries of traffic. Under such circumstances, changes in routing should be made to accommodate the larger number of people, but a company, unaided by the municipality and a general public conception of facts, can rarely make these changes owing to the local opposition of merchants and others who are used to having certain popular lines of cars run past their doors.

When the uninformed layman tries to butt into a subject as technical in its details as is street railroading he will do well to drop that sublime confidence in statistics which characterizes the ignorant and find out the facts of the case before he makes any odious comparisons. In the cases cited, certainly, the facts are not shown on the face of the statistics. The truth as to whether the number of transfers given is adequate or not depends entirely on the way in which the transportation system really works out in practice and this can only be ascertained by intelligent physical study of the conditions. If people who write to the newspapers and complain to the commissions would "stop, look and listen" instead of rushing into print or litigation the world would be well rid of a good bit of unpleasant friction. Public utility companies have a reasonable claim to fair play which entitles them to careful investigation of the facts before critics jump at conclusions.

THE MERCURY RECTIFIER LOCOMOTIVE

The announcement that a mercury rectifier equipment with an output capacity of 1000 hp has made 20,000 miles and is in revenue service on a branch line of the New Haven Railroad deserves more than passing notice. It has been known for some months that the Westinghouse Company has been conducting experiments with the Cooper-Hewitt mercury vapor rectifier with a view to extending its use to traction work. The success of this type of rectifier in the storage-battery and arc lighting fields indicated what might be expected in traction work if a substantial container could be made which would withstand the shocks incident to locomotive operation, keeping the necessarily high vacuum and good electrical insulation. Glass bulbs are excellent for stationary work in moderate capacities, but they are obviously unsuited for heavy railway work. A steel shell is the ideal container from a mechanical standpoint, but its use involves difficult problems in the particulars mentioned above. That at least a measure of success has been attained in overcoming these difficulties is attested by the record.

The incentive to the development of the mercury rectifier is furnished by the desirability of securing the efficiency of power transmission of alternating current, the simplicity of a single-phase overhead system and the excellent operating characteristics of the d.c. series motor. If a simple single-phase rectifier or converter were available, and the present tests indicate that it soon may be, it will be possible to make a selection of a single-phase system which will best suit service conditions. There can then be used either the induction motor with the phase converter, as in the Norfolk & Western electrification, the compensated a.c. series motor, as in the New Haven system, or the new mercury vapor rectifier with standard d.c. motors. The competition between the d.c. and a.c. systems will then be keener and more interesting than ever, with a serious handicap to the latter removed.

Among the advantages which an a.c.-d.c. equipment may be expected to possess are high efficiency, good speed-regulating qualities, lightness, high power factor of input and independence of frequency. Continued tests will develop some compensating disadvantages as no one system can possess all virtues and no faults. The substantial fact, however, is that the equipment is operating satisfactorily, and it is to be expected that details of design and operation will be forthcoming shortly.

Electric Freight Service at Bangor

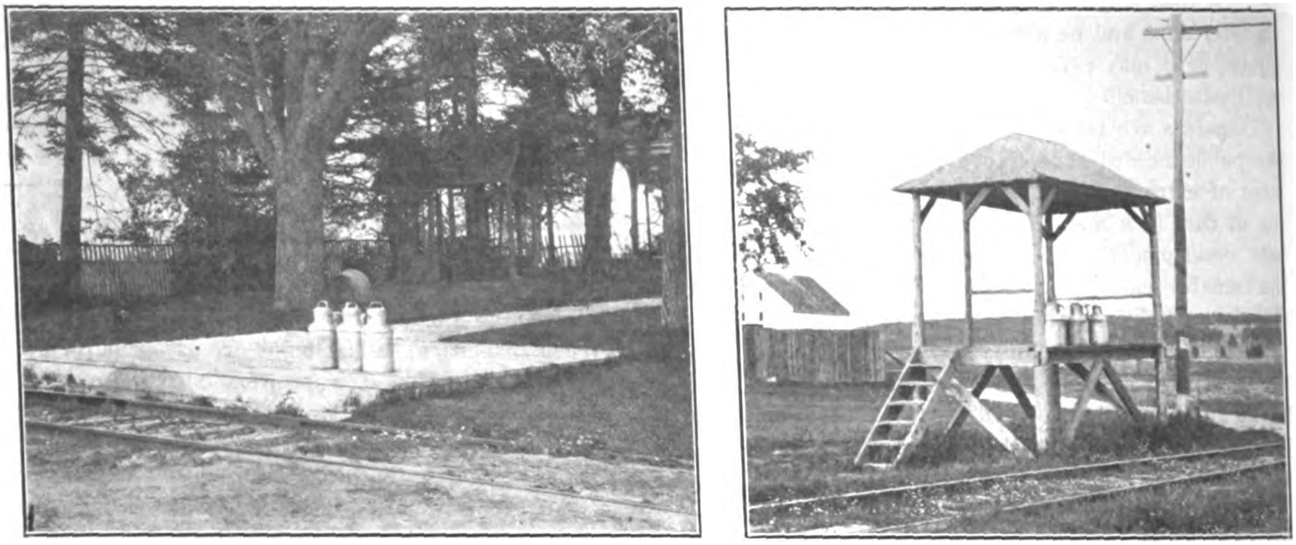
Development of Traffic on Thinly Populated Country Lines by Favorable Rates and Carefully Planned Service—Inauguration of Intensive Farming Under Company's Auspices

An interesting example of electric freight service developed from small beginnings to a profitable volume of traffic is afforded by the Charleston line of the Bangor (Maine) Railway & Electric Company. This branch of the system serves a purely agricultural district, the line being 25 miles long and having a tributary local population of about 2500. Under the executive direction of John R. Graham, president of the company, the revenue on this line has increased from gross earnings of $32,000 six years ago to a present income of $65,000, and the line now handles more than 50 per cent of the total electric freight business in the state. Co-operation with the farmers is the keynote of the company's policy, and the latest feature of the work is the establishment by the company of a model farm upon which the possibilities of intensive agriculture are being demonstrated for the benefit of the territory served by the line.

The line also serves the intermediate villages of Kenduskeag, 12 miles, and East Corinth, 18 miles from Bangor. Through passenger service is given in each direction on a two-hour headway, and hourly cars are operated between Bangor and Kenduskeag, in addition to the regular and extra freight service. Prior to the establishment of the present freight rates the line was losing about $25,000 per year. The present schedule was inaugurated by cutting the carload rate on potatoes 50 per cent. This reduction was extensively advertised in the local press and on posters in the cars. The present rate on potatoes and the shipments of potatoes during the past six years appear in Table I on the next page.

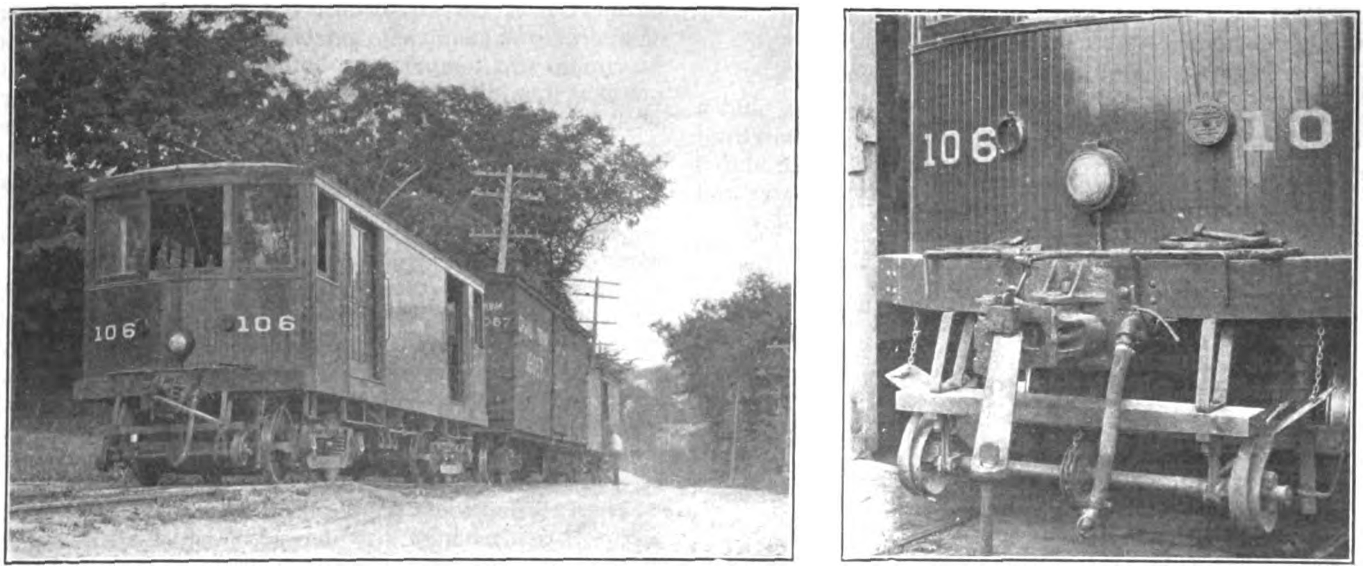
On other commodities the rates have been maintained substantially as at first, except that the rate on cordwood has been made especially favorable to the farmer. A few representative rates are given in Table II.

No house deliveries are made by the company. Shipments are frequently handled from platforms at the side of the track, as shown in two of the illustrations. These platforms are built of wood and in some cases are covered partially to protect the shipper and goods from the sun. A large amount of milk, cream and vegetables is shipped by the company daily into Bangor. On the regular return trip at 11:50 a. m. the company



BANGOR FREIGHT SERVICE—TYPICAL SHIPPING PLATFORMS

BANGOR FREIGHT SERVICE—POTATO FIELD AT COMPANY'S MODEL FARM. YIELD IS MUCH GREATER THAN ON OTHER FARMS IN VICINITY



BANGOR FREIGHT SERVICE—TYPICAL FREIGHT TRAIN, AND COUPLING AND AIR CONNECTION FOR FOREIGN CARS

handles farming implements, household supplies and miscellaneous freight. On week days a regular freight leaves Charleston at 6:30 a. m., East Corinth at 7 a. m., Kenduskeag at 8 a. m., arriving at Bangor at 9:30 at the company's freight depot, which is located on Front street, adjoining the wharf of the Eastern Steamship Corporation and having spur track connections with the Maine Central Railroad.

TABLE I—DATA ON RATES AND AMOUNTS OF POTATOES SHIPPED

	Carload Shipments to Bangor		
	Kenduskeag	East Corinth	Charleston
700 bushels	$11.89	$15.40	$19.60
800 bushels	13.59	17.60	22.40
Base rate per bushel for all carload lots, 500 bushels, minimum carload	1.7 cents	2.2 cents	2.8 cents

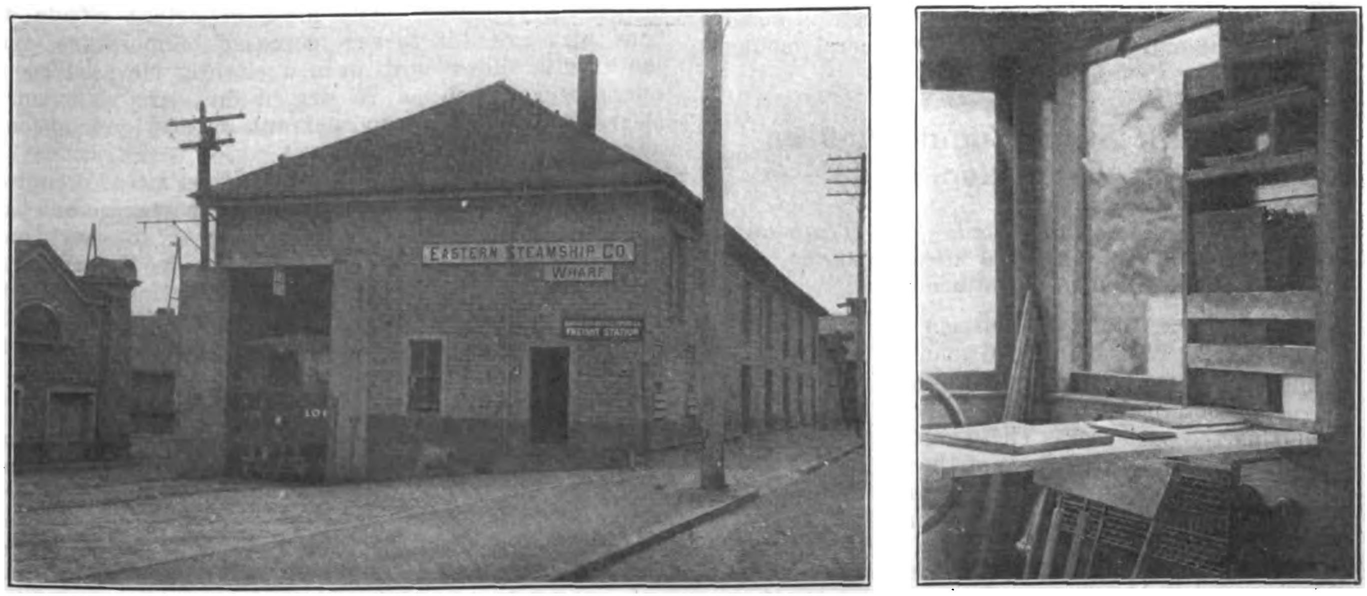
Season	Car Loads Potatoes
1907-1908	81
1908-1909	161
1909-1910	340
1910-1911	436
1911-1912	276
1912-1913	438
Total	1732

TABLE II—TYPICAL RATES CHARLESTON LINE

	Between Bangor and		
	Kenduskeag	East Corinth	Charleston
Pulpwood, per hundredweight	$0.0257	$0.0285	$0.0314
Cordwood, per cord	.75	.90	1.00
Fertilizer, per ton	1.00	1.30	1.60
Grain, per ton	1.00	1.30	1.60
Hay and straw, per ton	1.00	1.10	1.30
Groceries, less than 500 lb., per hundredweight	0.08	0.11	0.12
Berries, per small crate	0.15	0.20	0.25
Berries, per large crate	0.20	0.25	0.30
Horses, cattle, etc., less than carlot	2.75	3.30	3.85
Eggs, per case (56 doz.)	0.20	0.25	0.28

MODEL FARM

The model farm is 6 miles from Bangor and last season 40 acres were under cultivation, 30 acres being devoted to potatoes. The company finances the enterprise, which is operated by an expert agriculturist who is on the staff of the University of Maine. The average yield of potatoes in Maine is 200 bushels per acre, and the model farm is being run with the expectation of obtaining 400 bushels. One of the potato fields, which has been developed by the use of phosphates costing $35 per ton, is illustrated. Experiments are also being made with lime. The size of the plants and blossoms indicates the merits of intensive farming, when these are compared with others in the Bangor region farmed according to the old methods. In the summer the company holds farmers' meetings on the model farm, lestures and inspection of exhibits. In this way the farmers in the neighborhood have an opportunity to study at first hand the latest methods employed in scientific farming as well as to inspect the most modern



BANGOR FREIGHT SERVICE—FREIGHT STATION AT BANGOR AND FREIGHT RECORD DESK ON LOCOMOTIVE sanitary appliances and electrically operated labor saving devices.

FREIGHT EQUIPMENT AND POWER SUPPLY

The company owns ten box and ten flat cars, and a considerable part of its traffic consists in switching and hauling foreign freight cars to and from the Maine Central Railroad. Three combination express cars and electric locomotives are in service. Each locomotive is equipped with four G.E.-80 motors, K-28 control and straight air brakes. Each is capable of hauling four loaded box cars at a speed of 15 m.p.h. The latest equipment of this type, which was built by the Wason Manufacturing Company, Brightwood, Mass., is 34 ft. 6 in. long and 8 ft. wide inside, with side doors 5 ft. wide and 6 ft. 4 in. high. The car is equipped for double-end operation and weighs complete 24 tons. The door sills are of corrugated iron 6 in. wide. Nine 16-cp lamps furnish the interior illumination, and both luminous arc and incandescent headlights are installed. To facilitate handling foreign cars a coupler and intermediate air hose are provided. Two men handle the locomotive car and all trailers. A convenient home-made desk used on the car illustrated on page 1329. This is made of a box 4 in. deep, 18 in. wide and 30 in. high attached to the car siding and provided with a hinged cover with a leg at the outer end. The cover is at a height of 3 ft. 4 in. above the floor, and the box, which is of ½-in. stock, is divided into five compartments, the lower slats being provided with pencil grooves.

In March, 1914, the company handled 5022 tons of freight, its freight cars being operated 13,318 car miles. The motor cars made 4886 miles, and trailers 8432. The earnings of the freight department were $4,739, an increase of 17 per cent over March, 1913. Of this revenue, $1,002 came from way freight in less than carload lots, the balance being from handling cars in bulk. A substantial shifting service on the Hampden line of the company is included in the above revenue producers. The maximum grade on the Charleston line is 8 per cent, and the most difficult combination of grade and curve is in the city of Bangor, where the trains are operated around a 72-ft. radius curve on a 5 per cent incline.

Power for the operation of the Charleston line was formerly supplied by an inefficient steam plant at an expense of $18,000 per year. When the Graham interests took hold of the property the plant was shut down and later converted into a potato storage depot. The hydroelectric system of the Bangor company supplies power to the Charleston line at an almost insignificant cost, since the number of motor cars in service at any one time rarely exceeds six. Howard Brett is general freight agent and M. E. McCormick general manager of the company.

New York State Commission on Ventilation

Report of First Year's Experiments—High Temperatures Have Marked Physiological Effect—Vitiated Air of Little Influence

The New York State Commission on Ventilation, of which C. E. A. Winslow is chairman and G. T. Palmer is chief of investigating staff, has given out some of the results obtained in a series of experiments carried out during the past year. These were conducted in observation rooms at the College of the City of New York where the effect on human beings of air of various temperatures, humidities and chemical conditions was investigated in detail. The observations were made under circumstances not extreme in character, as in the case of most past investigations, but were designed to be comparable to conditions existing in occupied rooms, the maximum test temperature being 86 deg. Fahr. with 80 per cent humidity, and the minimum being 70 deg. Fahr. with humidities of 50 per cent and 60 per cent. Fans were used for agitating the air in some cases, but their influence appeared to be negligible on both the mental and physical condition of the subjects. There were no experiments with the use of agitating fans in a vitiated atmosphere.

Summed up, the results of the first year's work seem to have established that a very high temperature, such as 86 deg. Fahr. with 80 per cent relative humidity, produces slight but distinct elevation of body temperature, and an increase in heart rate. A moderately high room temperature, 75 per cent with 50 per cent relative humidity, has the same effect, although, of course, in less degree than the extreme temperature condition.

The extreme room temperature of 86 per cent with 80 per cent relative humidity showed no effect upon respiration, dead space in the lungs, acidosis of the blood, rate of heat production, or rate of digestion. Nor is the power to do either mental or physical work, when actually working in a concentrated fashion, diminished at all by a room temperature of 86 deg. with 80 per cent relative humidity.

On the other hand, the inclination to do physical work is certainly diminished and the inclination to do mental work is probably diminished by high room temperatures. So far as physical work is concerned the tests showed a decrease in actual work performed (when the subject was given his choice of working or idling) of 15 per cent under the 75-deg. temperature and of 37 per cent under the 86-deg. temperature as compared in each case with 68 deg.

Stagnant air at the same temperature as fresh air, even when it contains twenty or more parts of carbon dioxide and all the organic and other substances in the breathed air of occupied rooms, has no effect on any of the physiological responses nor on the power nor inclination to do physical or mental work nor on the sensations of comfort of the subjects breathing it. On the other hand, the appetite for food of subjects exposed to such stagnant air is slightly but distinctly reduced, perhaps as a result of a subconscious effect of odors.

These experiments seem to indicate that overheated rooms are not only uncomfortable but produce well-marked effects upon the heat regulating and circulatory systems of the body and materially reduce the work done by the occupants when they are free to work or not as they choose. The most important effects of "bad air" are due to the increased temperature, and the results shown with even a slightly elevated room temperature, such as 75 deg. Fahr., are sufficiently clear and important to warrant careful precautions against overheating.

The chemical changes in the breathed air of occupied rooms are of comparatively minor importance, but the substances present in such air appear to exert one definite measurable effect, a decrease in the appetite for food, and this constitutes an observation which, for the first time, offers scientific evidence in favor of fresh air as compared with stagnant air of the same temperature and humidity.

The work of making the existing double-track line from Tokio to Yokohama, Japan, into a four-track line has been practically finished. The old track will continue as a steam line, while the new track will be used for electric service. Electric cars will run from the new Tokio central station.

Valuation of Franchises

New Jersey Court of Errors and Appeals Holds that Value of Franchises Must Be Considered in Public Utility Rate-Making—Passaic 90-Cent Gas Ruling Reversed

An important decision was handed down last week by the Court of Errors and Appeals of New Jersey, in the case of Public Service Gas Company vs. Board of Public Utility Commissioners et al. A short statement of the decision was published on page 1311 of last week's issue. The syllabus of the decision, written by the court follows:

"When a public utility corporation is in the enjoyment of privileges to use streets and public places in this State for the purposes of its business, whether such privileges be conferred by the State alone or partly by the State and partly by the municipality and whether they be exclusive or subject to duplication such privileges constitute a special franchise, which is property, is subject to taxation and has normally a substantial value; and in making a valuation of the property of such corporation for the purpose of establishing a basis for the regulation of rates to be paid to it by the public for its product or service, it is erroneous to assign no value, or a merely nominal value, to such franchise when a substantial value is fairly reflected in the total market value of its securities."

In the decision, which was delivered by Judge Parker, the court concurs with the Public Utility Commission and the Supreme Court in holding that 8 per cent upon the true value of the company's property is a fair and lawful rate of income in determining the price to be charged consumers. The only real point of difference, therefore, hinged upon how this true value should be determined, and primarily upon whether a nominal or substantial value should be given to the special franchise. In discussing this point the court said, in part:

ALLOWANCE FOR FRANCHISE VALUE

"This brings us to the other main element of value, called by the commission the total value of all the intangible property of the company, and which the board estimated at 30 per cent of the valuation assigned by them to the structural plant. This, as the board expressly stated, included everything outside of the tangible property and associated plant assets, such as working capital. They expressly included preliminary outlay, such as engineering and legal expenses, canvassing, costs of incorporation, cost of securing franchises, financing, bankers' commission, deficit in operation during the earlier years, and inadequate early returns upon the investment; also 'the entire value of all franchises, primary or secondary, possessed or exercised by the company in the Passaic division.' Two or three other specific intangible elements were included that need no notice here. Nothing was allowed for good-will.

"In discussing the matter of franchises, the commission remarked that its finding as to the total amount of intangible property was 'tantamount to including the franchises of the company at a moderate rating, at a value comparable to the cost of obtaining these or similar franchise. It amounts, therefore, say the commissioners, 'to a practical denial of the company's contentions as to the value of its franchises.'

"The board stated that it is the public policy of the State not to allow the capitalization of franchises for an amount in excess of the actual cost involved in obtaining said franchises; evidently referring to paragraph F of Section 18 of the utilities act, P. L. 1911, page 381. We find difficulty in ascertaining from the report the method adopted by the commissioners for valuation of the franchises. In one place they announce that such value is included in the 30 per cent estimate of all the intangible property; in other places they say that there is no evidence before them to show that these franchises should be valued at any more than the cost of obtaining them; in their general summary of valuations the franchises are listed as an item and no value assigned thereto, and the next item consists of patent rights, which the commission expressly declares to have no value whatever; and yet the commission conceded that special franchises are property; that when tangible property is operated under franchise rights the instrument of public service is worth more than the material and labor involved in its construction; that taxation is imposed in respect of special charters as 'property' in this and other States; and that neither franchise nor any other property can be taken for public use without just compensation.

HAVE A SUBSTANTIAL WORTH

"These are extracts from the report in its exact language. In dealing with this question the Supreme Court seems to have gone a step further, for it held that 'logically no allowance should be made for the value of the special franchises in a case where it is not legally exclusive, and where the State still retains the right to fix rates.' 84 N. J. L. 482.

"We find ourselves unable to concur in this result. Without adopting in its entirety the rule laid down in our railroad tax cases, that the total valuation of the property and franchises should be gaged by the market value of the outstanding corporate securities plus floating debt, and that therefore the value of the franchises would be indicated by the difference between this total and the sum of the value of the physical plant, plus development cost; and conceding that in most of the cases of public utilities the privilege of utilizing the public domain is not exclusive, and is therefore subject to invasion by other similar utilities, and conceding also that charters and local franchises are often granted by the State or the municipality, without a cash or property consideration, the conviction still remains that such franchises have substantial value.

"We often hear of old charters being bought up for use by new enterprises. The very charter of the appellant seems to be one of this class. It seems a fallacy to say that if and because a municipality confers upon a gas company or a street railway company the privilege of using the public streets without any consideration in cash or property passing from the company, the rights thereby conferred should have no value for rate-making purposes; for this disregards at least the meritorious consideration that the promoters of the company have invested their money and given their time and taken their business risks in view of the making of this very concession, and the value of the enterprise on which the owners are entitled to draw an income should not be limited to the mere cash that they have put into it, but should include something for the risk and responsibility that they have taken in organizing and developing it.

"It is true, as the board remarked, that the utilities act forbids the capitalization of franchises. This prohibition, however, refers to the inclusion of a franchise valuation in the par value of capital stock, but does not affect its market value. Just as the value of a bank stock may be and often is legitimately enhanced by public confidence in the directors of a bank and the methods of its business management, Newark vs Tunis, 81 L. 45; 82 L. 461; so the market value of the securities of a public utility may be enhanced in part at least by the fact that it is operating under a municipal franchise costing little or nothing in cash outlay, subject, it may be, to duplication, but which the public has the right to suppose in a proper case will follow the general run of such franchises and be free from indiscriminate competition although not legally exclusive. Such a situation would be a legitimate element of market value and would be taxable, as reasonably and fairly enhancing the value of the property in the public mind. It would thus be capitalized, not by the utility itself but by the public as a business matter, and against such capitalization there is no prohibition, legislative or otherwise."

TAXATION EMPHASIZES WORTH

The court here presented a long list of citations to confirm this view. It then points out that the status of franchises as property is emphasized by the provisions made by the Legislature for taxing them and the deliverances of the courts in tax cases and says, in part:

"It should be unnecessary to remark that our reports would not contain this long line of decisions in earnestly litigated franchise tax cases, were it not a fact that franchises, general or local, State or municipal, have a substantial value of which the taxing authorities are prompt to take advantage, and which value in tax assessment controversies, the authorities estimate often in large figures. If other evidence of substantial value were needed, it may be found in the fact that as to municipal franchises, the municipality may impose within reason, and the utility must comply with, conditions involving considerable expense. J. C. & H. R. R. Co. vs. J. C. & B. R. R. Co., 21 Eq., 550.

"The respondents then must take and sustain this position: That although by numerous decisions of the Supreme Court, Court of Chancery, and of this court, it has been repeatedly declared that the privilege given to public utility corporations, either directly by the State, or partly by the State and partly by the municipality as a State agency, and whether exclusive or not, is a franchise, and as a franchise is property, to which the utility in a proper case may assert its special right as against an usurper, and as property is subject to taxation, at the will of the Legislature, upon a substantial valuation fixed by the taxing authorities; and though its bestowal may be and in most cases is conditioned upon a substantial, valuable consideration in money or contract obligation, yet when in the exercise of its rate regulating power the Legislature deputes an agency to determine a valuation as a basis for the rate, such agency may disregard the unquestionable value that is attached to the franchise for the purpose of yielding an income to the State or its subdivisions, and declare that such franchise has only a nominal value for the purpose of yielding an income to the public utility.

"We cannot agree to such a proposition. We are aware that some courts have held that a valuation for taxation is not necessarily identical with valuation for rate regulation. This may be so in a measure. Indeed, it is readily conceivable that if the franchise were exempt, as it was claimed to be under the act of 1903 (North Jersey Street Railway Company vs. Jersey City, supra) the rate valuation might exceed the tax valuation by the value of the franchise.

"But normally, when all the corporate property is subject to taxation and also valued for rate regulation, it would seem reasonable to say that the owner of the property is entitled to a fair income on property for which it is taxed. The fact that the State or the municipality, or both, have seen fit to confer a franchise in many cases as a gift (so-called) or for a consideration deemed inadequate in view of the advantages conferred, does not, as it seems to us, create any implication in the grant that the value of the franchise should be disregarded in fixing a reasonable rate.

FRANCHISES BASED ON A CONSIDERATION

"Recurring to the argument that these special or municipal franchises are given to the utility, or contributed by the public, and therefore should not be estimated in fixing a rate, we repeat that the minor premise is an unwarranted assumption of fact. A municipality desires street car or gas service. It can, if so authorized by the Legislature, build and operate its own plant and equipment. Perhaps the cost of installation is too great, so that there would be no sale for the bonds, or the citizens are unwilling to shoulder the interest charge; perhaps, also, the usual extravagance in operation due to public ownership is a deterrent. It is common knowledge that in this country a public utility is usually operated by the public at a loss or an inadequate return.

"The economic advantage of private ownership is generally recognized. In this situation, a company is organized and asks a franchise. The risk is all that of the organizers; nothing is risked by the municipality. If it fails, they lose their money. It must operate, however, so long as it does operate, at a reasonable rate, based on a theoretically economical plant and operating expense. It cannot charge the public more than the service is worth, just because otherwise it will not meet its operating expenses and fixed charges. It must pay its taxes, whether it earns them or not. In short, all such franchises are based on a consideration, viz., the risk and obligation undertaken by their grantees; and it will not do to say that the franchise is a public contribution exclusively.

"If the plant and franchise be taken over by the public, the franchise must be paid for like any other property. Monongahela Nav. Co. vs. U. S. 148, U. S. 312; Brunswick and Topsham Water Dist. vs. Maine Water Co., 99 Me. 371, 59 Atl. 537. In the latter case the Legislature expressly recognized that it should be paid for, but the court did not rest on that; on the contrary, it said that even in cases where by statute franchises were not to be included in the valuation, the court conceived that it must have been implied that the property was to be valued as rightfully where it was, and rightfully to be used; adding that the right to use and charge reasonable tolls were the franchises, at any rate the most important ones.

"If, as we think is the law, substantial allowance should be made for the franchise of a gas plant if taken for public use, and the value of such franchise paid in money to the owners thereof, we fail to see why, so long as the plant and franchise possessing that value for sale or condemnation are held and operated by the owners, the latter should not be entitled to a reasonable income on all elements of their property, including the franchise, in the absence of any charter reservation or contract to the contrary. As was said by the Supreme Court of Maine, in the Brunswick case, ubi supra, 'we apprehend that some difficulty in discussion has arisen from attempting to differentiate in logic what is inseparable in fact. The property taken is a single thing, to which belong certain characteristics which affect its value.'

"We do not wish to be understood as laying down the doctrine that the value of the franchise is to be measured necessarily by the total market value of outstanding capital stock and indebtedness, less physical valuation and development cost, because this would take no account of inflation of stock values; but if such market value added to indebtedness show an excess, such excess is at least evidential that where there are special franchises such franchises have some substantial value in excess of the mere outlays for legal, advertising and other legitimate expenses in obtaining them. This element was, apparently, expressly excluded both by the commission and by the Supreme Court. This exclusion, in our opinion, was error. We think there was evidence before the commission to indicate that from this standpoint the franchises had a substantial value which the commission refused to give to them, and as the 90-cent rate fixed by the commission was based on the theory of providing net income of 8 per cent of the total value of the property of the company, the finding of fact that such rate was just and reasonable was in direct violation of the fundamental theory on which the commission undertook to fix the rate, and is presumably not justified by it. On the appeal of the gas company, therefore, the judgment of the Supreme Court will be reversed and the order fixing the 90-cent rate will be set aside."

The opinion was delivered by Judge Parker. Five other judges concurred in it. Four judges voted to affirm the decision of the Supreme Court.

Rapid Handling of Auto Bodies on the Detroit United Railway

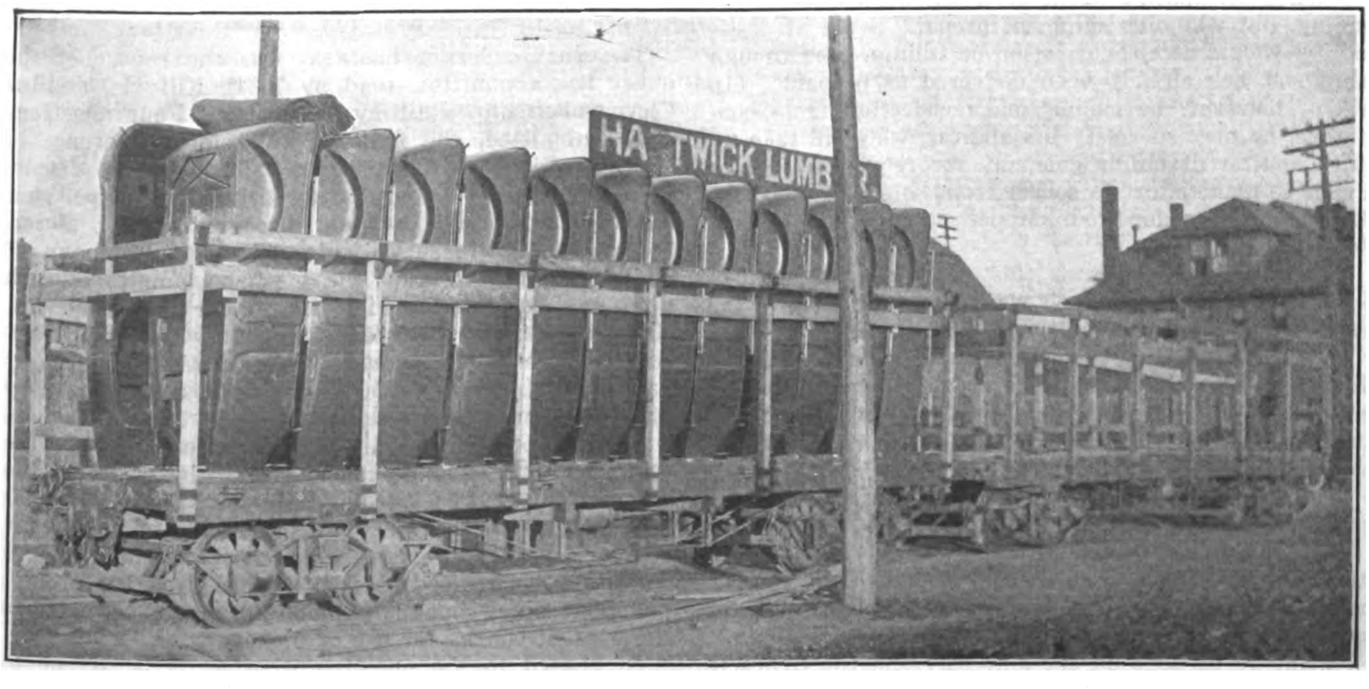
BY N. RUMNEY, TRAVELING FREIGHT AND EXPRESS AGENT DETROIT UNITED LINES

In Detroit, Mich., the movement of carload freight within the central district is entirely out of the question, and any business of this character must necessarily be confined to the outer districts. There are, however, a large number of factories located in the outlying sections engaged in the manufacture of various articles and part of the output of these factories is forwarded to customers in adjoining cities. Some of this material includes automobile parts, and the manufacturer is usually under contract to deliver a specified quantity of the material daily. This is difficult with the service afforded by the steam railroads in some cases, because of the delays en route and the unreliability of the service.

The accompanying illustration shows how automobile bodies are handled by the Detroit United Railway on flat cars equipped with stakes and railings. These bodies are shipped by automobile body companies of Detroit to one motor company at Flint, Mich., a distance of 70 miles, and to another motor car company at Pontiac, Mich., a distance of 25 miles. The bodies are 10 ft. 2 in. long and are set upon end, eighteen bodies being loaded upon a 34-ft. car. In transit the bodies are covered with a large canvas which, after the car is unloaded, is folded and placed in a side-hinged box provided for that purpose beneath the car.

During the busy automobile season it is a vital problem to secure material with sufficient regularity, for any interruption in the daily supply of any one of the numerous parts which enter into the make-up of the completed automobile may mean a serious setback, if not an actual money loss. So in this case the Detroit United Railway is relied upon to secure the prompt delivery of bodies, despite the fact that trucking is necessary at both the point of receipt and delivery, whereas the steam railroad could make complete delivery. These cars are loaded at Detroit during the day and are placed at the destination ready for unloading before 6:30 a. m. the following day.

The rate for transportation exceeds that charged by the steam railroads. The shippers, however, consider that this higher rate is more than offset by the advantage gained in having the goods on hand when required, thus enabling them to have the bodies well advanced in the process of painting and finishing before they would have been received in the ordinary course of steam railroad freight movement. To the shippers, another advantage lies in the fact that they are permitted to continue loading until a late hour in the afternoon or evening, thereby making it possible to ship the entire day's output at the close of the day's work. This increased efficiency enables the manufacturer to make contract deliveries even during the busiest part of the season.



VIEW OF CAR OF AUTO BODIES BEFORE COVERING THEM WITH TARPAULIN; ALSO AN EMPTY CAR

Annual Meeting of C. E. R. A. Accountants

Report of Proceedings of This Meeting in Dayton, Ohio, on Dec. 11 and 12, with Abstracts of Committee Reports and Papers—Depreciation of Equipment and Cost Accounting Main Topics

The twenty-sixth annual meeting of the Central Electric Railway Accountants' Association was held on Dec. 11 and 12 in the Hotel Beckel, Dayton, Ohio. After a meeting of the executive committee the opening session was called to order on Friday afternoon at 2:30 o'clock by the president, L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind. The minutes of the mid-year meeting in Toledo were read and approved, and the delegates then accepted with thanks an invitation from John F. Ohmer, president Ohmer Fare Register Company, to join him at dinner at the Dayton Club. The address by President Hixson, abstracted elsewhere in this issue, followed. The executive committee reported with recommendations that F. S. Kelser, Mansfield Railway, Light & Power Company, Mansfield, Ohio; F. J. Haas, secretary Public Utilities Company, Evansville, Ind., and H. Armstrong, Steubenville & East Liverpool Railway & Light Company, East Liverpool, Ohio, be admitted to membership; that A. F. Elkins, auditor Columbus, Delaware & Marion Railway, Columbus, Ohio, be elected as honorary member, and that the printed list of membership of the association hereafter include only active members. These recommendations were all adopted.

REPORTS OF COMMITTEES ON ACCOUNTS

After the report of the treasurer, the reports of special committees were taken up. E. L. Kasemeier, auditor Ohio Electric Railway, Springfield, Ohio, chairman of the standing committee on freight accounts, presented two new paragraphs for addition under Section 4—way-bill corrections—as follows:

"When originating agent gives shipper prepaid bill of lading, but way-bills show shipment collect, agent at destination will deliver shipment without collection of charges, if consignee refuses to pay and turns over to destination agent the prepaid bill of lading. (Destination agent will ask originating agent to issue correction on billing.)

"When originating agent gives shipper collect bill of lading, but way-bills shipment prepaid, agent at destination should accept correction on billing, even though shipment has already been delivered as prepaid. (In event, however, he cannot make collection from consignee, he may so notify his auditor, who will take up with auditor of billing company for request of billing agent to make effort to collect from shipper. If collection cannot be made from shipper, destination road will be so advised.)"

Upon the discussion of this recommendation, however, the second paragraph was changed to relieve the destination road of liability as follows:

"When originating agent gives shipper collect bill of lading but way-bills shipment prepaid, agent at destination should endeavor to collect and if successful accept correction. If collection cannot be made, the correction should be denied."

The two paragraphs were then adopted by the delegates.

Mr. Kasemeier's committee further recommended that the association should print in pamphlet form the recommendations for handling interline freight accounts on paper cut to tariff size (8 in. x 10 in.), printing to be done on one side only and the copies to be disposed of at cost to railways by the secretary. This recommendation was also adopted. Mr. Kasemeier suggested that on account of the growing use of way-billing typewriters and the fact that some machines could accommodate way-bills only 8½ in. wide, it might be advisable for the association to recommend a form of interline way-bill of different size than at present so that such bills could be made out on small carriage machines. Upon motion by Walter Shroyer, auditor Union Traction Company of Indiana, Anderson, Ind., this matter was referred to the committee for further consideration. In regard to the matter of interchanging freight trailers, the committee recommended that the association adopt the recommendation of the Central Electric Railway Association as outlined in its bulletin 71, Brown Book 4, pages 10 to 14. This method provides for a report to be made by the junction agent to the auditor of the road owning the car with a copy of the report to the auditor of his own road, the report to show car initial and number, loaded or empty state, road to which delivered, exact hour and minute, and date. It was felt that such information would enable the owning road to make a proper bill against the using road. The recommendation was adopted.

In connection with his report, Mr. Kasemeier recalled that at the last meeting the committee was asked to prepare a resolution that "order notify" shipments be discontinued. The committee had not acted on this point, however, and a discussion was requested. Mr. Shroyer moved that before taking definite action the committee should write to different companies to find out how they handle such shipments and whether they object to receiving them, which was duly carried.

The report of the standing committee on passenger accounts was presented by Mr. Shroyer, chairman, who said that on account of a lack of questions submitted a report was unnecessary. He approved the combination of the standing committee on freight accounts and the standing committee on passenger accounts, and a motion to this effect by him was seconded by Mr. Kasemeier and carried.

QUERY BOX REPORT

The next order of business was the report of the query box committee, read by T. P. Kilfoyle, auditor Cleveland (Ohio) Railway, chairman. Four questions were submitted, the first of which had reference to what constitutes cash discount. To start the discussion Mr. Kilfoyle stated that anything above 3 per cent might be considered a trade discount. W. H. Forse, secretary and treasurer Union Traction Company of Indiana, Anderson, Ind., cited some examples of cash discounts running as high as 30 per cent, and Mr. Kasemeier stated that cash discount was discount received for prompt payment within ten, twenty or thirty days. Mr. Loftus said that in a recent case he refused to pass anything more than 2 per cent for ten days as a cash discount. Mr. Kilfoyle remarked that in Ohio cash discounts must be considered in the basis for the income tax. Large discounts should be considered as trade discounts, showing the possession of good purchasing qualities. According to President Hixson's definition, cash discount is a sum allowed for prompt payment, which amount is made up on a basis equal to the current charge for use of money.

In regard to the question whether it is proper to transfer any amount of sinking fund reserve to surplus after the bonds have been purchased and canceled, Mr. Kasemeier stated that if all the bonds have been retired any balance in the sinking fund reserve could be so transferred. President Hixson mentioned a $50,000 bond issue with $25,000 of the bonds retired from time to time through the sinking fund and the remaining $25,000 taken care of through a refunding issue. In this case the $25,000 of sinking fund reserve offsetting the sinking fund cash used to buy the bonds should not be retired without notation to surplus but should be ear-marked to show that the cash represented by this section of surplus had been spent. In this connection Mr. Forse stated in general that he was opposed to the splitting up of surplus into parts for dividends, sinking fund, depreciation, etc.

The next question dealt with the proper entry in making payment of bond interest when a portion of the company's bonds is held by the sinking fund trustee for the benefit of the company. President Hixson said that the new Interstate Commerce Commission classification provides that the account for interest on funded debt shall not include charges for interest on funded debt obligations issued or assumed by the company and owned by it, whether held in its treasury, special deposits, sinking or other reserve fund, or pledged as collateral. He also quoted from the accounts dealing with the appropriation of surplus to sinking fund and other reserves, sinking fund and sinking fund reserve, to show that interest on bonds held in sinking funds cannot be shown as a deduction from income. In such cases the debits would be to bond interest deductions for interest as bonds in the hands of the public only, and to sinking fund for interest on bonds which are held by the trustee and on which the trustee collects the coupons. The credit would be to cash for the interest on the full amount of the uncanceled bond issue. The next entry would be to debit surplus account 309—appropriation of surplus to sinking fund and other reserves—and credit sinking fund reserve for the amount of surplus representing the income accretion to the sinking fund during the period. Mr. Kilfoyle said that the Cleveland Railway has an interest fund of $500,000 created by ordinance, $300,000 of which is invested in the company's own stock. Each interest period the company pays directly to the interest fund 6 per cent.

The last question was as follows:—In reporting net income to the internal revenue collector, should the amount of discount on bonds purchased by the sinking fund trustee be included as income? Mr. Forse said that Interstate Commerce Commission account 306—profit and loss, miscellaneous credits—would show the proper provision to be made for such amounts.

At this point Mr. Forse called attention to the first ruling covering the reporting of deductions of bond interest in stating income. The first ruling provided for taking the entire capital stock and entire bonded indebtedness and dividing the total by two to secure a base for interest. The second ruling, however, was more favorable to most companies, inasmuch as they were allowed to take the entire bonded debt and half the capital stock as the base. Mr. Forse said that more than $800 had been returned to his company as a result of this second ruling and that it was worth following up by all companies.

President Hixson read a letter from H. J. Davies, secretary Cleveland (Ohio) Railway, to the effect that the Treasury Department in connection with the income tax on corporations had ruled that the gain or loss resulting from the sale of capital assets acquired before Jan. 1, 1909, was to be increased or decreased accordingly as there was gain or loss by the amount of depreciation charged off since Jan. 1, 1909, and not used to make good depreciation. This ruling as regards depreciation applied only to such tangible properties as were subject to wear and tear, exhaustion and obsolescence.

Committee to Confer with C. E. R. A.

The committee to confer with the Central Electric Railway Association reported through Mr. Kilfoyle, chairman, that the joint committee appointed to confer on the differences existing between the Central Electric Railway Association and the Central Electric Railway Accountants' Association had submitted a report to the executive committee of the former association at a meeting at Fort Wayne on Nov. 19, which was adopted. This report stated that a necessity was found for handling more properly the obligations incurred by the Accountants' Association, and it was recommended that an annual appropriation of $150 be made from the general fund, any unexpended balance to be returned to the general treasurer by the Accountants' Association and no obligation exceeding that amount to be incurred unless authorized in advance by the executive committee of the Central Electric Railway Association. Upon motion by Mr. Cavanaugh, this report was adopted by the Accountants' Association.

A telegram was received from C. S. Mitchell, comptroller Beaver Valley Traction Company, Pittsburgh, Pa., expressing his regret that he was unable to attend the meeting as scheduled. A representative of a Central printing house was given the privilege of the floor to state that his firm is trying to standardize railway accounting forms as to size, quality of paper, style of ruling, etc., the object being the attainment of a large reduction in printing cost. President Hixson appointed Messrs. Shroyer, Kilfoyle and Kasemeier as the nominating committee and the meeting was then adjourned.

SATURDAY'S SESSION

The first order of business on Saturday morning was the presentation of a paper on "Cost Accounting In a Manufacturing Plant" by G. D. Piper, director of works accounting Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa. This paper is abstracted elsewhere in this issue. In explaining the systems of wage payments used by his company Mr. Piper said that the company uses four different systems, namely, day work, piece work, premium and bonus. The premium or Halsey system is based on time. A definite time is fixed for the completion of a certain job by the average workman, to which is added a premium of from 30 to 60 per cent of the time. The workmen are paid for one-half of the time saved below the total on each job. The bonus plan is also based on time, but without the incentive of a premium being added to the base or net time. If the workman completes the work any time within the time limit, a flat bonus of 30 per cent on the day's wages is paid, but all jobs during the day must have been produced within the time limits. The base rates are set by a group of men independent of the foreman and under the direction of one of the staff. The bonus system is more generally used with jobs of short duration, while the premium plan is used in the main works in productive labor. Mr. Piper stated that the losses due to abnormal conditions are charged directly against income and are not used to inflate costs. Mr. Forse recommended that sets of forms furnished by Mr. Piper should be distributed among the absent members. A vote of thanks was rendered to Mr. Piper.

Discussion on Depreciation of Equipment

H. J. Davies was unable to be present for his address and the attention of the meeting was turned to a general discussion on the basis and the methods of accounting for depreciation on equipment. Mr. Forse opened the discussion by reading the Interstate Commerce Commission requirements on this point. He stated that the Boston & Maine Railroad within the last decade had charged off almost 4 per cent of the book value of its rolling stock, while the New York Central lines charged off 2 per cent per annum for freight car depreciation, and the New York, New Haven & Hartford Railroad only this year inaugurated a regular charge of 2 per cent. At the present time the Pennsylvania Railroad charges depreciation at the rate of 4 per cent of the original cost of locomotives and passenger cars and 3 per cent on freight cars. Other figures given were as follows:—European cars, 1.7 per cent per annum; British Columbia Electric Railway, 3.5 per cent; Stone & Webster testimony in Chicago Union Traction case, 5 per cent; testimony in Milwaukeee 3-cent fare case, 7½ per cent; average Scotch practice, 7½ per cent, and average English practice, 10 per cent. The above figures, according to Mr. Forse, show clearly the variation in practices and the estimated life of equipment, the latter ranging from ten to fifty-nine years. In his opinion accounting for depreciation must depend upon the policy of the individual company regarding upkeep and renewals. One company is providing for maintenance and renewals at a rate sufficient to pay for the rolling stock in nine years. Under such conditions it is inconceivable that some depreciation is not taken care of through such a process. Mr. Forse stated emphatically that if a car has passed one-half of its estimated life it is by no means proved that it has depreciated one-half. In the present Detroit valuation case the state engineers desired to write off depreciation on a 17-year-old car, but when the company tore the car down for inspection the posts, sills and general fittings were found to be in the best of condition.

Mr. Forse quoted from the editorial in the ELECTRIC RAILWAY JOURNAL of March 21, 1914, to show the conflict in commission rulings as regards the distinction between the treatment of maintenance and depreciation charges. He also noted conflicts in commission ruling where the question of valuation was involved, such as in the recent Manchester fare decision, the famous Kansas City Southern case and the recent Middlesex & Boston rate decision.

Mr. Forse said that the committee on standard classification of accounts recently received a letter asking whether the carriers had a right to figure depreciation on any other basis than the cost or purchase price—for instance, whether it could be calculated at a rate of 2½ cents per car-mile or 7 per cent of the gross earnings. The commission in answering this query said that depreciation may only be accrued as a percentage of the original cost. Mr. Forse objected to setting up each month an amount based on the book cost of the equipment, on account of conflicting tabulation experiences on the subject and on account of general lack of knowledge regarding it. He believed that companies should be permitted to charge off a lump sum based on experience, or a percentage of net earnings based on financial ability, or an amount per car-mile based on experience. Companies should be chary in setting up large amounts for depreciation on account of possible ultimate valuations, for the increased value of properties through terminals, rights of way, solidification of roadbed, as well as other intangible values, may not be allowed, and the valuation engineer will deduct depreciation already set up from the ascertained value of the property.

In Mr. Kasemeier's opinion the matter of depreciating equipment rests entirely with the company and depends on local conditions, class of cars and extent of maintenance. The practical way is to make a valuation of each road's equipment less the final scrap value, estimate its remaining life and thus secure a rate. Mr. Kasemeier believed that obsolescence is the most vital element in this question.

Mr. Campbell, representing the Illinois Traction System, said that a company should write off as much depreciation on equipment as seemed proper. The real question is whether it desires to spread this amount over a period of years or to be burdened with the whole amount when the equipment is scrapped. His company is trying to get an appraisal of the scrap value of the car bodies and electrical equipment to be deducted from the cost, the remainder to be spread over certain periods at the following rates: bodies and truck equipment, 4 per cent; electrical equipment, 5 per cent; freight equipment, 5 per cent; locomotive and bonding cars, 6 per cent. In cases where the company was unable to ascertain the purchase cost, the superintendent of motive equipment estimated the replacement cost. The company intends to figure depreciation on all the secured amounts down to July 1, the starting point. Each car is a separate unit in this accounting work. Mr. Kasemeier and Mr. Forse agreed that depreciation of equipment on electric railways was a more difficult question to handle than on steam railroads because of the difficulty of judging the value of electrical equipment as it is maintained, renewed or superseded from time to time.

Mr. Piper, in giving the experience of a manufacturing plant, said that fifteen years ago the Westinghouse board decided to discontinue charging to capital account expenditures made for additions to small tools, patterns, etc. Henceforth all went to operating expenses except the cost of special tools and patterns, which was treated as a development cost of special apparatus. Four years ago the plant was appraised and the difference between the book value and the appraised value was set up as a reserve. Since then additions to the reserve have been made by monthly charges to operating expenses, based on a flat percentage rate of the appraised value without respect to the different classes of equipment. A lower rate, however, is used for buildings. The results of this plan have more than proved the policy of the company to be conservative. The plan is not quite so accurate as it should be, but the board decided that the blanket rate was sufficient for all practical purposes. The plan provides for reappraisals at the end of each five-year period.

F. K. Young, auditor Scioto Valley Traction Company, Columbus, Ohio, said that no two lines could use the same rate for depreciation. He asked whether companies were compelled to show depreciation charges monthly or whether they were allowed at the end of the year to appropriate an amount for depreciation from surplus without any charge to the maintenance accounts. In support of this plan he said that this method would show the real and tangible operating expenses for each month and in addition satisfy stockholders and the public that depreciation charges for each fiscal period were being provided for, but the question was whether this method of accounting would satisfy the Interstate Commerce Commission. Mr. Forse replied that the commission requires monthly charges to be included in the operating expenses, but that a company may publish its own annual report in a form to do itself the most justice and secure proper credit for its depreciation accounting.

In connection with the situation in Cleveland, Mr. Kilfoyle explained that the street railway settlement there provided for a charge of 5 cents per car-mile for maintenance, renewals and depreciation. An average of this amount per year was set aside from earnings up to March 1, 1913, but the fund was insufficient to take care of maintenance and renewals, there being an overdraft of $324,000 without any provision for depreciation. A short time ago the company agreed with the city to charge out $6,000 per month. Since 1913 there has been another overdraft of $584,000 without any provision for depreciation. The 5 per cent rate per car-mile provides about $1,500,000 a year, or 20 per cent of the gross earnings. Mr. Kilfoyle cited these figures to show how impossible it is for engineers to estimate accurately what will be needed for maintenance, renewals and depreciation.

President Hixson stated that it was unwise to endeavor to distinguish between maintenance, depreciation and renewals on the books, and that these should all be grouped under one account, any amount remaining from the estimated sum after provision for maintenance and renewals to be considered as the charge to depreciation. Mr. Kilfoyle also thought that there should be one reserve to cover all these items.

NEW OFFICERS

At the conclusion of the discussion on depreciation of equipment, the nominating committee presented the names of the following nominees: President, H. B. Cavanaugh, auditor Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio; first vice-president, F. T. Loftus, auditor Indianapolis & Cincinnati Traction Company, Rushville, Ind.; second vice-president, J. B. Hooper, auditor freight accounts Detroit (Mich.) United Railway; secretary, A. L. Neereamer, secretary Central Electric Railway Association, Indianapolis, Ind. Upon motion the secretary was instructed to cast one ballot for the above nominees. The election of Mr. Neereamer as secretary effected a consolidation of the offices of treasurer and secretary. The following members were elected to the executive committee: J. N. Tabb, treasurer Parkersburg, Marieta & Interurban Railway, Parkersburg, W. Va.; T. P. Kilfoyle, auditor Cleveland (Ohio) Railway; Oren A. Small, auditor Benton Harbor-St. Joseph Railway & Light Company, Benton Harbor, Mich.; Edward Hayes, auditor receipts Illinois Traction System, Champaign, Ill., and F. K. Young, auditor Scioto Valley Traction Company, Columbus, Ohio.

The new president was escorted to the chair by Messrs. Kilfoyle and Young, after which speeches were heard from the newly-elected officers. President Cavanaugh then stated that at the last meeting in Cleveland it was voted to prepare a book of forms. On account of the Interstate Commerce Commission classification this had not been done, but he intended early in 1915 to ask for a new set of forms to be turned over to the new first vice-president. Mr. Kilfoyle moved that these forms be kept in the office of the secretary of the Central Electrical Railway Association and that the latter official should collect the forms. This motion was amended by Mr. Loftus to the effect that the secretary should be instructed to call upon a committee to be appointed by the president to help keep the book up to date. The motion was passed as amended and the meeting then adjourned.

PRESIDENT'S ADDRESS

BY L. T. HIXSON, AUDITOR TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION COMPANY, INDIANAPOLIS, IND.

In opening his address, President Hixson reviewed the advances that have been made in electric railway accounting during recent years but also mentioned several problems that still remain to be solved. In his opinion the part of the new Interstate Commerce Commission's instructions most difficult to comply with is that referring to depreciation. Another point was that while most companies use the official classification, very few secure the full benefit of the information which could be furnished from accounting departments, because of the great lack of proper departmental costs. Valuable lessons could be learned from manufacturing concerns regarding cost accounting, which term embraces timekeeping and storekeeping. Electric railway accountants might also well observe the methods employed by any large and progressive mercantile company with reference to accounts receivable.

President Hixson called attention to the facts that some state commissions have adopted a uniform classification of accounts for electric utilities and that the increasing number of combined railway and lighting properties make this form of accounting a most suitable subject of study for electric railway accountants. He observed also that some slight difficulty had been experienced in the past in regard to the failure of some companies to comply with rulings established by a majority vote of the association and pertaining to uniform practice in handling reports and settlements on interchanged business. He suggested that the executive committee of the Central Electric Railway Association should be requested to inforce the rulings made. Besides the above points, the following recommendations were made: the consolidation of the standing committee on passenger accounts and the standing committee on freight accounts into a standing committee on passenger and freight accounts, this step being advisable on account of many matters which come within the scope of both committees; a study of the balance sheet, with reference principally to a proper analysis to make this statement more intelligible; and the formation of a condensed system of departmental expenses, such system to be subsidiary and readily adapted to the present system of accounts.

COST ACCOUNTING IN A MANUFACTURING PLANT

BY G. D. PIPER, DIRECTOR OF WORKS ACCOUNTING WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, PITTSBURGH, PA.

In the main works of the Westinghouse Electric & Manufacturing Company the investment in working and trading assets is divided into three groups—i.e., (1) raw materials and supplies, (2) finished parts and completed apparatus, and (3) work in progress.

(1) Raw materials and supplies: The investment in this account represents the cost, f.o.b. works, of raw materials and supplies purchased and held in general stores pending withdrawals by the various works departments or shipment direct from the former to the customer.

(2) Finished parts and completed apparatus: The investment in this account represents the factory cost value of a portion of the parts made in the various works departments, delivered by the latter to general stores and held therein pending withdrawals by the works to be later assembled into complete salable units. It also represents the factory cost value of the completed apparatus made for specific customers, resting temporarily in this account awaiting shipment, and completed standard apparatus not yet sold, but a stock of which has been authorized by the commercial department.

(3) Work in progress: The investment in this account represents the factory cost value of parts and apparatus in course of manufacture preliminary to being delivered to general stores; the cost of working stocks of raw materials withdrawn from general stores on which no labor has yet been performed; the factory

cost value of working stocks of finished parts withdrawn from general stores for assembly into complete units, and the factory cost value of stocks of certain classes of finished parts which are always carried in this account. The latter are the heavier parts (frames, bedplates, shafts, etc.) to move which in and out of stores would entail unnecessary expense.

It is with the last named account that the following mostly deals. The total investment in this account is divided into forty odd sub accounts, this division having been made to conform very largely to the line-up of the supervision.

Handling Customer's Order

Upon receipt of a customer's order, a list of the apparatus sold is written on a form which is thereafter known as a "general order." This general order sheet is sent to the storekeeper, who, from his records of finished parts and completed apparatus, ascertains whether the apparatus is in stock, on order, or whether it will need be built specially for that specific customer. All items on the general order that are in stock or are coming through on an order for stock are marked "in stock" or "available." For items that must be specially made the storekeeper enters a manufacturing order, copies of which are distributed to the various works departments involved, and to the engineering department. The latter department proceeds to prepare a specification for each kind and size of apparatus for which manufacturing orders have been entered, detailing practically every item entering into the construction of the apparatus. A copy of the complete specification is sent to the works departments that will assemble the apparatus, and additional copies of such portions of specification as contain parts to be made in other departments and forwarded to the latter.

The first element of the total cost identified with the order is incurred in the engineering department in the preparation of the specification. This cost is secured through the medium of semi-monthly time reports turned in by this department, including drafting, tracing and clerical or specification divisions. This item of cost covers an amount for the overhead expenses of the department and becomes part of the "development cost," the total development cost including special tools, patterns, fixtures, etc., in addition to the engineering development.

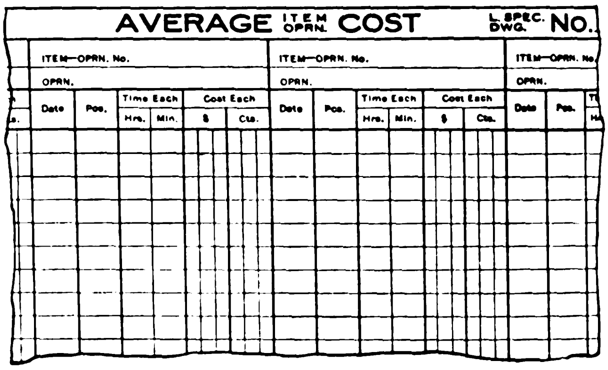
Material Cost

Upon receipt of the specification in the works department steps are taken to provide the necessary material. If the raw materials and finished standard parts listed in the specification are not to be had from the working stocks carried by the department, and are not to be provided by a feeder department, the item or items lacking are ordered from the general stores by a requisition, which is made out in duplicate, the carbon copy accompanying the material to the section ordering same and the original being retained by the stores department for pricing and extending. After this latter operation is finished, the day's, or possibly several days', issues are summarized and the proper stores accounts credited and the work in progress account of the department drawing the material charged. The requirements are forwarded to the latter to be used in maintaining the price files in up-to-date condition, and, where required, as a basis for determining the material cost of the order. In case surplus material has been withdrawn on an order, the surplus is credited to the order by returning same to general stores on a credit memorandum, which is contra to the requisition.

It might be inferred that the material portion of the total cost is determined from these requisitions and credit memoranda. This is not the case, however, as the values appearing on these requisitions are used in arriving at the material cost of an order in comparatively few cases. The majority of the material costs are determined from tabulated lists of material commonly known as "bills of material." The bill of material is part of the information appearing on the face of each drawing, and is simply a tabulation of the description, quantity, dimension, etc., of the raw material necessary to produce one unit of each item appearing on the drawing.

Besides these two methods of building up the material cost, there is another source of material charges. Some parts will be delivered to the assembling department by the feeder departments at values which represent the factory cost of those parts. These charges flow into the assembling departments on interworks delivery reports, which show the quantity, description, weight or measurement, unit price and value. One of the three copies made out bears the factory cost for which the feeder department's work in progress account receives credit and the assembling department's work in progress account is correspondingly charged. The latter in building up the cost of the complete unit treat these interworks charges as "material," notwithstanding these values include both labor and overhead expense.

Another source of material charges, but one not frequently employed in connection with manufacturing orders for the reason that the specifications automatically provide for all work and material to be regularly supplied by other departments, is through the medium of foreman's requisitions. In some cases a department is unable, owing to an excess amount of work for its equipment, equipment disabled or for other reasons, to perform all the work assigned to it promptly enough to meet production requirements. When this condition obtains a requisition is issued by the foreman upon another department, requesting the latter to perform certain labor on material which will be furnished by the department issuing the requisition. It may be that the department on which the requisition is issued will be asked to supply the material as well as the labor. These transactions, commonly termed "requisition jobs," are treated in a similar manner to the interworks deliveries in the building up of the material cost in the assembling department.


AVERAGE ITEM OPRN. COST L. SPEC. DWG. NO.

ITEM—OPRN. No.

OPRN.

Date	Pos.	Time Each Hrs.	Time Each Min.	Cost Each $	Cost Each Cts.	Date	Pos.	Time Each Hrs.	Time Each Min.	Cost Each $	Cost Each Cts.

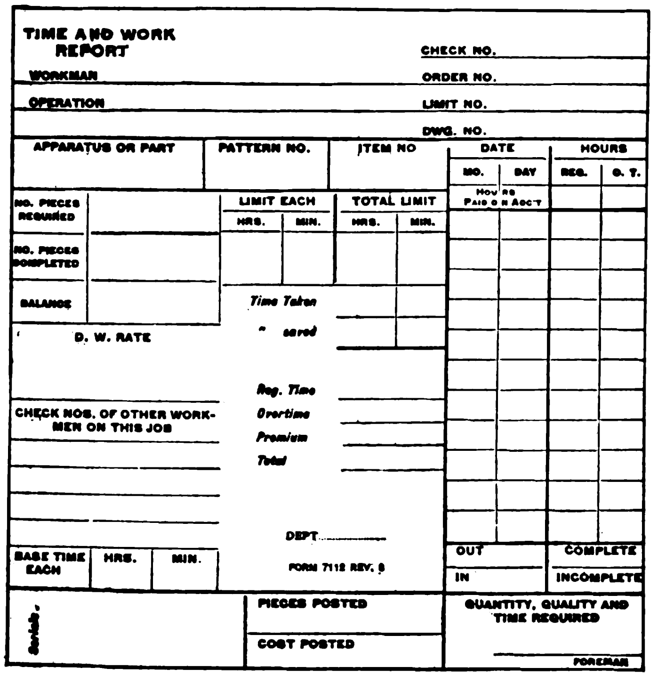
FORM I—USED IN TABULATING AVERAGE COST OF PARTS RECEIVED FROM OTHER DEPARTMENTS

For convenience in tabulating the average cost each of parts received from other departments at various times and in varying quantities Form I, shown herewith, is used, it serving the double purpose of checking the prices at which the supplying department charges the using department and providing a price file for the latter. The card is 5 in. x 8 in., containing four similarly-ruled columns front and back. This form is also used to record the "average" cost of labor operations (frequently repeated) in the department in which they are performed.

Labor Cost

The Westinghouse Company has four different systems of wage payment—viz., day work, piece work, premium and bonus. The premium system of wage payment predominates, however, for the chief reason that furnishing of labor costs on individual orders, and it is this system is more generally used on productive work throughout the main works than are the other three.

The receipt of the specification in a section prompts the time clerk to open up a labor record. This is a loose-leaf sheet, 8¾ in. x 15 in., ruled on both sides with five labor columns. Each column is headed with the operator's name and number, base time, limit time, pieces, and rate spaces. Interior rulings are provided for check number, date, hours, pieces, total pieces and cost. This record performs the double function of preventing payment for more pieces than the order calls for and the furnishing of labor costs on individual orders, and it is used where the operations are numerous and extend over a considerable period of time. A similar form, or a 5 in. x 8 in. card, is used in sections where the operations are not so numerous and are shorter. This provides for practically the same information in the column headings as the other form, except that no provision is made for posting money values thereon. Its prime purpose is simply to safeguard the payroll.


TIME AND WORK REPORT
CHECK NO.
WORKMAN
ORDER NO.
OPERATION
LIMIT NO.
DWG. NO.
APPARATUS OR PART
PATTERN NO.
ITEM NO
DATE: MO. DAY
HOURS: REG. O. T.
HOURS PAID ON ACC'T
NO. PIECES REQUIRED
NO. PIECES COMPLETED
BALANCE
LIMIT EACH: HRS. MIN.
TOTAL LIMIT: HRS. MIN.
Time Taken
" saved
D. W. RATE
Reg. Time
Overtime
Premium
Total
CHECK NOS. OF OTHER WORKMEN ON THIS JOB
DEPT.
BASE TIME EACH
HRS.
MIN.
FORM 7112 REV. 8
OUT
IN
COMPLETE
INCOMPLETE
Serials
PIECES POSTED
COST POSTED
QUANTITY, QUALITY AND TIME REQUIRED
FOREMAN

FORM II—SINGLE TIME AND WORK REPORT ISSUED BY TIME CLERK TO WORKMAN

The information filled in on either of the forms is a combination of that secured from the specification and from premium limit records. The information secured from these two sources may not, in fact frequently does not, complete the labor record, as day work operations may be necessary which cannot be foreseen at the time the labor record is opened. To provide for such cases blank spaces are usually available when needed, or an additional labor record may be added. The labor record is then placed in the active file ready to have recorded thereon the time expended, etc., as reported during the progress of the work.

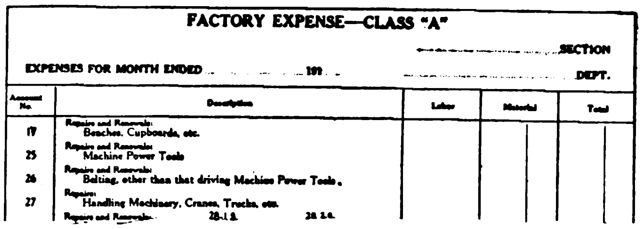
Departments using the first labor record employ single time and work reports, as illustrated by Form II. These are issued to the workman by the time clerk upon instructions from the foreman, and are retained by the workman until the number of pieces assigned to him has been completed. Upon completion the time and work report is approved by the foreman, assistant foreman or inspector and surrendered to the time clerk, when a new time and work report for the next job is issued. These reports are then rated, extended, posted to the labor record and forwarded to the payroll clerks.

Departments using the smaller labor record employ a similar form of time and work report, the top portion of which has a carbonized back to facilitate providing a carbon copy. This form of time and work report is kept intact until the values have been extended thereon. Then the original and carbon copy are separated, the former forwarded to the payroll clerk and the latter filed for cost purposes.

Overhead Expenses

A writer recently said that there never has been a perfectly satisfactory method devised for absorbing the overhead expenses, and that the aim of the cost accountant should be to adopt the "least unsatisfactory" method. In general the method we employ is the percentage-on-direct-labor plan. While this is not perfect, and is probably not so equitable as the machine hourly rate combined with a productive man hour rate, the company has hesitated to depart from it on account of the expense involved in the operation of these more theoretically correct methods.

The shop accounts approximate forty-five in number, each of which is known by a title, viz., Controller Department, Forge Department, Industrial Motor Departments (three in number), Locomotive Department, Punch Department, Transformer Department etc The overhead expenses for each department are ascertained monthly. While we do not fluctuate monthly the percentages added to direct labor in figuring costs, a comparison is made each month between the percentages used in costs with the percentage relations of the actual expenses to direct labor for that month. Obviously, if wide differences are noted between the percentages used and the actuals, investigations and explanations are demanded by the management.


FACTORY EXPENSE—CLASS "A"

SECTION

EXPENSES FOR MONTH ENDED .... 191..

DEPT.

Account No.	Description	Labor	Material	Total
17	Repairs and Renewals: Benches, Cupboards, etc.			
25	Repairs and Renewals: Machine Power Tools			
26	Repairs and Renewals: Belting, other than that driving Machine Power Tools.			
27	Repairs: Handling Machinery, Cranes, Trucks, etc.			
	Repairs and Renewals: 28.1.2. 28.2.0.			

FORM III—MONTHLY STATEMENT OF OVERHEAD EXPENSES BY DEPARTMENTS FOR EACH CLASS OF EXPENSE

A monthly statement of the overhead expenses for each department is prepared on record sheets similar to Form III, showing in detail just what amount was expended for each class of expense. This statement is divided into three groups—i. e., class "A," class "B" and class "C." Class "A" are the expenses which are controllable by the foreman of the section (a sub division of a department) and reported in their entirety by the departmental cost clerk. That is to say, nothing is added to this class of expense by the general accounting department. Class "B" are the expenses which are beyond the control of the foremen and general foreman of a department, but are considered to be largely, although not wholly, controllable by the superintendent of the department. While the bulk of this class of expense is reported by the department itself, some items are added to this group by the general accounting department, but none are added which are not considered as belonging to that class which the superintendent of the department controls wholly or in part. Class "C" are the expenses which are beyond the control of even the superintendent, and, as their titles indicate, are expenses added almost entirely by the general accounting department. After the additions to classes "B" and "C" are made by the general accounting department, copies of these statements are issued to the executives and other department heads, including the superintendents, who can, from a glance at the bottom of the class "C" portion of the expense statement, readily see how the actual percentages compare with the "fixed" or used percentages.

Numerous bases are used for distributing the various expenses added by the general accounting department on the class "B" and class "C" portions of these statements, those most commonly used being the relative number of employees, floor space, productive labor, etc. Such expense items as depreciation, power, storekeeping and shipping and charges for defectives are allocated to departments on more definite bases than the more or less arbitrary ones just referred to.

The company endeavors to control the major portion of the total factory expenses by a comparatively simple but effective method. After a review of the records for a considerable period, we established standard percentages of direct labor for the various classes of expenses which the superintendent can control, and within which he is expected to confine his expenditures for the month. At the beginning of each month the superintendent estimates the direct labor for his department or departments for the ensuing month, and by multiplying this estimated direct labor by the "standard" percentages he determines the amount he can spend during that month for each class of expense he controls. To enable him to keep in close touch with the condition of each expense account for which an allowance has been established two forms have been provided. One covers an individual account and shows the date of requisition, requisition estimates and allowances unspent. The other is a condensed summary of the whole analyzed as to accounts and days of the month.

In determining the percentages that are added to direct labor to absorb the overhead expenses, neither one general percentage or a few varying percentages are used. Rates have been established wherever an analysis and distribution of the "B" and "C" expenses to individual sections indicated that separate rates were justified. In fact, there are at present approximately one hundred sectional overhead percentages, some of which may be of the same value, ranging from 25 per cent to over 200 per cent. With this flexibility, combined with the advantage of segregated works departments, we are not so far away from the theoretically correct plan of machine hour rate supplemented by a productive man hour rate.

COMPOSITION OF COST

The combination of material cost and labor cost gives the prime cost of articles manufactured, which in turn becomes the factory cost on the addition of factory overhead. The further addition of commercial overhead gives the commercial cost, while the total cost is a combination of the commercial cost and the profit. The total cost may itself be increased by charges for boxes and containers, and development expenses and royalties, if they apply, are treated as a surcharge at this point, thus giving the selling price.

Reducing the Operating Ratio

In a recent issue of this paper S. H. Bennett, auditor Hagerstown & Frederick Railway, gave an account of some of the methods by which the company was hoping to bring down its operating ratio from 64 per cent to 50 per cent. Recent reports of the company show that its efforts toward economy are proving successful, as shown by the following table:

INCREASES IN OPERATING REVENUES, 1913 TO 1914

	Railway	Light and Power	Gas	Total
July	$422.82	$1,527.92	$139.10*	$1,811.64
August	180.37*	920.19	150.35*	589.47
September	1,697.82	927.34	234.84	2,860.00
October	1,125.01	1,247.86	49.27	2,422.14
Total	$3,065.28	$4,618.31	$10.34	$7,683.25

*Decrease.

INCREASES IN NET OPERATING INCOME, 1913 TO 1914

	Railway	Light and Power	Gas	Total
July	$1,044.95*	$1,756.49	$34.75*	$676.79
August	1,783.47	1,553.97	305.92	3,643.36
September	2,279.52	1,036.76	520.75	3,837.03
October	822.86	2,821.09	302.85	3,946.80
Total	$3,840.90	$7,163.31	$1,089.77	$12,093.98

*Decrease.

Decreases in operating ratio, 1913 to 1914, July, none; August, 8 per cent; September, 7.2 per cent.

The operating ratio for October, 1914, was 54.40 per cent as compared with 61.24 per cent for October, 1913. For the four months ending Oct. 31 the ratio was 56.07 per cent as compared with 61.70 per cent for the same period last year.

The company accounts for its reduction in expenses as follows:

In the power department some inexpensive changes in the forced draft system cut down fuel costs by one-third. At present the company is using with very satisfactory results small-vein coal costing from $1 to $1.10 per ton where formerly from $1.35 to $1.65 per ton was paid. The consumption of power by the cars has been reduced by training motormen regarding the importance of saving current. In car service the elimination of all layovers with but a slight increase in running time has resulted in a reduction of car mileage more than 6 per cent. It was accompanied by an actual increase in revenue due at least in some measure to a rigid adherence to published schedules.

In the way department a redistribution of the track force resulted in a labor saving of more than 10 per cent. Under the present arrangements foremen and their men live on the sections of track which they cover, while under previous conditions this was not done and a great deal of company time was spent in going to and from work.

In the passenger equipment no reductions in maintenance cost have been made, but in the freight equipment there has been considerable gain. During the months of July, August and September, owing to the increased volume of business thrown upon the road by its steam railroad connections, it was necessary to operate for twenty-four hours a day to avoid freight blockades. It was possible to do this because a blower outfit, controlled automatically and continuous in its action, had been placed on the largest locomotive, and armature and field troubles were thus greatly reduced while efficiency was increased. Formerly it was necessary to keep this locomotive in the shop for a much greater proportion of the time than at present.

In general, the cost has been brought down by organization, by abolishing useless departments and combining departments in some cases, by the elimination of duplication of work and by the lessening of useless "red tape."

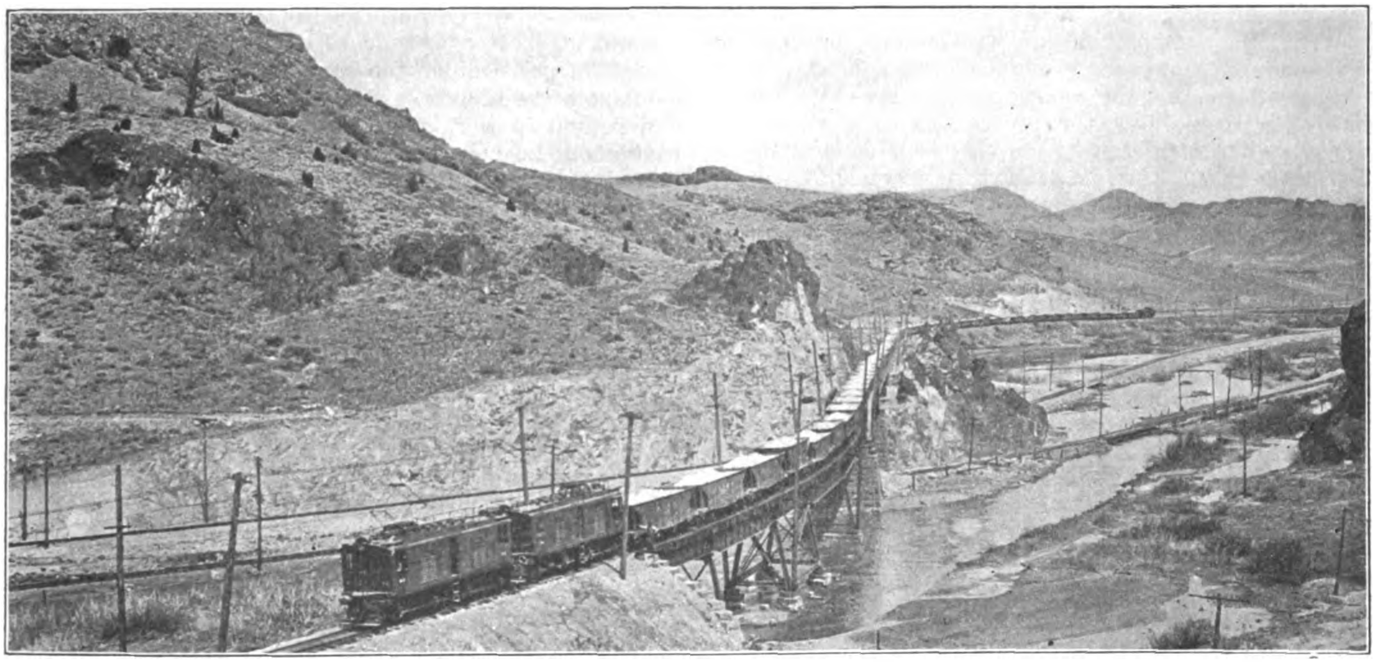
Operating Plans for the Electrified Division of the C., M. & St. P.

Provision for Continuous Power Supply—Twin-Conductor Trolley-Wire Suspended by Alternate Hangers from a Single Catenary—Operation of Pusher Locomotives on Down Grade

The operating plans for the electrified division of the Chicago, Milwaukee & St. Paul Railway possess special interest, for the reason that this is the first attempt to install and operate electric locomotives on tracks extending over several engine divisions. Under these conditions it is claimed that the full advantage of electrification can be secured. Previous terminal and tunnel installations of electric operation have been made necessary, more or less, by reason of local conditions; but the electrification of this steam road has been undertaken purely on economic grounds, with the expectation that superior operating results with electric locomotives will return an attractive percentage on the investment required.

As described in the full technical description of the electrification that was published exclusively in the ELECTRIC RAILWAY JOURNAL for Nov. 21, a contract has been let to the Montana Power Company for an adequate supply of energy over the 440 miles of main line considered for immediate electrification. This company has covered a great part of Montana and part of Idaho with a network of transmission lines, which are fed from several sources that provide a total developed and undeveloped capacity of 244,000 kw. The several power sites are inter-connected by transmission lines on steel towers and operating at 100,000 volts. Ample water storage capacity is provided in the Hebgen Reservoir, amounting to 300,000 acre-feet, and this is supplemented by auxiliary reservoir capacity at the several power sites, bringing the total up to 418,000 acre-feet. The Hebgen Reservoir is so located at the head waters of the Madison River that water drawn from it can supply in turn the several installations on the Madison and Missouri Rivers. Consequently the same storage capacity is used a number of times, affording an available storage capacity considerably greater than is indicated by the figures given. It would seem, therefore, in changing from coal to electricity as a source of motive power, that the railroad is amply protected in respect to the reliability and continuity of the power supply.

The initial contract calls for nine freight locomotives and three passenger locomotives, each weighing 260 tons, and taking current from a twin-conductor trolley, composed of two No. 0000 wires suspended side by side from the same catenary by independent hangers alternately connected to each trolley wire. This form of construction permits the collection of very heavy current by reason of the twin contact of the pantograph with the two trolley wires, and also insures sparkless collection under the extremes of either heavy current at low speed or more moderate current at very high speed. It is stated that the twin-conductor type of construction is equally adapted to the heavy grades calling for the collection of very heavy currents, and on the more level portions of the profile where maximum speeds of 60 m.p.h. will be reached with the passenger trains having a total weight of more than 1000 tons. The advantage of this type of construction is due partly to the greater surface for the collection of current, but largely to the very great flexibility of the alternately suspended trolley wires, a form of construction which eliminates any tendency to flash at the hangers either at low or high speed. Each locomotive, as stated in the above mentioned article, will be equipped with eight 430-hp General Electric motors. These will be twin-geared to the driving axles in the same manner as on the Butte, Anaconda & Pacific, the Detroit River Tunnel and the Baltimore & Ohio locomotives, a pinion being mounted on each end of the armature shaft. The motors are of the commutating-pole type and have openings for forced ventilation from a motor-driven blower located in the cab. The freight locomotives are designed to haul a 2500-ton trailing load on all gradients up to 1 per cent at a speed of approximately 16 m.p.h., and this same train load, unbroken, will be carried over the 1.66-per cent and 2-per cent ruling grades on the west and east slopes of the Rocky Mountain Divide with the help of a second similar freight locomotive acting as pusher. Track provision is being made at Donald, the summit of the grade, so that the pusher locomotive may run around and couple to the head end



C., M. & ST. P. ELECTRIFICATION—ONE TRAIN OF SIXTY-FIVE CARS IN TRANSIT ON ELECTRIFIED BUTTE, ANACONDA. & PACIFIC RAILWAY CONNECTING WITH THE MILWAUKEE SYSTEM of the train to permit electric braking on the down grade. In this case the entire train will be under compression and will be held back by the two locomotives at this head end, the entire electric braking of the two locomotives being under the control of the motorman in the operating cab of the leading locomotive.

It is considered that electric braking will prove very valuable in this mountain railroading, for, in addition to providing the greatest safety in operation, it returns a considerable amount of energy to the substations and transmission system, which can be utilized by other trains needing power. In this connection, the electric locomotives will have electric braking capacity sufficient to hold back the entire train on down grade, leaving the air-brake equipment with which they are also equipped to be used only in emergency and when stopping the train. There is provided, therefore, a duplicate braking system on down grades, which should result in the greatest safety of operation and the elimination of a considerable part of the customary break-downs, wheel and truck wear and overheating, thus reducing maintenance and improving track conditions.

With the completion of the remaining engine divisions, it is proposed to take advantage of the possibilities afforded by the construction of the electric locomotive by combining the present four steam engine divisions into two locomotive divisions of approximately 220 miles length, changing crews, however, at the present division points. As the electric locomotive needs inspection only after a run of approximately 2000 miles, requires no stops for taking on coal or water, or layover due to dumping ashes, cleaning boilers or petty roundhouse repairs, it is expected that the greater flexibility of the locomotive so provided will result in considerable change in the method of handling trains or limited by the restrictions of the steam engine.

Express Cars in City Service

Rush-Hour Service in Boston and Noon-Hour Service in Schenectady Are Described

As a means to the end of improving schedule speed on certain runs several companies have recently begun operating express cars sandwiched in between the regular local cars in city service. The Boston Elevated Railway about a year ago commenced this kind of operation in the rush hours on certain routes where the segregation of through from local traffic appeared desirable. At present the express cars are operated outward-bound in the afternoon rush hours from the rapid transit terminals at Dudley Street, Harvard Square and Sullivan Square. On the front and rear vestibules a 19-in. x 21-in. sign marked "Limited Stops" is hung as the car enters the terminal station of the rapid transit lines, acnouncement of the first stopping point being made by platform men, motormen and conductors. In the morning, inward-bound cars approaching junction points where inspectors are located may be run as expresses to the rapid transit terminal upon order of the inspector. In this case the limited-stop sign is taken from the inside of the vestibule and hung in position, the car number being taken by the inspector. Inward-bound limited-stop cars stop to discharge passengers between the point of departure and the rapid transit terminals, and outward-bound cars of this class stop to receive passengers between the terminal and the first scheduled stop after beginning the express run. Of seventy-five outward-bound cars that are run from Harvard Square in one afternoon rush hour, twenty-five are in limited-stop service. With this close headway it is impossible to provide gaps ahead of the express cars, but the distribution of the traffic and the comfort of the patrons are much improved.

The Schenectady Railway Company also has inaugurated a special express service during the noon hour from the General Electric plant to the suburbs. This started with one car which was first operated for and patronized principally by the heads of the various departments in this plant. Later, it became so popular that the custom gradually extended from the heads of departments to the general office help, and at present all are enabled to go to their homes for lunch if they so desire. The company is now operating express cars on every line to the suburbs. Many of these cars do not make any stops until reaching the outlying sections, and with one exception the cars are able to reach the terminals within ten minutes from the time they leave the main entrance to the General Electric Works. As the headway on all city lines around the noon hour is not closer than fifteen minutes and as the regular cars are made to wait at the intersections and junction points, all express cars can receive a clearance at this hour. Very little delay is experienced in the regular service on account of these express cars having the right of way. About 75 per cent of the cars make return trips, and employees are therefore able to eat their lunch at home and return to work within one hour. It is estimated that about 25 per cent of the employees have a lunch period of one hour and fifteen minutes, and they usually return on the regular cars.

Senate Hearings on Adamson Water Power Bill

The hearings on the so-called Adamson bill, which has already passed the House, were begun on Dec. 9 and have continued during the past week. Testimony has been presented by John A. Britton, vice-president Pacific Gas & Electric Company; W. A. Brackenridge, vice-president Southern California Edison Company; Franklin T. Griffith, president Portland (Ore.) Railway, Light & Power Company; George C. Ward, vice-president Pacific Light & Power Corporation, and others. The testimony indicated that state regulation in California had been in general satisfactory to the companies. The provision in the bill that not more than 50 per cent of the output of a plant should be sold to one customer was objected to on the ground that it will hamper development, as will also the limiting of the term to a short period, say less than fifty years. Incidentally the economy of modern steam plants was brought out, one speaker stating that his company had been able to produce from 285 to 290 kw-hr. per barrel of oil.

New Bulletin on Coal Analyses Issued

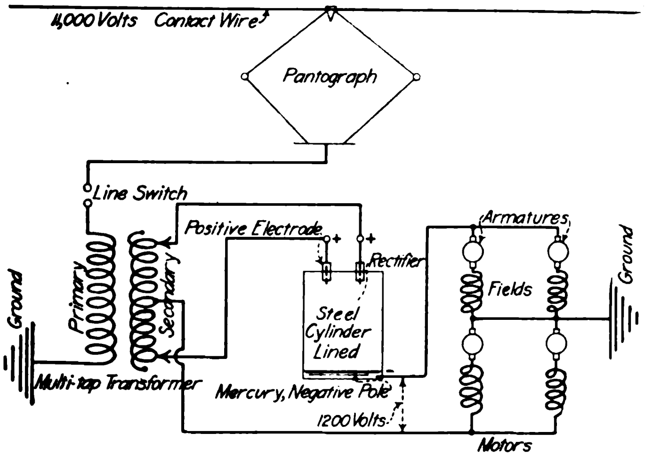
The United States bureau of mines recently issued a small edition of Bulletin 85, "Analyses of Mine and Car Samples of Coal Collected in the Fiscal Years 1911 to 1913," by Arno C. Fieldner, Howard I. Smith, Albert H. Fay and Samuel Sanford. The present bulletin presents analyses and descriptions of samples of coal collected from many mines throughout the entire country. In order that the material in this bulletin may be made to supplement that presented in Bulletin 22, "Analysis of Coals in the United States," the same plan of geographical classification has been followed, the analyses and descriptions of the samples being grouped in alphabetical order according to the state, county and town near which the mines or prospects sampled are situated. Bulletin 22 was said to be the most comprehensive publication ever issued on the coals of the United States, and the new bulletin is an extension of that work.

Mercury Vapor Rectifier Locomotive an Accomplished Fact

Trial Equipment Has Covered 20,000 Miles and Is in Revenue Service on New Haven Branch Line

The Westinghouse Electric & Manufacturing Company has had in service for some months a motor car provided with a Westinghouse-Cooper-Hewitt mercury arc rectifier locomotive equipment. This consists essentially of a transformer for lowering the a.c. line voltage from 11,000 to about 1200, with secondary taps for use in varying the voltage; two single-phase rectifiers, one for service and one for reserve; four d.c. motors of 1000-hp combined capacity, and the necessary control apparatus, rectifier exciter, etc.

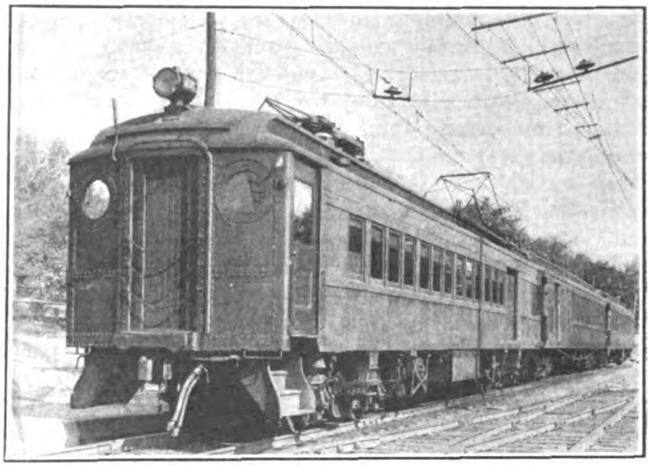
This demonstration was for the purpose of developing the rectifier locomotive equipment for the Pennsylvania Railroad, and it is installed on a combination baggage and passenger car furnished by that railroad. The reason for installing the equipment on a car in this instance was to secure in the readiest manner possible railroad operation with an equipment of substantial size. This car was first tried out on the Westinghouse Company's test track at Pittsburgh. As the length of this track and the power available were not sufficient for an ample test under service conditions the equipment was later transferred to the electrified zone of the New Haven Railroad and is now running on the New Canaan branch of that company. After preliminary trials it was put into revenue service, hauling trains, and to date has been operated more than 20,000 miles. Its present schedule calls for a daily mileage of 240. These tests were designed to demonstrate the durability of the equipment under general service conditions, such as sustained high voltage, voltage fluctuations, as well as mechanical shocks and vibrations.



MERCURY RECTIFIER LOCOMOTIVE EQUIPMENT—SIMPLIFIED ELECTRIC CIRCUIT DIAGRAM

The fundamental parts of the equipment and the circuit connections are shown in the accompanying diagram. Current is drawn from the 11,000-volt overhead contact wire through the standard pantograph of the New Haven Railroad. It flows through a line switch and the primary winding of a lowering transformer to the rail return. The transformer secondary is provided with a center tap and with a number of others equally spaced two by two from the center on both sides to permit the varying of the a.c. voltage from zero to the maximum. The center tap connects with the terminal of a group of four motors connected permanently in series-parallel. These motors are standard Westinghouse No. 308, wound for 600 volts. The group is grounded at the center to limit the d.c. voltage between any point in the equipment and ground to 600. The outside secondary transformer terminals connect to the two positive electrodes at the top of the rectifier. The remaining connection is from the mercury or negative terminal of the rectifier to the other terminal of the motor group.

The rectifier consists of a light steel cylinder container approximately of 20-in. diameter and 36-in. height. The electrodes enter at the top of the container through airtight insulating bushings, projecting a short distance into the cylinder. The arc is started by means of a small motor-generator exciter. No external reactance is needed on the d.c. side, as the motors furnish ample reactance for the purpose of steadying the current. That they do so is indicated by the fact that they operate as well on the rectified current as on that supplied from a rotating machine. The voltage drop in the rectifier is about 25 volts; practically regardless of the magnitude of the current, so that at say 750 d.c. amp, which is about full load for the motors, the power loss is 18¾ kw, and the efficiency, at 1200 volts, is very high.



MERCURY RECTIFIER LOCOMOTIVE EQUIPMENT—MOTOR CAR HAULING TWO COACHES

Details of the cooling system, electrodes, exciter connections, etc., are not yet available, but it is understood that the important problems in these items, as well as the larger ones, have been successfully met on this equipment.

The rectifier weighs but a few hundred pounds, and the motor car complete weighs 72 tons. The rectifier equipment is mounted in the baggage compartment and occupies, with the switch groups and transformer, not more than one-half the floor area. The accompanying half-tone shows the rectifier train in service on the New Canaan branch.

London Motor Omnibuses at the Front

A number of the motor omnibuses belonging to the London General Onmibus Company are serving as armed road cruisers in the British battle line in France. They are driven in a number of cases by men from the omnibus company which, with the other transportation companies in England, has sent many men to the front. The associated transportation lines in London which are under the direction of Sir Albert Stanley publish the news in regard to employees at the war as well as the progress of the relief fund of the company in a small paper, published every two weeks. The last few issues of this paper received in this country contain letters from men who have enlisted in the army and navy and also chronicle the status of the relief fund, which, up to a recent date, amounted to £11,319.

COMMUNICATIONS

Effects of Variance in Car-Wheel Diameters on Motors

ST. LOUIS, MO., Dec. 5, 1914.

To the Editors:

The communications dealing with the effects of variance in car-wheel diameters on motors that have appeared in your issues of Oct. 3, Oct. 31 and Nov. 28 reveal not only uncertainty concerning the magnitude of the effects attributable to differences in wheel diameter but also a belief that the solution of the problem involves considerable complication. As a matter of fact the problem is relatively simple, and is susceptible of complete solution without the use of mathematics and with no more data than are to be found in the curves of motor performance furnished by the manufacturers. It is not unlikely that the problem has been solved by others, especially by the designers of railway motors, but as the writer has been unable to find any publication bearing upon the question, the following analysis is submitted for the use of those who are interested in the matter.

The torque and speed curves in the accompanying diagram are taken from a bulletin of the General Electric Company, and in the original form showed tractive effort and speed of car as functions of current input for a motor having a gear ratio of 25:73 and with driving wheels of 33-in. diameter. For the purpose of this discussion speed in miles per hour has been converted into motor revolutions per minute, and tractive effort into net motor torque in pound-feet. The change from speed in miles per hour to speed in revolutions per minute was made by using the simple relation

$$\frac{\pi \times \text{wheel diameter in inches} \times \text{r.p.m.} \times 60 \times \text{gear ratio}}{12 \times 5280} = \text{miles per hour,}$$

or, since wheel diameter equals 33 in. and gear ratio is 25:73, it follows that

$$\text{r.p.m.} = 29.76 \times \text{miles per hour.}$$

Similarly,

$$\frac{\text{Tractive effort} \times \text{wheel radius in inches} \times \text{gear ratio}}{12} = \text{net motor torque in pound-feet.}$$

or,

$$\text{net motor torque} = 0.471 \times \text{tractive effort.}$$

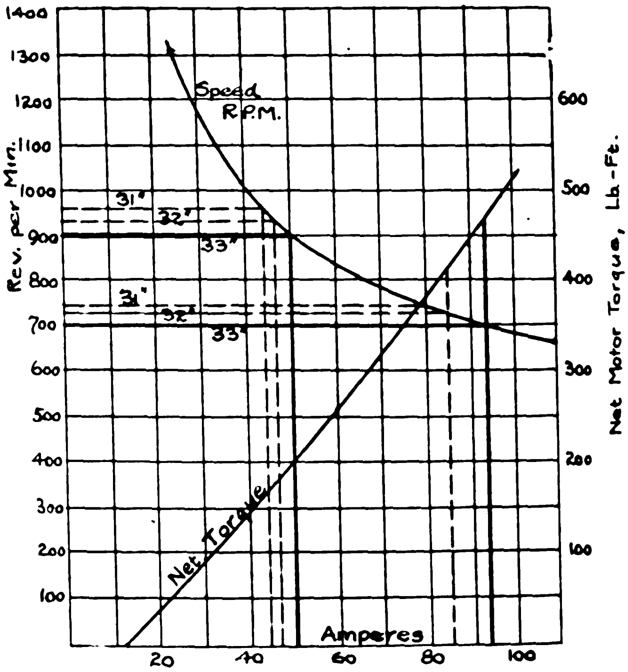
The consideration that determines the division of the load between two identical motors having equal gear ratios but driving wheels of different diameters is that the peripheral velocities of both sets of driving wheels must be the same, for otherwise there would be slipping of the wheels. It follows from this fact that the actual speeds of the two motors (expressed in revolutions per minute) will be to each other in the inverse ratio of their respective wheel diameters. Thus, if one motor of a pair has 33-in. wheels and the other 32-in. wheels, the latter will run faster than the former in the ratio of 33 to 32.

For example, let *A* be a motor with the characteristics shown, and let it be provided with 33-in. wheels; and let *B* be an exactly similar motor, with the same gear ratio, but with 32-in. wheels. If motor *A* runs at 900 r.p.m., corresponding to a car speed of 30.3 miles per hour, motor *B* will run at a speed of 900 × 33/32 = 929 r.p.m. Reference to the curves shows that under these conditions motor *A* will take 50 amp and will develop a torque of 200 lb.-ft., while motor *B* will take 47 amp and will develop a torque of 180 lb.-ft. The tractive effort communicated through the 33-in. wheels will be 425 lb. and that through the 32-in. wheels will be 394 lb.

Again, if the motor *A* runs at 700 r.p.m., equivalent to a car speed of 23.5 miles per hour, its current input will be 93 amp and the tractive effort 1000 lb.; at the same time motor *B* will run at 700 × 33/32 = 722 r.p.m., and will take only 85 amp and develop a torque of 410 lb.-ft. and a tractive effort of 899 lb.

In the figure lines have been drawn to indicate the method of determining the effect of a 2-in. difference between the wheel diameters, the diameter of the wheels of motor *A* being assumed, as before, to be 33 in., while those of motor *B* are taken as 31 in. Under these conditions a speed of 900 r.p.m. in the case of motor *A* corresponds to a current of 50 amp through *A* and of 44 amp through *B;* the corresponding torques are 200 and 170 lb.-ft., and the tractive efforts are 425 and 372 lb., respectively. When motor *A* runs at 700 r.p.m., the currents through *A* and *B* are, respectively, 93 and 80 amp, the torques are 470 and 380 lb.-ft., and the tractive efforts 1000 and 832 lb.

In the case where the wheel diameters were assumed to be 33 in. and 32 in., respectively, the currents at an assumed speed of 900 r.p.m. for motor *A* were in the ratio 50:47. The copper losses in the two motors will then bear to each other the ratio $(50/47)^2$, or, in other words, the copper loss in *A* will be 13 per cent greater than it is in *B;* at the same time the core loss of *A*, due to the 6 per cent greater excitation, will be about 2 per cent greater than in *B*, so that *A* is called upon to radiate about 15 per cent more heat than is developed in *B*, while its speed of rotation is about 3 per cent less than that of *B*. At a car speed of 23.5 miles per hour the copper loss of motor *A* is 30.5 per cent greater than that of motor *B*, and the core loss will be about 9 per cent greater. These differences become more and more pronounced with increasing differences between wheel diameters; thus, with diameters of 33 in. and 31 in., and at a car speed of 23.5 m.p.h., the copper loss of motor *A* is 35 per cent greater than that of motor *B*, and the core loss about 10 per cent greater.



EFFECTS OF VARIANCE IN CAR-WHEEL DIAMETER

It will be evident from the diagram that a difference of wheel diameter of only $\frac{1}{4}$ in. will not have much influence unless the speed curve bends around very sharply toward the horizontal, as in motors with highly-saturated magnetic circuits. In general, however, the conclusions deducible from this analysis may be applied to any standard railway motor, since the performance curves of practically all motors have quite similar shapes. It will be understood, of course, that the numerical values used are merely illustrative of one particular equipment.

A. S. LANGSDORF,
Dean of the College of Engineering.

Substation Spacing in A.C. and D.C. Systems

THE NEW YORK, NEW HAVEN & HARTFORD RAILROAD COMPANY

NEW HAVEN, CONN., Dec. 15, 1914.

To the Editors:

In your Dec. 5 issue I note with interest an abstract of a paper read by H. F. Parshall, entitled "Economics of Electric Railway Distribution." Mr. Parshall shows clearly the large economic gain which follows by increasing from 600 volts to 1200 volts, and the still further gain when the potential is raised to 2400 volts. He also points out that beyond 2400 volts with direct current no further gain is possible because of the increased cost of rolling stock. Passing on, however, to the use of alternating current, he shows that much higher voltages may economically be utilized. This is indeed a beam of welcome light from one who has been regarded as a d.c. partisan. For a number of years there have been those who have attempted to minimize the large economic advantages which a high voltage a.c. system made possible. I cannot, therefore, but be pleased to have had Mr. Parshall announce his later convictions as to the possibilities of the a.c. system.

There are, however, other statements in Mr. Parshall's article to which I cannot so fully subscribe. He states "the energy losses in distribution conductors of a given section vary with the cube of the distance between substations." While this is true, its statement in this manner obscures a more important truth, namely, that a change in the substation spacing, while varying the energy losses between individual substations as the cube of the distance, varies the energy losses in the total system as the square of the distance between substations. Why use this new flower, the "cube rose" in our mathematical garden, which applies only to part of the problem, when the good old "square" serves the whole?

It is unfortunate that Mr. Parshall should lay such stress upon the influence of the density factor in deciding the substation spacing for, after all, this factor has nothing to do with the economic result. If in any given situation the correct substation spacing has been determined, then for, say, twice the density of traffic the same number of substations may again be the most commercially efficient solution. With a given train density the correct spacing can be found by separately plotting as abscissas the yearly operating and fixed charges for both line and substation, with the number of substation intervals as ordinates. Two intersecting curves would be formed and obviously the most commercially efficient result is shown at that point where the sum of the line and substation yearly charges is a minimum. If a proper balance has thus been struck between substation and line charges, then the increased traffic would necessitate both increased line and substation capacity and charges, but not necessarily the shortening of the distance between substations.

There is a further point. I note that Mr. Parshall shows the correct substation spacing for 2400 volts, under certain conditions to be 16 miles, and that for the single-phase system at 5000 volts, the spacing is again only 16 miles. This is a very surprising conclusion to reach, since apparently it implies a power factor for the single-phase system of from only 40 per cent to 45 per cent, or little more than half of that which would obtain in actual practice. However, lacking details of the exact conditions upon which Mr. Parshall has figured, it is difficult to do more than say that so far as I know no conditions have ever obtained in practice which would justify such a conclusion. Such experience as I have had, and what I can gather of the conditions with which Mr. Parshall is dealing, would lead me to suppose that the single-phase substation spacing for this voltage would be in the neighborhood of 21 miles, instead of the 16 miles given by Mr. Parshall, and that an increase to 15,000 volts would increase the substation spacing to 43 miles, or more than two and one-half times that for 2400 volts.

Advancing the thought still further, I would point out that the cost of one of these a.c. substations is on the order of one-sixth that of a d.c. substation, and further that it requires practically no attendance; so that on Mr. Parshall's own showing, a 15,000-volt a.c. substation at one-sixth of the cost will replace more than two and a half 2400-volt d.c. substations. The comparative economic net efficiency of a.c. and d.c. substations is therefore on the order of at least 15 to 1, even leaving out of consideration the difference in the yearly operating charges.

WILLIAM S. MURRAY,
Consulting Engineer.

The Code of Principles and Publicity

THE AMERICAN RAILWAYS COMPANY

PHILADELPHIA, PA., Dec. 16, 1914.

To the Editors:

I have your recent letter asking that I write you something with reference to the Code of Principles. The code is so elementary and at the same time so fundamentally sound, that the principles become almost axiomatic. It is, therefore, rather difficult to enlarge upon them without seeming to be arguing in favor of that which is obvious. At the same time, you will find in the industry someone who will, in the strictest confidence possibly, dissent from these principles in some particular; and if the inquiry were pushed far enough, you would doubtless find a sufficient number of individuals among whom someone would dissent from practically every article of the code.

Either by design or through a happy coincidence, the Code of Principles contains ten articles, and they might be likened to the ten commandments of the business. It is just as important that the electric railway operator should get these ten articles thoroughly engraved upon his understanding and that he should guide his conduct thereby as it is that the individual should be guided by the decalogue.

To my mind at this time, probably, the most important of these principles is the tenth, and it is the one from which, I fancy, there will be the most general dissent. Publicity is not as generally understood as it should be, and a number of companies have had unfortunate experiences with so-called publicity. An electric railway has as much right to expect results from publicity designed and put out by an amateur as a great department store might expect to get results from the same kind of advertising. The merchant has a message to deliver to the public, and he has found by experience that it is economy to employ competent persons to prepare that message and place it before the public, and he therefore employs a skilled advertising man. A public utility, which has a message to deliver to the public, sometimes employs a skilled man who can deliver the message with a punch and sometimes entrusts it to someone already in the office. In the latter case the message usually lacks the punch because the railroad man is a railroad man; he knows the facts and he presents his message to the public in a manner which the public doesn't understand, or he fails to emphasize a salient point, or he overburdens it with detail.

Several years ago I had a message that I wanted to get from our company to the public, and I took occasion to embody it in an address I made before our employees' beneficial association. It was duly published in the daily papers of the city, and I don't think it made even a scratch, much less a dent. A short time after that we employed a publicity agent in another city, and in getting together material for him to work with he was shown a newspaper report of this address. He remarked that it was full of excellent material, but that I had used up in one publication enough material to last a campaign of from six to eight weeks. He then proceeded, in the other city, to take identical material relative to that property and conduct such a campaign, and the campaign was successful. This merely by way of illustration and to enforce the point which seems to me should be my contribution to this discussion, that publicity is the important thing at this time, because the events of last November show that the public mind is wavering and is in a receptive condition. The time is therefore opportune to get before the public our side of the story, but it must be done by men who know how to do it and who can put the necessary punch in their statements.

C. L. S. TINGLEY,
Second Vice-President.

Importance of the Public Library to Railway Men

FREE PUBLIC LIBRARY
NEW HAVEN, CONN., Dec. 3, 1914.

To the Editors:

It seems to me that the editorial which appeared in the issue of the ELECTRIC RAILWAY JOURNAL for Nov. 28, 1914, page 1188, entitled "Electric Railways and Public Libraries," should tend to bring about a closer spirit of co-operation between these two fields. As the editorial states, the present-day librarian is rapidly breaking away from the attitude of the man of the past who, like a former librarian of Harvard College, sighed a sigh of great relief because he had all of his books in the sanctuary. It is not so much that our work here is an activity peculiar to New Haven, but rather that it is a direct reflection of the signs of the times. That our activities are taken up with the electric railway industry is due, no doubt, to the fact that the librarian has given me free use of my power as head of the department and, like electricity, I moved in the line of least resistance. Being more or less familiar with the electric railway industry I felt better qualified to cooperate with the men in this line than with those in lines less familiar.

That the ELECTRIC RAILWAY JOURNAL has so kindly offered to act as a clearing house for discussion of the relations of the public library to the electric railway industry will, I am sure, be greatly appreciated by librarians at large as well as by the members of the industry in which the paper is such a valuable organ.

In my mind the public library of a given size can play a most important part in the conducting of a transportation company inasmuch as it is the storehouse for printed material, whether in book, pamphlet, periodical, transaction, clipping, photograph or even manuscript and excerpt form. These all pass through the librarian's hands and they represent much valuable material. If railway men realized this fact the material could easily be made very useful.

I trust that we, the public libraries, will not fail to realize our splendid opportunity to help such a large and most important industry as electric railroading.

KENNETH C. WALKER,
Head of the Department of Technology.

"Poisoning the Wells"

DREXEL INSTITUTE
PHILADELPHIA, PA., Dec. 15, 1914.

To the Editors:

The editorial "Poisoning the Wells" in the ELECTRIC RAILWAY JOURNAL of Dec. 5 is well put. It is so common for newspaper people at least to read greed and selfishness into anything originating with public service companies that it is probably wise to take the space which is devoted to this editorial for its particular purposes. One fault I find with it is that it calls attention to an article in *The New Republic*, which probably few people have seen or read.

So many college men go into the employ of government, municipalities and public service companies, while so few get any training worth while in practical economics, that no overestimate is likely to be made of an inter-relation planned to put into the hands of faculty and students information on public service relations which the public service companies have at their command, but which has been difficult to reach heretofore. Their willingness to co-operate is, of course, one of the signs of the times and shows an enlightened cooperative spirit which is certainly to be admired.

The need of more and better training in practical economics for technical students is slowly beginning to be recognized. May nothing arise to interfere in the least with the formation of closer bonds between educators and men of wide experience in public service relations.

I sometimes wonder at the patience which such men exhibit, since their motives are so constantly misinterpreted and their purposes maligned. I suppose there must be some rascals connected with public service enterprises, but I have not personally met any of them. I must, therefore, believe in the sincerity and honesty of purpose of those who manage these great enterprises, and particularly believe in the committee of the American Electric Railway Association which drew up the "Code of Principles."

ARTHUR J. ROWLAND,
Dean.

Cost of Hand-Throw Signals

NACHOD SIGNAL COMPANY, INC.
NEW YORK, Dec. 14, 1914.

To the Editors:

In your issue of Dec. 12, in the proceedings of the Pennsylvania Street Railway Association, we note that one of the speakers is reported to have said "in times of rigid economy, the old hand-throw signal of five lights in series would be the most advisable system."

It may not be generally known what the apparently small amount of time lost at each turn-out due to the use of hand signals amounts to in a year. For example: Consider one turn-out on a single-track line having a twenty-minute average headway during the twenty-four hours, then cars would meet there every ten minutes, or 144 times a day. If we assume only fifteen seconds lost due to the operation of throwing hand signals, which seems to be a very conservative estimate, this amounts in a day to thirty-six minutes, or six-tenths of an hour. If the wages of the car crew are 25 cents per hour, then the time lost for the four men costs 60 cents per day, or $219 per year of 365 days.

Since automatics to replace the hand signals cost not much over $400 per block installed and have a low maintenance charge, it is easy to see that the automatic signals would save their cost in about two years. Furthermore, the saving effected by the automatics has been figured on the wages of car crews alone, which is of course only one of the items involved.

CARL P. NACHOD,
President and Chief Engineer.

Maximum Motor Input

TRANSIT DEVELOPMENT COMPANY
BROOKLYN, N. Y., Dec. 8, 1914.

To the Editors:

Referring to the communication from William A. Del Mar, printed in the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 5, page 1254, relative to the maximum input in railway motors, discussed by the railway section of the standards committee of the A. I. E. E., it is my opinion that the maximum input of a railway motor should be such that it will be capable of carrying a load of twice the nominal rating for one minute at the rated voltage, without flashover or injurious sparking at the brushes. I do not believe it necessary that this period be as long as five minutes for the average and possibly more than average conditions in this country.

I believe, further, that since the tapped-field motor is coming into quite general service and is applicable to a very large percentage of railroads throughout the country, the definite rating should be specified for such type of motor, in which case I am of the opinion that to properly protect the motor from injury, it should have the rating mentioned above for use when operating on full field, and it should withstand a swing for ten seconds of three times its nominal current rating at the rated voltage without flashover or mechanical injury or injurious sparking at the brushes.

WILLIAM G. GOVE, Superintendent of Equipment.

NEW YORK, Dec. 15, 1914.

To the Editors:

The subject of motor overloads referred to in the communication from William A. Del Mar, printed in your issue of Dec. 5, seems to me to take up a matter which very few persons are really qualified and competent to pronounce upon. I would expect that circumstances would alter cases to a considerable extent. As Mr. Del Mar correctly points out, the manufacturers and the users of railway motors have different points of view in regard to overload capacity. There is something to be said on each side. Under these circumstances I think that it would be difficult, if not impossible, to settle the matter definitely until there are more results of experiments and tests available. Until this time a provisional compromise on the matter is all that can be expected.

C. O. MAILLOUX,
Consulting Engineer.

ALLIS-CHALMERS MANUFACTURING COMPANY
MILWAUKEE, WIS., Dec. 15, 1914.

To the Editors:

Referring to Mr. Del Mar's communication on "Motor Overloads," I would say that the proposed section of the Institute rules referring to railway motors as it stood in the preliminary edition would work against the interests of the manufacturers who have a stock of non-interpole motors on hand.

It would be unreasonable, as a commercial proposition, to expect a non-interpole motor to withstand the tests specified. There are many classes of service where the use of the interpole motors is not required or justified.

It would seem to the writer that the proposed section should be split up under two headings, namely, interpole railway motors and non-interpole railway motors. The railway company's specifications should state the requirements which will determine whether interpole motors are necessary or not.

H. W. CHENEY,
Engineer Electrical Department.

[NOTE.—The section referred to in these three letters is No. 418 in the A. I. E. E. standardization rules. As it appeared in the preliminary draft approved tentatively by the board of directors on July 10, 1914, it read as follows:

"418. *Maximum Input.* Railway motors shall be capable of carrying twice the current corresponding to their normal rating for a period of five minutes, without flash-over or mechanical injury. They shall also be capable of carrying a load of three times their nominal rating for one minute under the same conditions. These overloads shall be applied when the motor is at the temperature which it would acquire when operating at its continuous rating."

As revised by the standards committee and as it will appear in the regular edition of the rules now in press this section reads: "The subject of overloads for railway motors is under investigation."

As the preliminary form of the rule has been already published in at least one important book it is well to direct attention to this significant emendation.—EDS.]

Functions of the Company Section

WASHINGTON RAILWAY & ELECTRIC COMPANY
WASHINGTON, D. C., Dec. 12, 1914.

To the Editors:

By way of comment on your editorial of Nov. 28, entitled "Functions of the A. E. R. A. Company Section," I send the following:

AN ASSOCIATION ACROSTIC

The functions of a company section may be expressed in a few words as follows:

They stimulate and promote:

A.mbition
E.ducation
R.eliance
A.dvancement

Co-operation
Opinions
Mentality
Publicity
Ability
Notoriety
Your ideas

Sociability
Entertainment
Congeniality
Thought
Interest
Originality
New conceptions

Many
Opportunities of great
Value, which with
Enthusiastic support
Means much to
Electric railway companies
Now and in
The future

This little acrostic seems to me to contain references to most of the benefits which accrue to us as members of a company section.

GEORGE G. WHITNEY,
President Company Section.

The Jones System of Control

PITTSBURGH RAILWAYS COMPANY,
PITTSBURGH, PA., Dec. 10, 1914.

To the Editors:

I notice in your issue of Dec. 5 an article by C. W. Squier explaining the control used in Pittsburgh. You may be interested to learn that in a recent patent (issued Sept. 1, 1914) further improvements have been made in the control, and under the new system there are never fewer than three motors in use. We still have one of the original equipments in use with the connections as they seem to be explained in Mr. Squier's article, but we early found that we could increase the acceleration of the car on bad track and on grades by a slightly different arrangement of connections beyond the series-parallel position. Fifty-five cars are now in operation here equipped with these controllers built in our own shops, and 100 additional equipments, on which delivery is now beginning, are being manufactured for us. This control is applicable to other than the baby motors, as we have used it with four standard 50-hp motors.

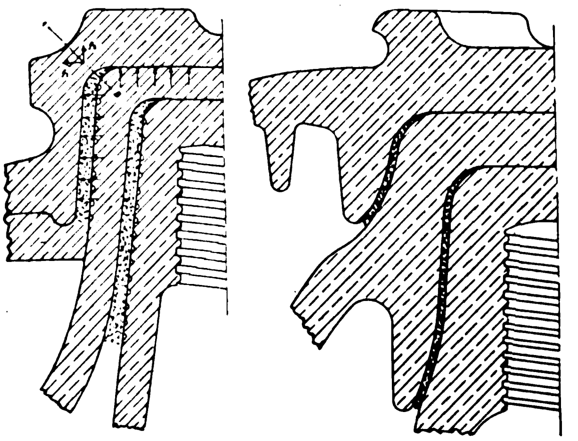
The new control, together with small motors and 24-in. wheels, saves 20 per cent to 30 per cent in power consumption, depending upon the type of city equipment with which it is compared.

The motors and trucks weigh 4½ tons to 5 tons less than the usual trucks and quadruple equipment of four 50-hp motors in use in many cities. The saving due to the controller is 10 per cent in energy for typical city service, and where there is much wagon traffic the slow speed with all motors in series is of great benefit.

P. N. JONES, General Manager.

High-Tension Power Transmission Problems Discussed at December A. I. E. E. Meeting

At the regular monthly meeting of the American Institute of Electrical Engineers, held in New York on Dec. 11, papers were presented by A. O. Austin, chief engineer Ohio Insulator Company, on "Insulator Depreciation and Effect on Operation," and F. W. Peek, Jr., consulting engineer General Electric Company, on "Effect of Altitude on the Spark-Over Voltages of Bushings, Leads and Insulators." Mr. Austin stated that some lines operate for years without insulator troubles only to run into serious and increasing trouble. This is usually attributed to fatigue in the insulator, but it may be due to one or more of a number of causes. Examination of fractured pin insulators show that there must have been strong radial forces which split the outer parts, or sheared the heads of the cylinders from the side walls. These results appear to be due to high stress rather than to long-continued low stress, and they are probably due to uneven expansion from varying temperature, and to expansion of the cement. Porcelain is a poor conductor of heat so that, when suddenly cooled, say by rain, severe stresses may be set up, possibly producing cracks.



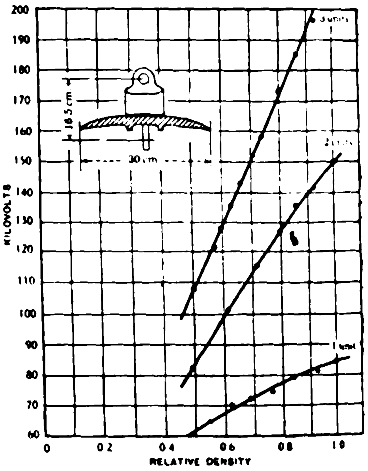
HIGH-TENSION PROBLEMS—FIG. 1—PIN-TYPE INSULATOR OF OLDER FORM—FIG. 2—NEWER FORM, PRACTICALLY LIGHTNING PROOF

In Mr. Austin's opinion temperature differences do not account for all insulator failure, for insulators sometimes fail in storerooms and other protected places. Troubles usually develop at railway crossings first where it appears that sulphur fumes in the smoke attack the cement and produce crystalline growth, presumably of calcium sulphate, with consequent expansion. Microscopic examination sometimes shows such crystals. Little attention has been given to this complicated subject as the operating conditions are difficult to reproduce experimentally.

In illustrating the general principles of insulator design, Mr. Austin used the diagrams shown in Figs. 1 and 2. Fig. 1 represents a cross-section of part of a pin-type insulator with which trouble was experienced from cracking, particularly along the line *AB*. The directions of the forces are shown by the arrows, the resultants being represented by f_1 and f_2. Fig. 2 shows a section of a later type of insulator in which the stresses, due to uneven heating or cement expansion, are less, while the strength of the parts resisting them is greater. Refinements in the cement or the use of an elastic varnish or wax on the ends of the shells, while desirable in the older type are unnecessary in the newer one. A new process of sanding the porcelain surfaces in contact with the cement is also used to avoid the use of grooves.

Mr. Austin also took up the general subject of insulator depreciation, calling attention to the fact that with modern insulators there is little to be feared from static punctures in comparison with other dangers. Trouble comes not from the depreciation of the insulator as a whole, but from the matching up of defective parts in a single insulator or string. He gave a mathematical demonstration based on the theory of probability showing the relation of the rate of depreciation and the probability of the occurrence of bad strings of insulators under different conditions.

Mr. Peek's paper contained a wealth of experimental data, secured by testing various high-tension insulating devices under varying atmospheric pressure, presented in tabular and graphical form. Fig. 3 is typical of the illustrations. It is impossible to present a digest of these data in a few words.



HIGH-TENSION PROBLEMS—FIG. 3—ARC-OVER VOLTAGES AT VARIOUS DENSITIES

In the discussion which followed the presentation of the papers, Dr. Steinmetz urged the development of a systematic method of testing insulators on the line with or without removing the voltage. Mr. Peek suggested a more accurate use of the expression "high frequency" which is now applied to alternating quantities, wave trains and impulses of short duration. He hinted at some interesting data soon to be available on the effects of high-potential impulses of extremely short duration, say one millionth of a second, upon insulators. Mr. Peek also explained why more insulator failures occur on low-tension than on high-tension lines, this being due to the lower arc-over voltage of the former which are subjected to the same lightning voltages. He also advocated more rigid inspection of insulators and the rejection of all when more than 2 per cent fail under test.

American Association News

List of Committee Chairmen Announced—Several Committee Meetings Were Held Last Week, Including Those of Two Important Joint National Committees—A. E. R. A. Arrangements for the Mid-Year Meeting

CHAIRMEN OF COMMITTEES, 1914-1915

Following are the lists of chairmen of the several associations. Lists of the members of the committees will follow as soon as they are complete. It is expected that preliminary reports of all committees will be completed in time for presentation to the executive committee at the American Association meeting at Washington on Jan. 29, 1915.

AMERICAN ASSOCIATION

Subjects—C. L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; insurance—H. J. Davies, secretary Cleveland Railway, Cleveland, O.; education—H. H. Norris, associate editor ELECTRIC RAILWAY JOURNAL, New York, N. Y.; federal relations—Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind.; taxation—T. W. Wilson, vice-president and general manager Wilmington & Philadelphia Traction Company, Wilmington, Del.; compensation for carrying United States mail—Captain A. R. Piper, general freight agent Brooklyn Rapid Transit Company, Brooklyn, N. Y.; public relations—Thomas N. McCarter, president Public Service Railway, Newark, N. J.; to consider relations with state and sectional associations—R. P. Stevens, president Mahoning & Shenango Railway & Light Company, Youngstown, O.; *Aera* advisory—H. C. Donecker, assistant general manager Public Service Railway, Newark, N. J.; company membership—James E. Gibson, general superintendent Metropolitan Street Railway, Kansas City, Mo.; company sections and individual membership—Martin Schreiber, engineer maintenance of way Public Service Railway, Newark, N. J.

Electrolysis—Calvert Townley, chairman board of directors Lackawanna & Wyoming Valley Rapid Transit Company, New York, N. Y.; ways and means—J. H. Pardee, president J. G. White Management Corporation, New York, N. Y.; 1915 convention—J. D. Mortimer, president Milwaukee Electric Railway & Light Company, New York, N. Y.; award of bronze medal for best paper presented before a company section—Oscar T. Crosby, Warrenton, Va.; relations with manufacturers' association—C. L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; special committee on membership—L. S. Storrs, president Connecticut Company, New Haven, Conn.; to confer with other organizations regarding meeting dates—H. C. Clark, editor *Aera*, New York, N. Y.; to represent the association at the American Good Roads congress—E. C. Faber, second vice-president and general manager Aurora, Elgin & Chicago Railroad, Wheaton, Ill.; arrangements for mid-year conference and dinner—C. L. Henry, president Indianapolis & Cincinnati Traction Company, Indianapolis, Ind.; valuation—L. S. Storrs, president Connecticut Company, New Haven, Conn.; standards for car loading—S. W. Huff, vice-president Brooklyn Rapid Transit Company, Brooklyn, N. Y.; Anthony N. Brady medal—Arthur W. Brady, president Union Traction Company of Indiana, Anderson, Ind., and 1915 transportation committee—J. H. Pardee, president J. G. White Management Corporation, New York, N. Y., master of transportation.

TRANSPORTATION AND TRAFFIC ASSOCIATION

Rules—W. H. Collins, general manager Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.; passenger traffic—P. P. Crafts, general manager Mobile Light & Railroad Company; express and freight traffic—F. D. Norviel, general passenger and freight agent Union Traction Company of Indiana, Anderson, Ind.; fares and transfers—J. E. Duffy, general superintendent New York State Railways, Syracuse, N. Y.; training of transportation employees—Cyrus Ching, chief instructor Boston Elevated Railway, Boston, Mass.; transportation-accounting—Joseph K. Choate, vice-president J. G. White Management Corporation, New York, N. Y. (co-chairman); block signals—J. W. Brown, assistant general superintendent Public Service Railway, Newark, N. J. (co-chairman); standards—L. H. Palmer, Harrison Williams, New York, N. Y.; to develop uniform definitions—H. C. Donecker, assistant general manager Public Service Railway, Newark, N. J.; construction of schedules and time-tables—Alexander Jackson, superintendent schedules and time-tables Public Service Railway, Newark, N. J., and transportation-engineering—P. N. Jones, general manager Pittsburgh Railways, Pittsburgh, Pa. (co-chairman).

ENGINEERING ASSOCIATION

Power generation—J. W. Welsh, electrical engineer Pittsburgh Railways, Pittsburgh, Pa.; buildings and structures—C. F. Bedwell, assistant engineer Public Service Railway, Newark, N. J.; equipment—W. G. Gove, superintendent of equipment Brooklyn Rapid Transit Company, Brooklyn, N. Y.; heavy electric traction—E. R. Hill, consulting engineer Pennsylvania Railroad, New York, N. Y.; power distribution—A. S. Richey, Worcester Polytechnic Institute, Worcester, Mass.; electrolysis—A. S. Richey, Worcester Polytechnic Institute, Worcester, Mass.; transportation-engineering—R. N. Hemming, superintendent of motive power Union Traction Company of Indiana, Anderson, Ind. (co-chairman); engineering-accounting—Charles Rufus Harte, construction engineer Connecticut Company, New Haven, Conn. (co-chairman); life of railway physical property—Martin Schreiber, engineer maintenance of way Public Service Railway Company, Newark, N. J. (co-chairman); way matters—C. S. Kimball, engineer maintenance of way Washington Railway & Electric Company, Washington, D. C., and block signals—J. M. Waldron, signal engineer Interborough Rapid Transit Company, New York, N. Y. (co-chairman).

ACCOUNTANT'S ASSOCIATION

Express and freight accounting—E. L. Kasemeier, auditor Ohio Electric Railway, Springfield, O.; passenger accounting—L. T. Hixson, auditor Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis, Ind., and to represent association at convention of railroad commissioners—W. F. Ham, vice-president and comptroller Washington Railway & Electric Company, Washington, D. C.

JOINT COMMITTEE ON ELECTROLYSIS

The sub-committee on publication of the national committee met for the first time at 29 West Thirty-ninth Street, New York, on Dec. 16 under the chairmanship of E. B. Katté, chief engineer electric traction New York Central Railroad. The committee met to consider the reports submitted by the other sub-committees which had been referred to it by the full committee at its last meeting. The present meeting was devoted to organization and a preliminary examination of the data submitted. Members of the main committee have until Jan. 1 to submit comments on the sub-committee reports. After considering these the publication committee will submit the complete report to the full committee for final approval.

ARRANGEMENTS FOR MID-YEAR MEETING

Arrangements for the mid-year meeting of the American Electric Railway Association, to be held in Washington, D. C., on Jan. 29, 1915, are being perfected. A meeting was held at the New Willard, Washington, on Dec. 13, and was attended by C. Loomis Allen, C. L. Henry, C. C. Peirce, E. B. Burritt and H. G. McConnaughy of the committee of arrangements, and S. L. Colby of the Manufacturers' Association and J. N. Shannahan of the Transportation & Traffic Association. It was decided to hold the day sessions of the association as well as the banquet in the evening at the New Willard Hotel. The committee hopes in the afternoon of Jan. 29 to arrange for a reception of the delegates by President Wilson at the White House. If they are successful in this there will be but one business session beginning at 10 o'clock and lasting until the business of the association is finished.

All of the speakers for this session have not yet been selected, but they will include Col. T. S. Williams, president Brooklyn Rapid Transit Company, who will speak on the "Code of Principles," and N. C. Kingsbury, vice-president American Telephone & Telegraph Company, New York, who will discuss some features of publicity.

The committee anticipates a large attendance at this meeting and is making arrangements for special transportation so as to add to the convenience of those planning to be present. Probably special trains will be run from New York to Washington and return over both the Pennsylvania and Jersey Central-Reading routes. Actual leaving times will be announced later, but the trains will be planned to leave New York on the night of Jan. 28 and returning will leave Washington on Jan. 29 after the banquet. The committee hopes also to arrange for special cars from other cities like Chicago, St. Louis, Pittsburgh and Atlanta.

NATIONAL JOINT COMMITTEE ON OVERHEAD AND UNDERGROUND CONSTRUCTION

This committee held its first full meeting in New York on Dec. 16 with Farley Osgood, assistant general manager Public Service Electric Company, in the chair. R. D. Coombs, consulting engineer, New York, representing the A. R. E. A., is secretary. The American Association was represented by W. J. Harvie, of Allen & Peck, Inc.., while G. W. Palmer, Jr., Bay State Railway, and C. L. Cadle, New York State Railways, represented the Engineering Association. The meeting was addressed by J. J. Carty, chief engineer American Telephone & Telegraph Company, and E. B. Rosa, chief physicist United States bureau of standards, on co-operation between the telephone and other interests and on the work of the bureau respectively. The discussion brought out these facts, among others: That the purpose of the committee is to furnish a clearing house for information; that it will endeavor to prevent by its influence the independent action of one interest which might interfere with the rights of another; that the specifications for overhead crossings prepared by the predecessor of the present committee are being increasingly adopted by public service commissions; that it is not desirable that these specifications be incorporated into state laws, as they are always subject to revision, but that it is preferable that commissions base orders upon them "as revised." There are thirteen interests now represented in the committee of twenty-one members. Alternates to a number somewhat less than this will also be appointed.

COMMITTEE ON TRAINING TRANSPORTATION EMPLOYEES

This committee of the T. & T. Association met in New York on Dec. 17. Those present were Cyrus Ching, chief instructor Boston Elevated Railway, chairman; E. E. Strong, superintendent of transportation New York State Railways, and W. J. Harvie, Allen & Peck, Inc. The assignments made by the executive committee were considered and the chairman undertook to frame a set of questions which can be sent out to the membership to secure the necessary data for filling the assignments.

ANNUAL SMOKER OF COMPANY SECTION NO. 2

The annual social gathering of the Public Service Railway Company Section was held on Dec. 17 in Newark, N. J., with a large attendance. The secretary announced that the registration at the November meeting was 418 names, indicating the record attendance in the history of the section. The evening was spent in singing, smoking and listening to a vaudeville program furnished by professional entertainers. It closed with a turkey supper served in the company employees' dining room. President Maguire urged the inauguration of an "each-get-one-more" membership campaign.

The association was represented at the Good Roads Congress in Chicago this week by E. C. Faber, chairman of a committee appointed for the purpose, C. N. Wilcoxon and C. D. Emmons.

Committee on Uniform Crossing Agreements

This committee which had been appointed, at the request of the Pennsylvania Public Service Commission, to represent the Pennsylvania Street Railway Association on a joint committee on wire crossings, reported at the recent convention of the association that it had met with the joint committee in Harrisburg, Pa., on Nov. 16. It was then decided to draw up specifications for recommendation to the commission to supersede the present order covering this subject and a sub-committee was appointed for the purpose. Beginning Dec. 1 the sub-committee has followed the plan of holding weekly meetings in Philadelphia on Tuesdays pending the completion of its report. The Railway Association is represented on the sub-committee by G. E. Wendell, Vallamont Traction Company; Pittsburgh & Allegheny Valley Traction Company, and R. P. Stevens, Mahoning & Shenango Valley Railway & Light Company. The last-named is also chairman of the Railway Association committee.

United States Civil Service Examination

The United States Civil Service Commission has announced open competitive examinations for the following positions: Junior railway mechanical engineer, grades I and II; junior railway signal engineer, grades I and II; junior railway electrical engineer, grades I and II; junior railway civil engineer, grades I and II. The salaries, in each instance, are: Grade I, $1,200 to $1,680; grade II, $720 to $1,080. Persons desirous of taking either of these examinations should apply at once for Form 2039, stating the title of the examination for which the form is desired, to the United States Civil Service Commission, Washington, D. C. The examinations will be held on Jan. 20.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical Practices in Every Department of Electric Railroading

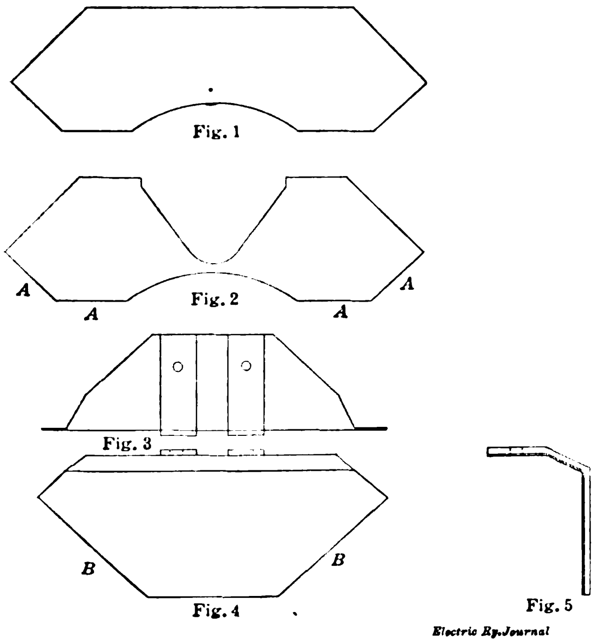
(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Handy Templets for Assembling Brush-Holder Yokes for GE-57 Motors

BY J. N. GRAHAM, MASTER MECHANIC ROCKFORD (ILL.) & INTERURBAN RAILWAY

In assembling the parts of brush-holder yokes for some of the older types of railway motors it is sometimes difficult to get the positions of the castings on the body of the yoke absolutely correct. The accompanying illustration shows a set of templets which, if properly made and properly used, greatly simplify the making of these yokes. As the castings seldom are damaged in any way, they can be removed from blocks that are charred or otherwise damaged and again used on new blocks.

All templets are made of 1/16-in. blue annealed steel. Fig. 1 shows a plate cut out of the steel and used as a pattern for marking out the blocks of well-seasoned hard maple which form the body of the yoke. After the blocks are cut to the proper size and shape they must be soaked for at least twenty-four hours in hot paraffine. Fig. 2 is a templet for setting the casting which holds the yoke to the motor frame, the edges *AAAA* of which are turned over for about 1 in. at right angles to the templet. The lip so formed acts as a guide to hold the templet in the proper position on the yoke while the holes are being marked for the rivets which hold the casting to the block. The space cut out at the top of the templet must fit the casting. This casting is then riveted to the block.



DETAILS OF TEMPLETS FOR GE-57 BRUSH-HOLDER YOKES

Figs. 3, 4 and 5 show three views of the templet used in placing the castings which hold the brush-holders on the block. This templet is bolted to the yoke at the point where the yoke is to be bolted to the motor frame through the holes shown in the cut. This plan allows the rest of the templet to lie against the face of the yoke, the lines *BB* being the inside edges of the castings which hold the brush-holders. This templet should be left on the yoke while the castings which hold the brush-holders are being riveted to the yoke. To assure the proper position of all castings, the templet should not be crowded out of place. This templet is reinforced with two pieces of ¼-in. x 1½-in. iron which are bent to fit over the outside of the templet and are riveted to the templet with conutersunk rivets to get a smooth surface.

The best way to make a set of these templets is to fit them to a new yoke that is absolutely correct. The different types of motors will require different sets of templets, as there is a difference in the size of the yokes. The ones shown in the illustration are used for GE-57 motors.

Economical Use of Wood and Preservation of Timber

BY E. W. BRIGHT, TIE AND TIMBER AGENT BOSTON ELEVATED RAILWAY

It is astonishing to see the saving that the consumer can make by the proper selection of the kind and quality of the wood for a particular class of service. First of all, it has been my experience in regard to specifications for lumber that very good results can be obtained by using the grading rules issued by the various lumber associations, and by careful study one can invariably find some grade that will meet with his requirements.

The buyer must bear in mind that if he specifies certain widths or lengths that are not given in standard grading rules the material is going to cost more money. However, I know that conditions come up where it is advisable to order special widths or lengths. When material is ordered in this way it is a good plan to have it piled separately and marked "Special," for men at work around the mill will invariably go to a pile of lumber and pick out the best they can find regardless of how and where they are going to use material.

As to care of lumber, the material should be well seasoned as far as possible before it is used because it is a commonly accepted fact that dry timber will not decay nearly so fast as wet timber. It is therefore essential that all lumber should be piled properly and air spaced. This applies to lumber piled indoors as well as in the open. Where lumber or ties are piled in the open, bed blocks should be used to keep the material from the ground, and a slanting roof should be made over each pile to protect the material from the sun, rain and snow. Hardwoods and flooring should always be piled under cover, and all sheds housing lumber should be absolutely watertight, for to store material in a leaky building is far worse than to pile it out in the open.

Wood Preservation—Methods and Quantities

The preservative treatment of timber is widespread, and each year sees it applied more extensively. I will not go into the different processes used in the treating of timber, but will give some idea of the Bethell process which, no doubt, is used more in the United States than any other process.

Under the Bethell process timber to be treated is placed on iron trucks or "cylinder buggies" and run into huge horizontal cylinders. These cylinders are capable of withstanding high pressure, and their doors are so arranged that they can be closed and hermetically sealed after the timber is drawn in. After the doors are closed live steam is admitted into the cylinders, and a pressure of about 25 lb. per square inch is maintained for several hours. After the vacuum period the preservative is run into the cylinder at a temperature of about 170 deg. Fahr., and the pressure pumps are started and are continued until the desired amount of preservative is forced into the wood. The surplus preservative is then blown back into the storage tanks, the timber is allowed to drip for a few minutes, the cylinder doors are then opened and the timber is withdrawn.

Many antiseptics are used in the United States, particularly zinc chlorid, corrosive sublimate (bichorid of mercury), and copper sulphate, but creosote (dead oil of coal tar) is used more than any other antiseptic. I think the best specification for creosote oil is that which was adopted by the American Railway Engineering Association at its thirteenth annual convention, held in Chicago in March, 1912.

In the treatment of lumber the pounds of oil to be used per cubic foot should be based in a measure on the quality of the timber to be treated and on where the material is to be used. In other words, we know that lumber with a great deal of sap will take more penetration that that which contains more heart. It is the writer's opinion that where one specifies a 10 lb. treatment for a 6 in. x 8 in. x 8 ft. hard pine sawn tie of standard quality, an 8 lb. treatment is sufficient for a tie that grades "merchantable" or "prime."

I have always maintained that the consumers of treated material have been specifying more pounds of oil to the cubic foot than is really required in the treatment of lumber. I understand that in experiments which have been made at the Forest Products Laboratory it was found that the amount of creosote usually injected into wood is from 20 per cent to 50 per cent greater than the amount actually required to prevent attack. As to the strength of treated timber, it is my opinion that creosoting does not directly weaken wood. I would refer the reader to Circular 39 issued by the Forest Service, which covers fully experiments on the strength of treated timber.

Timber to be treated should be thoroughly air seasoned. If, however, there is not time for this, the inspector in charge should decide with the superintendent of the creosoting plant the length of time the material is to be steamed. Care should be taken to remove all inner and outer bark from the material before treatment, as creosote oil will not penetrate through the inner bark.

The inspector should keep lumber of similar sizes and quality together as far as possible where the quantity of the oil to be used is the same. He should also see that the creosoting plant is in good operating condition. Leaky valves and pumps should not be permitted, and all gage scales should be accurate, with the pulleys and floats running free.

It is the duty of the inspector to take readings during the creosoting process, and occasionally he should take samples of oil from the cylinders to see if the oil comes up to the specification. After the vacuum period he should see that all valves to sap drums, drainage tanks, etc., whereby oil may escape from the cylinder about to be filled with oil, are closed.

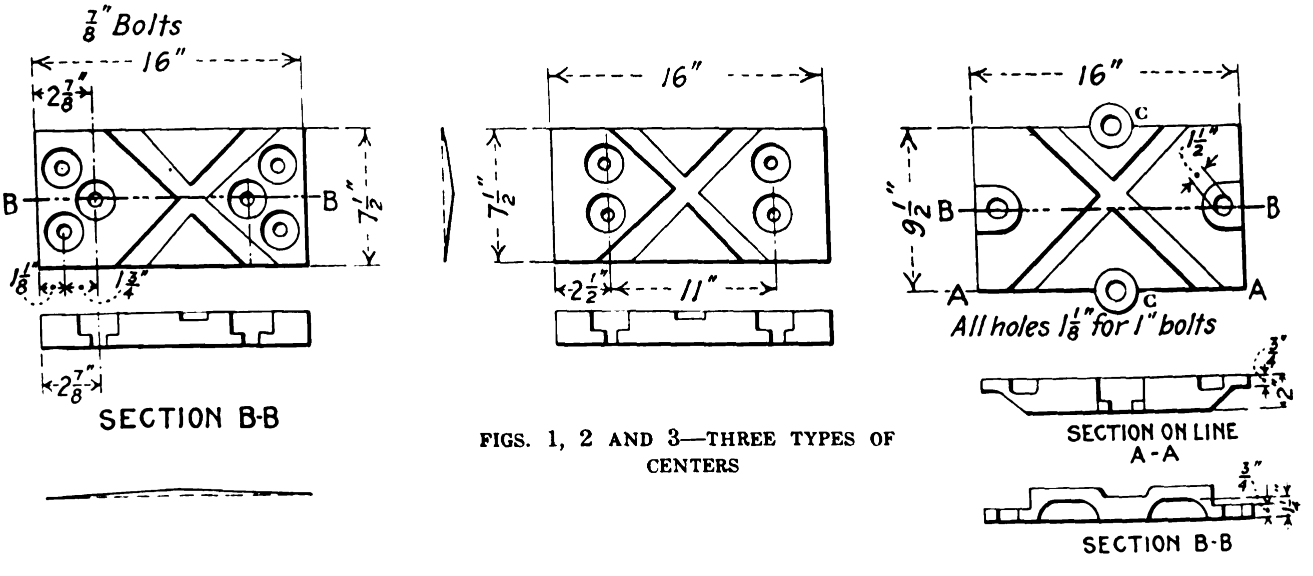
Treated lumber or ties that have been on hand for some time should be used in preference to that which has just been treated, as treated material improves in strength by air seasoning.

The All-Babbitted Center

BY R. P. WILLIAMS, INSPECTOR OF SPECIAL WORK BROOKLYN RAPID TRANSIT SYSTEM

As the writer's statement in his article of Sept. 19 that the all-babbitted center, properly installed, would hold just as well as the partially-machined or the machined insert has been questioned by a correspondent, it may be worth while to present some further discussion based on fifteen years' experience with the babbitted construction.

The writer believes that if the real reasons for the loosening up of centers had been thoroughly canvassed and eliminated, the machined types would never have come into existence. To illustrate, let us take three types of centers as follows: The center in Fig. 1 is held by six 7/8-in. bolts, and note the leverage. The two outer bolts are 1 1/8 in. from the edge; the middle bolts are each 2 7/8 in. from the edge. When this center is made of manganese and cold rolling takes place all of the strain is put on the center bolts, which invariably show the first signs of loosening. As one of these centers was found loose and broken, a new center of sixty-point carbon open-hearth hammered steel was substituted. It is three years since this installation was



FIGS. 1, 2 AND 3—THREE TYPES OF CENTERS

made, yet the center is still perfectly tight. Many similar renewals have been made and none have loosened up. The center in Fig. 2 is held by four 1-in. bolts. We have 192 of these centers in 90-deg. crossings, only twelve of which have become loose. Note the position of the bolts, 2½ in. from the edge; yet in removing centers of this type on account of breakage, they have shown as much as ⅝-in. camber. This type is all manganese. Clearly there are two causes here which would not be removed by machining the bed, namely, the quality of the metal and the improper placing of the bolts.

These comparisons could be carried on with all of the keyed types, showing the same results. We have made renewals of the vertical and horizontal keyed types, using open hearth hammered steel in replacements, employing in every case the original method of holding. Although these experiments have been carried through four and one-half years and under every degree of traffic, we have yet to find the first loosened center.

As to the last center, Fig. 3, one would think from the almost even distribution of the holding-down pressure that the bolts would not loosen, but the reverse is the fact. Although held down by four 1-in. bolts, out of three crossings (forty-eight centers) not one has remained tight. The cause is plain: To reduce the amount of manganese metal the bearing area of the center has been corrugated, permitting peening action to such an extent that the light lugs at *CC* bend under the raising action. The center begins to pump and then nothing is left to do to save the crossing but to renew the centers and await the next loosening, for a center once loosened on account of peening can never be made permanently tight.

The writer is familiar with the construction of the partly machined and completely machined types, although he has had no experience in their up-keep. He has no doubt that a greater number will remain tight than in the case of the all-babbitted center, for the reason that more care has been given to the bolting. He does not believe, however, that renewals can be made permanent unless the work is followed very closely, for if the bearing surface is allowed to become worn, nothing is left to do but to make a complete renewal.

Equipment Defects—Control Apparatus and Connections—VI

BY C. W. SQUIER, E.E.

Increased Size of Motors for Rheostatic Braking.—The question is often asked as to how much it is necessary to increase the size of the motors when they are used for rheostatic braking in addition to propelling the car. Of course, this will vary with the service, but to illustrate how rheostatic braking may affect the size of the motors from a heating standpoint I have shown in Fig. 15 a speed-time curve and a curve plotted from the squares of the instantaneous values of current per motor for a car loaded weighing 14.75 tons, making a schedule speed of 9 m.p.h. with ten stops of eight seconds each per mile. The initial acceleration is taken as 1.6 m.p.h.p.s. and the average rate of braking as 1.5 m.p.h.p.s. The amount of heating of the motors in service is determined by the square root of the mean square motor current and the average voltage on the motors. The value of this average or mean square current is determined from this curve by dividing the area under the curve in (amperes per motor)^2 — seconds by the time of the run, including the stop in seconds, and taking the square root of this value. In this case it is found that a mean square current of 42.4 amp per motor is required to propel the car, and as the motors are also used for producing the stop by rheostatic braking, this average current will be increased to 54.4 amp per motor, or an increase of 28.3 per cent in the value of the heating current.

In deciding on a motor to do the work as outlined hereinbefore it is found on referring to the rating for several sizes of standard motors that a 55-hp motor has a continuous rating of 46 amp. This motor would be large enough for this service provided rheostatic braking was not used, but with rheostatic braking we should have to choose a 75-hp motor which has a continuous rating of 55 amp. It is thus seen that in this particular case the motors have to be 36 per cent larger when used with rheostatic braking than if they were used only to propel the car.

High Voltages and Skidding of Wheels.—Motors used for braking are also subjected to greater voltage peaks than would otherwise be the case. In some tests peaks as high as 2000 volts were recorded while using the motors to furnish power for electric brakes. Also with the car traveling at a high rate of speed, the motorman when required to make an emergency stop will be quite likely to throw this controller handle right around to the last braking notch, with the object of stopping the car as rapidly as possible. This results in a very high current in the braking circuit and in the development of an enormous retarding torque by the motor armatures so that the wheels are often badly skidded. To prevent these troubles the British Westinghouse Electric & Manufacturing Company has developed a device for automatically shunting the field current of the motors when certain predetermined limits are reached, and by this means the voltage generated by the motors is kept down to approximately that for which the machines are wound. This improvement effectually prevents the skidding which is produced in service when the motors act as generators.

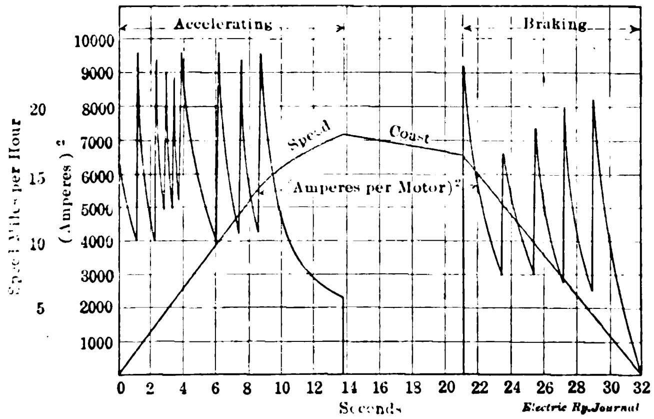


FIG. 15—SPEED-TIME AND POWER CURVES FOR A CAR USING RHEOSTATIC BRAKING

Fig. 16 shows the connections for electric braking with this voltage regulator incorporated. Two solenoid switches *A* and *B* are connected in the braking circuit in series with the magnetic brake coils, and these switches close when the current in the brake circuit exceeds certain predetermined values. The windings of these solenoids are different so that switch *A* will close with less current through the circuit than is required to operate *B*. When these switches close they connect the resistances R_1 and R_2 in parallel with the fields of the motors. R_1 usually consists of about 0.4 ohm and R_2 of 0.2 ohm, but generally enough grids are provided to adjust the resistance to meet the service requirements. The switches themselves can also be adjusted to close at any required current merely by screwing or unscrewing a movable portion of the solenoid core, thereby altering the air gap for the magnetic circuit of the solenoid switches. This device is satisfactorily used on the Glasgow Corporation Tramways and the London County Council Tramways in connection with their electric brakes.

The amount of regulating resistance required when the motors are used for electric braking is appreciably more than is required for ordinary operation. Eight to 9 ohms are commonly used for equipments with electric brakes, while without electric brakes 4 to 5 ohms would be sufficient to give a good resistance stepping.

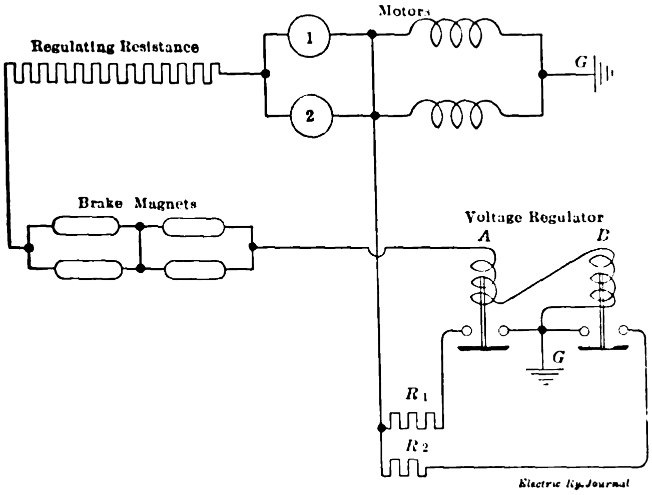


FIG. 16—CONNECTIONS FOR ELECTRIC BRAKING WITH VOLTAGE REGULATION

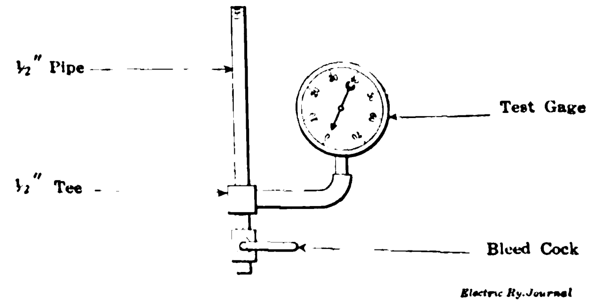
The General Electric Company's Type B controllers are specially arranged to care for electric braking. The power circuit connections of these controllers are the same as for that company's Type K controllers.

Device for Testing Air Gage and Governor

BY R. H. PARSONS, ELECTRICAL FOREMAN

A simple outfit consisting of a small test gage, bleed cock and a little pipe will be found to be of great value in testing the air gages and governor of a car. The ½-in pipe shown in the accompanying sketch is made to screw into the drain cock of the main air reservoir. After the attachment is made the drain cock can be opened and the air pressure will be indicated on the test gage.

A man who uses this device can check up the reading of the test gage with the platform gages without removing the latter, unless they are found to be incorrect. With the same means he can, from his testing station, bleed his main reservoir to check up the cutting-in and cutting-out points of the governor. Many cars are equipped with the governor beneath the car. In that case one man has the whole situation before him and can check and set his governor easily and accurately. The gage used should be of a high grade and should be tested at least once a week to insure accuracy.



DEVICE FOR TESTING AIR GAGES AND GOVERNORS

Standard Aspects for Contact Signals

BY H. R. STADELMAN

No doubt all those who attended the Atlantic City Convention noticed the many exhibits showing American Electric Railway Association's standard signal aspect, and since the Street Railway Signal Company was the first manufacturer to use this aspect, the writer wishes to explain some of the reasons that led to its adoption by that company, aside from the important fact that it had been designed and recommended by the block-signal committee of the association.

Red, the indication for "stop" or "block occupied," is the most conspicuous of all colors and attracts the eye more quickly than any other. It is not dazzling, nor does it dim the sight by over-brilliancy. Because it stands out boldly against all surrounding colors, no matter what the atmospheric conditions may be, it is the safest color to use as a danger signal.

The use of yellow in combination with red for a permissive indication, or "proceed with caution," is generally recommended by signal experts and color scientists owing to the prevalence of color blindness with regard to red, so that yellow in combination with red becomes a positive, distinctive, unmistakable indication.

Green has become generally known as a clear indication. There are several reasons for this, primarily because it marks a positive difference between the signal light and existing neighboring lights, the latter being white in nearly all cases. Then, too, green is nature's own color, and is therefore a safe color for the eye to rest upon for a long time.

In railroad rules a dark signal is considered to be a danger signal, and a motorman coming up to a signal that displays no indication should bring his car to a stop and be governed by his operating rules. If the indication is green as the motorman approaches the signal, and it changes to red alone as he passes into the block, the contrast will be so great that he cannot help realizing that he should stop. If the indication changes to red with a staggered yellow, the indication is obviously proceed. For following movements in which the yellow changes to the opposite side of the red when the car enters the block, the red acts as a finder or marker, and the motorman has a positive indication that he has operated his signals.

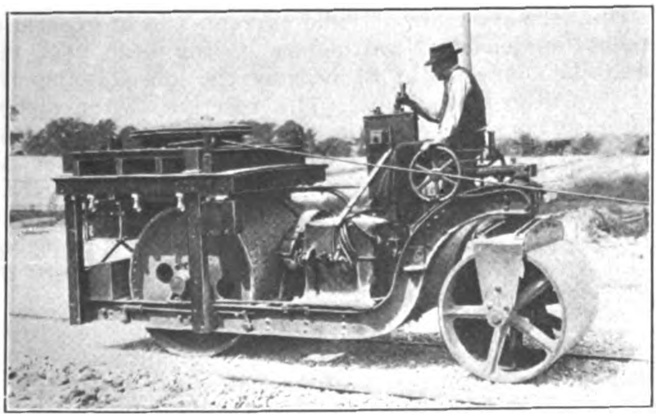
With all-light signals it is true that, if a light burns out, there is no provision for an indication, but the lamps in the all-light signal may be installed, either two in multiple, or on a reserve relay, so that the probability of both being out at the same time is very remote. The writer wishes to take exception here to any claims that an electric lamp behind a lens is an inefficient indication. In the first place, a 110-volt, 35-watt lamp behind a 6⅜-in. green lens with efficient sunshades can be readily seen under most adverse conditions at a distance of 1200 ft., and when it is behind a red lens it can be seen 1500 ft. away. In fact, ranges of visibility of 1800 ft. and 2000 ft. respectively have been publicly advertised. In the second place, in actual tests on the Pennsylvania Railroad light indications could be seen when the semaphores were invisible owing to the distance, and because of this test this road is equipping its new electric division with all-light signals. With efficient sunshades no phantom indications or lights occur.

It is true that a semaphore stands out from its mast clearly, but, in spite of this, steam railroads have found it necessary to shape the blades differently for different functions, a dovetail for caution, and a square or half round for stop, and some railroads do not even change the color of the blades at all, letting only the shape of the ends signify their meaning. When the writer was a repairman at a prominent tower on the Pennsylvania Railroad he had instructions to keep his signal lamps burning all the time because on a dark day the blades were not discernible. In consequence, the same indication for both day and night seems to be a thoroughly practical economy.

Electrically-Driven Road Roller at St. Louis

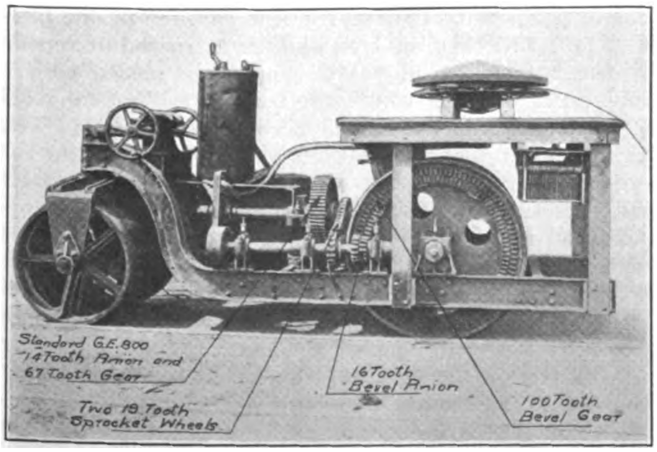
Through the courtesy of Richard McCulloch, vice-president and general manager, the following particulars are available on an electrically driven road roller which the United Railways of St. Louis has been using during the season of 1914.

A five-ton roller without steam engine, boiler or water tank was purchased from the Iroquois Engineering Works. This roller was equipped with a GE-800 railway motor geared down as indicated in one of the illustrations. The reduction in gearing is such that when the motor is running at its maximum speed the roller makes about 4 m.p.h. Current is conveyed to the motor through a duplex wire, one going to the trolley and the other to a contact on the rail. This duplex wire is kept taut by means of an automatic reel mounted on top of the roller. The roller is electrically illuminated besides being equipped with the usual oil signal lamps.



ELECTRICALLY-DRIVEN ROLLER RUNNING OVER MACADAM

The machine is used principally for rolling granite, brick or creosoted wooden block paving. It has also been used for rolling trenches in advance of track laying, although a heavier roller would be more satisfactory for this purpose. When rolling paving it requires, for its operation, a maximum of about 15 hp. It is simple to operate, an ordinary laborer being instructed in its operation within a few days. The electrically-driven roller has the following advantages over the steam-driven roller: No skilled mechanic is required for its operation; it is ready to run at a moment's notice; it requires no supplies, such as coal and water; it will not freeze up in the winter and it makes no dense smoke or noise on the street.



REDUCTION GEARING OF ROLLER EXPOSED

Auxiliary Contact Wire of Steel — Long-Life Pantograph Shoe

Excessive wear in the No. 0000 copper trolley wire installed on the 6600-volt, single-phase lines of the Chicago, Lake Shore & South Bend Railway, Michigan City, Ind., made it necessary to install a No. 0000 steel auxiliary contact wire during the past summer. This wire was suspended 1¾ in. below the copper wire on 2-in. duplex clips. The old copper trolley wire had been in service more than seven years and would soon have required replacement. At the present time approximately 103 miles of steel wire is in service. It is used exclusively where the trolley wire is supported on mast-arm construction, but it is planned to test this construction also on span-wire suspension.

Following this change from copper to steel trolley wire, it was found that the greater rate of wear had been transferred from the wire to the No. 12-gage galvanized iron sliding pantograph shoes. In fact, it was possible to obtain only 2500 miles from each shoe before renewal was necessary. In seeking a remedy for this difficulty two pieces of half-oval mild steel, ⅜ in. x 1½ in. in section, were substituted for the 12-gage galvanized iron. This change has raised the useful life of the shoe to 9000 miles.

The two sections of half-oval steel 36 in. long are fastened with four rivets to the pantograph shoe frame which is made of ¾-in. x ¾-in. angles. In order to permit the steel contact wire to shift from these contact shoes to the frame and back again without catching, the ends of the half-oval pieces are given a long taper at each end. The average cost of the new shoes is approximately 15 cents for material and 30 cents for labor.

Electric Railways of Japan in 1912

The Japanese Ministry of Finance has issued the following data on the electric railways of Japan for the calendar year 1912:

The country possessed forty-four privately-owned installations totaling 432 miles of route, or 692 miles of single track, the construction cost of which was $44,295,000. About 133 miles of track were under construction, and in addition, thirty corporations with a combined capitalization of $14,255,000 had not yet begun operation. The municipally-owned systems, which are at Osaka, Tokyo and Kyoto, have built 116 miles of route or 209 miles of single track for $124,764,750, with another 66 miles of route under way. The operating statistics of the privately and publicly owned lines are presented in the accompanying table.

TABLE SHOWING STATISTICS OF ELECTRIC RAILWAYS IN JAPAN FOR 1912

	Privately Owned Lines	Municipal Lines of— Osaka	Tokyo	Kyoto	Tota
Systems	44	1	1	1	47
Route mileage	442	23	72	21	558
Single track mileage	635	45	143	21	844
Capitalization, yen*	89,180,000	26,079,359	82,796,100	10,379,212	208,434,671
Cars	1,392	413	1,211	119	3,135
Passengers	124,512,924	97,491,378	225,395,343	11,389,077	458,788,722
Passenger earnings, yen*	10,558,772	3,454,677	8,709,922	388,030	23,111,401
Other earnings, yen*	1,143,346	18,472	663,223	991	1,826,032
Operating expenses, yen*	5,573,621	1,779,003	3,856,624	280,549	11,489,797
Other expenses, yen*	1,189,813	18,890	55,997	3,497	1,268,197
Surplus, yen*	4,938,684	1,675,256	5,460,524	104,975	12,179,439

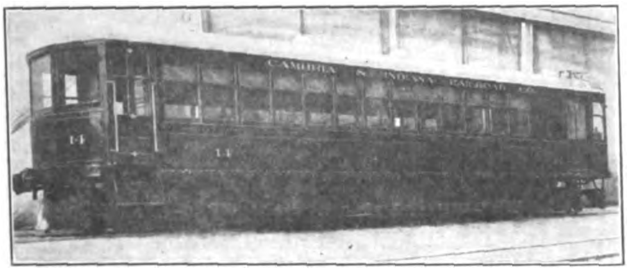
*A yen is worth approximately 50 cents.

Large Storage Battery Car for Cambria & Indiana Railway

A new 50-ft. storage-battery car, which marks an advance in meeting more effectively the requirements of service on light service branch lines of steam railroads, was put in operation on Dec. 9 on the 12-mile Colver Heights-Rexis line of the Cambria & Indiana Railroad, Colver, Pa.

By means of steam locomotives this railroad handles a large coal business. The lightness of passenger traffic on the line, however, has favored storage-battery propulsion, and for some time a battery car has been operated over the Colver Heights-Rexis section, making three round trips a day, with five intermediate stops per trip. With the acquisition of the new equipment the railroad may extend electric service to the remainder of the road, as well as to a proposed 4-mile extension for which a third car would be used.

The car is equipped to meet the peculiar feature of operation found on the 2¼ miles between Colver Heights and Colver, where a constant 5 per cent grade exists. The batteries are powerful enough in themselves to propel the new car up the grade, but as this would greatly reduce the possible mileage on one charge, 600-volt energy is taken on this section from an overhead wire. To delay corrosion from the exhaust gases of steam locomotives the trolley wire is offset. The trolley board, of course, is also offset.



CAMBRIA & INDIANA CAR—VIEW SHOWING POWERFUL STORAGE-BATTERY EQUIPMENT

The new Cambria & Indiana car has a much greater operating capacity than its predecessor, which was described in the Electric Railway Journal of Oct. 4, 1913. The length of the new car is 50 ft. or 15 ft. more than the old car, while its total weight, including trucks and battery equipment, is about 29.5 tons, as against 18 tons, the average loaded weight of the older car. The difference in weight is due mainly to the increased length of the car and its greater number of cells. The electrical equipment of the new car consists of 240 Edison A-12 cells for power and ten A-12 cells for lighting purposes, supplied by the Railway Storage Battery Car Company, and four Westinghouse 25-hp motors and control. The battery equipment weighs 14,000 lb. The batteries have a range of 130 miles on level track on a normal seven and one-half-hour charge, twice the distance possible under the same conditions with the older car. The maximum speed of the new car is 35 m.p.h.

The car body is mounted on Brill 69-E double-truck equipments with M.C.B. 33-in. wheels. These trucks are furnished with S.K.F. self-aligning ball-bearings. The car body, which was built by The J. G. Brill Company, is of steel up to the belt rail and has steel posts. It has a 32-ft. passenger compartment, a baggage compartment, space for smokers, partitioned section for the motorman and a toilet compartment. The total seating capacity is fifty-two. The car is heated by the Peter Smith forced hot-air system.

Reactive Factor Meters

Although instructed to keep the power factor of the circuits over which they have control as near unity as possible, switchboard attendants often maintain a power factor of 1 per cent or 2 per cent less than unity as being good and do not try to improve it. But computation and tests show that at 98½ per cent power factor the armature copper loss in the leading tap coils of a rotary is almost half again as much as at 100 per cent power factor. Under heavy load this is often enough to cause trouble in the tap coils. Also, the average heating in all the armature coils is about a quarter again as much at 98½ per cent power factor as at 100 per cent. The capacity of the rotary is therefore decreased considerably.

REACTIVE FACTOR METER

The measurements of "idle currents" is in general a recent development, wattmeters having been used recently so connected as to measure the idle volt-ampere, or "wattless component." The reactive factor meter, however, corresponds in its action to the power factor meter and bears the same relation to the latter that the "wattless component meter" bears to the "wattmeter." This meter indicates the sine of the angle of lag or lead instead of the cosine, as in the power factor meter. Unity power factor is, therefore, indicated as zero reactive factor.

If instead of the power factor meter there is on the circuit a reactive factor meter, a condition of 98½ per cent power factor is indicated as 17½ per cent reactive factor. The attendant consequently will be more on the alert and will be more likely to improve it. Power factor and reactive factor are equal at the value 70.7 per cent. At higher power factor, the load conditions are more conspicuously indicated on the reactive factor scale. At lower power factors the reverse is true. Reactive factor meters are therefore recommended for use only on circuits operating normally at power factors close to unity and which never fall below 70 per cent.

The Westinghouse Electric & Manufacturing Company's reactive factor meter, which has been recently introduced, operates on the rotating field principle like its power factor meters. A rotating field is produced in angularly placed coils connected in shunt with the metered circuits, one for each phase of the system in the case of polyphase meters. In their field is provided a movable iron vane or armature, magnetized by a stationary coil the current of which is proportional and in phase with that of the line current in one phase of the circuit. As the iron vane is attracted or repelled by the rotating field of the angularly placed coils, it takes up a position where the zero of the rotating field occurs at the same instant as zero of its own field. Thus its position indicates the phase angle between the voltage and current of the circuit. The reactive factor meter is then calibrated to read the sine of the angle indicated while the power factor meter is calibrated to read the cosine.

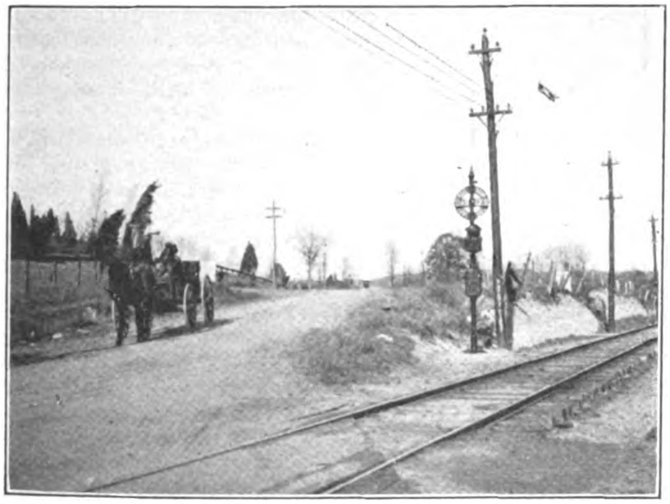
In the three-phase meter the rotating field is produced by three coils spaced 60 deg. apart; in the two-phase meter by two coils spaced 90 deg.; in the single-phase meter the rotating field is produced by means of a split-phase winding connected to the voltage circuit.

The meters are inclosed in round dust-proof cases, the type SI being 7 in. and the type TI being 9 in. in diameter. The entire pointer is visible so that readings are easily made from a distance. No springs are used to control the movement or carry current, nor are there any moving coils, the construction thus being extremely simple. The meters are not influenced by external fields.

Highway-Crossing Protection by Trolley Contact Control

As instances of grade-crossing protection with control exactly adapted to the operating conditions some installations of Nachod highway-crossing signals on the Washington-Virginia Railway are interesting. In one case, on double track, the headway is thirty minutes during the day and fifteen minutes in the evenings. Trains are run in sections, as many as four or five cars following each other closely. The highway crosses at right angles and at a considerable grade, but the view is obscured by trees, brush and high banks on three of the corners.

The apparatus installed at this crossing consists of an iron pole with the sign, bell and relay attached, and the control box a part of the pole. The starting contactors, operated by the trolley wheels, are placed about eight poles from the highway in each direction on the corresponding track, and stopping contactors are located at the highway, there being four contactors in all. Flashing pilot lights are located three poles ahead of each starting contactor to indicate to the motorman that the bell is in operation. The control circuit, bell and lights are all tapped from the trolley wire, and no other source of power is used. The speed reaches a maximum of about 30 m.p.h. under the contactors, the bell ringing from twenty seconds to twenty-five seconds before the car reaches the crossing. The warning indication is given by a 12-in. bell, and a transparency also flashes the word "Danger," a connection from one of the series of lights in this transparency being run each way to the pilot light. Consequently, when the car passes the starting contactor the action of the bell is made apparent to the motorman by the flashing of the pilot light. This use of a flashing light as a "return indication" of the actual ringing of the bell has been favorably received by the railways, as it overcomes the objectionable condition of requiring the motorman to proceed upon only the assumption that the bell is ringing.



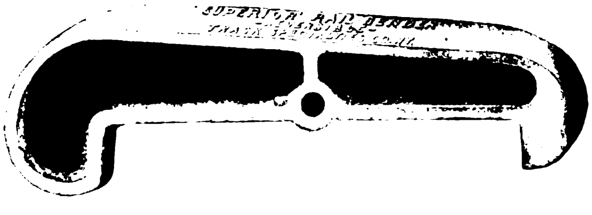
HIGHWAY CROSSING PROTECTION—CROSSING SIGNAL WITH ANSWER-BACK PILOT LIGHT ON WASHINGTON-VIRGINIA RAILWAY

The transparency contains six 23-watt 110-volt Mazda lamps shunted by resistances, so that a failure of one lamp does not open the circuit of the remainder. The flashing of the lights is produced by a contact maker on the armature of the bell clapper. Because cars follow each other so closely over the crossing, a car-counting control was provided, so that the bell would not be cut out at the crossing until all the cars that have passed the starting contactor have also passed the crossing.

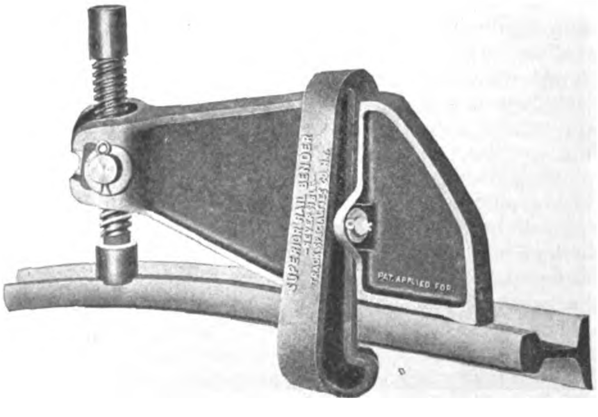
In another installation for a single-track crossing of a main highway where funerals and tourists' sightseeing cars pass frequently, cars follow each other closely at certain times of the day, passing every fifteen minutes. The starting contactors in this installation are about nine spans away from the highway, three contactors being used. The control in this case is both car-counting and directional, and the frequency of cars at this point involves the ringing of the bell for about one hour in the twenty-four. The bell and relay unit with bracket is mounted on an existing pole, and a separate danger transparency is hung by a bracket on the same pole. This transparency is novel as it consists of a sheet-iron sign with letters 12 in. high which are composed of small lens-like glasses with many facets, the letters showing white on a black background. The subdivision of the glass into a multiplicity of small units is a protection against malicious breakage and, like the military mast on a warship, would require many blows to demolish it.

Portable Rail Bender

A cast-steel rail bender which weighs but 150 lb. has lately been devised by the Track Specialties Company, New York. As shown in the accompanying illustrations, the principal feature is the reversible hook and swivel collar through which the screw passes. This swivel collar maintains the screw perpendicular to the rail at all times. Merely by reversing the yoke the same bender may be used either as a right-hand or left-hand tool, a feature which is of particular service at the heels of frogs or at switches. The bender is sold under the trade name of "Superior."



REVERSIBLE SWIVEL COLLAR



COMPLETE RAIL BENDER IN SERVICE

The Philippine Board of Public Utilities Commissioners has decided that it has no jurisdiction over the so-called public utilities owned by a province or a municipality.

News of Electric Railways

I. C. C. REPORT

Recommendations of Commission and Parts of Report of General Interest to Electric Railways Reproduced

The twenty-eighth annual report of the Interstate Commerce Commission to Congress, dated Dec. 1, 1914, contains these recommendations:

That, for the purpose of uniformity and to prevent injustice, there should be provided by law one period—in our opinion three years—for the beginning of all actions relating to transportation charges subject to the act.

That there should be appropriate and adequate legislation upon the subject of control over railway capitalization.

That there should be legislation to make explicit and certain the authority of the commission to examine all correspondence, files, indexes, and other papers and documents retained by carriers subject to the act.

That the penalty for violations of the hours-of-service act be changed to a fixed and definite sum, or that a minimum penalty of $100 be established instead of the penalty of "not to exceed $500," as now provided.

That the use of steel cars in passenger-train service should be required, and that the use in passenger trains of wooden cars between or in front of steel cars should be prohibited.

The total expenditures of the commission for the year ended June 30, 1914, were $2,209,627.

Referring to the division of carriers' accounts the commission says in part:

"At the date of the last report a general revision of the accounting classifications for steam railways, electric railways, and express companies was in progress. This work has been completed and the revised classifications were made effective July 1, 1914.

"This general revision has been in the direction of development rather than change in principle. Additional accounts have been provided, instructions have been amplified, item lists extended, and the terminology simplified and made more descriptive. The grouping of accounts has also been so changed as better to show their relations. In the classifications of operating expenses for steam railways, electric railways, and express companies accounts have been provided for depreciation upon several classes of fixed property as well as equipment. The carriers are required to report to the commission the bases used by them in calculating depreciation. The revenues and expenses of certain auxiliary, or 'outside' operations of steam railways, heretofore shown separately in income account, are now combined with those of the main operations to which they are incidental, although they are still chargeable to separate primary accounts. The increasing use of electricity as an auxiliary in the operation of steam railways has been recognized by the addition of several new accounts.

"The system of accounts for electric railways has been completed by the addition of classifications of income, profit and loss, and balance-sheet accounts, and that of express companies by the addition of income and profit and loss accounts. The bulletin of accounting decisions under the former classifications for steam railways will be revised to conform to the new classifications and will be issued with additional cases. A similar revision of decisions under the electric railway classifications is in preparation.

"While much progress has been made during recent years in the practice of accounting by carriers, it is necessary to bear in mind that much remains to be done. A correct statement of assets and liabilities is not reached through recording merely the receipts and payments of money. So far as possible, account should be taken of the changes in values as they progress. Depreciation is not yet receiving adequate treatment by carriers. Repair expenses, which should be current, do not always appear in the period in which they accrue.

"An important administrative change in this division has been made since our last report. When organized, and for two years thereafter, the entire force of the division had its headquarters at Washington. On July 1, 1910, a branch office was opened at Chicago. During the past year additional branch offices have been established at New York, Philadelphia, Pittsburgh, St. Paul, St. Louis and San Francisco. Another will be opened at New Orleans. A force of resident examiners is attached to each branch office. An advantage expected to accrue from this change is increased efficiency through better acquaintance with local conditions at important railroad centers and in their vicinity."

In referring to judicial interpretation of the safety appliance act the commission says:

"In Spokane & Inland Empire Railroad v. United States, 210 Feb., 243, the Circuit Court of Appeals for the Ninth Circuit, affirming the judgment of the District Court for the Eastern District of Washington, held that the words 'used on street railways' as employed in the act of 1893, exempting such cars from the operation of the statute, do not include cars of an interurban line engaged in interstate commerce, even though they may be run for a short distance over the street railway tracks in order to reach a terminal in the center of a city."

Sixty-three train accidents were investigated by the Interstate Commerce Commission during the year ended June 30, 1914, forty being collisions and twenty-three derailments. The collisions were responsible for 108 deaths and 1162 injuries and the derailments caused 61 deaths and 972 injuries. The report says:

"Collisions caused by improper flagging continue to be a prominent feature of these investigations. Eight of the forty collisions investigated were due to this cause. In these eight collisions forty-five persons were killed and 286 injured. Attention has been called to the indefiniteness of the flagging rule in force on many roads, and to the practice of employing inexperienced men as flagmen." In one collision, due to improper flagging, which caused fourteen deaths and 294 injuries, the flagman at fault had been employed only twenty-four days and was entirely without previous railroad experience.

The record of accidents investigated shows a considerable decrease in the number of collisions due to the failure of enginemen to obey the indications of block signals. There were but two collisions of this nature during the past year, as against seven the previous year. The enginemen at fault were trusted employees of long experience and no adequate explanation can be given for these lapses from duty by trusted and competent men, who in many cases suffer death as a consequence of their error. It is to be hoped that the investigations authorized by the Congress may lead to the development and use of some system of automatic train control to be used in connection with existing signal systems which will eliminate this class of accidents.

The report adds: "The inherent weakness of the train-order system continues to manifest itself as a prominent feature of the accident record." Seven collisions were caused by trains encroaching upon the time of superior class trains and six were caused by the failure of trainmen to obey orders. On most roads where the train-order system is used the rules require that an order establishing a meeting point for opposing trains shall be sent simultaneously to all the trains involved, and also, whenever practicable, to the operator at the designated meeting point, thus providing a check against the possibility of trainmen forgetting or misunderstanding the order. This check, provided by the so-called "middle order," is an important element of safety in the movement of trains on single-track lines, but on some roads the rule which requires it to be used is not observed. Two of the collisions herein discussed, in which five persons were killed and three injured, could have been prevented by an observance of the rule, and in both cases the placing of a middle order was practicable.

In the report attention is again directed to the need of legislation requiring the standardization of operating rules. The efforts of the American Railway Association to standardize operating rules, while commendable, have not been wholly effective, for the reason that the association has no power to compel individual roads to observe its recommendations. The situation is similar to that which led to the passage of federal legislation enforcing uniformity in the application of safety appliances to cars and engines.

In previous annual reports the commission has called attention to bad conditions of track and roadway. No material improvement in such conditions is noticeable. Six of the twenty-three derailments investigated were either directly caused or greatly contributed to by bad track, and were responsible for 54 per cent of the deaths and more than 50 per cent of the injuries due to derailments from all causes. In at least three of these derailments, occurring in widely separated sections of the country, the track conditions were absolutely unsafe for the operation of trains at speed. Investigations of accidents caused by broken rails and fractured car wheels have confirmed the need for further investigation to determine with accuracy the stresses to which rails, car wheels and track structures are subjected under existing conditions of service, and to establish safe working limits for their use. The commission also renews the recommendation contained in its last annual report respecting legislation requiring the use of steel cars.

In connection with the authorization to investigate the use and necessity of block signal systems, appliances for the automatic control of railway trains and any devices intended to promote the safety of railway operation, an engineer-physicist and a signal engineer have been employed, and other employees of the commission have been also assigned to this work. Information has been received regarding experiments with train-control devices on several railroads, and in some instances official tests have been made. The total length of railroad line operated under the block system on Jan. 1, 1914, was 86,736.9 miles. The increase during the year 1913 was 2787.1 miles In previous reports the commission has recommended that railroads be required to adopt the block system.

The report shows the extent to which inspection of locomotive boilers has been carried out. In 1912, 74,234 boilers were inspected; in 1913 the number was increased to 90,346, and in 1914 it reached 92,716. During 1914 also 2141 defects to locomotives for which existing laws do not provide a remedy, 1155 of which were defective wheels, were reported by inspectors and brought to the attention of the railroad officials, with request that proper repairs be made.

In connection with the work of appraising the railroads of the country the report stated that the eight parties now at work in each district cover an aggregate of from 1500 to 1700 miles per month. It is believed that these same parties, by reason of increase in efficiency with experience, will soon be able to cover an appreciably increased mileage. It seems advisable not to increase the present force until methods of computing and assembling have been so far perfected that the result of these surveys can be placed upon the assembly sheets as fast as they are made. The preparation of inventories of telegraph and telephone lines has also been begun.

The commission says that beginning Jan. 1 next the most economical conduct of the work of valuation will probably require the increase of the field parties to from sixteen to twenty in each district. The opinion is expressed that the present general organization should be able to suppor twenty field parties, the cost decreasing in proportion as surveying parties can be multiplied without increase in overhead expenses.

KANSAS ARBITRATION

Board Decides Against Men, Except as Regards Sliding Scale—Award Lower than Company Offer

The board of arbitration selected to adjust the wage scale on the Joplin & Pittsburg Railway, Pittsburg, Kan., made its report on Dec. 5, to the effect that only the wages of platform men are to be readjusted. Following the settlement of the strike on the road on Sept. 24, after eighty days of idleness, an agreement was signed by the representatives of the local union and by officers of the company covering all points of difference except the wage scale. This matter was by agreement submitted to arbitration, the arbitration decision to be final and to be embodied in the contract. James A. Cable was selected by the local Amalgamated Association men and John M. Kinkel by the company as arbitrators. Both are members of the Public Utilities Commission of Kansas. They requested Frank A. Wightman of the Public Service Commission of Missouri to act with them, the conditions of the previous agreement that the board must be constituted of members of these two state commissions being thereby complied with. The board heard testimony on Dec. 3 at Pittsburg. One paragraph says:

"The board of arbitration unanimously finds that sufficient facts were not presented to justify or warrant at this time a change in the wage scale, except that the so-called 'merit system' or 'sliding scale' seems desirable, and should wherever possible be instituted, for the reason that it has a tendency to promote efficiency of service on the part of the employees."

The finding follows:

"It is the unanimous judgment of this board of arbitration that the wage scale now in force and effect on the Joplin & Pittsburg Railway be continued with the further provision that motormen and conductors (commonly known as 'platform men') should, after five years of continuous service, be paid at the rate of 27 cents an hour."

Before the strike the company offered the men 26 cents an hour for the first year and 27 cents thereafter. The men at first demanded 40 cents, but reduced the demand to 33⅓ cents. Since the resumption of traffic, the rate paid has been 25 cents an hour, with the provision that a platform man after one year of service is to receive 26 cents. The award adds 1 cent an hour after five years' service. Thus the award is considerably under the offer made by the company before the strike, the offered figure of 27 cents after the first year, made by the company, not being reached under the arbitration decision until after five years, and the offered figure of 26 cents an hour made by the company for the first year coming under the award with the second year.

The other sections of the wage schedule, which remains unchanged, are as follows: Blacksmiths, 33 cents an hour; machinists, 35 cents; carpenters, first class, 33 cents; carpenters, second class, 28 cents; painters, 33 cents; painter's helpers, 20 cents; pitmen, 27 cents; pitmen's helpers, 20 cents; armature winders, 35 cents; car cleaners, 20 cents; head-light, tail-light and telephone men, 25 cents.

MASSACHUSETTS STREET RAILWAY ASSOCIATION

Account of December Meeting and of Presentation to Secretary Clark

At the regular monthly meeting of the Massachusetts Street Railway Association at Boston on Dec. 16 P. F. Sullivan, president of the Bay State Street Railway, said that in his opinion the recent Middlesex & Boston rate decision marked a turning point in electric railway history and opened the way toward better days for the industry. The pronouncement of the board allowing 20 per cent of gross income as a tentative figure covering maintenance and depreciation was of great interest. If such an allowance had been made by the Massachusetts street railways last year there would have been required $600,000 in excess of the amount paid out in maintenance alone. The companies actually paid 17.5 per cent, although 25 per cent is the actual requirement in many cases. Great difference existed among companies, and to reproduce the property in twenty years would require in one case a 15 per cent and in another a 40 per cent maintenance and depreciation allowance. The importance of studying each case upon its merits was emphasized by Mr. Sullivan in closing his formal remarks, after which he turned unexpectedly to Secretary Charles S. Clark and on behalf of the association presented him with a handsome gold watch appropriately encased in a Christmas stocking as a mark of appreciation. Before the secretary could respond a second gift was brought forth in the form of a hand-illustrated book depicting in verse and sketches various episodes in the career of the astonished guest of honor, and one after the other past-presidents, E. C. Foster. John R. Graham, Francis H. Dewey, E. P. Shaw and Robert S. Goff, spoke of the able and loyal service rendered by Secretary Clark. On behalf of Stone & Webster, Edward F. Flynn, Boston, offered congratulations and good wishes, and after the guest of honor made a characteristic response the meeting adjourned.

CLEVELAND NEAR-SIDE ORDINANCE DEFEATED

The Meyers ordinance, requiring cars to stop on the near side of the street, was defeated in the City Council at Cleveland, Ohio, on Dec. 14. At the same meeting Councilman Dittman submitted an ordinance providing that all cars leaving the Public Square shall be operated as pay-as-you-leave cars and all cars going toward the Square shall be operated as pay-as-you-enter cars. This will make the system uniform on all lines reaching the Square. Heretofore changes have been made frequently and much confusion resulted.

The Warner Road extension of the Cleveland Railway tracks from the intersection of Miles Avenue and Broadway to Bancroft Avenue was put in operation on Dec. 15. The through 105th Street cars will now use this track instead of making a loop that has not been satisfactory in the past. The Harvard-Denison line, which terminated at Broadway, will soon be completed on Harvard Avenue to East Ninety-third Street.

Legislation is pending in Council providing for the purchase of the North Randall line by the Cleveland Railway. This is the line that reaches the race tracks.

It is possible that plans for building tracks on Euclid Avenue between East Twenty-second and East Fortieth Streets, known as "Millionaires' Row," may meet with opposition from members of Council who feel that this additional expense should not be incurred just now. Because of the opposition of wealthy residents along that section of the street the company was never able to secure the right-of-way for tracks and was forced to run on Prospect Avenue for that distance, but the shift in the residence section has made it possible, both company and city officials believe, to secure consents of property owners at this time.

Judge Leighley of the Common Pleas Court has set aside the verdict of the jury which recently found George De Graff guilty of obtaining $500 from the Cleveland Railway on false pretenses and allowed the man to plead guilty to a minor offense. The cases against Dr. C. D. Treister and Dr. Sidney J. Havre, who were indicted with him, have been dismissed.

SUBWAY ORDINANCE PASSED IN CLEVELAND

The City Council of Cleveland, Ohio, passed the amended ordinance of the Cleveland Rapid Transit Railway on Dec. 14. W. R. Hopkins, president of the company, stated that the Ohio Public Utilities Commission will be asked to authorize an issue of bonds to the amount of $12,000,000 or $15,000,000, from the proceeds of which the first two lines of the proposed subway system will be built. The amended ordinance gives the company twelve months within which to begin the construction work and the first line must be completed within thirty months. It allows the use of larger tubes than were contemplated originally and increases from $350,000 to $550,000 per mile of single track the fixed amount the city shall pay in case municipal ownership of the line is decided upon.

LOS ANGELES FRANCHISES

Eleven Grants Expire in Los Angeles at Different Periods in Next Four Years

The Board of Public Utilities of Los Angeles has recently made an investigation of the franchises held by the local street railway companies and reports that between the present time and Jan. 1, 1919, eleven street railway franchises, covering approximately 9.45 miles of track within the city limits, will expire. The franchises held by the Los Angeles Railway Corporation and their dates of expiration are as follows: Temple Street, from Spring to Hoover, 2.94 miles, July 7, 1915; Maple Avenue, from Seventh to Thirty-second, 1.95 miles, Jan. 28, 1916; Pico Street, from Flower to Hoover, 1 mile, Jan. 28, 1916; Ninth Street, from Lake to Grandview, 7 miles, Nov. 27, 1916; Macy Street, from Mission to Brooklyn, 0.17 mile, April 14, 1917; Fifth Street, from Maple to San Pedro, 0.17 mile, Aug. 27, 1917; Mateo Street, from Palmetto to Eighth, 0.73 mile, Sept. 29, 1918; Santa Fé Avenue, from Ninth to south charter boundary, 0.72 mile, Sept. 29, 1918. Total, 7.75 miles.

The expiring franchises of the Pacific Electric Railway are Sunset Boulevard, from Echo Park to Maltman, 1.59 miles, Dec. 1, 1916; Echo Park Avenue, from Sunset to 600 ft. north of Sunset, 0.11 mile, April 15, 1917; Pasadena Short Line crossing at Macy, Echandia and Lord Streets, Dec. 13, 1918, making a total of 1.70 miles.

The fact that the Temple Street franchise of the Los Angeles Railway Company, from Spring Street to Hoover Street, will expire almost within six months, has given rise to the suggestion that if the city plans to take this line over for municipal ownership the Council should at once define its position in the matter.

"S. O. S." MUNICIPAL OWNERSHIP SIGNAL

After relating briefly the experiences of the Canadian cities of Edmonton and Calgary with municipally-owned electric railways the Seattle *Times* said in an editorial in its issue of Dec. 9:

"By contrast Seattle is in splendid condition, although while Seattle's population has grown fourfold, its debts, on account of municipal ownership and other follies, have increased twelvefold.

"If the municipal ownership theorists in the City Council could have had their way and plunged this city clear in 'to the neck' as is the case at Edmonton, the situation here would be indescribably bad.

"Seattle's bonded debt to-day is $15,420,000; but if the Edmonton per capita rate prevailed here, the total now would be the stupendous figure of $98,784,000—or nearly six times the present total. If Seattle carried Edmonton's per capita municipal railway debt, the obligation on that count alone would be $12,222,000.

"The Canadian towns have sunk into the depths of despair by reason of their ruinous experience.

"Seattle is waking up just in time to save the taxpayers from similar disaster.

"It is proper, therefore, to 'shake down' the municipally-owned car lines, to ferret out the false and fictitious 'dividends' proclaimed regularly by the city lighting plant, and to take warning generally that the fad for control and operation of public utilities is a thing that can be pushed too far.

"In a word, Seattle can catch this fallacy in time to spare the necessity of the 'S. O. S.' for the municipal 'ship of state.'"

SAFETY EXPOSITION IN NEW YORK

The second exposition of safety and sanitation was held at the Grand Central Palace, New York, during the week ended Dec. 19, under the auspices of the American Museum of Safety. The New York Central Railroad occupied a large amount of space with a model of the Empire State Express running at top speed and with slides of its road equipment, methods of operation, and charts showing what that road has accomplished by its campaign of safety in preventing accidents. The Southern Pacific Company and the Union Pacific Railroad had exhibits displaying sections of actual roadbed and block signal equipment operated automatically by electricity. Figures were displayed to show how accidents have been all but eliminated. Accident prevention was the keynote of the exhibit of the Brooklyn Rapid Transit Company, which showed stereopticon and other pictures. Models of the new side-door type of subway cars and stepless cars were shown. Alongside of this exhibit was one by the Brooklyn Institute for Safety. A jury of awards will select the best and most important new devices shown by each industry and will award prizes.

ANNUAL REPORT OF CONNECTICUT COMMISSION

The third annual report of the Public Utilities Commission of Connecticut was submitted to the Governor on Dec. 16. The commission declares that the continued frank and friendly cooperation of all public service companies and the prompt acceptance of suggestions made by the commission, as well as the compliance with orders for the betterment of service or safety of operation, is resulting in an increased efficiency that is highly gratifying to the commission. Attention is again called to the recommendations made in the report for 1912 that there should be enacted "a law which will effectively prohibit the merger or consolidation of public service companies without first obtaining the approval of the public utilities commission."

There are 190 public service companies under the jurisdiction of the commission, twenty-nine electric, two express, thirteen gas, seventeen gas and electric, eight railroad, twenty-two electric railway, three telegraph, ten telephone and eighty-six water companies. Forty-eight petitions of approval of proposed construction or reconstruction of tracks by electric railways have been approved in whole or in part. One hundred and fourteen informal complaints were received, all of which were investigated, and in most cases the conditions complained of were corrected. The details of the report in so far as they relate to the electric railways will be published in the ELECTRIC RAILWAY JOURNAL of Dec. 26.

Annual Report of Transit Commissioner of Philadelphia.—The annual report of A. Merritt Taylor, director of the department of city transit of Philadelphia, Pa., for the current year has just been published. It gives a brief sketch of the organization of the department and outlines the recommendations of the commissioner as to the proposed rapid transit system, previously described in these columns.

New York's Subway Labor Problem.—Owing to the situation caused by the pending litigation involving the constitutionality of the alien labor clause of the State labor law and the recent decision of Judge Newburger, upholding the law, the Public Service Commission for the First District of New York deferred the opening of bids for the construction of Section No. 4 of Routes Nos. 4 and 36, set for Dec. 11, until Dec. 29. Section No. 4 covers that portion of the Broadway subway lying in Seventh Avenue between Fifty-first and Fifty-ninth Streets. The commission began advertising for bids for its construction about three weeks ago.

The Proposed Cleveland, Canton & Akron Terminal Railway.—In order to work out plans for the freight subway under East Fifty-fifth Street, Cleveland, as proposed by O. C. Barber, the Cleveland, Canton & Akron Terminal Railway has been incorporated with a capital stock of $10,000 by W. W. White, Thomas H. Garry, James McSweeney, W. M. Connelly and W. B. Snavely. The present capital is only nominal. The company will first endeavor to secure a franchise, after which the Public Utilities Commission will be asked to allow the issue of securities to construct the road and large coal and ore docks on the lake front.

Chicago Elevated Organizes Club.—About one hundred of the officers and supervisory force of the Chicago (Ill.) Elevated Railways have formed an organization to be known as the Elevated Club. The following officers have been elected: President, H. A. Johnson, master mechanic; vice-president, T. D. Milne, trainmaster; secretary and treasurer, E. L. Smith, power supervisor. The club will hold regular meetings once each month. At these meetings addresses will be made by one of its members or by outside speakers. Following the organization of the club, Peter Junkersfeld, assistant to the vice-president of the Commonwealth Edison Company, Chicago, delivered an illustrated address on power development in and about Chicago.

Subway Suggestion in St. Louis.—Richard McCulloch, vice-president and general manager of the United Railways, St. Louis, Mo., commenting on the initial plans for a subway, considered by the Kiel administration, was quoted recently as follows: "A subway for St. Louis is a big project. A municipal corporation or a private corporation cannot afford to put money into a subway unless it believes from the reports of competent engineers that the probable earnings and service will justify the cost. The United Railways has not employed engineers so far to investigate the feasibility of a subway from this standpoint. City officials have not consulted us on the subject, but we are ready and willing to give city officials any information or assistance we can whenever they decide to take up the question."

Prospects for Increased Power for the I. C. C.—Senator Newlands, of the interstate commerce committee of the Senate, said after a visit to the White House, on Dec. 11, that the Rayburn bill, regulating stock and bond issues of railroads engaged in interstate commerce, had not been abandoned. Senator Newlands said the President was inclined to believe that the Interstate Commerce Commission is overburdened with work at the present time, and that it would be better to let the stock and bonds issue bill go over until next session when a comprehensive measure, increasing the size of the commission and perfecting the machinery of that body so as to handle the additional work, could be presented. Such a bill would probably provide for dividing the work of the commission so as to be handled by three sections, one taking railroad rates, another physical valuation of railroads and the third the issue of securities.

Seattle Reconstruction Costs.—The first of the reports from the heads of city departments regarding the cost of reconstruction of the Seattle, Renton & Southern Railway as a city line have been made to Mayor H. C. Gill of Seattle, Wash. According to M. H. Tiedeman, assistant city engineer, it will cost between $363,000 and $762,000, depending upon the character of the work, to reconstruct the roadbed, install a double track from Dearborn Street to Fifty-seventh Avenue South and put in the necessary street improvements. This estimate does not include the cost of cars. J. D. Ross, superintendent of lighting of the city, estimates that it will cost an additional $150,000 to provide equipment necessary to furnish power to the line from the city plant. New substations will be necessary in Columbia City and an addition will have to be built to the central distributing plant in Seattle. The sale of the property to the city is now pending.

Chicago Merger and Subway Proposals.—Several propositions before the local transportation committee of the Chicago City Council upon which hinge the character of a proposed passenger subway are again up for disposition. These include consolidating the surface and the elevated lines with a subway in the downtown district to furnish both lines additional track capacity. Negotiations with this in mind were taken up in 1912, but failed because of a $30,000,000 difference in the real estate values as estimated by the railway company and by the city's harbor and subway commission. Recently a sub-committee of the local transportation committee has been appointed to give further consideration to this difference in real estate values. The work of this committee consisted of bringing the real estate values up to date and making such revisions as it deems necessary. The committee, assisted by Montague Ferry, commissioner of public service, reported its findings to the local transportation committee on Dec. 17, 1914.

Kentucky Compensation Law Unconstitutional. — The Court of Appeals of Kentucky, in a majority opinion handed down on Dec. 11, held unconstitutional the workmen's compensation act passed by the last Legislature. The decision turned on the contention that while employees might voluntarily waive their rights to recover damages under the constitution, the provisions of the law were such that they would automatically be drawn into such contract and that thus the law was such that "the compensation of the injured man is limited to the amount specified in the schedule of the act." The majority of the court expressed the opinion that the Legislature could pass an enforcible act, but the dissenting opinion, signed by three judges, held that the decision was such as to make it impossible for the Legislature to enact an effective compensation law under the present constitution. The law was to have become effective as to its compensatory provisions on Jan. 1, 1915.

Proposed Auto-Bus Routes in New York.—Harry P. Nichols, head of the franchise bureau of the Board of Estimate and Apportionment of New York, N. Y., has worked out a plan of routes in connection with the applications for auto-bus rights before the city and a public hearing was set for Dec. 18 in the City Hall. Applications for franchises have been made by the present Fifth Avenue Coach Company, the New York Motor Bus Company, the Manhattan Motor Bus Company, and the People's Five-Cent Bus Corporation. The Nichols plan has not followed the suggestions made by any one of these concerns, but rather has been worked out to provide a system of routes which would be particularly useful in this city, taking into account the existing lines of the Fifth Avenue Coach Company and providing for operation to fill in the gaps left by the subway, elevated and surface railway systems already in operation. According to Mr. Nichols' plan none of the motor buses would run south of Fourteenth Street. From that thoroughfare two trunk lines are planned, one to serve the east side and one the west side of the city.

New Haven Conspiracy Cases Argued.—Argument was heard on Dec. 11 before Judge Grubb in the Criminal Branch of the United States District Court at New York in the conspiracy case in which twenty-one directors of the New York, New Haven & Hartford Railroad were indicted. The cases of John L. Billard, James S. Elton and William Skinner came up, they having put in pleas in bar. Counsel for Mr. Billard, in the first place, however, moved to withdraw that plea, and to have a plea in abatement entered instead, the effect of which would be, if successful, to bring the proceeding to an end, because of mistakes made by the government. Judge Grubb denied the motion. Counsel for the other defendants maintained that they were immune from prosecution because of their testimony before the Interstate Commerce Commission. Counsel for the government argued that the purpose of the law, which provides that testimony given by a defendant cannot be used against him, applies only to that particular proceeding; or, at any rate, only to a proceeding in which no case could be made out without the testimony of such defendant, which, it was claimed, would not apply in the present instance.

Valuation of St. Louis Properties Suggested.—The Civic League of St. Louis, Mo., has suggested to the Missouri Public Service Commission that a physical valuation of the property of the United Railways be made to afford a basis upon which to settle the question of downtown loops and service improvements. A letter to the commission from the league says in part: "Your engineer has accepted a certain arbitrary standard as adequate service, namely, an average of all seats filled and a certain number standing. The quality and price of service from a public utility should depend, we believe, not upon any arbitrary standard, but upon the public's getting everything over and above a reasonable return on the company's investment or fair value of the property devoted to the service of the public. Granting that there should be a return on the capital such as will form a proper reward for its use, all above that amount earned by the company should be put either into improved service or into a reduction in fares. This, of course, at once raises the question of valuation, and no satisfactory solution can be had without a valuation. The valuation of the United Railways should not be a difficult matter. In fact, through our local public service commission a valuation of physical property has been made which was agreed to by the company within 6 per cent. We submit that it would be easy to verify that valuation and determine what amount has been put into the property since. With the physical valuation determined, the question of intangible values only remains."

PROGRAMS OF ASSOCIATION MEETINGS

Wisconsin Electrical Association

The annual meeting of the Wisconsin Electrical Association will be held at Milwaukee, Wis., on Jan. 20, 21 and 22. The session on Jan. 20 will be devoted to gas subjects, that on Jan. 21 to joint subjects and that on Jan. 22 to subjects pertaining to electric railways and electric utilities. The banquet will be held at the Hotel Pfister, Milwaukee, on the evening of Jan. 21.

International Engineering Congress, 1915

Some confusion seems to have arisen regarding the international electrical congress, which is was proposed to hold in San Francisco in September, 1915, and the International Engineering Congress, which is to be held during the same month. Owing to the situation abroad, and the impossibility of convening the International Electrotechnical Commission, under whose authorization the electrical congress was to have been held, it has been decided by the governing body of the American Institute of Electrical Engineers to postpone the holding of the electrical congress indefinitely. This does not affect the International Engineering Congress, in connection with which marked progress is being made. Full information concerning the congress may be obtained by inquiry at the headquarters of the congress, Foxcroft Building, San Francisco, Cal.

Financial and Corporate

RESUMPTION OF STOCK TRADING

The chief item of interest during the past week has been the results of the opening of the New York Stock Exchange on Dec. 12. The opening was hedged with caution, but there were no evidences of an avalanche of foreign liquidation. Rather does there exist, as a result of long economy, a substantial and confident investment demand. The advance of Brooklyn Rapid Transit stock on the opening day one-quarter over the last committee sale and 7¼ over the July 30 price indicates the general behavior of price quotations.

On the curb American Light & Traction is selling above the closing price of July 30, and the elimination of weak accounts during the last three months is expected to create a steady increase. The common and preferred stocks of the Cities Service Company advanced sharply on rumors of dividend resumption, but the common has fallen back to around 50. The resumption of dividends seems to be dependent upon a market for absorbing new securities. The company reports a small increase in gross operating revenue for November, but a decrease in net income and surplus as compared to the same month of last year. Virginia Railway & Power Company reports slightly decreased gross but improved net earnings.

Some hesitancy among the investors in taking up railroad and industrial issues is still apparent, the railroad issues in particular being passed by the more conservative buyers. That this condition will remain until the railroads get some relief from their present financial troubles is the opinion of the majority of the bond dealers. Investment bankers, however, expect that after the first of the year there will be a general resumption of business to normal.

CORPORATION TAXES

The report of the commissioner of internal revenue shows that 316,909 corporations made reports under the income tax law for 1913. These represented a total capitalization of $101,207,534,281, divided into capital stock of $64.071,319,185 and bonded and other indebtedness of $37,136.215,096, an increase of $2,333,091,459 over 1912 in capital stock and $2,386,698,743 in indebtedness. Their total income was $4,339,550,008, an increase of $507,399,597 over 1912. Of the 316,909 corporations reporting 128,043 made declarations that they had earned no net income in the year.

In Class "B," public service corporations, such as railroads, steamboat, ferryboat and stage line companies; pipe line, gas and electric light companies; transportation and storage companies; telegraph and telephone companies, 26,358 companies made reports, showing capital stock of $22,120,255,489 and bonded and other indebtedness of $20,198,907,819, on which net income was $1,003,185,721, although 11,928 companies reported no income. The percentage earned on capital stock was 4.55 per cent, and the percentage of indebtedness to capital stock was 91.31 per cent.

Returns filed during the year increased 3.79 per cent over previous year, while increase of taxable returns was 209.02 per cent, due almost entirely to removal of the $5,000 specific exemption. For years 1909 to 1912, inclusive, there was collected as special excise tax on corporations $118,060,868. During the fiscal year 1914 there was collected as special excise tax $10,671,077, or a grand total of $128,731,945 special excise tax collected for 1909 to 1912, inclusive. as well as for January and February, 1913. Special excise and income tax collected during the fiscal year ended June 30, 1914, was $43,127,739, against an aggregate assessment during that period of $45,614,369.

The following table shows the details of the various classes, Class "A" representing financial and commercial corporations; Class "C" industrial and manufacturing plants; Class "D" mercantile dealers, and Class "E" architects, contractors, theaters and all others.

	Net income
Class A	$438,746,584
Class B	1,003,185,721
Class C	2,026,883,951
Class D	473,201,741
Class E	397,532,000
Total	$4,339,550,008

ANNUAL REPORT

Aurora, Elgin & Chicago Railroad

The statement of income, profit and loss of the Aurora, Elgin & Chicago Railroad, Wheaton, Ill., for the year ended June 30, 1914, follows:

Gross earnings and other income:	
Revenue from transportation	$1,726,724
Revenue from operations other than transportation	368,259
Interest	870
Miscellaneous	330
Total	$2,096,183
Operating expenses and taxes:	
Maintenance of way and structures	$202,806
Maintenance of equipment	158,190
Traffic	9,604
Conducting transportation	655,454
Other operations	33,966
General and miscellaneous	307,522
Total	$1,366,942
Less undistributed operating credits	24,091
Remainder	$1,342,851
Taxes	53,940
Total operating expenses and taxes	$1,396,791
Gross income	$699,392
Deductions from income	418,759
Net income	$280,633
Profit and loss surplus at beginning of year	557,394
Profit and loss—gross surplus	$838,027
Profit and loss charges:	
Dividends	$279,000
Other	1,308
Total	$280,308
Profit and loss—surplus at end of year	$557,719

The revenue from transportation during the year was $1,726,724, as compared to $1,674,768 for the year ended June 30, 1913, an increase of $51,956, or 3.1 per cent. The total gross earnings increased $81,340, or 4.03 per cent. The total operating expenses and taxes increased from $1,238,642 to $1,396,791, an amount of $148,149, or 11.9 per cent. This increase was largely made up by the following increases in the several operating groups: Maintenance of way and structures, $48,417, or 31.3 per cent; maintenance of equipment, $29,918, or 23.3 per cent; conducting transportation, $55,061, or 9.1 per cent; general and miscellaneous, $15,585, or 5.3 per cent, and taxes, $9,973, or 22.7 per cent. Expenses for other operations decreased approximately 3 per cent, and traffic expenses showed a slight decrease.

Gross income for the period decreased $76,809, or 9.7 per cent, while the net income on account of increased deductions decreased $100,345, or 26.3 per cent. Owing to the fact, however, that the profit and loss surplus at the beginning of the previous year was nearly $100,000 larger than at the beginning of the present year, the surplus at the end of the present year has been slightly more than fully maintained up to the June 30, 1913, standard.

The report mentions the various unusual items of maintenance during the year, and states that the lines and property of the company are in excellent condition. Ten new cars were put in service during the year. Owing to the dissolution of the United States Express Company, the revenue from this source was lost, but the company is undertaking through the Arrow Transfer Company to build up a local freight and express business between Chicago and various towns along the line. The company now has in its treasury $1,119,000 of first and refunding bonds certified against construction heretofore made, which will be sold to liquidate present notes and accounts payable and leave a substantial cash balance when market conditions again become normal.

Bartlesville (Okla.) Interurban Railway.—Henry L. Doherty & Company and Frederick J. Curnick, New York, N. Y., are offering for subscription, at 95 and interest, the final block of $32,500 of a total of $250,000 of first mortgage 6 per cent gold bonds of the Bartlesville Interurban Railway, dated 1910 and due July 1, 1934, but redeemable on any interest date at 102 and interest. The mortgage under which the bonds are secured is now closed. The interest on the bonds is payable January and July at the office of the Equitable Trust Company, New York, N. Y. The bonds are in the denomination of $500. The Citizen's Bank & Trust Company, Bartlesville, is trustee in the mortgage.

Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala.—The independent committee of bondholders of the Birmingham, Ensley & Bessemer Railroad has decided to hold open its deposits for the present and invites the holders of the first mortgage 5 per cent bonds to deposit their securities with the American Trust Company, Boston, Mass., depository, or with the Columbia Trust Company, New York, N. Y., as agent. The committee says that the financial and physical investigation conducted in its interest makes it possible for the committee to intervene in any foreclosure suit and to guarantee its bondholders against any prejudice to their interest which may arise from a private sale.

Cities Service Company, New York, N. Y.—Henry L. Doherty, president of the Cities Service Company, has concluded a circular to the stockholders of the company as follows: "We are still of the opinion that when the present disturbance is at an end and conditions have become normal, public utility securities will be held in relatively higher esteem than ever before, and especially those representing a wide diversity, such as is found in the Cities Service Company. No immediate change is contemplated in policy of deferring dividends, although the matter is under constant consideration."

Fairmount Park Transportation Company, Philadelphia, Pa.—C. J. Jones has been elected a director of the Fairmount Park Transportation Company to succeed Robert Wetherill, Chester, Pa., resigned.

Interborough-Metropolitan Company, New York, N. Y.—The application of the Interborough-Metropolitan Company to the Stock Exchange is to list $28,784,100 of 5 per cent cumulative preferred stock instead of $17,942,000 as announced in the ELECTRIC RAILWAY JOURNAL of Dec. 12, page 1316. This is not in any manner an increase of capital stock, but simply a reconversion of preferred stock voting trust certificates into preferred stock. To date $17,942,000 of the voting trust certificates have been reconverted into preferred stock, leaving $10,842,000 still to be reconverted from time to time. Of the $45,740,000 total preferred stock of Interborough-Metropolitan Company only $28,784,100 was originally placed in the voting trust. The difference of $16,955,900, in stock, was listed long ago. The common stock is all in voting trust certificates, which are listed, but the stock itself is not.

International Traction Company, Buffalo, N. Y.—Ten second mortgage sinking fund gold bonds of the Buffalo & Niagara Falls Electric Railway, dated July 1, 1896, have been called for payment on Jan. 1, 1915, at 105 and interest at the office of the Bankers' Trust Company, New York, N. Y.

Jacksonville Railway & Light Company, Jacksonville, Ill.—The Jacksonville Railway & Light Company has called for payment at 103 and interest on Jan. 1, 1915, at the office of the Merchants' Loan & Trust Company, Chicago, Ill., two first mortgage bonds of $1,000 each and six of $500 each issued by the Jacksonville Gas, Light & Coke Company.

Memphis (Tenn.) Street Railway.—The Memphis Street Railway has declared a dividend of 2½ per cent on the $2,500,000 of common stock, payable on Dec. 31 to holders of record of Dec. 22. The American Cities Company owns 86 per cent of the common stock of the Memphis Street Railway and 88 per cent of the preferred stock. On June 30, 1914, one-half of 1 per cent was paid and in December and March, 1913, and June, 1912, 1 per cent each. The payment in June, 1912, was the first made.

National Properties Company, New York, N. Y.—The National Properties Company, through its ownership of the Wilmington & Philadelphia Traction Company and the Wilmington Light & Power Company, has secured control of the E. I. duPont de Nemours Powder Company's electric transmission lines, distributing system and light and power business, extending through the Valley of the Brandywine from Wilmington to Winterthur.

New Orleans Railway & Light Company, New Orleans, La.—The New Orleans Railway & Light Company has declared a dividend of 1 per cent on the $20,000,000 of common stock of the company, payable on Dec. 31 to holders of record of Dec. 19. In June, April and January, 1914, one-half of 1 per cent was paid on the stock, while 1 per cent was paid in June and one-half of 1 per cent in January, 1913. An initial payment of 1 per cent was made on July 1, 1912.

Oakland, Antioch & Eastern Railway, Oakland, Cal.—The Railroad Commission of California has authorized the Oakland, Antioch & Eastern Railway to issue promissory notes of the total face value of $295,345. It is made a condition of the commission's order that these notes shall bear interest at not to exceed 7 per cent per annum. A group of bondholders of the company called a general meeting of bondholders in San Francisco on Dec. 11 and elected W. M. Alexander temporary chairman, giving him power to appoint a committee of four to consider the financial report of the expert accountants which is now in course of preparation, and advise the security holders of their views concerning the new financing.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—The unsold portion of a total authorized issue of $500,000 of new first mortgage 6 per cent bonds of the Portsmouth Street Railroad & Light Company is being offered for a subscription at par and interest by John Nickerson, Jr., New York, N. Y., and St. Louis, Mo. The bonds are dated July 1, 1914, and are due serially, $25,000 each July 1, from 1918 to 1934, both inclusive, and $75,000 on July 1, 1935. They are in the denomination of $1,000 and $500 and are callable at 102½ on any interest date. Interest is payable in January and July at the office of the Guaranty Trust Company, New York, N. Y., trustee. The bonds are being issued to provide funds to extend the railway lines of the company from Portsmouth, Ohio, to Ironton, Ohio, 22 miles, build a new carhouse, make other improvements and reimburse the treasury for the redemption of the $50,000 of first mortgage 5 per cent bonds of 1906 called for payment on Jan. 1, 1915, at 102. The extension to the railway lines will be built by the Ohio Valley Traction Company, a subsidiary, all of the securities of which will be pledged as part security for the new bond issue. The line between Portsmouth and Ironton will be operated by the Portsmouth Street Railroad & Light Company under the lease from the Ohio Valley Traction Company, which continues for twenty years after the maturity of the bonds.

San Francisco-Oakland Terminal Railways, Oakland, Cal.—The San Francisco-Oakland Terminal Railways has asked the Railroad Commission for an extension of time to June 30, 1915, in which to dispose of $239,370 of promissory notes. These notes are part of an issue amounting to $650,000, which was ratified by the commission on June 23, 1914. Up to Oct. 1, 1914, when the authority granted by the commission expired, the company had succeeded in disposing of only $420,630 of the notes. In addition to an extension of time on the $239,370 of notes remaining unsold, the company desires authority for a further issue of notes secured by the pledge of $370,000 of its general lien mortgage bonds, upon the condition that the face value of the notes issued shall at no time be greater than 66 2/3 per cent of the face value of the bonds pledged as collateral. From the proceeds of the sale of these new notes the company proposes to reimburse itself for $148,922 expended from income for capital purposes; purchase new cars to the value of $75,000; and expend $22,744 for the construction of an interlocking plant at Stanford Avenue and Lowell Street, Oakland. Between Jan. 1 and Jan. 15, 1915, the company states that it will be required to meet interest payments on its bonded indebtedness amounting to $372,830.

Shore Line Electric Railway, Norwich, Conn.—The board of directors of the Shore Line Electric Railway has been reduced from fifteen to nine. The following directors have been elected: C. W. Sheafe, Jr., W. S. Rathbun, W. L. Barnett, F. E. Hall, A. E. Clark, A. S. May, W. C. Skidmore, E. G. Buckland and J. M. Tomlinson.

St. Joseph Railway, Light, Heat & Power Company, St. Joseph, Mo.—E. W. Clark & Company, Philadelphia, Pa., with whom there was deposited substantially all of the $3,500,000 of common stock of St. Joseph Railway, Light, Heat & Power Company, sold to Henry L. Doherty & Company, New York, N. Y., for the Cities Service Company at $60 a share, notified depositing stockholders that the balance of $35 a share on the stock would be paid, with accrued interest, on and after Dec. 10. Funds for the payment of this stock were secured by the sale of $1,118,000 of St. Joseph Railway, Light, Heat & Power Company trust certificates secured by all the deposited common stock of the St. Joseph company. Trust certificates will be retired monthly through a sinking fund provided by the Cities Service Company, the final certificate being retired June 1, 1917.

DIVIDENDS DECLARED

American Cities Company, New Orleans, La., 3 per cent preferred.

Boston & Worcester Electric Companies, Boston, Mass., $1 preferred.

Duluth-Superior Traction Company, Duluth, Minn., quarterly, 1 per cent, preferred; quarterly, 1 per cent, common.

Elmira Water, Light & Railroad Company, Elmira, N. Y., 1¾ per cent, first preferred.

Illinois Traction System, Peoria, Ill., quarterly, 1½ per cent, preferred.

Memphis (Tenn.) Street Railway, quarterly, 1¼ per cent preferred; 2½ per cent, common.

New Orleans Railway & Light Company, New Orleans, La., quarterly, 1¼ per cent, preferred; 1 per cent, common.

Twin City Rapid Transit Company, Minneapolis, Minn., quarterly, 1¾ per cent, preferred; quarterly, 1½ per cent, common.

Washington, Baltimore & Annapolis Electric Railway, Washington, D. C., quarterly, 1½ per cent, preferred.

West Philadelphia (Pa.) Passenger Railway, $5.

ELECTRIC RAILWAY MONTHLY EARNINGS

COMMONWEALTH POWER, RAILWAY & LIGHT COMPANY, GRAND RAPIDS, MICH.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$1,238,485	*$694,238	$544,247	$354,160	$190,087
1 " "	'13	1,228,540	*717,582	510,958	327,301	183,657
12 " "	'14	14,755,029	*8,366,386	6,388,643	4,149,615	2,239,028
12 " "	'13	13,969,348	*8,094,798	5,874,550	3,788,479	2,086,071

CUMBERLAND COUNTY POWER & LIGHT COMPANY, PORTLAND, MAINE.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$214,808	*$124,150	$90,658	$62,050	$28,608
1 " "	'13	204,249	*115,886	88,363	63,735	24,628
12 " "	'14	2,514,508	*1,437,982	1,076,526	761,103	315,423
12 " "	'13	2,306,150	*1,286,259	1,019,891	700,142	319,749

EAST ST. LOUIS & SUBURBAN COMPANY, EAST ST. LOUIS, ILL.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$216,801	*$130,395	$86,406	$62,175	$24,231
1 " "	'13	210,841	*148,447	92,394	49,547	42,847
12 " "	'14	2,686,595	*1,673,694	1,012,901	668,393	344,508
12 " "	'13	2,668,715	*1,545,041	1,123,674	589,109	534,565

GRAND RAPIDS (MICH.) RAILWAY.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$102,963	*$70,443	$32,520	$13,990	$18,530
1 " "	'13	104,968	*69,108	35,860	13,306	22,554
12 " "	'14	1,286,295	*834,409	451,886	160,123	291,763
12 " "	'13	1,286,369	*790,821	495,548	171,038	324,510

HUDSON & MANHATTAN RAILROAD, NEW YORK, N. Y.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$468,023	$191,179	$276,844	$211,132	$65,712
1 " "	'13	473,988	198,899	275,088	207,341	67,747
4 " "	'14	1,767,346	742,844	1,024,502	848,556	175,946
4 " "	'13	1,768,527	767,431	1,001,094	823,816	177,278

INTERBOROUGH RAPID TRANSIT COMPANY, NEW YORK, N. Y.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$2,982,156	$1,070,342	$1,911,814	$1,081,205	$830,609
1 " "	'13	2,955,977	1,079,517	1,876,460	1,227,996	648,464
4 " "	'14	10,616,495	4,126,622	6,489,873	4,327,325	2,162,548
4 " "	'13	10,371,063	4,134,218	6,236,845	4,550,761	1,686,084

LEWISTON, AUGUSTA & WATERVILLE STREET RAILWAY, LEWISTON, MAINE.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$57,309	*$37,506	$19,803	$15,569	$4,234
1 " "	'13	51,301	*36,068	15,233	14,456	777
12 " "	'14	679,626	*463,852	215,774	185,789	29,985
12 " "	'13	668,543	*419,260	249,283	177,699	71,584

NEW YORK & STAMFORD RAILWAY, PORT CHESTER, N. Y.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	14	$27,185	*$25,085	$2,100	$7,876	†$5,776
1 " "	'13	26,982	*29,635	2,654	7,850	†10,504
4 " "	'14	166,581	*115,642	50,949	31,503	19,446
4 " "	'13	161,169	*114,909	46,260	30,741	15,519

NEW YORK, WESTCHESTER & BOSTON RAILWAY, NEW YORK, N. Y.

Period		Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Oct.,	'14	$39,075	*$42,944	$3,799	$5,874	†$2,075
1 " "	'13	35,297	*45,320	10,024	5,123	†15,147
4 " "	'14	149,820	*171,132	21,312	23,695	†45,007
4 " "	'13	139,194	*193,965	54,771	20,998	†75,764

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*Includes taxes.
†Deficit.

Traffic and Transportation

THE CLAY COUNTY RATE DECISION

Rehearing Will Be Asked in Case of Order for Commutation Fares Applying Only to Short Distances on Two Divisions

As announced briefly in the ELECTRIC RAILWAY JOURNAL of Dec. 12, page 1319, the Public Service Commission of Missouri on Dec. 7 issued an order to the Kansas City, Clay County & St. Joseph Railroad to begin on Jan. 1, 1915, issuing commutation tickets on definite rate schedules established by the commission which figure out at about 1.1 cents a mile. A feature of the order was the commission's valuation of the property of the company.

The Kansas City, Clay County & St. Joseph Railroad was placed in operation on Jan. 21, 1913, charging 2½ cents a mile, or 2¼ cents a mile round trip. Three months later people at Liberty, Mo., and owners of real estate between Liberty and Kansas City began asking for commutation tickets. Shortly after this the steam railroad rates were reduced to 2 cents and the commission ruled that the interurban was a railway and should charge only 2 cents.

The commission asked the company to make a valuation of the property. This was a comparatively simple process because all the records of promotion and organization and of the physical property were available. The company's valuation totaled $5,320,000, as follows: cash, $3,800,000; discount on bonds, $450,000; discount on stock, $310,000; going value, $350,000; working capital, $30,000; promotion fee (figured at 10 per cent of the cash), $380,000. The commission took these figures and made its valuation of $3,900,000. Instead of the company's figure of $380,000 for promotion the commission allowed only $16,000 for this item, although the books and evidence showed that the figure given by the company was the amount of actual cash paid to the promoter. The company's valuation was prepared by Sloan, Huddle, Feustel & Freeman, Madison, Wis. The commission allowed for no discount on the securities of the company issued before the existence of the commission, although when the company issued $135,000 of bonds for a signal system it did allow their sale at a discount of 15 per cent. Included in the section devoted to valuation the order mentioned that the company in its first year showed that it had earned 6.2 per cent on the valuation set by the commission, and the statement was made that this was not as much as the commission would allow the company to earn. There was no statement, however, as to what percentage the company would be allowed to make.

The order requiring commutation rates applies only between Kansas City and Liberty, 14.4 miles, on the Excelsior Springs Division; and to a distance of about 10 miles on the St. Joseph division. As stated, a considerable number of complainants from Liberty and between Liberty and Kansas City had asked the rates, but it is said that only one person on the St. Joseph division in the 10-mile limit had joined the request. There is no order as to commutation rates between St. Joseph and any other points or between Excelsior Springs and any other points. There is no provision for lower rates between intermediate points in the limits named in the order, all the reductions applying to traffic into and out of Kansas City. Explicit prices of commutation tickets, fifty-two rides in a book good for thirty days, the books being non-transferable, are made.

As previously stated, the average rate established by the order is about 1.1 cents a mile. The railway pays the company owning the bridge over the Missouri River, by which entrance is gained to Kansas City, 3½ cents per passenger each way. An instance of the operation of the rate is that the commutation rate from Avondale 4.14 miles from Kansas City is 5.7 cents, which leaves 2.2 cents for the electric line, after paying the bridge company, or about half a cent a mile. The contract with the bridge company was cited in the brief of the electric railway, but there was no reference to it in the commission's order. The Kansas City, Clay County & St. Joseph Railroad is the only electric interurban out of Kansas City wholly or chiefly in Missouri. The Missouri commission, however, took cognizance of the commutation rates of other Kansas City interurbans serving Kansas communities, which rates vary from 1 cent to 1¼ cents a mile.

In its conclusions the commission said that people had bought land along the route of the interurban with the desire and purpose of building homes, but the transportation rate was so high into Kansas City that they could not afford to live there.

J. R. Harrigan, general manager of the company, said that several points presented in the brief and testimony during the hearings warrant a request for a rehearing and continued:

"We showed that the cost of handling passengers, not including taxes or interest charges, was 1 cent a mile. Including the taxes and interest charges the cost of handling passengers was shown to be 1.6 cents a mile. We also showed that we are purely a railway and are not interested in any land along our line; that our revenue is entirely from our street railway traffic."

ORDER IN ALBANY SERVICE CASE

Substantially all of the recommendations regarding service in Albany, N. Y., made by Charles R. Barnes, the electric railway inspector of the Public Service Commission of the Second District of New York, are embodied in an order issued to the United Traction Company on Dec. 12 by the commission. The following improvements are immediately enjoined on the company:

Three modern snow plows to replace the 5½-ton plows now in service and the installation of 50-hp motors instead of 30-hp on the present sweepers. These to be installed by Feb. 1.

Non-rush hour headway of five minutes instead of seven minutes on the Belt Line and rush-hour headway of four minutes between 6:30 a. m. and 9 a. m. and three minutes between 5 p. m. and 6:30 p. m. instead of the present five-minute headway.

Seven-minute headway instead of ten-minute headway during non-rush hours on the Delaware Avenue line.

Transfers to and from the Schenectady cars for passengers to and from points within the city limits on the Schenectady line.

Immediate purchase of twelve new modern cars, seating not less than forty, to be used in place of the present 18-ft. cars of the 100 series.

Immediate increase in the power supply.

Immediate purchase of an automobile wrecking truck, properly equipped, manned and located.

Installation before April 1 of a telephone system along the lines with proper switchboards, etc., for emergency use and for dispatching cars.

Equipment of all single truck cars to remain in service with an auxiliary brake system not later than May 1.

The company is further enjoined to submit a definite program of further improvement to the commission, concerning matters largely of local interest in Albany.

The thirteen clauses in the commission's order of Dec. 12, added to the ten clauses of the order issued on Aug. 10 last, carry out all of the recommendations of Mr. Barnes, or provide for their development at as rapid a rate as possible, with the single exception of the elimination of all the open cars. It was found that this step would have been generally unpopular with the patrons of the road. The orders to the company made last August have been carried out or are under way, the commission finds.

The present decision is in the case into which all of the complaints against the company were consolidated last spring. The recommendations of Mr. Barnes were filed with the commission early in the summer, and hearings were held at which the company objected to many of the recommendations. Those to which there was little objection were immediately made effective and the remainder, the subject of the order of Dec. 12, have been a matter of weekly consideration at the executive sessions of the commission, in order that a way might be found to meet the complaints in an order which would be possible for the company to carry into effect. The order just issued is so arranged as to time that it should not, in the opinion of the commission, impose any undue hardship on the company. The company is instructed to report to the commission the progress which it makes toward carrying out the recommendations.

NEW INDIANA FARES

Statement by Union Traction Company Regarding New Fares Effective on Jan. 1, 1915

The new system of fares which the Union Traction Company of Indiana has been authorized to establish by the Indiana Public Utility Commission will go into effect on Jan. 1, 1915. A statement which has been issued by the company in regard to the new fares reads in part as follows:

"The new system of interurban fares which will be put into effect on the Union Traction lines on Jan. 1, 1915, introduces the copper zone, or 1-cent zone, system in place of the nickel zone, or 5-cent zone, system, which has been in use on the interurban lines as well as on the steam lines in Indiana. Under both systems the rate of fare is 2 cents per mile. By the nickel zone system all fares are computed in multiples of 5 cents, the fare being 'that multiple of five nearest reached by multiplying the rate by the distance.' In determining the distance, the law requires that 'fractions of less than ½ mile shall be disregarded, and all other fractions counted as 1 mile.' As a result of calculating fares in this way the actual rate per mile traveled varies greatly. For instance, the fare for a ride of 3.4 miles is 5 cents, or a little less than 1½ cents per mile. The fare for a ride of 3.8 miles is 10 cents, or almost 3 cents a mile. A ride of any distance, no matter how short, beyond the point where the fares change, adds 5 cents to the fare.

"Under the new copper zone system all fares will be calculated at the former rate of 2 cents per mile, but in ½-mile zones at 1 cent instead of 2½-mile zones at 5 cents each. As a result all passengers will pay at the same rate, as nearly as possible, for the distance actually traveled. The addition of ½ mile to a ride will make a difference of only 1 cent in the fare paid, instead of 5 cents, as was frequently the case under the nickel zone system. Taking the cases already stated, a passenger traveling 3.4 miles will pay 7 cents instead of 5 cents, while a passenger traveling 3.8 miles will pay 8 cents instead of 10 cents. Both passengers will pay at the same rate of 2 cents per mile, instead of one paying almost twice the rate per mile as the other.

"The effect of the changes in fare under the new system will be in some cases to increase and in others to decrease the present fares, while in still other cases no change will be made.

"The new system, it has long been recognized, would do away with discriminations existing under the nickel zone system, but the practical objections to computing fares in odd cents have made interurban officials slow to adopt the copper zone system.

"The officials of the Union Traction Company believe that the new fares will carry out one of the chief objects of the Public Service Commission law—that of eliminating discriminations—and will be generally approved by the public."

The order of the commission in this case was referred to in the ELECTRIC RAILWAY JOURNAL of Nov. 28, page 1221.

"AN 1894 NICKEL"

Under the caption "An 1894 Nickel" the Georgia Railway & Power Company, Atlanta, Ga., carried the following 3½-in. x 4½-in. advertisement in the Atlanta papers recently:

"Got one in your pocket? Look at it. Twenty years of circulation have worn it smooth.

"When that nickel was new it was worth one street car ride in Atlanta.

"Now that it's worn, it still is worth here in Atlanta one street car ride.

"Everything's gone up—except your street car ride.

"That's cheaper—yes, cheaper—than it was when your 1894 nickel was coined. Two decades have brought you better and faster and more comfortable cars, greater transfer privileges, miles and miles of new track lines that didn't exist then. Your 1894 nickel pays your fare in 1914 from College Park to Decatur, or from Decatur to Bolton, or from Bolton to Buckhead, or from Buckhead to East Lake, or from East Lake to Druid Hills, or from Druid Hills to Hapeville, or between any two of a score other extremities of the Atlanta system.

"You couldn't be served adequately to-day by Atlanta's street car equipment of twenty or even ten years ago. You'd laugh at the man who tries to convince you that to-day's equipment will suffice ten years from now.

"We've got to keep growing. That's the foundation of one phase of good service. Growth calls for new investment. That must be assured fair return. That's impossible without your good-will. To win your good-will and keep it, we must give good service. The thing's a cycle.

"Would we be so foolish as to break it?"

JAY WALKER SIGNS IN LOUISVILLE

For two weeks preceding Dec. 13 patrons of the Louisville (Ky.) Railway and the Louisville & Interurban Railroad read and re-read signs placed prominently in every car in the service, on which was this text:

> WHO WHEN WHY
> IS A JAY WALKER?
> Safety First
> Louisville Safety First Association

The public of Louisville has been more or less interested for several months in the efforts of the Louisville Railway to school it in "safety first" practices, and is co-operating with the company to a considerable degree. This particular sign, however, provoked an unusual amount of discussion because its import was not obvious. The card which succeeded it is now answering the question that was driven home to everybody during the last fortnight. This second card reads:

> A JAY WALKER
> WHO? Perhaps you.
> WHEN? You cross the street at any other place than a regular crossing.
> WHY? To save time instead of yourself.
> ARE YOU A J-W?

The graphic character of this series, it is believed, has accomplished much in the way of attracting increased attention to and in getting support for the company "safety first" campaign.

"SAFETY FIRST" AT ALLENTOWN

Extensive Efforts Made to Enlist the Co-operation of the Public in This Campaign

The Lehigh Valley Transit Company on Dec. 11 inaugurated a campaign for "safety first" in Allentown, Pa., with the co-operation of the Allentown School Board, the local council for industrial safety and the Chamber of Commerce. Through the courtesy of the management the Lyric Theater, the largest in the city, was secured, and three public meetings were held. The first was at 2:30 p. m., the second at 4:30 p. m. (a special meeting for the public school children and teachers), and the third, a mass meeting, at 8 p. m. Addresses were made by E. M. Young, vice-president of the transit company; E. C. Spring, manager of the Philadelphia division; Mayor C. W. Rinn, E. J. Tumley, president of the Chamber of Commerce; District Attorney S. H. Rupp, G. T. Fonda, safety engineer of the Bethlehem Steel Company; J. W. Haas, president of Muhlenberg College, and Dr. F. D. Patterson, of the Philadelphia department of accident prevention and of The J. G. Brill Company and Harrison Brothers.

At the 4:30 p. m. children's meeting there were 2000 auditors. The illustrated slides and moving picture reels showed how carelessness results in serious accidents. E. M. Young presided at the evening meeting. In his opening remarks he spoke of the changes in transportation methods in recent years and how greater care was necessary by both the employee and the public. He introduced E. C. Spring, who said that in four years the company had carried 100,000,000 people without the death of one passenger by accident. Mayor Rinn complimented the officials on their efforts. He said that if the 60,000 people of Allentown emulated the employees of the company all accidents would be wiped out. Mr. Tumley said that in one year in the United States 40,000 people were killed and 2,000,000 injured. He said that accident work should be extended to the home. Mr. Fonda stated that the Bethlehem Steel Company had reduced its accidents 60 per cent in the last year by safeguarding employees and educating workmen. Of accidents occurring in industrial plants 80 per cent were due to careless employees and only 20 per cent to non-protected machinery.

Dr. Haas said the safety movement showed a larger human interest, the coming of a better democracy. It was no longer speed first, but care first. Mr. Rupp pointed out that at least five cases had come to his attention in the past year where men were injured or killed through their own carelessness. He showed the economic value of keeping trained employees steadily at their work by giving them the best possible protection. Dr. Patterson proved very adept in driving home the idea of safety first, last and all the time. In the Brill factory the average number of accidents per month had been reduced to thirty. The Pennsylvania Railroad had reduced accidents by 69 per cent. By means of colored slides he illustrated how accidents can easily happen on the street. The moving pictures, "The Workman's Message" and "The Price of Thoughtlessness" were shown on the screen. Another reel showed the difference in damage wrought by an actual head-on collision between two railroad trains made up of antiquated wooden cars and a collision between solid steel trains.

This is the first of a series of meetings which it is proposed to hold in the communities served by the company.

"CAR-FULL" SIGNS AND LIMITED STOP SERVICE IN BOSTON

Limited stop and car-full service has been begun by the Boston (Mass.) Elevated Railway on the Reservoir-Beacon Street and Commonwealth Avenue-Boylston Street subway lines. "Car Full" signs are to be used at the discretion of inspectors during morning rush hours and will be displayed on cars inward bound from Reservoir station upon reaching Coolidge Corner and on inbound Commonwealth Avenue and Brighton cars upon reaching Harvard Avenue, Allston. Such cars will not stop to take passengers until reaching the subway, but will discharge passengers en route. "Limited Stop" signs are to be used during the evening rush hours on outward-bound cars on these lines. Express service will be provided by these cars from the subway incline near Kenmore Street to Harvard Avenue and Corner, respectively, without stops except to receive passengers. In order to accommodate local passengers an additional alternate service will be operated between Park Street subway loop and Coolidge Corner and between Park Street and Oak Square, Brighton, making all regular stops. During both rush-hour periods cars are now scheduled at three-minute intervals between Reservoir station and Park Street in addition to the local line between Coolidge Corner and Park Street, on which a four-minute schedule is maintained. The company has discontinued the use of the term "Express" on passenger car signs, and has substituted the limited-stop sign with destination specified.

Another Elevated Accident in New York.—Seven persons were injured on Dec. 13 in a rear-end collision at 150th Street, New York, between trains of the Manhattan Elevated division, Interborough Rapid Transit Company.

Conductor Convicted of Stealing.—A conductor, charged with petit larceny for pilfering $2.42 from a New York State Railways, Rochester Lines, pay-as-you-enter car, was found guilty in Police Court on Dec. 7. He was ordered to pay a fine of $25, or to serve as many days in the penitentiary. The fine was paid.

Commission to Decide on Augusta-Aiken Fare.—The Railway Commission of South Carolina expected to hold a final hearing on Dec. 16 to decide whether to allow the Augusta & Aiken Railway to increase its passenger rate from 1 cent to 2 cents a mile. If allowed, the order would increase the fare between Augusta and Aiken to 50 cents.

Post-office Appropriation Bill.—It was announced on Dec. 14 that the post-office appropriation bill was virtually completed and ready for submission to the House. The measure includes as a rider the railway mail pay bill, passed by the House and now pending in the Senate, to change the basis of pay from a tonnage to the car space basis used by the mails carried. Approximately $1,000,000 additional compensation would be given the railroads because of the burdens imposed by the parcel post.

City Traffic Committee Proposed.—The transportation committee of the City Council of Toronto, Ont., on Dec. 11 again adopted a report favoring the appointment by the city of a traffic commission and asking that the Board of Control nominate one member for four years, one for three years and one for two years, the commission to investigate the traffic situation of the city and report to Council from time to time the lines of action it deems advisable. The last time the matter was before the Council it was almost unanimously rejected.

Allston Transfer Decision.—The Massachusetts Public Service Commission has issued an order requiring the Boston Elevated Railway to grant free transfers at the intersection of Commonwealth and Harvard Avenues, Allston, to enable passengers to ride inward bound from that point into Brookline Village and thence into Boston, and to transfer from outward-bound Harvard Avenue cars to outward-bound Commonwealth Avenue cars; the privilege not applying to passengers boarding the former cars in the subway on account of the service of the latter on that portion of the system.

Air Reservoir Explosion in New York.—The air reservoir on a Third Avenue Railway car exploded on Dec. 14 without causing any personal injuries and involving only insignificant damage. The reservoir had welded joints throughout, and indications pointed to an initial failure of the longitudinal seam on account of insufficient welded area, the sheet tearing loose from the drumheads over the major part of the joints. The heads remained intact and were not separated completely from the sheet forming the drum so that no metal was thrown by the explosion. Even the pipe connection on one drumhead was left in place.

"Safety First" Zones in Louisville.—Experiments with "safety first" zones at the busy downtown corners in Louisville, Ky., have been so successful that the city police department has established them at all the important corners where streets in the retail section are narrow. The traffic regulations require vehicles of all descriptions to stop at the standards between the tracks and the curb or at the white lines which are painted on the pavement to indicate the limits of the safety zone. The first arrest for disregard of the limits defined by the traffic police was made after the system had been in operation for several months.

Ruling Regarding Trains of Steel and Wooden Cars.—The Long Island Railroad recently petitioned the Public Service Commission for the First District of New York for a modification of the commission's order requiring it, on Dec. 1, 1914, to discontinue the use of wooden cars in trains made up in part of steel cars. The company stated that it had only fifty-three wooden cars in use on the Atlantic Avenue Division, and that these would be retired as soon as new cars could be purchased; but that owing to the financial conditions the company had not yet been able to place its order for the new cars. The commission denied the request for modification.

Ordinance to Free Tracks of Wagons.—At the suggestion of Alderman Capitan the local transportation committee of the Chicago City Council is considering the preparation of an ordinance prohibiting wagons from using the street railway tracks during the Chicago rush-hour periods. In this connection some interesting figures showing delays for the first ten days in December were furnished by J. E. Wilkie, assistant to the president of the Chicago Surface Lines. During this period 100 breakdowns occurred causing an average delay to cars of ten minutes each, and each ten-minute delay meant the holding up an average of ten other cars. Practically all of these delays were accounted for as being due to simple breakdowns in wagons. The territory included in these delay figures was confined only to the Chicago business district.

Employees' Association in Wichita.—An employees' benefit association has recently been organized among the employees of the Wichita Railroad & Light Company, Wichita, Kan. The operation of the association is governed by nine trustees, six selected by the men and three from officers of the company. There are about 150 members. The assessments are 30 cents a month for each member, and the company pays into the treasury an amount similar to that collected among the members. Benefits of $8 a week are paid after the first week of sickness. The maximum sick allowance is fourteen weeks in any one year. The officers act without pay with the exception of the secretary, who receives a salary of $50 a year. Officers and trustees are elected for a year. The trustees meet once a month. General meetings of all of the members are held three times a year.

Fare Changes on Hudson Valley Railway.—The Hudson Valley Railway, Glens Falls, N. Y., has filed with the Public Service Commission of the Second District of New York effective on Jan. 1, 1915, the following changes in fare: Local one-way fares between stations and stops; Through fare between Saratoga Terminal and Ballston Spa, via Hamilton Street (Saratoga), increased from 10 cents to 15 cents, and sub-zones increased from two to three; limited as follows: Saratoga to Geyser's; Geyser's to Gray's Crossing; Gray's Crossing to Ballston Spa; fare between any two points within a sub-zone 5 cents. Through fare between Thomson and Greenwich increased from 10 cents to 15 cents, and sub-zones increased from two to three; limited as follows: Thomson to Trionda Mill Stop; Trionda Mill Stop to Power House No. 2; Power House No. 2 to Greenwich; fare between any two points within a sub-zone 5 cents.

Inquiry Into New York Elevated Accident.—A public inquiry into the fatal accident of Dec. 9 on the elevated railroad in New York was held by the Public Service Commission, First District, on Dec. 16. C. W. Welder, electrical engineer of the commission, stated that there had been thirty-seven collisions on the New York elevated lines since 1908. Two of these resulted in fatalities to passengers. During this time 2,000,000,000 passengers had been carried. He announced that a new speed-control device was under consideration by the commission which would provide safety without limiting the capacity of the lines as would block signals. Frank Hedley, vice-president of the Interborough Rapid Transit Company, testified that steel cars could not be built light enough for use on the elevated lines without rebuilding the structure, the weight of the present wooden motor car being 58,440 lb. He outlined a new device which he had just conceived for short-circuiting the third-rail shoes and the rails in case of accident to insure the blowing of the circuit breakers. This would prevent fires in wooden cars. The accident was caused by failure of the conductor to ride the front platform of the train and signal to the motorman, who was in the fourth car owing to electrical trouble in the front half of the train.

Pennsylvania Commission Rules on Fares.—The Public Service Commission of Pennsylvania, in a decision made public on Dec. 12 in the case of the Pennsylvania, the Philadelphia & Reading and the Baltimore & Ohio Railroads, which a month ago prepared new tariffs effective on Dec. 15, approved certain of the new rates. The commission ordered the continuance of the fifty and 100-trip commutation tickets, but established a fixed rate of not more than 1½ cents a mile as a maximum rate. This allows an advance over the old rate, the old rate on the 100-trip ticket having been approximately 1 cent. The commission also ruled that the sixty-trip monthly ticket and the forty-trip school ticket shall be valid for a period of one month from date of sale, instead of one calendar month, as the railroads proposed, and that the 180-trip commutation ticket shall be valid for three full months from time of issue. In only one particular are the railroads restrained from putting a higher passenger rate into effect, and that is the charge of 2¼ cents a mile on the ten-trip tickets. The commission ruled that the companies shall sell a ten-trip family ticket, on which ten persons can ride at the same time, for a rate no higher than 2 cents a mile. The railroads are permitted to increase the sixty-trip monthly tickets 25 cents each, but must make the ticket good for one full month from the date of sale, instead of only a calendar month. The railroads are allowed also to increase the forty-six-trip school ticket 20 cents each, but they likewise must be good one month from date of sale.

Personal Mention

Mr. Victor S. Curtis has been elected secretary of the Connecticut Company with headquarters at New Haven, Conn.

Mr. W. P. Hendricks, superintendent and master mechanic of the Elgin & Belvidere Electric Company, Marengo, Ill., has resigned to engage in other work.

Mr. H. L. Moss, formerly electrical engineer of the Elgin & Belvidere Electric Company, Marengo, Ill., has been appointed acting superintendent to succeed Mr. W. P. Hendricks, resigned.

Mr. E. C. Clark, the retiring superintendent of the Northampton (Mass.) Street Railway, was tendered a dinner at the Draper Hotel, Northampton, on Dec. 9 and presented with a mahogany clock by the employees as a token of esteem.

Mr. Peter Witt, street railway commissioner at Cleveland, Ohio, has announced his candidacy for the office of Mayor to succeed Mr. Newton D. Baker, who will not seek office again. Mr. Witt served as city clerk for a long period while the late Tom L. Johnson was Mayor.

Mr. J. Stanley Moore, until recently passenger agent of the Empire United Railways, Syracuse, N. Y., has been named by Governor-Elect Whitman as his military secretary with the rank of major. Mr. Moore was born in Syracuse in 1870 and was graduated from Yale in 1893.

Mr. Ivy Ledbetter Lee has resigned as executive assistant of the Pennsylvania Railroad to become a member of the personal staff of Mr. John D. Rockefeller, New York, N. Y., and will take up the duties of Mr. Jerome D. Greene, who in future will devote his entire time to the Rockefeller Foundation.

Mr. John H. Roemer, chairman of the Railroad Commission of Wisconsin, will, on Feb. 1, 1915, join the organization of H. M. Byllesby & Company, Chicago, Ill., in charge of the extensive legal business of that organization and its allied interests. Mr. Roemer has served on the Wisconsin Commission since the time its duties were enlarged to embrace the regulation of utilities other than steam railways in 1907.

Mr. J. J. Scovern, who has been appointed editor of the *H. & M. Review*, which is to be devoted to affairs of the Hudson & Manhattan Railroad, New York, N. Y., began his railroad career in 1902 as chief clerk to the assistant chief engineer of the Erie Railroad. In 1907 he was made chief clerk of the grade commission bureau of the company. From 1909 up to the present time he has been connected with the Hudson & Manhattan Railroad, holding the positions of secretary of the discipline board, secretary of the general safety committee and secretary of the Hudson & Manhattan Railroad Athletic Association.

Mr. E. E. Eysenbach has resigned as general manager of the San Antonio (Tex.) Traction Company and of the San Antonio Gas & Electric Company to devote attention to his own private interests in Oklahoma. Mr. Eysenbach was formerly vice-president and manager of the Consolidated Gas Company of New Jersey, Long Branch, a consolidation of the Long Branch Gas Light Company and the Long Branch Electric Light Company. His duties at San Antonio will be taken over temporarily by Mr. W. B. Tuttle, vice-president of the companies. Before Mr. Eysenbach left San Antonio he was waited on by a committee of the employees, with Mr. Fred Johnston, claim agent of the company, as chairman, and presented with a silver coffee service from the men as a token of their esteem.

Mr. Charles H. Armatage, formerly traffic manager of the United Traction Company, Albany, N. Y., has been appointed first deputy fiscal supervisor of State charities, succeeding Mr. Charles E. Weisz, who resigned on Dec. 1. Mr. Armatage is a prominent Mason and trustee of the Masonic Home at Utica. For six and one-half years he was superintendent of the Albany County almshouse. He has been connected prominently with several interests in Albany other than the United Traction Company. From 1892 to 1894 he was president of the Common Council of Albany. From 1904 to 1906 he was vice-president and general manager of the William E. Drislane Company, grocers. He was affiliated with the United Traction Company for fourteen years. Mr. Armatage's railroad experience also includes terms of service with the West Shore Railroad as assistant superintendent of the Buffalo division and with the New York Central & Hudson River Railroad.

Mr. Horace P. Leiper has been named by officials of the Union Traction Company of Indiana to succeed Mr. L. C. Bewsey as superintendent of the Indianapolis division of the company. Mr. Leiper has lately been a conductor on the Muncie division of the Union Traction Company. He has been connected with the company for thirteen years, serving in the operating department of the Logansport and Muncie divisions. He was born in Franklin, Ind., in 1879. Before entering the service of the Union Traction Company he was employed by the Indianapolis Street Railway, which has been succeeded by the Indianapolis Traction & Terminal Company. The men employed on the Indianapolis division of the Union Traction Company have presented Mr. Bewsey with a diamond ring in appreciation of his courtesy to them while superintendent of the division. As previously announced in the ELECTRIC RAILWAY JOURNAL, Mr. Bewsey has become connected with the Buffalo, Lockport & Rochester Railway as superintendent of transportation.

Mr. D. F. Sherman has resigned as vice-president and as a member of the board of directors of the Rhode Island Company, Providence, R. I. While Mr. Sherman is a member of the bondholders' protective committee of the Birmingham, Ensley & Bessemer Railroad, Birmingham, Ala., now in the hands of a receiver, he has no intention of taking up railroad or other business, but is planning to spend the later winter months in California with Mrs. Sherman and hopes to be out of active business for a time at least. Before being elected vice-president of the Rhode Island Company on July 1, 1911, Mr. Sherman was president of the Providence & Danielson Railroad and the Sea View Railroad, both of which later became a part of the system of the Rhode Island Company. About a year ago, at the time the New York, New Haven & Hartford Railroad, the parent company, was involved in the federal investigation and it became apparent that the electric railways would have to be segregated, Mr. Sherman tendered his resignation as vice-president of the Rhode Island Compay, but it was not accepted. He remained with the company and helped in the reorganization work that followed. This fall when the Rhode Island Company's stock, which was held by the New Haven, was turned over to the trustees to be sold, Mr. Sherman was one of the directors who resigned. Mr. Sherman was born near Indianapolis, Ind. He entered a bank at Kankakee, Ill., as a messenger. A number of years later he became cashier of a bank in Montana and aided in developing the bituminous coal mines in the Rocky Mountains. He next located in Portland, Ore., where he spent fifteen years in the banking business, becoming vice-president of one of the banks there. While in southern California in 1900 Mr. Sherman became interested in the plan for the construction of the Providence & Danielson Railway, assisted in financing the line and later took up residence in Providence.

OBITUARY

Richard Henry Bennett, superintendent of equipment of the Union Street Railway, New Bedford, Mass., died in that city suddenly on Dec. 8. Mr. Bennett was born in New Bedford on Jan. 27, 1873, and was graduated from the New Bedford High School. Shortly after leaving school he entered the employ of the Union Street Railway and was advanced through various positions with the company, finally being appointed superintendent of equipment.

Col. Edward Daniel Meier, past president of the American Society of Mecahnical Engineers, veteran of the Civil War, and one of the most eminent mechanical engineers of the country, died in New York on Dec. 16. Col. Meier was born in St. Louis, Mo., on May 30, 1841. At the close of a scientific course at Washington University, St. Louis, he spent four years in Germany at the Royal Polytechnic College in Hanover. In 1884 he organized the Heine Safety Boiler Company for the development in the United States of the water-tube boiler of that name, and was president and chief engineer of the company from its formation up to the time of his death. He was also responsible for the introduction of the Diesel motor into the United States and until 1908 was an officer of the American Diesel Engine Company.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

***Ozark Valley Railroad, Cascade, Mo.**—Chartered in Missouri to build a 35-mile interurban railway between Cascade and Williamsville. Capital stock, $350,000. Incorporators: Orah D. Ridgely and J. T. Long, Kansas City; James K. Cochran, Pana, Ill.; James H. Downes, Assumption, Ill., and G. A. Long, Kenner, Mo.

***Cleveland, Canton & Akron Railway, Cleveland, Ohio.**—Incorporated in Ohio to build a four-track subway under Fifty-fifth Street between the lake front and Kingsbury Run in Cleveland. Capital stock, $10,000. Incorporators: W. W. White, Thomas H. Garry, James McSweeney, W. M. Connelly and W. B. Snavely.

***Washington Boulevard Street Railroad, Cleveland Heights, Ohio.**—Charter in Ohio to build an electric railway in Cleveland Heights. Capital stock, $10,000. Incorporators: J. C. Lowe, F. C. Work, V. E. Davis, R. F. Allen and H. W. Downing.

FRANCHISES

Argenta, Ark.—The Argenta Railway has received a franchise from the Council to extend its Washington Avenue line east on Washington Avenue and north on Beech Street to the Rock Island station in Little Rock.

Los Angeles, Cal.—The Pacific Electric Railway has asked the Council for permission to abandon its line on Mountain Avenue, now Avenue Sixty-four, from a point north of the former city limits at Meridian Street in Los Angeles.

Los Angeles, Cal.—The City Council of Los Angeles has voted to advertise for sale the proposed franchise for an electric line for Malabar District, on Boyle Heights, in accordance with the amended route. Bond was fixed at $2,500, and bids will be opened on Dec. 21.

***Los Angeles, Cal.**—The City Council has been asked to offer for sale to the highest bidder a twenty-one-year franchise to build an electric railway along certain portions of Brooklyn Avenue, Wabash Avenue and Evergreen Avenue in Los Angeles.

Pasadena, Cal.—The Pacific Electric Railway has received a thirty-year franchise from the Council for a double-track line on North Lake Avenue between Colorado Street and Washington Street in Pasadena.

***Tarpon Springs, Fla.**—The Pinellas Electric Light & Power Company has asked the Council for a franchise to operate an interurban electric railway in Tarpon Springs.

Chicago, Ill.—The Chicago City Council has been asked to grant a franchise for an extension of the Chicago Avenue line from North Clark Street to the lake shore in Chicago. Alderman Geiger offered the consent of the Lincoln Park Commissioners to have the line pass through park property.

Milwaukie, Ore.—The Portland & Oregon City Railroad has received a twenty-five-year franchise from the Council to build a line through Milwaukie from the south on Elmer Street and use Elmer Street to Washington Street, on Washington Street to Twenty-ninth Street and thence north to the city limits.

Portland, Ore.—The United Railways Company has petitioned the City Council to grant a relinquishment of that portion of its franchise on Stark Street west of Tenth Street and from the terminal yards in North Portland to the city limits. This section of track will be useless to the company in the near future by reason of the revocation of its franchise on the Linnton Road by the Multnomah County Commissioners, which takes effect on Feb. 1, 1915. The proposition may mean readjustment in this city of the entire interurban railway system of the Hill interests, which own both the United Railways and the Oregon Electric Railway. The Council has the proposition under advisement. It is said that an effort may be made to have the company give up its line on Stark Street entirely, as many of the property-owners on that thoroughfare are opposed to an interurban line.

TRACK AND ROADWAY

Florence & Huntsville Interurban Railway, Florence, Ala.—Right-of-way is being secured by this company for its line from Florence to Huntsville. Thurston H. Allen, president. [E. R. J., Nov. 21, '14.]

***Calico Rock, Ark.**—Plans are being considered to build an electric railway between Hoxie and Calico Rock. S. J. Johnson, Calico Rock, and associates are interested.

Little Rock, Pine Bluff & Eastern Traction Company, Little Rock, Ark.—Plans are being considered by this company to purchase its power from the Pine Bluff Company. This is part of a plan to build an electric line to connect Little Rock, Altheimer, Stuttgart, Helena and Pine Bluff. C. C. Kavanaugh, Little Rock, president. [E. R. J., Jan. 31, '14.]

Benicia Land & Terminal Company, Benicia, Cal.—Bids have been received for part of the construction work of the proposed Benicia-Vallejo electric railroad, according to a statement of J. J. Henry, representing the A. D. Bowen Company, of San Francisco. The proposed franchise for the line within the Vallejo city limits is in the hands of City Attorney O'Donnell and will be finally acted on about Dec. 30. The Benicia franchise was granted two months ago and the promoters say everything will soon be in shape to start the construction work. [E. R. J., Oct. 5, '14.]

Glendale & Montrose Railway, Glendale, Cal.—During the next two weeks this company will award contracts to build 2.3 miles of new track between the cities of Glendale and Eagle Rock.

Pacific Electric Railway, Los Angeles, Cal.—Work has been begun by this company lowering the tracks in D Street north from Base Line to Highland Avenue, in the city of San Bernardino.

Sacramento Valley Electric Railway, Sacramento, Cal.—G. W. Pierce, president of this company, announces that the construction of the second unit of this railway, from Dixon to Woodland, will begin as soon as financial and right-of-way arrangements are completed. Surveys are now being made on three proposed routes. The reports regarding three available rights-of-way are expected to be presented to the Supervisors within the next two weeks.

San Francisco (Cal.) Municipal Railway.—M. M. O'Shaughnessy, city engineer, has been directed to prepare plans and specifications for the proposed line of this municipal railway through Golden Gate Park to the Sunset District. The Supervisors have unanimously adopted a resolution to that effect. The line will be routed through the park from the present terminus of the railway at Tenth Avenue and Fulton Street and will extend back of the Museum and around Strawberry Hill. The cars will emerge at Fourteenth Avenue and continue to Kirkham Street.

Middletown & Chester Railway, Middletown, Conn.—Plans are being considered to build this line along the river bank through the towns of Chester, Shailerville, Haddam, Durham, Higganum and Middletown. It will connect at Chester with the Shore Line Electric Railway and in South Farms with the tracks of the Connecticut Company. Richard H. Bunce is interested. [E. R. J., Dec. 12, '14.]

***Torrington (Conn.) Traction Company.**—Preliminary arrangements are being made by this company to apply for a charter in January, 1915, to build an interurban line between Torrington and Thomaston to be operated by electric power or any other power than steam. Among those interested are: Hosea Mann, George B. Goodwin and Howard Guernsey.

Waterbury & Milldale Tramway, Waterbury, Conn.—This company has completed its entire line between Milldale and Waterbury, 8 miles.

***Willimantic & Manchester Street Railway, Willimantic, Conn.**—T. J. Spellacy, Hartford, and associates are reported as stating that they will petition the incoming General Assembly for the incorporation of this railway. The company will ask for a franchise for the construction of an electric railway from Willimantic through Columbia, Andover, Coventry, Bolton and Manchester.

Central of Florida Railway, Daytona, Fla.—Between 5 and 6 miles of new track will be built by this company during 1915.

Caldwell (Idaho) Traction Company.—Plans are being contemplated by this company to electrify about 1 mile of steam railroad between Caldwell and Wilder during 1915.

Lee County Central Electric Railway, Amboy, Ill.—During 1915 this company plans to build a 12-mile line between Middleburg and Rochelle.

Alton & Eastern Electric Railway, Alton, Ill.—Arrangements are being made by this company to build soon the extension of the Alton Street line from Alton to the new hospital east of Alton. T. W. Gregory, East St. Louis, secretary. [E. R. J., Feb. 15, '13.]

Joliet & Eastern Traction Company, Joliet, Ill.—An 18-mile extension between Charles City and the Great Western Railway will be built by this company during 1915.

Erlanger, Ky.—Extension of the Fort Mitchell electric line along the side of the Lexington Pike to Erlanger is a project which the Erlanger Improvement League, the Retail Merchants' Association and the Covington Industrial League have under consideration with the County Commissioners. It is proposed to build a single-track line and efforts are being made by these several organizations to get the right-of-way. David Castlemen, J. P. Rife and Samuel Adams are the local committeemen who are pushing the project.

Kentucky Utilities Company, Somerset, Ky.—Extension of the electric railway line from Somerset to Burnside, also in Pulaski County and about 7 miles due south, is said to be an improvement which it is proposed to make out of the funds realized by this company from the sale of its recently authorized $3,000,000 bond issue.

Orleans-Kenner Electric Railway, New Orleans, La.—The Metairie loop will be built by this company in New Orleans. The route over which the extension will come into the city has not yet been agreed upon. [E. R. J., Oct. 5, '14.]

Boston (Mass.) Elevated Railway.—Three new lines for Brookline are being planned by this company. The plans call for a line from Allston Street down Harvard Street to Dudley Street on a ten-minute headway for normal hours and on shorter time for the rush hours; another line from Cypress Street down Huntington Avenue to Park Street, and another from Cypress Street through Brookline Village down Brookline Avenue and Longwood Avenue to North Station.

Springfield (Mass.) Street Railway.—Rapid progress is being made by this company in the construction of the new line in East Main Street in Springfield.

Worcester (Mass.) Consolidated Street Railway.—Plans are being considered by this company for its branch line to Sandersdale.

***Adrian, Mich.**—Plans are being considered for an electric railway from Adrian to Elkhart.

Detroit (Mich.) United Railway.—This company is asked to consider plans to extend its tracks on the western city limits at Webb Avenue to Palmer Park in Detroit.

Menominee & Marinette Light & Traction Company, Menominee, Mich.—About 1½ miles of new track will be built by this company in Menominee during 1915.

***Trans-Michigan Railway, Muskegon, Mich.**—Right-of-way has been secured, franchises voted and options have been secured for terminal properties by this company for its proposed line between Muskegon and Saginaw.

Fallon (Nev.) Electric Railway.—Plans are being made by this company to push the work on the grade to Sand Springs. About 12 miles of the grade has been completed. The Berney Construction Company has taken the contract to complete the grade to Sand Springs and to build all bridges and culverts.

Omaha & Council Bluffs Street Railway, Omaha, Neb.—This company has placed in operation its Center Street line to the southwest section of Omaha.

***Trenton, N. J.**—Right-of-way is being secured to build an electric railway from Trenton to Washington's Crossing and Lambertville. Among those interested are: Joseph H. Moore, Horace G. Hough, Barton T. Fell and George W. McGuire.

Batavia (N. Y.) Traction Company.—Estimates are being secured and plans made by this company for a 3-mile line from Batavia to Horseshoe Lake. The line will connect with the Batavia Street Railway at its eastern terminus.

Buffalo & Depew Railway, Buffalo, N. Y.—Plans are being considered by this company for an extension east from Depew to Crittenden, 6 miles. A ½-mile extension to Lancaster will be constructed during 1915.

Interborough Rapid Transit Company, New York, N. Y.—The Public Service Commission, First District, has disapproved the contract submitted by the Interborough Rapid Transit Company for the construction of the dual system extensions of the elevated railroads in Manhattan and The Bronx. This contract the company proposed to give without competitive bidding to T. A. Gillespie Company, Snare & Triest and Terry & Tench, the contractors now doing the third-tracking work on the elevated railroads for the company. Instead of a lump sum they were to be paid cost plus 12½ per cent. The commission decided that the company may allow the contractors doing the third-tracking work to build connections with the new lines, but that the main parts of the elevated extensions should be awarded as a separate contract after the company had secured bids thereon from at least six different contractors.

Manhattan & Queens Traction Corporation, New York, N. Y.—This company is asked to consider plans to extend its line now running between Long Island City and Jamaica to St. Albans. It is planned to extend the line along Archer Place in Jamaica, to Washington Street, where the company could connect with the other electric lines extending north and south, east and west in Jamaica.

Shelby (N. C.) Northern Railway.—Preliminary arrangements are being made by this company but no definite plans have been decided upon as to when construction will be begun on its 21-mile line to connect Shelby, Spurlinville, Costners, Beams Mill, Fallston, Boggs, Belwood, Warlicks and Casar. The company will furnish power for lighting purposes. Capital stock, authorized, $400,000. Officers: S. S. Royster, Shelby, president, and Orlando Elam, Shelby, secretary.

Chillicothe Electric Light & Power Company, Chillicothe, Ohio.—This company has been repairing its track on Main Street as far as Brownell Street in Chillicothe. The old track has been taken out and new ties have been placed on a foundation of cement.

Cincinnati (Ohio) Traction Company.—An agreement has been reached between the city of Cincinnati and the Cincinnati Traction Company for extensions of various lengths on the following lines: Vine-Clifton, Warsaw-Elberon (main line now under construction), Sixth Street, Vine Street and Clifton-Elm. The electric railway committee has advised against the construction of tracks on Plum Street between Fourth Street and Eighth Street and Central Avenue between Freeman Avenue and Mohawk Bridge. The construction of the Bond Hill line will go forward as rapidly as possible. Agreements were also reached regarding transfers on certain lines. The extensions are in line with the plan of rerouting made some time ago. A new crosstown line north of the present line on McMillen Street is under consideration.

Cleveland (Ohio) Railway.—Plans are being considered by this company for an extension along Euclid Avenue between East Twenty-second Street and East Fortieth Street in Cleveland. Plans to secure an extension of the Buckeye line from East 116th Street to East 130th Street in Cleveland, are being contemplated.

Cushing (Okla.) Traction Company.—Rapid progress is being made by this company on its line from Cushing in an easterly direction through the oil fields. It is planned to purchase power from the Cushing Electric Light & Power Company. Frank Brown, Independence, president. [E. R. J., Nov. 21, '14.]

***Oklahoma City, Okla.**—H. S. Shelor, president of the Chamber of Commerce, and associates are considering plans to build an electric railway to connect Oklahoma City, Okmulgee and Muskogee. Preliminary surveys have been made.

Peterborough (Ont.) Radial Railway.—Within the next few months this company plans to build 1 mile of new track in Peterborough. All material is now on had.

Sarnia (Ont.) Street Railway, Ltd.—During the next few months this company plans to build about ½ mile of new track in Sarnia.

***Toronto, Ont.**—E. A. Wallberg, 10 Adelaide Street E., owner and engineer, is negotiating with the City Council for permission to build an electric line 4½ miles long, from Leaside to Merton Avenue, North Toronto. The owner will buy all material and will superintend construction. Estimated cost of line $200,000.

Sudbury, Ont.—The Board of Railway Commissioners has authorized the Sudbury-Copper Cliff Suburban Electric Railway to build its tracks across the Canadian Pacific Railway in Sudbury, and across various spur lines and the Canadian Pacific Railway Stobie branch. J. H. Mackey, Sudbury, president. [E. R. J., Nov. 7, '14.]

Rhode Island Company, Providence, R. I.—This company is asked to consider plans to extend its North Main Street tracks to the terminus of this highway at the state line, near St. Paul's Cemetery in Woonsocket.

***Beaumont, Tex.**—Initial steps are being taken to build an electric railway between Houston and Beaumont, via Liberty, Dayton and Crosby. Edward Kennedy and associates are promoting the project.

Brenham, Tex.—At a recent mass meeting in Brenham the plans of L. M. Hewitt, promoter for a 15-mile electric line to connect Brenham, Independence, William Penn and Bryan were accepted. A bonus of $35,000 was asked from the citizens of Brenham, with an additional $50,000 worth of stock in the company. [E. R. J., Nov. 21, '14.]

San Antonio (Tex.) Traction Company.—Work has been begun by this company double-tracking North Flores Street in San Antonio.

SHOPS AND BUILDINGS

Birmingham Railway, Light & Power Company, Birmingham, Ala.—Plans are being made by this company to occupy its new building at First Avenue and Twenty-first Street in Birmingham by Jan. 1.

Glendale & Montrose Railway, Glendale, Cal.—During the next two weeks this company plans to award contracts to build a new carhouse. The structure will be 30 ft. x 120 ft. and will be fully equipped for repairing, etc.

San Francisco (Cal.) Municipal Railway.—The Board of Works has awarded the contract for the construction of the municipal railway carhouse on Seventeenth Street to the Clinton Fireproof Company for $195,900.

Norton & Taunton Street Railway, Norton, Mass.—This company's carhouse at Norton Center was destroyed by fire on Dec. 10. The loss is estimated to be about $50,000.

Mansfield Railway, Light & Power Company, Mansfield, Ohio.—This company is building a new interurban office and waiting station in Mansfield. The cost is estimated to be about $20,000.

Chambersburg, Greencastle & Waynesboro Street Railway, Waynesburg, Pa.—This company is building a new passenger station at Kauffmans.

Columbia (S. C.) Street Railway.—Plans are being made by this company to rebuild its carhouse in Columbia. The cost is estimated to be about $30,000.

Wellsburg, Bethany & Washington Street Railway, Bethany, W. Va.—This company plans to build soon a new carhouse at Bethany.

POWER HOUSES AND SUBSTATIONS

United Traction Company, Albany, N. Y.—Work will be begun at once by this company on the construction of its new transformer station at the corner of Sheridan Avenue and Chapel Street in Albany. The contract for the building has recently been awarded to the Hunkin-Conkey Construction Company, Cleveland, Ohio. The structure will be 60 ft. x 85 ft. and 45 ft. high, except in the center, where the height will be increased to 62 ft. It is estimated that the cost will be about $40,000. In addition to the building the company will spend $55,000 on machinery, copper and underground cable.

Westmoreland County Railway, Pittsburgh, Pa.—This company is scrapping the equipment in its old power house and will buy its power in the future.

Monongahela Valley Traction Company, Fairmont, W. Va.—The new gas-driven power plant of this company at Hutchinson, midway between Fairmont and Clarksburg, W. Va., is nearing completion. Its total cost will be about $350,000. It will be used to supplement the steam plant from which power has been furnished for the line.

Manufactures and Supplies

ROLLING STOCK

Detroit (Mich.) United Railway, according to an unconfirmed report, is expecting to purchase twenty cars shortly.

Glendale & Montrose Railway, Glendale, Cal., expects to purchase one double-truck passenger car, with seating capacity of forty-four to forty-six passengers.

Cushing (Okla.) Traction Company, Cushing, Okla., has just placed an order with the Westinghouse Electric & Mfg. Company for one 50-ton locomotive and two passenger equipments for its new 1500-volt road.

Westmoreland County Railway, Pittsburgh, Pa., has ordered three cars, 42 ft. over all, seating capacity of forty-four, 26-in. wheels, four Westinghouse baby motors from the Cincinnati Car Company.

Los Angeles (Cal.) Railway has ordered from the St. Louis Car Company a car equipment to be placed on exhibition at the Panama-Pacific Exposition which later will go into city service. The equipment is of the low-floor design and is equipped with double Westinghouse No. 306 50-hp motors and light-weight HL pneumatic control.

TRADE NOTES

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has received an order from the Easton (Pa.) Transit Company for one four-motor equipment of No. 306 Westinghouse motors and HL control.

Union Switch & Signal Company, Swissvale, Pa., has appointed H. R. Sheene as sales engineer with headquarters in Room 2039 Railway Exchange Building, St. Louis, Mo., reporting to the resident manager at Chicago.

Mesta Machine Company, Pittsburgh, Pa., has recently acquired the rights from the Stumpf Una-Flow Engine Company, Syracuse, N. Y., to build the Stumpf Una-Flow type of engine in the United States. This company is at present making detailed shop drawings of various sizes of engines for rolling mill purposes. In addition to rolling mill engines, the company will build large units for driving electric generators, air compressors, hoisting engines, etc.

Arthur D. Little, Inc., Boston, Mass., has recently prepared specifications for body, roof and truck paints for electric cars, following studies of the car-painting practice on more than twenty electric railways, which demonstrated the feasibility of reduced painting costs by nearly 50 per cent while cutting time in the shops in half. This company has co-operated with the American Electric Railway Engineering Association in developing specifications for rubber-covered wire and cables and for trolley wire.

Edison Storage Battery Company, Orange, N. J., reports that its storage-battery works, which escaped uninjured by the recent fire which destroyed part of the Edison Phonograph Works on Dec. 9, suffered no interruption whatever to its business. The telephone exchange was in one of the burned buildings, but through the prompt action of the New York Telephone Company a temporary switchboard was working in the battery office before business hours the next morning and the Public Service Electric Company had emergency lines furnishing power about as quickly.

Esterline Company, Indianapolis, Ind., manufacturer of "Golden Glow" headlights, reports shipments of these headlights during the month of November to the following properties: Sioux City (Ia.) Service Company; Virginia Railway & Power Company; Birmingham (Ala.) Railway, Light & Power Company; St. Louis Car Company for Empire United Railway's new cars; Los Angeles (Cal.) Railway; Strickland-Goodwin Management Association; Western Light & Power Company; Northern Texas Traction Company; Michigan Central Railroad; Cincinnati Car Company, for Ephrata & Lebanon Traction Company's new cars; Topeka (Kan.) Railway; Harrisburg (Pa.) Railways; Indiana Railways & Light Company; Iowa Railway & Light Company; American Car Company, for Bryan & College Interurban Railway's new cars; Southwestern Gas & Electric Company; Omaha & Council Bluffs Street Railway; Wausau (Wis.) Street Railway; Lowell & Fitchburg Street Railway; Scranton (Pa.) Railway; Georgia Railway & Power Company; Jackson Railway & Light Company and Altoona & Logan Valley Electric Railway.

ADVERTISING LITERATURE

Stow Manufacturing Company, Binghamton, N. Y., has issued a catalog describing some of its portable tools, including drills and grinders.

Dielectric Manufacturing Company, St. Louis, Mo., has issued Bulletin No. 9, describing "Dielac Black," its spirit finishing varnish, for painting armatures.

Arnold Company, Chicago, Ill., has issued a postal containing an illustration of a substation just completed by this company for the Chesapeake & Ohio Railway.

Ohmer Fare Register Company, Dayton, Ohio, has published a pamphlet describing its fare box for both cash and tickets. The pamphlet also quotes remarks made by railway men at the last convention covering the use of various types of fare boxes.

Asbestos Protected Metal Company, Beaver Falls, Pa., has issued a catalog describing special uses of Asbestosteel, its asbestos protecting metal, in connection with concrete for the construction of roofs and curtain walls. The catalog contains a number of illustrations of applications of this material to various buildings, among them being a view of the interior of the Philadelphia & Garretsford Railway, which uses this type of construction for the roof of its substation. In developing this process sheet steel is protected from corrosion by being covered on both sides with a uniform coating of asphalt, which in turn is protected from fire and weather exposure by a layer of hardened and waterproof pure asbestos felt laid over and imbedded in the asphalt while still hot and soft. This is done without sacrificing the advantages inherent in corrugated sheets for roof and wall constructions. The catalog is designed and written by Ray D. Lillibridge, Inc., New York.

Archbold-Brady Company, Syracuse, N. Y., has issued a booklet on the subject of its steel transmission structures and catenary bridges. In the booklet are presented views of structures covering a wide range of designs and localities. With the idea of showing actual and varied practice, brief descriptions are given to transmission lines using "A" frame towers and narrow base poles, catenary bridges and also anchor towers and structures required for special purposes. The electric railways represented by the illustrations shown include the Puget Sound Traction, Light & Power Company, East St. Louis & Suburban Railway, Fonda, Johnstown & Gloversville Railroad, Northern Ohio Traction & Light Company, Boston & Maine Railroad (Hoosac Tunnel), Empire United Railways, United Traction Company, Albany, N. Y., and Berkshire Street Railway. The "A" frame towers are designed for both pin and suspension type insulators and for conductors of all sizes and materials. The laced channel poles are particularly adapted for lines in rough country. Since they take up little room at the ground line, the poles save expensive right-of-way where land is valuable and on steep side hills the necessity of erecting "benching in" or extension legs for wide base towers is avoided. They can be set interchangeably with concrete bases or with all steel foundation, as may be most suited to the nature of the ground.

NEW PUBLICATIONS

Proceedings of New York State Association for the Fiscal Year Ending June 30, 1914, published by the secretary, Brooklyn, N. Y. 276 pages.

The annual report of the New York Electric Railway Association always contains a great deal of good material, and this volume is no exception to the rule. The conventions reported are the annual meeting at Bluff Point, June 30 and July 1, and the quarterly meeting at New York on Dec. 9, 1913. The volume is not only attractive because of its contents but because of its exceptionally good typographical execution.

Proceedings of Southwestern Electrical & Gas Association for 1913, published by the secretary, Slaughter Building, Dallas, Tex. 145 pages.

The Southwestern Electrical & Gas Association is to be congratulated upon the excellence of its conventions. A note from the secretary states that the papers in the present volume are not printed in full but in abstract, and that the 1914 proceedings will be published within a short time.

Electric Railway Journal

Published by the McGraw Publishing Company, Inc.

Consolidation of STREET RAILWAY JOURNAL AND ELECTRIC RAILWAY REVIEW

Vol. XLIV NEW YORK, SATURDAY, DECEMBER 26, 1914 No. 26

SEMI-STEEL AND ALL-STEEL CARS

The difficulty of drawing a sharp distinction between the terms "semi-steel" and "all-steel" is made apparent by several conflicting statements which we have recently received from railway companies in regard to the rolling stock list of our next week's annual statistical issue. In a number of cases the railway described its new cars as "all-steel," whereas the builder of the cars designated them as "semi-steel." This difference in classification may have been due in some cases to the ambition of the general manager to expand the ill-defined but halo-creating term "all-steel" in order to appear more progressive. The confusion, however, more likely arises from the number of small variations in the proportion of steel parts used, ranging between entirely wood and entirely steel construction. The absence of any strict dividing line between composite and all-metal types has rendered impracticable any official cut-and-dried definition. Nevertheless, the slight variations in the proportion of steel in cases do not hinder the effective use of arbitrary and approximate terms for the valuable purpose of noting the progress of modern practice toward adopting steel construction. In presenting our statistics, therefore, we shall endeavor, as closely as our records and variations in design permit, to consider all-steel passenger cars as those which possess not only the steel side sheathing of semi-steel cars, but also steel posts and carlins. We believe that its definition, though arbitrary, should add to the practical value of the statistics.

AN ANOMALOUS SITUATION

The hearing at Washington this week before the Interstate Commerce Commission emphasizes the importance of delimiting in some way the jurisdictions of the federal and state commissions. In saying this we are not criticizing commission regulation in general or the federal commission or individual state commissions in particular. But, as we have said before, commission regulation is so recent it is not surprising that there should be many problems still to be settled, and one of these is the extent of the jurisdiction of each kind of commission. The steam railroads have also suffered from this situation of conflicting authority and in general, we believe, favor the authority of a single federal commission. Certainly President Harrison of the Southern Railway expressed his preference in this way in no uncertain terms at the dinner on Dec. 10 of the Railway Business Association, and his views seemed to receive the approval of those present. On the other hand, state regulation has been favored by electric railway speakers at two recent hearings in Washington, partly because of the better knowledge possessed by the state authorities of local conditions, and partly because the hearings before these commissions are held at state capitals, which are more readily accessible than Washington. We assume that both the federal and state commissioners themselves would be glad to have the present situation clarified, not only as it applies to electric railway problems, but also to steam railroad problems. Indeed, this thought was voiced in a resolution introduced at the last meeting of the National Association of Railway Commissioners by Commissioner Williams of Texas. It certainly seems absurd for the Interstate Commerce Commission to spend its time discussing the best type of fender to be used to prevent accidents in Detroit, for instance, just as it would be to have the rates, schedules and operating conditions of a transcontinental line regulated according to the diverse views of fifteen or twenty state commissions. No serious constructive effort has yet been made to clear up the present anomalous situation, but the matter is so important that we believe it demands prompt attention on the part of our legislators.

A CONSTRUCTIVE RATE DECISION

The Interstate Commerce Commission decision granting to steam railroads in official classification territory a 5 per cent rate increase is probably the greatest single piece of constructive co-operation between the carriers and the public that American finances could receive to-day. We say the public, for we look upon the decision as a notable victory for public opinion rather than a self-inspired action on the part of the commission. For some time the public has realized that the earning power, efficiency and credit of the railroads could be revived only through an increase in revenues, but it has taken the crash of war and widespread financial stringency to bring this fact home to the commission. The statement, however, that the determination of properly remunerative rates must take into consideraton the increasing hire of capital as well as other costs, is really constructive, and we hope that the commission will henceforth be permanent advocates of this modern policy. The exemption of certain rates, it is true, makes the $50,000,000 increase in revenue less than the amount expected by some carriers, but on the whole the decision is a distinct help to the general railroad situation. As great as will be the benefit derived from the increased earnings, more important will be the restored confidence of the investing public as reflected in more active securities. The railroads should be enabled to do the financing that has been denied to them on account of their lessened earning power, and thus replenish their depleted equipment and rolling stock. It must not be expected, however, that an avalanche of orders will now ensue, for liberal buying will depend upon a decided improvement in stock market, general business and foreign trade conditions. Yet in its psychological aspect, as causing managers more hopefully to contemplate added facilities, the present effect of the decision bids fair to be helpful.

INCREASED BAGGAGE CHARGES

In its broad scope the rate decision shows that the relief which the commission had previously thought could be gained from other measures than increased freight charges has been made largely impossible by present depressed conditions. Yet some movements have already been made along the suggested lines, such as the increase of passenger mileage rates, and steam railroad managers are now seriously considering the practicability of adopting uniform rates for the transportation of baggage. In previous issues we have mentioned the first development as being important from the viewpoint of electric railways, but the latter proposal is comparatively no less so.

The proposed new rates for the transportation of baggage would apply only to articles that are now checked free or carried for the payment of a small charge for the excess weight. Some difficulties might be experienced in adopting uniform baggage rates, inasmuch as it would be necessary to change or amend some state laws providing free transportation for baggage weighing under 150 lb. and federal laws requiring the same for emigrants' baggage weighing less than 250 lb. Interstate electric lines, however, are exempt from both of these restrictions, so that they, as well as electric lines in states without baggage laws, might well apply the uniform baggage rate. Such rates would be equitable because there is no reason why a railroad should transport a heavy trunk and a passenger for the same price as that which it charges for a passenger alone. The practice abroad, of course, is to charge for all baggage which is not hand baggage carried by the passenger, and to charge rates for baggage comparable to those charged for passenger transportation. The opposite practice of the American roads has always seemed anomalous to the European manager.

At present some electric interurban roads make an arbitrary charge for all baggage, regardless of its weight, while others handle it free without a charge for excess. Many traveling men with large, heavy sample cases take advantage of the fixed charge regardless of weight, having found that the payment for excess weight on steam railroads is more than the fixed charge on the electric lines and that the latter roads also afford a cheaper passenger rate. We believe that the convenience of frequent electric service to salesmen is so established that the normal increase in their transportation will not be affected if the charge for baggage is made the same as on steam railroads. The detail work in connection with the handling of baggage has become quite a problem, and it is only just that such transportation should be remunerative in proportion to the value of the service rendered.

EFFECTIVE COMMITTEE WORK

The American Electric Railway Association is successful in proportion to the effectiveness of its committee work. Effective committee activity is the barometer which, when indicating a high pressure, predicts fair association weather. At this season, when the committees are pondering their assignments, it may not be inappropriate to consider a few of the elements which observation shows lead to success. In recent issues of this journal the subjects allotted to many committees have been listed as well as the names of the chairmen responsible for the carrying out of the program. A few preliminary committee meetings have also been reported. The committees are expected to have program reports in the hands of the secretary by Jan. 20 for presentation in abstract to the executive committee at the Washington meeting. The committees on subjects of the several associations met early, their reports were laid before the respective executive committees and were promptly acted upon, the schedules were transmitted soon thereafter to the committee chairmen, and now the committees have a good six-month period to do their constructive work. May they go to it, with our best wishes for a fruitful year!

There seem to be at least three elements of success in committee work, namely, the character of the commission given to the committee, the caliber of the committee personnel and the definiteness of the committee's plan of campaign. In the present case the responsibility for the first is upon the committees on subjects, for the second on the officers who appoint the committees, and for the third on the committee chairmen.

A good commission for a committee must be definite, with no ambiguity as to the subjects to be considered. Furthermore, the subject must be timely, even urgent, for railway men, like those in other vocations, have time to do only what must be done. Finally, it must be reasonable in scope, in view of the time and energy available. A few salient topics thoroughly covered are worth more than a vast array of undigested data.

The best of commissions will fall flat unless the committee has the proper personnel, and agreeable personality is not the only qualification for committeemen. Each must have some incentives to do good work and to stimulate and feed his interest. As human nature is constituted self-interest is a dominant characteristic, hence the association will benefit most when the committeemen personally are profiting most, directly or remotely, from their committee activity. There was a time when committee appointments were more or less honorary, but now they are merely opportunities to work, and to work hard.

But with the finest general scheme, the most carefully selected committee will fail to "arrive" without a definite plan and good internal discipline. By virtue of his appointment the chairman is invested with certain responsibility and corresponding authority which are recognized by acceptance of appointment to serve under him. The chairman must command the respect of his colleagues to insure the success of his plans. He must make allowance for "human frailty" by assigning work to sub-committees in definite tasks to be completed within prescribed periods. It has come to be accepted that chairmen are expected to do the work of committees, while the other members play advisory roles. The chairman can only protect himself by handing out reasonable "stints."

Our observation leads us to believe that the railway association committee work is commendable from the standpoint of the above specifications. It is always in order, however, for each committee and each present and prospective member thereof, to apply the same rigid tests of efficiency in this work as are applied in every-day business. The association committee work represents large investments of money and time. The industry has a right to expect results. At this date the burden rests upon the committee chairmen.

"POISONING THE WELLS" AGAIN

In the issue of the ELECTRIC RAILWAY JOURNAL for Dec. 5 an editorial was published under the title "Poisoning the Wells." This was provoked by another editorial in *The New Republic* of Nov. 21, in which the writer rather sarcastically stated that "We are much in need of a far more thorough exposition of the practices and purposes of the public service companies—an *honestly* (our italics) partisan exposition of their side, with no pretence to a monopoly of 'correct principles.' But a deliberate policy of 'influencing public education at its source' is sure to prove worse than futile." Then follows the well-poisoning figure and the statement that colleges now welcome men of affairs to their classrooms to enlighten the student body, but that an organized effort by private interests will defeat this form of co-operation.

Without any desire to make "much ado about nothing," it seems to us that our contemporary has rendered valuable service in bringing out more clearly by way of contrast the underlying facts in this case. Last week we printed a letter from an eminent dean, and two letters from equally competent sources are printed this week. These writers know both sides of the present problem, and they realize keenly how difficult it is to give students a working grasp of the conditions under which they must earn their living after graduation. Occupied as the curriculum necessarily is with fundamental theory, important practical conditions are frequently overlooked. The men who know, from outside, are the only ones who can give the facts. Aside from these men information is largely second-hand. As *The New Republic* allows, they have been welcome visitors in college halls. As *The New Republic* omits to state, these men, while willing enough, have been too busy to spend their time in doing work that the teachers were supposed to be engaged on. They now realize somewhat the importance of lending a hand, and the committee on public relations of the American Electric Railway Association hopes to arrange for more readily meeting the wishes of the educational institutions. To read *The New Republic* editorial one would infer that prominent railway magnates were sitting up nights to devise ways for invading the college field. As a matter of fact, it is only by means of an influential body like the American Electric Railway Association that the educational institutions can get such invaluable assistance, and even then it is far from easy.

CALCULATING STARTING RESISTANCES

Many electric railway problems lend themselves readily to graphical calculation. The graphical representation of data is valuable not only in the solution of problems, but in presenting relationships in easily tangible form. These two statements apply especially to the series motor in which there are the three interdependent variables, speed, torque and current. As these are connected through the magnetic flux in the motor field, which does not vary with the current in any simple relation, it is not practicable to express the relation by formulas. Curves of a very simple nature, however, are easily obtained from experiment and are equally readily applied to operating conditions. Every manufacturer's bulletin describing a modern motor contains a pair of characteristic curves, as a matter of course. In some cases several pairs, for different gear ratios, are given for the user's convenience.

Among the many calculations which can be made with the aid of the characteristic motor curves, that described in this issue by F. Castiglioni is especially interesting and valuable. This article will repay study not only by those who are directly concerned with starting resistances, but by all equipment men who want to be familiar with the simple theory of the subject. It would be productive of energy saving, we have no doubt, if every superintendent of equipment would apply this method to his own equipment just to assure himself that the starting resistance is graduated to suit his requirements. An official of a very large road suspected, some years ago, that all was not right in this direction. Instruments were put upon the cars with astonishing results. By readjusting some resistance grids large power economies were effected. As the method here described indicates, the calculations are simple enough and there is no mystery about them. This must be so, for the data needed for the calculations are so few and so easily obtained.

Mr. Castiglioni's method involves the assumption merely of the upper and lower current limits in starting. These are the limits mechanically set in a control provided with the automatic acceleration feature. By means of sets of curves of certain factors in the elementary formulas calculated for different voltages once for all, and having nothing to do with the motor curves, he is able to save an enormous amount of labor in the actual solution of the problem. As in all such methods the principal labor is performed when these curves are calculated, corresponding to the careful designing and making of dies and jigs in connection with a manufacturing process.

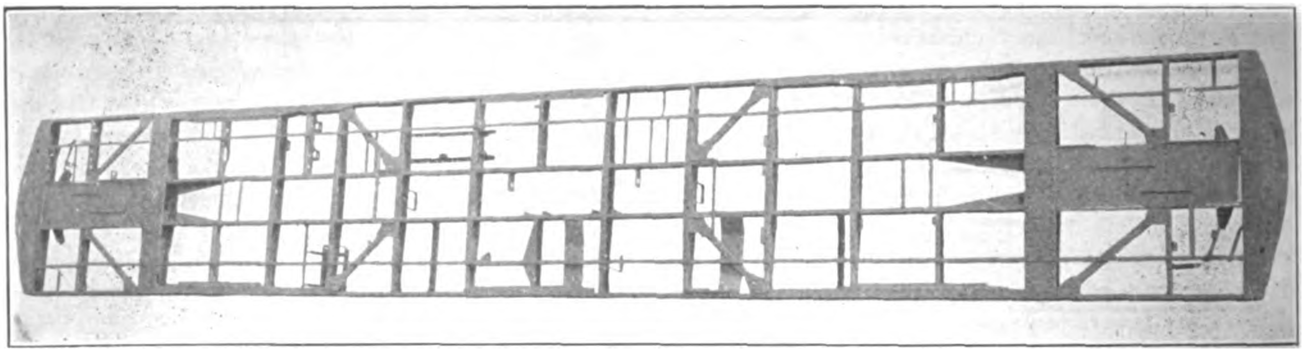
The New York Municipal Car—Trucks, Brake Rigging and Draft Gear

Trucks without Equalizer Bars, Clasp Brakes, Automatic Car Coupler Combined with Air Brake and Control Coupler, and Friction Draft Gear Are Among the Special Features—The Weight of the Truck for a Center-Plate Loading of 45,000 Lb. Is Only 11,280 Lb.

Previous articles* on the New York Municipal Railway Corporation's car for rapid transit service have described the operating conditions that influenced the selection of an extra-wide multi-side door type and the adoption of the principal features of the body. The present article describes in detail the trucks, brake rigging and draft gear, and calls attention to a number of improvements which are incorporated in the details.

TRUCK

The service in which the cars are to be used necessitates that the load per wheel be limited to a definite amount, as explained in the article of June 6. In order that the maximum loaded weight of the car be within the predetermined wheel-load limitations, one motor is placed on each truck and the center line of the truck bolster is 7 in. nearer the center line of the trailer axle than to the motor axle, so that the wheel loads at the rail are equal. Furthermore, the truck design excludes all unnecessary weight, each member, however, being proportioned for its respective duty with an ample factor of safety.



N. Y. M. CAR—UNDERFRAME TILTED AT RIGHT ANGLES TO SHOW ALL MEMBERS

To obtain the desired strength of truck with the least weight of material, the equalizer bars as ordinarily used have been discarded, and the helical springs are placed directly between the top of the journal boxes and the truck frame. The side frame of the truck is in the form of a truss, the top frame member or wheel piece being a pressed channel, developing into an angle form where it meets the transom gussets. The tension member of the truss side frame is a rolled steel angle. The transoms are specially flanged channel forms, fitted with an efficient spring support for the motor nose.

The swing links are supported by the transoms on hardened steel gibs resting on hardened steel gib seats. The lower ends of the links are fitted with the Woodard bolster height adjuster, providing graduations of height of three steps of 3/4 in. each. This arrangement will insure standard height of couplers and car floor during the full wear of the wheels and other parts of the truck.

Safety straps are provided to guard against dropping of the bolster should the swing links break. This safety device includes a special design of lower spring seat. In case a swing link breaks, one end of the spring seat will be caught by the lower member of the side frame and the other end will be caught by the usual form of safety strap.

BOLSTER

On account of close clearances, the bolster is pressed in the form of a U suitably flanged and reinforced with diaphragms and spring seats. The great depth available for the side walls of this type of bolster secures unusual strength with minimum weight. To avoid lost motion in the wearing parts between the car body and the truck, the bolster is fitted with removable, hardened spring-steel chafing plates, located near the ends of the bolster, which engage with similar plates attached to the transom gusset castings.

Provision is made to minimize wear on the wheel flanges, by the use of center plates of cast steel with felt dust guards, phosphor bronze wearing washers and an arrangement for supplying lubricating oil through the floor from the inside of the car body. Self-centering side bearings of the Stucki type are fitted to the trucks. They are provided with shims to permit the adjustment of clearance between car body and truck in steps of 1/16 in.

The pedestals are of cast steel with machined guides for the journal boxes, which are of the McCord type with a suitable seat for the helical spring. The guides are fitted with pressed spring steel liners. Oil wells for supplying lubrication for the guiding surfaces are cast iu the side walls of the box. Recesses are also provided in the sides of the journal boxes to receive the contact shoe beam attachment. Harrison dust guards are used on this truck. The journal brasses are of the semicircular type developed in 1912 by the Interborough Rapid Transit Company, New York, to provide for the heavy pressure of high-speed brake equipment and the driving effort of the motors.

SPRINGS

As clearance limitations will permit only 2 1/2 in. deflection of the elliptic springs due to passenger load of 20,000 lb. per truck, and as it is desired that the

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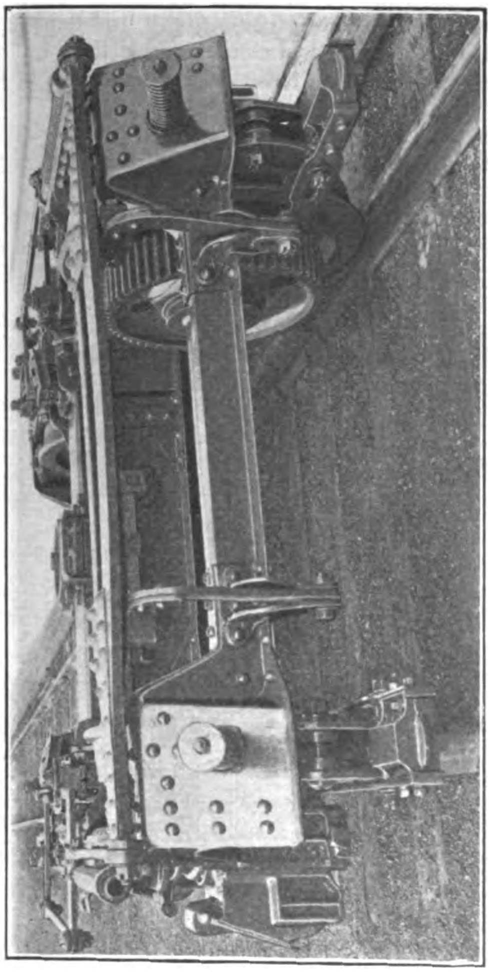
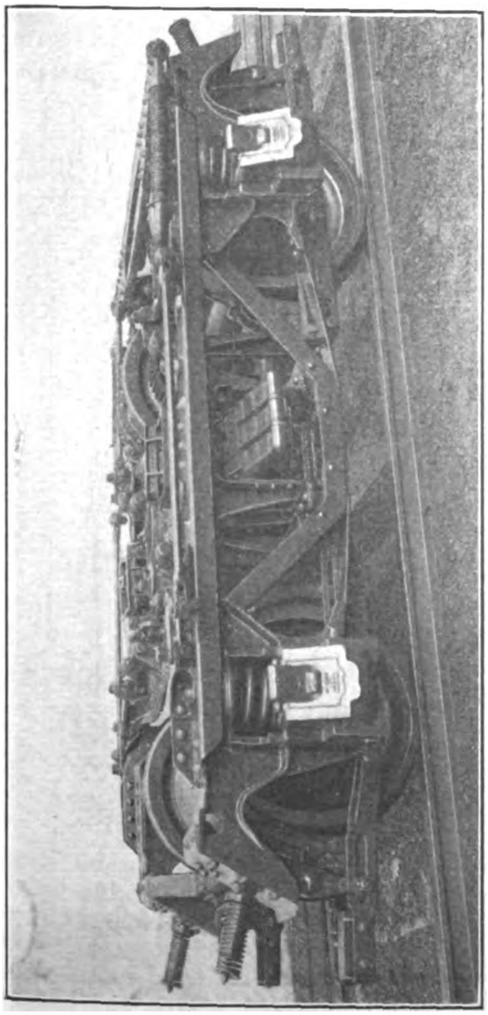
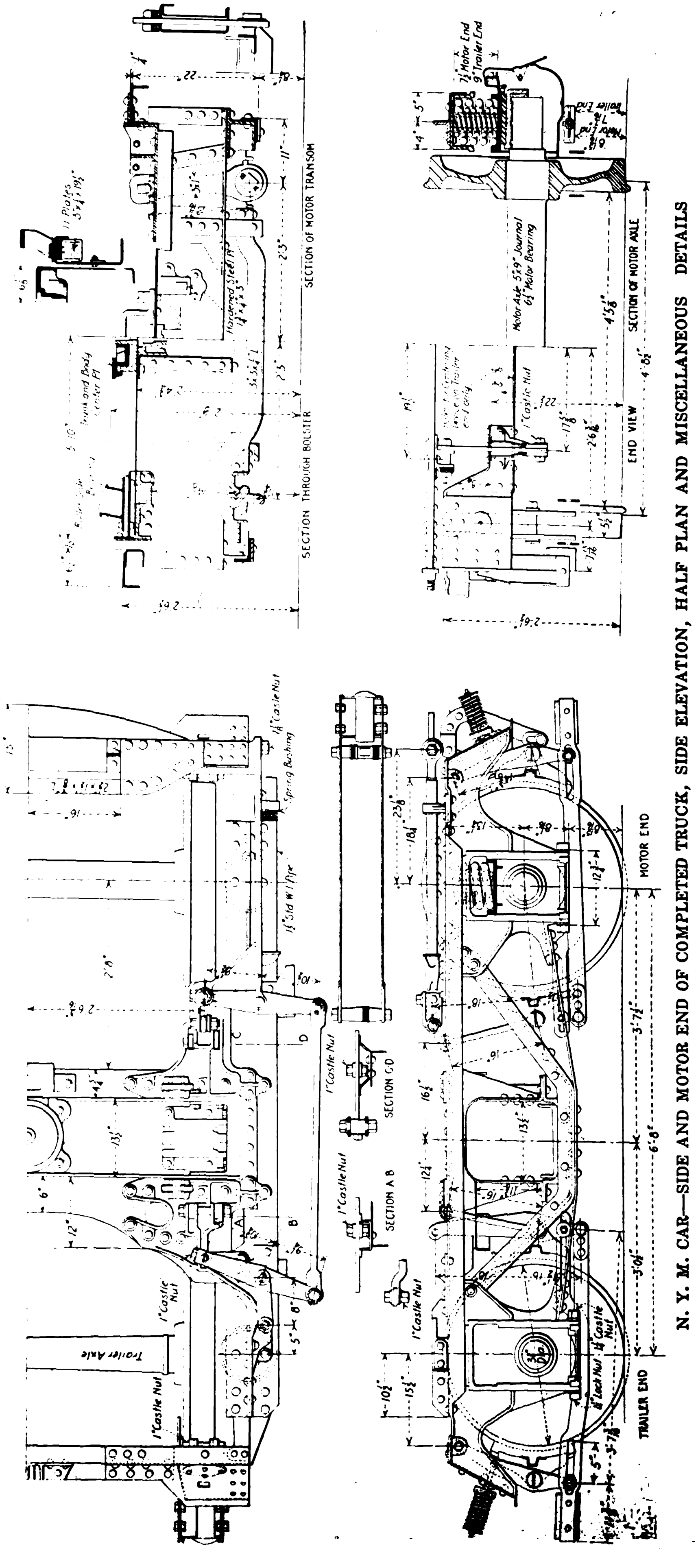
*See articles on "Design" and "Body" respectively in the Electric Railway Journal for June 6 and June 13, 1914.

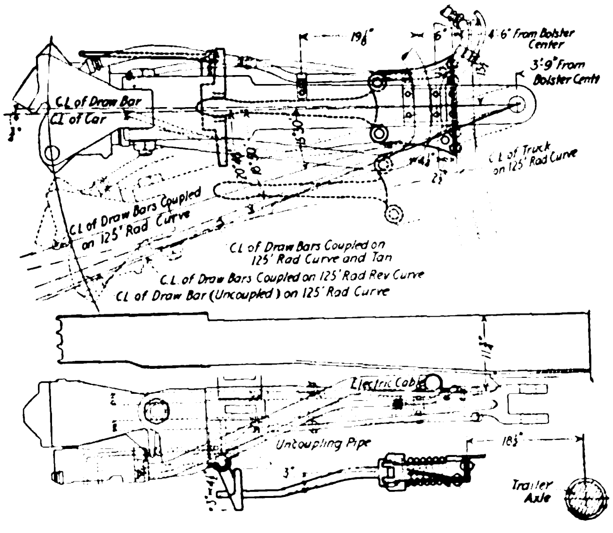





SECTION OF MOTOR TRANSOM
SECTION THROUGH BOLSTER
11 Plates 5/16"×1½"
Hardened Steel Pl.
Trunk and Body Center Pl.
7½" Motor End
9" Trailer End
Motor Axle 5×9" Journal
6½" Motor Bearing
1" Castle Nut
END VIEW
SECTION OF MOTOR AXLE
1⅛" Castle Nut
Spring Bushing
1½" Std. W.I. Pipe
Trailer Axle
SECTION C D
SECTION A B
MOTOR END
TRAILER END
1¼" Lock Nut
1¼" Castle Nut

N. Y. M. CAR—SIDE AND MOTOR END OF COMPLETED TRUCK, SIDE ELEVATION, HALF PLAN AND MISCELLANEOUS DETAILS springs impart as easy riding qualities to the car when containing but few passengers as when fully loaded, the springs have been arranged with supplementary leaves which come into bearing as the load increases. Easy riding is thus obtained for the extraordinary range of 37,800 lb. passenger load.

About 25 per cent of the springs have been tested by gradually applying sufficient pressure to bring the bands together and readings were taken at each ¼-in. deflection during application and release. The curve on page 1381 shows that the line representing the average between the deflection reading and the release reading taken at each ¼-in. stage, approximates the desired curve. The average of the springs tested did not vary more than 5 per cent from the specified curve.


19⅛"
6"
4'6" From Bolster Center
3'9" From Bolster Centr
C.L. of Draw Bar
C.L. of Car
C.L. of Truck on 125' Rad Curve
C.L. of Draw Bars Coupled on 125' Rad Curve
C.L. of Draw Bars Coupled on 125' Rad Curve and Tan
C.L. of Draw Bars Coupled on 125' Rad Rev Curve
C.L. of Draw Bar (Uncoupled) on 125' Rad Curve
Electric Cable
Uncoupling Pipe
18⅜"
3"
Trailer Axle

N. Y. M. CAR—DRAWBAR CENTERING DEVICE

The helical springs over each journal box are so proportioned that the deflection due to a passenger load of 20,000 lb. on each center plate is not more than ¾ in. nor less than ⅝ in.

WHEELS AND AXLES

The wheels are of Carnegie rolled steel. The driver wheels are 32½ in. in diameter; the trailer wheels, 30 in. in diameter. The rim thickness is suitable for the "one-wear" method of operation, though the design of the truck and brake rigging is such that 34-in. and 31-in. wheels may be used if found desirable at a later date. The decision to use "one-wear" wheels effected a saving of 800 lb. per car. The axles are of open-hearth carbon quenched and tempered steel and have 5-in. x 9-in. collarless type journals.

TRUCK BRAKE RIGGING AND AUTOMATIC SLACK ADJUSTER

As the highest rates of retardation consistent with comfort of passengers are desirable in any rapid transit service, and as the operation of the clasp brake rigging on the New York, Westchester & Boston cars fully demonstrated its success as applied to electric motive power equipment, the New York Municipal Railway trucks have been equipped with clasp brake rigging whereby the shoe pressure is divided between two brakeshoes per wheel with consequent low temperature and high coefficient of friction. This system not only results in economy of brakeshoe wear, but also minimizes the journal wear and eliminates such hot journals as are caused by displacement of the journal and journal brass.

The wear of the brakeshoes will be taken up automatically by the Sauvage shim slack adjuster. The advantage of automatic slack adjustment in nearly doubling the period between brakeshoe inspections has been already exemplified with the surface cars of the Brooklyn Rapid Transit System.

It was originally intended to ream all holes for brake pins in levers, jaws and hangers to a diameter 1/64 in. larger than the pin used and case-harden the metal around the holes to a depth of 1/16 in. In most instances, however, it has been found more practicable to use bushings of seamless cold-drawn case-hardened tubing.

All brake pins are of turned steel, with castle nuts and cotters, and case-hardened to a depth of approximately 1/16-in. Brake levers are of mild open-hearth steel, and all forgings, hangers and tension rods are of refined wrought iron. The brake heads are of manganese cast steel.

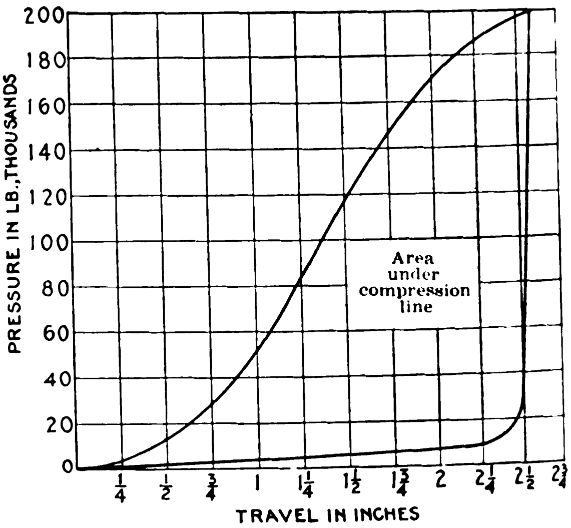
TRUCK DATA

Minimum radius of curve	125 ft.
Distance center to center of truck bolsters	47 ft
Truck wheelbase	6 ft. 8 in.
Distance from center of bolster to center of trailer axle	3 ft. 0⅛ in.
Distance from center of bolster to center of motor axle	3 ft. 7⅛ in.

Wheels—Solid rolled steel 5½-in. tread, M.C.B. 1909 standard contour.
Motor axles—Heat-treated carbon steel, 5-in. x 9-in. collarless journals, 6½-in. motor bearings.
Trailer axles—Heat-treated carbon steel, 5-in. x 9 in. collarless journals.
Height from top rail to bottom of car-body bolster at center plate with car light 2 ft. 9 in.
Frame—Rolled steel and pressed members.
Springs—Full triple elliptic, 40-in. long with scroll ends in bolster, and helical over journal boxes.
Pedestals—Cast steel with pressed hardened steel liners.
Journal boxes—Malleable iron.
Bolster—Pressed steel.
Center plates—Cast steel, self-lubricating and phosphor-bronze washers for wearing surface and felt dust protectors.
Brakes—Clasp type (two shoes per wheel) with helical adjustable release springs, cast manganese steel brake heads.
Transom—Pressed steel channel.
Motors—One per truck inside hung, with flat-leaf spring nose suspension.

WEIGHTS ASSUMED FOR PURPOSE OF CALCULATION

Weight on center plate of each truck due to car body and equipment	25,000 lb.
Weight on center plate of each truck due to maximum passenger load	20,000 lb.
Total weight of center plate of each truck due to car body and full passenger load	45,000 lb.
Weight on each truck center plate for purpose of figuring stresses	55,000 lb.
Load on motor nose support due to weight of motor	2,900 lb.
Torque of motor at motor nose support	3,000 lb.



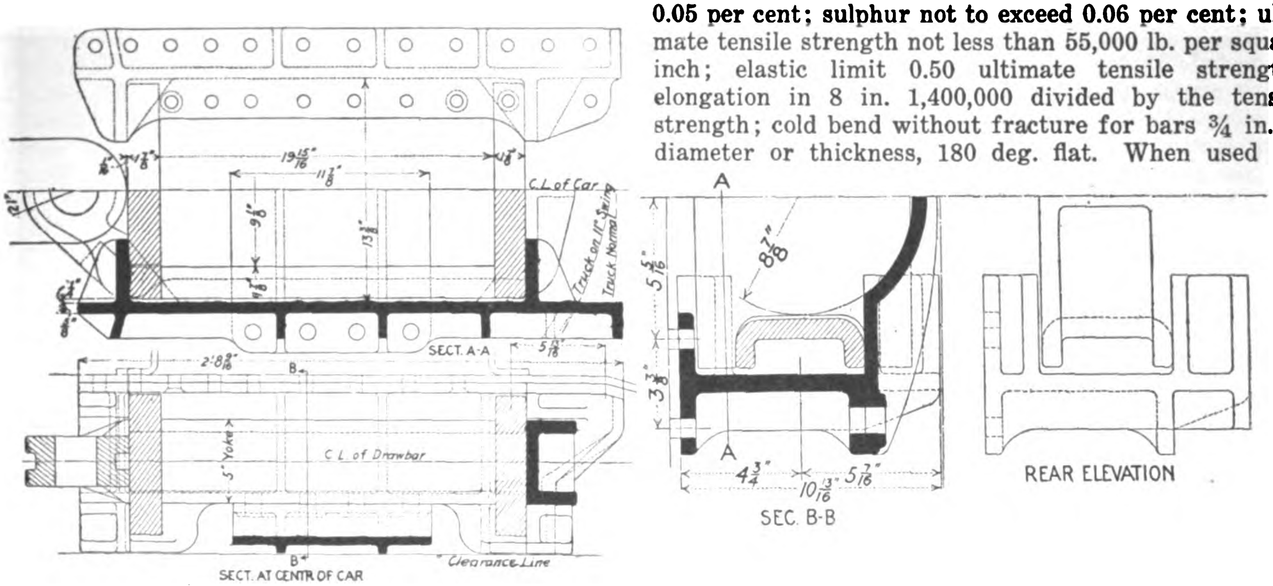
N. Y. M. CAR—TYPICAL DRAFT GEAR TEST CURVES

As a result of the design described, and in spite of the greater weight of the clasp brake rigging used, the actual scale weight of the first truck delivered by the American Car & Foundry Company to meet a center-plate loading of 45,000 lb. was but 11,280 lb. This weight includes the clasp brakes, the motor gear, the truck side bearings and the truck center plate, but not the car-body center plate.

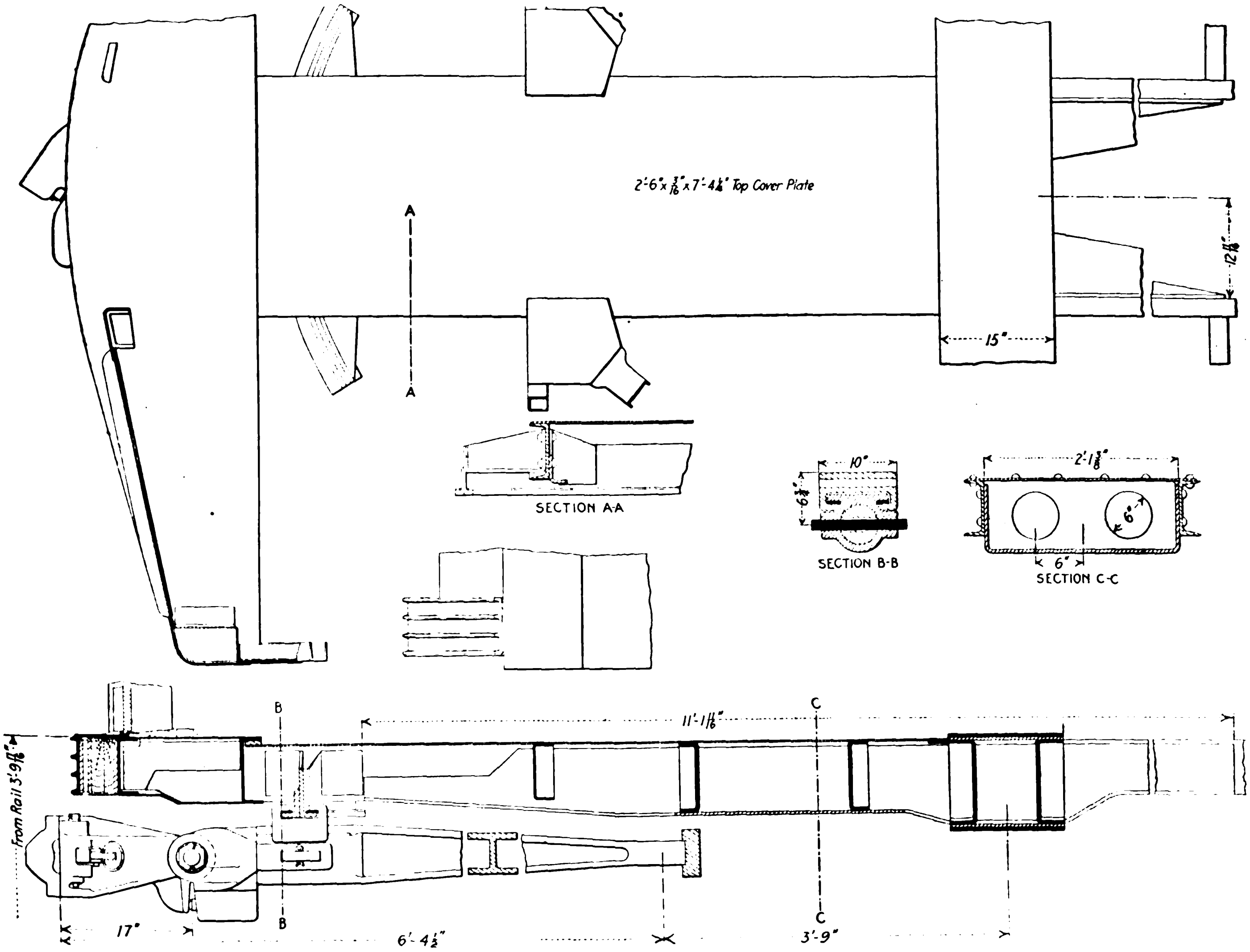
DETAIL SPECIFICATIONS FOR TRUCK AND BRAKE RIGGING

The specifications for structural steel shapes, plates, bar steel, rivet steel and wrought iron conform to those promulgated by the American Society for Testing Materials under date of June 1, 1912. The open-hearth and crucible steel castings conform to the following specifications: Neither phosphorus nor sulphur to exceed 0.05 per cent; tensile strength per square inch not less than 60,000 lb.; elastic limit per square inch not less than 27,000 lb.; elongation in 2 in. not less than 22 per cent; reduction in area not less than 30 per cent. The specifications for malleable iron and gray iron follow those adopted by the American Society for Testing Materials under date of Nov. 15, 1904, and Sept. 1, 1905, respectively.

All bolts were specified to be open-hearth steel with the following characteristics: Phosphorus not to exceed 0.05 per cent; sulphur not to exceed 0.06 per cent; ultimate tensile strength not less than 55,000 lb. per square inch; elastic limit 0.50 ultimate tensile strength; elongation in 8 in. 1,400,000 divided by the tensile strength; cold bend without fracture for bars ¾ in. in diameter or thickness, 180 deg. flat. When used for


19 15/16"
11 7/8"
1 1/8"
C.L. of Car
Truck on 11' Swing
Truck Normal
9 1/8"
13 3/8"
21"
SECT. A-A
5 13/16"
2'-8 9/16"
B
5" Yoke
C.L. of Drawbar
Clearance Line
SECT. AT CENTR OF CAR
A
8 7/8"
5 5/16"
3 3/8"
4 3/4"
5 7/16"
10 3/16"
SEC. B-B
REAR ELEVATION

N. Y. M. CAR—DRAFT GEAR ATTACHMENTS


2'-6" x 7/16" x 7'-4 1/4" Top Cover Plate
A
A
15"
12 1/8"
SECTION A-A
10"
6 1/4"
SECTION B-B
2'-1 1/8"
6"
6"
SECTION C-C
B
B
C
C
11'-1 1/16"
From Rail 3'-9 1/16"
17"
6'-4 1/2"
3'-9"

N. Y. M. CAR—PLAN, ELEVATIONS AND SECTIONS OF DRAFT RIGGING brake pins, the bolts are turned slightly larger in diameter than the size called for, are ground true to size after being case-hardened, are fitted with semi-finished case-hardened castle nuts and provided with spring cotter pins. The threads of the bolts are not case-hardened.

The journal bearing metal is of the following B. R. T. standard composition: Copper, 77 per cent; tin, 8 per cent, and lead, 15 per cent. A variation of 10 per cent was allowed from the specified proportions of tin and lead, but impurities in excess of 1 per cent were not permitted.

The babbitt for journal bearing lining is of the following composition: Tin (New Straits), 91.5 per cent; antimony (Cookson's), 5.7 to 6.3 per cent; copper (refined electrolytic) 1.8 to 2.2 per cent. In this case impurities were not permitted to exceed 0.5 per cent.

DRAFT GEAR

The draft gear specification is of particular interest inasmuch as it includes the first application of the high shock-absorbing qualities of Westinghouse friction draft gear to subway and elevated operation. The gear is figured for a maximum end shock of 185,000 lb. The draft rigging includes automatic car, air and electric coupler heads, radial drawbars and friction draft gear attachment.

The coupler heads are of the tight-locking type, pivoted at the forward end of the drawbar to provide for vertical variations and sway of the car bodies. The drawbars are pivoted on the front end of the draft gear yoke to permit the necessary radial movement required for passing around curves and over crossovers, and they have lugs for centering device atachments.

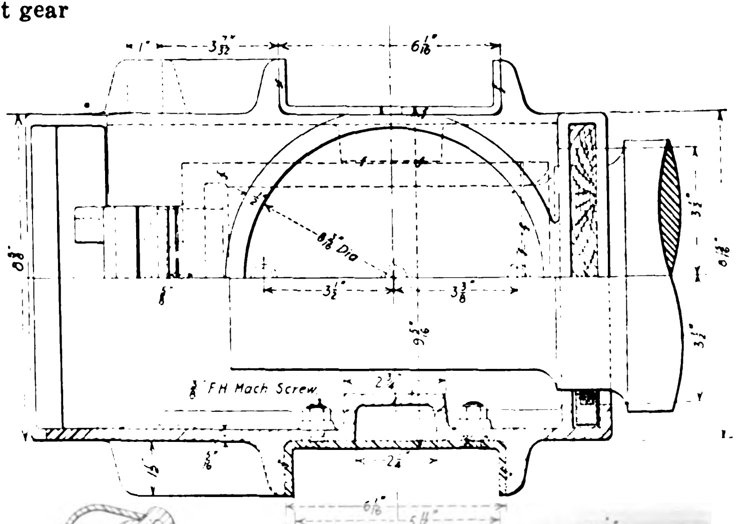
The automatic couplers are so arranged that all necessary electric control and auxiliary circuit connections are actuated from a valve in either one of the cabs on the adjacent ends of adjoining cars. Also, cars can be uncoupied from either of the two adjacent cabs or cars between which uncoupling is desired. When so uncoupled, all necessary connections on the exposed ends of the cars required for proper operation are automatically obtained. Provision is also made so that cars can be coupled from either side of a train on the ground.

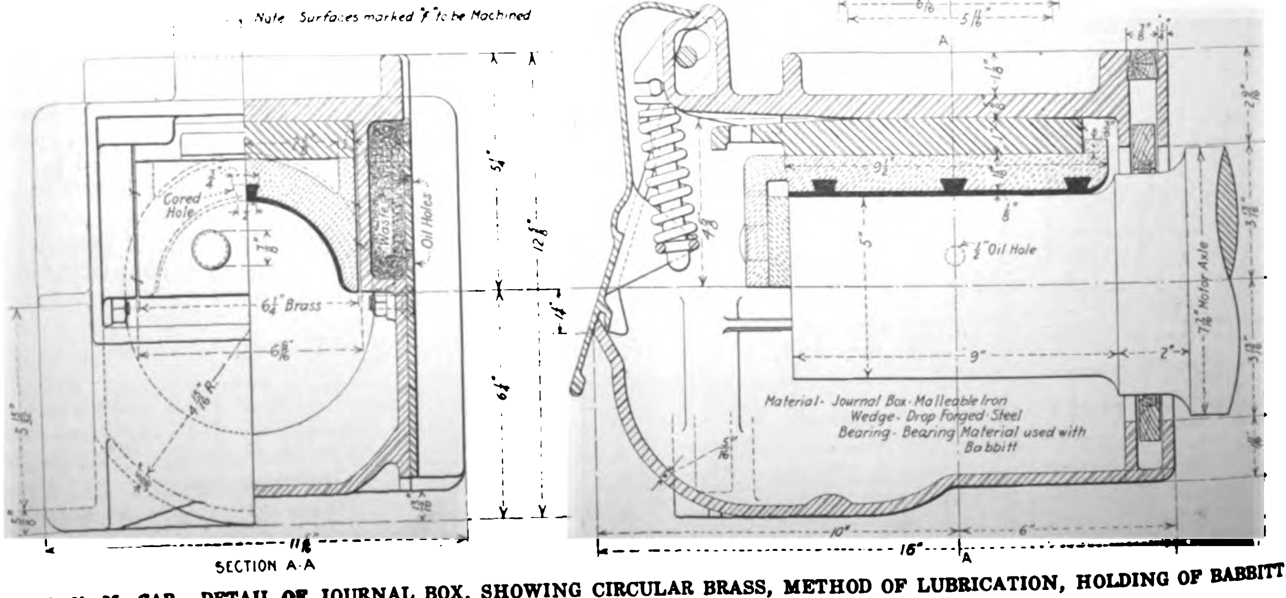
The draft gears were tested for capacity with a static load of 130,000 lb., and with this load the amount of compression measured from the free position of gear did not exceed $1\frac{3}{4}$ in. Tests were also made on about 10 per cent of the total number of gears ordered to determine the absorption capacity of the gear as follows:

"Gear shall be compressed in an approved static test machine and pressure readings recorded for each $\frac{1}{4}$ in. increment of compression from free height until gear is solid. Similar readings shall be taken during the period of the release of pressure at corresponding degrees of compression. These readings when plotted in a manner similar to that illustrated on the appended typical chart, shall show that the area inclosed by the release line, base line drawn through zero pressure line, and a perpendicular erected from the base line to a point where the gear becomes solid, shall not exceed 20 per cent of the area inclosed by the compression line and the other sides of the triangle above described."

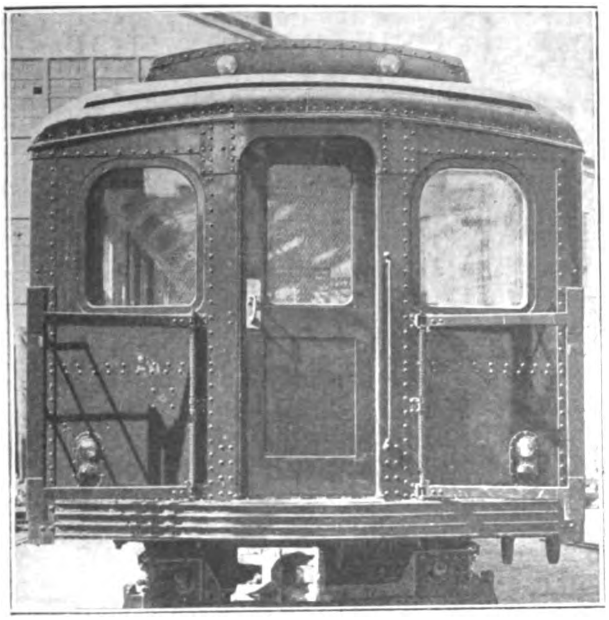
The couplers and draft gears were designed for the physical and operating conditions as in Table on page 1381.

The typical chart referred to is reproduced on page 1378. The maximum end shock of couplers due to buffing is assumed as a static load of 185,000 lb., and the maximum load due to pulling is assumed as 100,000 lb., applied horizontally at the center line of the coupler heads. The draft gear has a travel of not less than $2\frac{3}{8}$ in. from its assembled position and a capacity of not less than 130,000 lb. with $1\frac{3}{4}$ in. compression measured




Note Surfaces marked 'f' to be Machined
Cored Hole
6¼" Brass
Waste
Oil Holes
Oil Hole
9½"
9"
2"
7⅛" Motor Axle
Material- Journal Box- Malleable Iron
Wedge- Drop Forged Steel
Bearing- Bearing Material used with Babbitt
A
A
10"
6"
16"
11⅛"
SECTION A-A

N. Y. M. CAR—DETAIL OF JOURNAL BOX, SHOWING CIRCULAR BRASS, METHOD OF LUBRICATION, HOLDING OF BABBITT, DUST GUARDS, ETC.



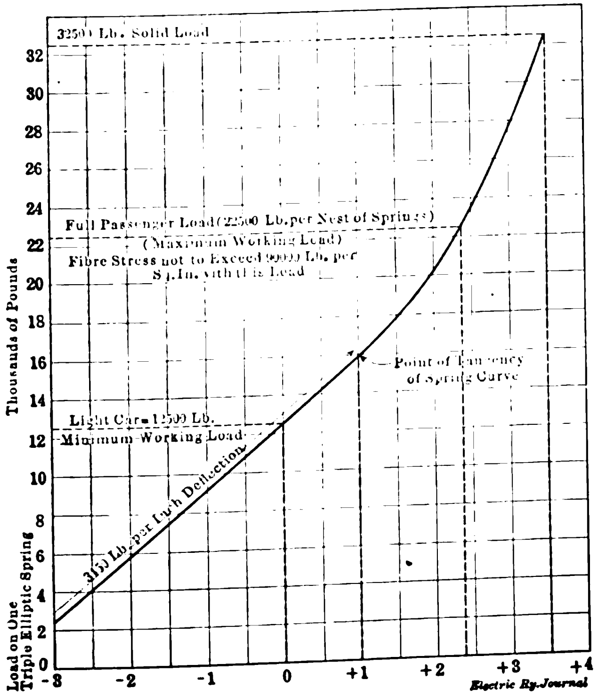
N. Y. M. CAR—END VIEW TO SHOW COUPLER

from the free position of the gear. The gear was assembled with an initial compression of 6000 lb.

The draft gear lugs and housings are of cast steel substantially as specified for the trucks. All parts of the draft rigging were so proportioned that the sum of the maximum unit stresses to which the member is subject does not exceed the amounts in pounds per square inch as shown in Table II, which is presented on this page.

TABLE I

Radius of shortest curves	125 ft.
Maximum change of grade	6.8 per cent
Radius of vertical curve with maximum change in grade, approximately	3000 ft.
Length of vertical curve with maximum change in grade, approximately	200 ft.
Maximum free running speed	52 m.p.h.
Average rate of retardation with emergency application of brakes	3 m.p.h.s.
Average rate of retardation with service application of brakes	2 m.p.h.s.
Average rate of acceleration	1.25 m.p.h.s.
(Above are with fully-loaded cars.)	
Maximum grade	5.4 per cent
Average distance between express stops	1.48 miles
Average distance between local stops	0.48 miles



N. Y. M. CAR—DEFLECTION CURVES OF BOLSTER SPRINGS AT DIFFERENT LOADS

Provisions are made in the couplers for the vertical movement required for the proper operation over track conditions as specified, with a variation of 2 in. in the height of the couplers when the cars are on a level track. Couplers will couple when the vertical distance between the center lines does not exceed 3 in. and they have a horizontal gathering range of 8 in.

TABLE II

Cast steel, other than buffing	12,000 lb.
Cast steel buffing	20,000 lb.
Rivets, shear, other than buffing	10,000 lb.
Rivets, bearing, other than buffing	20,000 lb.
Rivets, shear, buffing	12,000 lb.
Rivets, bearing, buffing	24,000 lb.

Connections are provided in the coupler heads for air brake pipe connections and for such air connections as are required for the automatic coupling and uncoupling of cars; all couple in unison with the coupler. Provision is also made for eighteen train line wires and local circuits, designed for Westinghouse A. B. F. control and other apparatus operated on 32-volt battery circuit.

Progress of Suburban Electrification In Melbourne, Australia

In their annual report the Victorian Railway Commissioners state, in regard to suburban electrification, that despite the large amount of preliminary and detail work inseparable from a scheme of such magnitude, satisfactory progress has been made with the different portions of the work of electrifying the suburban lines. E. P. Grove, as the representative of Merz & McLellan, consulting engineers, arrived in Melbourne in October last and has since, with his staff, been actively engaged in the supervision of the work already in hand at the substations, the Jolimont car repair shed, and the Newport power house. The principal contracts which had been let up to June 30, 1914, were: Condensing plant, circulating water pumps and accessories for the power station, G. Weymouth Proprietary, Ltd. £85,252; equipment for substations, Siemens Brothers Dynamo Works, £201,624; overhead contact lines and power transmission lines, British Insulated & Helsby Cables, Ltd., £278,286; power station buildings and boiler equipment, Babcock & Wilcox, Ltd., £427,720; six 10,000-kw sets of turbo-alternators and transformers, C. A. Parsons & Co., Ltd., £182,046; switch gear for power station and substations, Siemens Brothers Dynamo Works, £140,070; equipment for motor and trailer coaches, General Electric Company, £676,189; provision and laying of 20,000-volt feeder cables, etc., British Insulated & Helsby Cables, Ltd., £259,121; total, £2,250,299. The different contractors have the manufacture of the necessary plant and equipment well in hand, and substantial progress has been made with the erection of the power house, as well as with the excavations for the conduits, pits, etc., and the provision of sidings. It was anticipated that the first section of the car shop at Jolimont would be completed about December, 1914.

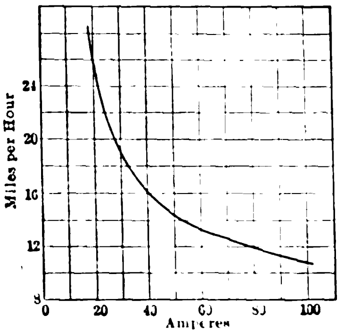
With the eastern Kentucky coal mines shipping to their markets almost past the coal bins of the Kentucky Traction & Terminal Company's power plants, the railroad and utilities company has been able to contract for some 40,000 tons of Tennessee coal at a price which the eastern Kentucky mines could not meet. The explanation is that the coal to be delivered on the contract comes from the Tennessee State mines at Petros on Brushy Mountain, which are worked by convict labor. The convict mine managers can sell at a low price and still make money.

Calculations of Starting Resistances for Railway Motors

An Original Graphical Method for Calculating Starting Resistances for Motors is Described and Illustrated by the Author—This Method Should be Useful in Checking the Gradation of Resistance in Existing Equipment

BY F. CASTIGLIONI, NEW YORK

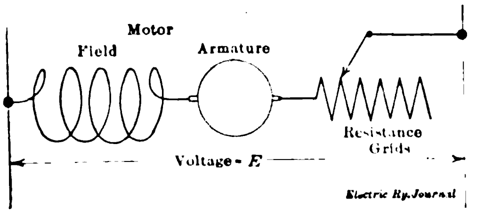
The purpose of this study is to present a simple and accurate graphical method for the calculation of the grid resistances corresponding to the several controller steps. This calculation is very tedious by "cut and try" methods but is extremely interesting and expeditious with a convenient graphical method. In order that the method may be perfectly clear a preliminary statement is given to illustrate how the graphical plan simplifies the calculations.



MOTOR STARTING RESISTANCES—FIG. 1—CURRENT SPEED CURVE OF MOTOR

In the series motor a definite current corresponds to a definite speed. This relation is expressed in the familiar current-speed curve. See Fig. 1.

In bringing a motor up to speed resistance is inserted, as shown diagrammatically in Fig. 2, and is cut out in steps keeping the current between certain limits. If a person were starting a motor with an ammeter in front of him he could throw in the starting switch with sufficient resistance in circuit to keep the current within the upper limit, and would wait before cutting out resistance until it fell to the lower limit, as the rising counter emf reduced it. Then he would cut out sufficient resistance to allow the current to jump to the upper limit, and so on until the motor reached full speed. This operation is sometimes performed by means of automatic relays. To perform it successfully requires that the resistance steps be accurately graduated.



MOTOR STARTING RESISTANCES—FIG. 2—DIAGRAM OF MOTOR CONNECTIONS

Now let us consider the calculation of these resistance steps if we have (*a*) the current-speed curve of our motor as shown in Fig. 1 corresponding to the voltage E (Fig. 2), (*b*) the hot resistance of the motor, and (*c*) the upper and lower current limits which are desirable for the given case.

The natural way in which to start the calculation is to begin with the motor at rest and generating no counter emf. The total resistance can then be calculated from Ohm's law: where

$$R_1 + r = \frac{E}{I''}$$

R_1 = resistance of grids,
r = hot motor resistance, and
I'' = upper current limit.

Assume then that we consider the speed to increase until the current has fallen to the lower limit. Then resistance must be cut out to allow the current to jump to the upper limit again. But how much must go out? In the series motor as the current increases the field strength also increases so that, at a given speed (and we may consider the speed to remain constant during the change of resistance) the current will only increase until a balance is reached so that the new counter emf plus the resistance drop equals the line voltage. This relation is shown by the following familiar formula.

For any value of current I',

$$s_1 = s' \frac{E - I'(R_1 + r)}{E - I' \times r} \qquad \text{(a)}$$

where

s_1 = speed with grid resistance R_1 inserted,
s' = speed (from curve) corresponding to I', and
r = hot motor resistance.

From this formula s_1 can be calculated.

Now sufficient resistance is to be cut out for the next controller notch to bring the current up to the maximum again, that is to I''. We can assume that the speed remains constant during this change, so that we can write,

$$s_1 = s'' \frac{E - I''(R_2 + r)}{E - I'' \times r} \qquad \text{(b)}$$

where s'' = speed (from curve) corresponding to I''.

From this, by inserting the proper value of s'' from the curve and bringing over the value of s' from the previous calculation, R_2 can be calculated.

Again the speed is allowed to increase until the current falls to I' once more, when the speed is,

$$s_2 = s' \frac{E - I'(R_2 + r)}{E - I' \times r} \qquad \text{(c)}$$

and so on until the speed has come up to the value corresponding to I', when all grid resistance is cut out.

The same process is repeated for the two motors in parallel in the case of a car equipment.

This process is somewhat tedious, involving as it does substitutions in formulas and corresponding liability of error. The problem lends itself readily to graphical solution, by means of curves, plotted once for all and applicable to all conditions, showing the relations of current, speed and resistance.

I have found it to be most convenient to rewrite equation (a) in the following manner: Let

$$R + r = \alpha r,$$

when R is any value of grid resistance and α is a factor showing the increased resistance per motor due to the addition of R.

This may also be written

$$R = (\alpha - 1)r.$$

Substituting this value of *R* in formula (a) and writing *I* to represent the current and *s* to represent the corresponding speed, and allowing s_1 to represent here the speed corresponding to the grid resistance *R*,

$$s_1 = s\,\frac{E - I\alpha r}{E - I \times r}.$$

For convenience $I \times r$ may be represented by *a*, whence

$$s_1 = s\,\frac{E - \alpha a}{E - a},$$

or putting the speeds in the form of a ratio,

$$\frac{s_1}{s} = \frac{E - \alpha a}{E - a}. \qquad \text{(c)}$$

The right-hand term is then a *ratio* of the new to the old speed, when, *at a given current*, the resistance is increased to α times the motor resistance by the addition of grid resistance. For convenience let us call this the *speed factor.*

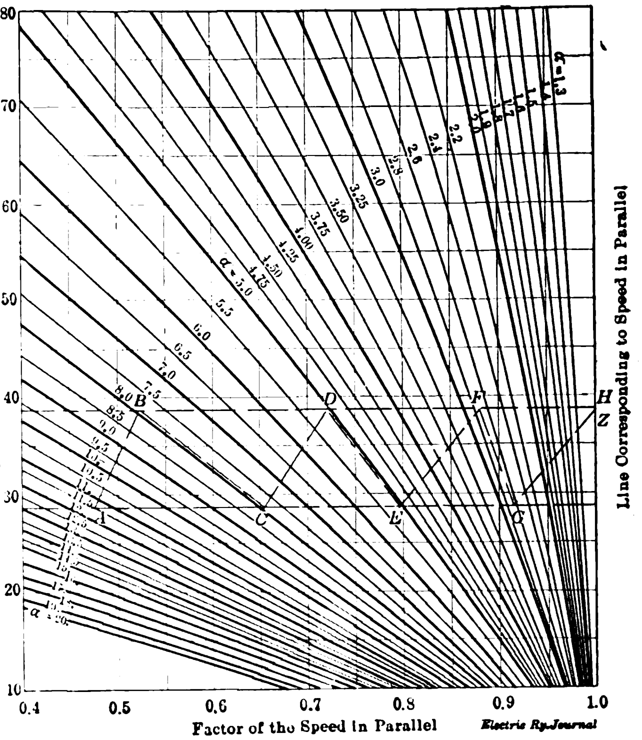
If we consider *E* constant, formula (c) contains three variables s_1/s, α and *a*. Charts showing the relations of these may be plotted and used as illustrated hereinafter. It is most convenient to plot these in the form shown in Figs. 3 and 4.

In calculating the data for these charts values of α were selected within a range shown by experience to be most useful, and then varying *a* and calculating from the formula the corresponding speed factors. The charts illustrated are for 600 volts and 300 volts also. For my own use I have prepared other charts for 575, 550, 525, 500 and 450 voltages with the corresponding half voltages and will be pleased to give railway men access to them for use in making calculations.

It should be noted that these curves are independent of the motor curves which are used as previously explained and as will be illustrated later in this article.

EXAMPLES OF THE USES OF THE CHARTS

Let it be required to determine the resistance steps necessary to start a certain railway equipment comprising two motors, each having a hot resistance of 0.15 ohm, including, say, 20 per cent in leads and car wiring. The starting current at 600 volts is to average 225 amp and the starting "jerks" may have an amplitude 30 per cent as great as the average current; that is, the current may range between $I'' = 258$ amp and $I' = 192$ amp.



MOTOR STARTING RESISTANCES—FIG. 3—SPEED FACTOR CURVES, MOTORS IN PARALLEL

The motor curve, of the variety illustrated in Fig. 1 which is for a smaller motor, shows that the corresponding speeds are $s'' = 15.3$ m.p.h. and $s' = 16.9$ m.p.h. at full voltage.

From the formula,

$$s_1 = s\,\frac{300 - r \times I}{600 - r \times I},$$

we find that the corresponding speeds with motors in series are 7.1 m.p.h. and 8.01 m.p.h.

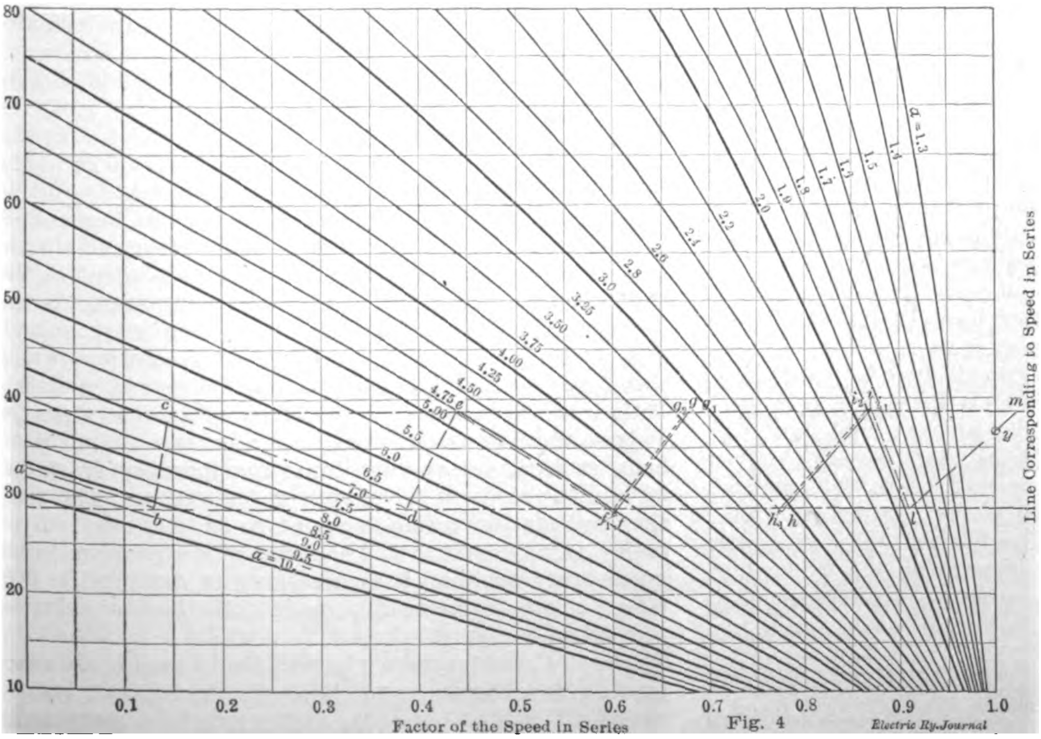


Fig. 4

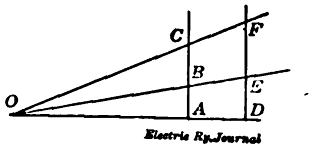


Fig. 5

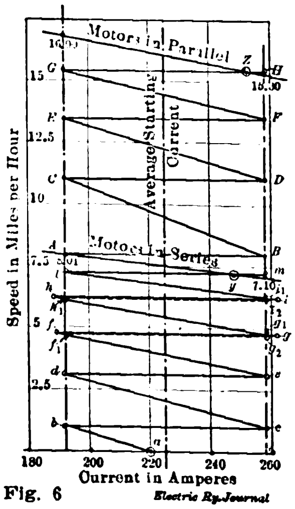


Fig. 6

MOTOR STARTING RESISTANCES—FIG. 4—SPEED FACTOR CURVES, MOTORS IN SERIES. FIG. 5—GEOMETRICAL DIAGRAM. FIG. 6—CURRENT-SPEED CHART

The ratios of limiting speeds are:

In parallel $16.9 \div 15.3 = 1.103$, and
in series $8.01 \div 7.1 = 1.129$.

Also the values of a, or $I \times r$, are:

$$258 \times 0.15 = 38.7, \text{ and}$$
$$192 \times 0.15 = 28.8.$$

It proves to be better to begin at the middle of the calculation, so to speak, at the point of changing over from series to parallel. Also it is not desirable to select in advance a number of resistance steps, for, as was evident from the previous explanation, this is determined by the current limits selected.

Taking up first, then, the "parallel" chart let us plot on it two horizontal lines corresponding to the above values of $I \times r$.

As shown, the full series speed for 192 amp is 8.01 m.p.h. and the full parallel speed for the same current is 16.9 m.p.h. The ratio of these is 0.474, which is therefore the speed factor for the full series position for use on the "parallel" chart. The point is plotted on the chart at "*A*."

The motors are now instantly thrown into parallel with resistance to limit the current to 282 amp per motor, the speed of 8.01 m.p.h. being assumed to remain constant for this instant.

The speed factor for this speed at 192 amp was 0.474. At 258 amp it is $0.474 \times 1.103 = 0.523$.

This point is plotted on the chart at "*B*." "*B*" is located between $\alpha = 7.5$ and $\alpha = 8.0$. Scaling it off shows it to be on the line of $\alpha = 7.9$.

But

$$R_{1p} = (\alpha - 1)r = 6.9 \times 0.15 = 1.04 \text{ ohms}.$$

which is the resistance (per motor) for the first parallel notch.

The motors now accelerate, the resistance (and, therefore, α) remaining the same, so that we may draw a line parallel to $\alpha = 8.0$ for $\alpha = 7.9$ until it intersects the lower "*a*" line at "*C*."

C is 0.654 of 16.9 m.p.h. which is,
$0.654 \times 1.103 = 0.721$ of 15.3 m.p.h. corresponding to 258 amp.

This is plotted at "*D*" which corresponds to $\alpha = 5.06$. From this

$$R_{2p} = 4.06 \times 0.15 = 0.62 \text{ ohm}.$$

Following the same process, "*F*" and "*G*" correspond to $\alpha = 2.72$ and $R_{3p} = 0.26$ ohm, while "*H*" corresponds to $\alpha = 1.02$, or practically 1.

The line "*GH*" cuts the line corresponding to the speed in parallel at point *Z*, which is very near to the assumed limit. Therefore, the whole set of rheostats for the parallel steps of the controller can be considered as provided for, if further considerations connected with the series-operation do not call for some alteration.

It is not asserted that in all cases the point *Z* will be sufficiently near to the upper limit to render changes unnecessary by either increasing or reducing the number of steps by one (which can be done by reducing or increasing the interval between the current limits); but in each case these results are not final until they have satisfied another practical condition which, from the theoretical standpoint, is only there to complicate the problem. This condition is that, in order to minimize the cost of the controller by possibly utilizing the same contacts in series as in parallel, the grid resistances must be arranged to give satisfactory steps in both motor connections.*

We have found the following resistances for parallel operation:

$R_{1p} = 1.04$ ohms, $R_{2p} = 0.62$ ohm, $R_{3p} = 0.26$ ohm, and if we want to utilize them for series operation, as we always call R the grid resistance per motor, we must have for series operation the resistance values R_1 equal to one-half the correspond R_p or to:

0.57 ohm, 0.31 ohm, and 0.13 ohm.

The corresponding α values for these R_1 values are equal to

$$\frac{R+r}{r}, \ 4.8, \ 3.10 \text{ and } 1.87.$$

We may plot these α curves in the chart for motors in series, where previously the horizontal lines for $I \times r = 28.80$ and 38.70 were drawn, and call them ef_1, g_1h_1 and i_1l.

The next step would be to see if these steps, where for operation in series, remain fairly near to the assumed current-limits.

Point f_1 is 0.594 of speed 8.01 m.p.h. in series operation, and it is equal to $0.594 \times$ factor $1.129 = 0.670$ of the speed of 7.10 m.p.h. at the point g_2, which is not precisely coincident with the point g. Without stopping to consider this difference for the moment we may find for $h_1 = 0.772$ the corresponding point $i_2 = 0.772 \times 1.129 = 0.871$, and for $l = 0.909$ the corresponding point $m = 0.909 \times 1.129 = 1.025$.

It is easy to see that the curves ef_1, g_1h, i_1l can be combined to show a satisfactory set of starting resistances by increasing the interval between the current limits at the points f, g, h, i, l and m. In determining these last points, we draw the lines f_1g_2 and h_1i_2 parallel to the corresponding lines fg and hi. It should be remarked that the steepness of these lines varies with the speed factor and that, furthermore, the proportion between the two speeds in series corresponding to the current limits varies with the interval between these limits, but the new lines are so near the old lines that a parallelism is all that is needed for practical purposes.

The point y, where the speed in series is reached, is also satisfactorily near to the limit, and therefore, these steps to be used for both series and parallel positions may be regarded as fixed.

Going backwards we can now determine the remaining steps.

The speed factor at point e is equal to 0.437; therefore that at point d will be

$$0.437 \div 1.129 = 0.388$$

Through d we draw the curve cd for $\alpha = 6.75$. The point $c = 0.145$, and the point $b = 0.25 \div 1.129 = 0.129$.

The first resistance step ab will correspond to $\alpha = 9.05$.

The point a is not at the corresponding maximum limit, but this is rather an advantage on account of the first starting jerk being the most uncomfortable to the passengers. Thus, the problem is completely solved, and if, for some reason or other, this solution is not satisfactory—for instance, because of the uneven distribution of three steps in parallel and of five steps in series—the number of steps in parallel can be increased by narrowing the current-limits for operation in parallel and the steps in series can be reduced by increasing the limits for operation in series, so as to obtain four of each. In any case, as the solution of the problem takes much less time than it is necessary to describe it, different trials can be readily made until the best solution is reached.

The series resistances per motor would be, in this case,

$R_{1s} = 8.25 \times 0.15 = 1.24$ ohms;
$R_{2s} = 5.75 \times 0.15 = 0.862$ ohm.
$R_{3s} = 0.57$ ohm; $R_{4s} = 0.31$ ohm; $R_{5s} = 0.13$ ohm.

It should be remembered that these resistance values are "per motor," and that the real values of the resistance steps are to be figured according to the different combination of motors and resistances, the different grouping of the motors among themselves, etc. The first step of all in the determination will be that of determining what part of the total resistance for a certain combination the resistance per motor really is.

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To illustrate this point: The problem above was worked out on the basis of the resistance being in series with the motors. Now when two motors are connected in series with resistance the resistance per motor is one-half the total. If two motors are in parallel and resistance is in series with the pair *the equivalent resistance per motor is four times* the series resistance.

In practice it is possible to make up grid frames of any resistance; and as the heating capacity of the grids is already calculated to stand normal railway service, questions of rheostat design may be ignored.

As a last remark it is proper to point out that all of the lines *bc*, *de*, *fg*, etc., meet at a point on the line, speed factor = 0, as shown in Fig. 5. This fact may be utilized in still further reducing the time needed for this calculation.

The figure shows two lines *CA* and *FD* which represent the lines for $I \times r$ in the charts. *OD* represents the line for zero speed factor. Considering the speed factors in a vertical direction, we have, for instance, $\frac{ED}{BA} = \frac{FD}{CA}$ = constant = ratio of the speed factors at the current limits.

But $\frac{ED}{BA}$ is also equal to $\frac{OD}{OA} = \frac{OA + AD}{OA} = 1 + \frac{AD}{OA}$

We know, for instance, that our factor for operation in series is 1.129; therefore, by scaling the lengths in Fig. 4,

$$1.129 = 1 + \frac{AD}{OA} \text{ and } OA = \frac{AD}{0.129} = \frac{0.5 \text{ in.}}{0.129} = 3.9 \text{ in.}$$

below the lower $I \times r$ line, on the zero line.

For a better understanding of the whole discussion of the method the results have been plotted in the usual manner in Fig. 6.

Power Investigation on the Boston & Middlesex Street Railway

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The cost of such a plant would be about $250,000 and that of the necessary 13,000-volt transmission system, with substations, $250,000 more. A plant of this kind should produce energy at a manufacturing cost of 0.8 cent per kilowatt-hour, and the total yearly cost per kilowatt-hour at the substation d.c. bus would be 1.57 cents, assuming a transmission efficiency of 80 per cent average and 11 per cent interest and depreciation on the cost of the new plant. The company now purchases 9,614,511 kw-hr. from the Edison company at an average cost of about 1.7 cents.

Professor Moore stated that against the above apparent possible saving should be set the advantages that the railway has no money invested in electric generating apparatus, which easily may be damaged to the extent of $5,000 by a single electrical storm and is freed from the risk of maintaining a 13,000-volt system. Therefore it may be desirable from the standpoint of uninterrupted service and freedom from anxiety to allow the Edison company to take the risk and the corresponding profit.

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Various Systems Are Described, Including That Followed by the Research Laboratory of the Massachusetts Institute of Technology

BY D. J. MCGRATH, RESEARCH ASSISTANT MASSACHUSETTS INSTITUTE OF TECHNOLOGY

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Probably the most recent work on passenger traffic counts is that which has been performed during the past summer by the research laboratory of the Massachusetts Institute of Technology. In connection with the research on the economic limits of the 5-cent fare which is being carried on at the institute the investigators have had occasion to consider in detail the question of the average passenger ride on urban systems. During the latter part of the summer, traffic counts were made on several lines of the Boston Elevated Railway. The results of this work are not available for publication, but it is believed that the experience gained may be of value to transportation officials generally.

Before starting the work the writer had occasion to review the published reports of similar efforts by others, and a brief summary of the various methods and best practice is presented in this article.

Broadly speaking, there are three general methods of making traffic counts determined chiefly by the purpose for which the study is being made.

The first, which we may call the street (or car) tabulation method, consists in recording the load on the cars at a number of previously designated traffic points. It may be done by inspectors stationed at transfer points and reasonably short intervals along the line, or by the conductors on the cars. Street inspectors have been used by the Boston Elevated Railway for several years. During the now famous Milwaukee fare case proceedings, the Milwaukee company made a traffic count by having the conductors record the load at every half-mile point. A similar system as used by the Grosse Berliner Strassenbahn was described in the STREET RAILWAY JOURNAL of May 19, 1906.

From counts of this kind, load curves for the various lines may be plotted, and if the total number of passengers carried is known a fair average value of the passenger ride may be derived. The chief use of this method is for determining car service requirements. It requires quite a few men, if the street inspection scheme is used, and fails to take into account the changes between inspection points.

The second method may be termed the passenger tagging type of count. The only record that has been found of the use of this method is in the case of the city of Philadelphia's investigation of the surface and subway-elevated lines in 1912. The application of this method involves the seeking of information directly from the passengers themselves, or at least from a certain definite proportion of them. Observers are placed on a number of the cars of a line, and as each revenue paying passenger enters the car the first inspector makes out and hands him a card with the name of the street

The ratios of limiting speeds are:

In parallel 16.9 ÷ 15.3 = 1.103, and
in series 8.01 ÷ 7.1 = 1.129.

Also the values of a, or $I \times r$, are:

$$258 \times 0.15 = 38.7, \text{ and}$$
$$192 \times 0.15 = 28.8.$$

It proves to be better to begin at the middle of the calculation, so to speak, at the point of changing over from series to parallel. Also it is not desirable to select in advance a number of resistance steps, for, as was evident from the previous explanation, this is determined by the current limits selected.

Taking up first, then, the "parallel" chart let us plot on it two horizontal lines corresponding to the above values of $I \times r$.

As shown, the full series speed for 192 amp is 8.01 m.p.h. and the full parallel speed for the same current is 16.9 m.p.h. The ratio of these is 0.474, which is therefore the speed factor for the full series position for use on the "parallel" chart. The point is plotted on the chart at "*A*."

The motors are now instantly thrown into parallel with resistance to limit the current to 282 amp per motor, the speed of 8.01 m.p.h. being assumed to remain constant for this instant.

The speed factor for this speed at 192 amp was 0.474. At 258 amp it is $0.474 \times 1.103 = 0.523$.

This point is plotted on the chart at "*B*." "*B*" is located between $\alpha = 7.5$ and $\alpha = 8.0$. Scaling it off shows it to be on the line of $\alpha = 7.9$.

But

$$R_{1p} = (\alpha - 1)r = 6.9 \times 0.15 = 1.04 \text{ ohms}.$$

which is the resistance (per motor) for the first parallel notch.

The motors now accelerate, the resistance (and, therefore, α) remaining the same, so that we may draw a line parallel to $\alpha = 8.0$ for $\alpha = 7.9$ until it intersects the lower "*a*" line at "*C*."

C is 0.654 of 16.9 m.p.h. which is,

$0.654 \times 1.103 = 0.721$ of 15.3 m.p.h. corresponding to 258 amp.

This is plotted at "*D*" which corresponds to $\alpha = 5.06$. From this

$$R_{2p} = 4.06 \times 0.15 = 0.62 \text{ ohm}.$$

Following the same process, "*F*" and "*G*" correspond to $\alpha = 2.72$ and $R_{3p} = 0.26$ ohm, while "*H*" corresponds to $\alpha = 1.02$, or practically 1.

The line "*GH*" cuts the line corresponding to the speed in parallel at point *Z*, which is very near to the assumed limit. Therefore, the whole set of rheostats for the parallel steps of the controller can be considered as provided for, if further considerations connected with the series-operation do not call for some alteration.

It is not asserted that in all cases the point *Z* will be sufficiently near to the upper limit to render changes unnecessary by either increasing or reducing the number of steps by one (which can be done by reducing or increasing the interval between the current limits); but in each case these results are not final until they have satisfied another practical condition which, from the theoretical standpoint, is only there to complicate the problem. This condition is that, in order to minimize the cost of the controller by possibly utilizing the same contacts in series as in parallel, the grid resistances must be arranged to give satisfactory steps in both motor connections.*

We have found the following resistances for parallel operation:

$R_{1p} = 1.04$ ohms, $R_{2p} = 0.62$ ohm, $R_{3p} = 0.26$ ohm, and if we want to utilize them for series operation, as we always call R the grid resistance per motor, we must have for series operation the resistance values R_1 equal to one-half the correspond R_p or to:

0.57 ohm, 0.31 ohm, and 0.13 ohm.

The corresponding α values for these R_1 values are equal to

$$\frac{R + r}{r}, 4.8, 3.10 \text{ and } 1.87.$$

We may plot these α curves in the chart for motors in series, where previously the horizontal lines for $I \times r = 28.80$ and 38.70 were drawn, and call them ef_1, g_1h_1 and i_1l.

The next step would be to see if these steps, where for operation in series, remain fairly near to the assumed current-limits.

Point f_1 is 0.594 of speed 8.01 m.p.h. in series operation, and it is equal to $0.594 \times$ factor $1.129 = 0.670$ of the speed of 7.10 m.p.h. at the point g_2, which is not precisely coincident with the point g. Without stopping to consider this difference for the moment we may find for $h_1 = 0.772$ the corresponding point $i_2 = 0.772 \times 1.129 = 0.871$, and for $l = 0.909$ the corresponding point $m = 0.909 \times 1.129 = 1.025$.

It is easy to see that the curves ef_1, g_1h, i_1l can be combined to show a satisfactory set of starting resistances by increasing the interval between the current limits at the points f, g, h, i, l and m. In determining these last points, we draw the lines f_1g_2 and h_1i_2 parallel to the corresponding lines fg and hi. It should be remarked that the steepness of these lines varies with the speed factor and that, furthermore, the proportion between the two speeds in series corresponding to the current limits varies with the interval between these limits, but the new lines are so near the old lines that a parallelism is all that is needed for practical purposes.

The point y, where the speed in series is reached, is also satisfactorily near to the limit, and therefore, these steps to be used for both series and parallel positions may be regarded as fixed.

Going backwards we can now determine the remaining steps.

The speed factor at point e is equal to 0.437; therefore that at point d will be

$$0.437 \div 1.129 = 0.388$$

Through d we draw the curve cd for $\alpha = 6.75$. The point $c = 0.145$, and the point $b = 0.25 \div 1.129 = 0.129$.

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The point a is not at the corresponding maximum limit, but this is rather an advantage on account of the first starting jerk being the most uncomfortable to the passengers. Thus, the problem is completely solved, and if, for some reason or other, this solution is not satisfactory—for instance, because of the uneven distribution of three steps in parallel and of five steps in series—the number of steps in parallel can be increased by narrowing the current-limits for operation in parallel and the steps in series can be reduced by increasing the limits for operation in series, so as to obtain four of each. In any case, as the solution of the problem takes much less time than it is necessary to describe it, different trials can be readily made until the best solution is reached.

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For determining the total ride taken by the average paying passenger, the distribution of traffic by lines, routes and localities, and the proportions of passengers taking long, short and average rides, this is no doubt the ideal method of traffic survey. It may be very valuable for the rerouting of lines, but for proportioning service to lines as actually operated it involves much unnecessary work. .It is a rather expensive piece of work, requires the co-operation of the public, which can only be gained by extensive advertising prior to the attempt, and results in many thousands of individual cards which must be assembled, assorted and tabulated. Even with electric tabulating and statistical machinery for compiling the data it is no simple task.

BOSTON ELEVATED RAILWAY—ROUTE 279

Hyde Square—Roxbury Crossing—Subway Inbound, Tuesday, Aug. 11, 1914.

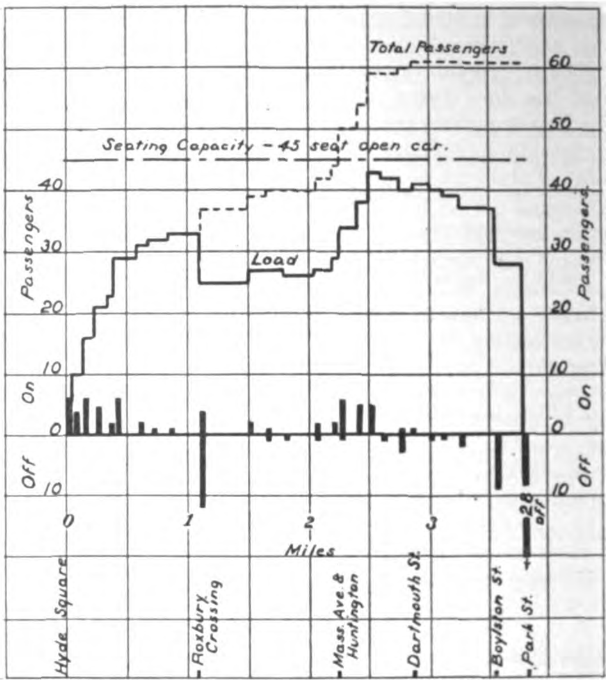
Leave Hyde Square, 7:22 a.m.; arrive Park Street Subway, 7:49 a.m.

Total passenger-miles 116
Total number of passengers.. 61
Average ride per total-passenger = 1.90 miles.

TABLE SHOWING FORM FOR RECORDING DATA IN TRAFFIC COUNT

Route 279. *Inbound, Aug.* 11, 1914. *Start* 7:22 *a.m. Arrive* 7:49 *a.m.* 45-*Seat Open Car.*

Stop	On	Off	Load	Cash	Transfer
Hyde Square	6	..	..	..	..
Forbes Street	4	..	10	..	..
Wyman Street	6	..	16	..	..
Mozart Street	5	..	21	..	..
Bickford Street	2	..	23	..	..
Wise Street	6	..	29	..	..
Old Heath Street	2	..	31	..	..
New Heath Street	1	..	32	..	..
Cedar Street	1	..	33	..	..
Roxbury Crossing	4	12	25	..	1
Ruggles Street	2	..	27	..	..
Walpole Street	1	1	27	..	..
Benton Street	..	1	26	..	..
Massachusetts Avenue	2	1	27	..	..
St. Botolph Street	2	..	29	..	..
Massachusetts and Huntington	6	1	34	..	1
Norway Street	4	..	38	..	2
West Newton Street	5	..	43	..	..
Garrison Street	..	1	42	..	..
Exeter Street	1	3	40	..	..
Dartmouth Street	1	..	41	59	..
Clarendon Street	..	1	40	..	..
Berkeley Street	..	1	39	..	..
Arlington Street	..	2	37	..	..
Boylston Street	..	9	28	..	..
Park Street	..	28	0	..	..
	61	61	..	59	4



BOSTON ELEVATED TRAFFIC—TABLE SHOWING FORM FOR RECORDING DATA AND CHART PLOTTED FROM THESE DATA

The third, or boarding and leaving tabulation method, is the one which has been used in the recent Boston counts above referred to, and to some extent by operating companies and commissions. It is suggested here as the most suitable method for any street railway company to develop for obtaining data on average passenger ride and service requirements. This method consists in simply counting the passengers as they board and leave the car at each stop, by placing one or more observers on a certain proportion of all the cars as outlined for the other method. From the net additions (or subtractions) at each stop, the load is readily figured and this figure may be at once checked by counting up the load actually on the car after leaving the stop. The officials of the transportation department of the Boston Elevated Railway were sufficiently impressed with the value of this type of count to adopt it for their regular service studies. It is being used by the timetable department of the Public Service Railway of New Jersey and others.

The usual custom has been to place two observers on each car under surveillance, one man to devote his attention to passengers entering the car and the other to count those getting off. On the work done in Boston by the men from the Institute of Technology, it was found that one experienced observer could handle an entire car alone in nearly every case. The Boston Elevated's articulated cars or any others with single entrance and exit are easy, while the prepayment style with entrance at one end and exit at the other are not difficult for one man to take care of if he utilizes the possibility of checking his counts frequently by adding up the total passenger load on the car. Where extreme accuracy is desired, as for instance when the figures must be submitted to a commission, it is better to furnish two men per car. On the recent Boston work, one observer handled a trip carrying a total of 203 passengers with a maximum load at one time of 134, this great overcrowding being due to an unavoidable street blockade.

A pocket-size loose-leaf note book was used. The accompanying table shows the way in which the notes are kept, and the accompanying diagram is the load curve plot corresponding to these notes.

The heavy black lines indicate the interchange of passengers at the various stops, those above the base line representing the number getting on, while those below represent the number getting off. The solid black line represents the load actually on the car at every point and will be found to check at any point with the total number boarding minus the total number leaving up to that point. The broken line simply gives the cumulative totals of all passengers boarding.

A number of these plots should be made up for each line covering all hours of the day. The number and times of trips selected will of course be a matter of judgment for the official in charge of the work and will depend on what specific object he has in view. With such a set of plots, the transportation department will have complete graphical records showing the variation in density of traffic along the line, the adequacy of the service provided and the importance of various stops. From these plots they can quickly determine the points at which it will be advantageous to "turn back" or "short-trip" part of the cars, and the possibilities of inaugurating express service, limited or skip-stop service, or other similar efficiency ideas will be made apparent.

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*See ELECTRIC RAILWAY JOURNAL for Nov. 2, 1912, page 949.

A few such charts, made up from actual observations on the cars described in this article, will do more to convince a commission and the public of the adequacy of service (if it is adequate), or the advisability of proposed changes, than a week's testimony of opinions and beliefs.

Electric Railway Mail Statistics

The report of the Second Assistant Postmaster General for the year ended June 30, 1914, has just been published. It contains the following statistical table:

ELECTRIC AND CABLE CAR SERVICE	
Number of routes	559
Length of routes, miles	7,932.28
Annual travel, miles	13,151,943.56
Annual rate of expenditure	$762,205.39
Average rate of cost per mile of length	$96.08
Average rate of cost per mile traveled, cents	5.79
Average number of trips per week	15.94
Comparison with the previous year shows:	
	Per cent
Decrease in number of routes	10, or 1.757
Increase in length of routes, miles	291.16, or 3.814
Increase in annual travel, miles	781,974.16, or 6.321
Increase in annual rate of expenditure	$46,010.35, or 6.424
Increase in average rate of cost per mile of length	$2.36, or 2.518
Average rate of cost per mile traveled, cents	No change
Increase in average number of trips per week	0.38, or 2.442

In commenting on this table the report says:

"The appropriation for the fiscal year was $847,400; the amount expended, as reported by the auditor, to Sept. 30, 1914, was $739,458.36, leaving an unexpended balance of $107,941.64, out of which unsettled accounts must be paid. This balance is due to the fact that less new and additional service than was contemplated was authorized and the additional expense on account of the parcel-post system was considerably less than was anticipated.

"The appropriation for the fiscal year 1915 is $784,000.

"The annual rate of expenditure was:

July 1, 1914	$762,283.92
Sept. 30, 1914	775,565.78

"The sum estimated as necessary for the fiscal year ending June 30, 1916, is $845,000, being $61,000, or 7.78 per cent, more than the appropriation for the previous year.

"*Electric car rates.*—The annual rate of expenditure for electric and cable car service authorized at the various rates provided by law was, on June 30, 1914, as follows:

At 3 cents a mile	$194,572.97
At 4 cents a mile	54,391.69
Under special provision	6,007.20
At railroad rates	58,860.91
At schedule rates other than 3 cents and 4 cents a mile	37,400.00
At apartment and independent car regular rates	34,828.80
At apartment and independent car maximum rates	370,579.45
At special agreement rates less than regular rates	5,564.37
Total	$762,205.39

"The estimates for the next fiscal year include the existing special provisions regarding rates that may be paid.

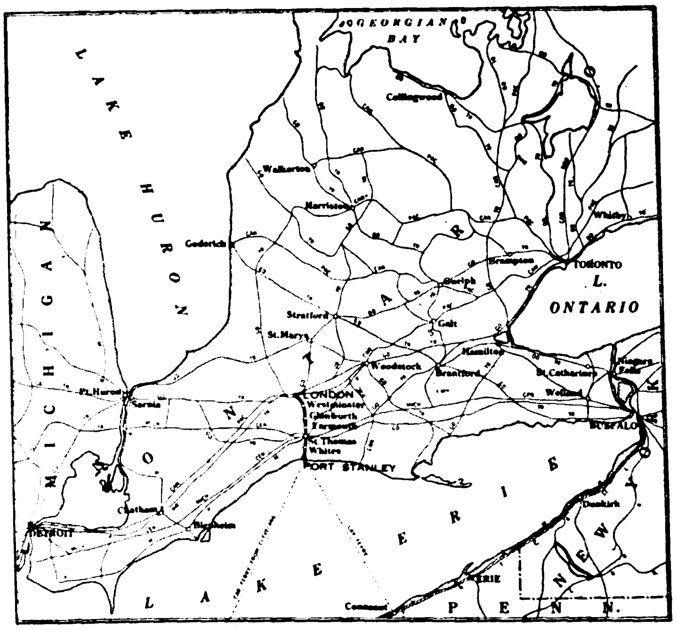
"Many demands were made upon the department during the fiscal year by electric car companies for increased compensation, and increases were allowed where conditions warranted. The Connecticut Company, performing service in the State of Connecticut, refused to accept the compensation fixed by law and abandoned the service on eighteen routes during the year. Substitute service was provided for all offices concerned. At Brooklyn, N. Y., the Brooklyn Heights Railroad Company, having refused to continue the electric car service under the usual conditions imposed by the department and for the rates fixed by law, the electric car service was discontinued and superseded by automobile service."

Electrification of London & Port Stanley Railroad

This Is the First Step in the 1500-Volt, Direct-Current Electrification of the Ontario Municipal Railways

Various municipalities of the province of Ontario, Canada, have for some time been considering an extensive system of inter-connecting electric railways. The general scheme provides for a network of interurban roads supported, as it were, by a backbone of main line electrification handling a relatively heavy freight service. The links connecting the cities and towns will be municipally owned and operated, thus continuing the already extensive municipal ownership feature existing in Canada.

The scheme, in brief, contemplates new roads, or the electrification of existing steam roads, through the central part of that portion of the province lying between Lake Erie and the Georgian Bay. The roads extend from Sarnia on the west to Toronto and Whitby on the east, passing through London, St. Mary's and Guelph. This route follows generally the transmission system of the Hydro-Electric Power Commission from Niagara Falls. Several branches and connections are contemplated, communicating with all the larger cities in that portion of the province, and the proximity of the transmission system affords excellent facilities for substation locations and precludes the necessity of building a distributing transmission line along a large part of the right-of-way.



ONTARIO ELECTRIFICATIONS—MAP SHOWING LONDON-PORT STANLEY LINE, THE FIRST STEP IN THE GENERAL PLAN

The Hydro-Electric Commission of Ontario, of which Sir Adam Beck is chairman and F. A. Gaby is chief engineer, will perform the double function of consulting engineer and contractor for the entire project, installing all equipment ready for operation. The individual sections of the system will then be turned over to the municipalities for operation. The city of London

has taken the first step in this plan and is now proceeding with the electrification of that portion of the main line between Port Stanley on Lake Erie and London, about 24 miles north thereof, mention of the expected costs and operating conditions having been made in the ELECTRIC RAILWAY JOURNAL for Sept. 27, 1913, page 505.

This road has for several years been leased by the city of London to the Pere Marquette Railroad and it forms an important connecting link between the Lake Erie freight ferries and the distributing centers of the province of Ontario. The chief commodity for transportation is coal from Pennsylvania. The single-track line is approximately 23.5 miles long and passes through Whites, St. Thomas, Glenworth and Westminster, connecting with the main lines of the Grand Trunk, Michigan Central and Canadian Pacific Railroads. The profile includes a maximum of 1 per cent grade north of Port Stanley and contains other grades of 0.8 per cent and 0.5 per cent for short distances.

The scheduled service will comprise locomotive freight traffic and multiple-unit passenger car trains between the two termini. Sixty-ton locomotives will take loaded freight cars from the ferry boats at Port Stanley and will haul them in trains of approximately 800 tons to St. Thomas and London, returning with trains of empty cars. In addition there is a local traffic of merchandise between the stations along the line. The passenger service will be performed by limited and local trains consisting, for a large part of the time, of two-car trains providing a half-hourly service in each direction, the limited and local trains alternating. Trail cars will be used with each motor car.

At the inception of the work the Hydro-Electric Commission made a careful investigation of operating results to be expected with high-voltage direct current and also with single-phase alternating current for the trolley, resulting in the final adoption of 1500-volt direct current for propulsion. The energy will be supplied from two substations; one located at London in an extension of the present Hydro-Electric substation, and the other at a distance of 14.2 miles from London, near St. Thomas. The latter will be a new substation. Each will be equipped with synchronous converters and the necessary transformers and switchboards for conversion of the power from the 110,000-volt, twenty-five-cycle form in which it will be supplied by the Hydro-Electric Power Commission's lines.

The overhead structure will be of the familiar single-catenary type supported on side brackets from lattice steel poles placed approximately 180 ft. apart on the tangents. The No. 0000 copper trolley wire will be supplemented by suitable copper feeders.

The materials covered by the first order placed with the General Electric Company includes three 1500-volt, 60-ton locomotives and equipments for five four-motor, 1500-volt passenger cars complete with multiple-unit control and air brakes, and for four trail-cars with controllers and air brakes. Each of the locomotives will be carried on two swivel trucks, bringing all the weight on the drivers, the equipment being housed in a steel, box-type cab extending over practically the entire length of the locomotive. Each will be provided with four GE-251, 750-1500-volt motors designed for 750 volts across each armature and insulated for 1500 volts. The motors will be connected permanently in pairs in series, and the two motor groups thus formed will be capable of connection in series or parallel for speed control. The cab will be divided into three compartments, one at each end for accommodating the operator, and an intervening compartment where the control equipment and accessories will be located. The operating compartments will be provided with 1500-volt electric heaters.

Each of the motors will have an hourly rating of 245 hp with 1500 volts on the trolley, giving a total of 980 hp for the locomotive. At this rating the locomotive will exert a tractive effort of 21,500 lb. Control will be effected by a double-end, type-M, standard equipment, a master controller at each operating position actuating the main 1500-volt contactors by means of a 600-volt circuit supplied from a dynamotor. Provision is made for multiple-unit train operation so that the simultaneous control of three locomotives coupled together can be accomplished from any master controller. The equipment is also designed so that a locomotive may haul a train of eight or ten passenger trail cars and provide lighting energy for them at 600 volts.

The current collectors for the locomotives will consist of pantograph slider trolleys having two contact pans pressing against the trolley conductor. Two of these devices will be furnished on each locomotive. They will be electro-pneumatically controlled from any operating position with one, two or three locomotives hauling a train.

Each motor passenger car will be driven by four GE-225, 750-1500-volt, fully-ventilated, commutating-pole motors connected in groups of two in series. The one-hour rating is 125 hp with 1500 volts on the trolley. Each motor car has sufficient capacity to haul one trail car, and provision is made for the motor and trail cars to be operated in trains up to a total of three motor and three trail cars. All trail cars will be equipped with master controllers at each end, so that multiple-unit train operation is possible from either end of any motor or trail car.

Control energy for the cars will be derived from a 1500-600-volt dynamotor on each motor car. The dynamotor will also supply sufficient energy to light one motor and one trail car. Main and auxiliary train cables will run continuously throughout a train, provision being made for the simultaneous raising and lowering of all pantographs and also for simultaneous sanding (by electro-pneumatic valves) of all cars from any operating position. The pantograph trolleys will be identical with those on the locomotives.

Each car will carry a combined straight and automatic air-brake outfit of the variable release type, with the air supply furnished by 1500-volt compressors. The compressor governors will all be equalized on a special wire running throughout the trains in the auxiliary train cable.

The cars will be built according to the commission's specifications. They will be all-steel, 59 ft. long, and thoroughly modern in every respect. Motor and trail cars will be identical except for the motors. The motor car will weigh approximately 51 tons when fully equipped, while the trailer will have an approximate weight of 32 tons.

"Safety First" Competition in Louisville

In the competition conducted by the Louisville Railway Company to select sentence sermons on safety first to be used on the cards which are being displayed in the company's cars, 642 suggestions were received by the committee which acted as judges. Out of this number the committee, of which Superintendent Samuel Riddle was a member, selected the following for the first award: "Never cross in front of a moving car. There is more room behind." The second award was made for the following sentence: "Here, There, and Everywhere, Safety First."

One of the contestants was given to making rhymes. His suggestions were: "Safety first on cars and trains, saves many travelers aches and pains," and "No matter how great the hurry, 'safety first' saves time and worry."

Hearing Before Interstate Commerce Commission

Argument by John T. Beasley of Terre Haute on Authority of Interstate Commerce Commission to Require Reports of Accidents and Other Statistics from Urban Railways

The hearing of the Interstate Commerce Commission on the subject of urban railway reports was held at the rooms of the commission in Washington on Dec. 18. The full commission was present. There was also quite a gathering of electric railway officials and counsel in attendance. They included John T. Beasley, counsel Terre Haute, Indianapolis & Eastern Traction Company; James F. Jackson, general counsel Bay State Street Railway and formerly chairman Massachusetts Railroad Commission; John C. Donnelly, chief counsel Detroit United Railways, Detroit; B. F. Weadock, counsel of the same company; Horace F. Clark, Washington representative of the American Electric Railway Association; C. Loomis Allen, president American Electric Railway Association and president Newport News & Hampton Railway, Gas & Electric Company; C. L. Henry, first vice-president of the association and president Indianapolis & Cincinnati Traction Company; Arthur W. Brady, chairman of the committee on federal relations and president Indiana Union Traction Company; L. S. Storrs, third vice-president of the association and president Connecticut Company; R. I. Todd, president Terre Haute, Indianapolis & Eastern Traction Company; E. C. Foster, president Manchester (N. H.) Traction, Light & Power Company; J. N. Shannahan, vice-president and general manager Newport News & Hampton Railway, Gas & Electric Company; F. W. Coen, vice-president and general manager Lake Shore Electric Railway; S. K. Colby of Allen & Peck, Inc.; C. C. Peirce, vice-president Providence & Fall River Railway Company and director Boston & Worcester Electric Railway; H. P. Megaree, assistant to the vice-president American Railways Company; H. G. McConnaughy, secretary American Electric Railway Manufacturers' Association; W. F. Ham, vice-president and comptroller Washington Railway & Electric Company; E. B. Burritt, secretary American Electric Railway Association; Henry B. Sawyer, treasurer Stone & Webster Management Association; W. Motley of Gaston, Snow & Saltonstall, counsel for the Boston Elevated Railway; S. S. Perry, legal department New York, New Haven & Hartford Railroad; J. H. Hanna, chief engineer Capital Traction Company, Washington, D. C.; F. W. Hoover, second vice-president Chattanooga Railway & Light Company; I. W. Phelps, claim agent Union Street Railway of New Bedford, and H. W. Blake, ELECTRIC RAILWAY JOURNAL.

The hearing which was to have been held in the morning was postponed until the afternoon so that the commission could listen to the arguments of counsel in a rate case in which the Denver & Rio Grande Railroad was concerned. This case was concluded at 2:45 p. m. and the electric railways then had an opportunity of presenting their case.

The principal argument was made by John T. Beasley, general counsel Terre Haute, Indianapolis & Eastern Traction Company, in the unavoidable absence of J. M. Barrett, president Fort Wayne & Northern Indiana Traction Company. Mr. Beasley explained that he did not have an opportunity, after receiving word that Mr. Barrett would not be able to be present, to prepare his argument in as logical and comprehensive a way as he otherwise would like to have done, but he expressed the hope that he would receive the right to prepare and file a formal brief later. He explained that the hearing did not relate to any concrete case, but it was granted to afford the railways an opportunity to express their views with regard to the statistics, particularly in regard to urban properties, which the railways that had an interstate business were being asked to file with the commission.

Commissioner Harlan asked whether Mr. Beasley would present his argument simply on the filing of accident reports or on the broader question of all statistical reports.

Mr. Beasley said he would proceed along the broader lines. The question, he said, involves a consideration of the Interstate Commerce Commission act itself and turns largely upon the language employed to designate the subjects coming under the act and particularly what the word "railroad" means in the various acts. Mr. Beasley then quoted from the act itself as well as from the safety appliance act to show that the same language was used in both cases, and he said that it is a familiar rule of law that when language has been employed in an act which has been construed by the courts and the same language is used in a later act, the words used in the later act have the same significance as those whose meaning has been defined. For this reason the term "railroad," mentioned in the safety appliance act, and referring to common carriers engaged in interstate commerce, must mean the same kind of carriers described in the previous acts. He added that these several acts have received interpretation by a number of the federal courts, including the United States Supreme Court.

Continuing, he said that in Indiana, with whose conditions he was most familiar, all of the interurban electric railways, so far as he knew, were incorporated under what is known there as the street railway act. This act was the one under which the original horse car lines were incorporated. Gradually these lines were extended into the suburbs, and when electric power became available the railways were extended from one town to another. In most of these cases the electric railway companies operate three classes of service, namely, (1) a local railway system, (2) the interurban system, and (3) the supply of electric current for lighting and power. In Terre Haute, for example, the same power plant supplies all of these services, and he pointed out that it was not possible either legally or practically to separate the units in this power station and to say that one unit was used in interstate business and another in local business. Hence, if the interstate commerce law applied to such companies and to the officers of such companies, it would necessarily apply to all of the officers in all of the services supplied by the company. Again, if the act was construed to apply to accidents which occurred to linemen on a transmission line supplying the interurban railway service, it would have to apply to accidents to linemen on transmission lines which in many cases were far distant from the railroads. He should say, therefore, that the safety appliance act should be narrowed to the particular accidents described in the act, and the act itself to roads having a "roadbed," that is, a private right-of-way.

Commissioner Harlan at this point asked what distinction, if any, Mr. Beasley drew between electric railways operating over streets and steam railroads operating over city streets when passing through a city.

Mr. Beasley thought that there was no difficulty in drawing a clear distinction. He said that so far as the companies with which he was connected were concerned, they did not object to reporting accidents which occurred on their interurban interstate lines but did object to reporting accidents on lines forming a part of their city service. He thought that the Goodrich transportation case did not apply in this instance. In that case the carriers were engaged in maritime commerce but also operated pleasure parks. The United States Supreme Court held that the operation of these parks was incidental only to the interstate business of the company. With an electric railway, on the other hand, there was no connection between the city service and the interurban service. The company operated different cars and different crews in each service and it had no passenger stations in its city service. Usually, also, it had a different superintendent and in its city service collected fares according to the city system, whereas on the interurban lines tickets were sold. It is true the interurban cars pass through the city, but they do not branch out and supply the local city service.

Commissioner Clark asked Mr. Beasley whether he would consider that the Washington, Baltimore & Annapolis Electric Railway was engaged in interstate traffic and should report the accidents in case it had any while operating over the city streets in Washington.

Mr. Beasley replied that the companies with which he was connected had no complaint to make in regard to reporting accidents on their interurban interstate lines.

Commissioner Daniels asked whether he believed that accidents which occurred in a repair shop which was common to an interstate line and to a local line should be reported.

Mr. Beasley replied in the negative. He thought that the accident should apply to something on the line of the railroad and not in the repair shop any more than on the transmission line.

Commissioner Harlan suggested the case of an interstate railroad which had a street car line at each end. He said that Mr. Beasley admitted that such a company should file reports of accidents on the interurban line and asked whether he thought that the company should also file reports of its financial operations.

Mr. Beasley replied that he did not admit that a company should report accidents on its interurban line. Personally, he believed that the commission had no authority to require such a report, but said his clients were not going to bring up this matter at present. Continuing his argument, he said he believed that the Supreme Court had clearly defined the language of the Interstate Commerce Commission act, especially in the case of the Omaha & Council Bluffs Street Railway, a company which supplied local transportation service across a bridge between Omaha, Neb., and Council Bluffs, Ia., as well as local service in each city. Mr. Beasley read extracts from this decision to show that although this road was an interstate road engaged in traffic the Supreme Court had held that it was not the kind of road which the court considered that Congress had in mind in passing the interstate commerce act.

Mr. Beasley referred to the debate on the bill in the Senate and the House and to its course through Congress, as further proof of the fact that Congress had in mind the ordinary railroad and not electric and interurban or street railroads in the passage of the act. He called particular atention to the case of United States v. New York Central Railroad Company, 205 Fed. 428, holding that where a train of cars was hauled by a switch engine over certain tracks and switched from one part of a railroad yard to another, that they might be classified, inspected and assembled, they were not engaged in interstate commerce so as to render the carrier are liable for violation of the safety appliance act, and to the case of Illinois Central Railroad Company v. Behrens, 58 L. Ed. 646, where it was held by the United States Supreme Court as late as March 6, 1914, that a fireman employed by an interstate railway carrier on a switch engine, who was killed while aiding in the work of moving several cars all loaded with intrastate freight between two points in the same city, was not employed in interstate commerce. In this case, he pointed out, the court quotes with approval from the Penderson case as follows:

"There can be no doubt that a right of recovery thereunder (employers' liability act) arises only where the injury is suffered while the carrier is engaged in interstate commerce and while the employee is employed by the carrier in such commerce."

Mr. Beasley's argument, according to the ruling of the commission, was limited to one hour. As he had then occupied fifty-five minutes, the chairman called his attention to this fact, and Mr. Beasley requested permission to file a brief. He received permission to do this if filed within thirty days. This permission was also granted to several other companies whose representatives asked the same privileges.

Recruiting Cars at Hull, England

W. J. McCombe, manager of Hull Corporation tramways, has recently received the sanction of the Lord Mayor to carry out an interesting recruiting scheme in which tramcars will be used as traveling information bureaus. Two electric cars are to be run for eight or nine hours daily on various routes for conveying prospective recruits to the City Hall. The cars will be driven by men in khaki, some of the drivers and conductors in the tramway service being frontiersmen, and the cars will be elaborately decorated with the flags of the Allies and notices bearing an invitation to men to "join now." Officials qualified to give advice on all questions of recruiting, rates of pay, separation allowances, pensions, etc., accompany each car to answer all inquiries. A timetable will be published so that the public will be able to know on which route and at what time the cars will be running.

Trespassers and Railroad Accidents

A bulletin issued by the coroner's office of Cook County, Ill., in which Chicago is situated, states that 70 per cent of all fatal accidents on railroads occur to trespassers, or to children playing on the tracks. It is also noted that a large proportion of these accidents occurred in Illinois, there being more in Cook County than in any other county in the United States, and more in Chicago than in any other city in the United States. On the other hand, the bulletin calls attention to the fact that there was a decrease of 30 per cent below the average for the last ten years and that street railway accidents during that period have been reduced 14 per cent. This marked decrease in the number of accidents to children and trespassers is believed to be due to the work of the public safety commission of Chicago.

United States Consul H. M. Byington reports that the city of Leeds, England, devoted the following surplus profits from its municipally owned public utilities to the relief of taxes for the year ended March 31, 1914: tramways, $340,924; electric lighting, $69,714; waterworks, $60,636; total, $470,936.

COMMUNICATIONS

"Poisoning the Wells" Again

LAFAYETTE COLLEGE
EASTON, PA., Dec. 16, 1914.

To the Editors:

It must be a matter of sincere regret to all interested in electric railway work that the editors of *The New Republic* in the issue of Nov. 21 have seen fit to condemn in such a point-blank way a sincere attempt of the American Electric Railway Association to be of real service in the solution of the electrical problems of today. I refer to the formulation by a very able committee of this association of a "Code of Principles" and the proposal that addresses be given before our student bodies by men of prominence in the electric railway field in order that a more thorough and better understanding between our railways and the public may be brought about.

In this country no man or cause is adjudged guilty until properly proven so after a fair and unbiased hearing of the case. Certainly such has not been given to the cause in question by *The New Republic*. Fortunately an appeal can readily be taken to a court of higher powers, the public. This can be reached through our colleges and through the press.

It is to be hoped that this snap decision against the action and recommendations of this committee may only serve to stir it and the association to even greater activity in pushing this matter. It is too important a question to be let drop merely because some see fit to oppose or condemn it. Certainly no one can deny that there is needed a closer and better understanding between the electric railways and the public they serve. Any movement which makes for this should in every way be helped and not hindered. It is not less but clearer mutual understanding that we need; not less but more and better publicity. I know of no better or more legitimate way of obtaining this than that proposed by the committee.

It is sincerely to be hoped that all interested in electric railway work, as well as the American Electric Railway Association, will stand behind this committee and aid it in its valuable work.

JAMES THERON ROOD,
Professor of Electrical Engineering.

CASE SCHOOL OF APPLIED SCIENCE
CLEVELAND, OHIO, Dec. 16, 1914.

To the Editors:

I have noted with interest your editorial in a recent issue of the ELECTRIC RAILWAY JOURNAL citicising an article in *The New Republic*. I feel very strongly that the opinion expressed in the latter article is based upon a complete misunderstanding of the recommendations of the public relations committee of the American Electric Railway Association. I attended the convention at Atlantic City, and heard not only the report of the public relations committee, various papers bearing on the public relations of the electric railway companies and the discussion on the "Code of Principles," but I had the opportunity to talk personally with many heads of railway companies.

Throughout all the discussions I was impressed with the obvious fairness of the attitude of the men having to do with the shaping of the policy of these public service corporations. It was said, and rightly, that the technical colleges ought to give more attention to the study of railway economics.

There has undoubtedly been but little attention given in the past to this very important subject. As educators we have been rather busily engaged in the engineering phases of our work and because this part of our curriculum has necessarily absorbed a large share of our time, and perhaps because of a lack of thorough understanding ourselves of railroad economics, we have not given sufficient attention to the economic questions involved.

Personally, I interpreted the suggestions of the public relations committee to mean that they wished to afford the technical educators of the country such contact with the railway industry as would permit them to study the economics of the railway business at first hand.

An increasing number of graduates of technical schools are rising to executive positions. There they must meet the many economic and social problems of to-day and, as educators having to do with the technical training of men, we should welcome the opportunity offered by the association to study these problems at first hand and thereby assist our students to a better understanding of them.

I felt throughout the recent convention that the attitude of the railway men toward me as a teacher could be expressed approximately thus: "You are training men we are to use. As railway men, we have many problems which you ought to know about. We don't ask you to accept our views or codes unless you find them to be right and just. But we do want you to know what our problems are, understand our point of view, believe that we are honest and sincere, appreciate that in the long run our interest and the public's interest are one, and then, in so far as you can in your teaching, present the various aspects of the electric railway industry to your students and encourage them to study from all sides, the economic questions involved."

I trust you will be able to read out of this my very sincere appreciation of the spirit of the Atlantic City convention as I found it. HENRY B. DATES,
Professor of Electrical Engineering.

Average Wear of Steel Wheels

In a recent test made by H. H. Buckman, master mechanic of the Louisville & Northern Railway, it was found that the average wear obtained from steel wheels with the American Electric Railway Association contour before the first turning, was 48,000 miles. The contour of these wheels was changed at the first turning to the C. E. R. A. standard, adopted as recommended practice at the November meeting. The mileage obtained from this C. E. R. A. contour between the first and second turning was 54,000, or greater than that obtained before first turning when the American Association contour was used. This increased life secured between the first and second turning is attributed to the additional metal in the C. E. R. A. contour at points where the American Association contour showed excessive wear.

Another Reason for Low Steps

A paper read at a meeting of the Chicago Osteopath Society, held recently, stated that the high steps of street cars were responsible for much lumbago and sciatica. In explaining the reason for this conclusion it was stated that the constant or even occasional reaching for high car steps caused a twisting of the pelvic joint, which produced a pressure upon the nerves, thereby shutting off the regular flow of blood. This resulted in producing severe pain that eventually developed into lumbago or sciatica. As a remedy for this, theuse of lower steps or of more steps where the car platform was high was recommended.

American Association News

Manufacturers' Association Executive Committee Holds Annual Meeting—Equipment Sub-Committee Assignments Are Made—Biographical Sketches of Company Section Officials Are Given Below

MEETING OF THE EXECUTIVE COMMITTEE OF MANUFACTURERS' ASSOCIATION

The executive committee of the American Electric Railway Manufacturers' Association held its annual meeting on Dec. 11 at the offices of the association, 165 Broadway, New York. The meeting was called to close the business of the current year. President Cornell S. Hawley presided and the others in attendance were Safford K. Colby, W. L. Conwell, F. A. Elmquist, Henry C. Evans, Thomas Farmer, Jr., B. A. Hegeman, Jr., Charles C. Peirce, Daniel W. Smith, E. F. Wickwire, George Stanton, W. F. Cutler and Secretary H. G. McConnaughy.

Reports covering the October convention at Atlantic City were received from Vice-President Ellicott, in charge of entertainment, Vice-President Colby in charge of finance, and Vice-President Baker, in charge of exhibits. The treasurer's annual financial statement and other reports from the chairman of various committees were also submitted.

Charles C. Peirce then made a report for the joint dinner committee for the 1915 mid-year meeting, in which he stated that arrangements had been completed to hold the dinner at the New Willard Hotel, Washington, D. C., on the evening of Friday, Jan. 29. Mr. Peirce also outlined a tentative program of that meeting. Letters from both the Railway Association and the Manufacturers' Association containing application blanks for tickets and giving full information regarding the dinner will be sent to the members of each association shortly.

The committee on speakers reported progress and announced that arrangements were under way to secure speakers of national prominence and that the names would be announced later.

Mr. Hawley then retired from the chair, and in the absence of President-elect Baker, Charles C. Peirce was made temporary chairman.

Mr. Peirce asked for a report from the committee on resolutions, and Mr. Colby read the resolutions which the committee had prepared, speaking of the excellence of the work of the retiring president, Mr. Hawley, Chairman W. G. Kaylor of the entertainment committee and Chairman Wylie Brown of the finance committee. The resolutions in regard to Messrs. Kaylor and Brown expressed the thanks of the association for the work accomplished by them and their committees. In the resolution referring to Mr. Hawley, the committee expressed its appreciation of the fact that the splendid advance made by the association and the increased scope of its work was due in a large measure to his executive skill, hard work and close attention to detail and thanked him for his untiring devotion to the interests and aims of the association.

DECEMBER MEETING OF DENVER TRAMWAY SECTION

The twenty-second regular monthly meeting of the Denver Tramway Company Section was held in the Tramway Auditorium on Dec. 17 with an attendance of 100. The presiding officer, C. B. Wells, made an introductory address which was followed by a paper by Walter L. Whitlock, foreman south division, track department. This paper covered the author's observations during a recent trip to St. Louis. Auxiliary papers were read by H. N. Hilling and G. S. LeVine. The papers were followed by a lively discussion.

FOUR LIVE COMPANY SECTION OFFICIALS

These portraits and biographical notes are printed on the "Association News" pages in order to give a personal touch between the readers and company sections.

C. B. Wells, who was recently elected president of the Denver Tramway Company section, began his business career on a cattle range of Wyoming. Later, with his father, he went to Denver, where educational opportunities were better than in the cattle country. He entered the service of the Denver Tramway Company in 1891 as stenographer in the transportation department. Not long after he was appointed to the position of chief clerk and in 1910 was made superintendent of transportation. In June of the present year Mr. Wells became assistant to the general manager of the company and editor and manager of the *Tramway Bulletin*, a monthly magazine published for circulation among the employees of the company.

C. B. WELLS
President Denver Tramway Company Section

H. G. MUNDHENK
Secretary Denver Tramway Company Section

In addition to his electric railway work, he is considerably interested in Denver real estate and has identified himself in the larger welfare of the city. In connection with his work with the company he has taken an active part in the welfare associations organized among the men and has personally participated in the club work, particularly in the bowling league and billiard contests, and has organized a successful glee club. His enjoyment of these activities and his interest in the men of the company have served to keep him in the street car business in spite of a strong leaning on the side of real estate. Mr. Wells' ambition is to be considered the true friend of the "Tramway boys" and he prizes nothing more than the good-will that they constantly show him.

H. G. Mundhenk, who was recently elected to his third term of office as secretary of the Denver Tramway Company Section, was a member of the class of 1908 in the University of Wisconsin. He entered the employ of the Denver Tramway Company in the transportation department as stenographer in 1906 and has served in this department since that year. In addition to being secretary of the company section he is also secretary of the Central Tramway Club, an organization of employees of the company, having a membership of about 300. Immediately after taking up work with the company, Mr. Mundhenk interested himself actively in welfare work among the employees, and his election as secretary of the company section indicates the esteem in which he was held.

George G. Whitney, president of the Washington Railway & Electric Company section, has lived in Washington for just thirty years, having been transferred there at the age of three from his native Republican City, Neb. After a course in the grade and business high schools, in 1899 he entered the employ of the predecessor of his present employer, the then Washington Traction & Electric Company. At that time the Washington roads were in process of electrification. Since 1900 he has been associated with W. F. Ham, comptroller, having been chief clerk of the accounting department since 1909. Mr. Whitney is a member of the American Association committee on company sections and individual membership and of the Accountants' Association committee of education. He was re-elected president of company section No. 4 in October.

GEORGE G. WHITNEY
President Washington Company Section

B. F. HUNTER
Secretary Washington Company Section

B. F. Hunter, who is secretary of the Washington Railway & Electric Company section, was born in Washington in 1891. He attended the public schools in that city and graduated from the business high school in 1909. After filling a preliminary position with a local lumber firm, with which he remained about six months, he was employed in the claim department of the Washington Railway & Electric Company, and is still so employed. While Mr. Hunter is undoubtedly the youngest of the company section secretaries, his recent re-election to his present office is a guarantee that he is doing effective work in it.

COMING COMMITTEE MEETINGS

A meeting of the American Association valuation committee, L. S. Storrs, president the Connecticut Company, chairman, will be held at association headquarters at 2 p. m. on Jan. 7.

The American Association committee on education will meet at the same place at 10 a. m. on Jan. 4. This committee will take up the work on the correspondence course now being inaugurated under the auspices of the association and will lay definite plans for keeping track of the instruction and for stimulating interest.

Sub-committees of the joint committee of the Engineering and Transportation & Traffic Associations on block signals, J. M. Waldron and J. W. Brown, co-chairmen, will meet in New York as follows: Jan. 4, design of standard signal apparatus, J. M. Waldron, chairman; study of costs of maintenance, etc., of signal systems, G. W. Brown, chairman; review of block signal standards and recommendations, C. H. Morrison, chairman; Jan. 5, clearance diagram for semaphore signals; J. Leisenring, chairman; light signals for interurban railways, J. Leisenring, chairman; consideration of A. I. E. E. standardization rules, G. N. Brown, chairman; preparation of a list of items of information needed in connection with block signal contracts, J. M. Waldron and G. N. Brown, co-chairmen.

COMMITTEE ON EQUIPMENT

W. G. Gove, superintendent of equipment Brooklyn Rapid Transit System, chairman of the Engineering Association committee on equipment, has made his assignments of sub-committee work as follows, the name of the chairman being given first in each case: Specifications for heat-treated carbon-steel axles, shafts and similar parts, W. E. Johnson, New York Municipal Railway; R. H. Dalgleish, Capital Traction Company (Washington, D. C.); specifications for gears and pinions, R. H. Dalgleish, J. R. Ayers, New York State Railways (Utica, N. Y.); M. C. B. brass for heavy electric traction, R. N. Hemming, Union Traction Company of Indiana (Anderson, Ind.), L. M. Clark, Indianapolis Traction & Terminal Company; wires and cables for car equipment, W. R. McRae, Toronto (Ont.) Railway Company, F. W. Garrett, Boston Elevated Railway; specification for air-brake hose, W. E. Johnson, W. R. McRae; design of limit-of-wear gage, F. W. Garrett, W. E. Johnson; steel wheel design, J. R. Ayers, F. R. Phillips, Pittsburgh, Railways; to review all existing standards and recommendations originating with the committee on equipment, F. R. Phillips, R. H. Dalgleish; consideration of the A. I. E. E. standardization rules, L. M. Clark, R. N. Hemming.

New England Street Railway Club

At the monthly meeting of the New England Street Railway Club at Boston, Mass., on Dec. 17, H. A. Bullock, staff assistant to the president Brooklyn Rapid Transit Company, gave an illustrated address upon "Employees' Welfare." The work on the Brooklyn system was reviewed as described by the speaker in a paper published in the ELECTRIC RAILWAY JOURNAL of Oct. 16, 1913, with various supplementary remarks. Mr. Bullock described the medical inspection system of the company, which now requires five physicians, and which has reduced the total time lost from sickness by 25 per cent, 10,000 as against 8000 men being employed.

Much good has arisen from an arrangement by which men may apply for recreation time off for one day in ten, except on Saturdays, Sundays and holidays in the summer. A new and greatly improved portable "first aid" case has been designed, the fundamental solutions being kept in Thermos bottles, the smaller bottles being in papier-maché cases to prevent breakage. Individual dressings and bandages in sealed wax paper packages are used to prevent infection. A novel and useful feature in each case is a sealed compartment for doctors' convenience only, containing a hypodermic needle, catgut and other supplies. The cases cost about $18 each, complete, and 114 are now in use or on order. The prone pressure method of resuscitation is taught in first-aid classes and mechanical respiratory apparatus is used to supplement human effort, which tends to become fatigued too early in many cases. The speaker also described the work of the benefit association, the company's safety campaign, the pension system, excursions, recreation rooms and athletic activities, the last including a full-fledged baseball league which has been a great success in creating esprit-de-corps. George H. Vose, assistant superintendent United Shoe Machinery Company, Beverly, Mass., also described the welfare work of his organization.

Equipment and Its Maintenance

Short Descriptions of Labor, Mechanical and Electrical
Practices in Every Department of Electric Railroading

(Contributions from the Men in the Field Are Solicited and Will be Paid for at Special Rates.)

Replaceable Flange Risers of Tool Steel in Seattle Special Work

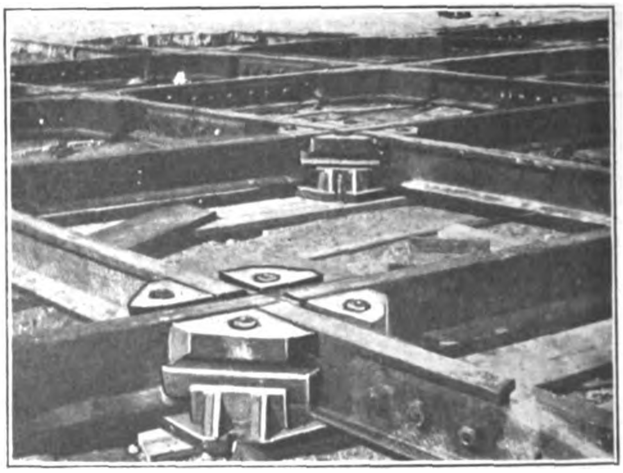
BY JOSEPH PARKIN, RECEIVER SEATTLE, RENTON & SOUTHERN RAILWAY

On the Seattle (Wash.), Renton & Southern Railroad, as elsewhere, loose and broken inserts, loose arms, worn points, etc., gave rise to heavy maintenance charges which, after considerable experience with various types, we had come to look upon as unavoidable.

APPEARANCE ON DEC. 2, 1914, OF CROSSING AT FOURTH AVENUE AND PINE STREET, SEATTLE, PLACED SEPTEMBER, 1913

About a year and a half ago, however, there was brought to the writer's attention a new type of crossing which dispensed entirely with the unsatisfactory inserts and was designed, instead, to take the greatest part of the wear on a replaceable flange riser. These risers are made of tool steel, with a taper of about 1 in 40, instead of the abrupt rise found in most types of manganese work, where it is frequently as steep as 1 in 20 or even 1 in 12. The matter of easy approach was also looked after in tapering the throats of the frogs, with the result that the crossing gave very easy riding for the cars.

By avoiding the use of the expensive manganese steel, the designer, Merle J. Wightman, an engineer of Seattle, demonstrated with apparent good reasoning that he could produce a crossing for about one-half the cost of insert work. In view of this large initial saving, the writer was persuaded to install a double-track double diamond at Fourth Avenue and Pine Street, where it was submitted to a seven-minute headway, north and south, and a two-minute headway east and west.



CROSSING AS INSTALLED JUNE, 1913, FOURTEENTH AND JACKSON STREETS, SEATTLE, BEFORE THE ADDITION OF THE PAVING

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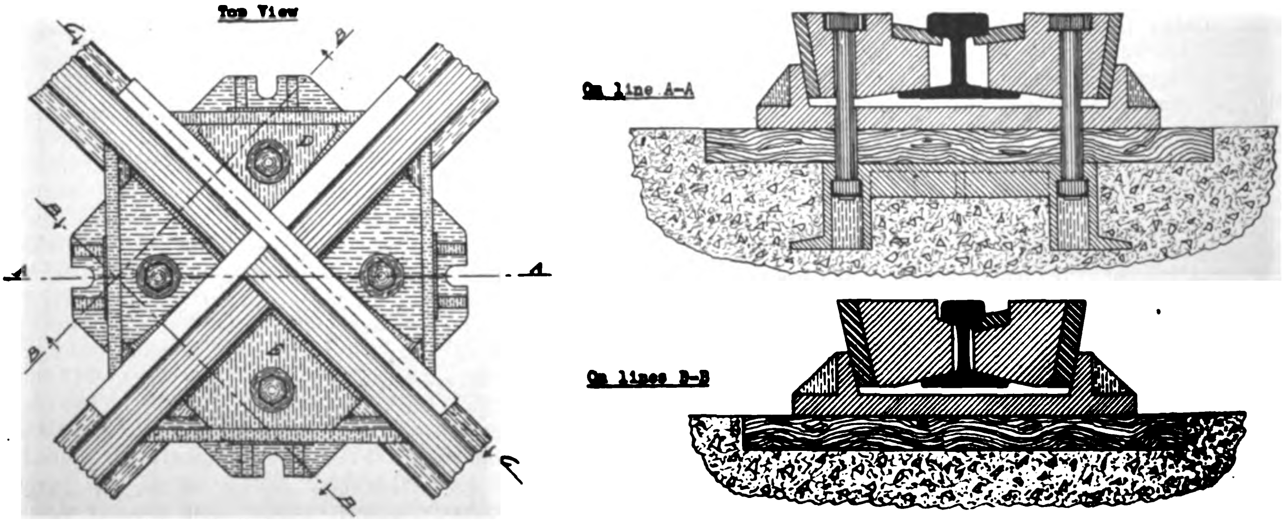
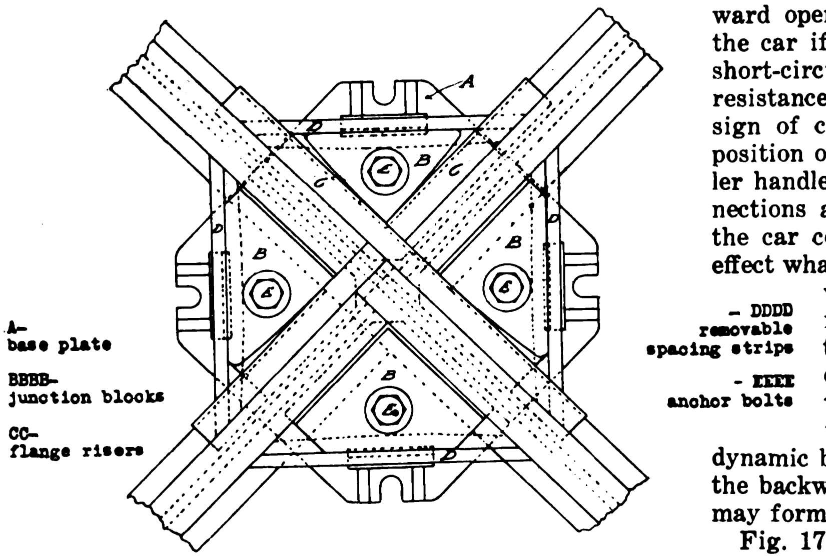


TOP VIEW OF THE ARCH-SUPPORTED CROSSING AND CROSS-SECTIONS SHOWING WOOD CUSHION AND ANCHOR PLATE IMBEDDED IN CONCRETE not supposed that its effective life would approach that of the manganese work. In this the company was agreeably disappointed. After fourteen months of continuous service, without attention, the crossing is in as good condition as at the start. It shows no wear except on the riser, and very little is found even there. Furthermore, a manganese insert diamond, installed about the same time and under similar conditions, has already required attention for loose inserts and shows much greater deterioration throughout than the Wightman type.

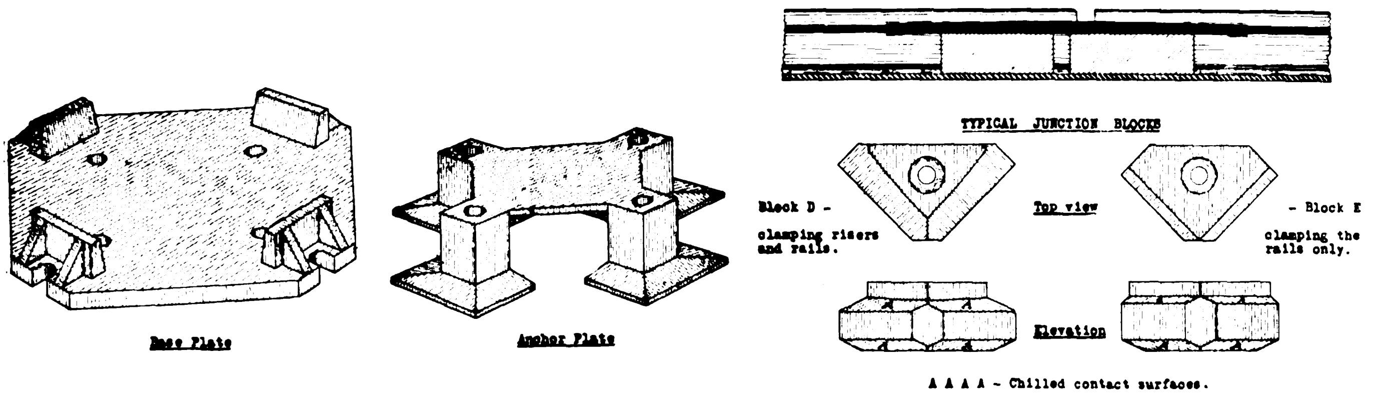
By reason of this excellent showing the Seattle, Renton & Southern Railroad has now adopted this crossing as standard. Two of our manganese diamonds have already been replaced at Jackson and Fourteenth Streets, and plans are now under way for replacing others with the new type at one of our busiest corners.

Although, as indicated, repair work is slight on these crossings, the design enables adjustments to be made both easily and quickly. All parts of the structure are readily produced in any local shop, particularly the flange risers, the only wearing parts, which are made of tool steel instead of manganese. These risers can be set in place by the average track man without disturbing the surrounding pavement.

As a whole, this crossing is so designed that no loosening of any of the component parts is possible. Every piece is automatically self-tightening, and repairs of any nature, even including shimming for the correction of uneven settlement, can be made without breaking the pavement at any point.



PLAN VIEW IN OUTLINE



GENERAL VIEW OF FOUNDATION STRUCTURES—SECTIONAL VIEW ALONG THE THROUGH RAIL ON LINE C-C OF TOP VIEW; ALSO SHOWING JUNCTION BLOCKS, RISERS AND OTHER DETAILS

The itemized cost of building the Fourth and Pine Streets crossing, comprising four diamonds, made in our own shops and the cost of installation, is as follows:

Material Used

Six 80-lb. rails, 32 ft. long—5120 lb. at $2.75 per hundredweight	$140.80
Sixteen base plates, cast iron—2350 lb. at 3 cents per pound	70.50
Sixty-four corner blocks, cast iron—3210 lb. at 3 cents per pound	96.30
Sixty-four 1-in. x 9-in. bolts and nuts	9.15
Thirty-two 1¼ in. x 2 in. tool-steel risers 27 in. long, 800 lb.	36.00
Sixty-four spacing strips, ¾ in. x 2 in. x 10 in.—270 lb. at 3 cents per pound	8.10
Washers, studs, incidentals, etc	11.00
	$371.85
Shop labor and engineering	235.00
Total cost, f.o.b. shops	$606.85

Cost of Installing

300 paving brick	$7.85
25 yd. granite paving blocks, at $2.05 per yard	51.25
19 yd. sand, at $1.70 per yard	32.30
18 bbl. cement at $2.30 per yard	41.40
Team hire, two days	12.00
	$144.80
Labor on foundation	114.00
Labor and superintendence, installing	147.00
Total cost, installation	$405.80
Grand total, for crossing in place	$1,012.65
Estimated cost for renewing risers	$108.00

Equipment Defects—Control Apparatus and Connections—VII

BY C. W. SQUIER, E.E.

Connections for Backward Braking—As already stated, if the motors on a car are connected for forward operation, they will produce a braking effect on the car if it moves in a backward direction simply by short-circuiting the motors on themselves through a resistance. This fact has been made use of in the design of certain controllers with contacts in the "off" position of the controller, so that whenever the controller handle is thrown to this position the necessary connections are made for backward braking. As long as the car continues moving in the forward direction no effect whatever will be produced. Such connections provide automatic means to prevent an excessive rate of backward speed, and afford an additional safeguard against the backward running of a car down grade after it has been brought to rest. It is not necessary for the controller to be arranged with points for electric or dynamic braking in the forward direction in order that the backward braking contacts may be added, but these may form a part of any controller.

Fig. 17 shows a simplified diagram for the Westinghouse type T-1 controller. This controller has the backward braking contacts in the "off" position and is also arranged for either electric or rheostatic braking of the car in the forward direction. This controller has four series, four parallel and seven brake points and is designed for the series-parallel operation of two motors,

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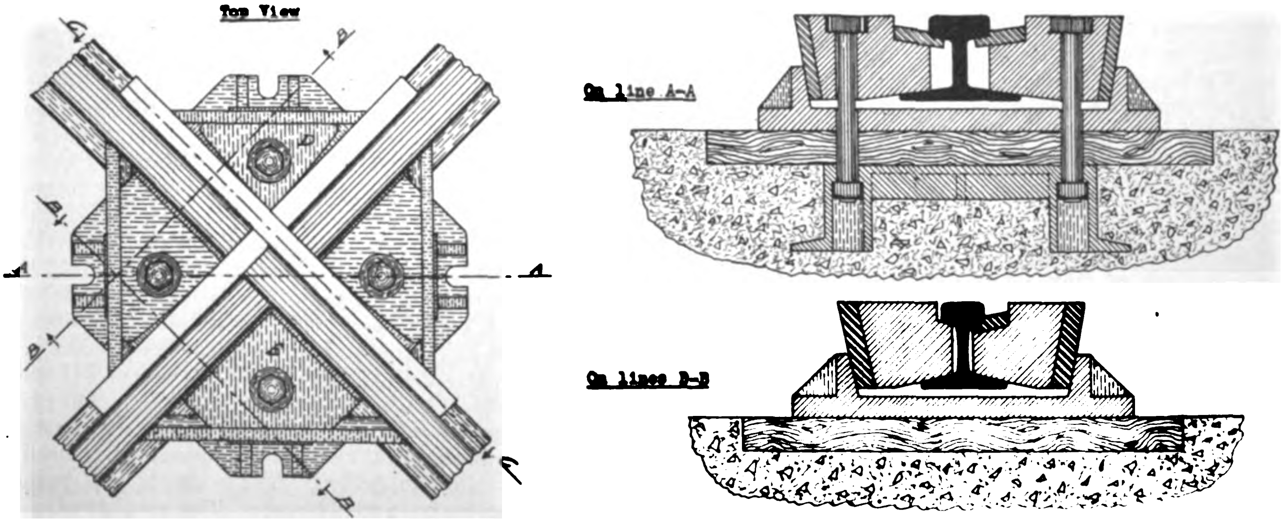

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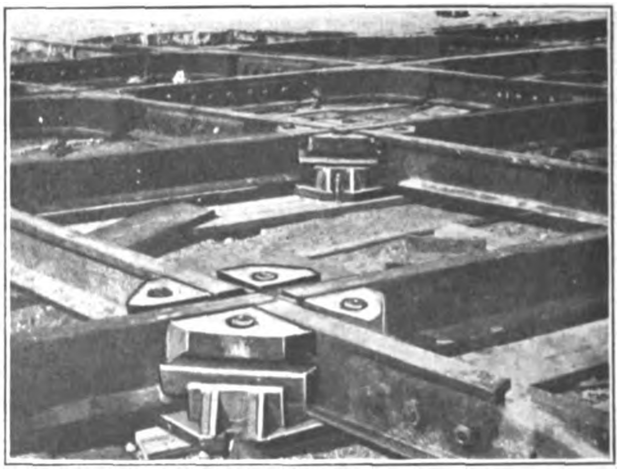

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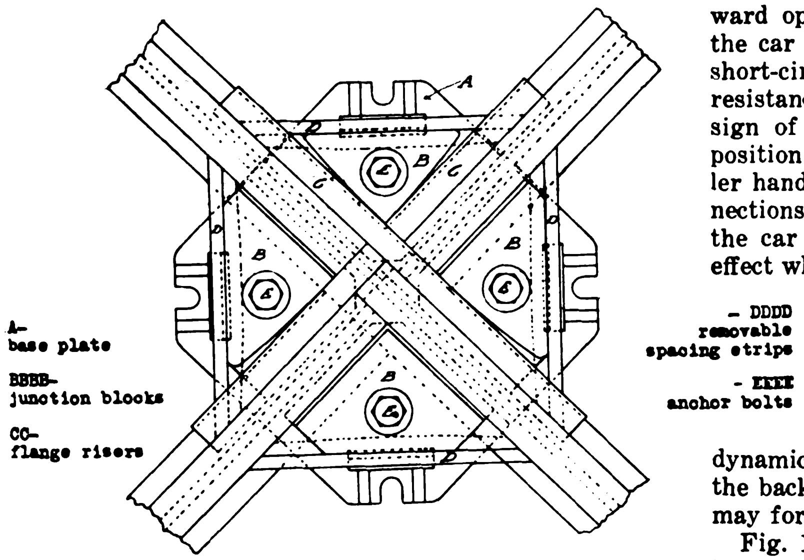

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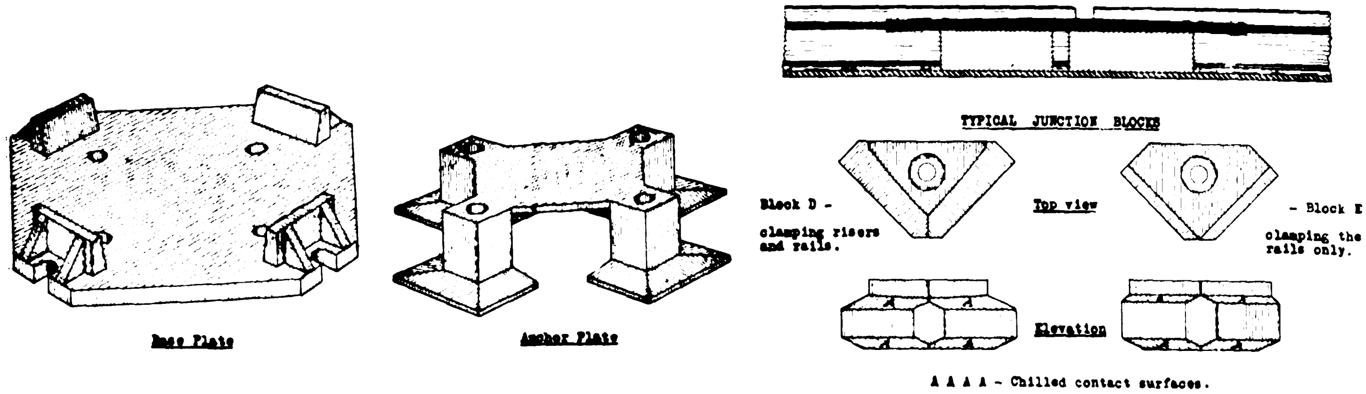

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Connections for Field Control—The regulation of the speed of railway motors by varying the strength of their fields is as old as railway motors themselves. Nearly all of the old double-reduction motors and some of the single-reduction motors were controlled in this manner. This was known as the "loop" system, and the term "loop" is still extensively used to-day by motormen to designate the last or full parallel position of the controller handle. They commonly say that they put the controller "on the loop," meaning that they threw the handle to the last position.

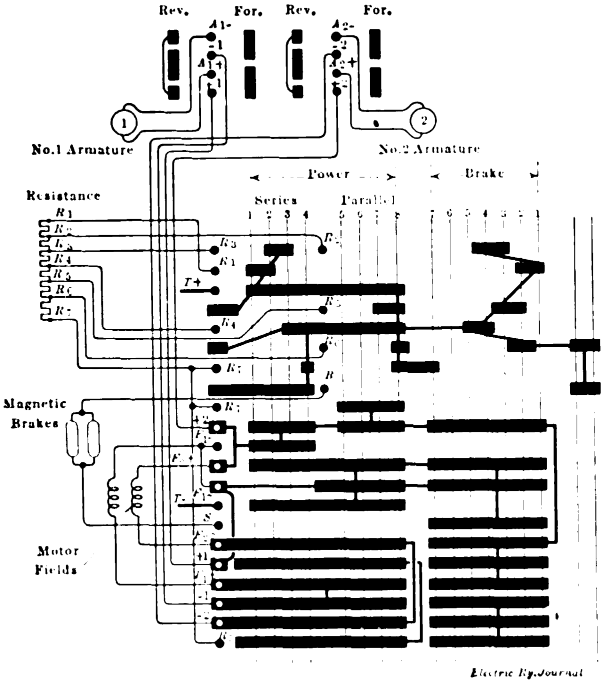


FIG. 17—CONNECTIONS FOR WESTINGHOUSE T-1 CONTROLLER

The first K controller and also the K-2 controller, which was designed twenty years ago, used this form of control. This method then met with poor success due to the difficulties of commutation in the older type motors. With the advent of the commutating-pole or interpole motor, and the use of high-grade carbon brushes with slotted commutators, this form of control has been resurrected in a modified form. Instead of shunting the fields, however, as was done previously, a portion of them is entirely cut out on the last notches for series and parallel. This method avoids having a non-inductive shunt around the motor fields. The shunt would make the magnetism sluggish and would be more liable to produce flashing.

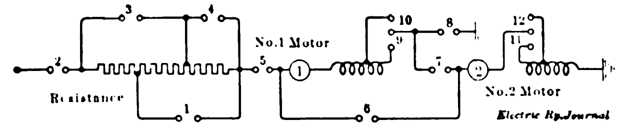


FIG. 18—MOTOR CIRCUIT CONNECTIONS WITH FIELD CONTROL

Fig. 18 shows the motor circuit connections commonly used with field control motors. After the regulating resistance is cut out the first running point is reached with both motors in series and with full field. Contacts 10 and 12 are next closed and 9 and 11 are opened. This first short-circuits and then cuts out a portion of the field in each motor so that we have the first tapped field position with both motors in series, which is the second running point. Before changing the connections to place the motors in parallel, the full field of the motors is again restored, so that we pass through the parallel resistance notches to the third running point with full fields in the motors, when a portion of the fields is again cut out and we have the fourth running point with the motors operating in parallel with tapped or short field. With these connections four different operating speeds are obtained; two in series and two in parallel with full and tapped field respectively.

With some types of control the tapped field speed in series is omitted. This permits the use of a standard controller if a current relay is used to operate switches for changing the field strength, and also simplifies the connections, as no interlocking is necessary to prevent going into parallel with short field. The only advantage gained by having a short field position in series is the small saving in energy that will be obtained. However, as the time that the short field position in series is used is very small, the saving will be correspondingly small, and this does not appear to be worth the added complications in the control. With the connections as shown in Fig. 18, the change from full to tapped field is made without introducing any regulating resistance into the circuit. This produces a high peak in the current as the field is reduced and requires very careful proportioning of the motor characteristics to prevent the peak from becoming objectionable.

The chief advantage of field control lies in its greater flexibility so that the same equipment may be operated efficiently in different classes of service. The saving in the energy consumed during acceleration is another advantage about which much has been written. Most of the work accomplished by the motors in bringing the car up to a speed where they can be operated in parallel across the line is done with resistance in circuit. Field control permits the regulating resistance to be cut out at a lower speed and so reduces the rheostatic losses. A more extended discussion of the saving in energy due to field control will be taken up in discussing motor defects.

Effects of Short-Circuited Field Coils—Ground and Puncture Tests

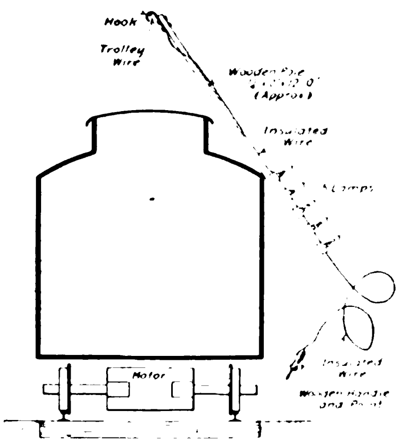
BY F. J. FOOTE, MASTER MECHANIC OHIO ELECTRIC RAILWAY, COLUMBUS, OHIO

The field coils or fields of railway motors often get much less attention from carhouse men than they deserve. The natural reason for this is the fact that the armature is the more active part of the motor and the part through which most of the troubles come to the surface. Thus the armature is nearly always supposed to be the offender when the basic cause may be a defective field. The fields may seem to be all right so far as ordinary inspection goes, but below the perfectly sound tape of the innocent-looking field may lurk the short-circuit that is responsible for the roasting of the armature coils and the blistering of the commutator.

The actual effect of a shorted or partly shorted field is twofold: first, it causes the field flux (or strength) to be less than normal and thus more than the normal current is made to flow through the armature to do the same work; second, the unequal field strength which results from a shorted field distorts the field flux, thereby changing the point of commutation and causing the brushes to flash more or less according to the amount that the field is shorted.

A very marked case of trouble from shorted fields arose recently. In this case, trouble was experienced in keeping the controllers in order on account of excessive burning. After a week of this it was decided to test out the fields of the motors. Several partly shorted fields were found and replaced by good fields, after which the controller trouble disappeared. The explanation is that when the fields were short-circuited the field strength was decreased and the increase in the current required to move the car was abnormal enough to burn the controller contacts.

On our property we find that ample attention to field coils saves a great deal of trouble and expense. On the larger motors, where the fields are of heavy strap copper with asbestos tape between adjacent turns, we have discovered the advantageous fact that a short rarely occurs unless there is also a ground at the same time. The reason is that the ground generally occurs first and is the initial cause of the short, because the arc to ground finally reaches across the turns and short-circuits them. Hence if a field tests free from ground, the chances are about 99 in 100 that there is no short. As the test for a ground is very simple and easily applied, the labor of testing these strap-wound fields is very small. In fact, our rule is to test the fields for ground every time a motor is disconnected from the car cables. A careful test for shorted fields is made in those cases where the large motors have armature trouble that we cannot account for otherwise. However, the ground test generally is considered sufficient for strap-wound fields. This practice does not apply to the wire-wound fields of the smaller motors, for we frequently have such fields that test clear of grounds and yet are badly shorted.



LAMP POLE FOR TESTING

Testing for Grounds

The simplest and most common test for grounds is carried out under the following conditions: At several convenient points we have lamp poles about 12 ft. long, equipped near the lower end with a bank of five incandescent lamps in series; the upper end of this series of lamps is in circuit with an insulated wire which is stapled to the pole and which is connected to a strong iron hook attached to the top of the pole. At the opposite end of the pole the insulated wire from the bank of lamps is stapled down to the extreme end, and is made long enough to leave about 8 ft. to 10 ft. of free wire. The end of this wire is fitted with a wooden handle carrying a point made of about No. 1 solid copper wire. This arrangement is shown in an accompanying drawing, which also illustrates the use of the device.

To operate, the pole is first hooked over the trolley wire. Then the workman takes hold of the insulated wooden handle and touches its copper point to the rail or truck frame which is, of course, grounded. If the lights burn we know that they are in good condition and ready for the test. Usually less than a minute is required to get the pole, hook it over the wire and try it out in this fashion. Next, if the field leads of the motor are disconnected, it is necessary only to touch the copper point to these leads; if the field is grounded, the lamps will burn, but otherwise they will remain dark. This follows from the fact that the motor cases are always grounded to the rail through the axles and wheels. This test can also be used to detect grounds in armatures, brush-holders and, in fact, in almost any other part of the electrical equipment. Under certain conditions the lamp pole is also convenient for use simply as a light, for all that is necessary is to hook the pole on the trolley wire and place the copper point against the rail. It is important that the lamps be tested out each time they are used to make sure that they are in working order.

The lamp pole will indicate any ground that is of low enough resistance to cause immediate trouble, but it will not detect an incipient ground whose resistance is greater than, say, 2500 to 3000 ohms. Such incipient grounds in time may develop into serious grounds, but they are easily detected with a voltmeter, connected in place of the lamp and in similar manner.

Testing for Punctures

While on the subject of grounds, the value of the puncture test should also be mentioned. This test consists of applying alternating current at from 1000 to 2000 volts between conductor and frame (or ground) for a period of one minute. No effect will follow if the insulation is sound, but if it has a weak point the high voltage will puncture it at that point. The advantage of this test is that the weak points can be found and repaired while the motors are on the shop floor instead of waiting for them to break down in service. As a general rule, grounds detected by the puncture test can be accurately located by a little puff of smoke at the instant of puncture. The cost of repairing the weak spot is very small, since the actual burning due to puncture is very slight. On the other hand, if the breakdown of insulation occurs in service the burning is generally serious and expensive to repair. The alternating current voltage to be used for a puncture test in any given case will vary according to the age and condition of the insulation; new insulation should stand at least 2000 volts, even 2500 volts being sometimes used on railway motors. On old insulation it is generally not well to use more than 1200 to 1500 volts, that is to say, double the normal working voltage. Transformers for giving any desired voltage are on the market, but one that will serve for shop purposes can readily be made by rewinding one of the small lighting transformers usually found in the junk pile of any lighting property.

Tests for short-circuited fields will be described by the writer in a second article.

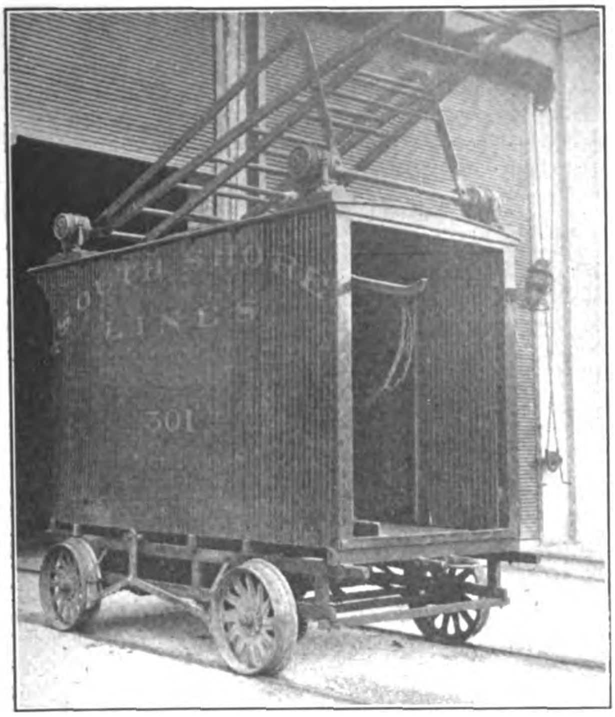
Trolley Buses at Shanghai

Consul General Thomas Sammons, Shanghai, China, reports that seven trolley omnibuses have been purchased in England for use in connection with the electric street car service in the International Settlement at Shanghai. Four of the buses have already arrived, but the remainder are detained on account of the European war. In the meantime it will not be practicable to use the buses already received because of the inability to arrange a satisfactory schedule.

Thus far it has not been possible to introduce the American electric storage-battery buses in China, and it is believed by street car managers in the Orient that the trolley buses may be operated on many of the narrow streets with profitable results. It is estimated that the cost of the trolley wire construction would not exceed the outlay required in purchasing storage-battery trucks. It is assumed that the battery bus is more popular in the United States because of the objection of the municipal authorities to the trolley wire installation in residence districts where there are no car tracks. Moreover, on wide and congested streets it is assumed that trolley omnibuses would not be suitable because of required right-of-way and overhead trolley construction.

A Gasoline Emergency Line Car

To carry linemen to the point of trouble when the power is off the line, the Chicago, Lake Shore & South Bend Railway has a gasoline emergency line car of Buda No. 14 type. A light inclosed top was added of strength sufficient to support two men on the adjustable ladder mounted on its roof. The A-frame ladder has a bracket support for one section which affords two points of attachment, thus giving it an adjustable range of 2 ft. As this road is operated at 6600-volt, single-phase, it was necessary to insulate the ladder thoroughly, and a standard pantograph base was used, as is shown in the accompanying illustration. The weight of the car and equipment permits it to be readily handled by four men. The equipment includes a turntable for removing the car from the track, but when it is on the road with fewer than four men it must take a siding at meeting points. While this causes some delay, the car is never allowed on the road without the dispatcher's order, so that meets with other trains may be readily arranged. The car is supplied, of course, with emergency line repair tools, gasoline and lubricating oil.



GASOLINE EMERGENCY LINE CAR

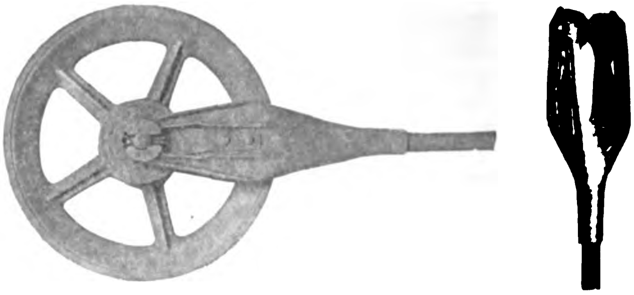
London Car Lamps Dipped in Violet Lacquer Because of War Conditions

Since the edict went forth for the darkening of London at night many experiments have been tried on the London County Council cars to arrive at a satisfactory scheme of lighting, whereby the light would be sufficient to allow passengers to read and conductors to cancel tickets, and at the same time fulfil the requirements as to reduced lighting. At a meeting of the Council in December, G. H. Hume, the chairman of the Highways Committee, announced that the difficulty had now been solved. In the lower saloon of the cars the lamp shades are dipped in a violet lacquer, thereby reducing the lighting by quite 50 per cent. In the upper saloon the shades are similarly dealt with, but the lamps are so arranged as to throw the light obliquely across the car. The dash lights are covered over with yellow paper, and the whole effect is such that, with the reduced public lighting, the cars become invisible at a comparatively short distance.

The lamps used by the London County Council for car lighting are of 22 cp and it was found that this candle-power was too great for the violet lacquer. Consequently the dipping of the lamps was discontinued, and now the lamp shades only are dipped. The effect of the 22-cp lamp on the lacquer was curious. Not only did the violet shade gradually fade away, but it was replaced by a dull reddish-brown hue. Experiments proved that an 8-cp lamp had little or no effect on the lacquer, but a candle-power of greater intensity had a proportionate effect in the manner described.

A 10-In. Trolley Wheel and Light Harp

A trolley wheel with some striking characteristics has just been placed on the market by the R. D. Nuttall Company, Pittsburgh, Pa. This wheel has a diameter of 10 in., a size specially adapted for high-speed service involving single car or train operation on 600-1200 volts, direct current or on single-phase roads. The wheel is said to be especially adapted for gathering heavy currents at high speed, and has an increased life of both the wheel and bushing over other types.



A 10-IN. TROLLEY WHEEL AND HARP

The harps used with these wheels are light in weight and have contact washers which do not turn. The contact spring is riveted to the outside of the harp, as shown in the accompanying illustration.

United States Bureau of Standards Roadbed Resistance Experiments

In connection with its work on stray currents from electric railways the United States bureau of standards is preparing to make experiments upon the electrical resistance of track roadbeds. Sixteen or more sample sections of track, each 12 ft. in length, will be built, and different methods of insulating the track from the ground will be experimented with. Each sample of track will be divided into two sections and resistance measurements will be made over an extended period. It is probable that arrangements will later be made to continue the experiments on a larger scale under traffic conditions. The purpose of the experiments is to determine if it is possible to insulate tracks from the ground reasonably well so as to discourage the flow of stray currents. The experiments are under the general direction of Dr. E. B. Rosa, chief physicist of the bureau.

The Manchester, England, Tramways Committee reports that 370 of its employees have been mobilized with the territorials and reservists. An additional 330 employees have volunteered for active service. At present there are 566 families receiving half-pay allowances from the tramways department.

An All-Steel Express Car and Snow Plow

The development of electric express service on the Albany Southern Railroad recently led that company to order from the Wason Manufacturing Company, Springfield, Mass., the impressive all-steel express car illustrated. The estimated weight of this car and trucks is 37,000 lb., while its capacity is 36,000 lb. The interior of the car has been made unusually light by installing a barred clear-class window between the baggage doors in addition to using clear glass for the upper panels of the doors themselves. The general dimensions follow:

Length over the end sills	44 ft.
Length over the share plows	56 ft. 4 in.
Width of body over sheathing	8 ft.
Width over the bit	8 ft. 4 in.
Height of the share noses	5 ft.
Height from rail over the roof	12 ft. 3⅝ in.
Height from the bottom of sill over the roof	9 ft. 1⅝ in.
Radius of shortest curve on which the car will operate with noses attached	214 ft.

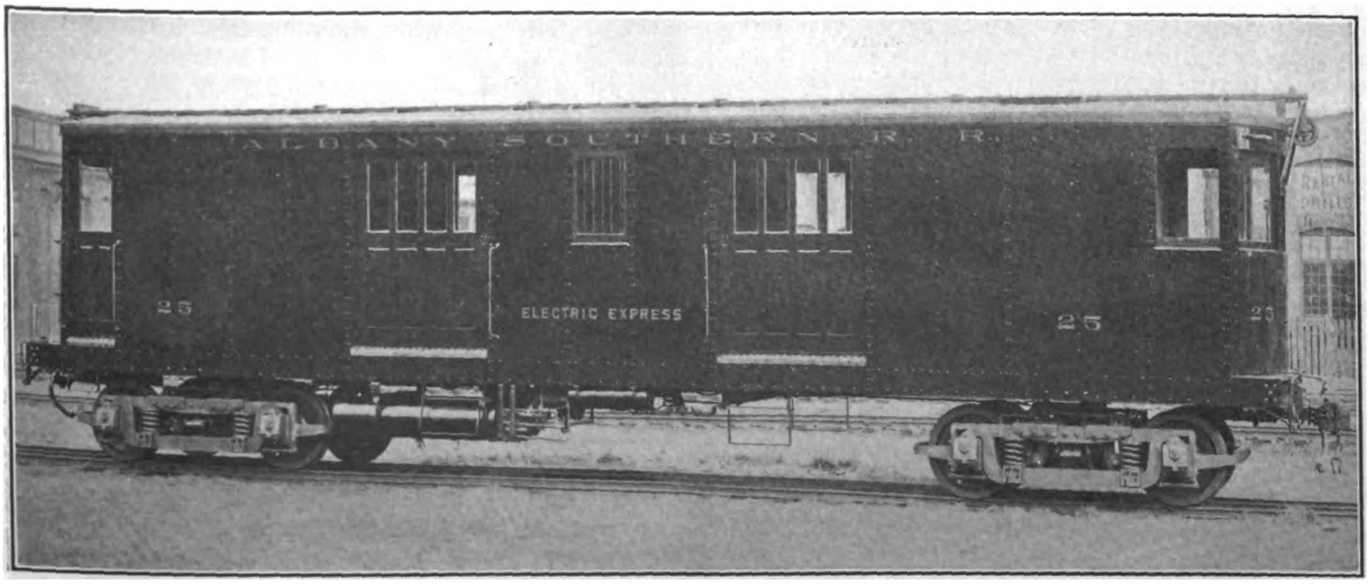
The underframe construction includes two center sills of 10-in. 35-lb. I-beams; side sills of 10-in. 25-lb. channels; two needle beams of 9-in. 21-lb. I's; crossings of 6-in. 8-lb. channels about 3 ft. center to center; end sills of 10-in. 25-lb. channels straight across the car. The bolsters are of the trussed type with 10-in. x 1-in. iron top plates and 10-in. x 1-in. steel bottom plates with cast-iron fillers between.

The side posts, end posts, rafters and side plates are of structural steel, while the outside sheathing to the eaves is of ⅛-in. steel plate. The inside lining is of yellow pine. The roof is of plain arch type with ¾-in. roof boards covered with duck. Ventilation is supplied by means of eight 6-in. Globe ventilators.

The two sliding doors on each side are 5 ft. wide; all other doors, including the sliding door in each partition at the motorman's left-hand side, are 2 ft. wide. The doors are of wood inside the car. The outside of the car is painted standard Pullman green and the inside is painted lead color. The trucks are of Brill No. 27-M.C.B.-3-X of 6-ft. 6-in. wheelbase and with 34-in. rolled-steel wheels. The operating equipment includes GE-214 motors, Westinghouse AMM air brakes and vertical hand brakes.

SNOW EQUIPMENT

The steel flanges are of the Ray V type, located one on the front of each truck. These flanges can clean ice and snow from between rails to a depth of 2½ in. below the top of the rails and outside of the rails equal to the width of the truck. The flanger is operated by air under the control of the motorman. The air-operated share noses are of structural steel and plate built for double track operation to a height of 5 ft., a length of 5 ft. 6 in. and a width of 8 ft. 4 in.

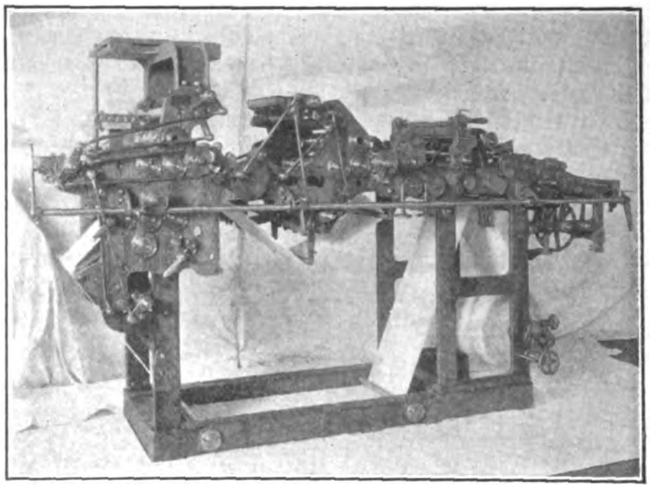


ALL-STEEL EXPRESS CAR OF ALBANY SOUTHERN RAILROAD BEFORE ADDITION OF SNOW FIGHTING EQUIPMENT

Press for Printing Transfers

The remarkable printing press shown in the accompanying halftone was built recently in duplicate for the Third Avenue Railway System, New York. One of these presses will produce 2800 transfers per minute. It is guaranteed to furnish 22,840,000 per month of twenty-six working days with due allowance made for changing the press, numbering, dating and make-ready.

This press has a speed of 200 r.p.m. The transfers are printed from a roll of paper 18 in. wide and are cut in sheets, after being printed, each containing twenty-one transfers. At this high speed and at one operation the transfers are printed in black, dated in red and numbered in red, and are perforated so that they tear easily although the perforations are hardly noticeable. At the same time the paper is trimmed so that the sheets bearing the twenty-one transfers may be easily jogged for binding.



PRESS WHICH PRINTS 2800 TRANSFERS A MINUTE

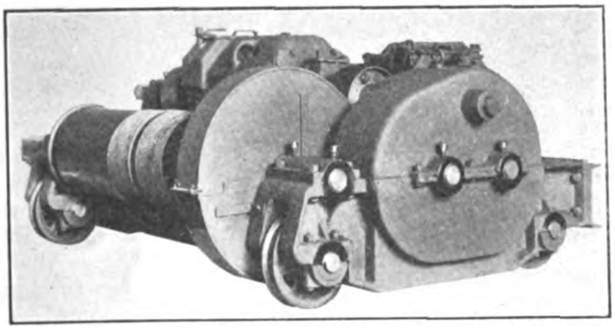
While designed primarily for producing transfers in one operation, this press will print other forms used by electric railway companies, such as order blanks, requisition blanks and other forms. Larger presses with double the capacity are also built by the Meisel

Press Manufacturing Company, Dorchester, Mass., but the smaller ones are usually preferred, because the investment is much greater for the larger presses. They require many more numbering machines, more electrotypes and more time for changing plates and resetting the numbering machines.

A Modern Crane Trolley

The Type E trolley, shown in its general form in the accompanying halftone, has been exploited by the Northern Engineering Works, Detroit, Mich., for some time, but lately several improved details have been added. Primary considerations have been safety, accessibility and rigidity. Durability of gears and other moving parts has been secured by inclosing and protecting them from dust and grit and running them in an oil bath. The construction is such that the covers of the gear cases must be in place or the gearing cannot run, thus insuring against the accidental omission of the gear covers.

Each train of back gears is rigidly mounted in a single frame. The bearings are bored in line and are capped and fitted with through bolts instead of studs, and are lined with bronze. The hoisting gear train from armature to drum gear is in one rigid casting, insuring permanent alignment. The trolley travel gearing is entirely inclosed in a single rigid cast unit gear case of the same general type as that used for the hoist gearing. No overhung gears are used. As the gear covers are castings, the joints of the inclosed gear cases are planned so as to make an absolutely tight construction, thus preventing the leakage and dripping of oil. Any gear with its shaft can be quickly lifted out, without disturbing other parts. Furthermore, very large handholes are provided in each cover, so that it is not necessary to remove the gear covers to inspect or oil the gearing. A point which is emphasized is the much longer life of gearing when running in an internally lubricated design of this kind. Another point is the almost noiseless operation. The trolley differs from others on the market inasmuch as the hoisting gear box is made an integral part of the main trolley frame, thus securing permanent alignment of all gears and their shafts. The advantage of thus making the gear case a part of the rigid trolley casting is especially emphasized as compared with the use of loose gear covers which are liable to be misplaced or bent out of shape and in many cases are not put back into place. A double brake system is used, also an effective limit stop for the hook.



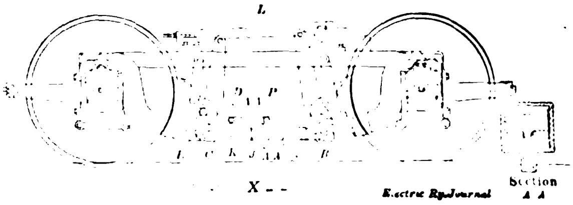
CRANE TROLLEY WITH HOISTING GEAR BOX AN INTEGRAL PART OF TROLLEY FRAME

In addition the trolley is wired in steel conduits. Steel gearing is used and interchangeability and standardization is made possible by the use of standard jigs and templets. This trolley is made in capacities from 2 tons to 125 tons.

Shim Type Slack Adjusters

Operators are beginning to realize in ever larger numbers that the automatic slack adjuster is of remarkable value not only in giving a longer, more uniform and safer wear of brakeshoes but also in multiplying the mileage between inspections. Of these devices for keeping lost motion out of the brake rigging that of the Sauvage-Ward Brake Company, New York, is of particular interest. This adjuster takes care of the wear by means of non-corroding shims which drop automatically into place one by one in the manner hereinafter described.

The accompanying drawing shows the application of a bottom rod shim adjuster to a Brill 27 M. C. B. truck. *A* is the shim box, the shims being shown by straight lines, vertically above the push rod *B*, which extends as far as the back end of the shim box at *K*. The adjusting rods *D* are bolted to the brakeshoe heads. These adjusting rods are made of two pieces, one of which is slotted. The parts are held together by a bolt and washer at *P*, which acts as a guide, and by a bolt, washer and volute spring at *E*. The tension on the volute spring is adjustable for the work. The parts shown at *C* vary in length according to the specific type of truck to which the adjuster is to be applied. The release spring is shown at *L*. The length shown as *X* is such as to allow the first two shims at *J*, which are thicker than those following, to rest on top of the push rod. This length is intended to permit sufficient room for the installation of new shoes, the shims dropping at the first application of the brake.



BOTTOM ROD SHIM ADJUSTER ON BRILL 27 M. C. B. TRUCK

The action of the shim adjuster is as follows: As the shoes wear the adjusting rod *D* is drawn out or extended when the brake is applied, and is held in this position by friction produced by the spring at *E*. When the brake is released the push rod *B* is drawn slightly out of the shim box, thus allowing shims to drop down. In this way the adjuster is lengthened and the wear taken up.

By varying the lengths of certain portions of these two adjusters, and with slight changes in form, it is possible to fit almost any kind of a truck, including brake-beam types, without varying from the principles involved in the design described.

War-Time Traffic in Vienna

In connection with the article on "Vienna Tramways and the War," contributed by Ludwig Spängler, manager of the Vienna Municipal Tramways, to the ELECTRIC RAILWAY JOURNAL of Dec. 5, it is of interest to add that a communication received from the Vienna Municipal Tramways under date of Nov. 16 states that traffic conditions are now excellent. On Nov. 1, for example, the Vienna Tramways actually made a high record both for number of passengers carried and revenue obtained, the figures being respectively 1,100,000 passengers and 220,000 crowns ($44,000). At the time (Nov. 16) the letter was written, the city showed few other signs of war than the presence of the hospital cars, already described in the article of Dec. 5.

News of Electric Railways

INSPECTION OF RAPID TRANSIT MATERIAL

$10,000,000 Worth of Steel Inspected in Year by New York Commission—Inspection Covers 201 Plants in 125 Cities and Towns in Fourteen States

Edward E. McCall, chairman of the Public Service Commission for the First District of New York, and a party of engineers and other officials of the commission were in Pittsburgh on Dec. 14 and 15 inspecting the steel plants from which the commission and the Interborough Rapid Transit Company and New York Municipal Railway Corporation are obtaining much of the structural steel, rails, etc., which go into the construction of the new subway and elevated railroads in Greater New York. The inspection party included, in addition to the chairman, Alfred Craven, chief engineer; Travis H. Whitney, secretary; LeRoy T. Harkness, assistant counsel; Robert Ridgway, engineer of subway construction, and George L. Lucas, engineer in charge of the materials inspection division. On Dec. 14 the party visited the National Tube Company's works at McKeesport, and spent the greater part of Dec. 15 at the Carrie furnaces at the Homestead plant of the Carnegie Steel Company. Taking all classes of materials which are subjected to the inspection of the commission's engineers, the work of inspection covers 201 plants and 125 cities and towns in fourteen states. A large number of these plants are located in Pennsylvania. The other states in which inspections are carried on by the commission's representatives are Connecticut, Delaware, Illinois, New Jersey, New York, Ohio, West Virginia, Michigan, Alabama, Florida, Louisiana, Mississippi and Texas. The materials inspected include in addition to steel and other metals, cement, concrete, waterproofing, lumber, paint and vitrified clay products.

From Mr. Lucas, who guided the party on its tour of inspection, it is learned on Dec. 23 that the commission is now passing upon steel being provided for subway purposes at the rate of 22,000 tons a month. The work of the materials inspection division for the last year has covered sixty general contracts and includes the steel used on the city-owned lines as well as that used by the two companies on privately owned lines of the dual system. Every piece and package is physically tested, and in the case of most materials a chemical test is also made. Accepted materials are branded or otherwise marked by the commission's inspector for identification by its engineers in the field. All materials are inspected at the place of manufacture, and no shipments are allowed without the inspector's approval. This prevents delay in construction by the rejection of material after it has been delivered.

In steel and iron alone the commission has inspected and passed during the last year about 260,000 tons of metal. For the entire dual system it is estimated that from 600,000 to 800,000 tons will be required. It is interesting to note in this connection that the total steel and iron used in the construction of the existing subway (for the tunnel portions only) was 35,000 tons. Expressed in dollars, the total of steel inspected during the last year, namely, 260,000 tons, is worth at prevailing prices, about $10,000,000.

CONNECTICUT COMMISSION REPORT

An Abstract is Presented of the Consolidated Returns of the Twenty-two Companies Reporting

Brief reference was made in the ELECTRIC RAILWAY JOURNAL of Dec. 19, page 1360, to the recommendations contained in the report of the Public Utility Commission of Connecticut presented to the Governor on Dec. 16. An abstract of the references to the electric railways contained in the report follows:

Twenty-two electric railways report to the commission, fourteen of which are operating companies and eight are non-operating. The Bridgeport & Danbury Electric Railway and the Waterbury & Milldale Tramway present reports of their operations this year for the first time. The Bridgeport & Danbury Electric Railway operates a distance of 5 miles in Bridgeport to Long Hill. Its expenditures on account of construction and equipment have been $284,435, representing a cost per mile of road owned of $56,887. The Waterbury & Milldale Tramway operates a line from Waterbury center to Byam road in Waterbury, a distance of 3.466 miles. Its expenditures on account of construction and equipment have been $208,182, which represents a cost per mile of road owned of $61,230. It has a bond issue per mile of road owned of $22,058.

The total amount invested in construction and equipment as reported by the several companies at June 30, 1914, was $90,915,918, to which should be added $14,917,955, the amount of construction and equipment expense paid on account of lines leased. During the year there has been paid on account of construction and equipment by the several companies $1,844,843, and on account of construction and equipment of property leased $1,672,738.

The total amount of capital stock of street railways issued and outstanding at June 30, 1914, was $73,055,900, of which $63,129,200 is common stock and $9,926,700 preferred stock. During the year there was an increase in preferred stock of $28,800 and in common stock $271,500.

The funded debt of all roads decreased $31,500. When the several independent electric railways in Connecticut were acquired by the New York, New Haven & Hartford Railroad and the subsequent organization of the Connecticut Company the several bond issues of the electric railways thus acquired were guaranteed and assumed by the New York, New Haven & Hartford Railroad. Although these bonds were secured by mortgage of the various electric railway properties coming into the ownership of the New York, New Haven & Hartford Railroad they have never been regarded as a liability of the subsequently organized Connecticut Company. The total amount of this bonded indebtedness of the properties now owned and controlled by the Connecticut Company is $7.428,000. During the year the New York, New Haven & Hartford Railroad has paid $850,000 of its original bonded indebtedness.

There was an increase in all of the separate branches of operating revenue except from miscellaneous sources. Freight revenue increased $50,346 and passenger revenue increased $357,270. The total operating revenue was $15,656,593, or $377,323 more than at June 30, 1913. Operating expenses increased $546,831. The total operating expenses of all roads was $10,119,004, resulting in a net operating revenue of $5,537,589. The increase in passenger revenue was practically absorbed by the increase in maintenance charges of $350,907.

On June 30, 1913, the net corporate income of all companies was $157,032. At the close of the year ending June 30, 1914, the net corporate income was $368,092, an increase for the year of $211,060.

The amount paid for taxes, federal, state and municipal, shows an increase for the year of $128,193. The amount paid for interest on funded debt and other indebtedness increased $119,149.

Two operating companies paid dividends and four non-operating companies, the total amount paid being $2,248,304, the average per cent being 4.82. Of the two operating companies paying dividends, the Bristol & Plainville Tramway disbursed $37,500 in dividends and the Connecticut Company $1,500,000. There was an actual decrease in dividends, from the amount paid a year ago, of $573,158.

On June 30, 1914, the surplus of all companies was $1.512,849, an increase of $269,158. If the increase of $346,831 in the surplus of the Rhode Island Company included in these figures be eliminated there was a total decrease in surplus of $77,673 for companies whose operations are for the most part in Connecticut.

The total number of fare passengers carried during the year reported by all roads with the exception of those reported by the Rhode Island Company, with only 1.98 miles of line in Connecticut, was 194,705,102. In addition to this number there were 34,502,789 transfer passengers, making a total of 229,207,891 fare passengers.

The total average fare revenue from each passenger on lines charging a 5-cent fare, not including transfer passengers, was $0.04668. Including such transfer passengers it was $0.04338.

The total mileage operated by the several companies on June 30, 1914, was 1,505.87. The mileage operated in the state of Connecticut was 1,069.68. On June 30, 1914, there had been laid by the several reporting companies in connection with their trackage 799.46 miles of various kinds of roadway construction. Of this total mileage, 73.225 miles was laid and constructed during the year under consideration, and of this total mileage, 60.199 miles was in the state of Connecticut. There are 1,050.41 miles of all kinds of steel rails laid in Connecticut, of which 42,423 were laid during the past year. The entire equipment of all reporting companies consists of 3075 cars with electric equipment and 455 without electric equipment, making a total of 3530 cars of all kinds. Of this total equipment, 2893 are cars used in passenger service.

LONDON MEN ON FIRING LINE

More Than 5000 Men at Front—Bus Drivers in Dangerous Commissariat Service

What the greatest of wars means to one of the big Continental tramway systems was graphically described in Ludwig Spängler's article in the Dec. 5 issue of this paper on "The Vienna Tramways and the War." The following particulars on the London Electric Railway, which operates the greater part of London's train, omnibus and tram (T. O. T.) service, shows how the same problem is dealt with by the biggest British system.

Immediately following the outbreak of hostilities the Admiralty and War Office commandeered, to use a Boer term, a large number of the company's buses. These buses have since become familiar objects in northern France and Belgium, but the story goes that when the natives saw the first ones in all their billboard glory they gave loud cheers for the beverage "Bovril" under the impression that this was the name of a great English general.

Of the company's employees more than 5000 of all ranks are now in the war service. Many of the bus drivers are in the transport service, continually risking their lives in driving right up to the firing line to supply food and ammunition. Their journey from the base is constantly subject to surprise attacks by the enemy who tries to destroy the lines of communication, but the boys have no "speed restrictions" or a "bobby's" orders to turn to the left, so that they rarely fail to get there.

The British government and the London County Council make the regular allowances to all dependents of the railway men at the front, but the London Electric Railway adds certain grants made up equally by the subscriptions of the remaining employees and the company. Under these conditions, the total weekly allotments range from 20 shillings for a wife without children to 36 shillings for a wife with eight children.

T. O. T. Fortnightly News, published for the employees of the company, contains several letters in each issue from the boys at the front. It is a tribute to the flexibility of human nature that in a few weeks these men have been transformed from peaceful drivers, motormen, conductors and gatemen to beings who are as callous to shot and shell as the most hardened veterans. A few extracts will show the spirit which animates the British volunteer.

"My regiment has caught it pretty hot," writes Conductor H. W. Wicks, of the Queen's Own Hussars. "Since we have been here we have lost eleven officers and about fifty men, killed and wounded. The German artillery are, I must admit, simply grand; and without it they would have been beaten by now, but I think the Allies have the whip hand of them. It is much safer down Ringstead Road with a broken brake chain than under fire from German artillery. I shall be very glad to get back to dear old Sutton now that the first excitement has worn off. We have had two days' rest, after being twenty-one days on the firing line, and we go in again for another spasm."

Another conductor, W. E. Brown, who has gone to the Nineteenth Hussars, says: "I am writing this on the butt end of my rifle in a hayloft, while I am seeking shelter from the terrible fusilade of shells; at the same time I am out of the snow. It's awfully cold here, especially when we can't get a rub with the Germans. It's much better to take fares than lives."

The traditional stolidity of the Briton is reflected in a remark by Driver Seymour of the 126th Battery, Twenty-ninth Brigade:

"We have seen plenty of action at Mons and the Aisne. . . . If the Germans don't stop messing us about there will be a war soon."

All of the letters breathe a spirit of utmost cheerfulness, and many express gratitude to Sir Albert H. Stanley and his staff for the care they are giving to the families of those at the front.

DES MOINES FRANCHISE MATTER

Franchise Issue to Be Determined at Election to Be Held on Jan. 16

The State Supreme Court of Iowa rendered a speedy decision in the Des Moines (Ia.) City Railway's franchise case and as a result the citizens of the city will vote on the proposed new franchise on Jan. 16, according to Mayor James R. Hanna, who says he will issue a proclamation for an election on that date. The Supreme Court issued its ruling the day after the oral arguments had been entered in the case. The procedure was merely for the determination of the legal method of conducting franchise elections and was necessary because of apparently conflicting provisions in the Iowa law. The court rules that the election must be held under a section which provides that the City Council may offer amendments at the same election.

Eleven amendments already have been drawn up by Mayor Hanna and they will be submitted to the people when the new franchise is voted upon. The franchise is practically the same as that drawn up by Mayor Hanna several months ago when the City Council and the company were negotiating for a franchise. After it was found that no agreement could be reached the company elected to carry the question to the people. More than half of the voters of the city signed the petition for the election.

Under the Supreme Court ruling the franchise must receive the approval of the City Council as well as that of the people. The question of capitalization is the only issue at stake between Mayor Hanna and the City Council. The capitalization clause is the only one in the Mayor's proposed franchise that is not included in the ordinance submitted by the railway. Mayor Hanna will seek to have this point covered in his amendments.

BAY STATE ARBITRATION HEARINGS BEGUN

Arbitration hearings upon the Bay State Street Railway wages and labor conditions were begun at Faneuil Hall, Boston, Mass., on Dec. 17, before a board consisting of District Attorney Joseph C. Pelletier of Suffolk County, chairman; Henry E. Reynolds, for the company, and James H. Vahey, representing sixteen local branches of the Amalgamated Association of Street & Electric Railway Employees of America. James M. Swift registered as counsel for the company and Joseph B. Eastman and Fred Fay appeared on behalf of the union.

The subject matters before the board are: 1, Determine what scale of wages shall be paid by the company to the members of the association; 2, The amount of extra compensation for regular men for outside time beyond twelve hours; 3, The amount of extra compensation for extra men for outside time beyond fourteen hours; 4, Minimum number of hours to be guaranteed extra men for a day's work; 5, The time allowance for a.m. extras and crews required to report in the morning to cover the list. The arbitration grows out of a series of conferences between officials of the company and of the union extending from Sept. 23, 1914, to Nov. 4, 1914. These conferences were made necessary by the expiration on Oct. 1, 1914, of a joint agreement governing wages and other working conditions, and were held to fix the terms of a new agreement. The stenographic record taken during the conferences has been listed as an exhibit in the arbitration proceedings. The company is the second largest in the world in point of track mileages and operates in ninety-one cities and towns in eastern New England. The union membership totals 3876, including many occupations immediately outside as well as the car service. The company operates 951.3 miles of track.

At the opening hearing Robert S. Goff, vice-president and general manager of the company, described the physical characteristics of the system and the methods of employing men now in vogue. Extra men have no guaranteed wage. The equipment of the road has not changed materially in the past six years, and the company's requirements bearing upon employment are not as severe as on many large city systems. There are 6600 men in the service. First-year men are paid 24 cents an hour, increasing in subsequent years to a maximum of 28 cents. The work of extra men was discussed at length. Mr. Goff said that he did not consider the work of a motorman or conductor as skilled labor, and looked with disfavor upon the Munsterberg methods of determining the qualifications of motormen by psychological laboratory tests. He believed the graduated scale to be an incentive to proficiency and extended duration of service. Many men leave the service each year because a great deal of the work on the system reaches its maximum in the summer. The system as it exists includes about 120 miles of track inherited from its predecessors which should never have been built. The hearing will be resumed on Dec. 28.

THE DETROIT APPRAISALS

Professor Bemis Fixes Physical Value at $16,500,000, Exclusive of Paving Charges and Franchise Values

A physical valuation of $16,500,000, excluding paving charges of $950,000 and franchise values, on the properties of the Detroit (Mich.) United Railway within the one-fare zone was submitted by Prof. E. W. Bemis in his report to the Detroit Street Railway Commission, which engaged him to make an appraisal. Nothing has been made public to indicate what the values of the franchises will be in Professor Bemis' opinion, but it is expected that the total for tangible and intangible values in the Bemis appraisal will not exceed $20,000,000. The company's inventory based upon the reproduction cost basis less depreciation was approximately $32,000,000. No details were given out, the Street Railway Commission contenting itself with the issuance of a statement in which it explained that the appraisal was submitted to the public "without any comments or opinions, subject to analysis and investigation by the board of commissioners."

F. W. Brooks, general manager of the company, issued a statement in which he said the company waited hopefully the outcome of the commission's investigation. He pointed out that in the appraisal of the Cleveland property the physical valuation was several millions lower than the actual value finally placed on the railway, and he intimated that a fair consideration of the subject by the commission would result in a considerable increase over the Bemis appraisal.

Inasmuch as Dean Cooley of the University of Michigan is directing an appraisal of all the properties of the Detroit United Lines for the State Railroad Commission, it is not regarded as probable that anything will be done by the railway or the Street Railway Commission until the Cooley valuation is announced. The Cooley appraisal of the lines within the one-fare zone is not likely to be announced before the latter part of next month.

The Bemis appraisal, in addition to omitting franchise values and paving charges, did not include the new Junction Avenue line, recently built, which has a physical value of $225,000. Professor Bemis included in his total the sum of $950,000 for paving charges, but this item was eliminated by the commission.

WESTINGHOUSE SICK AND ACCIDENT PAYMENT PLAN AND SERVICE PENSIONS ANNOUNCED

The Westinghouse Electric & Manufacturing Company has just issued a preliminary statement of its sickness and accident relief, accident compensation and service pensions, on which its officers have been working for more than a year. The plan includes three separate and distinct features: 1. Extension of the present relief department. 2. An accident and compensation plan. 3. Service pensions. The privileges of the relief department are open to every employee. The company pays the entire expense connected with the operation and maintenance of this department, the dues being reserved wholly for the payment of benefits for sickness and accident arising from causes other than employment. In the event of death the amount paid from the dues will be duplicated by the company, which will also meet any deficit that may arise. Benefits will continue as long as disability lasts, or until the age of seventy years is reached, when pensions will then be granted.

An accident compensation fund is maintained entirely by the company for the benefit of all employees. This plan covers the payment for disability due to accident, or for death resulting from accident, while at work as an employee, and makes provision for both total and partial disability.

Employees of the company are to be retired at the age of seventy years, and those who at the time of such retirement are members of the relief department and have completed at least twenty years of continuous service, are to be granted a pension amounting to 1 per cent of the average monthly wages during the last ten years of employment for every year of continuous service, with a minimum of $20 a month and a maximum of $100 a month. Upon the death of the pensioner, one-half of the pension will be paid to the widow until remarriage, providing marriage occurs at least ten years before the granting of the pension. For the support of each child under sixteen years of age, and for each wholly dependent grandchild under sixteen years of age, one-fourth of the pension will be paid until they reach the age of sixteen years. The president may, at his discretion, retire any employee between the ages of sixty and seventy years who has been in the service the required time, and he may increase any pension for specially meritorious service, by 25 per cent, but not beyond the maximum pension of $100 a month.

CONTRACT FOR SPEED CONTROL AUTOMATIC SIGNAL SYSTEM

The Public Service Commission for the First District of New York has approved the award of the contract by the New York Municipal Railway Corporation to the General Railway Signal Company for the equipment of the dual system lines to be operated by the New York Municipal Company with a speed control automatic signal system to inclube cab signals. This is a new system of automatic train control by which the signals are shown in the motorman's cab, and if the train fails to slow down at an appropriate signal a device in the track engages corresponding machinery in the cars, reducing the speed, independent of the motorman's actions, to an arbitrarily determined point, but allowing the train to continue at the reduced speed. Thus, the time lost by the complete stoppage of a train under the ordinary block signal system is saved. The commission's engineers reported that the new system, if developed as outlined, will be a very great advance over any system of signaling heretofore used. The total bid of the General Railway Signal Company for equipping all the subway and elevated lines to be operated by the New York Municipal Corporation is stated to be about $1,413,000.

BEFORE THE CLEVELAND COUNCIL

At the suggestion of Peter Witt, street railway commissioner, the City Council of Cleveland, Ohio, on the evening of Dec. 21 refused the request of a large number of residents of South Brooklyn to restore the old schedule on West Fourteenth Street. The cars now stop at the Holmden carhouse.

The Townes ordinance, to require interurban cars to stop at regular car stops to take on and discharge passengers, was defeated at this meeting.

Councilman Rolfe introduced legislation to make 5 cents the maximum fare between Nottingham Road and the Public Square. The present fare is 8 cents.

The Cleveland Railway has requested permission to use $35,000 for the construction of special tracks at Miles Avenue and East Ninety-third Street.

Mr. Witt has informed the Council that he will oppose the Dittrick ordinance, the object of which is to render payment of fare uniform on all cars. The measure would require that all cars leaving the Public Square be operated on the pay-as-you-leave plan and all cars going toward the square on the pay-as-you-enter plan.

Appraisal of London Street Railway.—Mayor C. M. R. Graham, of London, Ont., has asked Chief Engineer Gaby, of the Hydro-Electric Power Commission of Ontario, to appraise the London Street Railway.

Short Term Franchise Refused.—Because the term of the franchise recently granted the East Linden Railway by the City Council of Columbus was for only twelve years, it was refused. Request was made for a twenty-five-year grant.

Safety Exposition Prizes Awarded.—At the second annual exposition of safety and sanitation under the auspices of the American Museum of Safety held at the Grand Central Palace, New York, N. Y., during the week ended Dec. 19 grand prizes were awarded to the Brooklyn (N. Y.) Rapid Transit Company and to the New York Edison Company in connection with the exhibits made by these companies at the exposition as referred to in the ELECTRIC RAILWAY JOURNAL of Dec. 19.

Utilities Commission Proposed for Texas.—State Senator A. C. Robbins, Athens, Tex., has drafted a bill for presentation at the coming session of the Legislature in that State for the creation of a commission to be composed of three members which shall have authority to fix the rates of street railways, interurban railways, telephone and telegraph companies, water, light and gas plants, and all oil pipe lines which are common carriers and to have jurisdiction over them in other respects.

Not Under Federal Employers' Liability Act.—District Judge Camp, at Duluth, Minn., in an oral opinion delivered recently held that although the Duluth-Superior Traction Company operates an electric railway from Duluth, Minn., to Superior, Wis., it is not engaged in interstate commerce as contemplated by the federal employers' liability act. Emil Keto, who sought to recover under that act, will be obliged under the decision to accept the amount allowed him under the provisions of the Wisconsin workmen's compensation act.

Mr McMeen on Public Relations.—Samuel G. McMeen, president of the Columbus Railway, Power & Light Company and president of the Ohio State Telephone Company, Columbus, Ohio, addressed the members of the Cleveland Advertising Club at their weekly noon luncheon on Dec. 16. Mr. McMeen said that there was no distinct line of demarcation between public utilities and private business. There was no difference between selling to the few and selling to the many. Public service corporations were not the bogies they have been pictured. Utility men were as anxious as other business men to please the people. The idea that public utilities corporations endeavored to do business only in the dark was a mistake.

The New Jersey Gas Case.—Upon application of counsel representing the cities of Paterson and Passaic, the Court of Errors and Appeals of New Jersey on Dec. 21 decided to retain the record in the 90-cent gas rate case pending a formal move for a rehearing instead of sending the record down to the Supreme Court. Counsel was given until Jan. 7 to file the petition for the rehearing, and Jan. 14 was fixed as the date when the court will hear the arguments on the application. Reference was made in the ELECTRIC RAILWAY JOURNAL of Dec. 12 to the decision rendered on Dec. 9 by the Court of Errors and Appeals of New Jersey, upsetting the order of the Board of Public Utilities Commissioners requiring the Public Service Gas Company to establish a 90-cent rate for gas in the Passaic district. The interest of this decision to electric railways lies in the fact that this rate was placed on a valuation in which the commission made an allowance for "going concern" value, but made no special allowance for the value of franchises.

Detailed Data Desired Regarding Rolling Stock and Equipment Design.—The American Electric Railway Manufacturers' Association sent out under date of Dec. 18 a translation of a letter from Engineer S. F. Narushevitch, in charge of the purchasing department of the Moscow (Russia) City Railways, received through Consul-General John H. Snodgrass at Moscow. Mr. Narushevitch says that he is particularly interested in rolling stock and equipment, and therefore desires detailed data on this subject. He was induced to take recourse to this unusual method of procedure to receive information in which he is interested in anticipation of the closer relations between the technical circles of Russia and America likely to follow after the war. Mr. Snodgrass expresses the opinion that should the Moscow Metropolitan Railway be built after the war American manufacturers will stand a chance of securing some valuable orders. He thinks that American firms should get the contract for building the subway, which, it is estimated, will cost about $40,000,000. Correspondence is preferred in Russian, but may be sent in either French or English.

Hearing on Motor-Bus Applications in New York.—Applications for motor omnibus franchises covering 184 miles of new routes were received on Dec. 18 by the franchise committee of the Board of Estimate of New York City. The Fifth Avenue Coach Company, operating the existing lines, and the three contesting corporations which seek to establish new lines were represented at the hearing. The Fifth Avenue Coach Company applied for nine new routes, covering 7½ miles, as extensions to existing lines; the New York Motor Bus Company asked for twenty-one routes, with a total of 49 miles. The Manhattan Motor-Bus Company asked for three routes, covering 17½ miles, and the People's Five-Cent Bus Corporation applied for twenty routes with 70 miles. The franchise committee had before it the report of the franchise bureau of the Board of Estimate, which eliminated all motor-bus routes south of Fourteenth Street and laid out new lines in Madison and Park Avenues, crosstown lines in Seventy-ninth Street through Central Park, in Ninety-sixth Street and 125th Street, with other connecting spurs. Another hearing will be held on Dec. 29.

Resolution to Sell Seattle Municipal Line Killed.—The city utilities committee of the Council of Seattle, Wash., at a recent meeting voted with only one "no" to kill the resolution of Mr. Dale proposing a conference of Mayor Gill, the members of the Council, representatives of the civic and labor organizations of the city and the officers of the Puget Sound Traction, Light & Power Company, with a view to negotiating for the sale of the municipal railways, the extension of privately owned lines and the purchase of the Seattle, Renton & Southern Railway by the Puget Sound Traction, Light & Power Company. Councilman Dale has, however, reintroduced his resolution, modified in several particulars. He now proposes among other things that a plan be submitted to the voters in March to purchase the Seattle, Renton & Southern Railway at once or abandon all negotiations; that the existing municipal lines, known as Division "A" and Division "C," be offered for sale to the Puget Sound Traction, Light & Power Company, provided the company will also purchase the Seattle, Renton & Southern Railway and make needed improvements in the Rainier Valley; that the practicability of operating motor buses to connect Division "A" and "C" be thoroughly investigated; that the reasons for not proceeding to get common user rights for municipal cars on Fourth Avenue be looked into; that it be determined whether there is any merit in an ordinance authorizing the sale of utility bonds to connect the Lake Burien line, Division "C" with Division "A," without submitting such bond issue to the people.

PROGRAM OF ASSOCIATION MEETING

Second National Foreign Trade Convention

The Second National Trade Convention will be held at St. Louis, Mo., on Jan. 21 and 22, 1915. Three thousand commercial and industrial organizations, corporations, firms and individuals engaged in foreign trade have been invited to send delegates. W. C. Redfield, Secretary of Commerce, will open the convention. John Basset Moore, formerly counselor of the State Department, who is the foremost American authority on international law, will speak on "Problems Arising in War and Commerce." The sessions will be divided between authoritative papers by leaders in the business world and constructive discussions by delegates representing all sections of the country. Ways and means whereby the smaller manufacturer and merchant may engage in foreign trade will have an important place on the program. R. H. Catchin, 64 Stone Street, New York, N. Y., is secretary of the National Foreign Trade Council.

Financial and Corporate

IMPROVED CONDITIONS EXPECTED

The two important events this week in the world of finance and business were the granting of a horizontal 5 per cent rate increase to Eastern railroads and the temporary if not permanent postponement of a complete wage reduction by the United States Steel Corporation. The rate decision, whose importance is emphasized in other columns of this issue, was undoubtedly a factor in the action of the corporation, but the connection is interesting. Railroad purchases have been at a minimum for months, and the rigid purchasing policy of the carriers, combined with the general business depression, was a matter of such serious importance to the steel employers that decreases in the wage scale seemed inevitable. Now, however, a change for the better is expected, so that the corporation is making only minor wage adjustments affecting less than 10 per cent of the men on the payroll.

While an immediate influx of orders from railroads is not looked for, it is believed that the increased orders during the first few months of 1915 will substantially improve the earnings of the manufacturers. Decisions such as reached by the United States Steel Corporation can be based only on real optimism, and indicate what is generally believed will result from the favorable rate decision. It is likely that corporations which have been waiting to follow the lead of the United States Steel Corporation on a downward revision will also be led to look upon the future with brighter eyes and thus help to establish a better tone among the manufacturers and in the general business world.

REPORT FROM ADELAIDE TRAMWAYS

The Adelaide (Australia) Municipal Tramways Trust for the two years from Aug. 1, 1912, to July 31, 1914, showed for the first year total receipts of £310,240; total expenses, £207,319, and a net balance of £102,324. For the second year the figures were: total receipts, £328,810; total expenses, £202,503, and net balance £125,365. The number of passengers carried during the second year was 43,797,227. The receipts averaged 14.63d per mile and the average fare per passenger was 1.78d. The total amount spent on construction work during the two years was £1,359,013, and £36,878 was added to the reserve for renewals, this sum being 2½ per cent of the capital cost of the renewable parts of the lines, plus interest. An agreement has been reached for the purchase of the existing horse tramways in Port Adelaide and its vicinity. Plans for the construction of a system of electric tramways in this section are in preparation and a large amount of materials for construction has been delivered.

ANNUAL REPORTS

Southern Pacific Company

The annual report of the Southern Pacific Company, San Francisco, Cal., for the year ended June 30, 1914, states that the revenues from transportation-rail lines during the year amounted to $126,614,537, an increase of 2.87 per cent, while revenues from outside operations totaled $11,905,721, an increase of 4.15 per cent. Operating expenses-rail lines amounted to $82,800,067, an increase of only 0.81 per cent, but the expenses of outside operations were $10,862,200, an increase of 1.19 per cent, and taxes on rail lines and properties dealt with as outside operations were $7,162,625, an increase of 25.72 per cent. The net operating income was $37,695,367, a decrease of 14.73 per cent. The total fixed charges increased to $31,346,841, or 5.58 per cent, and the surplus decreased to $20,452,216 or 23.88 per cent.

It is stated that the large decrease in passenger earnings is attributable to deferred travel in anticipation of the exposition, the curtailment of travel through enforced economy and the increased competition of interurban electric lines and motor vehicles. Moreover, reduced rates compelled by the influence of federal and State commissions which were in effect during the last fiscal year and not during the previous year resulted in a shrinkage of at least $500,000 in gross revenues. It is conservatively estimated that cumulative reductions of this character during the four years ended June 30, 1914, decreased the gross revenues to the extent of at least $4,000,000.

Along this same line the report adds that while the company has cheerfully made such expenditures as were required by federal or state commissions or by legislation, many unreasonable laws have been enacted, which serve no public good and which add unnecessarily to the cost of operation. There is, moreover, a continuous agitation for the passage of more laws to further burden the railways regardless of necessity or reason. During the last fiscal year the cost of complying with such legislation and with the unreasonable requirements of commissions added $1,099,405 to the operating expenses of the company, viz.: Cost of inspectors required by the safety appliance act and the boiler inspection act, $326,589; increased cost incident to full train crew laws, hours of service laws and the law requiring self-cleaning ashpans for locomotives, $286,580; cost of complying with laws requiring substitution of electric for acetylene headlights, $4,121; cost of unnecessary train service required by railroad commissions, $18,872; cost of physical valuation of property required by state commissions, $37,609, and cost of compiling statistics, printing tariffs and other similar requirements of federal and state commissions, $425,634, or a total of $1,099,405. In addition to the above, the company lost approximately $275,000 during the year through failure to obtain approval of the Arizona Rail-

	Total	Pacific Electric Railway	Fresno Traction Company and Fresno City Railway Combined	Stockton Electric Railroad	Visalia Electric Railroad	San Jose Railroads	Peninsular Railway	Portland, Eugene & Eastern Railway
Receipts:								
Gross operating income	$10,947,777	$9,467,483	$240,972	$209,652	$98,162	$358,711	$294,172	$278,623
Other income	115,830	*64,202	......	298	3	8,165	37,480	5,683
Total receipts	$11,063,607	$9,531,685	$240,972	$209,950	$98,165	$366,876	$331,652	$284,306
Disbursements:								
Operating expenses	$7,817,744	$6,623,535	$164,297	$128,060	$88,942	$247,933	$271,423	$293,552
Taxes	561,902	447,037	11,872	10,698	4,232	18,081	16,108	23,873
Hire of equipment	21,967	......	......	......	......	......	......	21,967
Interest on funded debt	2,733,999	2,523,265	43,685	......	......	142,050	25,000	......
Interest on open accounts	811,921	282,187	24,694	18,990	83,404	8,356	207,645	186,646
Sinking fund contributions	169,699	142,881	12,500	......	......	14,318	......	......
Other charges	34,179	24,772	1,094	......	......	3	7,716	594
Discount on bonds sold	73,658	68,109	3,035	......	......	2,513	......	......
Total disbursements	$12,225,069	$10,141,786	$261,177	$157,748	$176,578	$433,254	$527,892	$526,632
Surplus	......	......	......	$52,202	......	......	......	......
Deficit	$1,161,462	$610,101	$20,205	......	$78,413	$66,378	$196,240	$242,326
Total single track mileage	1,385.21	1,005.77	44.25	16.74	46.51	41.93	100.94	†129.07
Tons of commercial freight carried	1,990,008	1,901,729	......	......	......	......	......	88,279
Revenue passengers carried	93,316,174	70,711,744	4,668,839	4,199,844	158,581	6,927,116	2,809,996	3,840,054
Electric locomotives owned	53	49	1	......	1	......	1	1
Electric motor cars owned	859	681	28	23	6	56	33	32
Trailer cars owned	38	13	2	......	2	3	2	16

*Does not include interest amounting to $312,46, accrued during the year on advances to the Pacific Electric Land Company.
†Includes 73.02 miles of steam lines.

road Commission for an issue of $30,000,000, par value, of two-year 5 per cent secured gold notes. Although the California Railroad Commission authorized the notes, the Arizona commission held the matter up pending certain unwarranted guarantees until the market changed and one-year notes had to be sold later at a lower price.

Additions and betterments to electric light and power plants of the company during the year cost $2,346. Maintenance of electric power transmission totaled $46,306, a decrease of 15.43 per cent. Electric locomotive repairs were only $77, while repairs of electrical equipment cost $39,790, an increase of 30.28 per cent. The accompanying table shows the total mileage, passenger carriage, equipment and a condensed statement of receipts and disbursements for the various proprietary electric railways of the Southern Pacific Company.

Middle West Utilities Company

The total earnings and expenses of the Middle West Utilities Company, Chicago, Ill., for the year ended April 30, 1914, follows:

Receipts:	
Total income (including securities valued by board of directors at $362,348)	$1,466,760
Expenditures:	
Administration expense	$141,263
Miscellaneous charges including taxes, depreciation of office furniture, etc.	16,699
Depreciation and losses on investments	7,096
Total	$165,058
Gross income	$1,301,702
Interest on three-year 6 per cent gold notes	$146,829
Other interest	80,687
Total	$227,516
Balance	$1,074,186
Appropriated toward writing off discount and expenses	75,000
Available for dividends	$999,186
Dividends on preferred stock paid and accrued	566,925
Balance carried to surplus	$432,261
Middle West Utilities Company's proportion of the aggregate surplus of subsidiary companies	147,416
Combined surplus earnings accruing to company	$579,677

The company is pursuing its policy of keeping the junior securities of its subsidiaries as far as possible in its own treasury. The $3,500,000 of three-year 6-per cent collateral gold notes issued June 1, 1913, and secured by the deposit with a trustee of $4,667,000 par value of subsidiary mortgage bonds, were all sold during the present fiscal year and the proceeds used for corporate purposes.

The combined earnings of subsidiary properties during the company's fiscal year, were as follows:

Gross earnings	$7,345,350
Operating expenses, including taxes	5,036,696
Net earnings from operation	$2,308,654
Fixed charges to outside holders	$908,032
Interest on junior securities, dividends on stock and proportion of undistributed earnings due outside holders	474,817
Total	$1,382,849
Earnings accruing to securities owned by Middle West Utilities Company	$925,805

Of the above-stated earnings, $336,127 has come into the company's treasury as interest on bonds and debentures, and $442,261 as dividends on stocks owned, leaving a balance of $147,416 as the company's proportion of the surplus carried in the aggregate surplus accounts of the subsidiary companies on their own books.

Chicago (Ill.) City Railway.—A quarterly dividend of 1½ per cent has been declared on the $18,000,000 of stock of the Chicago City Railway, payable on Dec. 30 to holders of record on Dec. 26. This compares with a regular rate of 2½ per cent quarterly from March, 1910, to September, 1914, extra payments in various amounts also having been made. The reduction in the dividend is due, according to the management, to a falling off of traffic which aggregates about 1 per cent on all the surface lines of the city for the year, but during the last month the decrease has been between 3 per cent and 4 per cent.

Chicago City & Connecting Railways, Chicago, Ill.—The Chicago City & Connecting Railways has declared a semi-annual dividend of $1.25 per share on the preferred participation shares, payable on Jan. 1 to stock of record of Dec. 26. The company has been paying semi-annual dividends of $2.25 per share for some time. The last dividend at this rate was paid July 1.

East St. Louis & Suburban Company, East St. Louis, Ill.—Smith, Moore & Company, St. Louis, Mo., are offering at par and interest $450,000 of one-year 6 per cent collateral gold notes of the East St. Louis & Suburban Company dated Dec. 15, 1914, and due Dec. 15, 1915, but callable on thirty days' notice at par and interest. The St. Louis Union Trust Company is trustee of the issue. The proceeds will be used to reimburse the company for advances made to the East St. Louis Light & Power Company in connection with the construction of a large power house on the Mississippi River just above Alton, Ill., and a high tension transmission line from that point to East St. Louis. The notes are secured by pledge of $600,000 of East St. Louis Light & Power Company first mortgage 5 per cent gold bonds.

Fresno (Cal.) Interurban Railway.—The Railroad Commission of California has authorized the Fresno Interurban Railway to issue 100 shares of its capital stock of the par value of $100 a share at a price not less than 80. These shares are to be issued in lieu of 100 shares of the company's stock purported to have been issued for the purpose of incorporation at the price of $10 per share. This latter price is to be considered as part payment upon the new issue just authorized by the commission. The proceeds from the sale of this stock are to be used by the company to purchase equipment in the sum of $4,700 and to pay engineering, administration, legal and other contingent fees. The commission has also authorized the Fresno Interurban Railway to issue 2125 shares of common stock of the par value of $100 a share, $350,000 of its first mortgage 6 per cent twenty-six-year bonds and $350,000 of its 6 per cent cumulative preferred stock.

Humbolt Transit Company, Eureka, Cal.—Control of the Humbolt Transit Company, which operates 13 miles of street railway in Eureka, is reported to have been acquired by new owners acting in the interests of the Southern Pacific Company or the Northwestern Pacific Railroad. The Humbolt Transit Company has first mortgage 5 per cent bonds outstanding to the amount of $193,000 and an outstanding stock issue of $500,000.

International Traction Company, Buffalo, N. Y.—A hearing was held at Albany on Dec. 19 before the Public Service Commission of the Second District of New York on the application of the International Railway for authority to issue $3,000,000 of 5 per cent bonds under an existing mortgage to provide funds for the construction of a new line between Buffalo and Niagara Falls. Representatives of both the New York Central & Hudson River Railroad and of the Erie Railroad appeared before the commission at the hearing and reserved the right to object to the plan of the International Railway for the construction of the line should they so desire. The hearing has been adjourned until Jan. 5. The construction of the proposed line between Buffalo and Niagara Falls by the International Railway to supplement its existing line which connects the cities has been the subject of a number of previous items in the ELECTRIC RAILWAY JOURNAL.

Kansas City Railway & Light Company, Kansas City, Mo.—The Kansas City *Times* says that large holders of stock of the Kansas City Railway & Light Company residing in Kansas City have been approached in regard to their willingness to meet an assessment of $16 a share on the stock to provide cash for refinancing the company, second mortgage bonds to be given for the money thus contributed. It is estimated that in this way about $3,500,000 could be raised to pay floating debt and effect an exchange of new long-time bonds for existing bonds which are overdue. Fifty thousand dollars of first mortgage 5 per cent sinking fund gold bonds of the Corrigan Consolidated Street Railway, dated July 1, 1886, have been called for payment at $1,100 per bond on Jan. 1, 1915. The principal will be paid at the office of the Central Trust Company, New York, N. Y., trustee.

Kansas City, Kaw Valley & Western Railway, Bonner Springs, Kan.—The Kansas City, Kaw Valley & Western Railway has filed an application with the Kansas Public Utilities Commission for permission to issue $3,312,000 of first and second mortgage bonds. The company also asked permission to reduce its capital stock from $1,500,000 to $1,137,000. The new money which the company is asking permission of the commission to raise by a bond issue is to be used on the second section of the company's Kansas City-Topeka line. This second section is 24 miles from Bonner Springs to Lawrence, connecting with the line already operating to Bonner Springs.

Lake Shore Electric Railway, Cleveland, Ohio.—The Lake Shore Electric Railway has been authorized by the Public Utilities Commission of Ohio to issue and sell its general mortgage 5 per cent gold bonds of the total principal sum of $81,000 for the highest price obtainable, but for not less than 85. In the event of the inability of the company to sell the bonds for 85 or better, it may pledge the same as security for a loan for the largest amount negotiable but for not less than 60 per cent of the par value of the bonds. It is stipulated that the money secured shall be used by the company to reimburse its income account for expenditures for the construction of additions and improvements in the period from Jan. 1, 1914, to Sept. 13, 1914.

Louisville (Ky.) Railway.—James B. Brown, vice-president of the National Bank of Commerce, Louisville, has been elected a director of the Louisville Railway, succeeding Samuel Casseday, deceased.

New York, New Haven & Hartford Railroad, New Haven, Conn.—The Boston *News Bureau* in its issue of Dec. 23 said: "One factor in the New Haven situation which has made some of the inside interests feel decidedly encouraged during the last few weeks has been the decision by Chairman Elliott that the Connecticut Company stock will easily liquidate at a price better than its book value. The New Haven treasury indirectly holds $40,000,000 stock of the Connecticut Company, which is carried at par. This stock forms the largest asset of the New England Navigation Company, which in turn is owned by the New Haven Railroad. Chairman Elliott had until recently been somewhat doubtful about the value of the Connecticut Company investment, but investigation and the company's recent record of earnings have convinced him that the property is worth all or even more than its book valuation."

Stockton Terminal & Eastern Railroad, Stockton, Cal.—The Railroad Commission of California has issued an order extending to April 1, 1915, the time within which the Stockton Terminal & Eastern Railroad may issue $121,000 of its 6 per cent bonds authorized by the commission on March 20, 1913. The commission has also authorized the company to issue two promissory notes for $1,000 each to refund notes now outstanding.

United Railroads, San Francisco, Cal.—First mortgage 6 per cent bonds of the Ferries & Cliff House Railway to the amount of $400,000, have been purchased by E. H. Rollins & Sons and will be offered to investors at 99, yielding about 6½ per cent. The bonds are subject to call any time before maturity at 101½. The Ferries & Cliff House Railway was one of the companies included in the United Railroads when the latter was formed in 1902. The bonds referred to are an extension issue for the remainder of a $650,000 issue, due Mar. 31, 1949, of which a total of $250,000 has been redeemed for cash from the company's earnings. The extended issue is to mature on Dec. 31, 1916.

DIVIDENDS DECLARED

Asheville Power & Light Company, Asheville, N. C., quarterly, 1¾ per cent, preferred.

Aurora, Elgin & Chicago Railroad, Wheaton, Ill., quarterly, 1½ per cent, preferred.

Bangor Railway & Electric Company, Bangor, Maine, quarterly, 1¾ per cent, preferred.

Birmingham Railway, Light & Power Company, Birmingham, Ala., 3 per cent, common and preferred.

Capital Traction Company, Washington, D. C., quarterly, 1¼ per cent.

Cincinnati & Hamilton Traction Company, Cincinnati, Ohio, quarterly, 1¼ per cent, preferred; quarterly, 1 per cent, common.

Columbus Railway, Power & Light Company, Columbus, Ohio, quarterly, 1½ per cent, preferred series A.

Consolidated Traction Company of New Jersey, Newark, N. J., 2 per cent.

Germantown (Pa.) Passenger Railway, quarterly, $1.31¼.

Halifax (N. S.) Electric Tramway, Ltd., quarterly, 2 per cent.

Honolulu Rapid Transit & Land Company, Honolulu, Hawaii, quarterly, 2 per cent.

Interstate Railways, Philadelphia, Pa., 3 per cent, preferred.

Lake Shore Electric Railway, Cleveland, Ohio, quarterly, 1½ per cent, first preferred.

Little Rock Railway & Electric Company, Little Rock, Ark., 3 per cent, preferred; 5 per cent, common.

Mohawk Valley Company, New York, N. Y., quarterly, 1½ per cent.

New York State Railways, New York, N. Y., 1¼ per cent, preferred; 1 per cent, common.

Northern Ohio Traction & Light Company, Akron, Ohio, quarterly, 1½ per cent, preferred.

Public Service Corporation of New Jersey, Newark, N. J., quarterly, 1½ per cent.

Reading (Pa.) Traction Company, 75 cents.

Republic Railway & Light Company, New York, N. Y., quarterly, 1½ per cent, preferred.

Ridge Avenue Passenger Railway, Philadelphia, Pa., quarterly, $3.

Springfield & Xenia Traction Company, Springfield, Ohio, 3 per cent, common.

United Electric Company of New Jersey, Newark, N. J., 2½ per cent.

Virginia Railway & Power Company, Richmond, Va., 3 per cent, preferred.

Washington Water Power Company, Spokane, Wash., quarterly, 1½ per cent.

Western Ohio Railway, Lima, Ohio, quarterly, 1¾ per cent, first preferred.

West India Electric Company, Ltd., Kingston, Jamaica, quarterly, 1¼ per cent.

ELECTRIC RAILWAY MONTHLY EARNINGS

AMERICAN RAILWAYS, PHILADELPHIA, PA.

Period	Gross Earnings	Operating Expenses	Net Earnings	Fixed Charges	Net Surplus
1m., Nov., '14	$424,813	......	......	......	......
1 " " '13	435,395	......	......	......	......
5 " " '14	2,388,114	......	......	......	......
5 " " '13	2,400,334	......	......	......	......

BERKSHIRE STREET RAILWAY, PITTSFIELD, MASS.

1m., Oct., '14	$90,142	*$97,653	$7,511	$17,372	†$24,883
1 " " '13	82,849	*78,983	3,866	15,284	†11,418
4 " " '14	376,051	*334,996	41,055	68,607	†27,552
4 " " '13	389,592	*306,431	83,161	60,015	23,146

CONNECTICUT COMPANY, NEW HAVEN, CONN.

1m., Oct., '14	$676,361	*$500,921	$175,440	$98,754	$76,686
1 " " '13	680,597	*525,234	155,363	89,079	66,284
4 " " '14	3,046,448	*2,175,961	870,487	393,860	476,627
4 " " '13	3,114,757	*2,090,229	1,024,528	360,408	664,120

NEW YORK (N. Y.) RAILWAYS

1m., Oct., '14	$1,242,232	$750,315	$491,917	$363,708	$128,208
1 " " '13	1,304,536	761,366	543,170	367,787	175,383
4 " " '14	4,769,030	2,872,174	1,896,856	1,472,121	424,735
4 " " '13	4,970,814	2,972,060	1,998,754	1,483,913	514,841

PHILADELPHIA (PA.) RAPID TRANSIT COMPANY

1m., Nov., '14	$1,959,825	$1,138,110	$821,715	$806,903	$14,812
1 " " '13	2,018,497	1,173,980	844,517	792,251	52,266
5 " " '14	9,870,601	5,696,067	4,174,533	4,040,939	133,594
5 " " '13	10,098,016	5,887,174	4,210,841	3,987,498	223,343

REPUBLIC RAILWAY & LIGHT COMPANY, NEW YORK, N. Y.

1m., Nov., '14	$244,251	*$146,377	$97,874	$82,894	$14,980
1 " " '13	251,827	*153,425	98,402	85,870	12,532
12 " " '14	3,066,514	*1,847,410	1,219,134	1,000,700	218,434
12 " " '13	2,981,775	*1,857,535	1,124,241	1,006,439	117,802

RHODE ISLAND COMPANY, PROVIDENCE, R. I.

1m., Oct., '14	$468,735	*$337,179	$131,556	$118,551	$13,005
1 " " '13	462,302	*343,222	119,080	105,739	13,341
4 " " '14	2,014,167	*1,381,168	632,999	474,500	158,499
4 " " '13	2,056,689	*1,373,605	683,085	421,657	261,428

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*Includes taxes. †Deficit.

Traffic and Transportation

B. R. T. SAFETY BULLETIN NO. 6

Just before Christmas the instruction branch of the surface lines of the Brooklyn (N. Y.) Rapid Transit Company issued Bulletin No. 6, dated December. The bulletin was very tastefully arranged, being printed in black on red paper with holly at the top and showing the dates 1914 and 1915. On the cover was the following: "Your being careful and courteous will make others enjoy A Merry Christmas and A Happy New Year." The following table contained in the bulletin shows the percentage of decrease in accidents for October and November, 1914, over the same months last year:

	Percentage of Decrease	
Accidents	October, 1914	November, 1914
Car collisions	36.1	59.2
Car and vehicle collisions	26.9	29.2
Cars striking persons	14.8	8.9
Boarding and alighting	8.9	7.4

The bulletin then said:

"This is evidence of some mighty fine work in preventing and avoiding accidents. It is greatly appreciated and we sincerely hope each and every one of you will continue with the good work.

"There were only twelve car collisions on the entire surface system during November, which lowers the record for car collisions in any one month. This is a remarkable showing you have made when it is considered that there are 2000 cars operated daily and that the majority operate through the congested districts of lower Fulton Street, Brooklyn Bridge and Williamsburg Bridge and also in and around the depots. Never relax your constant watchfulness for danger.

"Christmas trees will soon be placed upright on the curb in front of stores located at street corners and, when placed in this manner they obstruct the view to the extent that in many cases it is practically impossible for motormen to see a vehicle approaching from the intersecting street until the car reaches the corner. Be extremely careful during the holidays. When the drivers of vehicles are out late at night they are anxious to get home, therefore, they will very often drive recklessly at a high rate of speed in front of cars. All of the drivers are not reckless, but be on the alert for the reckless driver. Never race up to a car, a vehicle or a street corner and try to stop quickly.

"Several accidents have occurred recently where pedestrians, carrying umbrellas, have either walked into the side or directly in front of a car. During stormy weather, a great many hold an umbrella over their head in such a manner as to make it impossible for them to see where they are going. Children wearing rubber hoods over their head during stormy weather have their view obstructed to a certain extent and they should be watched as closely as those carrying umbrellas. Also, men carrying large bundles upon their shoulder have their view obstructed, causing them, in many cases, to walk directly in front of the car. Not only look out for the reckless driver but also look out for the thoughtless pedestrian.

"We wish you all A Merry Christmas and A Happy New Year."

The bulletin was issued by E. C. Clarke, supervisor of instruction of the company, with the approval of William Siebert, superintendent of surface lines.

FIVE PER CENT RATE INCREASE GRANTED

The Interstate Commerce Commission on Dec. 16 decided that steam railroads in official classification territory should be allowed to make a horizontal rate increase of 5 per cent. It is estimated that this will result in increased earnings of about $50,000,000. The decision covers all rates in the territory with the exception of rail and lake, bituminous coal and coke, and anthracite coal and iron ore rates, all of which have been previously adjusted or are now under separate review. Rates on cement, starch, brick, tile, clay and plaster, which were denied in the preceding grant for the central territory, may now be increased. In handing down its decision, the commission states that the financial problems of the carriers have undoubtedly been made much more acute by the war and that if rates are to be set to afford reasonable remuneration of the carriers, consideration must be given to the increased hire of capital as well as to other increased costs. The commission expects the constructive work presented in its original report for the purpose of increasing net revenue will be carried on without interruption. There were two dissenting opinions to the decision. Commissioner Harlan agreed that the railroads need increased revenues, but he dissented from the course approved in the belief that the decision unlawfully shifts the burden of the carriers' troubles upon the interstate shipper. Commissioner Clements objected to the entire decision on the ground that no prior case before the commission or any court decision has held that the need of a carrier for money is in itself proof of the reasonableness of rates increased to meet such need.

ALL FOR FIVE CENTS

Gerald Stanley Lee, author of "Crowds," headed his talk in the New York Sunday *World* of Dec. 20 "A Street Car Christmas." In the course of his remarks Mr. Lee said:

"When I got home and was sitting by the fire in my slippers I fell to thinking again of the street car. It came over me gradually how much that street car meant —what a deep, wise and rather wonderful street car it was. I felt a little rebuked when I thought about it. The street car had apparently—all when I wasn't knowing—held me up quietly, good naturedly, made me stand perfectly still and put over on me an Idea! I recalled all the faces and the attitudes of those people I had been with in the car, and all the while that gay, mocking little fare recorder up there above their heads singing to them of the seats they were paying for that they hadn't got. All jammed full of kindness and hope! A kind of small, neatly packed-up, rolling America. The money singing away up over their heads, and people standing and joining in the chorus. Inconvenience and joy! Anybody coming over to this country and wishing to see America and see it soon, should be shown at once into such a street car. So as I sat by my fire I felt rebuked. I thought what a wonderful street car it was I had stood up and found fault in. It was a deep and wise street car. Elijah's chariot looping the loop and making a great idle, useless, glorious, lonely flourish in the heavens, was nothing—not as a sign of the times or a prophecy of the world—to that street car bowling jovially up the hill. Elijah's being grabbed decorously and caught away in the heavens all alone was not so essentially religious as what had happened to me that afternoon —and all for 5 cents."

Freight Rights Granted.—The Worcester (Mass.) Consolidated Street Railway and affiliated companies have been granted the right to carry freight and baggage in Oxford, Mass., by the Public Service Commission.

Approval of Folding Steps at Boston.—The Massachusetts Public Service Commission has approved the application of the Bay State Street Railway for the right to use double folding running boards on open cars of the Wason type and single-folding running boards on cars of the Bay State make.

"Safety First" Suggestions.—A department of *Trolley Topics*, the journal of the Louisville (Ky.) Railway, is given over to "safety first" suggestions from employees. The current issue of the publication, which is distributed among the men and sent to the newspaper offices, contains many suggestions.

Ice Interrupts Traffic.—Needle ice at the Decew Falls generating plant of the Dominion Power & Transmission Company choked the flumes during the night of Dec. 15 and power had to be shut off. The local railways in Hamilton, Ont., and several interurban lines were at a standstill for about five hours.

"Jitney" Bus a Menace in Everett.—Attorney J. A. Coleman, Superintendent George Newell and K. K. Carrick, representing the Everett Railway, Light & Water Company, Everett, Wash., appeared before the City Council recently to ask the city to bring action looking to the regulation of the auto-bus business.

Semi-Annual Safety Banquet.—The semi-annual banquet of the "safety first" committeemen of the Union Traction Company of Indiana was held at the Doxey Hotel, Anderson, Ind., on Dec. 1. H. A. Nicholl, general manager of the company, acted as toastmaster. Seven prize essays written by employees of the company were read.

Hearing on Fare Increase Petition.—The public hearing on the petition of the Charleston-Isle of Palms Traction Company to the Railroad Commission of South Carolina to increase the round-trip fare between Charleston, S. C., and the Isle of Palms from 30 cents to 40 cents was held recently. The hearing will be continued.

Fire in the New York Subway.—Fire in a subway train of the Interborough Rapid Transit Company, New York, N. Y., at the peak of the morning load on Dec. 21 started a rush of passengers on the platform of the Seventy-second Street express station. A man was cut by glass from a broken window and several women fainted. Traffic was delayed for twenty minutes.

Wage Question at Wilkes-Barre.—Thomas A. Wright, general manager of the Wilkes-Barre (Pa.) Railway, has offered an increase in wages to the trainmen in the employ of the company amounting to 1 cent an hour for the first year and an additional cent an hour for the next two years of a three-year contract. The agreement between the company and the men expires on Dec. 31.

Service Action Contemplated.—Counsel for the Public Service Commission of the First District of New York has been instructed to begin legal proceedings against the Interborough Rapid Transit Company to force it to live up to the orders of the commission concerning traffic during the non-rush hours. This means that the commission either will institute mandamus proceedings or will start a penalty action.

Health Crusade in Kansas City.—The sanitation inspectors of the board of health of Kansas City, Mo., Dec. 1 began on a campaign to stop the practice of spitting in street cars. The Metropolitan Street Railway is assisting to the extent of granting badges to the inspectors permitting them to ride free on the cars. The inspectors also will urge upon the conductors the necessity of proper ventilation in the cars.

Claim Agent Prepares Safety Hints.—The United Railroads, San Francisco, Cal., has included as a supplement to its magazine for December a series of safety hints by the claim agent, arranged in placard form for conspicuous display. The hints are addressed to motormen and conductors. They are concluded with the statement that any suggestions relative to the prevention of accidents will be welcomed by the claims department.

"Near Side" Stop Record in New York.—First reports of the operation of the near-side car-stop regulation during September, October and November indicate that it has materially promoted street safety. On the lines of the Third Avenue Railway during this period the number of crossing accidents fell to 1061 from a total of 1306 for the corresponding period last year. These figures include all car and knock-down accidents which occurred at street intersections only.

Safety Zones Recommended for Columbus.—After a trip to Detroit where they studied the safety zone system, Director of Public Safety Barger and Chief of Police Carter of Columbus, Ohio, have decided to recommend to the Council committee on streets the adoption of the plan for use in that city at such street intersections in the congested business district as have become especially dangerous for pedestrians. Director Barger has also inspected the traffic signal system installed some time ago at 105th Street, Cleveland.

Install Speed-Control Signals.—As a result of the investigation conducted by the Public Service Commission of the First District of New York into the accident and fire in the Lenox Avenue branch of the subway at 142nd Street on Sept. 29, the Interborough Rapid Transit Company has notified the commission that, in accordance with the recommendation of the commission's engineers, it will install speed-control signals on both south-bound tracks approaching the junction at this point. This will prevent a repetition of the collision which caused the fire.

Christmas Cards to Employees.—The public relations department of the Mahoning & Shenango Railway & Light Company, Youngstown, Ohio, of which R. P. Stevens is president, enclosed with its Dec. 20 pay checks to all employees the following notice: "At this time of the year when all mankind seeks to bring joy and happiness into the hearts and lives of those dear to him, let us not forget to take courtesy, kindliness and thoughtfulness for others into our work that we may handle the Christmastide rush in a spirit that is worthy of the gladsome season. May your Christmas be a merry one and may the New Year dawn in prosperity for you individually and for us in our common interest.—Mahoning & Shenango Railway & Light Company."

Gold Pieces Distributed in New York.—The Interborough Rapid Transit Company and the New York Railways gave a $5 gold piece as a Christmas present to each of their employees who receive $115 per month or less in salary. The subway and elevated employees received $43,500 and the surface railway employees more than $26,000. Frank Hedley, vice-president of the companies, in announcing the gift stated in a general order to the employees that it is being made in appreciation of their efforts in maintaining at all times the highest degree of comfort and convenience to the company's patrons. This is the third year that the gold pieces have been given to the Interborough Rapid Transit Company employees and the second year that the New York Railways' men have received them. The gift applies only to those employed prior to Jan. 1, 1914.

New Transfers in Portland.—On Jan. 1, the Portland Railway, Light & Power Company, Portland, Ore., will put into use a new system of transfers to apply on all the urban lines. Supplanting the present system, which provides one general form of transfer slip, punched to indicate originating line and secondary line of fare, the new system will have two forms for each line, one for each direction. A new feature is a stub for intermediate travel, to be used in cases where two transfers are to be made. The first conductor issues the slip and the second conductor tears off the stub, leaving theremainder of the slip for the third conductor. Another stub is printed "P. M.," but this is torn off by the issuing conductor if the slip is issued in the morning. The hours from one to twelve are printed in black type in a row, with a space marked off into quarters adjoining each.

Front-End Collection System Working Well.—*Electric Railway Service*, published in the interest of the Detroit (Mich.) United Railway, contains in its issue of Dec. 11, the following appeal to its patrons for their co-operation in connection with the trial of the front-end collector system: "The experiment of admitting passengers through the front doors of Woodward and Hamilton cars between 4 p. m. and 6 p. m. at the Pontchartrain, State and Grand River crossings is working out very nicely. There can be a great improvement if intending passengers will have the exact fare—cash, ticket or transfer—ready. For tickets, transfers and change it is necessary to board the car in the rear. The purpose of the experiment is to find some way of getting the cars through the congested district in shorter time. To accomplish this it is absolutely necessary for the passengers to be prompt."

Recent Accident Record in Louisville.—Comparison of records of the Louisville Railway Company for the months of November, 1913, and November, 1914, show a marked decrease in the ratio of accidents to mileage, one of the benefits attributed to the "safety first" campaign which has been conducted by the company. In November, 1914, there was one accident to every 2219 miles negotiated by the company's cars. Last November the ratio was one accident to every 2323 miles. Averages follow for the past four months on seven of the company's lines: Oak Street line, 4410 miles to each accident report; Twelfth and Fifteenth Street line, 3179; Second Street, 2814; Portland and Shelby Streets line, 2802; Market Street line, 2776; Fourth Avenue line, 2531, and Broadway line, 2490. Three motormen have not been involved in a vehicle collision in nearly four years.

Another Safety Campaign.—The Westchester Street Railroad, White Plains, N. Y., has inaugurated a "safety first" campaign among its employees. On Dec. 17 lectures on accident prevention were delivered to both the day and the night shifts by a representative of the Independence Inspection Bureau, Philadelphia. Slides were shown made by the bureau from pictures taken on various electric railroads and by a score or more of the Brooklyn Rapid Transit System's series on accidents to children and by collision with vehicles. J. H. Calhoun, superintendent of the company, prefaced the lectures with a plea to the men that they exercise the greatest care at all times. The company has required all its platform men to undergo an examination by a local optician. Those whose sight is found to be defective are required to provide themselves with glasses fitted according to the optician's prescription.

Package Service in Memphis.—The Memphis (Tenn.) Street Railway has put its first package car in operation, one car serving for the trips from Memphis to Raleigh, Memphis to Normal and Memphis to Lake View, with a second trip each day to Raleigh. The service is primarily for the benefit of the suburbanites. Service will not be rendered in the central portion of the city. A general classification of 15 cents for first-class, 12 cents for second-class and 10 cents for third-class express has been announced. Foodstuffs and canned goods are carried for 10 and 12 cents a hundred, and there will be special rates for green groceries, vegetables, etc. A minimum charge of 15 cents will be made from point to point on the same line, and from a point on one line to a point on another a charge of 1½ cents, with a maximum charge of 25 cents, will be collected. Schedules of the service and rates are being prepared and will be supplied to the public in printed form.

New Stop System in Salt Lake.—The Utah Light & Traction Company, Salt Lake City, Utah, has announced a new system of stops to be followed in operating its cars. At intersections in the paved districts, for stops on the near side, the front end will be stopped even with the cross walks. Far side stops will be made so that the rear of the car will be clear of the crosswalk. In the business district cars will pull up a full car length from the crosswalk on the far side before stopping. On unpaved streets when cars are bound toward the business district, they will be stopped with the rear platform at the crosswalk for passengers. When cars are outbound, from the business district, they will be stopped with the front platform at the crosswalk on the unpaved streets, except that during muddy weather they will be stopped with the rear platform at the crosswalk. Passengers desiring to alight will be requested by the trainmen to leave by the rear door. At the junction of paved and unpaved streets the car will be stopped so that passengers may board or leave them on the pavement.

Electric Railway Furthers Farming.—The following announcement has been made by the Cumberland County Power & Light Company, Portland, Maine, operating the Portland Railroad and the Lewiston, Augusta & Waterville Street Railway: "All of the freight business of the Atlantic Express Company, which includes freight carloads and parts of freight carloads, will be taken over by the Cumberland County Power & Light Company on Jan. 1, and F. E. Woods, late of the Springfield (Mass.) Street Railway, has been appointed general freight agent of this company with headquarters at Portland. The Atlantic Express Company will continue to handle the express business, but will not handle freight. The rates which we will put into effect will be considerably lower than former express rates and will be designed to develop the farming interests along the 270 miles of system which we operate. We will have close working arrangements with the Maine Central Railroad at all points where we connect, and hope to make our business a developer of more extensive farming along the entire line by placing the farmers in close touch with the markets at rates which will be attractive. At every point on our road where we can take care of the needs of shippers we will arrange to do so." The appointment of Mr. Woods to the company was announced in the ELECTRIC RAILWAY JOURNAL of Dec. 12.

Personal Mention

Mr. J. S. Pevear has resigned as president of the New Orleans Railway & Light Company, New Orleans, La.

Mr. E. J. Bean, formerly attorney for the Public Service Commission of Missouri, has succeeded Mr. William F. Woerner as a member of the commission.

Mr. J. J. Cogan has been appointed general superintendent of the Florence & Cripple Creek Railroad, Colorado Springs, Col., and leased lines, effective on Jan. 1. Mr. Cogan has also been appointed general superintendent of the Midland Terminal Railway.

Mr. James E. Allison, at one time chief engineer of the St. Louis Public Service Commission, has been appointed lecturer in economics in Washington University, St. Louis, Mo. His lectures will deal with the economic principles underlying the regulation of public utilities and the new course will replace in part the second semester's work in general economics for seniors in the school of engineering. Mr. Allison has established a fund for the purpose of awarding cash prizes or in other ways promoting the study of public utility economics.

Mr. W. L. Locke, superintendent of construction of the Stone & Webster Engineering Corporation, has taken up his activities as head of the construction department at Seattle, Wash. Mr. Locke was in Seattle prior to his assuming charge of the transmission line from the Big Creek development project, in California, to Los Angeles, where he was established in charge of the Los Angeles office, under Mr. Shuffleton. Before going to the Big Creek project Mr. Locke had charge of local construction in Seattle for the engineering corporation, which at that time did all of the construction work for the Seattle Electric Company.

Mr. P. C. Dugan has resigned as counsel for the United Traction Company, Albany, N. Y., to become associated in the general practice of law with Mr. S. W. Rosendale, Mr. Albert Hessberg and Mr. Edgar M. Haines, under the firm name of Rosendale, Hessberg, Dugan & Haines. Mr. Dugan was born at Wright, N. Y., on March 10, 1867. In 1889 he was admitted to the bar and immediately began the practice of law in Schoharie County. He moved to Albany in 1892 and in 1901 he became connected with the law department of the United Traction Company. In 1907 and 1908 he served as deputy under Governor Martin H. Glynn of New York, who then was Comptroller of the State.

Mr. Samuel Riddle, superintendent of transportation of the Louisville (Ky.) Railway and the Louisville & Interurban Railway, owned by the same interests, is featured by the Louisville *Times*, in the "Pousse Café" section, which is the joint work of the cartoonist on that paper and the staff humorist. It mostly has fun with the prominent people of the city, but one department is given over to a good likeness of some well-known man with a humorous appreciation of him and of his work. The text in connection with the cartoon, with pleasant references to Mr. Riddle's small daughter, says that since coming to Louisville Mr. Riddle has put into effect many reforms in operation of the local railways, such as to place the Louisville system in the front rank.

Mr. Byron T. Burt has resigned as general manager of the Chattanooga & Tennessee River Power Company, effective on Jan. 1. He will be succeeded by Mr. George S. Baker, who has been auditor of the company since it opened offices in Chattanooga. Mr. Burt will go to Buenos Aires early in the year as manager of the South American Trading Company, and will open the main office of that concern for the sale of American manufactures in Argentina. He has been conspicuous in Chattanooga business circles for several years, having been manager of the old Chattanooga Electric Company until its consolidation with the Chattanooga Railway & Light Company. When the Chattanooga & Tennessee River Power Company was organized to construct the Brady power plant at Hale's Bar on the Tennessee River he was made general manager.

Mr. A. N. Connett, who is chief engineer and a joint managing director of J. G. White & Company, Ltd., London, has accepted the position of a vice-chairman of the Belgian Relief Commission and will take charge of administering in Belgium the distribution of the food and other means of relief being sent to that country from America. This appointment will require Mr. Connett to make his headquarters in Brussels for the next few months, but his executive ability and long experience in the direction of large business affairs in America and in different European countries eminently fit him for the efficient organization and direction of this important philanthropical work. Mr. Connett is an American, and before taking up residence abroad some eighteen years ago, built the underground conduit electric railway lines in Washington, D. C. He is now in this country but expects to leave for London on Dec. 30, there to receive instructions before going to Brussels.

H. B. CAVANAUGH

Mr. H. B. Cavanaugh, elected president of the Central Electric Railway Accountants' Association at the meeting in Dayton, Ohio, on Dec. 11 and 12, was reared on a farm in northern Ohio and remained there until he was twenty-two years of age. Having completed a course in stenography, he entered the office of what is now the Cleveland, Southwestern & Columbus Railway as stenographer about sixteen years ago. The company was then operating 39 miles of track, connecting Cleveland and Berea and Cleveland and Elyria. After serving about a year and a half as stenographer Mr. Cavanaugh was appointed bookkeeper. Two years later he was made auditor. Mr. Cavanaugh has served continuously in the department of accounts. The company now operates 215 miles of road. He was one of the charter members of the Central Electric Railway Accountants' Association and served during the past year as first vice-president of the association.

Mr. D. D. Curran, now president of the New Orleans & Northeastern Railroad, has been elected president of the New Orleans Railway & Light Company, New Orleans, La., to succeed Mr. J. S. Pevear, resigned. Mr. Curran was born in Ireland. He entered railway service in 1873 as a brakeman on the Pennsylvania Railroad, which position he held for five years. He was then successively freight conductor of the Mobile & Montgomery Railroad, passenger conductor of the same road, yard master of the Louisville & Nashville Railroad at Montgomery and train master of the same road at Birmingham, Ala. From 1887 to 1893 Mr. Curran was connected with the Central of Georgia Railroad successively as superintendent of the South Carolina division, superintendent of the Southwestern division, superintendent of the Columbus & Western division and superintendent of the Savannah and Western division. He was appointed to the last mentioned position in 1892. From February, 1893, to August, 1907, he was superintendent of the New Orleans & Northeastern Railroad. In August, 1907, he was elected president of that company. Mr. Curran will assume his new duties in February. Commenting editorially on the election of Mr. Curran, the New Orleans *Times-Picayune* said recently: "Mr. Curran enjoys respect and confidence in this community. He has been in charge of the Queen and Crescent line for twenty years, and has had an opportunity to prove his ability in that position, to show that he understands the railroad business, and that he knows local conditions and desires. The fact that Mr. Curran is a local man will, without any narrow prejudice in the matter, better qualify him for the position."

OBITUARY

Elmer E. Spofford, chairman of the Maine Railroad Commission until the creation of the Public Utilities Commission, died in Deer Isle on Dec. 12, aged fifty-two years.

Construction News

Construction News Notes are classified under each heading alphabetically by States.

An asterisk (*) indicates a project not previously reported.

RECENT INCORPORATIONS

Willimantic & Manchester Street Railway, Willimantic, Conn.—Chartered in Connecticut to build an electric line to connect Willimantic, Hop River, Andover, Bolton and Manchester, 18 miles. T. J. Spellacy, Hartford, and associates are interested. [E. R. J., Dec. 19, '14.]

***Carolina, Greenville & Northern Railroad, Greenville, Tenn.**—Chartered in Tennessee to build a 30-mile electric railway from Kingsport to Newport, Tenn. Capital stock, authorized, $1,500,000. Common stock, $1,000,000. Preferred stock, $500,000. Much of the right-of-way has been secured. The line will connect at Kingsport with the Clinchfield Railway and at Newport with the Southern Railway. Officers: H. S. Reed, Los Angeles, president; James L. Callahan and Kirby Thomas, New York, vice-presidents.

FRANCHISES

Los Angeles, Cal.—The Public Utilities Committee of the City Council is considering the proposed notice of sale for the franchise for an incline railway in Griffith Park, applied for by Colonel Lewis Ginger. Arrangements have been made to begin work on this line as soon as the franchise is granted. This proposed line will be built on the northeastern side of the park and will extend 1850 ft. to the top of Mt. Hollywood to the site for placing an observatory. [E. R. J., Oct. 31, '14.]

Pasadena, Cal.—The Pacific Electric Railway has officially accepted the thirty-year franchise for its double-track line on North Lake Avenue in Pasadena.

Bristol, Conn.—The Bristol & Plainville Tramway Company has asked the Council for an extension of time on its franchise in which to build several extensions of its lines in Bristol and also for permission to change its tracks from Park Street to Divinity Street in Bristol.

***Sanford, Fla.**—I. Michael Sholtz and associates will ask the Seminole County Commissioners for permission to construct a bridge across the St. Johns River at the Monroe Ferry in Sanford. This is a part of a plan to build an electric railway from Daytona to Sanford, via DeLand.

Saratoga Springs, N. Y.—The Hudson Valley Railway has asked the Council for a franchise across Broadway at Congress Street and thus connect its Troy-Saratoga and Saratoga-Warrensburgh lines in Saratoga Springs.

Ironton, Ohio.—The only bid for the twenty-five-year franchise to be awarded by the City Council, opened on Dec. 15, was filed by the Ohio Valley Electric Railway, Huntington, W. Va., which has been operating the local road for some time past. The company proposes to carry passengers at a fare of 5 cents, but it is said that Council will probably insist on six tickets for 25 cents.

Portland, Ore.—The Portland & Oregon City Electric Railway has filed its acceptance of its Tacoma Avenue franchise at the same time filing a bond of $5,000 as required by the city. The franchise is for the use of streets from the southeast section of Portland to and through the downtown business section. Connection is to be made with an interurban line now being built between Portland and Oregon City.

TRACK AND ROADWAY

Birmingham Railway, Light & Power Company, Birmingham, Ala.—About 2.53 miles of new track will be built by this company in Birmingham during 1915.

Phoenix (Ariz.) Railway.—Plans are being contemplated by this company to build a 1½-mile extension in Phoenix from the terminus of the present South First Avenue line to the city limits and ½-mile from the city limits to Riverside Park.

Fresno (Cal.) Interurban Railway.—The 3-mile section of this railway between Fresno and Barton has been placed in operation. The company has asked the commission for authority to issue securities to provide for the extension of the line easterly to the Centerville citrus belt, and also for a branch line to what is known as "Gould Colony," north of Fresno. If the commission authorizes this issuance, work will be begun at once on the construction of the extensions of 26 miles. Power is purchased by this company from the San Joaquin Light & Power Corporation. J. B. Rogers, 625 Market Street, San Francisco, president.

Los Angeles, Cal.—A new survey is to be made by the City Engineer's department of the route of the proposed franchise for the electric line to extend northerly from North Pritchard Street and North Broadway, to reach Glen Alta, Schuetzen Park and the Hermon districts to the boundary limits of South Pasadena. [E. R. J., Nov. 14, '14.]

Pacific Electric Company, Los Angeles, Cal.—Work has been begun by this company laying track on the extension of its line between Harrison Street, Arlington and Corona.

Ukiah, Cal.—Preliminary arrangements are being made to build an electric railway to connect Ukiah, Cold Creek, Upperlake and Potter Valley. Among those interested are E. L. Cunningham, P. Connolly and T. J. Weldon. [E. R. J., Oct. 5, '14.]

Connecticut Company, New Haven, Conn.—This company is asked to consider plans to extend its lines through East Street from Water Street to State Street in New Haven.

Washington Railway & Electric Company, Washington, D. C.—Double tracks will be constructed by this company on Fourteenth Street from F Street to Pennsylvania Avenue; also from Water Street eastward from Fourteenth Street in Washington.

***Safety Harbor, Fla.**—Plans are being considered to build an electric railway in Safety Harbor.

Savannah (Ga.) Electric Company.—The tracks of this company on the Habersham Street line, which have heretofore ended at the intersection with the Atlantic Coast Line Railway right-of-way at Thirty-seventh Street, are now being extended to Forty-fourth Street in Chatham Crescent in Savannah.

Peoria, Ill.—Preliminary arrangements are being made by the citizens of Chillicothe to organize a company, with a capitalization of $5,000, to build an electric railway between Peoria, Ill., and Chillicothe, Ohio. Among those interested are: E. F. Hunter, E. A. Mitchell, E. V. Mattice, John F. Lynch and R. H. Truitt.

Sterling, Dixon & Eastern Electric Railway, Dixon, Ill.—This company plans to build 2 miles of new track in Dixon during 1915.

Freeport Railway & Light Company, Freeport, Ill.—About 1 mile of new track will be built by this company during 1915.

Chicago, Peoria & Quincy, Peoria, Ill.—Woolf Teitel, president of Woolf Teitel & Company, of Utah and California, has arrived in Peoria and is directing the disposition of stock in the proposed railway between Peoria and Quincy. It is expected to begin the construction of this line in the spring. [E. R. J., Oct. 5, '14.]

Bangor Railway & Electric Company, Bangor, Me.—This company has ordered the necessary equipment to build the Harlow Street and Central Street loop in Bangor. The sum of $40,000 will be expended in this work.

Boston, Mass.—A contract was awarded on Dec. 15 by the Boston Transit Commission (B. Leighton Beal, secretary), Boston, for the construction of Section E, Dorchester tunnel, under Ft. Point Channel, a distance of about 3200 ft., to P. McGovern at $1,955,375.

***Monticello & Middletown Railroad, Monticello, N. Y.**—Preliminary arrangements are being made for the organization of this company with a capitalization of $500,000 to build a railway between Monticello and Middletown, via Wurtsboro, Bridgeville and Bloomingburgh. Ultimately this line will be extended west of Monticello into White Lake, Bethel and Jeffersonville. Blake A. Mapledoram, Monticello, engineer, is interested.

Brooklyn, N. Y.—The construction work on the West End elevated line, which is part of the Broadway-Fourth Avenue route of the dual subway system, has been begun. That is the announcement which the Public Service Commission received from Post & McCord, the contractors. The work started on Tenth Avenue, between Thirty-eighth and Fortieth Streets. The steel for this elevated line has all been cast and is lying in the yards of the Public Service Commission, at Greenville, N. J. It will be shipped to Brooklyn as it is needed.

International Railway, Buffalo, N. Y.—This company has asked the Public Service Commission of the Second District for permission to build an extension from Buffalo to Niagara Falls and for permission to issue $3,000,000 of 5 per cent bonds under an existing mortgage to pay for such extension.

***Ilion, N. Y.**—Plans are being made for the preliminary surveys for an electric railway in Ilion. The Business Men's Association and the Board of Trade are furthering the preliminaries in the hope that the project may be taken up and the road constructed.

Richmond Light & Railroad Company, New York, N. Y.—During 1915 this company plans to build about 1½ miles of new track.

Stark Electric Railway, Alliance, Ohio.—Plans have been made by this company to extend one of the Alliance city lines to Marlborough, a distance of 7 miles. It has not yet been decided just when construction will be begun.

Cincinnati (Ohio) Traction Company.—The proposition of establishing an electric line to Fairview Heights was explained by Walter A. Draper, vice-president of this company, to a meeting of residents of that suburb, held under the auspices of the Fairview Heights Civic League. Mr. Draper said that the traction company was willing to establish the route if a "Y" were located near the incline.

Cleveland, Alliance & Mahoning Valley Railway, Cleveland, Ohio.—The 7-mile section of this line between Newton Falls and Leavittsburg is being completed. The grade has all been made and most of the track has been laid. The poles have all been set, but the overhead work is yet to be put up. This railway may be extended on to Warren within the next year.

Cleveland (Ohio) Railway.—A double-track into Garfield Park is being built by this company in Cleveland and it has placed in operation its new line down Warner Road to Bancroft Avenue.

Cleveland, Youngstown & Eastern Railway Company, Cleveland, Ohio.—R. D. Beatty, general manager of this company, was appointed receiver of that portion of the company's property between Chagrin Falls and Garretsville on Dec. 16. The application was filed by the Citizens' Savings & Trust Company, Cleveland, which asked that a mortgage for $52,000 held against that portion of the line be foreclosed. Attorneys stated that that portion of the property has not been on a paying basis since its construction.

Columbus Railway, Power & Light Company, Columbus, Ohio.—Citizens of the North Side are urging that what is known as the stub line on Eleventh Avenue be connected with the Chittenden Avenue line in order to furnish better service for that section of the city. It is possible that this may interfere with the proposed crosstown line on Fifth Avenue, but consideration will be given this point before action is taken.

Dayton, Middletown, Reading & Cincinnati Company, Middletown, Ohio.—Surveys have been completed by this company on its line between Middletown and Cincinnati, 30 miles, and surveys are now under way on the line between Middletown and Dayton, 20 miles. This 50-mile line will connect Middletown, Monroe, West Chester, Sharonville and Reading. James G. Miller, West Chester, president. [E. R. J., Oct. 12, '14.]

Galion, Mt. Gilead & Delaware Electric Railway, Mt. Gilead, Ohio.—Right-of-way has been secured, but on account of being unable to secure financial backing no further progress has been made on this proposed 39-mile electric railway to connect Galion, Westpoint, Mt. Gilead, Cardington, Ashley and Delaware. S. P. Gage, Marengo, president; A. H. Breese, Mt. Gilead, secretary, and T. E. Buck, Mt. Gilead, chief engineer.

Portsmouth Street Railroad & Light Company, Portsmouth, Ohio.—During 1915 this company expects to build a 22½-mile line from Sciotsville to Ironton, Ohio.

Springfield (Ohio) Electric Railway.—This company has placed in operation its Lowry Avenue extension in Springfield.

Ontario West Shore Railway, Goodrich, Ont.—The Ontario Hydro-Electric Commission is surveying the route of this railway between Kincardine and Goodrich. [E. R. J., Nov. 14, '14.]

Wentworth Street Incline Railway, Hamilton, Ont.—The Board of Control had a conference with G. F. Webb, with reference to the extension of this railway. Mr. Webb explained plans which had been prepared, showing tracks passing under the Toronto, Hamilton & Buffalo Railway, and across the Grand Trunk Railway on the level, and extending north from the present terminus, sufficiently far to reduce the existing gradient, and stated that he would undertake to carry out these plans if the city would construct a permanent roadway on Wentworth Street. The members expressed a general approval, and asked that complete details be submitted, so that a definite decision might be reached and a recommendation made to the City Council at an early date.

Toronto, Ont.—Ratepayers in the northwest section of Toronto are agitating for a civic car line on Lansdowne Avenue, south from the St. Clair Avenue line. Extension of the Gerrard Street civic line is being discussed by the ratepayers. The line does not at present extend to the eastern city limits.

Toronto, Ont.—Estimates have been given out covering the projected Hydro-electric railway in Elgin and Middlesex counties. Five possible routes are being considered, but only one of these is estimated to yield a surplus. This is a railway running between London and Tillsonburg, Ont., via Aylmer. This line would connect with the London & Port Stanley Railway at Westminster, and extend through Belmont, Lyons, Aylmer, Springfield, Brownsville and Tillsonburg. The estimated capital cost is $892,000.

Hagerstown, Greencastle & Mercersburg Railway, Middleburg, Pa.—C. S. Johann, consulting engineer, 50 Broad Street, New York, and associates have secured the control of this railway, whose main office is in Greencastle, Pa. The affairs of the company will be managed by Mr. Johann; plans and specifications for the completion of the work will be completed at an early date. At a recent meeting the following officers were elected: C. S. Johann, New York, president and general manager; E. J. Hutter, New York, treasurer, and F. S. Simons, New York, secretary. [E. R. J., Jan. 18, '14.]

***Marietta, Pa.**—The citizens of Maytown and Marietta are considering plans to build an electric railway between Maytown and Marietta. Several surveys have been made for the proposed line, and it is expected that work will be begun in the spring.

Titusville (Pa.) Electric Traction Company.—A 12½-mile line between Tryonville and Cambridge Springs will be constructed by this company during 1915.

Denison & Sherman Railway, Dallas, Tex.—Plans are being made by this company to build a loop line in South Denison.

Puget Sound Traction, Light & Power Company, Seattle, Wash.—This company has announced its intentions of expending not less than $100,000 in making necessary repairs on the right-of-way of the Seattle-Tacoma Interurban, between Seattle and Tacoma and in constructing two bridges, one over White River, 1 mile south of Kent, and the other over Black River, at Duwamish. Both structures will be of steel and the company is in the market for this material.

Charleston, Parkersburg & Northern Railroad, Parkersburg, W. Va.—The proposed line of this railway is 56 miles long from Charleston to Palestine, W. Va. It will connect at Palestine with the Little Kanawha River branch of the Baltimore & Ohio Railroad extending from Palestine to Parkersburg, 30 miles. The route chosen for the new line is via Sissonsville, Cicerone and Pocotalico River. The first grade will not exceed 1 per cent and the second not over 1½ per cent. Few bridges will be necessary, but where they are needed short spans of the through plate girder type will be used. Bids for construction will be opened about Jan. 1. [E. R. J., Oct. 5, '14.]

Appalachian Power Company, Bluefield, W. Va.—During 1915 this company plans to extend its city lines about 1 mile.

Badger Railway & Light Company, Milwaukee, Wis.—During 1915 this company plans to continue its line to Elkhorn and Lake Geneva and from Whitewater to Jefferson, a distance of 25 miles.

SHOPS AND BUILDINGS

Pacific Electric Railway, Los Angeles, Cal.—This company has opened its new station at the corner of Sherman Way and West F Street in Van Nuys.

Benicia Land & Terminal Company, Benicia, Cal.—This company has opened offices at 310 Georgia Street in Vallejo. [E. R. J., Oct. 5, '14.]

Jacksonville (Fla.) Traction Company.—Plans are being prepared by this company to build large modern storage track yards on its property to the north of the carhouse on Riverside Avenue in Jacksonville. It is moving its sub-offices from the old two-story building to the structure across the street and in the grounds surrounding the power house.

Metropolitan Street Railway, Kansas City, Kan.—Plans are being considered by this company to build a new union interurban station in Kansas City.

Boston (Mass.) Elevated Railway.—This company is asked to consider plans to build a new subway station at Arlington Street in Boston. Five hundred dollars has been raised by residents of Back Bay and Boylston Street for the purpose of obtaining legislation favoring the establishment of this new station.

Worcester (Mass.) Consolidated Street Railway.—This company has opened a new waiting station at 10 Monument Square in Worcester.

United Railways of St. Louis, St. Louis, Mo.—A plan for the erection of a passenger station at Main and North Market Streets in St. Louis, as a stop for all trains, and the building of a new United Railways line, with the station as an initial point, and the west city limits as a terminus, is being considered.

Hornell (N. Y.) Traction Company.—Plans are being made by this company for the erection of an addition to its carhouses on Adsit Street in Hornell. The addition will be 109 ft. long and will join the present structure on the Adsit Street side. The contract will be awarded at once so that the building can be completed early in the spring. It will be used as the machine shop, and the present machine shop will be used as a paint shop.

Ogden, Logan & Idaho Electric Railway, Ogden, Utah.—A new brick depot, a new freight house and new carhouses will soon be constructed by this company in Preston.

Rutland Railway, Light & Power Company, Rutland, Vt.—The new freight and express station on Strongs Avenue in Rutland has been completed and will be opened at once by this company.

POWER HOUSES AND SUBSTATIONS

Connecticut Company, New Haven, Conn.—Work has been begun by the Sperry Engineering Company for the Connecticut Company on an extensive addition to the buildings formerly used as a carhouse and power house in Ferry Street, near Quinnipiac River, in New Haven. It is stated that the enlargement of this plant, which has been used for storage purposes for some time past, will cost about $16,000. It is also planned to erect interior partitions of fireproof construction and a bulkhead will also be erected on the river front. When completed the building will be used as the storage house of the company in this city, and practically all of the supplies used in repair of equipment and in other work will be quartered here.

Stark Electric Railway, Alliance, Ohio.—An addition is being constructed to the power house near Alliance by this company.

Cushing (Okla.) Traction Company.—This company has ordered from the Westinghouse Electric & Manufacturing Company one 500-kw geared generator and turbine for its new 1500-volt line. This new line extends from Cushing to Drumwright, Okla., and will be primarily a freight road, drawing most of its traffic from the oil fields.

Manufactures and Supplies

Boston (Mass.) Elevated Railway, noted in the ELECTRIC RAILWAY JOURNAL of Nov. 14 as expecting to purchase 100 trailers, has ordered this equipment, including car bodies and trucks, from The J. G. Brill Company.

Norton & Taunton Street Railway, Norton, Mass., will probably purchase during 1915 ten or twelve new cars, equipped, to replace the fifteen or sixteen open and closed cars which were destroyed on Dec. 10 in the Norton Center carhouse fire.

TRADE NOTES

Simmen Automatic Railway Signal Company, Buffalo, N. Y., has appointed C. E. Chatfield as sales engineer.

Perry Ventilator Company, New Bedford, Mass., has received an order to equip with ventilators the fifty new cars recently ordered by the Pittsburgh (Pa.) Railways from the Pressed Steel Car Company.

Prof. Dugald C. Jackson of D. C. & W. B. Jackson, consulting engineers, Chicago and Boston, authorizes the statement that he has not been engaged by the Merchants' Association of New York City to investigate certain matters relting to the New York Edison Company. A statement to this effect has appeared in one or two technical papers.

Western Electric Company, New York, N. Y., reports that two days, December 7 and 8 of sleet, rain, cold, high winds and falling trees resulted in 25,000 miles of fallen wire and 1200 poles down on the toll and local lines of the Southern New England Telephone Company. By prompt and effective emergency shipments of material for making temporary repairs from this company's warehouse at West Haven, Conn., it was possible to re-establish toll lines to every exchange in the State by the evening of Dec. 10.

Canadian General Electric Company, Peterborough, Ont., has undertaken to construct buildings and install machinery in its Peterborough plant at an estimated cost of $150,000, in return for which the city agrees to take care of the rental of about three miles of the unused Chemong section of the Grand Trunk Railway, which the Canadian General Electric Company will use for testing purposes for the electric locomotives it proposes to manufacture. The expenditure incurred by the city will be approximately $115 a year.

General Electric Company, Schenectady, N. Y., has received the following orders for electric railway equipment: New Orleans (La.) Railway & Light Company, fifty GE-201, 60-hp, two-motor car equipments with K-36 controllers; Interurban Railway, Des Moines, Ia., four GE-210, 70-hp railway motors; Morgantown & Wheeling Railway, four GE-205, 80-hp railway motors; Auburn & Syracuse Electric Railway, twelve GE-200, 40-hp, two-motor equipments and twelve straight air-brake equipments; Arkansas Valley Railway & Light Company has ordered thirty-two GE-203, 50-hp railway motors and twelve K-35 controllers; Pacific Electric Railway, two GE-222, 140-hp, four-motor car equipments.

ADVERTISING LITERATURE

Shuman Advertising Company, Chicago, Ill., has issued a bulletin in regard to its advertising service for trade and technical journals.

Stone & Webster Engineering Corporation, Boston, Mass., constructing engineers, have issued a catalog describing and illustrating the Dundee Falls hydroelectric development of S. D. Warren & Company and the Falls Village development of the Connecticut Power Company, both recently constructed by this engineering company.

Harrison Dust Guard Company, Toledo, Ohio, has issued a folder describing its journal dust guards, which will be installed on the new cars of the New York Municipal Railway. The guards are designed to obviate cut journals and brasses and prevent delays to trains by hot boxes. These guards are constructed of hard wood, well oiled, and lined with heavy belting leather. The two sections are held yieldingly together by means of two special rods, with two twenty-coil brass springs, housed within the lower section, and secured by two hexagon jamb nuts on each rod.

NEW PUBLICATION

Die electrischen Stadtschnellbahnen der Vereinigten Staaten von Nordamerika (City Rapid Transit Systems of the United States—Construction and Operation) by F. Musil, Consulting Engineer, Vienna. Published by C. W. Kreidel, Wiesbaden, 1913. Two parts, 9½ x 12 in. paper, total, 84 pages exclusive of map inserts.

A Frenchman, Taine, wrote the most famous review of English literature. In the same way it seems we must look for the most comprehensive studies of American rapid transit practice to the publications of foreign engineers who have visited our largest cities to see what could be adopted for or adapted to their own cities. Mr. Musil's two pamphlets are among the latest and best of this kind. They are in the form of reports to the Vienna Rapid Transit Commission Commission für Verkehorsanlagen) which has charge of the present Stadtbahn. This is a steam-driven belt line with many tunnels, and therefore a fit object for electrification. The commission's plans also contemplate the extension of the system by means of three new electric subways each about 4 miles long. Preliminary work on these projects was well under way, but has now been interrupted by the war. As consulting engineer for the Vienna Rapid Transit Commission Mr. Musil was charged to visit the United States twice, in 1911 and 1913. Each time he spent two months studying transit conditions in New York, Boston, Philadelphia, Chicago, Pittsburgh and other cities, enjoying many courtesies from the officials and other experts named in his reports. Mr. Musil's reports are accompanied by numerous maps and drawings in addition to a large number of photographs, chiefly of construction methods and unusual traffic conditions.

RECENT BRITISH DEVELOPMENTS

Liverpool is preparing to point out to the Board of Trade the danger of allowing contracts with German companies, whether registered in England or not, to remain in operation and permitting payments to be made thereon during time of war.

The Brighouse and the Huddersfield Corporations have reached an agreement whereby the Huddersfield Corporation tram system will be extended to Brighouse. The Huddersfield Corporation intends to seek power to construct a tramway from its present line at Ashbrow to a point near the terminus of the Halifax trams. The Halifax Corporation has announced its intention of promoting a bill in Parliament for tramway extensions, to include a line from Brighouse to Rastrick. In this connection it sought the support of the Brighouse Corporation, which replied that as it was already negotiating with Huddersfield, it was unable to deal with Halifax.

The London County Council contemplates increasing its tramcar service. Before additional cars can be run it will be necessary to obtain a temporary supply of power from an outside source. The committee has been in communication on the matter with the London Electric Supply Corporation, which has agreed to provide an additional supply of power up to about 1500 kw at a price of £3 a kilowatt a year and 0.4d. a unit. This compares with the price paid for a supply of power previously obtained from the company of £3 a kilowatt a year and 0.35d. a unit. The increase of 0.05d. a unit is due to the increased cost of coal owing to war insurance risks. The power will be provided at the Lewisham substation, and will be sufficient to enable between fifty and sixty additional cars to be run. The Council's elaborate scheme for the consolidation of its tramways, which would have involved an expenditure of about £800.000 to £900,000, much of it being in the nature of linking-up and doing away with "dead" ends, has been abandoned for the present. It has been decided, however, to proceed to Parliament with the scheme for dealing with electricity in Greater London by means of a system of municipal control with company management. This will involve no immediate capital expenditure.

As there is still considerable opposition to the purchase of the Bristol tramways by the Bristol Corporation, A. Dickinson has prepared a report giving his views as to the financial aspect of the purchase. Mr. Dickinson estimates that the corporation may be called upon to pay about £1,215,000 as the purchase price of the undertaking.

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